

April 2012

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN UPDATE

TECHNICAL APPENDIX VOLUME 2

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

APPENDICES

Technical Appendices, Volume 2

Appendix 2A ..... Technical Memorandum #1: Plans and Policy Review
Appendix 2B ..... Technical Memorandum #2: Goals, Objectives, and Evaluation Criteria
Appendix 2C ..... Technical Memorandum #3: Existing Conditions
Appendix 2D ..... Technical Memorandum #4: Future Conditions
Appendix 2E ..... Technical Memorandum #5: Alternatives Analysis
Appendix 2F ..... Technical Memorandum #6: Preferred and Cost Constrained Alternatives
Appendix 2G ..... Klamath Falls Westside Refinement Plan
Appendix 2H ..... Orindale/Balsam Sub-Area Master Plan
Appendix 2I ..... Klamath Falls Campus Sub-Area Master Plan

Appendix 2A
Technical Memorandum #1: Plans and Policy Review

Angelo planning group LAND USE PLANNING • TRANSPORTATION PLANNING • PROJECT MANAGEMENT

Memorandum

Date: November 30, 2010

To: Mark Willrett, City of Klamath Falls
Stan Strickland, Klamath County

cc: Project Management Team, Technical Advisory Committee, Citizens Advisory Committee

From: Cathy Corliss, Darci Rudzinski, and Becky Dann

Re: Klamath Falls Urban Area Transportation System Plan Update
Technical Memorandum #1: Plans and Policy Review

I. Introduction

This memorandum provides an overview of federal, state, regional, and local documents that comprise the policy framework for transportation planning in the Klamath Falls Urban Area. Although each document reviewed contains many policies, only the policies and information most pertinent to the Klamath Falls Urban Area Transportation System Plan (TSP) Update are included to help focus this work. The information in this memorandum is meant to provide a framework for this planning process. New policies considered for inclusion in the updated Draft TSP should be consistent with the currently adopted policies reviewed here.

Section II of this memorandum is an assessment of how adopted City and County plans and ordinances meet the Transportation Planning Rule (TPR) OAR 660, Division 12. Table 1 in this section serves as the basis for identifying City and County polices or requirements that may be out-of-date or inconsistent with each other. This table reviews the requirements of TPR Section -0045, Implementation of the Transportation System Plan, lists the applicable implementation elements of the TPR, and demonstrates where the adopted City or County regulations comply and where amendments to code language are needed to comply with the TPR.

Section III provides summaries of regulatory documents that contain information pertinent to the development and adoption of an updated TSP for the City Klamath Falls Urban Area. State documents and requirements were reviewed for applicability to transportation planning within the Klamath Falls Urban Growth Boundary (UGB). Regional planning documents that contain policies or regulations with potential impacts to the City and County's transportation system are also reviewed. In the final subsection of this memorandum, the City and County's adopted land use and transportation policies and regulations are summarized

The following documents are reviewed in Section III for policies and regulations applicable to the City and County's transportation planning and resulting TSP Update. The page number where each document's review begins in this memorandum is included for quick reference in the following list.

STATE OF OREGON **27**

Transportation System Planning Guidelines (2008) *27*
Oregon Transportation Plan (2006) *28*
Oregon Highway Plan (1999, last amended 2006) *29*
Oregon Bicycle and Pedestrian Plan (1995) *38*
Oregon Rail Plan (2001) *39*
Oregon Public Transportation Plan (1997) *40*
Access Management Rule (OAR 734-051) *41*
Freight Moves the Oregon Economy (1999) *41*
Oregon Aviation Plan (2007) *41*
State Transportation Improvement Program (2000-present) *42*

REGIONAL AND COUNTY PLANS **45**

Klamath County Comprehensive Plan (2010) *45*
Klamath County Rural Transportation System Plan (2010) *47*
Klamath County Land Development Code *51*
Basin Transit Service Transit Development Plan (1995) *52*
Klamath Falls Urban Area Economic Opportunity Analysis (2009) *55*

LOCAL PLANS AND ORDINANCES **58**

City of Klamath Falls Comprehensive Plan (1981) *58*
Klamath Falls Urban Area Transportation System Plan (1998) *59*
Klamath Falls West Side Refinement Plan (2006) *61*
Orindale/Balsam Sub-Area Transportation Master Plan (2007) *61*
Campus Area Sub-Area Master Plan (2008) *63*
Klamath Falls Community Development Ordinance *65*
Basin View Planned Unit Development Standards (1990) *66*
City of Klamath Falls Public Works Engineering Standards Manual (2003) *66*
Klamath Falls, Oregon Parks Master Plan (1998) *66*
Klamath Falls Airport Master Plan (2005) *68*
2020 Klamath Vision (2010) *69*

II. TRANSPORTATION PLANNING RULE COMPLIANCE

Statewide Planning Goal 12, Transportation, requires cities, counties, metropolitan planning organizations, and ODOT to provide and encourage a safe, convenient, and economic transportation system. This is accomplished through development of Transportation System Plans (TSPs) based on inventories of local, regional and state transportation needs. The Transportation Planning Rule (TPR) implements the state's transportation policies and requires all jurisdictions to complete a transportation system plan (TSP), including local policies and ordinances to implement that plan. Klamath Falls Urban Area TSP was adopted in 1998. The City and County are updating the TSP to accurately reflect the current transportation system and plan for Klamath Falls UGB's future transportation needs. The goal of the update is to establish a set of land use and transportation measures and plans that incorporate recent and planned state and local transportation investments and to reflect the existing population and expected future growth. Specifically, amendments to the TSP will address new development and plans for development within the City's Urban Growth Boundary (UGB).

The City's adopted Community Development Ordinance (CDO) implements transportation policy within city limits and is the principal focus of the following TPR compliance assessment. The County's adopted Land Development Code (LDC) implements transportation policy in the county, including areas within the City's Urban Growth Boundary (UGB), but outside of the city limits. A similar compliance review has been conducted for County ordinances. The tables below list TPR implementation requirements, related existing code language, and, where relevant, TSP and other regulatory provisions that address the requirements. Table 1 reviews City compliance with the TPR; Table 2 contains the County review. These tables include recommendations for changes to the CDO and LDC that will likely be needed to fully implement the updated TSP for the Klamath Falls Urban Area and bring City and County regulations into compliance with the TPR. Recommended changes to local regulatory documents, indicated in **bold text**, are intended to provide guidance to project staff during the update of the TSP. Proposed amendments to the CDO and LDC will be drafted during the planning process and become implementation recommendations for inclusion in the draft TSP.[1]

The applicable portion of the TPR is found in OAR Section 660-12-0045, Implementation of the Transportation System Plan. In summary, the Transportation Planning Rule requires that local governments revise their land use regulations to implement the TSP. The following TPR requirements are paraphrased from Section -0045:

- *Amend land use regulations to reflect and implement the Transportation System Plan.*
- *Adopt land use or subdivision ordinance measures, consistent with applicable federal and state requirements, to protect transportation facilities, corridors and sites for their identified functions, to include the following topics:*
  - *access management and control;*

[1] Draft implementation language will be prepared as part of Task 6: Draft TSP and Implementing Ordinances (WOC #7 under PA #27456), which will include proposed text amendments to the CDO that will implement the updated TSP and address TPR compliance. Note that the City of Klamath Falls is in the process of updating the CDO and that some of the recommendations in Table 1 may be addressed through this process.

- *protection of public use airports;*
- *coordinated review of land use decisions potentially affecting transportation facilities;*
- *conditions to minimize development impacts to transportation facilities;*
- *regulations to provide notice to public agencies providing transportation facilities and services of land use applications that potentially affect transportation facilities;*
- *regulations assuring that amendments to land use applications, densities, and design standards are consistent with the Transportation System Plan.*

- *Adopt land use or subdivision regulations for urban areas and rural communities to provide safe and convenient pedestrian and bicycle circulation and bicycle parking, and to ensure that new development provides on-site streets and accessways that provide reasonably direct routes for pedestrian and bicycle travel.*
- *In MPO areas, adopt land use and subdivision regulations to reduce reliance on the automobile.*
- *Identify improvements to facilitate bicycle and pedestrian trips in developed areas.*
- *Establish street standards that minimize pavement width and total right-of-way.*

Table 1. TPR Requirements and City of Klamath Falls Compliance

TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
(1) Each local government shall amend its land use regulations to implement the TSP.	
(b) To the extent, if any, that a transportation facility, service, or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment.	The table in CDO Section 12.005, Uses Permitted by Zone, does not specifically list transportation-related improvements as a permitted use. **<u>Recommendations:</u> The CDO should be amended to allow transportation improvements in all zones, provided that the proposed improvements implement the transportation system plan and/or can be shown to be consistent with adopted policy.** **In contemplating this change to the permitted use table, the City should also consider if there is a need to differentiate between the types of street improvements allowed outright and those that will be permitted conditionally (e.g., surfaced travel lanes, curbs, gutters, drainage ditches, sidewalks, transit stops, landscaping and related structures and facilities located within rights-of-ways controlled by a public agency; expansion, widening or adding improvements within the right-of-way.)**

Table 1. TPR Requirements and City of Klamath Falls Compliance

TPR Requirement (OAR Section 660-12-0045)	Ordinance Compliance/Recommendations
(c) Where a transportation facility, service or improvement is determined to have a significant impact on land use or requires interpretation or the exercise of factual, policy or legal judgment regarding the application of a comprehensive plan or land use regulation, the local government shall provide a review and approval process that is consistent with 660-012-0050 (Transportation Project Development). Local governments shall amend regulations to provide for consolidated review of land use decisions required to permit a transportation project.	TPR Section -0050 addresses project development and implementation - how a transportation facility or improvement authorized in a TSP is designed and constructed. Project development may or may not require land use decision-making. The TPR directs that during project development, projects authorized in an acknowledged TSP will not be subject to further justification with regard to their need, mode, function, or general location. Through the update project, the Klamath Falls Urban Area TSP will make decisions about transportation need, mode, function and general location for facilities or improvement as required by the TPR. Project development may involve land use decision-making to the extent that determining compliance with applicable local requirements involves policy or legal interpretations. Examples include regulations protecting or regulating development within floodways and other hazard areas, identified Goal 5 resource areas, and local regulations establishing land use standards or processes for selecting specific alignments. A local review and approval process that is consistent with this TPR requirement needs to include public notice and hearing requirements where transportation projects involve land use decision-making. The local approval process needs to include notice to affected transportation facility and service providers, MPOs, and ODOT. Chapter 10, General Provisions, of the CDO includes Section 10.815, Agency Involvement. This Section allows, but does not require, the City to refer any application to the appropriate local, state, and federal agencies for their review and comment. For applications that require a transportation impact study (TIS), which includes proposals for sites that directly access a state highway, submittal of the TIS to ODOT is required (Section 14.050). CDO Section 10.535, Concurrent Applications, allows multiple land use requests to be processed concurrently, a provision that indicates that the local process required to permit a transportation project will be streamlined. The 1998 TSP also documents the coordinated review procedures outlined in Section 9 of the Urban Growth Management Agreement (1981) between the City and the County (See TSP Appendix G). This document establishes procedures between the two jurisdictions for land use actions

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	on land outside city limits but within the UGB. The UGMA also states that the City and County will cooperatively develop standards for these areas, including those for roads so that they will be compatible with City street alignments and extensions (Section 7 of the UGMA). **<u>Recommendations:</u> Section 10.815 should be amended to state that agencies will be notified of applications that may have an impact on their facilities. This section could also indicate what types of agencies (ODOT, DEQ, etc.) and could be expanded to include special districts (e.g. Basin Transit).** **The CDO does not contain specific requirements for notice to ODOT for applicable land use applications. Section 10.610, Notice of Hearing, could include provisions to notice ODOT when a proposal may impact state facilities. For example, under current requirements the City would not be required to notify ODOT of a proposal to modify a land use designation. Proposals that allow more intensive development and are in the vicinity of a State facility, but may not take direct access onto a highway (thereby triggering a traffic impact study and ODOT notice), may still have potential or projected impacts that are of interest to ODOT.**
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities for their identified functions.	
(a) Access control measures.	CDO Chapter 14, Private Site and Public Facility Standards, contains access control standards. Section 14.050 Access and Driveways specifies the minimum spacing requirements for access (public or private) on highways (based on category) and arterial streets. The 1998 TSP's Access Management Plan (Chapter 10) includes recommended guidelines for preliminary site plan requirements addressing access for development proposals that directly or indirectly access a state highway or an arterial. The TSP also recommended applying local access spacing standards as part of the site review process (Appendix G, Plans and Policies Review).

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	<u>Recommendations:</u> The requirements of the CDO currently control access on arterials. Access measures could be expanded to include limiting access onto collectors, as well as standards for driveway and public road spacing, median control, and signal spacing standards on local facilities. Additional access control measures to consider include limiting the number of access points based on land use type and enabling the City to require shared access as a condition of land division approval or design review. **CDO standards should be updated to implement the recommendations of the TSP and be consistent with the functional classification of roads. The updated TSP's Access Management Plan will be used as a guide to develop updated code language.**
(b) Standards to protect the future operations of roadways and transit corridors	The CDO requires a traffic impact study (TIS) for all proposed zone changes, subdivisions, partitions, new development and or/redevelopment if the proposal is for a site that directly accesses a state highway, if a comprehensive plan amendment is required, or if there is a traffic safety or operational deficiency recognized in the adopted TSP and the proposal exceeds specific generation or mitigation thresholds (Section 14.050.10). Proposals that require a TIS must submit the information to both the City of Klamath Falls and ODOT for review. CDO Section 14.051, Traffic Impact Study Requirements, lists the requirements for the traffic analysis. The Public Works Engineering Manual requires that all development proposals submit a traffic analysis with the Development Review application (Section 8-2, Traffic Studies). New development that will cause degradation below acceptable operating levels (generally, LOS D during the PM peak hour) is required to provide mitigating transportation system improvements that will restore the level of service to the acceptable standard. The Public Works Engineering Manual includes a list of information typically required for a TIS (p. 8-4). The 1998 TSP also includes recommendations for required elements of a TIS (Chapter 10), not all of which are codified in the CDO. **<u>Recommendation:</u> While the existing TIS requirement should provide decision-makers with adequate information with which to determine the impacts of land use decisions**

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	on the transportation system, the City should consider simplifying the TIS requirement by applying it to all development proposals that meet a given trip threshold. In addition, minor improvements to Section 14.051 could be made to distinguish between submittal requirements and approval criteria. Adding cross-references to the Public Works Engineering Manual can also clarify what is required for a TIS and the circumstances under which mitigation will be required. Also recommended is adding a statement in CDO Section 14.051 that confirms the City's ability to condition approval to require needed transportation improvements.
(d) Coordinated review of future land use decisions affecting transportation facilities, corridors or sites	The CDO does not provide a process for coordinated review of future land use decisions that affect transportation facilities. **<u>Recommendations:</u> Section 10.815, Agency Involvement, should be amended to state that agencies will be notified of applications that may have an impact on their facilities. Amending CDO Section 10.610, Notice of Hearing, to include requirements to provide notice to ODOT and relevant transportation service providers or special interest transportation groups (such as those advocating bicycle or freight interests) could help ensure "coordinated review" of land use decisions affecting transportation facilities.**
(e) Process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities	The CDO does not explicitly call out a process to apply development conditions in order to minimize impacts to transportation facilities. The CDO does, however, give the City the following authority. The CDO contains provisions to condition approval of conditional uses (11.110 Decision - Conditions of Approval) through an Administrative Action (approval by the Planning Director). Types of conditions listed include requiring an increase in street width (3) and requiring dedication and improvement of additional right of way (4). The City also has the authority to condition approval of a planned unit development (Section 12.372 Criteria for Approval). Review Criteria for proposed tentative subdivision plans enable the Planning Commission to require street dedication as a condition of approval (11.815(6)). **<u>Recommendations:</u> The CDO should explicitly give the City the ability to apply conditions of approval to new**

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	development and should specify that one of the objectives in imposing conditions will be to minimize impacts to transportation facilities. The subdivisions section (11.810 Tentative Plan Content) should be amended to include a requirement that development proposals include data on the potential traffic impacts where a TIS is required pursuant to Section 14.050.10. For additional related recommendations, see the TPR requirements in section 660-012-0060 below.
(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: land use applications that require public hearings, subdivision and partition applications, applications which affect private access to roads, applications within airport noise corridor and imaginary surfaces which affect airport operations.	Section 10.610, Notice of Hearing, of the CDO does not specify the types of decisions that require notice to public agencies, nor which public agencies should receive notice. **<u>Recommendations:</u> The City should amend the CDO to include a requirement that ODOT and other affected public agencies (DEQ, Oregon Department of Aviation, Klamath County, Basin Transit etc.) receive notification of land use applications that meet the descriptions in this TPR requirement.**
g) Regulations assuring amendments to land use designations, densities, design standards are consistent with the function, capacities, and levels of service of facilities designated in the TSP.	Pursuant to CDO Section 10.105, text amendments to Chapters 10, 11, 12, 13 or 14 may only be initiated by the City Council or Planning Commission. Under Section 10.505, zone changes may be initiated by the property owner or by the City (Council or Commission). Chapter 10 does not include approval criteria for zone changes or plan or ordinance amendments. **<u>Recommendations:</u> At a minimum, the CDO should dictate that approval of plan or ordinance (text) amendments is contingent on finding that the proposed amendment complies with all applicable Statewide Planning Goals, which would include compliance with the TPR. The City should consider further amending the CDO to specifically state that approval of amendments to land use designations, densities, and design standards is contingent on findings of consistency with the planned transportation system, as adopted in the City's TSP. Criteria for zone change approval (Section 10.505) should include the provision that adequate public facilities, services, and transportation networks are in place or are planned to be provided concurrently with the development of the property.** **In addition, because Klamath Falls has a one-map system**

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	and a zone change constitutes an amendment to the Comprehensive Plan land use designation,code language should be revised to include reference to TPR Section – 0060 (see Section 660-12-0060 below), or should include language from this TPR section that states under what circumstances a plan or land use regulation amendment "significantly affects a transportation facility" and the mitigation that is required. The options for ensuring that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the TSP should be included in the CDO or, at a minimum, code language should reference the relevant TPR section.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth in 660-012-0040(3)(a-d):	
(a) Provide bicycle parking in multifamily developments of 4 units or more, new retail, office and institutional developments, transit transfer stations and park-and-ride lots	Section 14.046, Bicycle Parking Facilities, meets this TPR requirement.
(b) Provide "safe and convenient" (per subsection 660-012-0045.3(d)) pedestrian and bicycle connections from new subdivisions/multifamily development to neighborhood activity centers; bikeways are required along arterials and major collectors; sidewalks are required along arterials, collectors, and most local streets in urban areas except controlled access roadways	Subdivision design standards (Chapter 11, Section 11.805) include provisions for sidewalks, requiring that they are installed on both sides of all streets, in any special pedestrian ways within the land development, and "when the Commission determines such improvements are necessary." The City may require a sidewalk or bikeway "to connect to a cul de sac or to pass through an unusually long or oddly shaped block or otherwise provide appropriate circulation." CDO Chapter 14, which contains the City's site development standards, does not expressly require that new subdivisions or multifamily developments include non-motorized access ways to reach activity centers. However, where a TIS is required, development proposals must address bike and pedestrian use and the availability of transit to serve the development (Section 14.051(6)). Each lot and parcel in a development is required to abut an improved street with sidewalks for the entire length of the lot frontage (Section 14.050(1)). Planned Unit Development (PUD) applications are required to show proposed access and circulation patterns for vehicle, bicycle, pedestrian and, where applicable, transit systems but there is no further code guidance on placement or intended

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	function of pedestrian and bicycle routes (Section 12.380 Development Plan Submittal Requirements). The Public Works Engineering Standards provide that sidewalks on Major Arterials in commercially zoned areas can be as wide as 8 feet. Major Arterials, Major Collectors, and Minor Collectors with on-street bike lanes are required to have 6-foot sidewalks. Local streets are required to have 5-foot sidewalks with four-foot planter strips on both sides of the street. **Recommendations: Consistent with this TPR requirement, code and public works standards specify where bikeways are required (based on street classification) and their construction design (width, material). The CDO also enables the City to require bicycle and pedestrian pathways to provide "appropriate circulation." The City should consider adding clarifying language in the CDO that providing bikeways and sidewalks along arterials and collectors is required.**
(c) Off-site road improvements required as a condition of development approval must accommodate bicycle and pedestrian travel, including facilities on arterials and major collectors	City code language does not specifically indicate that off-site road improvements can be required as a condition of development approval. **Recommendations: As part of the TIS requirements, add a statement in CDO Section 14.051 that confirms the City's ability to condition approval to require needed transportation improvements. Add similar language to 11.805, Design Standards, so that it also applies to subdivision approval where a TIS is not required.**
(e) Provide internal pedestrian circulation within new office parks and commercial developments	The CDO does not include requirements that new office and commercial developments provide pedestrian circulation internal to the site. **Recommendation: Design Review standards (Section 11.068 Criteria for Approval) and Design Standards for subdivisions (Section 11.805) should be amended to meet this TPR requirement. Proposed language should require that the planned pedestrian system internal to the development connect building entrances, adjacent streets, and nearby transit stops. (Note: Appendix G of the TSP includes some methods for meeting this TPR requirement.)**
(4) To support transit in urban areas containing a population greater than	

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TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)-(g) below:	
(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;	The updated Klamath Falls Urban Area TSP will identify transit routes and determine appropriate standards for these transportation facilities, consistent with this section of the TPR.
(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient pedestrian access to transit through the measures listed in (A) and (B) below. (A) Walkways shall be provided connecting building entrances and streets adjoining the site; (B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property; (C) In addition to (A) and (B) above, on sites at major transit stops provide the following: (i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street	Transit Stops are not currently identified in the existing TSP. Information from Basin Transit will be reviewed and incorporated into the updated TSP. The CDO does not currently identify specific development standards for development near major transit stops. **<u>Recommendation:</u> Design Review standards (Section 11.068 Criteria for Approval) and Design Standards for subdivisions (Section 11.805) should be amended to meet this TPR requirement. Specifically, these CDO sections should identify development standards consistent with TPR -0045(4) for development proposals that are within a certain distance from a major transit stop.**

Table 1. TPR Requirements and City of Klamath Falls Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
intersection; (ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site; (iii) A transit passenger landing pad accessible to disabled persons; (iv) An easement or dedication for a passenger shelter if requested by the transit provider; and (v) Lighting at the transit stop.	
(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts must comply with the requirement of (4)(b)(C) above;	Instead of requiring that all new retail, office and institutional development meet development requirements that satisfy -0045(A) and (B), the City has the option of requiring these standards within designated pedestrian districts. *Note: Considering the size of the community, City staff have determined that designating a pedestrian district is not necessary at this time.*
(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;	The Off Street Parking and Loading sections of Chapter 14 do not include a section that requires preferential parking for carpools or vanpools. **<u>Recommendation:</u> The City should consider requiring that new developments with planned designated employee parking areas provide preferential parking for employee carpools and vanpools. (Note: While Klamath Falls is not a large city, it is a major employment area and draws commuters from the larger urban area and the County. Requiring planned employment uses to dedicate carpool spaces can incentivize ride sharing. This idea is not new to transportation planning in the area, as Appendix G of the existing TSP includes a recommended requirement for employers with 50 employees or more to dedicate 10% of the required parking spaces for car/vanpools.)**
(e) Existing development shall be allowed to redevelop a portion of existing parking areas for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented	The CDO does not address redevelopment of sites for transit-oriented uses. **<u>Recommendation:</u> Chapter 14 should be revised to allow redevelopment of existing parking spaces for transit oriented uses. The City could also consider amending the**

Table 1. TPR Requirements and City of Klamath Falls Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
developments, and similar facilities, where appropriate;	**CDO to allow for a reduction in the number of minimum required parking spaces if the development proposes transit-related amenities such as transit stops, pull-outs, shelters, and park and ride lots, or when the development is abutting a street with transit service. (Note: Appendix G of the existing TSP recommends allowing a 10% reduction in required parking spaces for sites that are within 400 feet of a transit route and are proposing a transit stop or amenity as part of the development.)**
(f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances;	The TSP update will identify existing and planned transit routes; the location and design of planned new roadways will be consistent with existing and planned transit service. **<u>Recommendation:</u> Section 11.805, Design Standards for subdivisions, should be amended to require that new development provide pedestrian access to existing and planned future transit routes. (Note: The 1995 Basin Transit Service Transit Development Plan, reviewed in Section III of this memorandum, includes recommendations pertaining to access to transit.)**
(g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit.	Transit routes are not currently identified in the existing TSP. Information from Basin Transit will be reviewed and incorporated into the updated TSP. **Recommendation: When updating the transit element of the TSP, review existing land uses and consider land use changes that would support the viability of transit on existing or planned routes. (Note: The recommendation in Appendix G of the TSP is to develop specific corridor plans for transit route in the community that would address urban design issue, including access and transit-supportive land uses. The 1995 Basin Transit Service Transit Development Plan also includes recommendations pertaining to transit supporting land uses.)**
(6) As part of the pedestrian and bicycle circulation plans, local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel needs in developed areas.	**<u>Recommendation:</u> This requirement should be addressed by the TSP update planning process. The requirement can be met by adopting improvements in developed areas that meet the needs identified in the TSP's pedestrian and bicycle circulation elements.**
(7) Local governments shall establish standards for local streets and accessways	The design standards in the CDO (Section 11.805) call for a minimum right-of-way width of 60 feet for local roads, 36 feet of that curb-to-curb paving. The CDO does not provide for a

Table 1. TPR Requirements and City of Klamath Falls Compliance

TPR Requirement (OAR Section 660-12-0045)	Ordinance Compliance/Recommendations
that minimize pavement width and total ROW consistent with the operational needs of the facility.	narrower street width when on-street parking is restricted to one side or is prohibited. The existing TSP (Figure 7-3) requires a 50 to 60-foot right-of-way and 36 feet of paved road (for parking on both sides). The Public Works Engineering Standards has another set of requirements, specifying that local streets with parking on both sides have to be constructed with 65-66 feet of right-of-way and 42 feet of curb-to-curb pavement (Drawing No. 8-200). The state's Transportation and Growth Management program has developed a guidebook (Neighborhood Street Design Guideline) that suggests the following local street standards: Pavement / Right of-Way No On-Street Parking 20' 42-48' Parking on One Side 24' 47-52' Parking on Two Sides 28' 52-56' The City's TSP, the CDO and the Public Works standards require both a wider right-of-way and a wider paved local street than the options illustrated in the Neighborhood Street Design Guidelines. The street cross-section for a local street with no on-street parking, as shown in the existing TSP, is closest in design to the state guidelines, providing a right-of-way that is less wide and a paved width only slightly wider than the guidelines. See Table 2 in this section of the memorandum for a comparison of the City's standard. **<u>Recommendations:</u> The Street Standards table in Section 11.805 should be amended to be consistent with the updated TSP. The City should evaluate whether narrower local streets, consistent with the model language discussed above, will be permitted and under what circumstances. In Section 11.805 the City may also want to distinguish the different designs for local streets (parking allowed on one or both sides, or prohibited) to identify where the narrower standards are appropriate. If the City prefers to further define under what circumstances a narrower street right-of-way design may be approved (slopes under a certain grade, roadways carrying under a certain volume of traffic, etc.), the standards must be clear and objective.** **(Note: Local street width was one of the topics addressed in a 2004 Comprehensive Plan and Code Audit funded through the Transportation and Growth Management**

Table 1. TPR Requirements and City of Klamath Falls Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	(TGM) Program. The Citizen's Advisory Committee guiding the project had concerns over emergency vehicle access and snow removal and ultimately agreed not to forward a recommendation to reduce pavement width of local streets to the City Council. In the Final Audit Report the Project Management Team recommended the city revisit reducing pavement widths on local streets and discuss further areas or situations where narrower local streets might be appropriate in Klamath Falls in order to comply with the TPR.)
TPR Requirement (OAR Section 660-12-0060)	**Ordinance Compliance/Recommendations**
Amendments to functional plans, acknowledged comprehensive plans, and land use regulations that significantly affect an existing or planned transportation facility shall assure that allowed land uses are consistent with the identified function, capacity, and performance standards of the facility.	**<u>Recommendations:</u> Revise the CDO to include language that is consistent with the language of this section of the TPR.** **Section -0060 was amended in March 2005 and includes new provisions for local jurisdictions on how to make a determination whether or not an amendment to the City's adopted plans or land use regulations has a significant affect on a transportation facility.** **The TPR includes a category of facilities, improvements, and services that can be assumed to be "in-place" or committed and available to provide transportation capacity (-0060)(4)). For the City of Klamath Falls, these include projects in the STIP or locally adopted TIP or CIP and projects that are authorized in the local TSP for which a funding plan or mechanism is in place.** **The TPR also allows applicants and decision-makers to rely on transportation improvements that are "reasonably likely to be provided by the end of the planning period" (-0060 (4)(b)(D) when considering amendments to local plans and land use regulations. Through this TSP update process, the City of Klamath Falls has an opportunity to identify what, if any, planned improvements in the adopted TSP may be considered "reasonably likely" to be funded and built within the 20-year planning horizon.** **Pending the 20-year transportation improvement needs and the development of a corresponding funding element, revisit -0060 determination of "reasonably likely" transportation projects.**

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
(1) Each local government shall amend its land use regulations to implement the TSP.	
(b) To the extent, if any, that a transportation facility, service, or improvement concerns the application of a comprehensive plan provision or land use regulation, it may be allowed without further land use review if it is permitted outright or if it is subject to standards that do not require interpretation or the exercise of factual, policy or legal judgment.	The zone districts in Chapter 50, Land Use Zones, do not specifically list transportation-related improvements as a permitted use. **<u>Recommendations:</u> The Land Development Code (LDC) should be amended to allow transportation improvements in all zones, provided that the proposed improvements implement the transportation system plan and/or can be shown to be consistent with adopted policy. The County should consider including transportation facilities in the definition of Extensive Impact Services and Utilities (Article 11, Definitions), a conditional use in County zoning districts.**
(c) Where a transportation facility, service or improvement is determined to have a significant impact on land use or requires interpretation or the exercise of factual, policy or legal judgment regarding the application of a comprehensive plan or land use regulation, the local government shall provide a review and approval process that is consistent with 660-012-0050 (Transportation Project Development). Local governments shall amend regulations to provide for consolidated review of land use decisions required to permit a transportation project.	Section 32.030, Types of Notice, includes the provision that notice of quasi-judicial land use hearings for actions wholly or partially within an Urban Growth Boundary must be mailed to all owners of real property within 100 feet. **<u>Recommendations:</u> Section 32.030 could be expanded to require notification to state agencies when applications have the potential to impact their facilities, regardless of distance from the subject property.** **The LDC does not contain specific requirements for notice to ODOT for applicable land use applications. Section 32.030 could include provisions to notice ODOT when a proposal may impact state facilities. See further discussion in Table 1 under this TPR requirement.**
(2) Local governments shall adopt land use or subdivision ordinance regulations, consistent with applicable federal and state requirements, to protect transportation facilities for their identified functions.	
(a) Access control measures.	LDC Section 71.160, Access Permits, requires a County access

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
	permit prior to the construction of any driveway or road which connects with a public or county road or a permit from the State Highway Division if access is on a state highway. **<u>Recommendations:</u> Article 71, Vehicular Access and Circulation, does not include access spacing requirements. The LDC standards should be updated for the Klamath Falls Urban Area consistent with the recommendations of the updated TSP. See further discussion in Table 1 under this TPR requirement.**
(b) Standards to protect the future operations of roadways and transit corridors	The LDC does not require that development proposals or proposals for legislative land use changes include a traffic analysis to assess the impacts of the proposal on the transportation system. **<u>Recommendation:</u> The County should codify a requirement for a traffic impact analysis or study for development proposals that are expected to generate a significant amount of traffic. Code amendments should include the circumstances under which an analysis is required and what must be included in the study. To satisfy TPR -0060 requirements (see discussion in this table), the County should also require a traffic assessment in association with changes to the land use designations that significantly affect a transportation facility. Note: The City of Klamath Falls CDO Section 14.050, Access and Driveways, includes this requirement. The comparable LDC section is Article 71, Vehicular Access and Circulation.**
(d) Coordinated review of future land use decisions affecting transportation facilities, corridors or sites	LDC Chapter 30, Public Hearings, Notice, and Appeal, does not provide a process for coordinated review of future land use decisions that affect transportation facilities. **<u>Recommendations:</u> Article 32, Public Notice, should be amended to state that agencies will be notified of applications that may have an impact on their facilities.** **Amending Section 32.030, Types of Notice, to include a general requirement to provide notice other government agencies, including ODOT and relevant transportation service providers or special interest transportation groups, could help ensure "coordinated review" of land use decisions affecting transportation facilities.**
(e) Process to apply conditions to development proposals in order to	The LDC does not explicitly call out a process to apply development conditions in order to minimize impacts to

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
minimize impacts and protect transportation facilities	transportation facilities. The LCD does, however, give the County the following authority. Article 44, Conditional Use Permit, requires a Conditional Use Permit for all uses within the UGB (except Extensive Impact Services and Utilities), as well as subdivision and planned unit development applications as part of a Type II Administrative Review Procedure (Article 22) or Planning Commission Review Procedure (Article 26). The review body may condition approval, based on findings of fact that it deems necessary "to ensure compliance with the Klamath County Comprehensive Plan, Land Development code, and sound land use planning principles (Section 44.030.D)" Conditional Use Permit applications for all uses within the Urban Growth Boundary except for Extensive Impact Services and Utilities involving land located within an Urban Growth Boundary and those in conjunction with a subdivision or planned unit development. **Recommendations: Article 44 could be amended to explicitly state that conditions of approval may include requirements related to minimizing traffic impacts and protecting the transportation system. Article 45, Land Partition, should be amended to include a requirement that development proposals include data on the potential traffic impacts where a transportation impact analysis is required. For additional related recommendations, see the TPR requirements in section 660-012-0060 below.**
(f) Regulations to provide notice to public agencies providing transportation facilities and services, MPOs, and ODOT of: land use applications that require public hearings, subdivision and partition applications, applications which affect private access to roads, applications within airport noise corridor and imaginary surfaces which affect airport operations.	Article 32, Public Notice, does not specify the types of decisions that require notice to public agencies, nor which public agencies should receive notice. **Recommendations: The County should amend the LDC to include a requirement that ODOT and other affected public agencies (DEQ, Oregon Department of Aviation, City of Klamath Falls, Basin Transit etc.) receive notification of land use applications that meet the descriptions in this TPR requirement.**
g) Regulations assuring amendments to land use designations, densities, design standards are consistent with the function, capacities, and levels of service of facilities designated in the	Legislative amendments to the Klamath County Comprehensive Plan, Land Development Code, or zoning map require findings of consistency with Oregon Statewide Planning Goals and state statutes (Section 49.020).

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
TSP.	**Recommendations:** The County's approval criteria for legislative amendments, found in Article 49, satisfy this TPR requirement.
(3) Local governments shall adopt land use or subdivision regulations for urban areas and rural communities as set forth in 660-012-0040(3)(a-d):	
(a) Provide bicycle parking in multifamily developments of 4 units or more, new retail, office and institutional developments, transit transfer stations and park-and-ride lots	Article 68, Off-Street Parking and Loading, does not include requirements for bicycle parking. **Recommendations:** Amend LDC Article 68 to include requirements for bicycle parking, consistent with this TPR requirement.
(b) Provide "safe and convenient" (per subsection 660-012-0045.3(d)) pedestrian and bicycle connections from new subdivisions/multifamily development to neighborhood activity centers; bikeways are required along arterials and major collectors; sidewalks are required along arterials, collectors, and most local streets in urban areas except controlled access roadways	Chapter 60, Planning Department Development Standards, includes standards for developing sites within the Klamath Falls Urban Growth Area. There are no requirements for pedestrian and bicycle connectivity in Chapter 60. The County does, however, requires sidewalks for all subdivisions within the Klamath Falls Urban Growth Area where the average lot size of the development is not greater than 20,000 square feet (Public Works Department Development Standards, Section 71.050.A). The County may also require dedicated "pedestrian ways to permit access to cul-de-sacs, to pass through oddly shaped or unusually long blocks, or to provide access to schools, parks or other public or private areas (Section 71.050.E)." **Recommendations: Consistent with this TPR requirement, the LDC should specify where bikeways, as well as sidewalks, are required. The residential density standard on which the current sidewalk requirements are based (Section 71.050.A) should be reexamined in light of updated TSP recommendations. (Note: The current Urban Area TSP includes roadway design standards based on street classification. Table 7-1 of the County's TSP includes requirements for sidewalks and bicycle lanes, based on roadway classifications; however these standards are not for the Klamath Falls Urban Area.) The County should also consider amending development standards in Chapter 60 to include language that addresses this "safe and convenient" TPR requirement for non-motorized modes of transportation.**

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
(c) Off-site road improvements required as a condition of development approval must accommodate bicycle and pedestrian travel, including facilities on arterials and major collectors	County code language does not specifically indicate that off-site road improvements can be required as a condition of development approval. **<u>Recommendations:</u> As part of the recommended requirement for a transportation impact analysis, add a statement that confirms the County's ability to condition approval to require needed transportation improvements. Similar language is recommended for Article 44, Conditional Use Permit, so that conditions of approval may include requirements related to protecting the planned transportation system.**
(e) Provide internal pedestrian circulation within new office parks and commercial developments	The LDC does not include requirements that new office and commercial developments provide pedestrian circulation internal to the site. **<u>Recommendation:</u> Chapter 60, Planning Department Development Standards, should be amended to meet this TPR requirement. Proposed language should require that the planned pedestrian system internal to the development connect building entrances, adjacent streets, and nearby transit stops.**
(4) To support transit in urban areas containing a population greater than 25,000, where the area is already served by a public transit system or where a determination has been made that a public transit system is feasible, local governments shall adopt land use and subdivision regulations as provided in (a)-(g) below:	
(a) Transit routes and transit facilities shall be designed to support transit use through provision of bus stops, pullouts and shelters, optimum road geometrics, on-road parking restrictions and similar facilities, as appropriate;	The updated Klamath Falls Urban Area TSP will identify transit routes within the Urban Area and will determine appropriate standards for these transportation facilities, consistent with this section of the TPR.
(b) New retail, office and institutional buildings at or near major transit stops shall provide for convenient pedestrian access to transit through the measures listed in (A) and (B) below.	Transit Stops are not currently identified in the Rural TSP. Information from Basin Transit will be reviewed and incorporated into the updated (Urban Area) TSP. The LDO does not currently identify specific development standards for development near major transit stops.

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
(A) Walkways shall be provided connecting building entrances and streets adjoining the site; (B) Pedestrian connections to adjoining properties shall be provided except where such a connection is impracticable. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property; (C) In addition to (A) and (B) above, on sites at major transit stops provide the following: (i) Either locate buildings within 20 feet of the transit stop, a transit street or an intersecting street or provide a pedestrian plaza at the transit stop or a street intersection; (ii) A reasonably direct pedestrian connection between the transit stop and building entrances on the site; (iii) A transit passenger landing pad accessible to disabled persons; (iv) An easement or dedication for a passenger shelter if requested by the transit provider; and (v) Lighting at the transit stop.	**<u>Recommendation:</u> Chapter 60, Planning Department Development Standards, should be amended to meet this TPR requirement. Specifically, this chapter should identify development standards consistent with TPR -0045(4) for development proposals that are within a certain distance from a major transit stop.**
(c) Local governments may implement (4)(b)(A) and (B) above through the designation of pedestrian districts and adoption of appropriate implementing measures regulating development within pedestrian districts. Pedestrian districts	Instead of requiring that all new retail, office and institutional development meet development requirements that satisfy -0045(A) and (B), the County has the option of requiring these standards within designated pedestrian districts. **<u>Recommendation:</u> The County, in consultation with the City of Klamath Falls, should determine if there are any**

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
must comply with the requirement of (4)(b)(C) above;	**areas within the Urban Area where it is necessary or desirable to implement -0045(4)(b)(A) and (B) though the designation of pedestrian districts.**
(d) Designated employee parking areas in new developments shall provide preferential parking for carpools and vanpools;	Article 68, Off-Street Parking and Loading, does not include a section that requires preferential parking for carpools or vanpools. **<u>Recommendation:</u> Amend the development standards in Chapter 60 to require that all new developments with designated employee parking areas provide preferential parking for employee carpools and vanpools. (Note: Appendix G of the existing Urban Area TSP includes a recommended requirement for employers with 50 employees or more to dedicate 10% of the required parking spaces for car/vanpools.)**
(e) Existing development shall be allowed to redevelop a portion of existing parking areas for transit-oriented uses, including bus stops and pullouts, bus shelters, park and ride stations, transit-oriented developments, and similar facilities, where appropriate;	The LDC does not address redevelopment of sites for transit-oriented uses. **<u>Recommendation:</u> Chapter 60 should be revised to allow redevelopment of existing parking spaces for transit oriented uses. See additional discussion in Table 1 under this TPR requirement.**
(f) Road systems for new development shall be provided that can be adequately served by transit, including provision of pedestrian access to existing and identified future transit routes. This shall include, where appropriate, separate accessways to minimize travel distances;	The TSP update will identify existing and planned transit routes; the location and design of planned new roadways will be consistent with existing and planned transit service. **<u>Recommendation:</u> Chapter 60 should be amended to require that new development provide pedestrian access to existing and planned future transit routes. (Note: The 1995 Basin Transit Service Transit Development Plan, reviewed in Section III of this memorandum, includes recommendations pertaining to access to transit.)**
(g) Along existing or planned transit routes, designation of types and densities of land uses adequate to support transit.	Transit routes are not currently identified in the existing Rural TSP. Information from Basin Transit will be reviewed and incorporated into the updated TSP. **Recommendation: See discussion in Table 1 under this TPR requirement.**
(6) As part of the pedestrian and bicycle circulation plans, local governments shall identify improvements to facilitate bicycle and pedestrian trips to meet local travel	**<u>Recommendation:</u> This requirement should be addressed by the TSP update planning process. The requirement can be met by adopting improvements in developed areas that meet the needs identified in the TSP's pedestrian and**

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
needs in developed areas.	**bicycle circulation elements.**
(7) Local governments shall establish standards for local streets and accessways that minimize pavement width and total ROW consistent with the operational needs of the facility.	Section 71.050, Improvements in the Klamath Falls Urban Area, includes the standards for roadway improvements for subdivisions within the Klamath Falls Urban Growth Area. The LDC does not specify right-of-way widths, but for developments where average lot sizes are one acre or less, a minimum of 36 feet of paved roadway is required. For developments where average lot size is 20,000 square feet or less, street improvements must include sidewalks. For developments where average lot sizes are over one acre, the requirement is 24 feet of paved roadway with 4-foot gravel shoulders. Table 7-1 of the County's TSP includes roadway classifications and associated standards. The requirement for paved lanes on a local street is 10-11 feet. These standards, however, do not apply to the Klamath Falls Urban Area. The state's Transportation and Growth Management program has developed a guidebook (Neighborhood Street Design Guideline) that suggests the following local street standards: Pavement / Right of-Way No On-Street Parking 20' 42-48' Parking on One Side 24' 47-52' Parking on Two Sides 28' 52-56' The LDC requires a wider paved local street in the Urban Area than the options illustrated in the Neighborhood Street Design Guidelines. **<u>Recommendations:</u> The Street Standards table in Section 71.050 should be amended to be consistent with the recommendations of the updated (Urban Area) TSP.**
TPR Requirement (OAR Section 660-12-0060)	**Ordinance Compliance/Recommendations**
Amendments to functional plans, acknowledged comprehensive plans, and land use regulations that significantly affect an existing or planned transportation facility shall assure that allowed land uses are consistent with the identified function,	**<u>Recommendations:</u> Revise the LDC to include language that is consistent with the language of this section of the TPR. See the recommendation in Table 1 under this TPR requirement.**

Table 2. TPR Requirements and Klamath County Compliance	
TPR Requirement (OAR Section 660-12-0045)	**Ordinance Compliance/Recommendations**
capacity, and performance standards of the facility.	

Table 3. Comparison of Klamath Falls Urban Area Local Street Width Standards

	Street Widths, City of Klamath Falls Urban Area Transportation Systems Plan		Public Works Engineering Standards, City of Klamath Falls		Klamath Falls Community Development Ordinance		Klamath County Land Development Code		Recommended Neighborhood Street Design Guidelines*	
	Pavement Width	Right-of-Way	Pavement Width	Right-of-Way	Pavement Width	Right-of-Way	Pavement Width[1]	Right-of-Way	Pavement Width	Right-of-Way
No On-Street Parking	22’	35-45’	28’	51-52’	36’	60’	36’	-	20’	42-48’
Parking on One Side	30’	45-55’	35’	58-59’	36’	60’	36’	-	24’	47-52’
Parking on Two Sides	36’	50-60’	42’	65-66’	36’	60’	36’	-	28’	52-56’

[1] Standards shown are for development where the average lot size is greater than 1 acre; LDC Section 71.050.

*Neighborhood Street Design Guidelines (2000) http://www.oregon.gov/LCD/docs/publications/neighstreet.pdf

III. PLAN & POLICY REVIEW

STATE OF OREGON

Transportation System Planning Guidelines (2008)

ODOT's Transportation System Plan Guidelines ("Guidelines") document is comprised of four chapters: an overview of transportation system planning (Chapter 1); guidance for the preparation of a jurisdiction's first TSP and of TSP updates (Chapters 2 and 3); and policy guidance on transportation and land use issues in a series of technical appendices (Chapter 4). The 2008 Guidelines differ from the 2001 Guidelines in that the updated guidelines focus more on TSP updates, make stronger connections between local transportation needs and the availability of transportation funding, and provide more guidance related to mobility standards, the OTP, and project financing in the technical appendices. The Guidelines also provide electronic links throughout the document for easy access to additional resources.

The chapter on TSP updates is divided into three steps: determining if an update is needed and scoping the update project; preparing an assessment; and addressing recent regulatory and policy changes. The last two steps are relevant to the Klamath Falls Urban Area TSP update, at this point in the planning process.

The TSP Guidelines direct TSP updates to address recent policy and regulatory changes, and call out recent changes to the Oregon Transportation Plan, Oregon Highway Plan, and Transportation Planning Rule. A review of these documents and how they relate to the TSP update is provided in other sub-sections of this memorandum.

Several important changes have been made to state policy since the adoption of the Klamath Falls Urban Area TSP in 1998. The 2006 Oregon Transportation Plan (OTP) emphasizes maintaining facilities, optimizing existing system performance through technology and better system integration, creating sustainable funding, and investing in strategic capacity enhancements. Amendments to the Oregon Highway Plan (OHP) that have potential relevance to transportation planning in Klamath Falls include changes to Policy 1B (Land Use and Transportation), which requires a management plan for Special Transportation Areas on state highways that are also designated as State Freight Routes, and revisions to Policy 1F (Mobility Standards) that allows for the adoption of alternative mobility standards where "practical difficulties make conformance with the highway mobility standards infeasible." OHP Appendix C (Access Management Spacing Standards) was revised in 2004 to be consistent with amendments to the Access Management Rule, OAR 734-051 (as reviewed later in this memorandum).

The Guidelines detail amendments to the TPR (last updated in 2005), which also have bearing on the TSP update, as well as any other potential Comprehensive Plan amendments in the city. Section -0050 (Project Development) revisions protect determinations of need, mode, function and general location for projects identified in TSPs. Revisions to Section -0060, relating to plan amendments, include the following:

- *Require local jurisdictions to balance the need for development with the need for transportation improvements;*

- *Address "significant effect" by establishing the end of the planning period as the measure for determining whether proposed amendments would cause an imbalance between development and the transportation network serving that development;*
- *Identify the transportation improvements that a local government can consider in determining whether a proposed amendment will significantly affect transportation facilities; and*
- *Identify methods for local jurisdictions to determine whether or not a needed transportation facility is reasonably likely to be provided within the planning horizon.*

Oregon Transportation Plan (2006)

Originally adopted in 1992, the Oregon Transportation Plan (OTP) is a policy document developed by ODOT in response to federal and state mandates for systematic planning for the future of Oregon's transportation system. The OTP is intended to meet statutory requirements (ORS 184.618(1)) to develop a state transportation policy and comprehensive long-range plan for a multi-modal transportation system that addresses economic efficiency, orderly economic development, safety, and environmental quality. The 2006 OTP expands on the policy objectives of the 1992 plan, with an emphasis on maintaining assets in place,[2] optimizing existing system performance through technology and better system integration, creating sustainable funding, and investing in strategic capacity enhancements.

The OTP's goals, policies and strategies guide the development of state multimodal, modal/topic[3] and facility plans and regional and local transportation system plans. The OTP provides the framework for prioritizing transportation improvements and funding, but it does not identify specific projects for development.[4] As required by Oregon and federal statutes, the OTP guides development and investment in the transportation system through:

- Transportation goals and policies,
- Transportation investment scenarios and an implementation framework, and
- Key initiatives to implement the vision and policies.

Goals in the OTP include: Mobility and Accessibility; Management of the System; Economic Vitality; Sustainability; Safety and Security; Funding the Transportation System; and Coordination, Communication and Cooperation. Policies and strategies under many of these goals emphasize increasing coordination and cooperation among federal and state agencies, regional and local governments and private entities to achieve these goals.

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[2] The OTP defines "asset management" as a "systematic process of maintaining, upgrading and operating physical assets cost-effectively. It combines engineering principles with sound business practices and economic theory, and it provides tools to facilitate a more organized, logical approach to decision-making. Asset management provides a framework for handling both short- and long-range planning."

[3] Modal or topic plans, as developed by ODOT and other state agencies, include plans for aviation, bicycle and pedestrian facilities, highways, marine ports and waterways, public transportation and rail.

[4] Projects are identified through facility plans and regional and local transportation system plans, and sometimes through modal plans.

The Implementation Framework section of the OTP describes the implementation process and how state multimodal, modal/topic plans, regional and local transportation system plans and master plans will further refine the OTP's broad policies and investment levels. Local transportation system plans can further OTP implementation by defining standards, instituting performance measures, and requiring that operational strategies be developed.[5]

The Implementation section also describes three investment levels, examples of the investment priorities for each level of investment, and their impacts on the transportation system. These levels are described as "flat funding" (Level 1), "maintaining and improving existing infrastructure" (Level 2), and "expanding facilities and services and services" (Level 3). The recommendation in the OTP is for the State to invest at levels closer to Level 3 "in order to be competitive economically and to have the transportation infrastructure and services that allow communities to function well."

Finally, a list of "key initiatives" describes the OTP's implementation priorities. The key initiatives are intended to help frame plan implementation and reflect the directions of the OTP including system optimization, integration of transportation modes, integration of transportation, land use, the environment and the economy, and the need to make strategic investments using a sustainable funding structure. The key initiatives envision creating the sustainable funding plan using both traditional and new revenue sources.

Oregon Highway Plan (1999, last amended 2006)

The Oregon Highway Plan (OHP), an element and modal plan of the state's comprehensive transportation plan (OTP), guides the planning, operations, and financing of ODOT's Highway Division. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems.

The Oregon Transportation Commission adopted the Highway Plan on March 18, 1999. In July 2006, ODOT published an update that includes amendments made from November 1999 through January 2006. The updated TSP will need to be consistent with the OHP and the planning process will review and reference the recent changes to the OHP, where applicable.

The policies found within the OHP that apply to the Klamath Falls Urban Area TSP include:

Policy 1A: State Highway Classification System;

Policy 1B: Land Use and Transportation;

Policy 1C: State Highway Freight System

[5] As stated in the Implementation section of the OTP, requirements for regional and local transportation system plans (TSPs) are found in the Transportation Planning Rule (OAR 660-012). Regional and local TSPs must be consistent with the state TSP (the OTP), state multimodal, modal/topic and transportation facility plans.

Policy 1D: Scenic Byways

Policy 1F: Highway Mobility Standards;

Policy 1G: Major Improvements

Policy 1H: Bypasses

Policy 2B: Off-System Improvements;

Policy 2E: Intelligent Transportation Systems (ITS);

Policy 2F: Traffic Safety;

Policy 2G: Rail and Highway Compatibility

Policy 3A: Classification and Spacing Standards;

Policy 3B: Medians;

Policy 3C: Interchange Access Management Areas

Policy 3D: Deviations;

Policy 4A: Efficiency of Freight Movement;

Policy 4B: Alternative Passenger Modes;

Policy 4D: Transportation Demand Management

Policy 4E: Park-and-Ride Facilities; and

Policy 5A: Environmental Resources

Policy 1A: State Highway Classification System.

The 1991 Highway Plan's Level of Importance Policy classifies the state highway system into four levels of importance (Interstate, Statewide, Regional and District) to provide direction for managing the system and a basis for developing funding strategies for improvements. Remaining unclassified state highways are considered Local Interest Roads. ODOT uses the state highway classification system to guide management and investment decisions regarding state highway facilities. The system guides the development of corridor plans, transportation system plans, major investment studies, review of local plan and zoning amendments, periodic review of local comprehensive plans, highway project selection, design and development, and facility management decisions including road approach permits.

The federal government, as part of the Intermodal Surface Transportation Efficiency Act of 1991, required the establishment of a National Highway System (NHS) to provide an interconnected system of principal arterial routes that will serve "interstate and inter-regional travel." ODOT has an obligation to ensure that NHS roadways in Oregon adequately perform this function of serving a larger geographic area. Nearly all roadways designated by ODOT as Interstate and Statewide

highways are part of the NHS, as are a smaller number of Regional highways. Highways in and around Klamath Falls that are part of the NHS are listed on the following page.

Within Klamath Falls and the surrounding area, there are state highways with Statewide, Regional, and District Levels of Importance, as described on the following page. The purpose and management objectives of each of these classifications are summarized below.

- Statewide Highways typically provide inter-urban and inter-regional mobility and provide connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips. The management objective is to provide safe and efficient, high-speed, continuous-flow operation. In constrained and urban areas, interruptions to flow should be minimal.

- Regional Highways typically provide connections and links to regional centers, Statewide or interstate Highways, or economic or activity centers of regional significance. The management objective for these facilities is to provide safe and efficient, high-speed, continuous-flow operation in rural areas and moderate to high-speed operations in urban and urbanizing areas. A secondary function is to serve land uses in the vicinity of these highways.

- District Highways are facilities of county-wide significance and function largely as county and city arterials or collectors. They provide connections and links between small urbanized areas, rural centers and urban hubs, and also serve local access and traffic. The management objective is to provide for safe and efficient, moderate to high-speed continuous-flow operation in rural areas reflecting the surrounding environment and moderate to low-speed operation in urban and urbanizing areas for traffic flow and for pedestrian and bicycle movements.

ODOT also classifies certain state highways as "Expressways." Expressways are complete routes or segments of existing two-lane and multi-lane highways and planned multi-lane highways that provide for safe and efficient high speed and high volume traffic movements. Their primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions. A secondary function is to provide for long distance intra-urban travel in metropolitan areas. In urban areas, speeds are moderate to high. In rural areas, speeds are high. Usually there are no pedestrian facilities, and bikeways may be separated from the roadway.

The classification of the state highways that pass through and around Klamath Falls is described below.

- The Dalles-California Highway (US 97) runs north-south through Klamath Falls, connecting the city with Bend in the north and connecting to I-5 south of the California border. Through Klamath Falls, US 97 is part of the NHS and is designated with a Statewide Level of Importance.

- Oregon State Route 140 (OR 140) runs roughly northwest and southeast, skirting the southern edge of the city. Called Lake of the Woods northeast of the city, South Klamath Falls as it passes south of the city, and Klamath Falls-Lakeview to the southeast, OR 140 is also part of the NHS with a Statewide Level of Importance designation. Between its junction with OR 66 and its junction with OR 39, OR 140 is also classified as an Expressway.

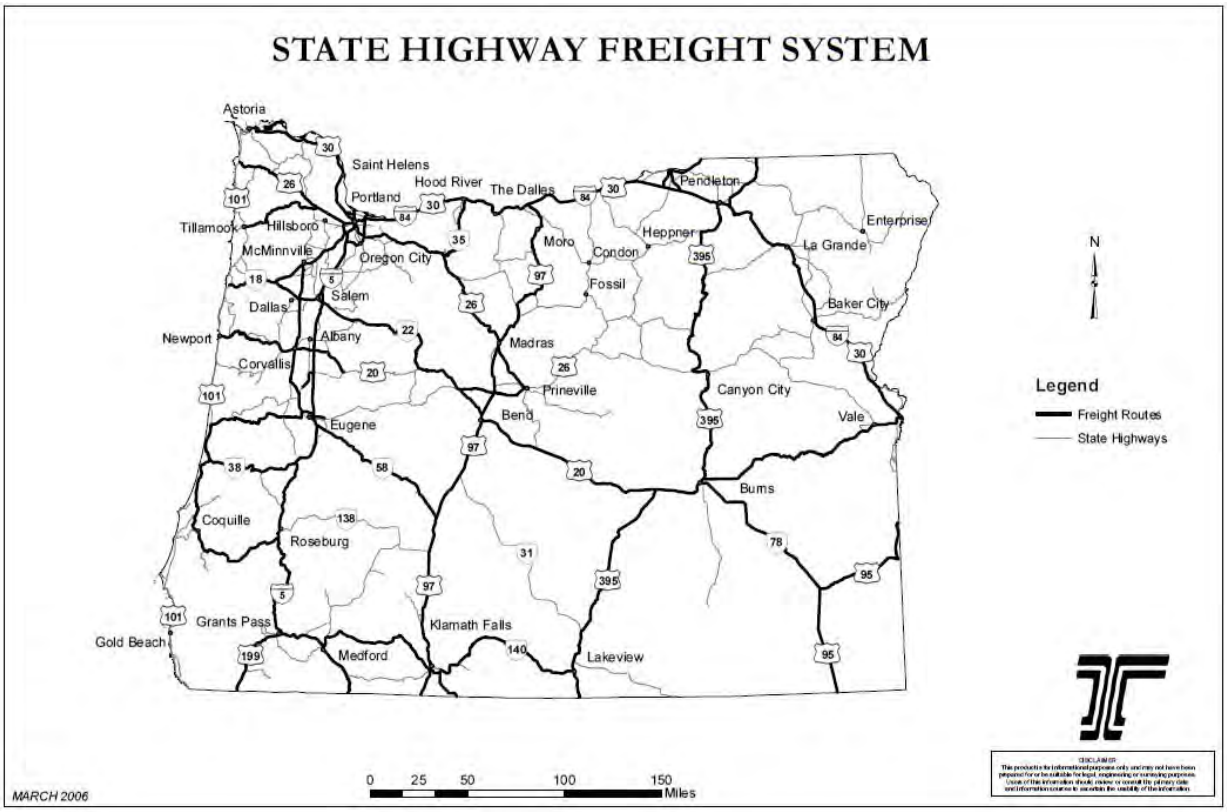
- Oregon State Route 39 (OR 39), which is called the Klamath Falls-Malin Highway for most of its length in Klamath Falls, is also part of the NHS, but it is designated with a Regional, rather than a Statewide, Level of Importance.

- Oregon State Route 66 (OR 66), called the Green Springs Highway, runs southwest to northeast, and terminates at the junction with US 97 in the southwest corner of Klamath Falls. OR66 is classified with District Level of Importance and is not part of the NHS, except where it briefly overlaps with OR 140, where it shares OR 140's Statewide Level of Importance and NHS designation.

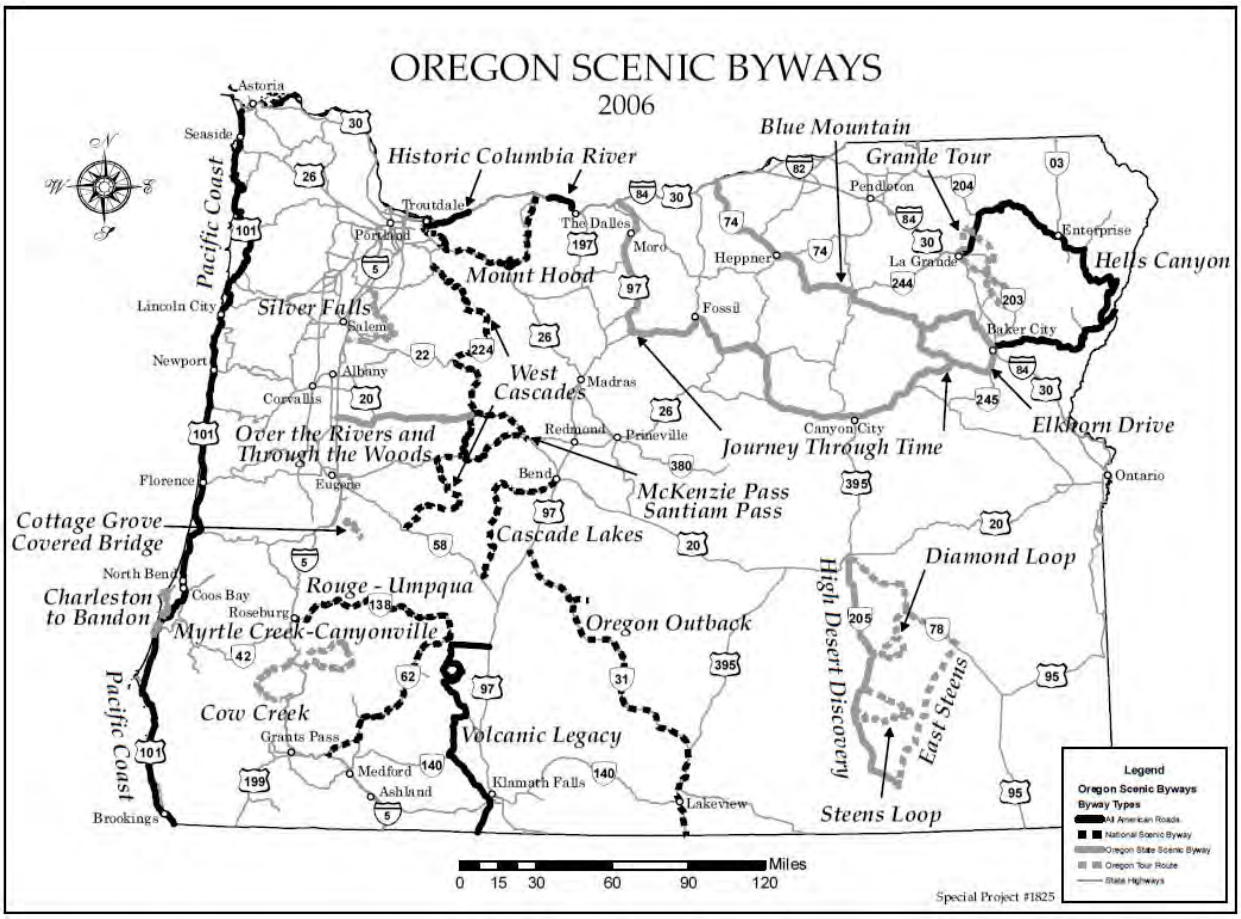
Policy 1B: Land Use and Transportation. Policy 1B applies to all state highways. It is designed to clarify how ODOT will work with local governments and others to link land use and transportation in transportation plans, facility and corridor plans, plan amendments, access permitting and project development. Policy 1B recognizes that state highways serve as the main streets of many communities and strives to maintain a balance between serving local communities (accessibility) and the through traveler (mobility). This policy recognizes the role of both the State and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning. The policy also provides for three types of highway segment designations – Special Transportation Areas (STAs), Urban Business Areas (UBAs) and Commercial Centers – that provide tools to implement more compact community development patterns.

Policy 1C: State Highway Freight System. The primary purpose of the State Highway Freight System is to facilitate efficient and reliable interstate, intrastate, and regional truck movement through a designated freight system. This freight system, made up of the Interstate Highways and certain Statewide, Regional and District Highways, the majority of which are on the National Highway System, includes routes that carry significant tonnage of freight by truck and serve as the primary interstate and intrastate highway freight connection to ports, intermodal terminals, and urban areas. Highways included in this designation have higher highway mobility standards than other Statewide Highways.

As shown on the following map, US 97 and OR 140 in Klamath Falls are classified as Freight Routes, as is OR 39 south of the junction with OR 140.



Policy 1D: Scenic Byways. The Oregon Transportation Commission has designated Scenic Byways throughout the state on federal, state, and local roads which have exceptional scenic value. As shown on the following map, the Lake of the Woods highway (OR 140), the small segment of OR 66 that connects OR 140 to US 97, and US 97 south from that junction into California are part of the "Volcanic Legacy" Scenic Byway, which is designated by the federal government as an "All American Road." For designated Scenic Byways, ODOT will consider aesthetic and design elements along with safety and performance considerations in managing and maintaining the roadway and will develop guidelines for aesthetic and design elements within the public right-of-way.



Policy 1F: Highway Mobility Standards Access Management Policy. This policy addresses state highway performance expectations for planning and plan implementation or amendment, as well as providing guidance for managing access and traffic control systems. For Klamath Falls, this policy pertains to all state highways (see Policy 1A). Action 1F.1 states that highway mobility standards apply to all state highway sections; for areas outside of the Portland Metro area, the maximum volume to capacity ratios for peak hour operating conditions in Table 6 apply. 1F.5 states that within transportation system plans, where the volume-to-capacity (v/c) ratio is worse than the identified standards in the OHP and transportation improvements are not planned, the performance standard for the highway shall be to improve performance as much as feasible and to avoid further degradation of performance.

The Methodology Memorandum and Existing Conditions Memorandum to be provided in Task 3 of the TSP update will present the study intersections and corresponding current mobility standards.

Policy 1G: Major Improvements. This policy requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Policy 1H: Bypasses. Bypasses are highways designed to maintain or increase mobility for through traffic, often by providing an alternate route around a downtown, an urban or metropolitan area or an existing highway. In Klamath Falls, there are two highway segments designated as Bypasses: US 97 from its junction with OR 39 to Klamath Falls city limits, and OR 140 from the junction with OR66 to the junction with OR 39.

In order for a bypass to work effectively over the long term, local planning and zoning and the local street network must support the function of the bypass. Local transportation plans and ordinances should assure that land development patterns in the vicinity of the bypass will not use cul-de-sac or other interrupted street network patterns which cause reliance on the new facility for a large number of local trips. In most cases local streets should not directly access the new bypass facility. ODOT and the local governments must agree on the location of connections to the local street network and agree that local streets will be disconnected if they negatively affect the through function of the highway. Local governments and ODOT must agree on the amendment to the TSP or local transportation plan which incorporates the bypass.

Policy 2B: Off-System Improvements. This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system.

Policy 2E: Intelligent Transportation Systems (ITS). This policy seeks to improve the safety and efficiency of transportation facilities, and to generally maximize operations in a cost-effective way. The policy requires coordination with the Oregon Intelligent Transportation Systems Strategic Plan.

Policy 2F: Traffic Safety. This policy emphasizes the state's efforts to improve safety of all users of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues.

Policy 2G: Rail and Highway Compatibility. This policy seeks to increase safety and transportation efficiency through the reduction and prevention of conflicts between railroad and highway users. Actions to address this policy include eliminating at-grade crossings wherever possible, designing highway projects to avoid at-grade crossings, coordinating highway projects affecting rail crossings with the ODOT Rail Division and the railroads, and addressing pedestrian and bicycle access when designing grade-separated crossings. (See the Oregon Rail Plan review section in this memorandum for an overview of the existing rail system in Klamath Falls.)

Policy 3A: Classification and Spacing Standards. This policy addresses the location, spacing, and type of road and street intersections and approach roads on state highways. It includes standards for each highway classification. The adopted standards can be found in Appendix C of the Oregon Highway Plan; generally, the minimum access spacing distance increases as either the highway's importance or posted speed increases. The access management spacing standards established in

the OHP are implemented by OAR 734, Division 51.[6] Table 1 illustrates the unsignalized intersection access spacing standards as they apply to Urban highways of various levels of importance. (Spacing for at-grade urban expressway intersections is 2,640 feet.)

Table 1 Access Spacing Standards for Private and Public Approaches[1]

Posted Speed (miles per hour)	Minimum Space Required (feet)		
	Statewide	Regional	District
≤ 25	520	350	350
30 and 35	720	425	350
40 and 45	990	750	500
50	1,100	830	550
≥ 55	1,320	990	700

[1] These access management spacing standards do not apply to approaches in existence prior to April 1, 2000 except as provided in OAR 734-051-0115(1)(c) and 734-051-0125(1)(c).

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

Traffic signal spacing standards supersede access management spacing standards for approaches. For signalized intersections on statewide and regional highways such as US 97, OR 140, and OR 39, OAR 734-020-470 identifies a desired minimum spacing of ½ mile (2,640 feet) be maintained between signalized intersections.

Policy 3B: Medians. This policy establishes the state's criteria for the placement of medians. It includes Action 3B.3 which requires the consideration of non-traversable medians for modernization of all urban, multi-lane Statewide (NHS) Highways as well as all urban, multi-lane Regional Highways where posted speeds are 45 mph or greater. The criteria for consideration include:

- Forecasted average daily traffic greater than 28,000 vehicles per day during the 20-year planning period;
- A higher-than-average accident rate;
- Pedestrian crossing safety issues; and
- Topographic and alignment issues resulting in inadequate left-turn sight distances.

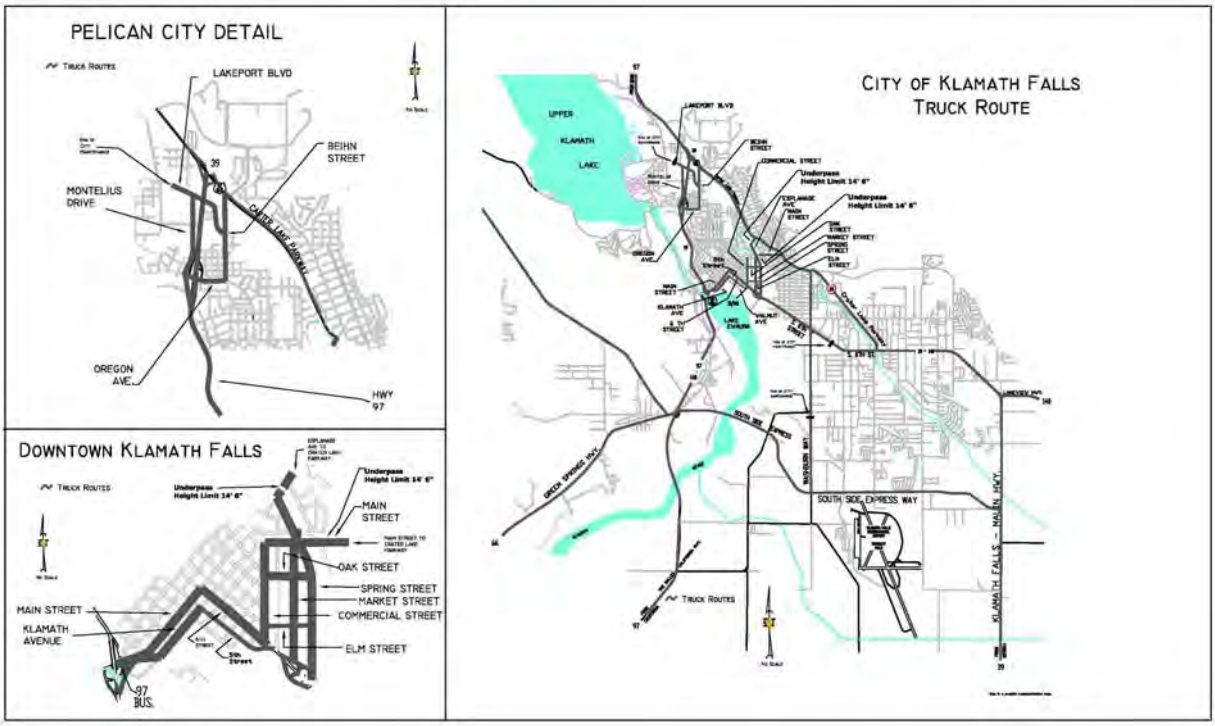
Policy 3C: Interchange Access Management Areas. This policy addresses management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. Action items include developing interchange area management plans to protect the function of the interchange to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges. The local jurisdiction's role in access

[6] Oregon Revised Statute (OAR) 734, Division 51, was amended in September 2005 to be consistent with August 2005 OHP revisions to Policy 1B. Specifically, the spacing standards in OAR 734-051 were amended to be consistent with the OHP tables in Appendix C, Access Management Standards.

management is stated in Policy 3C as follows: "necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place (Action 3C.2)." Access management standards are detailed in Policy 3C and include the distance required between an interchange and approaches and intersections.

Policy 3D: Deviations. This policy provides the foundation for requests for state highway approach permits that require deviation(s) from access management standards. Procedures for requesting deviations are included in OAR 734-051. Action 3D.5 identifies conditions to consider in evaluating requests for deviations: queuing that increases delays and unsafe operations, pedestrian and bicycle circulation, traffic controls, local road system requirements, improving connectivity to adjacent properties or local road system, potential use of channelization, or potential use of nontraversible medians.

Policy 4A: Efficiency of Freight Movement. This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. US 97, OR 140, and a portion of OR 39 are designated State Highway Freight Routes. Action 4A.8 under this policy recognizes that local truck routes are important linkages in the movement of freight throughout the state and that truck routes can serve to detour trucks off the state highway system. This action obligates ODOT to coordinate with local jurisdictions when designating, managing and constructing a project on a local freight route. The local truck routes are shown in the following graphic.[7]



[7] This graphic was developed by the Community Development Department in consultation from Public Works and the City Attorney, but has not been formally adopted.

Policy 4B: Alternative Passenger Modes. This policy encourages the development of alternative passenger services and systems as part of broader corridor strategies and promotes the development of alternative passenger transportation services located off the highway system to help preserve the performance and function of the state highway system.

Policy 4D: Transportation Demand Management. This policy establishes the state's interest in supporting demand management strategies that reduce peak period single occupant vehicle travel, thereby improving the flow of traffic on the state highway system.

Policy 4E: Park and Ride Facilities. This policy seeks to maximize the existing transportation system and passenger capacity by supporting and developing park-and-ride facilities. Basin Transit Service operates two transit centers in Klamath Falls that function as transfer points for the various bus routes, but neither of these provides dedicated parking for transit riders.

Policy 5A: Environmental Resources. This policy intends to protect the natural and built environment – including air quality, fish and wildlife habitat, migration routes, vegetation, and water resources from impacts from state highways and ODOT facilities. Impacts to identified natural resources must be avoided or mitigated by any proposed construction or reconstruction projects on state facilities in Klamath Falls.

Oregon Bicycle and Pedestrian Plan (1995)

The Oregon Bicycle and Pedestrian Plan is a modal element of the Oregon Transportation Plan and provides guidance for planning, design and operation of facilities for bicycle and pedestrian travel. The plan contains the standards and designs used on state highway projects for these facilities.

The plan includes two parts: the Policy and Action Plan and the Planning, Design, Maintenance, and Safety part. The policy section provides background information, including relevant state and federal laws, and contains the goals, actions, and implementation strategies proposed by ODOT to improve bicycle and pedestrian transportation.

Policies in the first part of the plan state that bikeway and walkway systems will be established on rural highways by widening shoulders as part of modernization projects, as well as on many preservation overlays, where warranted. For urban highways, implementation may take place:

- As part of modernization projects (bike lanes and sidewalks will be included);
- As part of preservation projects, where minor upgrades can be made;
- By restriping roads with bike lanes;
- With minor betterment projects, such as completing short missing segments of sidewalks;
- As bikeway or walkway modernization projects;
- By developers as part of permit conditions, where warranted.

Part Two of the plan addresses maintenance and construction issues, and establishes facility design standards for the following bicycle and pedestrian facilities: on-road bikeways (pp. 66-70), restriping existing roads with bike lanes (p. 86), walkways (pp. 91-92), multi-use paths (p. 117), signing and

marking (starting p. 143), and street crossings and intersections (crosswalks, raised crosswalks and raised intersections, p. 111-112; intersections pp. 134-135). The plan section on street crossings (Section II.5) includes standards and guidance for crosswalks, intersections, medians, and islands and refuges.

Standard widths for bike lanes and walkways are six feet. Minimum widths are five feet for bike lanes and walkways, when bike lanes are adjacent to curbs or parking lanes, and four feet for bike lanes when they are on uncurbed shoulders or in other severely constrained areas. For shoulder bikeways, recommended for rural highways, the plan refers to Highway Design Manual standards. Widths should be six feet for roadways with ADT of 400-2000 and eight feet for roadways with ADT greater than 2000.

The Bicycle and Pedestrian Plan is in the process of being updated. While many new pedestrian and bicycle treatments have been developed and incorporated into the update, ODOT program staff report that few design standards for bike and pedestrian facilities will change. However, staff indicate that standards for rumble strips may change, potentially making the strips "friendlier" to bikes.[8] Once adopted, the updated Oregon Bicycle and Pedestrian Plan Design Standards and Guidelines will be referenced where bicycle or pedestrian facilities are planned as part of improvements to any of the state-owned facilities in Klamath Falls.

Oregon Rail Plan (2001)

The Oregon Rail Plan is a modal element of the OTP. It is intended to implement the OTP's long-range vision of a viable freight and passenger rail system in Oregon.

Chapter 1, Rail Policies and Planning, includes federal requirements for rail freight. This chapter includes a section addressing compliance with Statewide Planning Goals. ODOT's certified State Agency Coordination (SAC) Program and Oregon Administrative Rules Chapter 31, Division 15 describe the procedures that ODOT will follow when developing and adopting plans to assure that they comply with the statewide planning goals and are compatible with acknowledged comprehensive plans. Relevant to a TSP update for the Klamath Falls Urban Area, the stated focus of ODOT's efforts to establish compatibility with acknowledged comprehensive plans will be at the facility planning and project planning stages of the planning program. Policy 1 under Freight Rail is "increase economic opportunities for the State by having a viable and competitive rail system." Regarding passenger rail policy, the OTP supports intercity rail passenger service as part of a balanced transportation system. Convenient connections with other modes should integrate passenger train service into a network linking all areas of the state, nation, and the world.

Chapter 2 is the Freight Element of the Oregon Rail Plan. The element has four major purposes: (1) describe Oregon's freight rail system in terms of the carriers and the individual properties that make

[8] Note: This information was obtained from ODOT as part of a 2009 document review for the South US 97 Corridor Plan. Staff indicated that new standards were expected to reflect updated standards in AASHTO's Guide for the Development of Bicycle Facilities, and that these national standards were slated for update in 2009. (The 1999 edition of the Guide for the Development of Bicycle Facilities is available at AASHTO's online bookstore.) ODOT's 2009 Traffic Manual states that: "The Department of Transportation has adopted the AASHTO publication, Guide for the Development of Bicycle Facilities, to establish bikeway design and construction standards, to establish traffic control devices guidelines for bikeways, and recommend illumination standards (6.3 Bicycle Facilities)."

up the state railroad system, (2) describe the commodities transported by rail in Oregon, (3) identify funding needs and potential funding sources for railroads in Oregon, (4) assess what shippers require of rail service in Oregon. Burlington Northern and Union Pacific have rail lines running through Klamath Falls. The two companies share the tracks that run north from Klamath Falls, and have separate tracks running southeast and southwest on the south side of Klamath Falls.

The Passenger Element is in Chapter 3. Amtrak operates passenger rail through Klamath Falls on the Coast Starlight route, which connects Seattle, Portland, Eugene, Sacramento, the San Francisco Bay Area, San Jose, and Los Angeles. The train provides the only direct intercity service to Oregon communities between Portland and Klamath Falls, and overnight service south to California. The Coast Starlight is an important element in Oregon's tourism and recreational industries. Sparse population between Eugene and Klamath Falls is unlikely to support a state-sponsored corridor train extension, but increasing popularity of the Coast Starlight may eventually require Amtrak to consider additional through service on the route. Station building improvements and improved passenger platforms at the Klamath Falls station are needed to meet current and projected passenger usage (p. 108).

There is also daily inter-city bus service from Klamath Falls to Medford, Ashland, Lakeview, Chemult, and Bend.

Oregon Public Transportation Plan (1997)

The Oregon Public Transportation Plan forms the transit modal plan of the Oregon Transportation Plan. The vision guiding the Public Transportation Plan is as follows:

> *The public transportation plan builds on and begins implementing the OTP's long-range vision for public transportation in the State of Oregon. That vision includes:*
>
> - *A comprehensive, interconnected and dependable public transportation system, with stable funding, that provides access and mobility in and between communities of Oregon in a convenient, reliable, and safe manner that encourages people to ride*
> - *A public transportation system that provides appropriate service in each area of the state, including service in urban areas that is an attractive alternative to the single-occupant vehicle, and high-quality, dependable service in suburban, rural, and frontier (remote) areas*
> - *A system that enables those who do not drive to meet their daily needs*
> - *A public transportation system that plays a critical role in improving the livability and economic prosperity for Oregonians.*

The plan contains goals, policies, and strategies relating to the whole of the state's public transportation system. The plan is intended to provide guidance for ODOT and public transportation agencies regarding the development of public transportation systems.

Basin Transit Service (BTS) provides bus and trolley service within Klamath Falls. The Basin Transit Service Transit Development Plan (TDP) is reviewed in a later subsection of this memorandum. Proposed policies and projects that result from this TSP update process will be reviewed in consultation with Basin Transit Service for consistency with the TDP and recent BTS planning efforts.

Access Management Rule (OAR 734-051)

Oregon Administrative Rule 734-051 defines the State's role in managing access to highway facilities in order to maintain functional use and safety and to preserve public investment. The provisions in the OAR apply to all roadways under state jurisdiction within Klamath Falls. The access management rules include spacing standards for varying types of state roadways.[9] It also lists criteria for granting right of access and approach locations onto state highway facilities.

The access management rule also provides criteria for granting right of access and approach locations onto state highway facilities (-0080) and for potential deviations from spacing standards (-0135). Section -0155 identifies when, how and why ODOT will develop access management plans and interchange area management plans for particular sections of a highway.

Freight Moves the Oregon Economy (1999)

This report summarizes a variety of information about issues and needs surrounding the transport of freight by roads, rail lines, waterways, aircraft, and pipelines. The document's stated purpose is to demonstrate the importance of freight to the Oregon economy and identify concerns and needs regarding the maintenance and enhancement of current and future mobility within the state of Oregon.

The report describes the US 97 corridor as "the most important north-south corridor for freight movements east of the Cascade Mountains" and notes that it provides an important alternative for freight moving between the Willamette Valley and northern California.[10] The highways identified in the OHP as part of the NHS, including US 97 and OR 140, are significant for freight movement. The importance of freight movement will be a consideration during the Klamath Falls Urban Area TSP update as it pertains to access to US 97 and OR 140 and how the local roadway system intersects with Union Pacific and Burlington Northern rail operations.

In addition, Pacific Gas Transmission has natural gas transmission lines that run from the California border to the Washington border and pass through Klamath Falls, with another line from Klamath Falls to Medford.

Klamath Falls also has one of seven large (over 500,000 bushels of capacity) grain elevators in the state where grain is brought in by truck and shipped out by rail, providing an important link between modes of freight movement.

Oregon Aviation Plan (2007)

The 2007 Oregon Aviation Plan (OAP) defines policies and investment strategies for Oregon's public use aviation system for the next 20 years. It further refines the goals and policies of the Oregon Transportation Plan and is part of the OTP. The plan assesses the condition of the existing aviation infrastructure, the economic benefit of the aviation industry, and the national importance and state

[9] "Spacing Standards" mean Access Management Spacing Standards as set forth in OAR 734-051-0115 and specified in Tables 2, 3, and 4, adopted and made a part of Division 51 rules.
[10] Part II, page 28.

significance of each airport. It also provides an overview of the airports in the system and the jurisdictional responsibilities at all levels of government for the management, maintenance, operation, and funding of Oregon's airports. The plan contains policies and recommended actions to be implemented by Oregon Department of Aviation in coordination with other state and local agencies and the Federal Aviation Administration.

The OAP categorizes airports based on functional role and service criteria. The Klamath Falls Airport is classified as a Category I commercial service airport. The significant function of this class of airport, according to the OAP, is to accommodate scheduled major/national or regional/commuter commercial air carrier service. Category I airports support some level of scheduled commercial airline service in addition to a full range of general aviation aircraft. This includes both domestic and international destinations. A summary of recommended improvements to the airport can be found in Table 5.19 of the OAP and include constructing new hangars, a full parallel taxiway to Runway 14/32, and a designated cargo apron with an associated small handling facility. Information specific to the Klamath Falls Airport can be found in the Individual Airport Report that was developed for the facility and that is part of the OAP. The Klamath Falls Airport Individual Report describes the location of the airport as four miles southeast of the city of Klamath Falls with access provided by State Route 97. The report also describes the history of the airport as a military air base, including the eighteen F-15 aircraft presently based at Klamath Falls for training fighter pilots. Kingsley Field also has 475 fulltime and 300 part-time personnel assigned to the base, which now trains flight surgeons, optometrists, and air traffic controllers (p. 19). According to surveys conducted as part of developing the airport report, users of the airport include those engaged in local business, out-of-town business, recreation, tourism, and agriculture. Surrounding communities rely on the airport for medical rescue flights, fire protection, delivery of mail/cargo, and Air National Guard (p. 28). For additional information regarding services and land uses at the airport, see the Klamath County Rural Transportation System Plan review (under "Regional Plans") and the Klamath Falls Airport Master Plan review (under "Local Plans") of this memorandum.

State Transportation Improvement Program (2000-present)

The State Transportation Improvement Program (STIP) is the programming and funding document for transportation projects and programs statewide. The projects and programs undergo a selection process managed by ODOT Regions or ODOT central offices. The document covers a period of four years and is updated every two years. Listed below are projects in Klamath County from the current, adopted STIP from 2008 through 2011, that are funded for FFY 2010 and 2011. A draft STIP for 2010 through 2013 is under development and has not been adopted at this time.

Section	**Route**	**Highway Name**	**Total Cost**	**Description**	**Year (FFY)**
OR140: BEATTY CURVES	OR-140	KLAMATH FALLS-LAKEVIEW	$3,955,000	REALIGN HIGHWAY TO CORRECT CURVE, IMPROVE SAFETY & FREIGHT MOBILITY	2010
OR140: BNSF (DAIRY) BRIDGE REPLACEMENT	OR-140	KLAMATH FALLS-LAKEVIEW	$2,622,000	REPLACE BRIDGE #02147	2011

Section	Route	Highway Name	Total Cost	Description	Year (FFY)
OR39: ALAMEDA AVE PARTIAL VIADUCT BRIDGE #06741 *	OR-39	KLAMATH FALLS-MALIN	$1,658,000	REPLACE BRIDGE #06741	2010
OR422: WILLIAMSON RIVER BRIDGE #01959	OR-422	CHILOQUIN	$1,113,000	DECK REPLACEMENT. NEW RAILS.	2010
OR66:GREEN SPRINGS INTERCHANGE AREA MANAGMENT PLAN*	OR-66	GREEN SPRINGS	$425,000	PLANNING PROJECT	2010
OR39: LINK RIVER BRIDGE #01579 (KLAMATH FALLS)*	OR-39	KLAMATH FALLS-LAKEVIEW	$231,000	DECK OVERLAY; REPAIR CRACKED SUPERSTRUCTURE & SUBSTRUCTURE BRIDGE 01579	2010
OR39: MATNEY - MERRIL N CITY LIMITS	OR-39	KLAMATH FALLS-MALIN	$629,000	PAVEMENT PRESERVATION, T-UP INTERSECTION, ADD RIGHT TURN DECEL LANE	2010
KLAMATH FALLS ADAPTIVE SIGNAL TIMING*	OR-39	KLAMATH FALLS-MALIN	$75,000	INSTALL COMMUNICATION INFRASTRUCTURE & SOFTWARE FOR SIGNAL TIMING SYSTEM	2010
OR140 @ WASHBURN WAY (KLAMATH FALLS)*	OR-140	SOUTH KLAMATH FALLS	$50,000	INTERSECTION MODERNIZATION IMPROVEMENT	2010
OR39 @ GETTLE (KLAMATH FALLS)*	OR-39	KLAMATH FALLS-MALIN	$44,000	INTERSECTION IMPROVEMENT	2010
US97: MISSISSIPPI DR - CRESCENT RANGER STATION	US-97	THE DALLES-CALIFORNIA	$865,000	PAVEMENT PRESERVATION; REPLACE GUARDRAIL & SIGNS; INSTALL OR REPLACE CURBS & SIDEWALKS	2010
US97: HAGELSTEIN PARK - N SHADY PINE	US-97	THE DALLES-CALIFORNIA	$1,606,000	DEVELOP PROJECT TO WIDEN SHOULDERS, ADD ROCKFALL PROTECTION & DECEL LANE	2010
REGION 4 CHIP SEAL PROJECTS ON OR58 & US97 HWYS		VARIOUS HIGHWAYS	$2,800,000	CHIP SEAL PRESERVATION PROJECTS ON OR58 MP70-86 & US97 MP195-240	2010
OR39: 6TH ST (AUSTIN AVE) -	OR-39	KLAMATH FALLS-MALIN	$250,000	PAVEMENT PRESERVATION	2010

Section	Route	Highway Name	Total Cost	Description	Year (FFY)
MERRILL/LAKEVIEW JCT*					
OR140: CURVE CORRECTIONS (MP43-45)	OR-140	KLAMATH FALLS-LAKEVIEW	$800,000	CURVE CORRECTIONS	2010
BONANZA SAFE WALK PROJECT	OR-70	DAIRY-BONANZA	$391,000	BIKE & PEDESTRIAN IMPROVEMENTS AND TRAFFIC CALMING	2010

Source: http://highway.odot.state.or.us/cf/STIPSrch/index.cfm

* Projects within the Klamath Falls UGB.

REGIONAL AND COUNTY PLANS

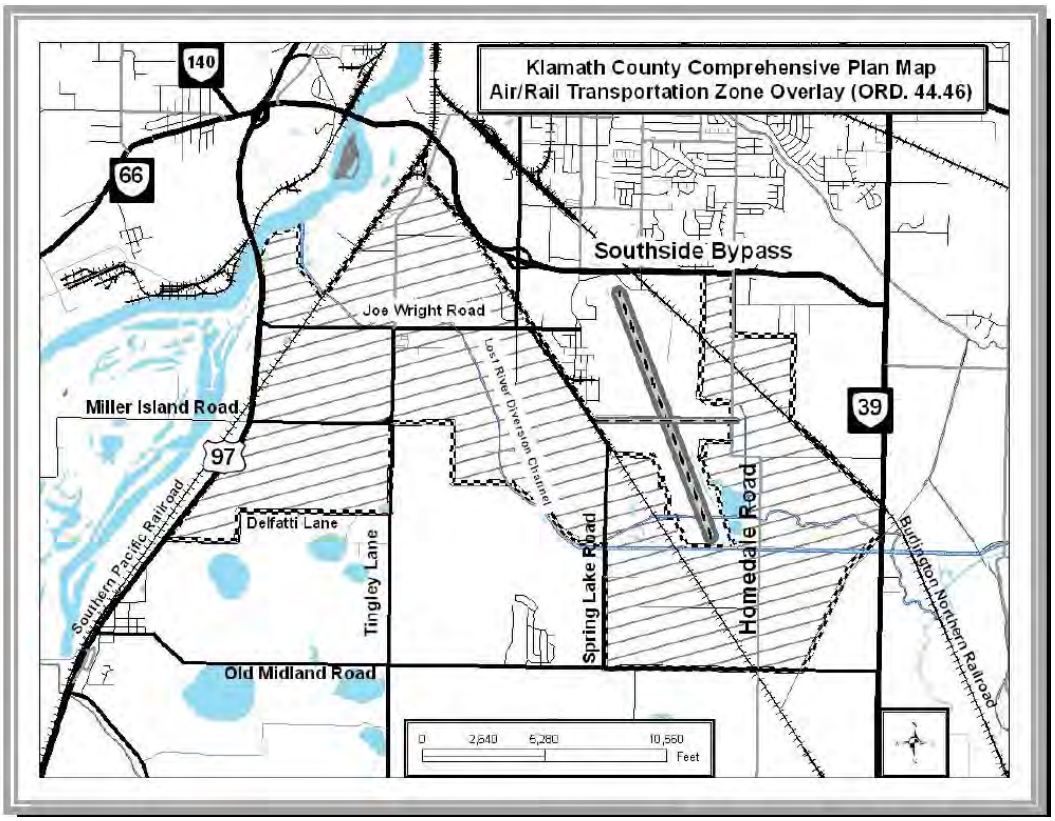
Klamath County Comprehensive Plan (2010)

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 2 – Land Use:

13. POLICY: The County shall encourage commercial/industrial development and identify potential industrial and commercial sites for uses that are compatible and related to airports in Klamath County.

Implementation: Lands proposed for rezoning that lay within the Airport/Transportation Development Zone will be restricted to commercial and industrial development. If land proposed for application of this development zone is designated for agricultural/forestry use, an exception to the applicable Statewide Planning Goals, through the plan amendment process, will be required.



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:

4. POLICY: The County shall encourage the extension of rail lines to serve major industrial developments, provided that such rail lines do not disrupt auto traffic or transport hazardous cargoes through residential areas.

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 l976 Airport Master Plan shall be limited (Arnold Thompson Associates, Inc., Master Plan, Klamath Falls Municipal Airport, April, l976); 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 Rural Transportation System Plan (2010)

The Klamath County Rural 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.[11] 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

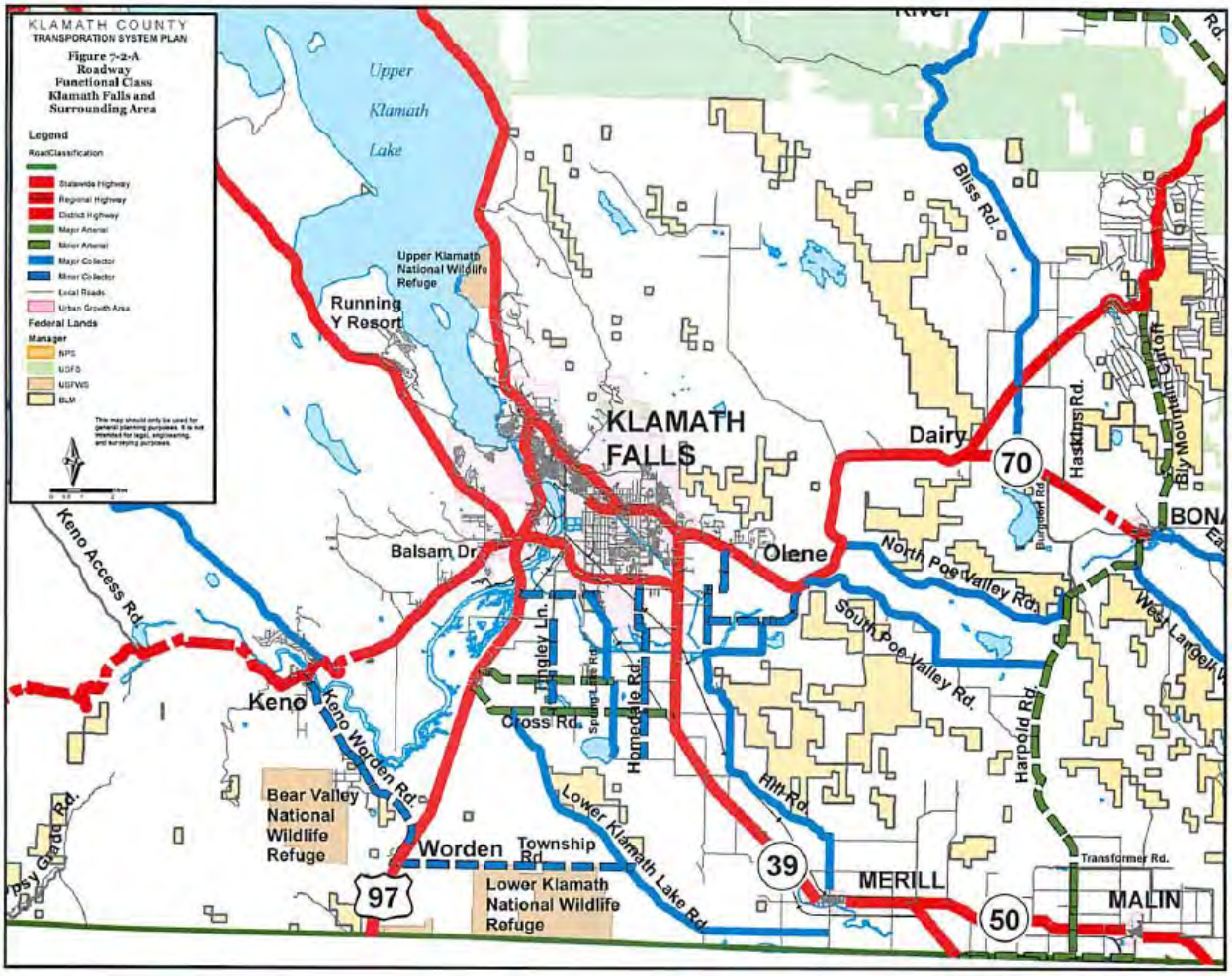
[11] The County TSP includes county roadways that traverse the Klamath Falls Urban Area, as well as the city limits. The updated City TSP will need to be consistent with the County's policies, roadway classifications, and planned improvements for these facilities.

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

The County TSP also notes that both Bel-Tec and Qwest have fiber optic lines in Klamath County, and that Bel-Tec has two lines that are entirely within the City of Klamath Falls. One hub is located at 403 Pine Street, and the other hub is located at the Sheriff's Office on Vandenberg Road.

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.



The purpose and management objectives of each of these classifications are summarized below.

- Rural Principal Arterials (State Highways) serve as the primary gateways in and out of the Klamath County area. 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.

- The Rural Minor Arterial System, in conjunction with the rural principal arterial system, links cities, larger towns, and other traffic generators that are capable of attracting travel over longer distances; provides routes for interstate and inter-county travel; runs within a reasonable distance of all developed areas of the state; and provide for relatively high travel speeds and minimum interference to through movement.

- Rural Collector routes generally serve intra-county rather than statewide travel with predominant travel distances shorter than on arterial routes and more moderate speeds.

    - Major Collector Roads 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; link these places with nearby larger towns or cities, or with routes of higher classifications; and serve the more important intra-county travel corridors.

    - Minor Collector Roads accumulate traffic from local roads and bring all developed areas within reasonable distances of collector roads; provide service to smaller communities; and link locally important traffic generators with their rural hinterland.

- The rural local road system 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.

Table 7-1 of the TSP (reproduced below) summarizes the design standards that are found in the *Klamath County Department of Public Works Standard Drawing,* which is Appendix "A" to the Land Development Code.

Recommended Design Standards for Klamath County Road Department

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 %

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 Roadway Element also addresses access management, acknowledging ODOT's standards for state roadways, and lists proposed access management guidelines by roadway functional classification for county roads in Table 7-5, reproduced below. These access management guidelines are generally not intended to eliminate existing intersections or driveways; they are intended to be applied as new development occurs.

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

The project list included in Chapter 7 for roadways and freight includes several projects in the vicinity of Klamath Falls urban area. The project team will work with City, County and regional ODOT staff to identify projects within the Klamath County Rural Transportation System Plan that have the potential to influence projects and alternatives developed as part of the Klamath Falls Urban Area TSP update.

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.

However, one of the proposed amendments to the county's development code applies within the Klamath Falls UGB:

> *62.040*
>
> *Front setbacks of 25 feet are required for the CN, CG, CR, and CT zones.*
> ***This standard should be reduced to 0 feet (for areas inside the Klamath Falls UGB) and to 5 feet (for areas outside the Klamath Falls UGB).***

Comment: While creating a good pedestrian environment is not a TPR requirement, it is very difficult to attain between major streets and parking areas. People generally walk in these places because they have to and not because they want to. Required setbacks such as these encourage commercial development to have parking in the front and the building in the rear. New commercial development should at least be given the option of locating the building near the street with parking to the rear or side.

Klamath County Land Development Code

The Land Development Code (LDC) regulates all land development within Klamath County that is not within an incorporated city, including land within the Klamath Falls UGB that is not inside city limits. Requirements pertaining specifically to the Klamath Falls Urban Area are located throughout the LDC. An assessment of LDC compliance with the requirements of the Transportation Planning Rule, as code requirements relate to the Urban Area, is found in Section II, Table 2 of this memorandum.

Chapter 10 includes general provisions about the use of the code. Chapter 20 establishes uniform procedures for reviewing permit applications and for making decisions on matters pertaining to the use and development of lands within Klamath County; Chapter 30 prescribes procedures for public hearings, public notice and appeal of decisions reached as a result of the review procedures described in Chapter 20. Chapter 40 provides standards and criteria for development permit and change of land use applications. Chapter 50 establishes land use zones to implement the goals and policies of the Comprehensive Plan, defines the purpose of each zone, and specifies the types of land uses appropriate for each zone.

Chapter 60 and 70 establish site development standards. Chapter 60 includes planning standards, such as Lot Size and Shape (Article 61); Building Heights and Setbacks (Article 62); Fences, Walls and Screening (Article 64); Landscaping (Article 65); Signs (Article 66); and Parking (Article 68). Chapter 70 has public works standards addressing vehicular access and circulation; street names, numbers and signs; and other infrastructure. Section 71.050, Improvements in the Klamath Falls Urban Area, contains required right-of-way improvements for the Urban Area. Section 71.100 limits cul-de-sacs in the Urban Area to 500 feet in length and they may not serve more than 18 dwelling units. Water and sewer service in Urban Areas are governed by Article 74; Urban Area utilities are addressed in Article 76.

Chapter 80 establishes supplementary property development standards for land uses that present unique or complex land use planning opportunities or constraints, including standards for Planned Unit Development; manufactured dwellings, recreational vehicles, and parks; destination resorts; and other uses. Chapter 90 includes only a Sensitive Bird Species Habitat Overlay.

The following sections of the LDC contain provisions that regulate transportation facilities and improvements in Klamath County:

62.060 - Vision Clearance (Building Setbacks)

64.020 - Vision Clearance (Fences, Walls, and Screening)

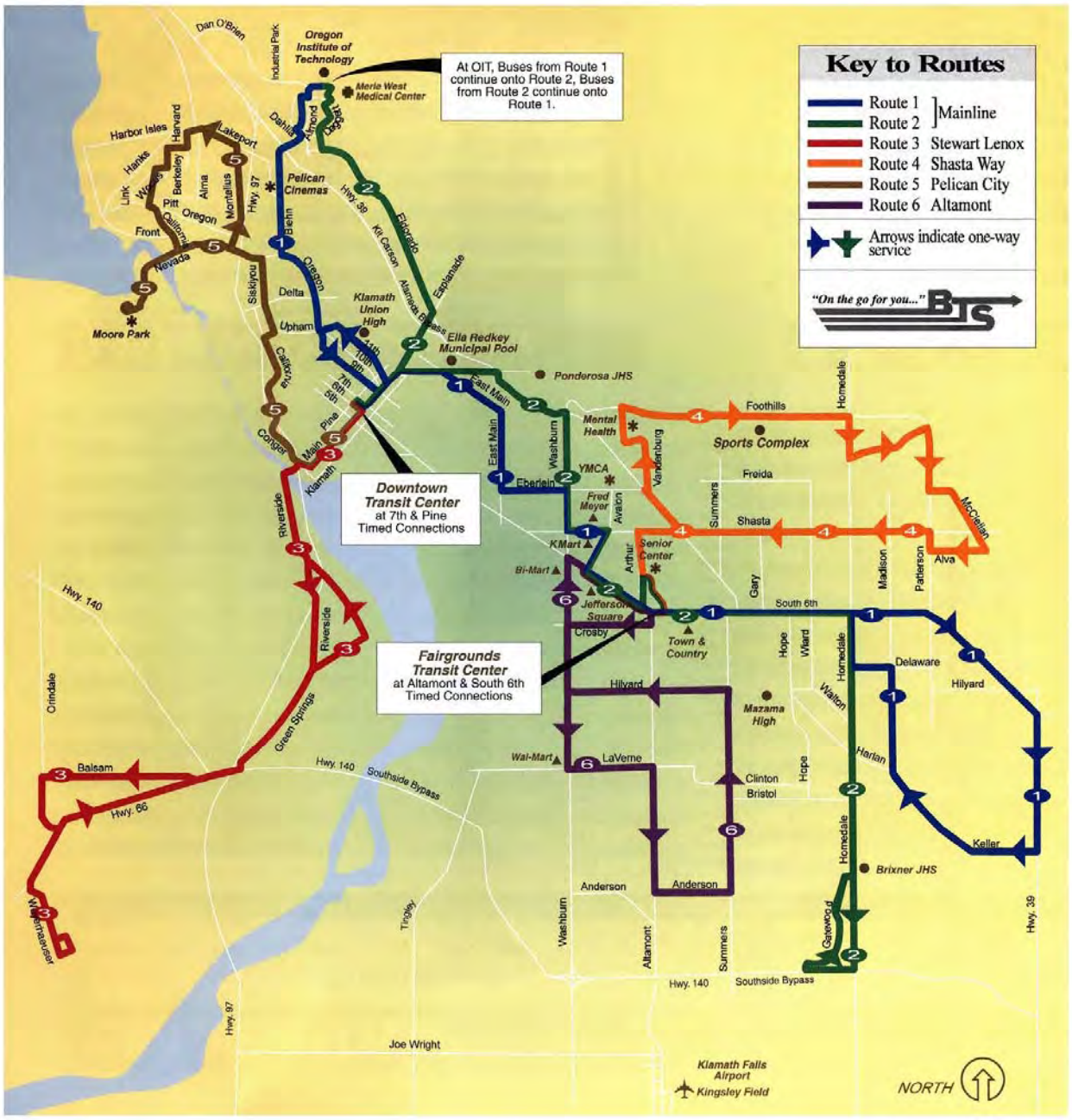
Article 71 - Vehicular Access AND Circulation

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. 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

Klamath Falls Urban Area Economic Opportunity Analysis (2009)

The 2009 Economic Opportunities Analysis and Long-Term Urban Land Need Assessment developed by the firm Johnson and Gardner is referred to as the Klamath Falls Urban Area Economic Opportunity Analysis, or KFEOA. The intent of the document is to provide the City with research and analysis of potential urban growth scenarios to assist in determining urban reserves needs over twenty-year and fifty-year planning periods. The document’s Statement of Purpose confirms that the analysis forecasts employment land demand consistent with State Planning Goal 9 Economic Opportunities Analysis methodology and documentation requirements.

The KFEOA includes goals and policies for the Klamath Falls Urban Area (i.e., land within the urban growth boundary) and, once the KFEOA is adopted, these will guide the City’s future economic development and employment land decisions. Related to the City’s goal to ensure an adequate land supply to accommodate economic growth (Goal 3, p. 70), the City will “Consider the transportation infrastructure needs of target industry opportunities when preparing Transportation System Plan updates and corridor plans to implement the City’s Goal 9 objectives (Implementation 3-5(c)).” The policy section also documents the City’s commitment to working with Basin Transit Service to increase level of service (“encourage efficient use of public facilities” through site selection criteria, Goal 4, Implementation 4-1(c)).

The KFEOA includes an economic trend analysis (national, regional, and local) and explores the area’s regional competitiveness, detailing industry sectors where the local economy is both regionally competitive and/or has growth potential. These sectors include wood products, educational and vocational training, medical services and bioscience, and emerging sectors (renewable energy and regional retail). Specific to transportation forecasting, the KFEOA forecasts employment within the City of Klamath Falls’ Urban Growth Boundary through 2028 (based on demographics from the state)

and, after evaluating site requirements by industry and documenting existing land supply and suitability, identifies needed employment lands for both the 20- and 50-year planning horizon.[12]

Figure 16 presents a forecast of total employment for Klamath Falls between 2008 and 2028; the baseline employment forecast anticipates an increase of 6,418 jobs, reflecting an average annual growth rate (AAGR) of 1.2%. The KFEOA states:

> *Significant employment gains are expected in existing employment sectors including Retail Trade and Education & Health Services. The Professional & Business Services sector is expected to continue on an accelerated growth trend. The sector has grown by over 75% during the current decade. Over the course of the planning period, we expect the maturation of the Klamath Falls economy to produce noteworthy growth in professional services on the margin. The State's regional forecast of manufacturing employment; which includes a pessimistic outlook for Wood Products Manufacturing, produces a limited forecast of less than 100 new Manufacturing jobs in Klamath Falls over the planning period.*

The KFEOA also includes alternative growth scenarios, which assume that the City will capture a significant share of the growth in the emerging renewable energy industry over the planning period. Alternative growth scenarios assume a 15% to 30% capture of regional growth forecasts resulting in an emerging industry forecast of 883 to 1,766 new jobs over the planning period (p. 29). In addition to emerging growth from renewable energy, the alternative growth scenarios also assume economic growth above and beyond the State's demographically driven forecast resulting from:

> *…broader economic growth, greater competiveness with neighboring employment areas, the strengthening of existing targeted industries, higher intensity demographic growth, and the City's goals policies, and aspirations:*
>
> *Medium Growth Scenario: Assumes a 1.4% AAGR across existing industries and composition.*
>
> *High Growth Scenario: Assumes a 1.6% AAGR across existing industries and composition.*

As stated in the KFEOA, this methodology translates into an additional 4,856 to 8,238 jobs beyond the baseline capture forecast.

Figure 27 illustrates where vacant sites are located in Klamath Falls' UGB and Figure 27, Vacant Land Supply by General Land Type, identifies that most of this land is heavy industrial. The 20-Year Supply/Demand Reconciliation section includes the estimates of gross demand and need for employment land by type ("site category"). Figure 33 provides detailed assessment of employment land demand and need (gross acres) by site quality through 2028. The results reflect three employment growth scenarios and correlate to employment site demands (provided in Figure 22). Klamath Falls will have a surplus of 52 gross acres of office commercial land under the Baseline Scenario and will need an additional 37 gross acres under the High Growth Scenario to meet economic opportunities identified in this analysis. The City has a significant amount of industrial land

[12] Because the planning horizon for the KFEOA is greater than the planning period that will be considered for the TSP update, only information relevant to the 20-year economic horizon will be summarized in this memorandum.

and only has a land need under the High Growth Scenario (97 acres). However, the KFEOA documents that the supply of adequate sites for a large industrial use is not available over the short-term; Klamath Falls does not have an unconstrained "shovel-ready" industrial parcel in the vicinity of 35 acres (p. 60). Under the Baseline Scenario, the City has a surplus of retail commercial (93 acres), but will need 223 gross acres suitable for retail commercial development over the planning period, particularly "Large" and "Medium" sites. The KFEOA does not include a locational analysis indicating where land needs may be satisfied in the future.

Also relevant to forecasting future transportation demand, the KFEOA includes a subregional commercial land analysis (Appendix G). This analysis divides the urban area into four subregions (North, South, East, and West) and documents that under current conditions, the majority of Klamath Falls' commercial activity occurs along its major corridors on the east side of the river; specifically South 6th Street, Klamath Downtown, and Washburn Way, and that very little commercial services exist on west of the Klamath River. Appendix G includes an analysis of commercial land needs on a subregional basis, based on residential and non-residential support; Table 8 summarizes the short-term subregional supply and demand; the following conclusions wrap up the subregional commercial land needs analysis.

- *Over a five-year period, the North and South Subregions have sufficient short-term supply of land under any demand scenario. This is largely a function of significant short-term supply in each subregion.*

- *Only the West Subregion has a short-term deficit of short-term commercial land posting a net deficit range of 27.1 to 37.9 acres.*

- *Over the twenty-year planning period, only the South Subregion has a long-range commercial land supply surplus.*

LOCAL PLANS AND ORDINANCES

City of Klamath Falls Comprehensive Plan (1981)

Once adopted, the Transportation Systems Plan will become the transportation element of the City's Comprehensive Plan. The City of Klamath Falls Comprehensive Plan was adopted in 1981 and the document itself has not been updated since that time.[13] 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 of the age of the document, the fact that the City adopted updated transportation goals in the 1998 TSP, and considering that the TSP update process will result in 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.

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

[13] 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.

V. URBANIZATION ELEMENT

Urbanization - Policies

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

It is recommended that, upon completion of the TSP update, the City formally adopt the revised transportation goals and policies as the transportation element of the Comprehensive Plan and that the adoption ordinance state that the policy chapter of the TSP replaces the Transportation Element in the Comprehensive Plan.

Klamath Falls Urban Area Transportation System Plan (1998)

In the late 1990s, with the participation of ODOT, Klamath County and Basin Transit, the City undertook a study of the Klamath Falls urban area that resulted in the adoption of the Klamath Falls Urban Area Transportation System Plan (TSP). The current TSP project will update the 1998 document. The current adopted TSP is described as both a multimodal plan, one that includes strategies to manage growth and the community's various transportation needs over a 20-year time horizon, as well as an intermodal plan that identifies important linkages between passenger transport services and freight.

The analysis of existing and future conditions (Chapters 3, 4, and 5) and subsequent evaluation of five primary alternatives, led to a recommended preferred alternative that is detailed in Chapter 6. As described in the Executive Summary, the preferred alternative includes a mixture of transportation-efficient land use strategies, enhancement of the existing pedestrian and bicycle system, expansion of Basin Transit Service (BTS) bus service, coordination of rail, air and highway passenger and cargo transportation, and improvements to the existing street system. The preferred alternative included the extension of the Eastside Expressway.

The City's transportation goals in Chapter 2 of the TSP are based on relevant policies from the Klamath County and City of Klamath Falls Comprehensive Plans and the Oregon Transportation Plan. Because of the age of the TSP and the changes that have occurred in the Klamath Falls area, and in light of updates to the OTP (see the review of the OTP in Section III of this memorandum), these goals will be reviewed and updated as part of the TSP update process. Chapter 2 also provides a summary of the content of the TSP chapters that follow.

Chapter 7 includes the recommended set of design standards to guide future construction of pedestrian, bicycle, and automobile facilities. This chapter includes the recommended street functional classification system (Figure 7-2), and the proposed facility design standards, based on classification (Table 7-1, Figure 7-3). Street width standards, including pedestrian and bicycle requirements, are discussed in Section II of this memorandum. Spacing standards and access management requirements are also provided in Chapter 7 (Table 7-2). The state classifications for highway segments through Klamath Falls and the associated access management standards can be found in Table 7-3.

The cost analysis and financing plan for the preferred alternative is in Chapter 8. Figure 8-2 shows the thirty-three street improvement projects needed to upgrade or increase the local street (collectors and arterials) and the highway system within the urban area. The cost for bicycle, pedestrian, and transit facilities is broken out for each mode. Table 8-3 lists possible funding responsibility (city,

county, ODOT) and sources for each planned improvement, as well as the timing of the needed improvement (0-5 years-short term; 6-10 years-intermediate; 11-20 years-long term).

Chapter 9 is the Transportation Systems Plan, containing recommendations for each modal plan that makes up the TSP: bicycle and pedestrian; transit; rail, air, water, pipeline; and street. Under the subheading "Personal Mobility," this chapter summarizes Basin Transit Service's adopted Transit Development Plan (TDP, also summarized in this memorandum). The TDP recommended restructuring the fixed-route bus system and outlined a ten-year plan to expand and finance operations. The TSP states that BTS fixed-route and dial-a-ride services are "essential to providing a balanced land use/transportation system in the Klamath Falls urban area." The TSP includes recommendations that are consistent with the TDP, including plans to expand service, periodically replace existing fixed-route vehicles, and developing a new transit center (which was completed by the time the TSP was adopted). The transit element of the TSP will be updated to reflect current BTS operations; recommended street system improvements will accommodate the needs of buses, consistent with the existing and planned transit system.

The pedestrian element of the TSP focuses on addressing the need for accessibility in downtown and improved safety in the South Sixth Street and Washburn Way areas. Sidewalk improvement projects are summarized in Table 9-1 and shown of Figure 9-1. The bicycle element of the TSP incorporates the goals from an earlier Bicycle Master Plan (1994) and expands on the recommendations of that plan to provide a comprehensive bicycle network. Table 9-3 and Figure 9-2 illustrate the recommended improvements.

The recommended local street system (arterials and collectors) is shown on Figure 9-3, Future Highway and Street Plan. Chapter 9, Section 8, includes a detailed list of street system improvements; Appendix F describes the type of improvement (capacity, upgrade, safety) for each project. This chapter also includes a list of needed highway improvements (Section 9).

Chapter 10 is the Recommended Transportation and Land Use Policies, or implementation, section of the TSP. It includes an Access Management Plan, which contains guidelines for what should be required on a preliminary site plan for development proposals that directly or indirectly access a state highway or an arterial. This section also includes the traffic impact study (TIS) requirement threshold, as well as the minimum required elements of a TIS. Chapter 10 also houses the Transportation Demand Management (TDM) Plan. The City's TDM goals are to reduce the rate of daily vehicle trips by 5 percent over the next twenty years and to increase the use of alternative modes, particularly transit. The TDM Plan includes recommendations for a parking management plan, bicycle and pedestrian improvements, and a Basin Transit service expansion plan.

The 1998 TSP was developed based on growth and development assumptions at the time and the resulting plan, as well as subsequent refinement plans, provides the standards and recommendations that continue to guide development and transportation improvements in the Urban Area. This current planning project will update the TSP using current forecasts and projections and, based on transportation modeling, will develop policy and implementation recommendations for transportation planning in the Urban Area for the next 20 years. Growth in unincorporated urban areas, coordination between the City of Klamath Falls and Klamath County, and consistency issues related to providing integrated and consistent transportation facilities within the Urban Area and between service providers will be a focus of the TSP update project.

Klamath Falls West Side Refinement Plan (2006)

The West Side Refinement Plan (Refinement Plan) was developed to address transportation needs for approximately 2,000 acres west of Highway 97, south of Lakeshore Drive, and north of Oregon 140/Oregon 66 (see figure on p. 2 of the Refinement Plan). The Refinement Plan addresses recent growth and planned development in the West Side, including the Southview PUD and the Castle Ridge Destination Resort. The Refinement Plan includes an assessment of the existing transportation system, provides an evaluation of the impacts of growth, identifies possible improvements, and concludes with the improvement projects that comprise preferred alternative.

The stated objectives for the Refinement Plan include planning the transportation system to accommodate future build-out of the area (approximately the year 2025), maintaining the functional classification of Lakeshore Drive, and access management for OR 140 that is consistent with state requirements (p. 4). Traffic conditions were evaluated for 2005 and 2025; level of service and volume-to-capacity ratios were generated for study area intersections to assess traffic operations (Table 2). The Refinement Plan shows that several intersections and highway interchange ramps will not meet operational standards by 2025 if no improvements or new facilities are constructed (p. 6-7).

Seventeen "packages" of transportation system alternatives to mitigate future traffic impacts were developed and analyzed for the Refinement Plan. With input from the public, these alternatives were refined, then analyzed using ODOT modeling techniques to find a combinations of improvements that could be phased to meet the development demands of the area. The modeling assumed approximately 3,827 single-family homes in the West Side. The results of the modeling confirmed that both highway and collector street improvements to optimally disperse traffic throughout the transportation network. A future collector street would provide a direct connection between population centers in the West Side, would delay needed capacity improvements on OR 140, and would help moderate the cost and complexity of the future US 97/OR 140/US 66 interchange replacement project (p. 10). The Refinement Plan evaluated six different collector street options, determining that the Cypress Avenue connection attracted the most trips to and from the West Side, making it the top-ranked corridor for connecting the West Side to downtown Klamath Falls. Due to possible technical engineering issues, and at the direction of the Technical Advisory Committee, the Refinement Plan recommended a second option for the collector street connection, one north of Lindley Way as an "alternate connection for connecting the West Side to Klamath Fall's regional transportation network (p. 12, also see Figure 3)." The recommended TSP project list is provided in Table 6; improvements are shown in Figure 2 of the Refinement Plan.

Orindale/Balsam Sub-Area Transportation Master Plan (2007)

The Orindale/Balsam Sub-Area Master Plan & Transportation SDC Methodology ("Sub-Area Plan") memorandum was developed by Kittelson and Associates in 2007 to present the transportation master plan for the Orindale/Balsam Sub-Area ("study area") and the recommended transportation System Development Charge methodology to fund the anticipated transportation improvements for the study area. The study area comprises approximately 1,115 acres southwest of OR-140; approximately 200 acres are within the City of Klamath Falls city limits and the remainder is within the City's UGB, in Klamath County. Downtown Klamath Falls, northeast of the study area, is a primary destination for employment, retail, and recreational traffic from the study area (shown in Figure 1 of the Sub-Area Plan). For analysis purposes the study area was divided into sub-sections north and south of OR-66 (Sub-Area Plan Figure 2). Highway 97, OR-140, and OR-66 are the primary

highways in the project vicinity. Orindale Road, running north-south, and Balsam Road, running east-west, are the primary arterial roads in the study area.

The Klamath Falls West Side Refinement Plan ("Refinement Plan," reviewed earlier in this memorandum) included much of the Sub-Area Plan's study area. However, the early plan assumed little development south of OR-140; the Sub-Area Plan was developed in response to the City's anticipating higher development north and south of OR-66, the focus of this 2007 study. The Sub-Area Plan considered the development potential of City and County property beyond what was assumed for this area in the Klamath Falls West Side Refinement Plan. As noted in the Sub-Area Plan, the Refinement Plan identified intersection improvements for three intersections within the Orindale/Balsam study area, including two concepts for the OR-66/OR-140 intersection. The Refinement Plan concluded that additional traffic in the Orindale/Balsam study area will trigger mitigation needs east of the OR-66/OR-140 intersection.

The Sub-Area Plan describes exiting conditions in the study area as more than 80 percent residential, with most of the land within the city limits zoned Medium Density, 5,000 square-foot lot size. The remainder of the residential land within the city limits and nearly all of the residential land in the study area outside the city limits is zoned Suburban Residential, which has a minimum lot size of 10,000 square-feet. There are also approximately 75 acres of commercial land and 65 acres of industrial land in the study area, most of which is adjacent to Highway 97 south of OR-66 (see Sub-Area Plan Figure 3). At the time of the Sub-Area Plan's completion, most of the study area was undeveloped, with only a few neighborhood developments and a minimal number of small agricultural land uses in the study area (p.2).

Table 1 in the Sub-Area Plan summarizes the characteristics of the key roadways in the study area; the list intersections analyzed can be found on page 6. Figure 4 illustrates the location of the study intersections, the existing lane configurations, and the associated traffic control devices. The existing conditions analysis indicates that all of the study intersections currently operate under capacity and at level of service (LOS) C or better and the ODOT managed intersections operate at a 0.32 v/c ratio or better. The Sub-Area Plan noted that its results are consistent with the existing conditions operations analysis provided in the Refinement Plan.

Consistent with the Refinement Plan, the Sub-Area Plan uses the forecast year 2025 for the "No Development Scenario," which assumes continued regional growth, but no new development within the study area (see regional growth assumptions on p. 8). To analyze future traffic conditions, the Sub-Area Plan assumed that the forecast transportation improvements identified for OR-140 in the Refinement Plan will occur. For the Local Build-Out Conditions scenario, it was assumed that undeveloped land would build-out at the maximum density permitted under the current zoning, with a few exceptions due to topographic or other constraints. The specific build-out assumptions, for both the northern and southern subsections, are discussed on pages 12-13; Figure 7 shows the location and size of the land uses expected to occur. Table 2 shows the corresponding estimated trip generation for the northern and southern sub-sections and for the entire study area. Consistent with the Local Build-Out Conditions assumptions, a total of 2,005 (1,625 in the north and 380 in the south) new homes could be built in the study area. In addition, 644,000 square feet of commercial property could be built and 70 acres of industrial land could be developed. Build-out of the study area could generate approximately 36,455 new trips daily with 2,270 occurring during the weekday a.m. peak hour and 3,600 occurring during the weekday p.m. peak hour (p. 16).

Year 2025 Local Build-Out traffic volumes shows the forecast total traffic operations associated with build-out of the study area in year 2025 (Figure 11). Page 17 includes a list of recommended

roadway improvements to accommodate the projected traffic volumes; a list of intersection improvements needed to achieve the operational conditions (Figure 11) follows on p. 17 and 18. Table 3 lists the necessary mitigation improvements required for build-out of the study area (including associated costs), Figure 12 shows their location, and Figure 13 shows the proposed traffic control and lane configurations associated with the recommended improvements. The discussion of system development charge (SDC) alternatives begins on page 24.

Campus Area Sub-Area Master Plan (2008)

The Campus Area Sub-Area Master Plan ("Campus Area Plan") is a transportation master plan for approximately 1,085 acres northeast of US-97 in the northeast corner of the City in the vicinity of the Oregon Institute of Technology (OIT). The City commissioned the Campus Area Plan to provide a better understanding of the potential impacts of growth on the transportation system, future deficiencies, and estimated costs to plan and construct necessary roadway improvements. The work also includes a transportation System Development Charge (SDC) methodology to fund the anticipated transportation improvements for the OIT study area. The SDC methodology section begins on p. 37. As described in the Campus Area Plan, the SDC was developed by considering the existing land uses and traffic conditions in the study area, identifying the potential for future development in the study area, and determining necessary transportation mitigations and associated costs for the build out scenario.

Figure 1 of the Campus Area Plan shows the site vicinity and the study area. The study area was divided into four sub-sections, as shown on Figure 2. Approximately 880 acres (80 percent of the study area) are within the city limits, with the remainder lying within the Urban Growth Boundary (UGB) in Klamath County. The 20 percent of the study area that is outside city limits is shown as undesignated zoning on the City of Klamath Falls zoning map and is zoned Residential by Klamath County. The Campus Area Plan documents that much of this undesignated land is on steep topography and may not be developable. The remaining study area is within the City limits and includes a mix of land use zoning, including residential, commercial (primarily located along Highway 97), heavy industrial and professional uses (medical) and public uses associated with the OIT campus (see Figure 3). At the time the Campus Area Plan was developed, almost sixty percent of the study area was undeveloped and existing development was comprised of primarily residential developments, the OIT campus, and medical and commercial uses.

Table 1 summarizes the characteristics of the key roadways in the study area, which include Highway 97, Highway 39 (Highway 97 Business Route/Crater Lake Parkway), Campus Drive, Dan O'Brien Way, and North El Dorado Avenue. Study intersections are found on p. 5. The existing conditions analysis found that all of the study intersections operated under capacity and at LOS D or better, except for the intersection of Campus Drive and Daggett Avenue in the AM peak hour, which operates at LOS F on the westbound approach.

To model future transportation needs ("Year 2030 Regional Growth Conditions"), traffic volumes for the 2030 regional growth conditions were developed by growing existing 2007 traffic volumes on Highway 97 by one percent per year to 2030 and then adding the traffic associated with the addition of the four approved "in-process" developments to the study area roadways. The four developments are listed beginning on p. 10 and include the OIT expansion, residential growth in the Valley Vista development, Harbor View Subdivision, and the Somerlande PUD. The methodology assumes that the planned roadway extensions connecting Daggett Avenue and Dahlia Street to Dan O'Brien Way will be constructed. The future traffic operational concludes that the Campus Drive/Daggett Avenue intersection will likely operate below City of Klamath Falls standards (Figure 6).

Future development assumptions ("Year 2025 Local Build-Out Conditions") can be found starting on p. 13 by sub-subsection; a series of figures illustrate future land uses in each sub-section (Figures 7, 8. 9 and 10). Table 2 summarizes the development potential of each sub-section and shows the estimated trip generation for each sub-section and for the entire study area. The Campus Area Plan concludes that a total of 432 new homes or dwelling units could be built in the study area, as well as approximately 1,795,000 square-feet of industrial uses, approximately 420,000 square-feet of commercial uses, and 182,000 square-feet of office/medical professional. In total, build-out of the study area could generate approximately 26,900 new trips daily with 1,800 occurring during the weekday a.m. peak hour and 3,100 occurring during the weekday p.m. peak hour (p. 23). All study area intersections are expected to fail during the weekday a.m. and/or p.m. peak hour study periods with the full local build-out in the study area (Figure 13).

The Campus Area Plan also includes a discussion of the improvements recommended by the 1999 Highway 97 Klamath Falls Campus Area Access and Circulation Refinement Plan (p. 24 and Attachment 1). It concludes that, because of the significant increase in traffic along Highway 97, Campus Drive, and Dan O'Brien Way, additional improvements are needed beyond those described

in the Campus Area Refinement Plan. The Campus Area Plan builds on Alternative 4-Option 1 of the Refinement Plan, which calls for the grade-separation of Dan O'Brien Way at Highway 97. All access to Highway 97 between Dan O'Brien Way and Campus Drive will be removed as part of Alternative 4-Option 1 and a local roadway network will be needed to distribute traffic to Dan O'Brien Way and Campus Drive. Other necessary roadway improvements are listed on p. 32 and shown on Figure 15; needed intersections improvements are shown in Figure 16. With the improvements detailed in the Campus Area Plan the planned transportation system can accommodate 65 percent of local build-out, with all intersections operating within the City of Klamath Falls and ODOT standards except for the intersection of Highway 97 and the Dan O'Brien Way ramp terminal, which is forecast to operate with a v/c > 1.0 and a LOS F during the weekday a.m. peak hour.

Klamath Falls Community Development Ordinance

The Community Development Ordinance (CDO) consists of Chapters 10 through 14 of the City's Code. The CDO regulates all land development within the City Limits. Chapter 10 establishes the application and hearings procedures for land use decisions within the City. Chapter 11 governs land development review and includes procedures and requirements for Design Review, Conditional Use Permits, land division, variances, and zone changes. Chapter 12 establishes the zoning in the City, including the uses permitted and the site standards for each zone. City boundary amendments and annexation procedures are governed by Chapter 13, which details procedures and provides the equivalency table of County/City land use and zoning classification to determine what zone should be applied to property upon annexation. Site development standards are contained in Chapter 14. Chapter 14 includes requirements for access, parking, landscaping, and bicycle facilities. Ordinance provisions that implement the City's TSP are reviewed in Table 1 of this memorandum.

The following sections of the CDO contain provisions that regulate transportation facilities and improvements in the city:

- Sections 12.360-12.395 Planned Unit Development
- Section 14.010 Off-Street Parking Requirements.
- Section 14.050 Access and Driveways
- Section 14.390 Vision Clearance
- Sections 14.450-14.490 Bikeways

An assessment of CDO compliance with the requirements of the Transportation Planning Rule is found in Section II of this memorandum.

Basin View Planned Unit Development Standards (1990)

The process for planned unit development (PUD) approval, as codified in Chapter 12 of the CDO, requires a zoning map amendment and a master plan for the entire subject property.

> ***12.375 Master Plan Submittal Requirements.*** *All development within the Planned Unit Development shall comply with the Master Plan as approved and adopted by the Council. Any application for a change in zone to establish a Planned Unit Development shall contain as a part of that application a Master Plan indicating the nature of the proposed development relative to the intent and purpose of Sections 12.360 to 12.395.*

Upon approval, the PUD master plan governs the allowed uses and development standards for the land with the PUD zone. The Basin View PUD was adopted in 1990. The adopting ordinance includes permitted land uses and development standards for the Basin View area and includes the provision that the Architectural Committee must approve all plans.

Single- and multi-family residential are permitted in the Basin View PUD, as well as a limited list of neighborhood commercial uses. Land use designations must be located in conformance with Exhibit B of the ordinance. For lots zoned commercial located south and west of Basin View Drive, the permitted uses are defined in the CDO [reference?] and are subject to design review procedures. Single family dwellings may not be less than 1,000 square feet (1,200 square feet in the North Hills subarea). Single-family residential structures may not occupy more than 30% of the lot area; other uses have a 50% lot area restriction. No single neighborhood commercial use may occupy more than 20,000 square feet of building area.

City of Klamath Falls Public Works Engineering Standards Manual (2003)

Standards for the construction of streets, sidewalks, and bike lanes are found in the City's Public Works Engineering Standards (January 2003) document. Drawing number 8-200 is a table that includes the design standards for the street classifications (major arterial, major collector, minor collector and local street). As discussed in Section II of this memorandum, the engineering standards are not consistent with the street standards in the Community Development Ordinance (Section 11.805), nor do they reflect the cross sections shown in the TSP (Figure 7-3).

Klamath Falls, Oregon Parks Master Plan (1998)

The Parks Master Plan is the policy document that describes the City's strategy for meeting existing and future parks needs in Klamath Falls. It assesses future park and recreation needs, establishes policies and guidelines for park development, identifies the location of future parks, trails, open space and other recreation facilities, and describes funding strategies. The Parks Master Plan is intended to be the park and recreation element of the Comprehensive Plan.

Section III of the Parks Master Plan describes existing conditions in the urban area, including the information that, at the time of plan adoption, there were 12 miles of trials, 10.5 of which were paved bike or walking trails. Table 4 is the Summary of Trails/Pathways in the planning area. Section V contains the recommendations for each element of the City's park and recreation system. Section 5.5 Trails and Pathways includes policies for providing walking, bicycling, and other non-motorized recreational facilities and opportunities. These types of facilities are identified as a way to travel throughout the community, but are distinct from routes that are incorporated into street designs. The Definition section (5.5.1) states:

> *By providing a link to other areas and facilities, they can provide non-vehicular options for travel throughout the community. Trails can be designed for a single type or multiple types of users. The trails and pathways emphasized here are those that are recreational and multiple use in nature. Bike routes located primarily on streets are not included in this study.*

Policies pertaining to Trails and Pathways clarify that the City will accommodate trails on public land, when possible, but will require trails as part of proposed development as a condition of approval (5.5.2(2)). Development Criteria (5.5.3) for trails includes the following:

1. *The primary purpose of recreation trails is to provide a recreation experience with transportation objectives as a secondary objective.*
2. *Whenever possible, recreation pathways and trails should not be part of a street roadway, however where routes use existing streets, the pathway should be designed to minimize potential conflicts between motorists and trail users.*

5. *Trails should be planned, sized, and designed for multiple uses, except for dedicated nature trails, and/or areas that cannot be developed to the standard necessary to minimize potential user conflicts.*
6. *Centralized and effective staging areas should be provided for trail access. They should include parking, orientation and information, and any necessary specialized unloading features. Where possible, primary trailheads should be located at major park sites that contain the normal support facilities. Secondary trailheads need only limited parking and signage.*
   Trail connections, locations and orientation should encourage users to walk or bicycle to the trail. Depending upon the expected and desired level of use, secondary trailheads may have 3-8 parking spaces, whereas primary trailheads may have 20 or more parking spaces.
7. *Trails should be looped and interconnected to provide a variety of trail lengths and destinations. They should link various parts of the community, such as schools, shopping, and park sites.*
8. *Trails should be located and designed to provide a diversity of challenges. Enhance accessibility wherever possible, with high priority given to nature trails and trail loops or destination opportunities.*

Table 15, Summary of Trail Recommendations, represents a com a combination of paved and unpaved trails "that can be used for recreation as well as transportation purposes (p. V-27)." Table 23, Summary of all Recommended Improvements Klamath Falls Parks Master Plan, also includes a list of planned new or extended trails. Recommendations in the updated TSP should be consistent with the City's trail planning. In particular, the bicycle and pedestrian plan in the TSP should show a

comprehensive network for non-motorized transportation that ties in with the planned trail system. [Note: There is a placeholder on p. V-8 for a "Facilities Plan Map," where the trails should be shown, but this map is not included in the Park Plan document.]

Klamath Falls Airport Master Plan (2005)

Klamath Falls Airport is operated by the City of Klamath Falls. The airport facility, Kingsley Field, is situated on a 1,166-acre site about 5 miles southeast of downtown Klamath Falls. The Klamath Falls Airport Master Plan ("Master Plan") documents existing airport facilities and operations, as well as future facility, land, and transportation needs based on projected growth.

Klamath Falls Airport is classified as a non-hub primary commercial service airport in the National Plan of Integrated Airport Systems 2001-2005, and is classified in the Oregon Aviation Plan as a Category 1, Commercial Service Airport. It serves virtually all of the aviation needs of the Greater Klamath Basin, including all of Klamath County and parts of Siskiyou and Modoc Counties in California. The Klamath Falls Airport serves a mixture of military, commercial, and general aviation use (see Chapters 1 and 2). Horizon Air provides four daily round trip flights between Klamath Falls and Portland. Much of the airport's use, however, is from general aviation (non-military, non-scheduled) users, such as non-scheduled air-taxi service, U.S. Forest Service fire suppression, agricultural spray applicators, flight school, scenic flights, corporate aviation, and air cargo. Military use of the Klamath Falls Airport is also substantial, and includes refueling of military aircraft; emergency support, air traffic control, and disaster relief by the Oregon Air National Guard; and military training.

Chapter 2 of the Master Plan includes an analysis of existing (2002) and projected future (2022) demand at the airport. Table 2L of the Master Plan summarizes the existing and projected demand for each component of the airport's use. Annual passenger boardings for commercial airline service at the Klamath Falls Airport ranged between 30,000 and 33,000 in the years leading up to the development of the Master Plan and are projected to grow to roughly 45,500 in 2022. Growth is also projected for military and general aviation usage. The Master Plan notes that the types of aircraft based at Klamath Falls Airport will change over the course of the 20-year planning period, and predicts a future need for larger hangars and more paved apron space.

The airport is bounded on the north side by the South Side By-Pass, on the east side by Homedale Road and the Burlington Northern Santa Fe Railroad (BNSF), and by the Lost River Diversion Channel and the Union Pacific Railroad to the south and west (p.1-10). The airfield has an X-shaped configuration formed by the two active runways. The primary building area is located northwest of the runway intersection. Though there are a few other buildings located elsewhere on the airport, development outside of the primary building area has been limited by safety setbacks defined by the military, clear areas required for airport navigational aids and radar, and wetlands (p.1-15). The main parking lot in the passenger terminal complex provides 250 parking spaces while an overflow lot constructed in 2002 provides an additional 190 spaces. Airport tenants occupy a substantial portion of the airport; tenants often maintain their own secure airside apron, buildings and facilities, and vehicle parking areas (p.1-21).

The City of Klamath Falls and Klamath County have jurisdiction over land use in the airport's environs. The airport property is currently designated Public Facility. Lands to the east, west and south are designated Exclusive Farm Use – Crop Land. Immediately adjacent to the airport to the

northwest and northeast are lands designated for various types of commercial and industrial uses. Several pockets of land north of the airport are designated Suburban Residential (p.1-5).

Airport access and circulation presents some existing and future challenges. Improvements along the South Side Bypass required the relocation of the main airport entrance from Altamont Drive to Washburn Way in 1997. The new route, via Washburn Way and Joe Wright Road, reduces airport traffic through the local neighborhoods in addition to improving the South Side Bypass. However, airport traffic is now forced to cross the Union Pacific Railroad tracks twice (p.1-20). Airline terminal access will be provided with a dedicated access-loop road at some point in the future, requiring altered on-site vehicular traffic patterns. Similarly, corporate development will increase traffic on the airport's access roadways. Finally, future development on the airport's east side will be enhanced by a dedicated access point connecting to the South-side bypass (p.5-3).

Expansion of airport facilities is constrained by airfield setbacks, physical barriers, airport property limitations, military safety setbacks and leased areas, existing facilities, roadway access, and potential environmental constraints (p. 5-2). Chapter 5 of the Master Plan identifies five sites that present growth opportunities for aviation and/or non-aviation uses; two of the five sites are planned for at least some non-aviation uses. Conceptual development plans for several of the sites noted a need for improved or revised access and/or circulation in order to facilitate development.

Chapter 5 also presents additional recommendations on land use and transportation that will shape the airport's future growth, including improvements to the Homedale Road interchange and east airport access, acquiring or protecting land on the airport's east side for future expansion, and railroad track consolidation and removal. ODOT has evaluated several alternatives to improve safety at the Homedale Road/South-Side Bypass intersection. The previous master plan study recommended relocating the airline terminal to the airport's east side; the 2005 master plan does not recommend terminal relocation but does note that roadway improvements to connect the airport's east side to population/business centers would help stimulate aviation and compatible non-aviation development in targeted airport development areas. The Airport Layout Plan (ALP) includes a local roadway connection and interchange similar to those that were under consideration by ODOT (p.5-11 – 5-13). The Master Plan also notes that duplicative railroad tracks currently constrain both the east and west side of the airport, and that some dialogue has already occurred between the City of Klamath Falls and the railroad operators regarding the potential to close and remove sections of track. Given the timeline of track closures and an unknown preference as to which track is most easily closed, however, the ALP retains the tracks as a permanent constraining influence on airport growth potential.

2020 Klamath Vision (2010)

The result of a process guided by the Klamath County Economic Development Association (KCEDA) and the Klamath County Chamber of Commerce, this vision document focuses on three main themes - Community, Economy, and Sustainability – and is organized around nine different topics: Education, Government, Health and Human Services, Image, Job Creation, Natural Resources, Recreation, Sustainability, and Transportation. The Klamath Vision document records the results of a series of facilitated conversations, where citizens were invited to choose among the various topics and to develop visions, ideas, and action items to implement the visions. Each group met several times and their input resulted in the Klamath Vision publication. Based on the stated focus of the planning effort, the intent of the document is to provide direction to community leaders involved in

community planning and economic and community development. The document is aspirational, with desired outcomes articulated as "vision" statements followed by implementation actions.

The Vision for Sustainability chapter includes the following goals that are related to the transportation system:

- *Safe, walkable, affordable, friendly neighborhoods, with a mix of housing types and costs, in which people can live, shop, recreate, and work*
- *A well-planned transportation system that accommodates people, bikes, and non-polluting vehicles and encourages a walkable community*
- *Easy access to parks, trails, community spaces, and natural areas to connect people with nature and with other people*

The Transportation subsection in this chapter provides a vision of the future transportation system and is included here:

Transportation

By 2020, the Klamath Basin will have a multi-layered, neighborhood and regional transportation system that moves people and goods around the region with minimal reliance on fossil fuels.

Vision 1: Klamath citizens will be aware of the need to reduce our reliance on fossil fuels and have available to them ways to do so.

A. Local governments and community agencies will work to ensure a knowledgeable citizenry by distributing information on ways to reduce reliance on fossil fuels and use energy efficiently.

1) Measurable Outcome: Information is distributed to citizens of Klamath County

2) Timeline: Ongoing

3) Stakeholders: City of Klamath Falls, Klamath County, State of Oregon, Basin Transit System, Local Utility Companies

4) Funding Considerations: Grants, TBD

5) Related Vision Teams: Government

Vision 2: Our community will make available a transportation infrastructure that does not depend on fossil fuels.

A. More citizens will use public transportation, and our local transit system will include vehicles designed or converted to run on electricity and locally-produced biofuels.

1) Measurable Outcome: Use of public transportation increases and local transit system will replace fleet with electric or biofuel vehicles

2) Timeline: Complete by 2020

3) Stakeholders: Basin Transit System, Klamath County, Local Citizens

4) Funding Considerations: Grants, TBD

5) Related Vision Teams: Natural Resources, Transportation, Government

B. Car sharing cooperatives will enable people to use biofuel, electric, or hybrid electric/biofuel vehicles without purchasing one.

1) Measurable Outcome: A car sharing cooperative is established

2) Timeline: 2020

3) Stakeholders: Citizens, Klamath County, BTS, Local Auto Dealers

4) Funding Considerations: Grants, government, private enterprise

5) Related Vision Teams: Transportation, Government, Image

C. Electric cars will have solar-powered charging stations throughout the Klamath Basin.

1) Measurable Outcome: Solar charging stations are located in Klamath County

2) Timeline: 2020

3) Stakeholders: Private Investors, Local Auto Dealers

4) Funding Considerations: Private, government, grants

5) Related Vision Teams: Transportation, Government, Image

D. A portion of Klamath's agricultural production and bio-waste will be used to make biofuels and create local jobs.

1) Measurable Outcome: Production of biofuel crops is increased; more jobs exist in this sector, and less bio-waste is deposited in landfill

2) Timeline: 2020

3) Stakeholders: Farmers, Waste Management, SCOEDD, KCEDA

4) Funding Considerations: Grants, subsidies, private enterprise

5) Related Vision Teams: Natural Resources

E. A local trucking industry using locally-produced biofuels and/or solar electricity moves goods arriving by train to homes and businesses.

1) Measurable Outcome: New local trucking industry – using biofuel or solar to transport goods – is located in Klamath County

2) Timeline: 2020

3) Stakeholders: Private Investors

4) Funding Considerations: Government incentives, private

5) Related Vision Teams: Transportation, Natural Resources

F. *Neighborhood-level transport businesses that do not rely on fossil fuels, such as pedicabs or small electric jitneys, add economic vitality and ensure no one is isolated from the community beyond the neighborhood.*

1) Measurable Outcome: Pedicab or similar company is located in Klamath County to provide transportation to the community neighborhoods

2) Timeline: 2020

3) Stakeholders: BTS, Klamath County, City of Klamath Falls, Private Investors

4) Funding Considerations: Grants, Government incentives, private

5) Related Vision Teams: Transportation, Government, Image

G. *Local governments, institutions, and organizations will adopt renewable energy-based transportation.*

1) Measurable Outcome: Local government, institutions and organizations will adopt renewable energy-based transportation as they retire used vehicles

2) Timeline: Ongoing

3) Stakeholders: City of Klamath Falls, Klamath County, BTS, OIT, KCC, State of Oregon

4) Funding Considerations: Government incentives, grants, private

5) Related Vision Teams: Transportation, Government, Image

H. *Klamath County citizens will walk and bicycle around the community on a safe, interconnected system of trails and pathways.*

1) Measurable Outcome: Local governments will make creation and maintenance of safe, efficient pedestrian and bicycle routes a community priority

2) Timeline: 2020

3) Stakeholders: Klamath County, City of Klamath Falls, State of Oregon

4) Funding Considerations: Grants, Street funds

5) Related Vision Teams: Transportation, Recreation

The 2020 Klamath Vision document is not a City-adopted policy document, but rather reflects the views of self-selecting groups of individuals, representing a variety of interests. It can provide guidance for updating TSP policy regarding how residents would like their transportation system to function in future, but it is not a document that carries the same regulatory weight as the City's adopted Comprehensive Plan.

Appendix 2B
Technical Memorandum #2: Goals, Objectives, and Evaluation Criteria

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MEMORANDUM

Date: December 1, 2010 Project #: 11172.0

To: Mark Willrett, City of Klamath Falls
Stan Strickland, Klamath County

Cc: Project Management Team, Technical Advisory Committee, Citizens Advisory Committee

From: Susan Wright, PE, Marc Butorac, PE, Erin Ferguson, and Matt Kittelson

Project: Klamath Falls Urban Area Transportation System Plan

Subject: Technical Memorandum #2: Goals, Objectives and Evaluation Criteria

This memorandum presents goals, objectives and a draft set of evaluation criteria for the Klamath Falls Urban Area Transportation System Plan (TSP) update. The goals and objectives will help guide the TSP update process. The evaluation criteria will be used to set policies and identify "preferred alternatives", which will comprise the list of recommended projects and associated policy, code amendments, and funding actions in the TSP.

The goals below are based on evaluating the current Klamath Falls Urban Area TSP, the Transportation Growth Management (TGM) grant application submitted by the City of Klamath Falls, and on conversations with City, County, and ODOT staff. The specific objectives and evaluation criteria were developed based on the goals. The project objectives and evaluation criteria will serve as the means by which the TSP goals are realized. Following the goals, objectives, and evaluation criteria below is a discussion of the evaluation process to be used to evaluate policies and alternatives as well as an evaluation matrix to be used later to assess alternatives.

Goals

TRANSPORTATION SYSTEM PLAN GOALS

The existing Klamath Falls Urban Area TSP was adopted in 1998. Since that time, the City of Klamath Falls and surrounding areas have grown in size, reaching 2015 population estimates by 2010, and, as such, are out-growing the projects and improvements identified in the 1998 TSP. Several goals were established to help guide the development of the Klamath Falls Urban Area TSP update. These goals are:

1. Ensure a safe and efficient transportation system for all users.

2. Provide access to the transportation system for all users, including low income and minority populations.

3. Integrate adequate bicycle and pedestrian pathways, sidewalks, and bicycle lanes through the community, particularly to connect residential areas with schools and activity centers.

4. Improve the local circulation system to reduce the community's reliance on State Highways to travel to local destinations.

5. Build and maintain the transportation system to facilitate economic development in the region.

6. Improve system performance by balancing mobility and access, particularly along main travel routes.

7. Minimize the impacts of transportation system development on the natural and built environment.

An underlying goal of the TSP update process is to satisfy the requirements of the Transportation Planning Rule (TPR) (OAR 660-012) for a TSP update. This includes compliance with Title VI (civil rights) requirements and collaborating with plan area residents and transportation users through the City and County Planning Commissions, City Council, County Board of Commissioners, public open houses, key participant workshops, and the public website. It also includes ensuring compliance with the TSP content requirements of the TPR and consistency with the Oregon Transportation Plan (OTP), Oregon Highway Plan (OHP), adopted local, regional and state plans, and ODOT's TSP guidelines.

Objectives and Evaluation Criteria

Based on the goals for the TSP update, objectives and evaluation criteria were developed for the purpose of further defining the intent of each goal and the metrics available to assess the progress towards each goal.

The goals and the corresponding objectives and evaluation criteria are below.

Goal #1: Ensure a safe and efficient transportation system for all users

Objectives

1A. Coordinate with existing safe routes to school (SRTS) plans and identify potential engineering components for future SRTS plans for local schools.

1B. Strategically plan for safety and operational improvements for bicyclists and pedestrians.

1C. Incorporate the Highway Safety Manual (HSM) into development review and capital project evaluation processes.

1D. Reduce the number of fatal and serious crashes in the plan area by 50% in the next 20 years.

1E. Reduce the frequency of bicycle and pedestrian related crashes in the plan area by 50% in the next 20 years.

1F. Meet applicable City, County, or State operational performance measures.

Criteria

1C1. Project includes pedestrian and bicycle improvements located within existing or potential SRTS plan areas.

1C2. Influence of proposed project on developing new SRTS plans and/or enhancing existing SRTS plans.

1C3. Number of conflict points between all modes of travel including crossing points for pedestrians and bicyclists along major arterials.

1C4. Miles of designated facilities (on-street and off-street) for bicyclists and pedestrians provided.

1C5. Intersection visibility and sight distances available to motorists, pedestrians, and bicyclists at intersections and key decision points.

1C6. Estimated number of fatal and serious injury crashes.

1C7. Estimated number of bicycle and pedestrian related crashes.

1C8. Percent of facilities meeting applicable operational performance measure.

Goal #2: Provide access to the transportation system for all users, including low income and minority populations

Objectives

2A. Provide transportation mode choices to all users of the transportation system.

2B. Consider impacts to low income or minority populations when assessing the impacts of transportation infrastructure projects.

Criteria

2C1. Impact of transportation projects on low income and minority populations

2C2. ADA Compliance.

2C3. Viability of non-auto travel.

2C4. Incorporation of safe, convenient, and comfortable multimodal facilities.

Goal #3: Integrate bicycle and pedestrian pathways, sidewalks, and bicycle lanes through the community, particularly to connect residential areas with schools and activity centers.

Objectives

3A. Provide safe and convenient connections between travel modes.

3B. Identify ways to improve street connectivity to provide additional travel routes for bicyclists, pedestrians, and autos.

3C. Prioritize projects that improve pedestrian and bicycle system connectivity in areas near schools.

3D. Provide signing and pavement markings to identify bicycle and pedestrian networks through the City and to help bicycle and pedestrians reach their destinations via the network.

Criteria

3C1. Potential impact on bicycle and pedestrian volumes.

3C2. Impact on connectivity of bicycle and pedestrian systems.

3C3. Average trip length for bicyclists from residential areas to activity centers via the bicycle/pedestrian networks.

3C4. Average trip length for pedestrians from residential areas to activity centers via the bicycle/pedestrian networks

3C5. Incorporation of wayfinding signs and pavement markings for pedestrians and bicyclists.

3C6. Number of uncontrolled crossing conflict points between vehicles and pedestrians/bicyclists on the bicyclist/pedestrian network.

Goal #4: Improve the local circulation system to reduce the community's reliance on State Highways to travel to local destinations.

Objectives

4A. Provide alternative routes to the state highways.

4B. Provide adequate capacity on alternative routes to state highways.

4C. Develop local circulation plan identifying valuable new local circulation routes and connections.

4D. Sign local routes for local destinations.

Criteria

4C1. Average trip length.

4C2. Percent of capacity on regional facilities used for reaching local destinations.

4C3. Volume-to-capacity (V/C) ratios on parallel routes to highways.

Goal #5: Build and maintain the transportation system to facilitate economic development in the region.

Objectives

5A. Improve the movement of goods and delivery of services throughout the region using a variety of travel modes.

5B. Ensure adequate capacity for future travel demand and multiple modes on collector and arterial streets and on the local highways to enable economic development in the community.

5C. Identify lower cost alternatives or provide funding mechanisms for transportation improvements necessary for development to occur.

5D. Program transportation improvements to facilitate the development of desired land uses.

5E. Provide adequate capacity at rail crossings to meet demand.

5F. Review transportation and land-use code and regulations and identify changes to attract and facilitate desired development.

Criteria

5C1. Roadway geometry accommodates freight movement where it is needed.

5C2. Traffic operations performance on designated freight routes.

5C3. Potential increased attraction to desired businesses and developers.

Goal #6: Improve system performance by balancing mobility and access, particularly along main travel routes.

Objectives

6A. Develop an access management plan that reflects desired character and operations of roadways and is feasible in terms of adoption and enforcement.

6B. Incorporate the HSM analysis into corridor planning, operations and design activities to help improve safety.

6C. Incorporate multimodal level-of-service (MMLOS) analysis from the Highway Capacity Manual (HCM) 2010 to improve mobility for multiple modes.

Criteria

6C1. Number of access points for motorists based on street classification and desired street character.

6C2. Estimated number of future crashes along the corridor.

6C3. Estimated MMLOS performance along the corridor.

6C4. Access provided for freight, bicyclists, and pedestrians.

Goal #7: Minimize the impacts of transportation system development on the natural and built environment.

Objectives

7A. Reduce vehicle miles traveled (VMT) to reduce emissions.

7B. Increase the non-auto mode split to reduce emissions.

7C. Update City design standards to reduce water run-off and street maintenance costs.

7D. Use technology to improve efficiency and safety of the transportation system.

7E. Assess the ability of the transportation system to handle proposed changes to, or development of, adjacent land uses.

7F. Promote transportation demand management strategies (carpooling, flexible work hours, telecommuting, etc.) to reduce VMT on the transportation system.

7G. Base planned future improvements on available funding.

Criteria

7C1. City-wide VMT and vehicle hours traveled (VHT).

7C2. Prevailing (i.e., 85th percentile) corridor travel speed on major thoroughfares compared to the desired operating speeds given roadway function, class, and desired character.

7C3. Travel mode split.

7C4. Effectiveness of City design standards to limit the environmental impact of the transportation system.

7C5. Vehicle occupancy along commuting corridors during the peak periods.

7C6. Installation of ITS devices.

7C7. Compatibility of transportation system and adjacent land use.

7C8. Compatibility of planned future improvements and available funding.

Evaluation Process

A qualitative process using the criteria above will be used to evaluate the policies and alternatives developed through the TSP update. The rating method used to evaluate the alternatives is described below.

- Most Desirable: The concept addresses the criterion and/or makes substantial improvements in the criteria category. (+2)
- Moderately Desirable: The concept partially addresses the criterion and/or makes some improvements in the criteria category. (+1)
- No Effect: The criterion does not apply to the concept or the concept has no influence on the criteria. (0)
- Least Desirable: The concept does not support the intent of and/or negatively impacts the criteria category. (-1)

At this level of screening, the criteria will not be weighted; the ratings will be used to inform discussions about the benefits and tradeoffs of each alternative.

Table 1 presents the evaluation matrix that will be used to qualitatively evaluate the policies and alternatives developed through the TSP update.

Table 1 Evaluation Matrix

Criteria Reference Number	Evaluation Criteria	Evaluation Measures
Goal 1: Ensure a safe and efficient transportation system for all users		
1C1	Project includes pedestrian and bicycle improvements located within existing or potential SRTS plan areas.	Does the proposed project include pedestrian and bicycle improvements located within a SRTS plan area? Measured as providing no, moderate or significant enhancements for student travel.
1C2	Influence of proposed project on developing new SRTS plans and/or enhancing existing SRTS plans.	To what extent does the alternative facilitate new SRTS plans being developed? Measured by the potential for students to walk or ride a bike to school due to the proposed project.
1C3	Number of conflict points between all modes of travel including crossing points for pedestrians and bicyclists along major arterials.	To what extent does the alternative increase safety by reducing vehicle to vehicle, vehicle to pedestrian/bicycle, or pedestrian/bicycle to pedestrian/bicycle conflict points? Measured as relative impact between alternatives in regards to the number of conflict between modes and speed differential.
1C4	Miles of designated facilities (on-street and off-street) for bicyclists and pedestrians provided.	To what extent does the alternative increase the number of miles of pedestrian and bicycle facilities? Measured by potential expansions of the pedestrian and bicycle systems.
1C5	Intersection visibility and sight distances available to motorists, pedestrians, and bicyclists at intersections and key decision points.	To what extent does the alternative improve sight distance for all system users, allowing each adequate time to identify and react to conflicts? Measured as relative impact between alternatives for providing adequate sight distance based on desired operating speeds.
1C6	Estimated number of fatal or serious injury crashes.	To what extent does the alternative reduce the estimated frequency of fatal and serious injury crashes? Whenever possible, measured using procedures in the HSM for estimating and predicting crash frequency.
1C7	Estimated number of bicycle and pedestrian related crashes.	To what extent does the alternative reduce the estimated frequency of pedestrian and bicycle related crashes? Whenever possible, measured using procedures in the HSM for estimating and predicting crash frequency.
1C8	Percent of facilities meeting applicable operational performance measure.	To what extent are operational performance measures met for the alternative? Measured by the percent of facilities where operational performance measures are met.
Goal 2: Provide access to the transportation system for all users, including low income and minority populations		
2C1	Impact of transportation project on low income and minority populations.	To what extent does the alternative affect low income and minority populations? Measured as relative ability of each alternative to spread the impacts of the transportation system evenly between all users.
2C2	ADA Compliance.	To what extent does the alternative provide opportunities to upgrade pedestrian facilities to ADA standards? Measured by percent of pedestrian facilities meeting ADA standards.

2C3	Viability of non-auto travel.	To what degree are transportation facilities (transit service, sidewalks, bicycle lanes, separated mixed-use paths, parks) for non-auto travelers integrated into the alternative? Measured relative to facilities and integration present in Baseline.
2C4	Incorporation of safe, convenient, and comfortable multimodal facilities.	To what degree does the alternative further multimodal transportation? Measured by degree to which alternatives provides for robust facilities and network connectivity.
Goal 3: Ensure integration of adequate bicycle and pedestrian pathways, sidewalks, and bicycle lanes through the community, particularly to connect residential areas with schools and activity centers.		
3C1	Potential impact on bicycle and pedestrian volumes.	To what degree does the alternative increase pedestrian and bicyclist travel? Measured by potential increase in pedestrian and bicyclist volume relative to Baseline.
3C2	Impact on connectivity of bicycle and pedestrian systems.	To what extent does the alternative improve the connectivity of the existing and proposed pedestrian and bicycle systems? Measured by the extent to which each alternative increases connectivity of pedestrian and bicycle facilities.
3C3	Average trip length for bicyclists from residential areas to activity centers via the bicycle/pedestrian networks.	To what degree does the alternative provide opportunities for bicycle trips from residential areas to activity centers? Measured by the potential increase in average bicycle trip length relative to Baseline.
3C4	Average trip length for pedestrians from residential areas to activity centers via the bicycle/pedestrian networks.	To what degree does the alternative provide opportunities for pedestrian trips from residential areas to activity centers? Measured by the potential increase in average pedestrian trip length relative to Baseline.
3C5	Incorporation of wayfinding signs and pavement markings for pedestrian and bicyclists.	To what extent does the alternative provide for the increase in wayfinding sings for pedestrians and bicyclists? Measured by the increase in wayfindings signs relative to Baseline.
3C6	Number of uncontrolled crossing conflict points between vehicles and pedestrians/bicyclists on the bicyclist/pedestrian network.	To what extent does the alternative reduce the number of uncontrolled crossing conflict points between vehicles, pedestrians, and bicycles? Measured by the number of uncontrolled crossing conflict points relative to Baseline.
Goal 4: Improve the local circulation system to reduce the community's reliance on State Highways to travel to local destinations.		
4C1	Average trip length.	To what degree are land use types dense and well mixed such that average trip lengths for plan area residents are reduced? Measured relative to Baseline average trip length.
4C2	Percent of capacity on regional facilities used for reaching local destinations.	To what extent does each alternative provide viable travel route options for local travelers that are not on regional facilities? Measured by percent of capacity on regional facilities used for reaching local destinations.
4C3	Volume-to-capacity (V/C) ratios on parallel routes to highways.	To what extent do viable local road alternatives to state highways provide sufficient mobility? Measured by relative number of facilities providing sufficient mobility compared to Baseline.

Goal 5: Build and maintain the transportation system to facilitate economic development in the region		
5C1	Roadway geometry accommodates freight movement where it is needed.	To what extent does the alternative accommodate the design vehicle for designated freight routes? Measured by whether or not an alternative is able to accommodate the design vehicle.
5C2	Traffic operations performance on designated freight routes.	To what extent does the alternative provide acceptable performance along designated freight routes? Measured by operational performance along freight routes.
5C3	Potential increased attraction to desired businesses and developers.	To what extent does the alternative eliminate roadblocks to development caused by the transportation system? Measured by the critical transportation improvements funded relative to Baseline.
Goal 6: Improve system performance by balancing mobility and access, particularly along main travel routes.		
6C1	Number of access points for motorists based on street classification and desired street character.	To what degree does the alternative provide connectivity that enables the street to better reflect reasonable access spacing given its classification and desired operations? Measured relative to existing access conditions.
6C2	Estimated number of future crashes along the corridor.	To what degree does the alternative reduce the occurrence of crashes along key roadway corridors? Measured by the expected number of crashes along key corridors relative to Baseline.
6C3	Estimated MMLOS performance along the corridor.	To what extent does the alternative improve MMLOS performance along key corridors? Measured by the MMLOS performance along key corridors relative to Baseline.
6C4	Access provided for freight, bicyclists, and pedestrians.	To what extent does the alternative provide access for freight, bicyclists, and pedestrians while balancing mobility? Measured by the access and mobility balance provided for all modes of travel relative to Baseline.
Goal 7: Minimize the impacts of transportation system development on the natural and built environment.		
7C1	City-wide VMT and vehicle hours traveled.	To what extent does the alternative provide for alternative modes, enhanced connectivity, and improved land-use integration thereby reducing vehicle miles traveled? Measured by potential VMT reduction relative to Baseline.
7C2	Prevailing (i.e., 85th percentile) corridor travel speed on major thoroughfares compared to the desired operating speeds given roadway function, class, and desired character.	To what extent are prevailing corridor travel speeds consistent with desired travel speed? Measured by the degree to which prevailing corridor travel speeds are consistent with desired travel speeds.
7C3	Travel mode split.	To what extent does the alternative reduce the reliance on auto trips? Measured by area-wide travel mode split.
7C4	Effectiveness of City design standards to limit the environmental impact of the transportation system.	To what extent do City design standards encourage designs that reduce the environmental impact of the transportation system? Measured relative to Baseline design standards.

7C5	Vehicle occupancy along commuting corridors during the peak periods.	To what extent does the alternative create opportunities for travelers to participate in rideshare programs and thereby increase vehicle occupancy? Measured by potential vehicle occupancy during the peak periods.
7C6	Installation of ITS devices.	To what extent are ITS devices being utilized for system improvements? Measured by the use of ITS devices relative to Baseline.
7C7	Compatibility of the transportation system and adjacent land use.	To what extent does the transportation system support the existing or desired land use mix in the area? Measured by the design speed, roadway cross-section, and modal facilities available relative to adjacent land use.
7C8	Compatibility of planned future improvements and available funding.	To what extent do the planned improvements for the alternative match the expected available funding? Measured by expected available funds for improvements compared to expected costs of planned improvements.

We look forward to discussing the draft goals, objectives and evaluation criteria presented above with you and other affected stakeholders in more detail. Members of the Project Management Team (PMT), Technical Advisory Committee (TAC), and Citizens Advisory Committee (CAC) will all have the opportunity to review, discuss, and provide comments on these draft goals, objectives and evaluation criteria. Based on these comments, we will revise the goals, objectives, and evaluation criteria to produce a final set that will be used as the Klamath Urban Area TSP update moves forward.

Appendix 2C
Technical Memorandum #3: Existing Conditions

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TECHNICAL MEMORANDUM #3
EXISTING CONDITIONS

Date: March 9, 2011 Project #: 11172

To: Mark Willrett, City of Klamath Falls and Stan Strickland, Klamath County
Cc: Project Management Team, Technical and Citizen Advisory Committees

From: Marc Butorac, P.E., Erin Ferguson and Matt Kittelson
Project: Klamath Falls Urban Area Transportation System Plan Update
Subject: Technical Memorandum #3 Existing Conditions

This memorandum inventories the existing Klamath Falls urban area transportation system and discusses its current performance. The purpose of the existing conditions inventory and performance evaluation is to document the baseline transportation system within the Transportation System Plan (TSP) project area. The information presented below was obtained and assembled using Geographic Information System (GIS) files, other data file formats (e.g., excel, PDF) and studies provided or produced by the City of Klamath Falls, Klamath County, Basin Transit Service, the Klamath Falls Airport, and the Oregon Department of Transportation (ODOT).

The information contained in this memorandum is organized into a series of sections. The name and the first page of these sections are listed below.

Land Use and Population 2
Street System and Traffic Analysis 9
Collision History and Crash Analysis 29
Public Transportation System 42
Truck Freight Routes 46
Rail System 48
Pedestrian and Bicycle System 50
Air Transportation System 53
Pipeline System 55
Water Transportation System 55
Intra-Modal and Inter-Modal Connections 55
Funding Analysis 56

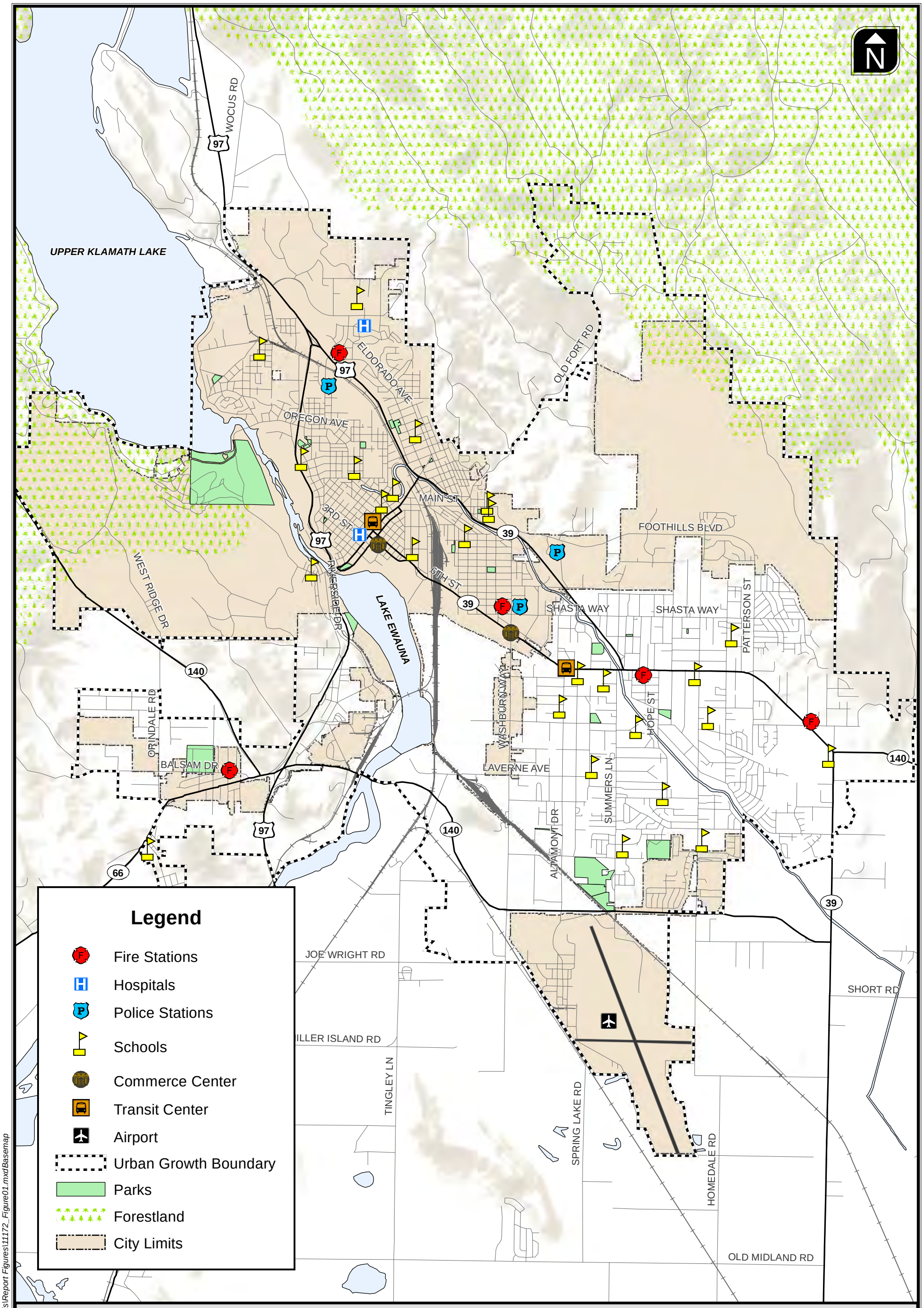
The majority of the inventory and analysis results are presented in figures and tabular form with supplemental text provided as needed to further explain the information illustrated. Future

work within this TSP update will identify potential policies and projects to improve the existing and future system.

Land Use and Population

The purpose of the land use and population inventory is to identify existing, planned, and potential land uses. The land use and population inventory will help inform the existing and future conditions analyses of the TSP update; particularly, as the project team works with the community to develop future alternative scenarios that capture the community's vision for Klamath Falls urban area.

Figure 1 illustrates activity centers that are likely destinations for motorists, transit users, bicyclists, pedestrians, and other active modes of transportation (e.g., rollerblading and skateboarding). As the TSP update completes the existing and future conditions analyses, the activity centers shown in Figure 1 will be integrated into considerations to improve access to these destinations for Klamath Falls residents. Additional activity centers, such as concentrations of commercial and employment uses, will also be considered when making recommendations for enhancing access for multiple transportation modes.



Klamath Falls Activity Centers

Figure 1

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Key destinations identified include Oregon Institute of Technology (OIT), Klamath Community College (KCC), Klamath Union High School, Mazama High School, Ponderosa Junior High School, Brixner Junior High School, Ella Red Key Municipal Pool, and Sky Lakes Medical Center. The downtown core is another significant destination for residents as well as the concentration of shopping and commercial uses along Washburn Way and Shasta Way including Fred Meyer, Bi-Mart, K-Mart and Walmart. There are also recreational uses spread through the urban area including Moore Park, the sports complex along Foothills Boulevard and the YMCA located on Eberlein Avenue. Creating and maintaining access to these and other similar land uses is important for ensuring a high quality of life for all segments of Klamath Falls' population.

Figure 2 illustrates the current basic land use zoning designations throughout the urban area. It was created from highly detailed land use zoning information obtained from the City and County that included 54 different designations. These designations were consolidated into eight categories that reflect the fundamental intended use of the land (e.g., residential, commercial, industrial). The original 54 designations were consolidated in Figure 2 to make it easier to identify land use trends across the urban area. Outside of the Urban Growth Boundary (UGB) the majority of land is zoned for forestry, exclusive farm use and/or agricultural uses. Within the UGB but outside of the city limits the primary land uses are suburban residential with some commercial and industrial zoned areas. Within the city limits, industrial zoned uses tend to be adjacent to the railroad lines passing through the City. The downtown area is primarily zoned for commercial uses with some mixed use designated areas. There are residential zoned uses of varying densities interspersed with neighborhood commercial uses spread throughout the City.

UPPER KLAMATH LAKE
HARBOR ISLES BLVD
LAKESHORE DR
NEVADA AVE
CAMPUS DR
BIEHN ST
CALIFORNIA AVE
ELDORADO AVE
OLD FORT RD
11TH ST
MAIN ST
PINE ST
9TH ST
FOOTHILLS BLVD
WEST RIDGE DR
RIVERSIDE DR
LAKE EWAUNA
SHASTA WAY
SHASTA WAY
PATTERSON ST
6TH ST
WASHBURN WAY
HILYARD AVE
HOPE ST
ORINDALE RD
BALSAM DR
LAVERNE AVE
SUMMERS LN
BRISTOL AVE
ALTAMONT DR
JOE WRIGHT RD
SHORT RD
MILLER ISLAND RD
TINGLEY LN
SPRING LAKE RD
OLD MIDLAND RD
HOMEDALE RD
SPRING LAKE
97
39
140
66

Legend

- Urban Growth Boundary
- City Limits

Zone Parcels

- Public Facility
- Forest & Agriculture
- Planned Unit Development
- Commercial
- Industrial
- Residential
- Mixed Use
- Special Reserve

Land Use Zoning Designations

Figure 2

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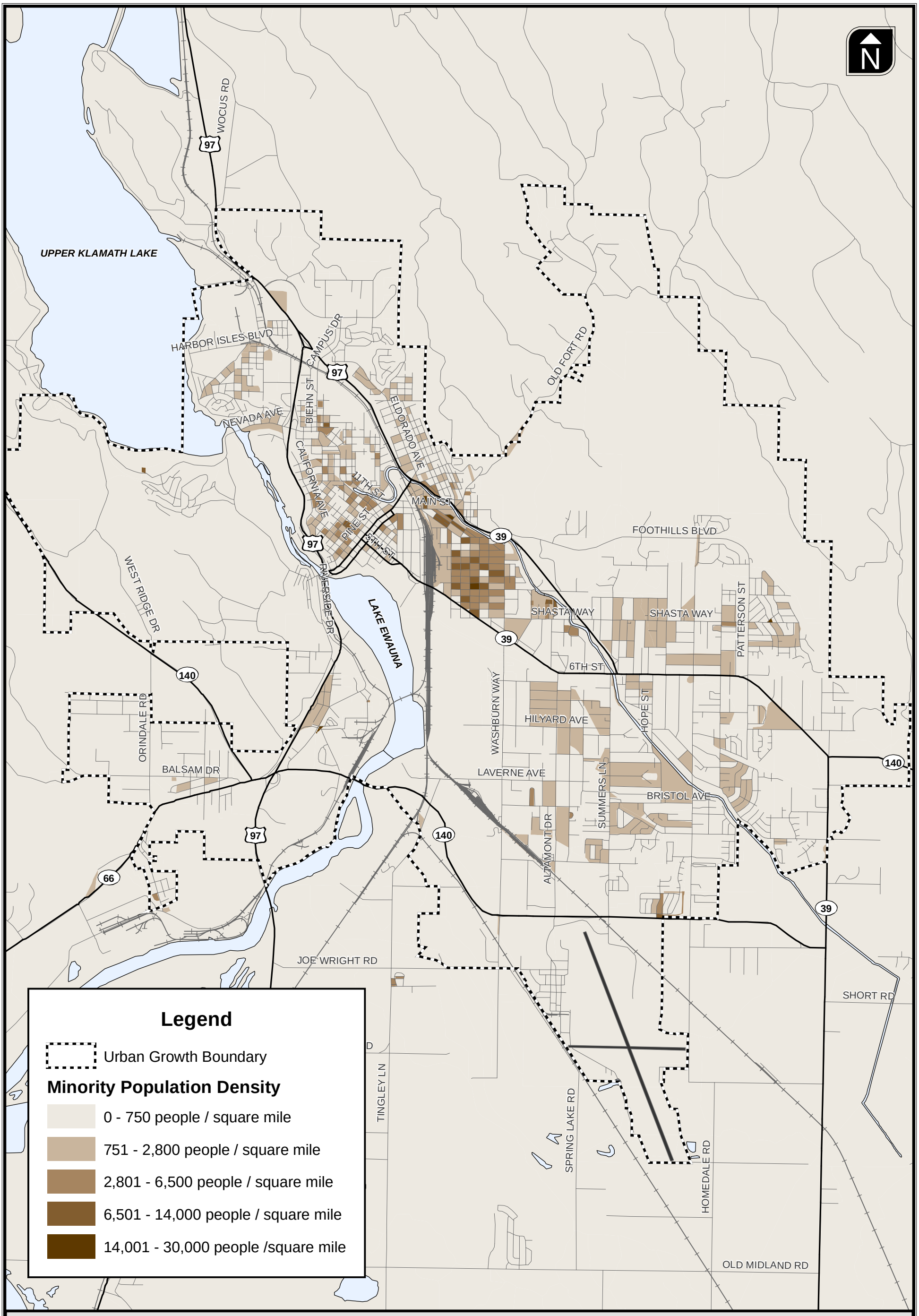
Figures 3 and 4 illustrate the minority population density and the overall population density within the Klamath Falls urban area mapped by census block, respectively. The purpose of mapping this information is to be aware of where the population is living while considering their needs to access different destinations. From Figure 3, it is evident the highest density of minority (non-Caucasian) residents live within the City limits in the area east of the railroad tracks, north of Shasta Way, and south of Crater Lake Parkway (OR 39). Similar to Figure 3, Figure 4 illustrates the highest densities for the total population are within the City limits in the area east of the railroad tracks, north of Shasta Way and south of Crater Lake Parkway (OR 39). The area northwest and north of downtown also tends to have higher densities than the areas outside of the city limits but within the UGB.



Minority Population Density (People Per Square Mile) By Census Block

Figure 3

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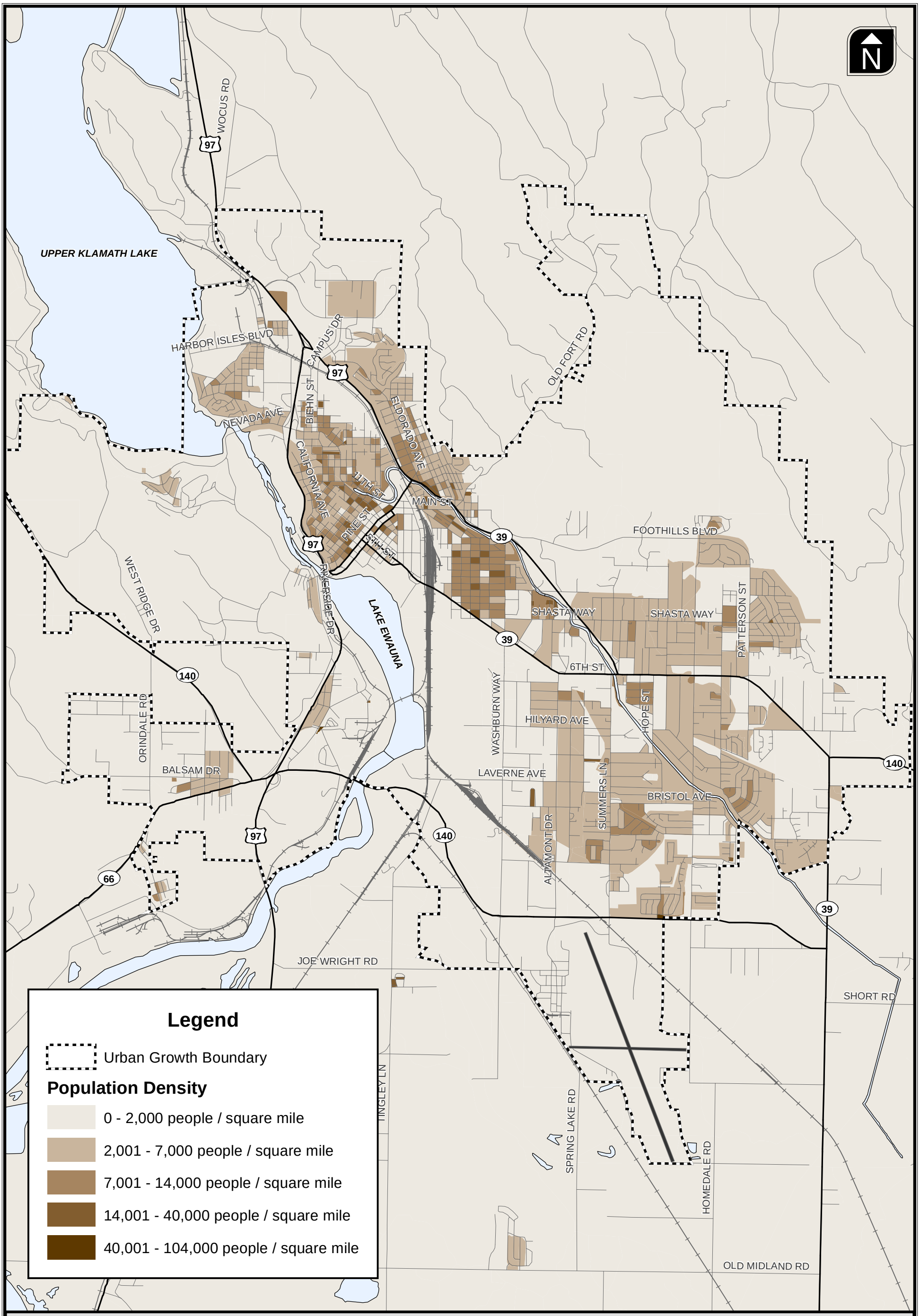

Population Density (People Per Square Mile) By Census Block

Figure 4

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Street System and Traffic Analysis

There are three state highways serving Klamath Falls Urban Area as well as a network of arterial and collector streets maintained by the City and/or County. An overview of the primary roadway facilities is summarized below followed by information on their characteristics and existing operational performance. The material in this section of the memorandum provides information from the automobile or motorists' perspective. Subsequent sections discuss the transportation system in terms of transit, freight movement, pedestrians, and bicyclists.

STREET SYSTEM OVERVIEW

US Highway 97 (US 97), Oregon State Highway 39 (OR 39), and Oregon State Highway 140 (OR 140) provide regional connectivity to other cities within southern Oregon, northern California and other destinations beyond. US 97, also known as The Dalles-California Highway, runs north-south connecting Klamath Falls to Bend to the north and Weed, California to the south where it intersects with Interstate 5. OR 39 provides a connection to Merrill and OR 140 runs east-west connecting to OR 66 and Interstate 5 (I-5) to the west linking Klamath Falls to Ashland, Medford, and Grants Pass. OR 140 also extends east connecting to Lakeview and continuing on into Nevada.

Within the UGB, US 97 splits becoming The Dalles-California Highway along the western edge of the UGB and coinciding with OR 39 as it passes through the eastern portion of the City. OR 39 is also known as Crater Lake Parkway, Alameda Bypass, and Klamath Falls Malin Highway at various locations within the UGB. OR 140 is also known as the Southside Expressway for the portion passing through southern end of the UGB and is referred to as the Klamath Falls – Lakeview Highway as it extends east of Klamath Falls UGB.

In addition to the state highway facilities that serve travel to, from and within the Klamath Falls urban area there are also a number of arterial and collector streets that provide connectivity, mobility and access. Key north-south arterials and collectors include Washburn Way, Homedale Road, Summers Lane, Altamont Drive, Madison Street, Patterson Street, Klamath Avenue, and Main Street. Key east-west arterials and collectors include Nevada Street-Oregon Avenue, Foothills Boulevard, Shasta Way and South 6th Street.

STREET SYSTEM CHARACTERISITICS

The following set of figures and tables illustrate and summarize the current street characteristics within the urban growth boundary including roadway classifications, roadway jurisdiction, intersection characteristics (e.g., signal locations), and number of vehicle travel lanes.

The City of Klamath Falls and Klamath County have five functional street classifications: State Highway, Major Arterial, Major Collector, Minor Collector and Local Street. Table 1 summarizes the functional classifications of roadways classified as minor collector and higher, the

jurisdictional responsibility of each of these roadways, and the number of travel lanes. Figure 5 illustrates the existing street functional classifications. Existing traffic control devices at the Klamath Falls Urban Area TSP update study intersections are shown in Figure 6.

Table 1 Street Classifications, Jurisdictional Responsibilities and Basic Number of Lanes

Street	Functional Class	Jurisdiction	Number of Travel Lanes
US 97 (The Dalles-California Highway)	State Highway	State	2/4
OR 140 (Southside Expressway, Klamath Falls – Lakeview Highway)	State Highway	State	2
OR 39 (Crater Lake Parkway, Klamath Falls-Malin Highway, Alameda Bypass)	State Highway	State	2/4/5
OR 66 (Green Springs Drive)	State Highway	State	2
3rd Street	Minor Collector	City	2
5th Street (South of Pine Street)	Major Arterial	City	2
6th Street (South of Pine Street)	Major Arterial	City	2/5
9th Street (North of Klamath Ave)	Major Collector	City	2
Altamont Drive	Minor Collector	County	2
Biehn Street	Major Collector	City	2
Bristol Avenue	Major Collector	County	2
Campus Drive	Major Collector	City	4
Clinton Avenue	Major Collector	County	2
Crescent Avenue	Minor Collector	City	2
Dan O'Brien Way	Major Collector/Minor Collector	City	2
East Main Street	Major Arterial	City	2
Eberlein Avenue	Minor Collector	City	2
Eldorado Avenue	Minor Collector	City	2
Eldorado Boulevard	Minor Collector	City	2
Erie Street	Local Street	City	2
Esplanade Avenue	Major Arterial	City	2
Foothills Boulevard	Major Collector	County	2/3
Green Springs Drive	Major Collector	County	2
Harbor Isles Boulevard	Minor Collector	City	2
Harlan Drive	Major Collector/Minor Collector	County	2
Hilyard Avenue	Major Arterial	County	2/3
Homedale Road	Major Collector	City/County	2/3
Hope Street	Minor Collector	County	2

Street	Functional Class	Jurisdiction	Number of Travel Lanes
Industrial Park Drive	Minor Collector	City	2
Keller Road	Major Collector	County	2
Klamath Avenue	Major Arterial	City	2
Lakeport Boulevard	Minor Collector	City/County	2
Lakeshore Drive	Major Collector	City/County	2
Laverne Avenue	Major Collector	County/State	2
Madison Street	Local Street	County	2/3
Main Street	Major Arterial/Major Collector	City	2
Nevada Avenue	Major Collector	City	2
Oregon Avenue	Major Collector	City	2
Patterson Street	Major Collector	County	2
Pine Street	Minor Collector	City	2
Shasta Way	Major Collector	City/County	2/3
Spring Street	Major Collector	City	2
Summers Lane	Major Collector	County	2/3
Tingley Lane	Minor Collector	County/State	2
Upham Street	Minor Collector	City	2
Washburn Way	Major Arterial	City/County/State	2/5

UPPER KLAMATH LAKE
LAKE EWAUNA
LAKESHORE DR
FRONT ST
ELDORADO AVE
MAIN ST
3RD ST
SPRING ST
FOOTHILLS BLVD
HOMEDALE RD
SHASTA WAY
6TH ST
PATTERSON ST
WASHBURN WAY
HOPE ST
HARLAN DR
ALTAMONT DR
SUMMERS LN
TINGLEY LN
SPRING LAKE RD
ORINDALE RD
BALSAM DR
GREENSPRINGS DR
97
39
140
66

Legend

- Urban Growth Boundary
- City Limits

Functional Classification

- State Highway
- Major Arterial
- Major Collector
- Minor Collector
- Local Street

Existing Street Functional Classifications

Figure 5

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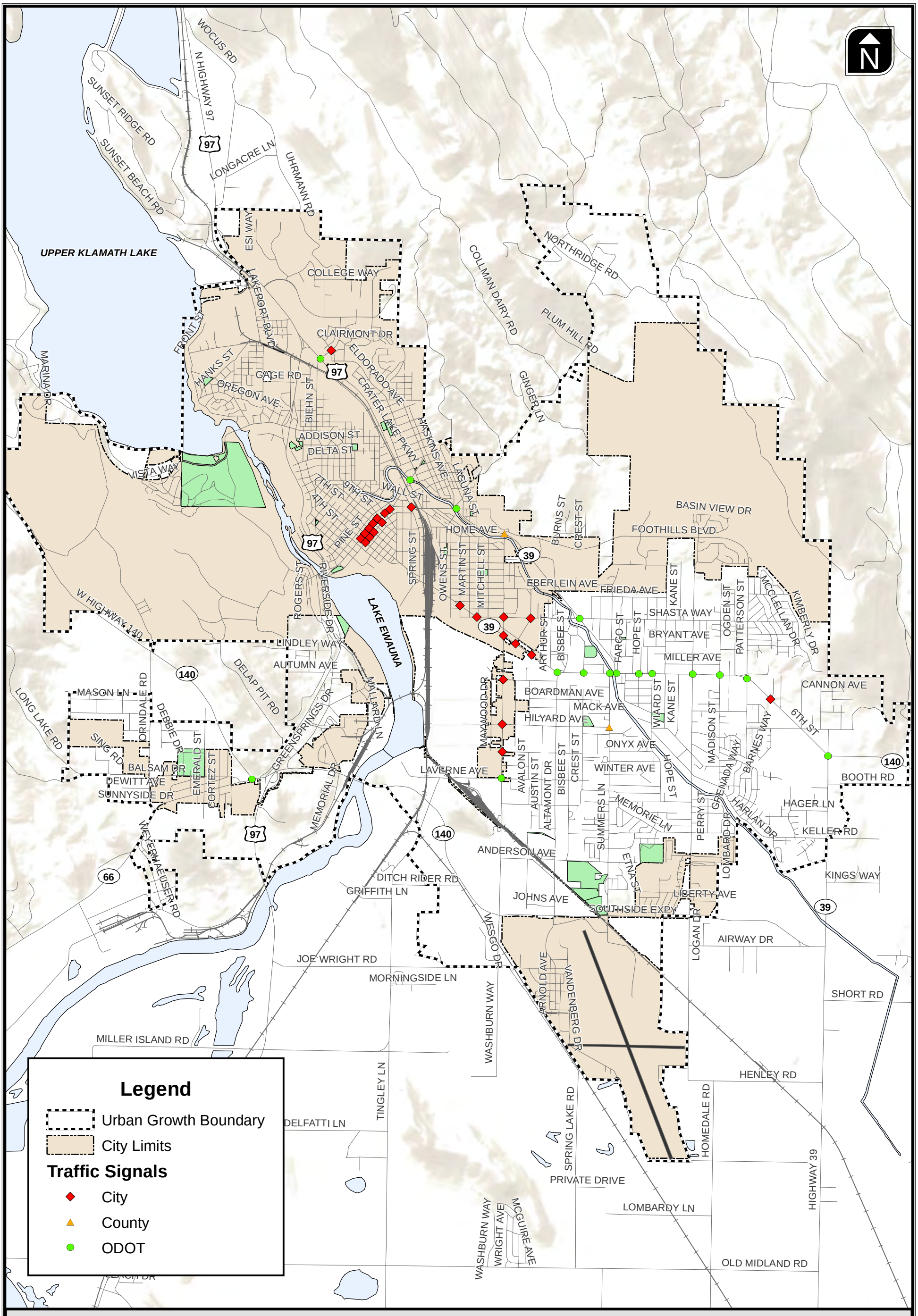

Existing Traffic Signal Locations

Figure 6

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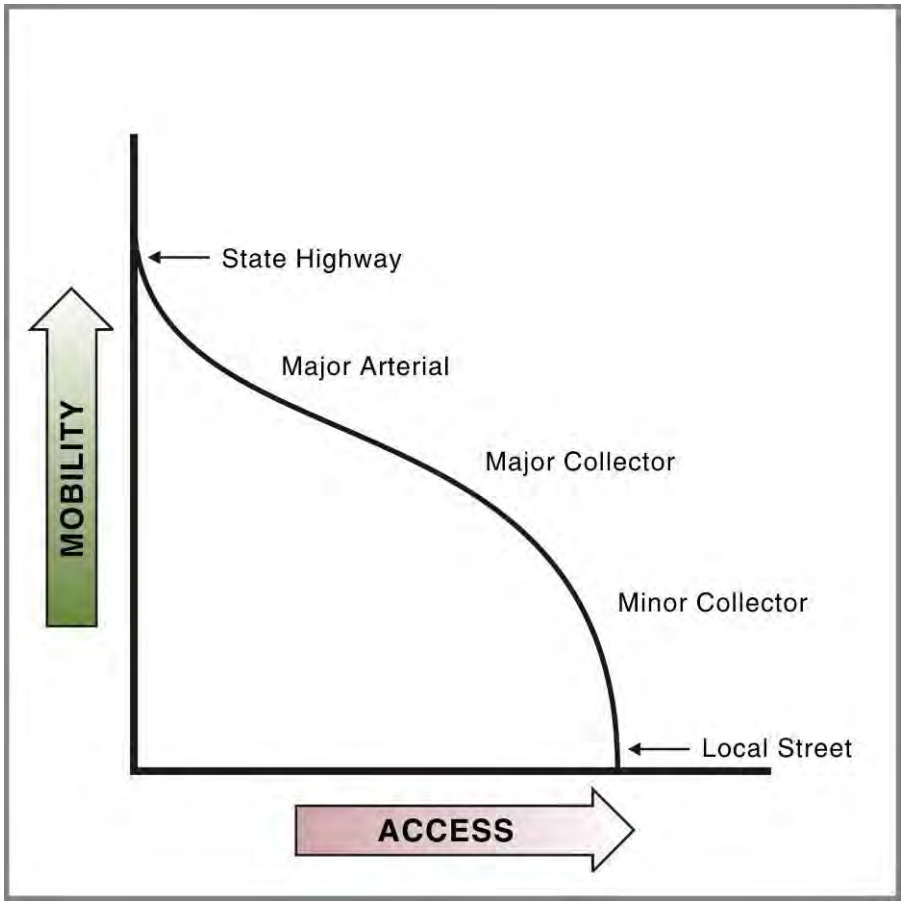
ACCESS SPACING AND ACCESS MANAGEMENT

Providing adequate access to other public roadways, land uses, and destinations is a critical part of an effective transportation system. However, it is necessary to balance access with the need for mobility and safety on the system as well. Providing access via other public streets and driveways to land uses creates points of friction from a traffic operations perspective thereby reducing mobility and introduces conflict points, which can increase the occurrence of crashes.

Access management strategies and implementation require careful consideration to balance the needs for access to developed land with the need to ensure movement of traffic in a safe and efficient manner. In general, access management is generally more stringent as the functional classification level of roadways increases and the corresponding importance of mobility increases. Exhibit 1 illustrates the relationship between access and mobility relative the street classifications in Klamath Falls urban area.

Exhibit 1 Relationship between Access, Mobility, and Functional Classification



Examples of State Highway, Major Arterial, Major Collector, and Local Street classified streets in Klamath Falls are shown below in Table 2.

Table 2 Street Classification and Access Management in Klamath Falls Urban Area

Street	Functional Classification	Mobility or Access Focused?	Photograph
US 97	State Highway	Mobility	
Washburn Way	Major Arterial	Mobility with Access	
Shasta Way	Major Collector	Mobility and Access	
Eberlein Avenue	Minor Collector	Access with Mobility	
White Avenue	Local Street	Access	

The City of Klamath Falls, Klamath County and ODOT each have slightly different access spacing standards. The access spacing standards that apply to a specific roadway depends on the roadways functional classification and the jurisdictional responsibility (i.e., City, County, State). The access spacing standards for each jurisdiction are presented below.

The City of Klamath Falls has access spacing standards for private driveways based on the type of land use; these are documented in their city code under *Section 8 Building and Fire Protection* and are summarized in Table 3 below. The notes below Table 3 are driveway spacing standards from the City of Klamath Falls Engineering Design Standards Section 8-5.3.8. In some instances, these two sets of spacing standards appear to conflict specifically with regard to minimum spacing for driveways serving a single property frontage or for driveways on adjacent properties.

Table 3 City of Klamath Falls Access Spacing Standards for Private Driveways

Land Use Type	Permitted Number of Driveways per Permit Holder	Minimum Driveway Spacing[1]
Single Dwelling Unit[2]	One driveway per street the dwelling unit abuts (Maximum of 2 driveways)	5 feet
Multiple Dwelling Units (e.g., Apartments)[2]	One driveway per street the dwelling units abut (Maximum of 2 driveways)	22 feet
Commercial[2,3]	Two driveways per street the commercial use abuts (Maximum of 4 driveways)	22 feet
Industrial	Two driveways per street the commercial use abuts (Maximum of 4 driveways)	22 feet

Notes:

[1]Per the City of Klamath Falls Engineering Standards, Section 8-5.3.8, there must be 10 feet separating driveways serving any one property frontage unless approved by the City. There must be 6 feet separating driveways on adjacent lots.

[2]Driveway is restricted to street with the lowest functional classification.

[3]Commercial driveways shall not be located within 150 feet from the approach to an arterial intersection and shall not be closer than 100 feet from the approach to a collector intersection. (Source: City of Klamath Falls Engineering Standards, Section 8-5.3.8 Driveways.)

Based on review of aerial photographs, the City streets within Klamath Falls urban area generally meet these standards the primary exceptions appear to be sections of South 6th Street, Klamath Avenue, and Main Street where access is more frequent than the minimum driveway spacing standards. A review in the field is necessary to further investigate and confirm the frequency of driveway and public street accesses.

The Klamath County uses the access spacing standards documented in the 1998 Klamath Falls Urban Area TSP in Table 7-2 Suggested Street Design Standards. Table 4 summarizes these standards.

Table 4 Klamath County Access Spacing Standards[1]

Street Functional Classification	System Spacing	Minimum Driveway Access Spacing	Residential Uses	Commercial Uses	Industrial Uses
Major Arterial	1 mile	300 feet	No Direct Access	Shared Access Encouraged Left-Turn Lanes Determined through Review	
Major Collector	¼ mile	100 feet	Shared Access Encouraged	Shared Access Encouraged Left-Turn Lanes Determined through Review	
Minor Collector	1/8 mile	50 feet	Shared Access Encouraged	Shared Access Encouraged Left-Turn Lanes Determined through Review	
Local Street	Min. 400 feet Max. 600 feet	None	Curb Cut Minimum 45 feet to Curb Return	Curb Cut Minimum 50 feet to Curb Return	No Direct Access

[1]County access spacing standards are subject to change due to on-going ODOT considerations to modify their access spacing standards.

Based on review of aerial photographs, the County streets within the Klamath Falls urban area tend to meet these standards. Potential variations to these standards where access is more frequent than the minimum spacing standards include sections of Bristol Avenue, Clinton Avenue, Hilyard Avenue, Summers Lane, Patterson Street and Washburn Way. A review in the field is necessary to further investigate and confirm the frequency of driveway and public street accesses.

ODOT's access spacing standards are organized by intersection traffic control and a specific state highway's level of importance. A spacing of a ½-mile between traffic signals is desired for statewide and regional urban highways (i.e., US 97, OR 140, and OR 39). Table 5 summarizes ODOT's spacing standards for unsignalized intersections on urban highways of various levels of importance.

Table 5 ODOT Access Spacing Standards for Unsignalized Private and Public Approaches

Posted Speed Limit	Minimum Space Required (feet)		
	Statewide	Regional	District
≤ 25 mph	520	350	350
30 mph and 35 mph	720	425	350
40 mph and 45 mph	990	750	500
50 mph	1,100	830	550
≥ 55 mph	1,320	990	700

Source: Oregon Highway Plan implemented by OAR 734, Division 51.

Within the Klamath Falls urban area, US 97, OR 140, and OR 39 are the statewide and regional highways subject to ODOT's standards. Standards and spacing for each are discussed below.

US 97 – US 97 is designated as a statewide highway. Through the Klamath Falls urban area, US 97 has fully controlled access through interchanges spaced approximately every 1 to 2 miles, which meets ODOT standards and is consistent with the suggestions in the 1998 Klamath Falls Urban Area TSP regarding access management.

OR 140 - OR 140 is also considered a statewide urban highway through the Klamath Falls urban area. The posted speed limit on OR 140 is 55 mph with reduced speeds limits of 45 mph on approach to the US 97/OR 140/OR 66 interchange and on approach to OR 39 & OR 140 (Klamath Falls-Lakeview Highway) intersection entering Klamath Falls from the east. The spacing standard applicable to OR 140 is 1,320 feet for unsignalized intersections and a ½-mile for signalized intersections. Based on reviews of aerial photographs, there are sections of OR 140 (Southside Expressway) that appear to meet this standard spacing with a few sections approaching the OR 39 & OR 140 (Southside Expressway) where the frequency of access exceeds the standards in Table 5. The section of OR 140 (Klamath Falls-Lakeview Highway) extending east from Klamath Falls does not appear to meet this spacing standard with access spacing more frequent than standards in Table 5. A review in the field is necessary to further investigate and confirm the frequency of driveway and public street accesses.

OR 39 – OR 39 is considered a regional urban highway. The majority of the OR 39 alignment within the UGB has a posted speed limit of 50 mph; the exception is the portion of OR 39 that coincides with South 6th Street. For the locations along OR 39 with a posted speed limit of 50 mph, the spacing standard is 830 feet for unsignalized intersections. Based on reviews of aerial photographs, the sections of OR 39 from US 97 to South 6th Street generally appear to meet the spacing standards. The portion of OR 39 that overlaps with South 6th Street does not appear to meet ODOT access spacing standards; access on South 6th Street is as frequent as every 50 to 150 feet (includes private driveways and public roadways). A review in the field is necessary to further investigate and confirm the frequency of driveway and public street accesses.

STREET SYSTEM TRAFFIC ANALYSIS

The focus of this section is to report the existing traffic operations for the study intersections identified for the TSP update. The sub-sections below present information on the traffic count data used in the evaluation, the analysis methodology applied, the operational standards used to assess the results, and the traffic operations results for the study intersections. Appendix A contains the traffic count data obtained from ODOT and used the analysis. Appendix B contains the Methodology Memorandum documenting the analysis method applied. Appendix C contains the existing conditions traffic operations and queuing analysis worksheets.

Analysis Methodology and Performance Standards

All operations analysis described in this report were performed in accordance with the procedures in the *2000 Highway Capacity Manual* (Reference 1).

Per the December 2010 Methodology Memorandum (see *Appendix B*) and the ODOT *Analysis Procedures Manual* (APM – Reference 2), intersection operational evaluations were conducted based on the peak 15-minute flow rate observed during the weekday p.m. peak hour. Using the peak 15-minute flow rate ensures this analysis is based on a reasonable worst-case scenario. For this reason, the analysis reflects conditions that are likely to occur for 15 minutes out of each average weekday p.m. peak hour. The transportation system will likely operate under conditions better than those described in this report during other typical time periods.

The operational analysis results were compared with mobility standards used by the local agencies to assess performance and potential areas for improvement.

City of Klamath Falls and Klamath County Intersection Traffic Operations Performance Standards

The City of Klamath Falls and Klamath County have established LOS "E" for the poorest operating approach as the performance standard for unsignalized intersections and LOS "D" as the performance standard for signalized intersections. The performance of the study intersections under control of either of these jurisdictions will be compared to these performance standards.

ODOT Intersection Traffic Operations Performance Standards

ODOT uses volume-to-capacity (V/C) ratio standards to assess intersections operations. Table 6 of the *Oregon Highway Plan* (OHP - Reference 3) provides the maximum volume-to-capacity ratios for all signalized and unsignalized intersections outside the Metro area. The OHP ratios are used to evaluate existing conditions.

Intersection Performance Standards

Table 6 below shows the applicable governing jurisdiction, intersection control, and performance standard for each study intersection.

Table 6 Intersection Performance Standard

Intersection	Jurisdiction	Control	Performance Standard
1. US 97 &* Lakeport Blvd	ODOT	Stop-Controlled	0.90 v/c
2. US 97 & Dan O'Brien Way	ODOT	Stop-Controlled	0.90 v/c
3. US 97 SB & Coli Ave	ODOT	Stop-Controlled	0.90 v/c
4. US 97 NB & Coli Ave	ODOT	Stop-Controlled	0.90 v/c
5. Lakeport Blvd & Hanks St	City of Klamath Falls	Yield-Controlled	LOS "E"
6. Quarry St & Lakeport Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"
7. OR 39 & Biehn St/Campus Dr	ODOT	Signalized	0.70 v/c
8. Dahila St & Campus Dr	City of Klamath Falls	Signalized	LOS "D"

Intersection	Jurisdiction	Control	Performance Standard
9. Biehn St & Lakeport Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"
10. California Ave & Nevada St	City of Klamath Falls	Stop-Controlled	LOS "E"
11. Montelius St & Nevada St	City of Klamath Falls	Stop-Controlled	LOS "E"
12. US 97 SB Off-Ramp & Nevada St	ODOT	Stop-Controlled	0.85 v/c
13. US 97 NB Ramps & Oregon Ave	ODOT	Stop-Controlled	0.85 v/c
14. Biehn St & Oregon Ave	City of Klamath Falls	Stop-Controlled	LOS "E"
15. 3rd St & California Ave	City of Klamath Falls	Stop-Controlled	LOS "E"
16. OR 39 & Portland St	ODOT	Stop-Controlled	0.75 v/c
17. US 97 SB Ramps & Main St	ODOT	Stop-Controlled	0.85 v/c
18. 3rd St & Main St	City of Klamath Falls	Stop-Controlled	LOS "E"
19. 3rd St & Klamath Ave	City of Klamath Falls	Stop-Controlled	LOS "E"
20. 9th St & Main St	City of Klamath Falls	Signalized	LOS "D"
21. 11th St & Klamath Ave	City of Klamath Falls	Stop-Controlled	LOS "E"
22. Spring St & Esplanade St	ODOT	Stop-Controlled	0.90 v/c
23. Esplanade St & OR 39	ODOT	Signalized	0.85 v/c
24. Spring St & Main St	City of Klamath Falls	Signalized	LOS "D"
25. Pacific Terrace & OR 39	ODOT	Stop-Controlled	0.70 v/c
26. Hillside Dr & Hubert St	City of Klamath Falls	Stop-Controlled	LOS "E"
27. OR 39 & Main St	ODOT	Signalized	0.85 v/c
28. Washburn Way & OR 39	ODOT, Klamath County, Klamath Falls	Signalized	0.75 v/c
29. E Main St & Eberlein Ave	City of Klamath Falls	Stop-Controlled	LOS "E"
30. OR 39 & Eberlein Ave	ODOT	Stop-Controlled	0.90 v/c
31. S 6th St & Shasta Way	City of Klamath Falls	Signalized	LOS "D"
32. Washburn Way & Shasta Way	City of Klamath Falls	Signalized	LOS "D"
33. OR 39 & Shasta Way	ODOT	Signalized	0.75 v/c
34. Homedale Rd & Foothills Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"
35. Homedale Rd & Shasta Way	Klamath County	Stop-Controlled	LOS "E"
36. Patterson St & Shasta Way	Klamath County	AWSC	LOS "E"
37. Washburn Way & S 6th St	City of Klamath Falls	Signalized	LOS "D"
38. Altamont Dr & S 6th St	ODOT, Klamath County	Signalized	0.85 v/c
39. Altamont Dr & Crosby Ave	Klamath County	Stop-Controlled	LOS "E"
40. Summers Ln & S 6th St	ODOT	Signalized	0.85 v/c
41. OR 39 & s 6th St	ODOT	Signalized	0.75 v/c
42. Fargo St & OR 39	ODOT	Stop-Controlled	0.90 v/c
43. Homedale Rd & OR 39	ODOT	Signalized	0.85 v/c
44. Madison St & OR 39	ODOT	Signalized	0.85 v/c

Intersection	Jurisdiction	Control	Performance Standard
45. Patterson St & OR 39	ODOT	Signalized	0.75 v/c
46. OR 39 & Hilyard Ave	ODOT	Stop-Controlled	0.90 v/c
47. Orindale Rd & OR 140	ODOT	Stop-Controlled	0.90 v/c
48. Orindale Rd & Balsam Dr	Klamath County	Stop-Controlled	LOS "E"
49. Orindale Rd & OR 66	ODOT	Stop-Controlled	0.90 v/c
50. Emerald St & OR 66	ODOT	Stop-Controlled	0.90 v/c
51. Balsam Dr & OR 66	ODOT	Stop-Controlled	0.90 v/c
52. OR 140 & OR 66	ODOT	Signalized	0.70 v/c
53. Delap Rd & OR 66	ODOT	Stop-Controlled	0.90 v/c
54. US 97 SB Ramps & OR 140	ODOT	Stop-Controlled	0.85 v/c
55. US 97 NB Ramps & OR 140	ODOT	Stop-Controlled	0.85 v/c
56. Green Springs Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c
57. Riverside Dr & Lindley Way	Klamath County	Stop-Controlled	LOS "E"
58. Riverside Dr & Autumn Ave	Klamath County	Stop-Controlled	LOS "E"
59. Green Springs Dr & Dover Ave	Klamath County	Stop-Controlled	LOS "E"
60. Memorial Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c
61. Midland Hwy & OR 140	ODOT	Signalized	0.70 v/c
62. Washburn Way & Laverne Ave	ODOT, Klamath County, Klamath Falls	Signalized	0.90 v/c or LOS D
63. Altamont Dr & Laverne Ave	Klamath County	Stop-Controlled	LOS "E"
64. Summers Ln & Clinton Ave	Klamath County	Stop-Controlled	LOS "E"
65. Homedale Rd & Bristol St	Klamath County	Stop-Controlled	LOS "E"
66. Madison St & Harlan Dr	Klamath County	Stop-Controlled	LOS "E"
67. OR 39 & OR 140 (Big Y)	ODOT	Signalized	0.70 v/c
68. OR 39 & Hager Way	ODOT	Stop-Controlled	0.90 v/c
69. Washburn Way & OR 140 WB Ramps	ODOT	Stop-Controlled	0.85 v/c
70. Washburn Way & OR 140 EB Ramps	ODOT	Stop-Controlled	0.85 v/c
71. Altamont Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c
72. Summers Ln & OR 140	ODOT	Stop-Controlled	0.90 v/c
73. Glenwood Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c
74. Homedale Rd & OR 140	ODOT	Stop-Controlled	0.90 v/c
75. OR 39 & OR 140	ODOT	Stop-Controlled	0.70 v/c

Note: AWSC – All-Way Stop-Controlled

Traffic Volumes

The following sub-sections discuss the weekday evening (PM) peak hour traffic volume development and the seasonal adjustment factor used to adjust the 2010 traffic counts.

Evening (PM) Peak Hour Development

Because the travel demand model that will be used to generate the future conditions analysis will produce traffic volumes representative of a 1-hour weekday p.m. peak that is assumed to occur between 3:00 and 6:00 p.m., intersections were assumed to peak within this time frame. A system-wide peak hour factor was found to occur between 4:30 and 5:30 p.m. As such, the analysis for this study considers traffic volumes for each intersection during that time period. Table 7 summarizes the total entering volume for all study intersections for each hour from 3:00 p.m. to 6:00 p.m.

Table 7 Total Entering Volume For All Study Intersections

All Study Intersections		
Time	**Total Entering Volumes**	**% Dif from Peak**
3:00-4:00	62,429	-15.08%
3:15-4:15	64,534	-12.21%
3:30-4:30	66,119	-10.06%
3:45-4:45	67,376	-8.35%
4:00-5:00	68,849	-6.34%
4:15-5:15	71,163	-3.19%
4:30-5:30	**73,511**	0.00%
4:45-5:45	72,118	-1.89%
5:00-6:00	69,620	-5.29%

Seasonal Adjustment Factor

30th Hour Volumes (30 HV) for Klamath Falls were calculated based on the traffic counts collected over the period from February to September in 2010 and the application a seasonal adjustment factor. The APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATR) located in select locations throughout the State Highway System that collect traffic data 24-hours a day/365 days a year. Each method was evaluated to determine the most appropriate method for the study area. Because an ATR station exists within the Klamath Falls Urban Area, information from that station was used to develop seasonal adjustment values for this analysis.

On-Site ATR Method

The On-Site ATR Method requires that the ATR be located within or near the project area. If the ATR is located outside the project area, there should be no major intersections between the ATR and the project area and the Average Annual Daily Traffic (AADT) collected by the ATR must be within 10 percent of the AADT near the project area. *Information on AADT for highway segments throughout Oregon can be found in ODOT's Transportation Volume Tables.*

One ATR station exists within the project study area. That station (18-018) is located on the Klamath Falls-Malin Highway 0.46 miles south of Main Street in Klamath Falls. Other season adjustment methods, including using the seasonal trend Table method or the characteristic table method were evaluated for use on this project. The seasonal trend Table was not used because a trend line that represented annual traffic fluctuations in Klamath Falls is not included in the table. Similarly, the characteristic table method was not used because the method results in lower seasonal adjustment factors than are produced by the ATR station location within Klamath Falls. As such, the on-site ATR method represents the most accurate portrayal of seasonal traffic fluctuations available for the Klamath Falls Urban Area.

The traffic volume data from this ATR station was compared to the counts available at the nearby Washburn Way/OR 39 study intersection. This comparison showed that the count data is within 8 percent of the ATR data. Table 8 below shows the monthly Seasonal Adjustment values calculated from the data provided from this station.

Table 8 On-Site ATR Seasonal Adjustment Values

ATR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
18-018	1.20	1.14	1.12	1.04	1.04	1.02	1.07	1.07	1.05	1.00	1.10	1.21

The traffic counts for this study were collected over a number of months. As such, a singular Seasonal Adjustment value cannot be used. Rather, the values from the table above will be used to adjust each traffic count based upon the month it was collected.

Traffic Operations Analysis Results

Level-of-service (LOS), volume-to-capacity (v/c) ratios and 95th percentile queue lengths were calculated for each of the study intersections identified for the Klamath Falls Urban Area TSP update. The following two sub-sections present the results of these analyses and discuss which intersections do not meet the applicable standards.

Intersection Delay and Capacity Analysis

Traffic analysis was conducted for 75 study intersections within the Klamath Falls Urban Area. Figures 7, 8, and 9 illustrate the study intersection locations, lane configurations and traffic control devices, and the traffic operations results, respectively. Figure 9 summarizes the volume-to-capacity (v/c) ratio and level-of-service (LOS).

As can be seen in Figure 9, there are three study intersections, Homedale Road & OR 39/140, OR 39 & OR 140, and Washburn Way & OR 140 EB Ramps, that do not meet the applicable mobility standards. Further discussion of these locations can be found below..

The ODOT study intersections were also evaluated against OHP standards for none stop-controlled movements. Based on these standards, no deficiencies were identified.

Intersection 43. Homedale Road & OR 39/140

The signalized intersection of Homedale Road & OR 39/140 is reported to operate with a v/c ratio of 0.87, which exceeds the ODOT mobility threshold of 0.85 for this location. This v/c ratio is due to moderate side-street volumes conflicting with heavy through volume on the mainline of OR 30/140. This intersection is part of a coordinated signal system along the South 6th Street / OR 39 corridor.

Intersection 67. OR 39 & OR 140

The signalized intersection of OR 39 & OR 140 is reported to operate with a v/c ratio of 0.73, which exceeds the ODOT mobility standard for this location of 0.70. This v/c ratio is the result of heavy demand of approximately 440 vehicles during the peak hour for the southbound left-turn movement. This intersection is the northern diverge point of the shared alignment of OR 39 and OR 140.

This intersection is included in the 2010 to 2013 Draft Statewide Transportation Improvement Program (STIP) list (Project#: 12555). The identified project would involve access management, upgrade turn lanes, and upgrade the overall lane configurations at the intersection.

Washburn Way & OR 140 EB Ramps

The intersection of Washburn Way & OR 140 EB Ramps is part of the Washburn Way / OR 140 interchange. This location is currently unsignalized and provides access to and from the Washburn Way corridor from the south. This intersection is currently reported to operate with a v/c ratio of 0.88, which exceeds the ODOT mobility threshold of 0.85 for this location. This V/C ratio results from a relatively high eastbound left-turn movement conflicting with traffic on Washburn Way.

A planned project to signalize the Washburn Way / OR 140 ramp terminals has been identified within the 2010 to 2013 Draft Statewide Transportation Improvement Program (STIP) list (Project#: 16240). This improvement would likely alleviate the shown deficiency.

Intersection Queuing Analysis

Queuing analysis was performed at the study intersections in accordance with the recommendations provided in Section 8.3 of the ODOT *Analysis Procedures Manual* (APM – Reference 3). The 95th Percentile queue lengths reported are from those calculated using Synchro 7 software, which implements the *2000 Highway Capacity Manual* methodology.

As there were 80 intersections included in the analysis, Table 9 summarizes the queuing results for the study intersections where storage deficiencies were identified. The queue lengths reported in Table 9 were rounded up to the nearest 25 feet. The available storage length is based on the striped storage lane at the intersection. If a striped storage lane is not provided for a

movement, the distance between roadways is reported as the available storage. *Appendix C* contains the results of the queuing analysis for all of the study intersections.

Table 9 95th Percentile Queues at Study Intersections with Storage Deficiencies

Location	Approach/ Movement	95th Percentile Queue (ft)	Striped Storage Available (ft)	Adequate Storage?
Dahlia St/Campus Dr	NBL	350	150	**No**
Washburn Way/OR 39	EBL	375	280	**No**
	EBR	275	200	**No**
OR 39/Shasta Way	SBL	350	300	**No**
Patterson Dr/OR 39	SBL	250	200	**No**

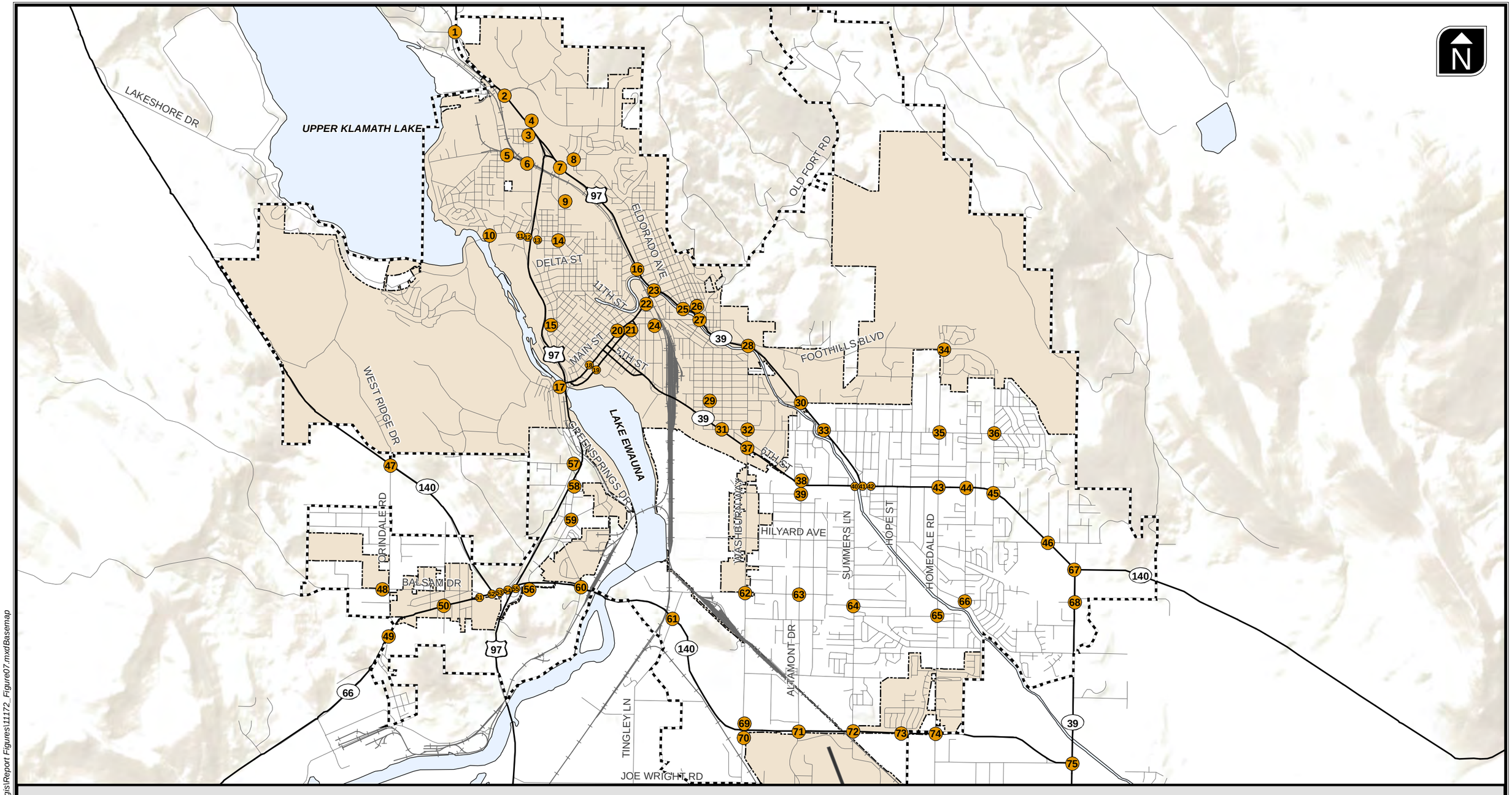
*The following abbreviations are used in this table: NB: Northbound; SB: Southbound; EB: Eastbound; WB: Westbound; L: Left; LTR: Shared left/through/right lane; LT: Shared left/through lane.

As shown in Table 9, four study intersections were found to have 95th percentile queues on one or more approach that exceed the available storage capacity. The remaining study intersections were found to have adequate storage at each approach.

Summary of Existing Traffic Conditions

Below is a summary of the major findings of the existing conditions operational analysis.

- Three of the 75 study intersections were found to not meet operational performance standards under existing conditions.
- All three locations that do not meet performance standards are located on state facilities.
- Washburn Way & OR 140 EB Ramps, a location that does not meet performance standards under existing conditions, has been identified in a project included in the current STIP.



Legend

- Urban Growth Boundary
- City Limits
- ## Study Intersection

Study Intersections

Figure 7

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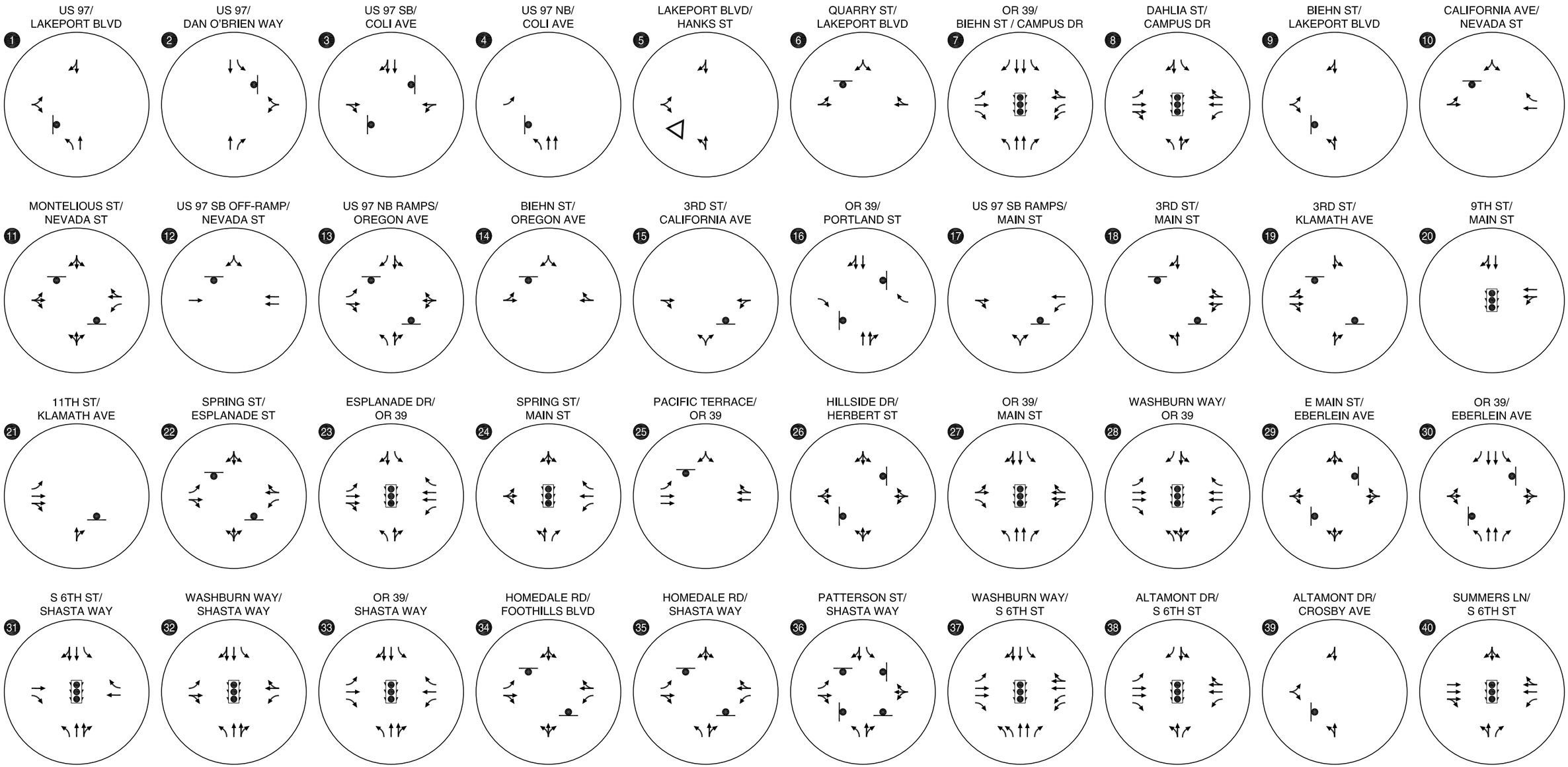

- STOP SIGN
- TRAFFIC SIGNAL
- YIELD SIGN

Existing Lane Configurations and Traffic Control Devices

CITY OF KLAMATH FALLS — KLAMATH COUNTY

Figure 8a

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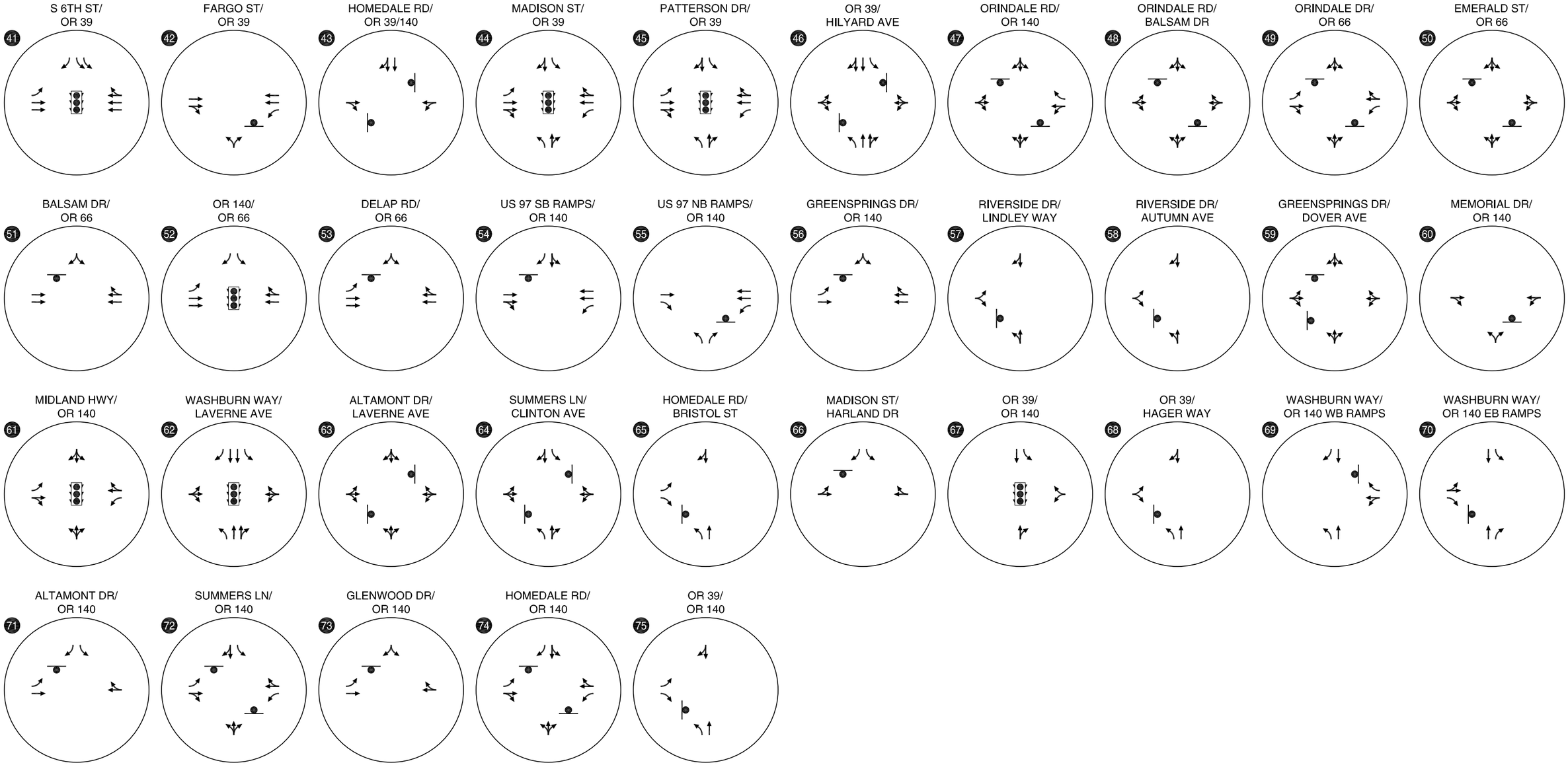

- STOP SIGN
- TRAFFIC SIGNAL
- YIELD SIGN

Existing Lane Configurations and Traffic Control Devices

Figure 8b

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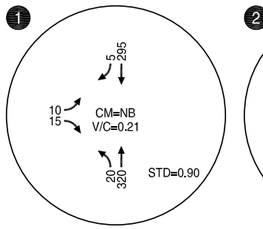
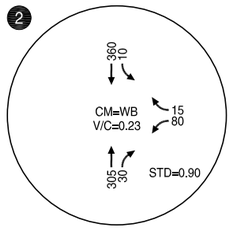
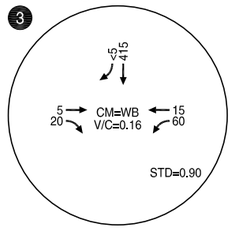
1 US 97/ LAKEPORT BLVD


2 US 97/ DAN O'BRIEN WAY


3 US 97 SB/ COLI AVE


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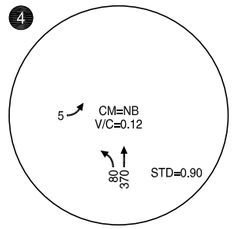
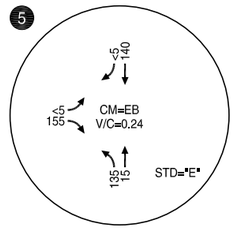


5 LAKEPORT BLVD/ HANKS ST


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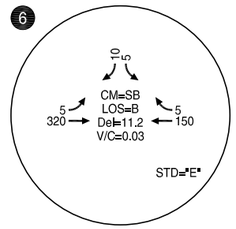
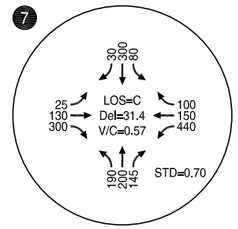


7 OR 39/ BIEHN ST / CAMPUS DR


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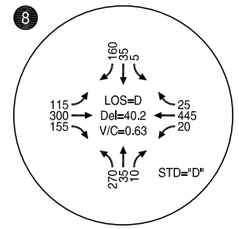

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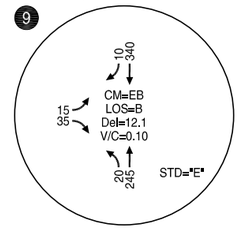
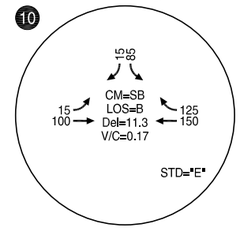


10 CALIFORNIA AVE/ NEVADA ST


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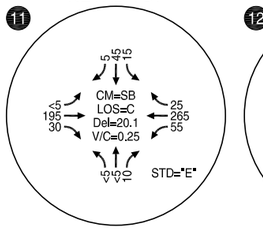
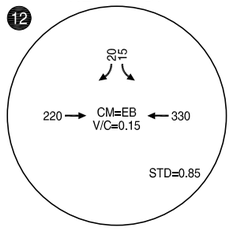


12 US 97 SB OFF-RAMP/ NEVADA ST


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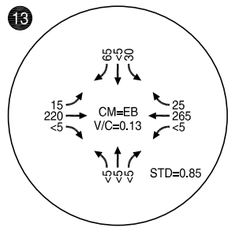

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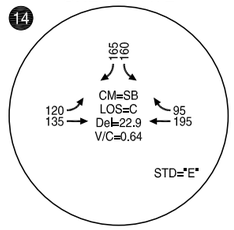

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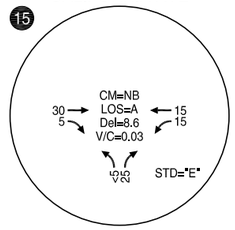
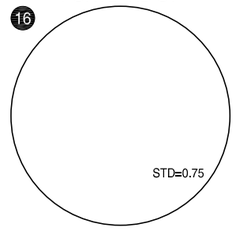


16 OR 39/ PORTLAND ST


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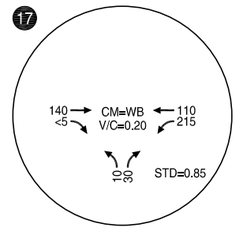

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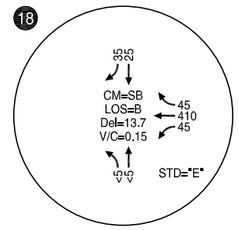
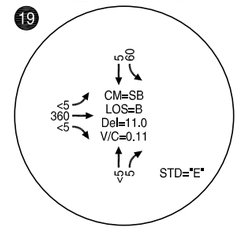


19 3RD ST/ KLAMATH AVE


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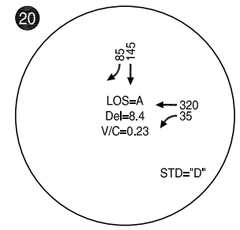

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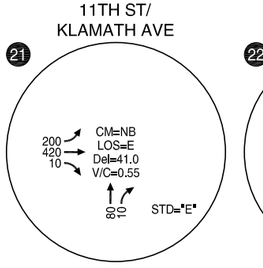

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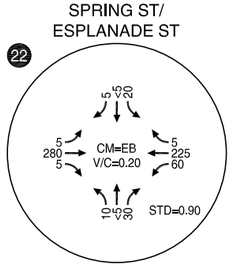

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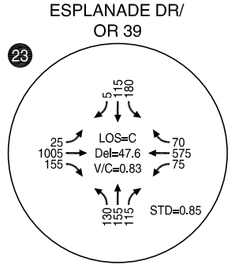

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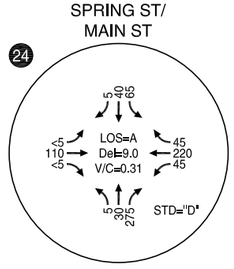

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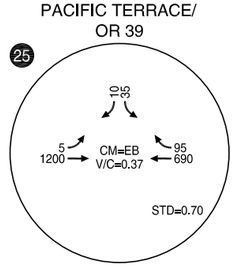

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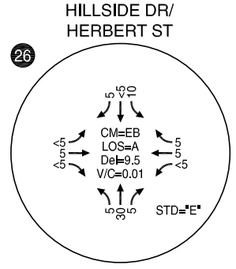
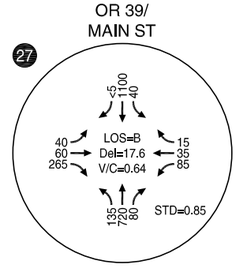


27 OR 39/ MAIN ST


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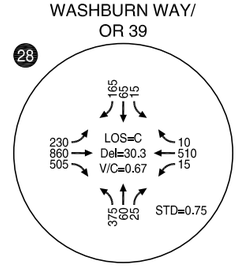
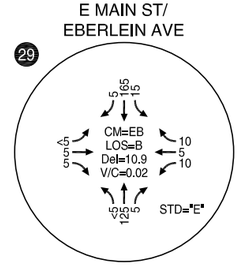


29 E MAIN ST/ EBERLEIN AVE


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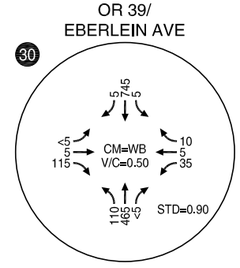

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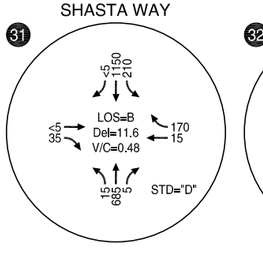

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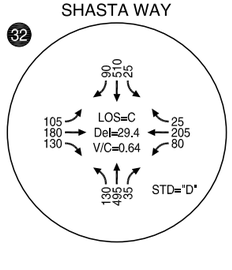

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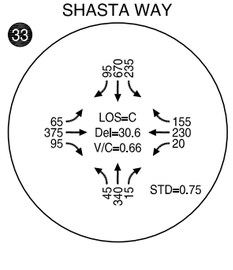

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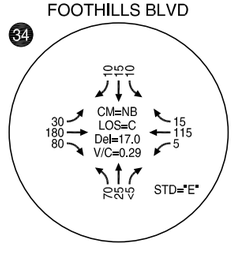

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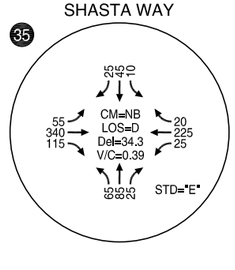

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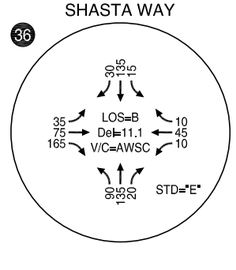
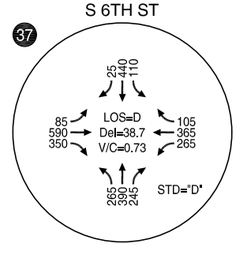
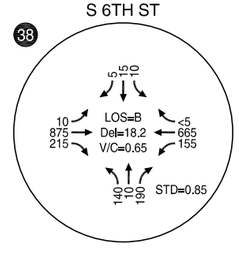
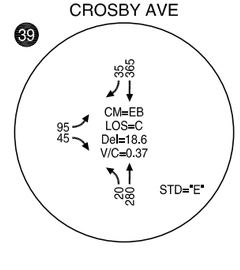
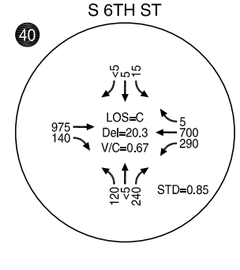


37 WASHBURN WAY/ S 6TH ST


38 ALTAMONT DR/ S 6TH ST


39 ALTAMONT DR/ CROSBY AVE


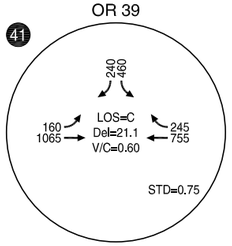
40 SUMMERS LN/ S 6TH ST


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Existing Traffic Conditions Weekday PM Peak Hour

Figure 9a

H:\profile\11172 - Klamath Falls TSP\11172_Fig09 comment update.dwg Mar 09, 2011 - 11:56am - openbnd Layout Tab: 9a

41 S 6TH ST/ OR 39


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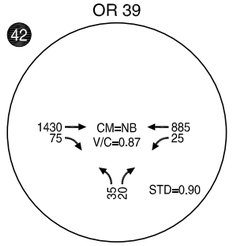
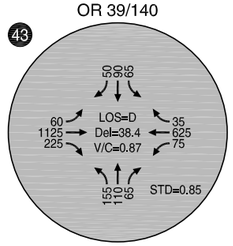


43 HOMEDALE RD/ OR 39/140


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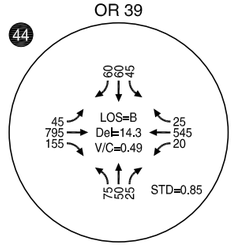

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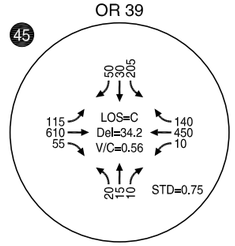
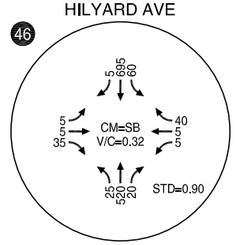


46 OR 39/ HILYARD AVE


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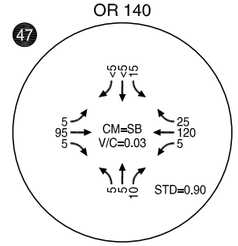

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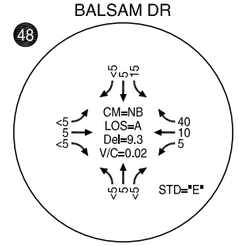

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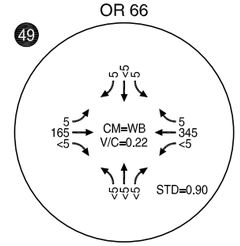

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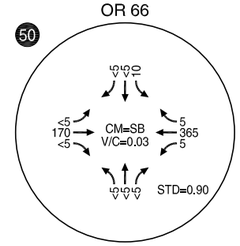

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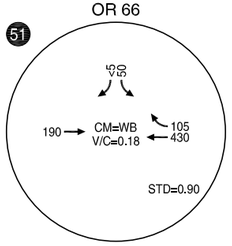
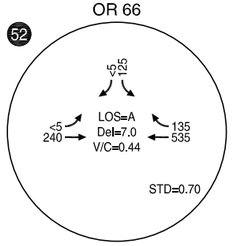


52 OR 140/ OR 66


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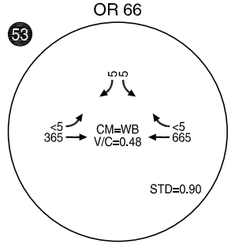

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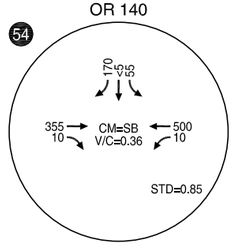
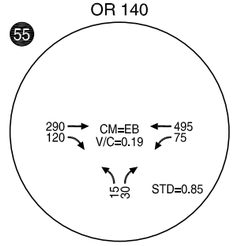
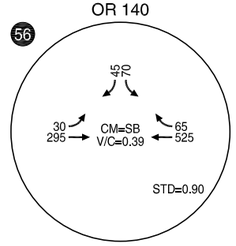
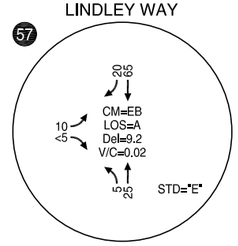
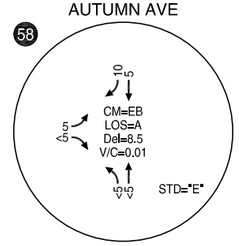
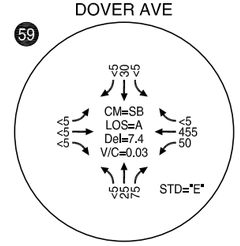


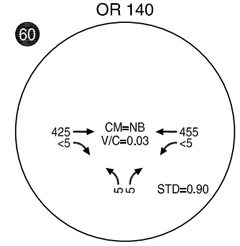
55 US 97 NB RAMPS/ OR 140


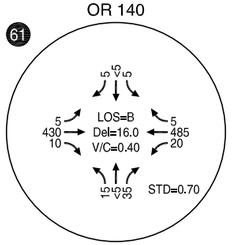
56 GREENSPRINGS DR/ OR 140


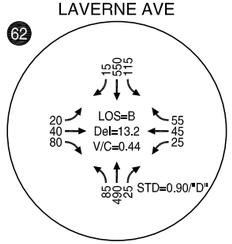
57 RIVERSIDE DR/ LINDLEY WAY


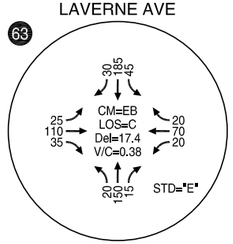
58 RIVERSIDE DR/ AUTUMN AVE


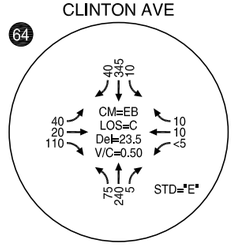
59 GREENSPRINGS DR/ DOVER AVE


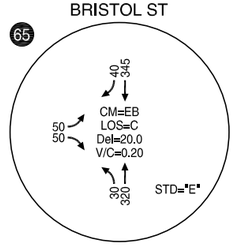
60 MEMORIAL DR/ OR 140


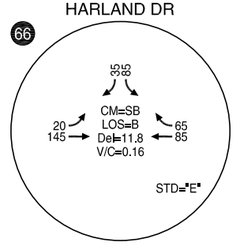
61 MIDLAND HWY/ OR 140


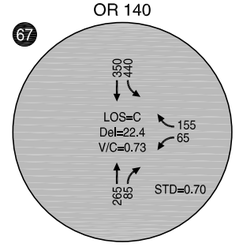
62 WASHBURN WAY/ LAVERNE AVE


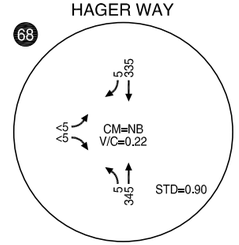
63 ALTAMONT DR/ LAVERNE AVE


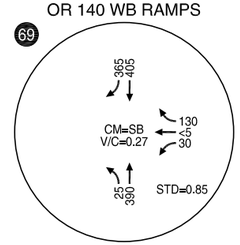
64 SUMMERS LN/ CLINTON AVE


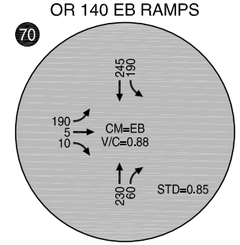
65 HOMEDALE RD/ BRISTOL ST


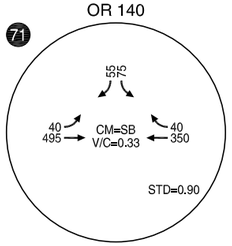
66 MADISON ST/ HARLAND DR


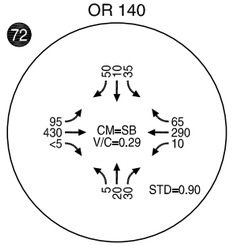
67 OR 39/ OR 140


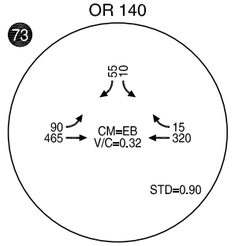
68 OR 39/ HAGER WAY


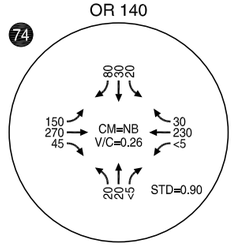
69 WASHBURN WAY/ OR 140 WB RAMPS


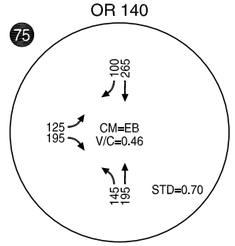
70 WASHBURN WAY/ OR 140 EB RAMPS


71 ALTAMONT DR/ OR 140


72 SUMMERS LN/ OR 140


73 GLENWOOD DR/ OR 140


74 HOMEDALE RD/ OR 140


75 OR 39/ OR 140


CM	=	CRITICAL MOVEMENT (UNSIGNALIZED)
LOS	=	INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del	=	INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C	=	CRITICAL VOLUME-TO-CAPACITY RATIO
STD	=	OPERATIONAL STANDARD

Existing Traffic Conditions Weekday PM Peak Hour

Figure 9b

H:\profile\11172 - Klamath Falls TSP\11172_Fig09 comment update.dwg Mar 09, 2011 - 11:56am - openbnd Layout Tab: 9b

Collision History and Crash Analysis

The purpose of documenting the collision history from the past five years in the Klamath Falls urban area and conducting crash analysis for the study intersections and key roadway segments in the area is to identify intersections and roadway sections that may benefit from roadway and/or operational adjustments to reduce the occurrence and severity of crashes. However, not all crashes are preventable through roadway engineering. The review conducted here highlights the locations that have a higher occurrence of crashes than expected and provides preliminary ideas on what additional studies and/or countermeasures may help reduce crashes at those locations.

The five most recent years of crash data were collected from ODOT for the study intersections and key roadway segments within the Klamath Falls urban area. Crash analysis was conducted using the data obtained from ODOT. As part of the analysis, the Statewide Priority Index System (SPIS) was also reviewed to determine if ODOT has identified any hazardous locations along US 97, OR 39 and/or OR 140 within the study area. ODOT's SPIS analysis uses the most recent three years of crash data (i.e., 2007 through 2009); the intersection and segment crash analysis conducted as part of this TSP update uses the five most recent years of crash data (i.e., 2005 through 2009).

Findings from the collision analysis indicate the following.

- Segments of US 97, OR 39 and OR 140 are rated as a SPIS Category 3 (of five categories with Category 5 the most severe rating) or below within the Klamath Falls urban area.
- There are two intersections within the Klamath Falls Urban area that are categorized as top 5% SPIS sites: 1) OR 140 (Southside Expressway)/Summers Lane; and 2) OR 39 (Klamath Falls-Malin Highway)/South 6th Street.
- There are six study intersections with crash rates higher than expected compared to crash rates at intersections in Klamath Falls urban area with the same type of traffic control; including:
    - OR 39 & Eberlein Avenue;
    - Washburn Way & Shasta Way;
    - Altamont Drive & Laverne Avenue;
    - OR 140 & Summers Lane;
    - OR 140 & Homedale Drive; and
    - OR 140 & OR 39 (south of the Big Y).
- From 2005 through 2009, 55% of crashes along key roadways in Klamath Falls were property damage only, 43% were injury crashes, and 2% were fatal crashes.

The following subsections discuss the SPIS list, the intersection crash analysis and the segment crash analysis.

STATEWIDE PRIORITY INDEX SYSTEM (SPIS)

The Statewide Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways by considering crash frequency, crash rate, and crash severity. As described in ODOT's SPIS description, a roadway segment is designated as a SPIS site if a location experiences three or more crashes or one or more fatal crashes over a three-year period. Under this method, all state highways are analyzed in 0.10 mile segments to identify SPIS sites. Statewide, there are approximately 6,000 sites identified as a SPIS site. SPIS sites are typically intersections, but can also be roadway segments.

Based on ODOT's most recent SPIS analysis[1] using data from 2007 through 2009, segments of US 97, OR 39, and OR 140 through the Klamath Falls urban area are classified as Category 3 (of five categories with Category 5 the most severe rating) or below. Category 3 indicates three to five fatal and/or serious injury crashes per five mile segment of the facility have occurred in the last three years. The fatal crashes that have occurred along US 97, OR 140, and OR 39 within the Klamath Falls urban area are discussed below under the Segment Crashes and Crash Analysis sub-section.

There are two intersections within the Klamath Falls Urban area that are categorized as top 5% SPIS sites. A top 5% site indicates the location has experienced more fatal and/or serious injury crashes in the last three years than 95% of other locations on the state highway system. One of the sites is the OR 140 (Southside Expressway) & Summers Lane intersection; the site includes portions of the OR 140 to either side of the intersection. The second site is the OR 39 (Klamath Falls-Malin Highway) & South 6th Street intersection; the site includes portions of OR 39 to either side of the intersection. There are also several lower rated SPIS sites (i.e., top 10% or 15% sites) on OR 39 (Klamath-Falls Malin Highway) in the vicinity of the OR 39 (Klamath Falls-Malin Highway) & South 6th Street intersection. The crash summary and analysis for the study intersections presented below discusses the fatal crashes that have occurred in the last five years at the study intersections including those along OR 140 (Southside Expressway) and OR 39 (Klamath Falls-Malin Highway).

Appendix D Crash Analysis Information includes a map of SPIS sites in the Klamath Falls vicinity.

INTERSECTION CRASHES AND CRASH ANALYSIS

The following two sub-sections present a summary of the historical crashes at the 75 study intersections and the intersection crash analysis results.

[1]Source for SPIS information:
http://www.oregon.gov/ODOT/TD/TDATA/gis/odotmaps.shtml#SPIS_SIP_Maps

Intersection Historical Crash Inventory

Table 10 summarizes the crash data by study intersection. The table summary provides the number of crashes, severity of crashes, and the number of vehicle-bicycle and/or vehicle-pedestrian crashes reported from 2005 through 2009.

Table 10 Summary of Reported Crashes at Study Intersections

Intersection	PDO[1]	Injury	Fatal	Total	Vehicle-Bicycle Crashes	Vehicle-Pedestrian Crashes
1. US 97 & Lakeport Blvd	0	0	0	0	0	0
2. US 97 & Dan O'Brien Way	3	0	0	3	0	0
3. US 97 SB & Coli Ave	0	0	0	0	0	0
4. US 97 NB & Coli Ave	1	0	0	1	0	0
5. Lakeport Blvd & Hanks St	0	0	0	0	0	0
6. Quarry St & Lakeport Blvd	2	0	0	2	0	0
7. OR 39 & Biehn St/Campus Dr	3	5	0	8	0	0
8. Dahlia St & Campus Dr	5	1	0	6	0	0
9. Biehn St & Lakeport Blvd	1	1	0	2	0	0
10. California Ave & Nevada St	2	1	0	3	0	0
11. Montelius St & Nevada St	0	1	0	1	0	0
12. US 97 SB Off-Ramp & Nevada St	0	0	0	0	0	0
13. US 97 NB Ramps & Oregon Ave	0	0	0	0	0	0
14. Biehn St & Oregon Ave	2	0	0	2	0	0
15. 3rd St & California Ave	0	1	0	1	0	0
16. OR 39 & Portland St	4	6	0	10	0	1
17. US 97 SB Ramps & Main St	1	0	0	1	0	0
18. 3rd St & Main St	1	0	0	1	0	0
19. 3rd St & Klamath Ave	1	0	0	1	0	0
20. 9th St & Main St	3	1	0	4	0	0
21. 11th St & Klamath Ave	0	0	0	0	0	0
22. Spring St & Esplanade St	0	1	0	0	0	0
23. Esplanade St & OR 39	6	5	0	11	0	0
24. Spring St & Main St	3	2	0	5	0	0
25. Pacific Terrace & OR 39	0	0	0	0	0	0
26. Hillside Dr & Herbert St	1	0	0	1	0	0
27. OR 39 & Main St	6	4	0	10	0	0
28. Washburn Way & OR 39	3	4	0	7	0	0
29. E Main St & Eberlein Ave	1	1	0	2	0	0
30. OR 39 & Eberlein Ave	2	7	0	9	0	0

Intersection	PDO[1]	Injury	Fatal	Total	Vehicle-Bicycle Crashes	Vehicle-Pedestrian Crashes
31. S 6th St & Shasta Way	3	1	0	4	0	0
32. Washburn Way & Shasta Way	5	10	1	16	0	0
33. OR 39 & Shasta Way	7	7	0	14	0	0
34. Homedale Rd & Foothills Blvd	0	0	0	0	0	0
35. Homedale Rd & Shasta Way	0	2	0	2	0	0
36. Patterson St & Shasta Way	1	0	0	1	0	0
37. Washburn Way & S 6th St	11	5	0	16	0	0
38. Altamont Dr & S 6th St	6	3	0	9	0	1
39. Altamont Dr & Crosby Ave	1	2	0	3	0	0
40. Summers Ln & S 6th St	4	11	0	15	0	0
41. OR 39 & S 6th St	0	0	0	0	0	0
42. Fargo St & OR 39	3	1	0	4	0	0
43. Homedale Rd & OR 39	9	4	0	13	0	0
44. Madison St & OR 39	1	10	0	11	0	0
45. Patterson St & OR 39	9	3	0	12	0	0
46. OR 39 & Hilyard Ave	3	1	0	4	0	0
47. Orindale Rd & OR 140	0	0	0	0	0	0
48. Orindale Rd & Balsam Dr	0	0	0	0	0	0
49. Orindale Rd & OR 66	0	2	0	2	0	0
50. Emerald St & OR 66	0	0	0	0	0	0
51. Balsam Dr & OR 66	0	0	0	0	0	0
52. OR 140 & OR 66	4	2	0	6	0	0
53. Delap Rd & OR 66	1	1	0	2	0	0
54. US 97 SB Ramps & OR 140	0	0	0	0	0	0
55. US 97 NB Ramps & OR 140	3	0	0	3	0	0
56. Green Springs Dr & OR 140	4	1	0	5	0	0
57. Riverside Dr & Lindley Way	0	0	0	0	0	0
58. Riverside Dr & Autumn Ave	0	0	0	0	0	0
59. Green Springs Dr & Dover Ave	0	0	0	0	0	0
60. Memorial Dr & OR 140	1	1	0	2	0	0
61. Midland Hwy & OR 140	2	6	0	8	0	0
62. Washburn Way & Laverne Ave	5	4	0	9	0	0
63. Altamont Dr & Laverne Ave	8	7	0	15	0	0

Intersection	PDO[1]	Injury	Fatal	Total	Vehicle-Bicycle Crashes	Vehicle-Pedestrian Crashes
64. Summers Ln & Clinton Ave	2	2	0	4	0	0
65. Homedale Rd & Bristol St	2	1	0	3	0	0
66. Madison St & Harlan Dr	1	0	0	1	0	0
67. OR 39 & OR 140 (Big Y)	1	1	0	2	0	0
68. OR 39 & Hager Way	0	0	0	0	0	0
69. Washburn Way & OR 140 WB Ramps	1	1	0	2	0	0
70. Washburn Way & OR 140 EB Ramps	1	2	0	3	0	0
71. Altamont Dr & OR 140	2	2	0	4	0	0
72. Summers Ln & OR 140	2	8	1	11	0	0
73. Glenwood Dr & OR 140	1	0	0	1	0	0
74. Homedale Rd & OR 140	3	3	0	6	0	0
75. OR 39 & OR 140	8	7	0	15	0	0
Study Intersection Total	**166**	**152**	**2**	**320**	**0**	**2**

Notes:

[1]PDO stands for property damage only crash.

The majority of reported crashes from 2005 through 2009 at the 75 study intersections were property damage only (PDO) crashes with most of the remaining crashes injury crashes. Of the 320 crashes that occurred in the five year period, there were two fatal. One fatal crash occurred at Washburn Way & Shasta Way intersection and the other at Summers Lane & OR 140 (Southside Expressway) intersection.

The fatal crash at Washburn Way & Shasta Way occurred when a southbound motorist on Washburn Way disregarded the traffic signal and struck a westbound vehicle on Shasta Way. The driver of the southbound vehicle was killed. The fatal crash at Summers Lane & OR 140 (Southside Expressway) occurred when an eastbound motorist on OR 140 turned left in front of an on-coming vehicle traveling westbound on OR 140. The driver traveling westbound on OR 140 was killed. Both fatal crashes occurred on a weekday morning under dry, clear conditions.

The following sub-section presents the crash analysis results for the 75 study intersections above. Potential countermeasures for the Washburn Way/Shasta Way and Summers Lane/OR 140 intersections are discussed below.

Intersection Crash Analysis

Crash analysis was performed for each study intersection. The critical rate method was used in the analysis (refer to *Appendix D Crash Analysis Information* for details of the crash rate calculations and ODOT crash data). Under this methodology, a critical crash rate is developed for each intersection based on comparing similar intersections. The study intersections were

divided into two groups: signalized intersections and unsignalized intersections. If the crash rate at a specific intersection was found to be higher than the critical crash rate for the intersection, further safety analysis was conducted (Reference 4).

Crash rates for intersections were calculated in crashes per million entering vehicles (MEV). Figure 10 illustrates the crash analysis results for the study intersections. The observed crash rate and critical crash rate for each study intersection are summarized in Table 11.

Table 11 Study Intersection Crash Analysis Results

Intersection	Crash Rate	Critical Crash Rate	Exceeds Critical Crash Rate?
1. US 97 & Lakeport Blvd	0.00	0.37	-
2. US 97 & Dan O'Brien Way	0.20	0.35	-
3. US 97 SB & Coli Ave	0.00	0.40	-
4. US 97 NB & Coli Ave	0.12	0.41	-
5. Lakeport Blvd & Hanks St	0.00	0.42	-
6. Quarry St & Lakeport Blvd	0.22	0.40	-
7. OR 39 & Biehn St/Campus Dr	0.21	0.38	-
8. Dahila St & Campus Dr	0.21	0.40	-
9. Biehn St & Lakeport Blvd	0.16	0.37	-
10. California Ave & Nevada St	0.33	0.40	-
11. Montelius St & Nevada St	0.08	0.37	-
12. US 97 SB Off-Ramp & Nevada St	0.00	0.39	-
13. US 97 NB Ramps & Oregon Ave	0.00	0.38	-
14. Biehn St & Oregon Ave	0.13	0.35	-
15. 3rd St & California Ave	0.59	0.70	-
16. OR 39 & Portland St	-	-	-
17. US 97 SB Ramps & Main St	0.11	0.40	-
18. 3rd St & Main St	0.10	0.39	-
19. 3rd St & Klamath Ave	0.13	0.42	-
20. 9th St & Main St	0.37	0.50	-
21. 11th St & Klamath Ave	0.00	0.36	-
22. Spring St & Esplanade St	0.08	0.37	-
23. Esplanade St & OR 39	0.23	0.37	-
24. Spring St & Main St	0.33	0.46	-
25. Pacific Terrace & OR 39	0.00	0.38	-
26. Hillside Dr & Herbert St	0.73	0.79	-
27. OR 39 & Main St	0.21	0.37	-
28. Washburn Way & OR 39	0.13	0.36	-
29. E Main St & Eberlein Ave	0.31	0.44	-
30. OR 39 & Eberlein Ave	0.33	0.31	Yes

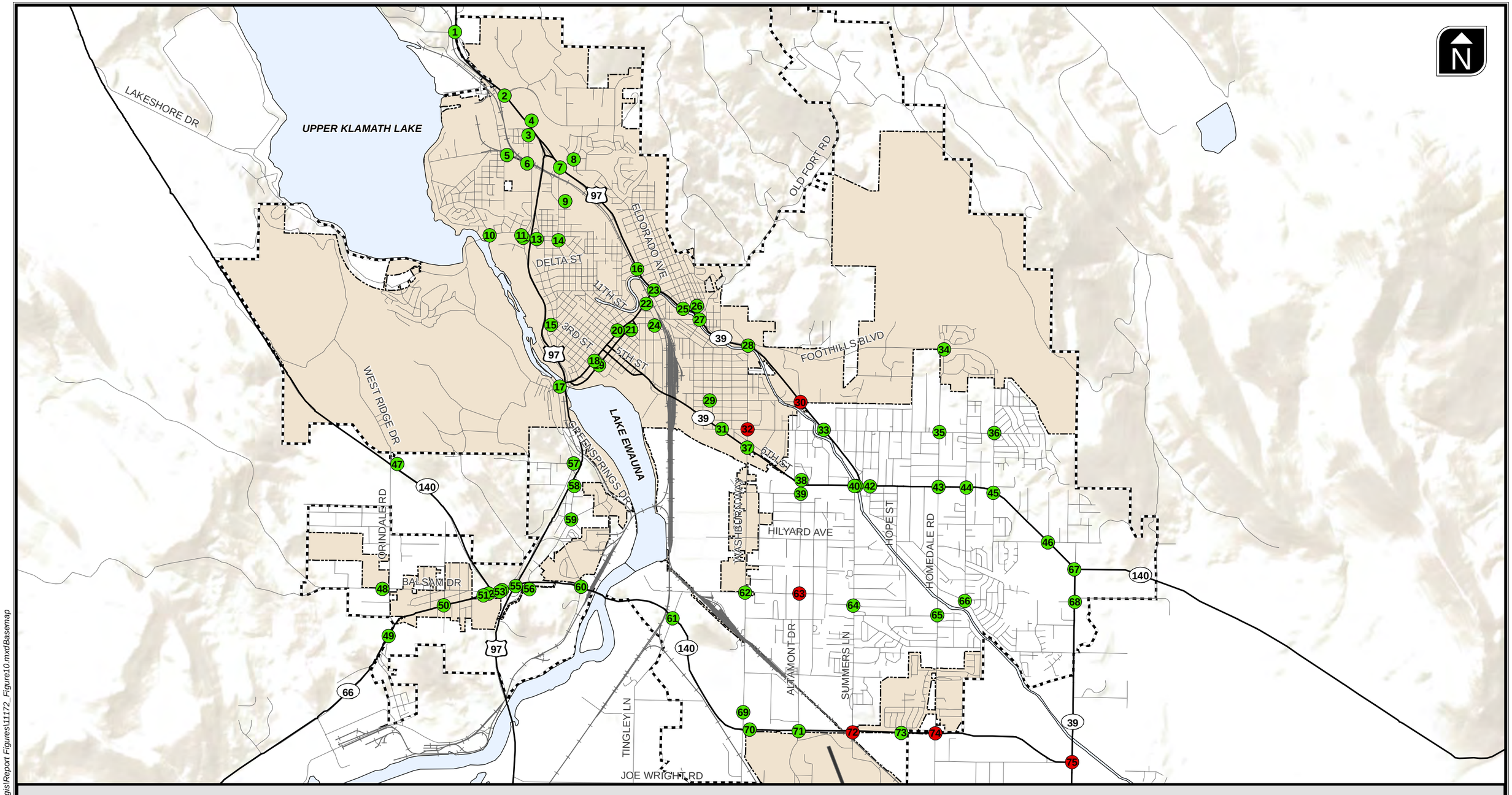
Intersection	Crash Rate	Critical Crash Rate	Exceeds Critical Crash Rate?
31. S 6th St & Shasta Way	0.10	0.38	-
32. Washburn Way & Shasta Way	0.44	0.39	Yes
33. OR 39 & Shasta Way	0.33	0.38	-
34. Homedale Rd & Foothills Blvd	0.00	0.39	-
35. Homedale Rd & Shasta Way	0.11	0.44	-
36. Patterson St & Shasta Way	0.07	0.36	-
37. Washburn Way & S 6th St	0.27	0.36	-
38. Altamont Dr & S 6th St	0.21	0.38	-
39. Altamont Dr & Crosby Ave	0.19	0.35	-
40. Summers Ln & S 6th St	0.33	0.37	-
41. OR 39 & s 6th St	0.00	0.36	-
42. Fargo St & OR 39	0.09	0.28	-
43. Homedale Rd & OR 39	0.27	0.37	-
44. Madison St & OR 39	0.32	0.39	-
45. Patterson St & OR 39	0.38	0.40	-
46. OR 39 & Hilyard Ave	0.15	0.31	-
47. Orindale Rd & OR 140	0.00	0.48	-
48. Orindale Rd & Balsam Dr	0.00	0.68	-
49. Orindale Rd & OR 66	0.20	0.39	-
50. Emerald St & OR 66	0.00	0.39	-
51. Balsam Dr & OR 66	0.00	0.36	-
52. OR 140 & OR 66	0.32	0.44	-
53. Delap Rd & OR 66	0.11	0.33	-
54. US 97 SB Ramps & OR 140	0.00	0.33	-
55. US 97 NB Ramps & OR 140	0.16	0.33	-
56. Green Springs Dr & OR 140	0.27	0.33	-
57. Riverside Dr & Lindley Way	0.00	0.62	-
58. Riverside Dr & Autumn Ave	0.00	1.29	-
59. Green Springs Dr & Dover Ave	0.00	0.54	-
60. Memorial Dr & OR 140	0.12	0.35	-
61. Midland Hwy & OR 140	0.43	0.44	-
62. Washburn Way & Laverne Ave	0.32	0.40	-
63. Altamont Dr & Laverne Ave	1.12	0.36	Yes
64. Summers Ln & Clinton Ave	0.24	0.34	-

Intersection	Crash Rate	Critical Crash Rate	Exceeds Critical Crash Rate?
65. Homedale Rd & Bristol St	0.20	0.35	-
66. Madison St & Harlan Dr	0.13	0.42	-
67. OR 39 & OR 140 (Big Y)	0.08	0.41	-
68. OR 39 & Hager Way	0.00	0.37	-
69. Washburn Way & OR 140 WB Ramps	0.08	0.31	-
70. Washburn Way & OR 140 EB Ramps	0.18	0.34	-
71. Altamont Dr & OR 140	0.21	0.33	-
72. Summers Ln & OR 140	0.58	0.33	Yes
73. Glenwood Dr & OR 140	0.06	0.34	-
74. Homedale Rd & OR 140	0.36	0.34	Yes
75. OR 39 & OR 140	0.80	0.33	Yes

As shown in Table 11 and Figure 10, the following intersections exceeded their respective critical crash rate:

- OR 39 & Eberlein Avenue
- Washburn Way & Shasta Way
- Altamont Drive & Laverne Avenue
- OR 140 & Summers Lane
- OR 140 & Homedale Drive
- OR 140 & OR 39 (south of the Big Y)

A more detailed review of the reported crashes at six of these intersections was conducted to determine potential contributing factors as well as potential countermeasures for reducing crashes. The results of the more detailed reviews are summarized in Table 12 and are discussed in *Appendix D Crash Analysis Information*.



Legend

- Urban Growth Boundary
- City Limits
- ## Study Intersection Number
- ## Below Critical Crash Rate
- ## Above Critical Crash Rate

Intersection Crash Analysis Results

Figure 10

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Table 12 Potential Countermeasures at Study Intersections Exceeding Critical Crash Rate

Intersection	Potential Activities/Countermeasures to Decrease Crashes
30. OR 39 & Eberlein Avenue	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Realign intersection to correct minor street offset and create a 90-degree angle between OR 39 and Eberlein Avenue. Investigate the feasibility of installing a roundabout at the intersection once intersection is realigned.
32. Washburn Way & Shasta Way	Conduct field visit to confirm traffic signal head visibility throughout the day on the southbound approach. Consider installing near-side traffic signals for approaching vehicles. Consider installing red-light running cameras.
63. Altamont Drive & Laverne Avenue	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.
72. OR 140 & Summers Lane	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.
74. OR 140 & Homedale Drive	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.
75. OR 140 & OR 39 (south of the Big Y)	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.

SEGMENT CRASHES AND CRASH ANALYSIS

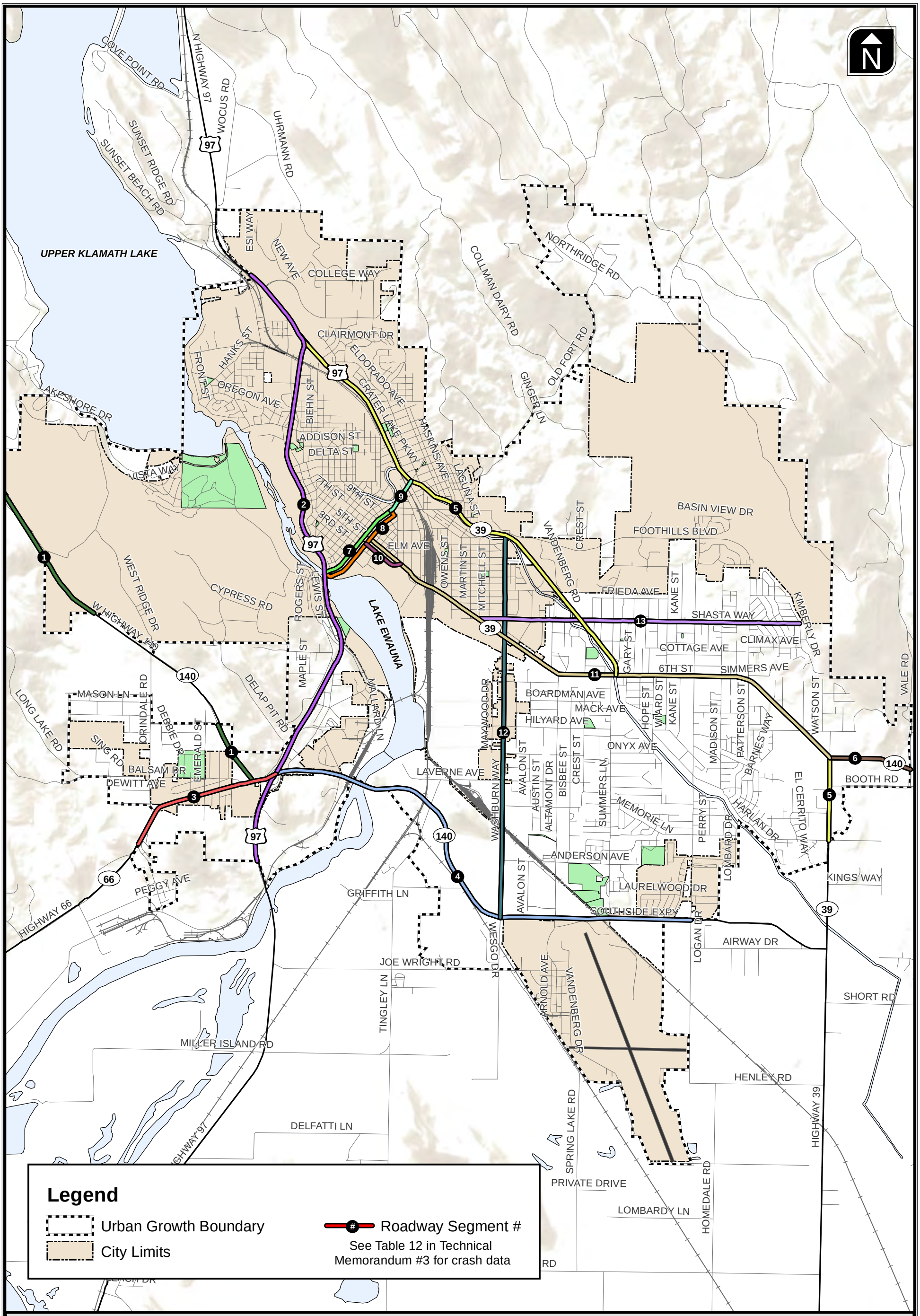
The following two sub-sections present a summary of the historical crashes along key roadway segments in Klamath Falls urban and discuss the roadway segment crash analysis.

Segment Historical Crash Inventory

Table 13 summarizes the crash data by key roadway segments, respectively. The table summary provides the number of crashes, severity of crashes, the number of vehicle-bicycle crashes, and the number of vehicle-pedestrian crashes reported from 2005 through 2009. Figure 11 illustrates the key roadway segments and total number of crashes reported on them from 2005 through 2009.

Table 13 Summary of Reported Crashes on Key Roadway Segments

Roadway Segment	PDO	Injury	Fatal	Total	Vehicle-Bicycle Crashes	Vehicle-Pedestrian Crashes
1. OR 140 from OR 66 to western UGB	4	1	1	6	0	0
2. The Dalles-California Highway (US 97) within the UGB	24	14	1	39	0	0
3. Green Springs Drive (OR 66) within the UGB	5	2	1	8	0	0
4. Southside Expressway (OR 140) from The Dalles-California Highway (US 97) to southeastern UGB	5	4	0	9	0	0
5. Klamath Falls-Malin Highway (OR 39): - US 97 to S 6th Street - Klamath Falls-Lakeview Highway (OR 140) to southern UGB	16	21	1	38	0	1
6. Klamath Falls-Lakeview Highway (OR 39) from S 6th Street to eastern UGB	19	12	0	31	0	0
7. Main Street – Entire Length	8	3	0	11	0	0
8. Klamath Avenue – Entire Length	8	1	0	9	0	0
9. Esplanade Street from Main Street to Alameda Avenue (OR 39)	0	3	0	3	0	0
10. 5th Street from Main Street to 6th Street	4	4	1	9	0	0
11. 6th Street from Main Street to Klamath-Falls Lakeview Highway (OR 140)	21	19	0	40	2	0
12. Washburn Way – Entire Length	39	33	0	72	5	1
13. Shasta Way – Entire Length	6	6	1	13	0	1
Roadway Segment Total	**159**	**123**	**6**	**288**	**7**	**3**



Legend

- Urban Growth Boundary
- City Limits
- Roadway Segment #

See Table 12 in Technical Memorandum #3 for crash data

Roadway Segment Crash Data

Figure 11

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The majority of crashes on the key roadway segments are PDO crashes accounting for approximately 55% of the reported crashes from 2005 through 2009. Injury crashes account for approximately 43% of the reported crashes with six fatal crashes occurring from 2005 through 2009. The six fatal crashes occurred on the following segments under the following situations. Alcohol and/or drugs were involved in two of the fatal crashes; in three of the fatal crashes, motorists were traveling too fast for conditions.

- **OR 140 from OR 66 to western UGB** – A head-on collision occurred in January during the middle of the day under snow conditions on OR 140 between OR 66 and Orindale Road. A motorist was traveling too fast and struck another motorist heading in the opposite direction. Alcohol and drugs were not involved. Both drivers were killed.
- **The Dalles –California Highway (US 97) within the UGB** – A motorist lost control under icy, dark conditions near the northbound Oregon Avenue exit striking a vehicle in the opposite direction. Alcohol was involved in the crash and the motorist that lost control was traveling too fast for conditions. One of the motorists was killed; the crash data for this crash was not sufficiently clear to know which motorist was killed.
- **Green Springs Drive (OR 66) within the UGB** – A vehicle was stopped in the roadway and was stuck from behind by an approaching vehicle. It is not clear from the crash data why the vehicle was stopped. The crash occurred in June at 3:00 p.m. under clear, dry road and weather conditions. Alcohol and drugs were not involved. One of the motorists was killed; the crash data for this crash was not sufficiently clear to know which motorist was killed.
- **Klamath Falls-Malin Highway (OR 39)** – A motorist lost control of his or her vehicle on a curve approaching the Erie Street intersection. The vehicle left the roadway and was immersed in the canal adjacent to the Klamath Falls-Malin Highway. The driver was killed, based on the crash data no passengers were in the car with driver. The crash occurred at 11:00 a.m. in July under clear and dry roadway and weather conditions. Alcohol and drugs were not involved.
- **5th Street from Main Street to 6th Street** – A motorist, under the influence of drugs, lost control of his or her vehicle while traveling too fast on a curve and struck a fixed object. The collision occurred at night under dry roadway conditions.
- **Shasta Way** - A motorist stuck and killed a pedestrian. The pedestrian was in the roadway in the process of crossing Shasta Way approximately 100 feet from Washburn Way intersection. The collision occurred at night under clear, dry conditions; alcohol and drugs were not involved.

Engineering solutions are not always able to address or prevent fatal crashes because they often involve choices or conditions outside of a roadway owners/operators control such as the speed drivers choose to drive, the use of alcohol or drugs by road users, and weather conditions. Based on the information available through ODOT crash data regarding the fatal crashes above, there are not any immediate or obvious changes to the roadway cross-sections that would have prevented the fatalities. However, potential countermeasures to be considered for reducing the occurrence of crashes include:

- Review the roadside design along the major highways through the urban area to look for opportunities to make them more forgiving for motorists who leave the roadway; and
- Look for ways to improve the frequency, safety and efficiency of crossing opportunities for pedestrians to cross arterials and collectors such as Shasta Way and Washburn Way.

The following sub-section discusses the segment crash data analysis.

Segment Crash Data Analysis

To accurately identify roadway segments for more detailed review of crash data, more precise crash data has been requested from ODOT. The roadway segment data summarized above provides information on the crashes occurring along the major roadways such as The Dalles-California Highway; however, to know which portions of that facility and other facilities, are performing as expected with respect to safety, crash data for the specific sections of the each roadway are needed. A more precise data request is being processed by ODOT; once this data is received the segment crash data analysis will be updated to identify sections of roadways with opportunities to reduce the number of crashes.

Public Transportation System

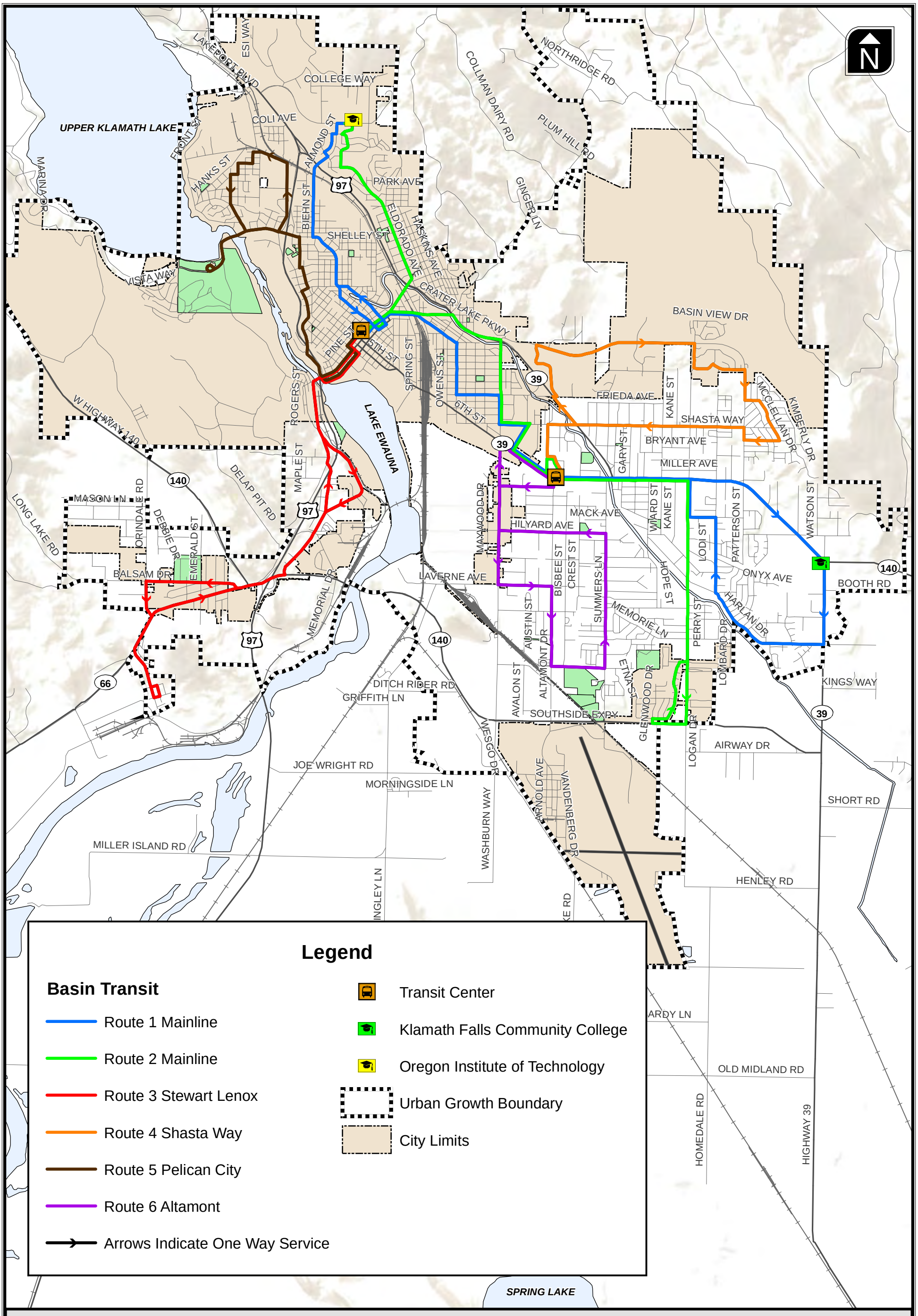
Basin Transit Services (BTS) is the public transit agency for the Greater Klamath Falls Urban Area. The Transit District extends from Terminal City in the north to Kingsley Field (i.e., Klamath Falls Airport) in the south and from the Klamath Falls city limits to an area just beyond OR 39 in the east. Within this area, BTS provides three forms of service: 1) Fixed Route Bus Service; 2) Dial-A-Ride Services and 3) Historical Trolley Tours. Each of these services is discussed below.

FIXED ROUTE BUS SERVICE

The most recent transit plan was completed in December 1995 and is called The Transit Development Plan (TDP). 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 were 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).

Figure 12 illustrates the existing transit routes and destinations of interest within the Klamath Falls urban area. The latest information on fixed route bus service can be found online at http://www.basintransit.com/.



Legend

Basin Transit

- Route 1 Mainline
- Route 2 Mainline
- Route 3 Stewart Lenox
- Route 4 Shasta Way
- Route 5 Pelican City
- Route 6 Altamont
- Arrows Indicate One Way Service

- Transit Center
- Klamath Falls Community College
- Oregon Institute of Technology
- Urban Growth Boundary
- City Limits

Basin Transit Service Fixed Bus Routes

Figure 12

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As can be seen from Figure 12, there are six fixed routes in operation in the Klamath Falls urban area and two key transit centers: 1) Downtown Transit Center at 7th Street & Pine Street; and 2) Fairgrounds Transit Center at Altamont Drive & South 6th Street. Routes 1 and 2 are considered the mainline providing a northwest to southeastern backbone of service from Oregon Institute of Technology (OIT) to Klamath Community College (KCC) and points in between. Routes 3 through 6 provide supplemental coverage in the area. Routes 3 and 5 serve the western portions of the urban area, Route 4 provides coverage in the northeastern portion of the urban area and Route 6 covers the southern portion. No bus routes currently extend far enough south to provide service to the airport. The fixed bus routes do have stops located within ¼-mile of the Amtrak Station in downtown Klamath Falls; however, there are no stops at the train station.

BTS provides service on their fixed routes Monday through Saturday; service is not provided on Sundays. Headways on all fixed routes are approximately 1 hour with stops in downtown and on South 6th Street being served multiple times per hour due to the over lapping routes in these areas. Table 14 summarizes the location and times each route starts and ends service.

Table 14 Basin Transit Service Fixed Routes Time of Day Service[1]

Routes	Route Begins	Monday though Friday		Saturday	
		Time First Bus Departs[2]	Time Last Bus Departs[2]	Time First Bus Departs[2]	Time Last Bus Departs[2]
Route 1 North	Keller Rd	6:30 a.m.	6:57 p.m.	9:57 a.m.	3:57 p.m.
Route 1 South	OIT	6:30 a.m.	7:13 p.m.	10:30 a.m.	4:13 p.m.
Route 2 North	Gatewood	6:27 a.m.	7:27 p.m.	10:27 a.m.	4:27 p.m.
Route 2 South	OIT	6:43 a.m.	6:43 p.m.	10:43 a.m.	3:43 p.m.
Route 3	Stewart Lennox	6:00 a.m.	6:00 p.m.	10:12 a.m.	4:00 p.m.[4]
Route 4	Fairgrounds	6:18 a.m.	6:18 p.m.	10:03a.m.[3]	4:18 p.m.
Route 5	Pelican City	6:30 a.m.	6:30 p.m.	10:12 a.m.	4:30 p.m.[5]
Route 6	Fairgrounds	6:48 a.m.	6:48 p.m.	10:18 a.m.	3:48 p.m.

Notes:

[1]Source: http://www.basintransit.com/routesrates.shtml

[2]This is the time the first bus departs from the first stop on the route.

[3]First departs from Mia's & Pia's.

[4]Last bus departs from Stewart Lennox.

[5]Last bus departs from Downtown.

Current ridership fares are summarized in Table 15 below.

Table 15 Basin Transit Service Ridership Fares for Fixed Routes[1]

Fare Type	Adult[2]	Student[3]	Senior[4]	Disabled[5]
Single Ride Fare	$1.25	$1.25	$0.60	$0.60
Ten Ride Ticket	$11.25	$11.25	$5.60	$5.60
Monthly Pass	$40.00	$37.50	$20.00	$20.00
Tokens (20)	$22.50	$22.50	$11.25	$11.25

Notes:

[1]Source: http://www.basintransit.com/routesrates.shtml

[2]Children 6 years old and under ride free with an adult.

[3]A "Student" is a full-time student from Kindergarten through College. Oregon Institute of Technology (OIT) faculty, staff, and students and students of Klamath Community College and Eagle Ridge High School ride BTS buses free when they show a valid identification card.

[4]A "Senior" is 60 years and older.

[5]A "Disabled Person" is a person with a physical or mental impairment that substantially limits one or more of the major life activities of such an individual; has a record of such impairment; or is regarded as having such impairment.

DIAL-A-RIDE SERVICE

Dial-A-Ride service by BTS provides curb-to-curb transportation within the Basin Transit Service District for customers over 60 years old and/or those with disabilities who are unable to use the fixed route bus service. The specific qualifying definition of disabled/handicapped is:

Handicapped persons means those individuals who, by reason of illness, injury, age, congenital malfunction, or other permanent or temporary incapacity or disability ,including those who are non-ambulatory wheelchair bound and those with semi-ambulatory capabilities are unable without special facilities or special planning or design to utilize mass transportation facilities and services as effectively as persons who are not so affected (49 CFR, Chapter IV, Part 609.3).

Customers must be pre-certified to use the BTS dial-a-ride service; the certification includes filling out a form available online.

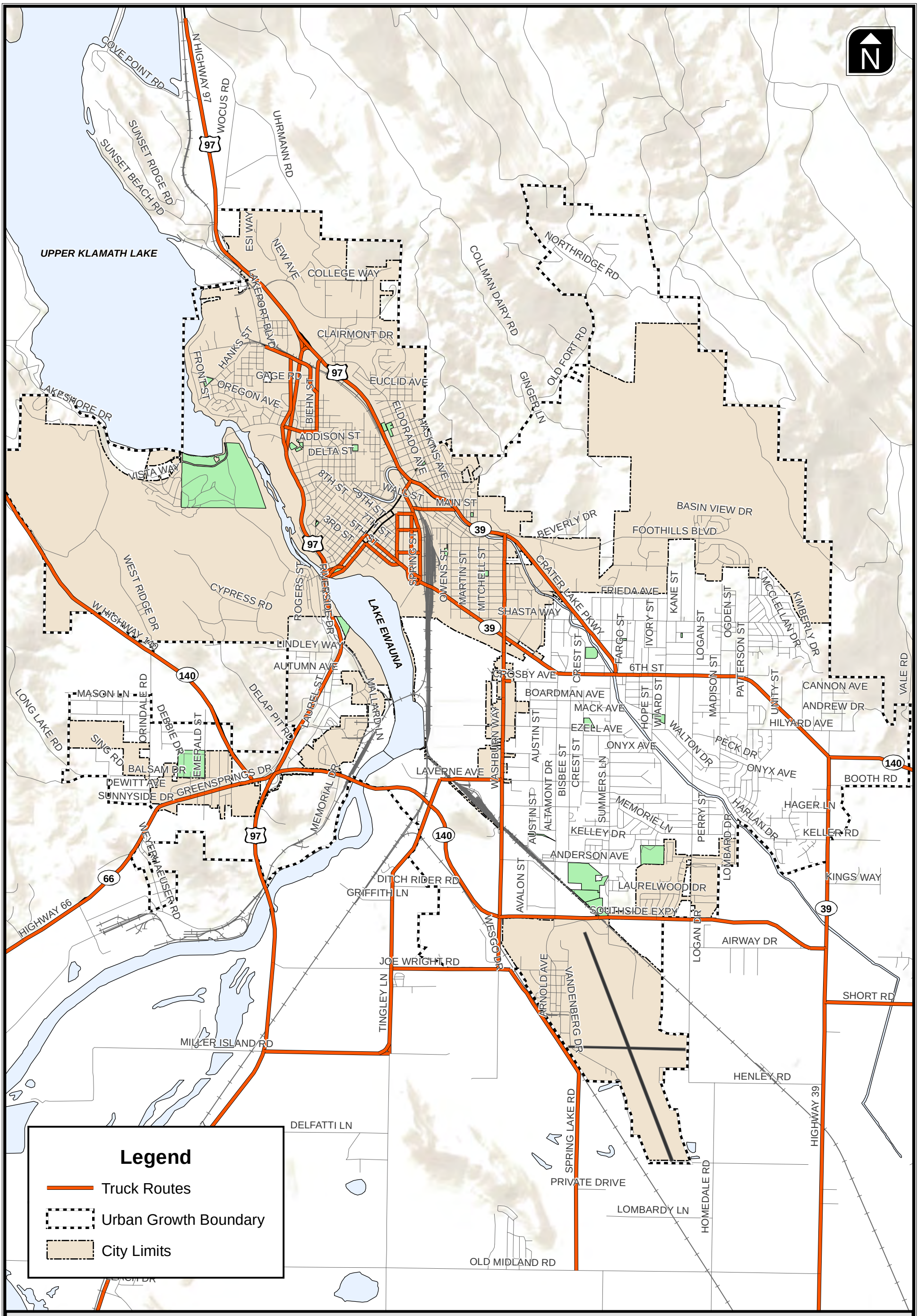
Dial-A-Ride service is available Monday through Friday from 6:00 a.m. to 7:00 p.m. and Saturday from 10:00 a.m. to 4:00 p.m. Service is not provided on Sundays, New Years Day, Presidents Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day, or Christmas Day. Customers schedule appointments at 541-883-2877. The cost to ride is $2.50 per trip (a trip is one-way service), a 10 ride ticket can be purchased for $22.50, or a 20 ride ticket can be purchased for $45.00. Additional information is available at: http://www.basintransit.com/dialaride.shtml.

HISTORICAL TROLLEY TOURS

Historical bus tours on a rubber-tired trolley are provided Tuesday through Saturday starting and ending at the Klamath County Museum in downtown Klamath Falls. The trolley is operated under Linkville Trolley Company, which is funded through cooperative efforts by the City of Klamath Falls, Klamath County and Basin Transit Service. All trolley rides are $1.00; more information is available at http://www.basintransit.com/trolley.shtml.

Truck Freight Routes

All three state highway facilities within the Klamath Falls urban area, US 97, OR 140 and OR 39 are designated as State Highway Freight Routes. Figure 13 illustrates the truck freight routes within the Klamath Falls urban area. National and regional truck freight movements are intended to occur via US 97, which is part of the National Highway System. Local and other regional truck freight movements are intended to occur on OR 140 and OR 39.



Truck Routes

Figure 13

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Rail System

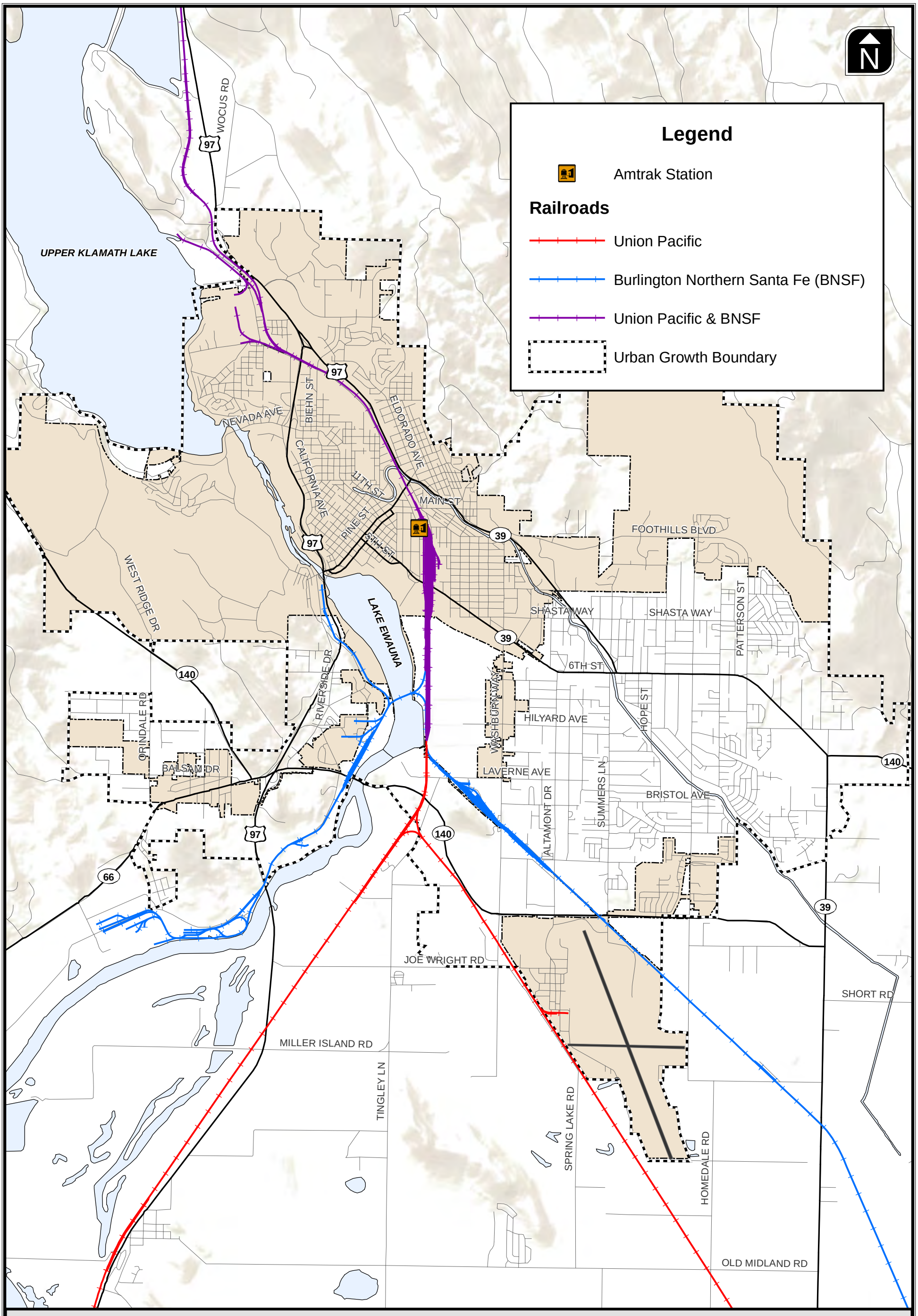
Klamath Falls has passenger and freight rail service. Passenger service is provided by Amtrak and freight rail service is provided by the Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) railroads. The Oregon California and Eastern Railroad (OC&E) abandoned its right-of-way, which was turned over to the County has and is now a multiuse path for pedestrians and bicyclists. The passenger and freight rail service are discussed below. Figure 14 shows the rail lines and operators within the Klamath Falls Urban Area.

PASSENGER SERVICE

Amtrak provides service to Klamath Falls via the Coast Starlight Line[2]; the Coast Starlight Line travels between Seattle, Washington and Los Angeles, California. The Klamath Falls Amtrak station is located at 1600 Oak Avenue and is open from 7:30 a.m. to 11:00 a.m. and 8:30 p.m. to 10:00 p.m. each day of the week. Service from Portland, Oregon is provided once per day departing Portland at 2:25 p.m. and arriving in Klamath Falls at 9:50 p.m. Service from Klamath Falls to Portland is also provided once per day departing Klamath Falls at 8:25 a.m. and arriving in Portland at 3:40 p.m. The most up-to-date information on passenger rail service is available at http://www.amtrak.com/.

Passengers traveling to/from Klamath Falls via Amtrak's Coast Starlight Line can connect to other long distance Amtrak trains that provide access to other destinations in the United States. In Portland, passengers can connect to the Empire Builder line which serves Spokane, St. Paul-Minneapolis, and Chicago. In Sacramento, passengers can connect to the California Zephyr Line which serves Salt Lake City, Denver and Chicago. In Los Angeles, passengers can connect to the Sunset Limited Line and the Southwest Chief Line. The Sunset Limited Line serves Tucson, El Paso, San Antonio, Houston, and New Orleans. The Southwest Chief Line serves Albuquerque, Kansas City and Chicago.

[2] Source of passenger rail service information: http://www.amtrak.com/.



Railroad System & Operators

Figure 14

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FREIGHT SERVICE

The primary track owners and freight line operators in the Klamath Basin are Union Pacific (UP) and Burlington Northern Santa Fe (BNSF) railroads[3]. Freight rail lines connect Klamath Falls to Redding, California in the south via UP's Cascade Line and to Keddie, California via BNSF's line. To the north, Klamath Falls is connected to Eugene through UP's Cascade Line and to Bend through shared trackage rights between UP and BNSF. Amtrak's Coast Staralight Line operates on UP's Cascade Line. The Cascade Line is a Class 4 Line per the Federal Rail Administration's standards; the maximum speed for freight trains on the line is 60 mph and the maximum speed for passenger trains is 80 mph.

UP's Cascade Line carries about 28 million gross tons between the Klamath Basin and California and over 20 million gross tons from the Klamath Basin to Eugene. The BNSF line to Keddie, California carries 1 to 5 million gross tons and approximately 6.5 million in BNSF freight moves to the north between the Klamath Basin and Bend.

Pedestrian and Bicycle System

Figure 15 illustrates the location of sidewalks on streets with a functional classification of minor collector and higher. Figure 16 illustrates the existing bicycle network in the Klamath Falls urban area. The information illustrated in Figure 15 and Figure 16 is based on information in the current (1998) Klamath Fall Urban Area TSP and inventory data obtained from the City of Klamath Falls GIS and operations/maintenance staff.

As can be seen from Figure 15, sidewalks are provided on one or both sides of some of the major roadways (i.e., arterials and collectors) in the urban area. Noticeable gaps in the sidewalk network exist along Nevada Avenue, Eldorado Boulevard, Spring Street, Washburn Way, Altamont Drive, Hope Street, Patterson Street, Crosby Avenue, Hilyard Avenue, Laverne Avenue, Clinton Avenue, Harlan Drive and Keller Road.

Figure 16 illustrates bike lanes are provided in relatively limited areas scattered throughout the urban area collectively amounting to 5.5 miles in length. There are approximately 11.8 miles of multiuse path facilities for bicycles and pedestrians generally traversing the urban area from the southeast to northwest along the abandoned OC&E (Oregon, California and Eastern) railroad right-of-way as well as along the "A" Canal. The "A" Canal parallels the western side of OR 39 (Klamath Falls-Malin Highway). The Klamath Falls Urban Area TSP from 1998 included the designations for shared roadways with high traffic and medium traffic volumes as shown in Figure 16. Based on review of aerial photographs, there do not appear to be special demarcations on the pavement nor do there appear to be signs along these facilities to alert motorists or other road users to this designation. The shared roadways designation appears to only be documented in local/regional planning documents.

[3] Source of freight rail service information: The Oregon Department of Transportation. 2001 *Oregon Rail Plan*. 2001. Available at http://www.oregon.gov/ODOT/RAIL/docs/Publications/railplan01.pdf?ga=t.

UPPER KLAMATH LAKE
LAKE EWAUNA
97
39
140
66
HARBOR ISLES BLVD
FRONT ST
LAKESHORE DR
NEVADA AVE
BIEHN ST
CAMPUS DR
ELDORADO AVE
UPHAM ST
8TH ST
11TH ST
3RD ST
6TH ST
MAIN ST
SPRING ST
EBERLEIN AVE
SHASTA WAY
6TH ST
FOOTHILLS BLVD
HOMEDALE RD
SUMMERS LN
PATTERSON ST
HILYARD AVE
HARLAN DR
HOPE ST
WASHBURN WAY
ALTAMONT DR
KELLER RD
RIVERSIDE DR
GREENSPRINGS DR
BALSAM DR
HIGHWAY 66
TINGLEY LN
JOE WRIGHT RD
SPRING LAKE RD

Legend

- Urban Growth Boundary
- City Limits

Sidewalks

- Both Sides of Street
- One Side of Street

Pedestrian Network

Figure 15

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UPPER KLAMATH LAKE
LAKE EWAUNA
LAKEPORT BLVD
CAMPUS DR
LAKESHORE DR
NEVADA AVE
BIEHN ST
DELTA ST
ELDORADO AVE
11TH ST
3RD ST
MAIN ST
5TH ST
RIVERSIDE DR
WEST RIDGE DR
OLD FORT RD
FOOTHILLS BLVD
SHASTA WAY
6TH ST
PATTERSON ST
HOPE ST
HILYARD AVE
WASHBURN WAY
ALTAMONT DR
SUMMERS LN
BRISTOL AVE
ANDERSON AVE
ORINDALE RD
BALSAM DR
GREENSPRINGS DR
JOE WRIGHT RD
TINGLEY LN
MILLER ISLAND RD
SHORT RD
SPRING LAKE RD
HOMEDALE RD
OLD MIDLAND RD
97
39
140
66

Legend

- Multi-Use Path - Motorized Vehicles Prohibited
- Street with Bicycle Lane
- Low Traffic Volume
- Low Traffic Volume with Paved Shoulders
- Medium Traffic Volume
- High Traffic Volume
- High Traffic Volume with Paved Shoulders
- Urban Growth Boundary
- City Limits

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Bicycle Network

Figure 16

Air Transportation System

Klamath Falls Airport serves the City of Klamath Falls, Klamath County and surrounding local region. The airport facility, Kingsley Field, is located about 5 miles southeast of downtown Klamath Falls; it is operated by the City of Klamath Falls.

Klamath Falls Airport[4] is classified as a non-hub primary commercial service airport in the National Plan of Integrated Airport Systems 2001-2005, and is classified in the Oregon Aviation Plan as a Category 1, Commercial Service Airport. It serves virtually all of the aviation needs of the Greater Klamath Basin, including all of Klamath County and parts of Siskiyou and Modoc Counties in California. The Klamath Falls Airport serves a mixture of military, commercial, and general aviation use. United Express provides once daily round trips to and from Portland and twice daily round trips to and from San Francisco[5]. Much of the airport's use, however, is from general aviation (non-military, non-scheduled) users, such as non-scheduled air-taxi service, U.S. Forest Service fire suppression, agricultural spray applicators, flight school, scenic flights, corporate aviation, and air cargo. Military use of the Klamath Falls Airport is also substantial, and includes refueling of military aircraft; emergency support, air traffic control, and disaster relief by the Oregon Air National Guard; and military training.

Annual passenger boardings for commercial airline service at the Klamath Falls Airport ranged between 30,000 and 33,000 in the years leading up to the development of the Klamath Falls Airport Master Plan in 2005. At the time of the Klamath Falls Airport Master Plan, the annual passenger boardings were projected to grow to roughly 45,500 in 2022; however, these projections have dropped due to the reduction in passenger service that occurred two years ago when Horizon Airlines eliminated service to Klamath Falls. The Klamath Falls Airport Master Plan also projects growth for military and general aviation usage. The Klamath Falls Airport Master Plan notes that the types of aircraft based at Klamath Falls Airport will change over the course of the 20-year planning period, and predicts a future need for larger hangars and more paved apron space.

The airport is bounded on the north side by OR 140 (Southside Expressway), on the east side by Homedale Road and the Burlington Northern Santa Fe Railroad (BNSF), and by the Lost River Diversion Channel and the Union Pacific Railroad to the south and west. The airfield has an X-shaped configuration formed by the two active runways. The primary building area is located northwest of the runway intersection. Though there are a few other buildings located elsewhere on the airport, development outside of the primary building area has been limited by safety setbacks defined by the military, clear areas required for airport navigational aids and radar, and wetlands. The main parking lot in the passenger terminal complex provides 250 parking spaces

[4] Information regarding Klamath Falls Airport was obtained from Klamath Falls Airport Master Plan prepared in 2005 by Mead & Hunt.

[5] Source: http://flykfalls.com/services/arrivals

while an overflow lot constructed in 2002 provides an additional 190 spaces. Airport tenants occupy a substantial portion of the airport; tenants often maintain their own secure airside apron, buildings and facilities, and vehicle parking areas.

The City of Klamath Falls and Klamath County have jurisdiction over land use in the airport's environs. The airport property is currently designated Public Facility. Lands to the east, west and south are designated Exclusive Farm Use – Crop Land. Immediately adjacent to the airport to the northwest and northeast are lands designated for various types of commercial and industrial uses. Several pockets of land north of the airport are designated Suburban Residential.

Airport access and circulation presents some existing and future challenges. Improvements along OR 140 (Southside Expressway) required the relocation of the main airport entrance from Altamont Drive to Washburn Way in 1997. The new route, via Washburn Way and Joe Wright Road, reduces airport traffic through the local neighborhoods in addition to improving OR 140 (Southside Expressway). However, airport traffic is now forced to cross the Union Pacific Railroad tracks twice. Airline terminal access will be provided with a dedicated access-loop road at some point in the future, requiring altered on-site vehicular traffic patterns. Similarly, corporate development will increase traffic on the airport's access roadways. Additionally, future development on the airport's east side will be enhanced by a dedicated access point connecting to the South-side bypass. Development of the business park adjacent to the airport cannot happen until improvements are made at the Summers Lane/OR 140 intersection. There are potential plans to extend Brett Way from Summers Lane to Homedale Road at which time the access from Summers Lane onto OR 140 would be closed.

Expansion of airport facilities is constrained by airfield setbacks, physical barriers, airport property limitations, military safety setbacks and leased areas, existing facilities, roadway access, and potential environmental constraints. Chapter 5 of the Master Plan identifies five sites that present growth opportunities for aviation and/or non-aviation uses; two of the five sites are planned for at least some non-aviation uses. Conceptual development plans for several of the sites noted a need for improved or revised access and/or circulation in order to facilitate development.

Chapter 5 of the Master Plan also presents additional recommendations on land use and transportation that will shape the airport's future growth, including improvements to the Homedale Road interchange and east airport access, acquiring or protecting land on the airport's east side for future expansion, and railroad track consolidation and removal. ODOT has evaluated several alternatives to improve safety at the Homedale Road & OR 140 (Southside Expressway) intersection. The previous master plan study recommended relocating the airline terminal to the airport's east side; the 2005 master plan does not recommend terminal relocation but does note that roadway improvements to connect the airport's east side to population/business centers would help stimulate aviation and compatible non-aviation development in targeted airport development areas. The Airport Layout Plan (ALP) includes a local roadway connection and interchange similar to those that were under consideration by ODOT. The Master Plan also notes that duplicative railroad tracks currently constrain both the east and west side of the airport, and that some dialogue has already occurred between the City

of Klamath Falls and the railroad operators regarding the potential to close and remove sections of track. Given the timeline of track closures and an unknown preference as to which track is most easily closed, however, the ALP retains the tracks as a permanent constraining influence on airport growth potential.

Pipeline System

Pipeline transportation within the Klamath Falls urban area includes transmissions lines for electricity, television, telephone services as well as transport of water, sanitary sewer, and a major north-south transmission line for natural gas. Pacific Power (owned by PacifiCorp) serves Klamath Falls with electricity and is the owner/operator of the primary transmission lines in the area. The City of Klamath Falls provides water to all areas within the UGB and sanitary sewer within the City Limits. South Suburban Sanitary District provides sanitary sewer within the County's jurisdiction of the UGB.

Water Transportation System

While Klamath Falls is located on one of the largest lakes in Pacific Northwest, Upper Klamath Lake, water transportation is limited to recreational uses of the lake. The nearest port is located in Coos Bay, OR and is an international/national shipping facility.

Intra-Modal and Inter-Modal Connections

The intra- and inter-modal connections for passengers are rail, transit, and airport connections. The intra- and inter-modal connections for freight movement are primarily between rail and truck freight shipments. Each is briefly discussed below.

PASSENGER TRAVEL

Within the Klamath Falls urban area, there are four locations that provide modal connections (i.e., hubs or locations that facilitate switching from one mode of travel to another) for passengers traveling to/from points within the Klamath Falls urban area and to points beyond the Klamath Falls urban area. These are:

- Amtrak Station at 1600 Oak Avenue
- Downtown Transit Center at 7th Street and Pine Street
- Fairgrounds Transit Center at South 6th Street and Altamont Drive
- Klamath Falls Airport

The Amtrak Station is located in the eastern portion of downtown Klamath Falls and serves as the hub for passengers connecting to the Amtrak's Coast Starlight, which provides service to

cities along the west coast from Seattle, Washington to Los Angeles, California. The BTS fixed bus routes provide service within a quarter-mile of the Amtrak Station.

The Downtown Transit Center located at 7th Street and Pine Street serves passengers making connections within the BTS fixed route service. Passengers can make connections between the mainline routes (Route 1 and Route 2) and the westside routes (Route 3 and Route 5). The Fairgrounds Transit Center is located at South 6th Street and Altamont Drive and provides connections for passengers traveling on the BTS fixed route service. Passengers can make connections between the mainline routes (Route 1 and Route 2) and the eastside routes (Route 4 and Route 6).

Currently, the only way to access the Klamath Falls Airport is by automobile. However, once at the airport, passenger service is provided to Portland and San Francisco. Private cab companies are available for reaching local destinations such as the Klamath Falls Airport. Private bus lines are also available for reaching regional destinations such as Medford and the Oregon Coast.

FREIGHT MOVEMENT

Freight movement within the Klamath Falls urban area occurs via the rail lines and the truck routes using the state highway facilities. The primary intra- and inter-modal connection for freight in the area occurs at the freight yards along the tracks south and east of downtown. However, Klamath Falls is not known nor equipped to be a substantial transfer area for goods from rail to truck or from truck to rail. The majority of freight movement passes through the area without switching modes.

Funding Analysis

Roadways within the Klamath Falls urban area fall under the jurisdiction of: 1) City of Klamath Falls; 2) Klamath County; or 3) ODOT. This section discusses the City and County's existing funding sources for capital improvement project as well as operations and maintenance activities.

CITY OF KLAMATH FALLS

Funding sources for capital projects as well as operation and maintenance for transportation within the city limits come from the City's Street Division. For capital improvement projects, the Street Division receives monies from area specific System Development Charges (SDC), ODOT via the Surface Transportation Program (STP), and Klamath County. A breakdown of each is below.

- **Area Specific System Development Charges** – These are received from the Stewart Lennox area at a rate of $2,258.52 per single-family home.

- **STP Monies** – On an annual basis, the City receives an average of approximately $200,000 in STP funds from ODOT. The distributions from 2008, 2009 and 2010 were slightly higher as noted below.
    - 2008 - $224,040
    - 2009 - $211,460
    - 2010 - $218,393
- **Klamath County** – On an annual basis, the City has historically received funding from Klamath County through the Secure Rural Schools Fund (Federal Forest Receipts) in the amount of approximately $750,000 to $800,00 (approximate average amount over the last 24 years). Approximately $150,000 of these funds is allocated to operations and maintenance activities. However, this funding source is anticipated to cease in 2012 unless new federal legislation is passed.

Historically, the City has had approximately $550,000 in total funds within their Street Division for capital projects. Other funding sources such as gas tax revenues and franchise fees supplement the Federal Forest Receipts and are used for operations and maintenance activities. A summary of these funds from the past several years is below.

- **Federal Forest Receipts** – $150,000 per year
- **Gas Tax**
    - 2007 - $946,362
    - 2008 – $897,845
    - 2009 – $807,471
    - 2010 - $879,105
- **Franchise Fees**
    - 2007 - $607,748
    - 2008 – $702,432
    - 2009 – $716,559
    - 2010 - $716,858

The City's operations and maintenance budget for the past few years was approximately $1.70 million to $1.75 million per year.

Given the uncertainty related to the funds the City receives from Klamath County (i.e., Federal Forest Receipts), future funding sources discussions presented in Technical Memorandum #4 and Technical Memorandum #5 will identify potential new funding strategies for the City.

KLAMATH COUNTY

Funding sources for capital projects as well as operation and maintenance for County roadways consist of Federal Forest Receipts, Motor Vehicle Apportionment, and STP Funds. Table 16 summarizes the amount from each of these sources in the last three years as well as the forecasted allotment from each source for the next three years.

Table 16 Funding Sources for Klamath County Public Works[1]

Year	Federal Forest Receipts	Motor Vehicle Apportionment	STP Funds	Total
2008	$10,962,222	$3,446,505	$479,172	**$14,887,899**
2009	$9,876,312	$3,079,096	$437,260	**$13,392,668**
2010	$8,883,833	$3,361,938	$455,859	**$12,701,630**
Forecasted 2011	$7,534,300	$3,862,000	$457,890	**$11,854,190**
Forecasted 2012	$4,944,226	$4,988,000	$450,000	**$10,382,226**
Forecasted 2013	$674,106	$5,000,000	$450,000	**$6,124,106**

Notes:

[1]Amounts rounded to nearest dollar.

As noted above, given the uncertainty and decline related to Federal Forest Receipts, future funding sources discussions presented in Technical Memorandum #4 and Technical Memorandum #5 will identify potential new funding strategies for the County as well as the City.

REFERENCES

1. Transportation Research Board. *Highway Capacity Manual*. 2000.
2. The Oregon Department of Transportation. *Analysis Procedures Manual*. 2006.
3. The Oregon Department of Transportation. *Oregon Highway Plan.* 1999.
4. American Association of State Highway Transportation Officials. *Highway Safety Manual*. 2010.

APPENDICES

Appendix A – Traffic Count Data

Appendix B – Methodology Memorandum

Appendix C – Existing Conditions Traffic Operations and Queuing Analysis Worksheets

Appendix D – Crash Analysis Information

Appendices
Draft Technical Memorandum #3 Existing Conditions

APPENDIX A – TRAFFIC COUNT DATA

APPENDIX B – METHODOLOGY MEMORANDUM

APPENDIX C- EXISTING CONDITIONS TRAFFIC OPERATIONS AND QUEUING ANALYSIS WORKSHEETS

APPENDIX D – CRASH ANALYSIS INFORMATION

APPENDIX A – TRAFFIC COUNT DATA

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

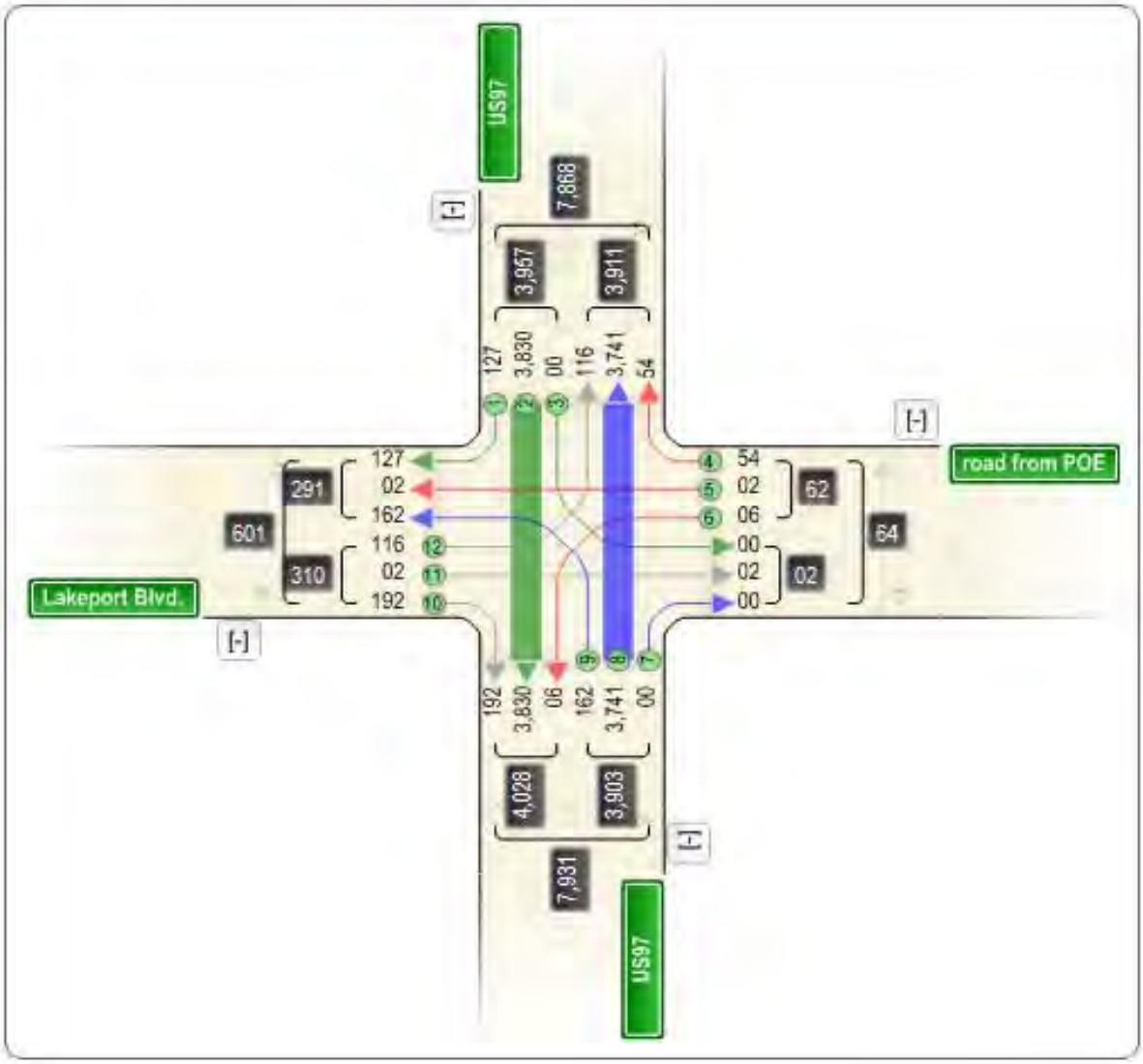
Date: 4/7/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear

Source

Site Number: 18172010
Mile Point: 271.43
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 @ Lakeport Blvd. site 682 - south leg
included road from POE since it is directly across Lakeport Blvd.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

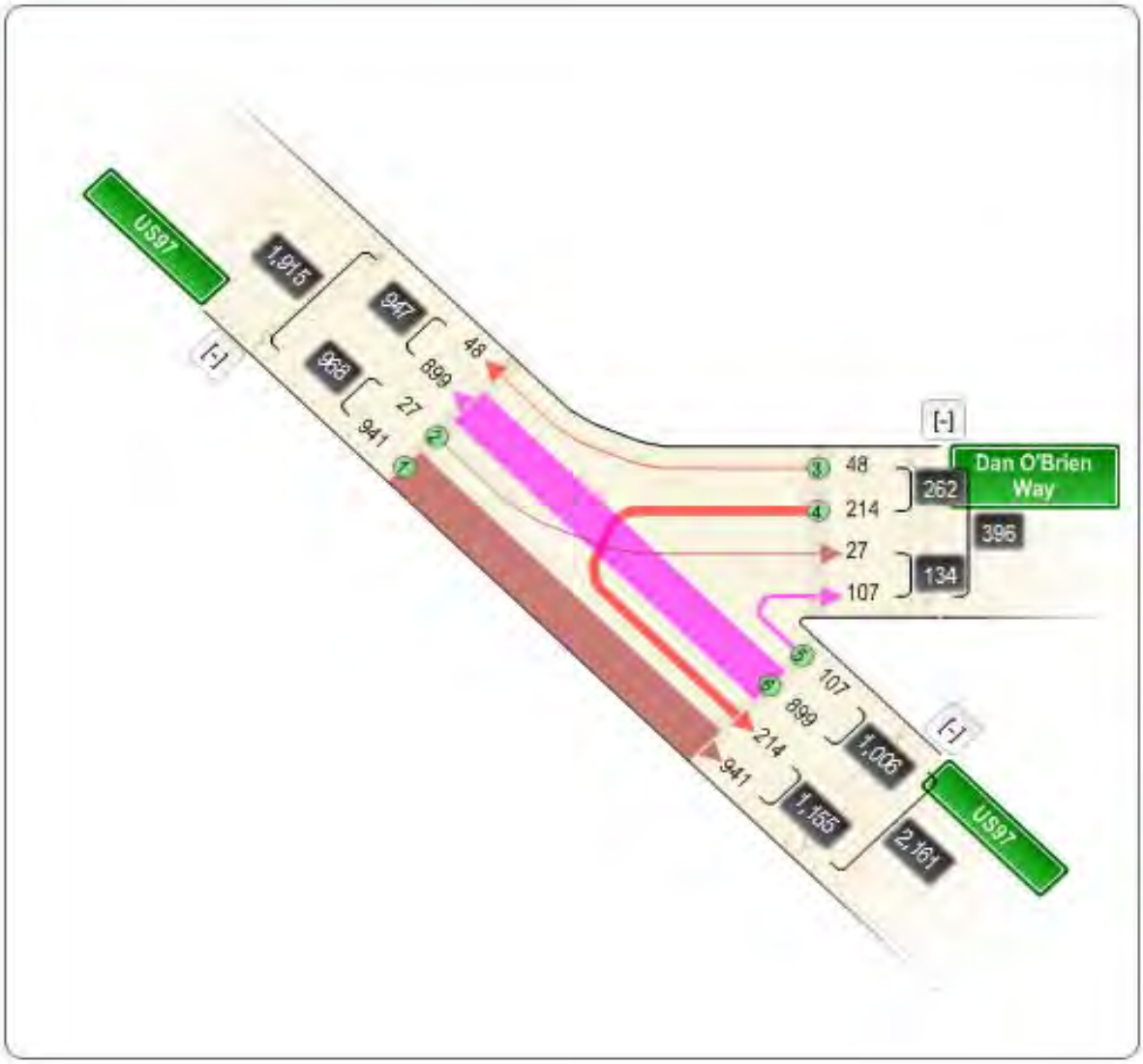
Date: 5/17/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18292010
Mile Point: 272.20
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 @ Dan O'Brien Way 3hr count 3 - 6PM
site 683 - south leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

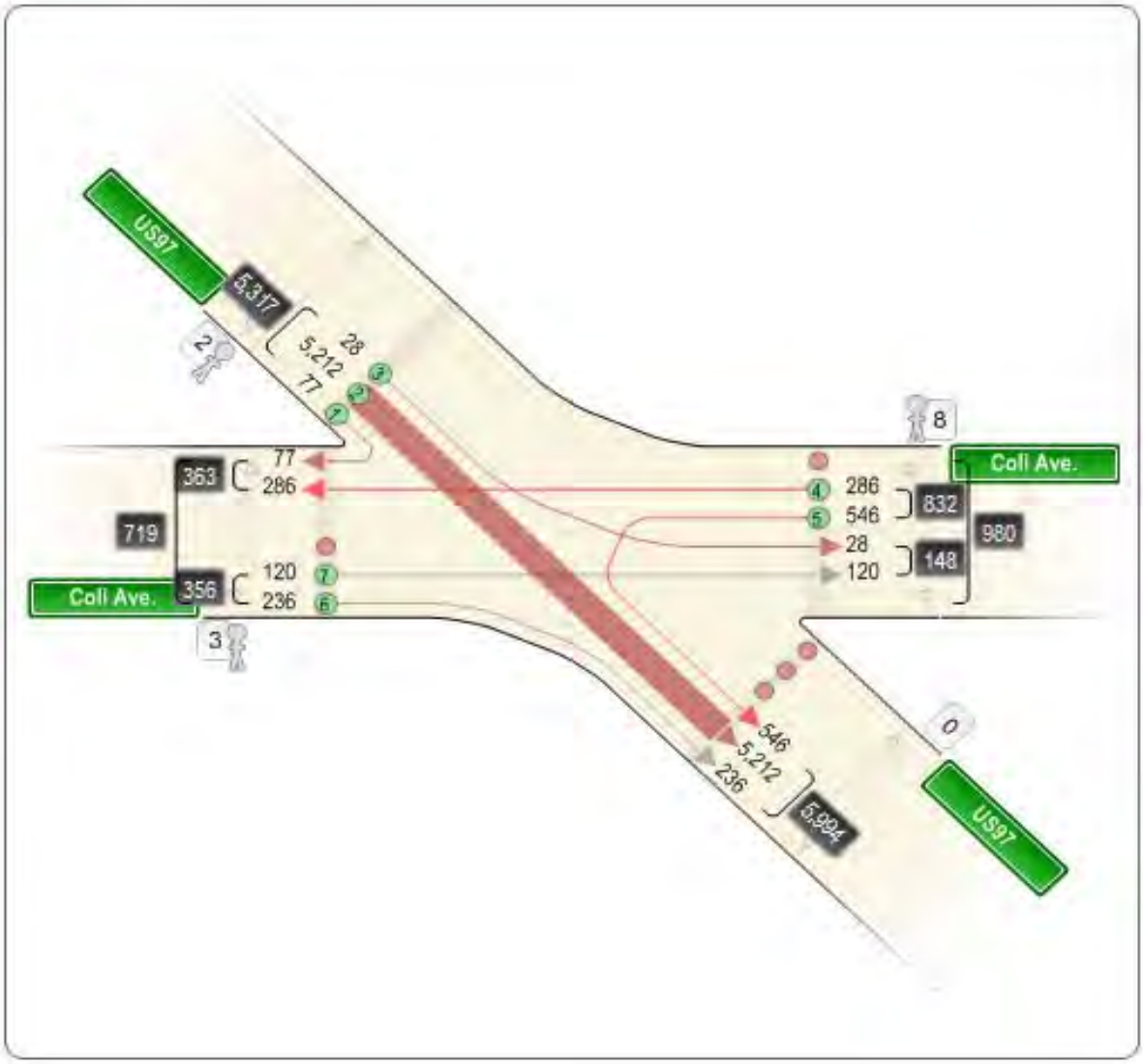
Date: 5/13/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18282010
Mile Point: 272.56
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 S/B @ Coli Ave. site 684 south leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

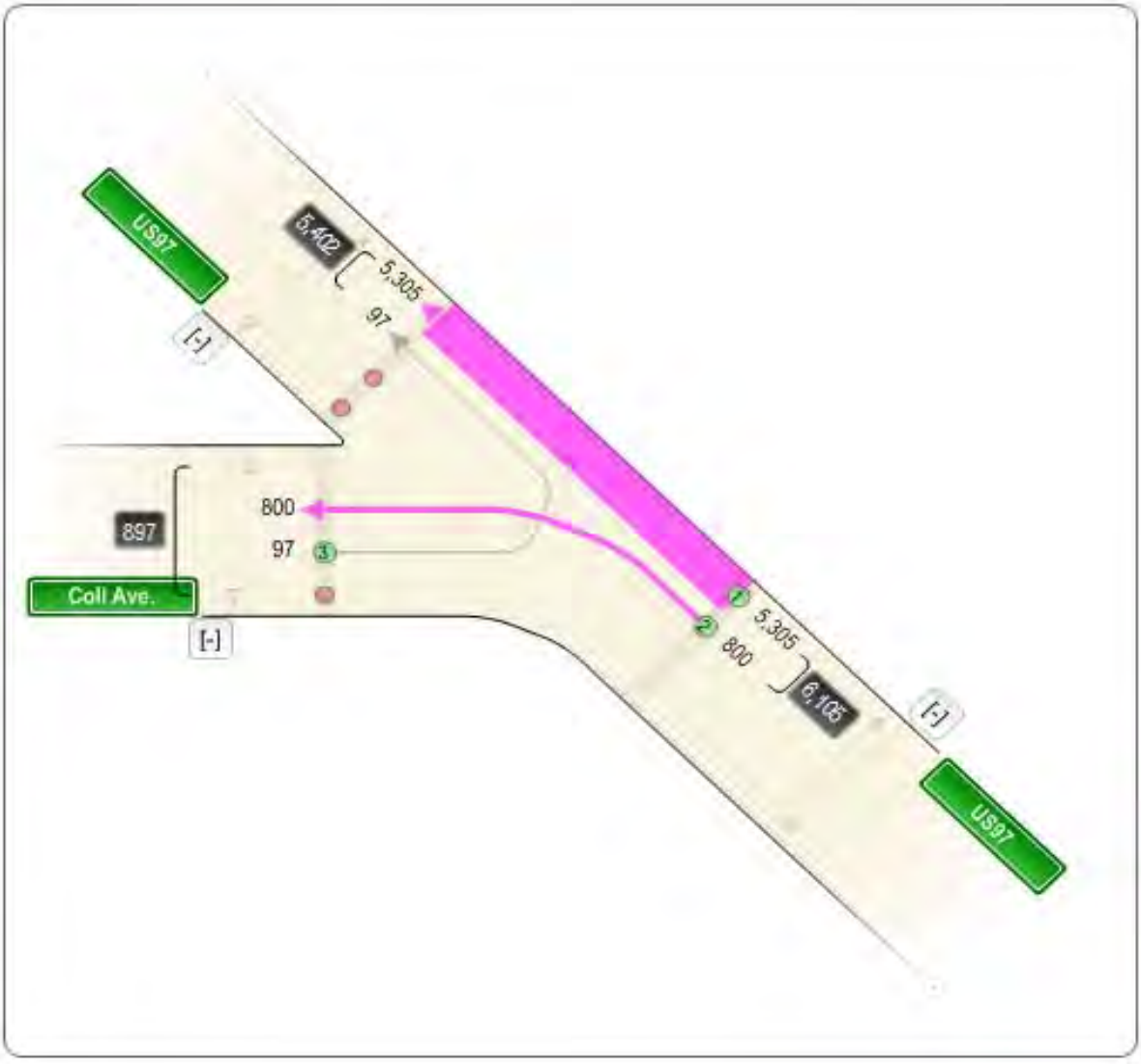
Date: 5/13/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18272010
Mile Point: 272.56
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 N/B @ Coli Ave. site 683 south leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

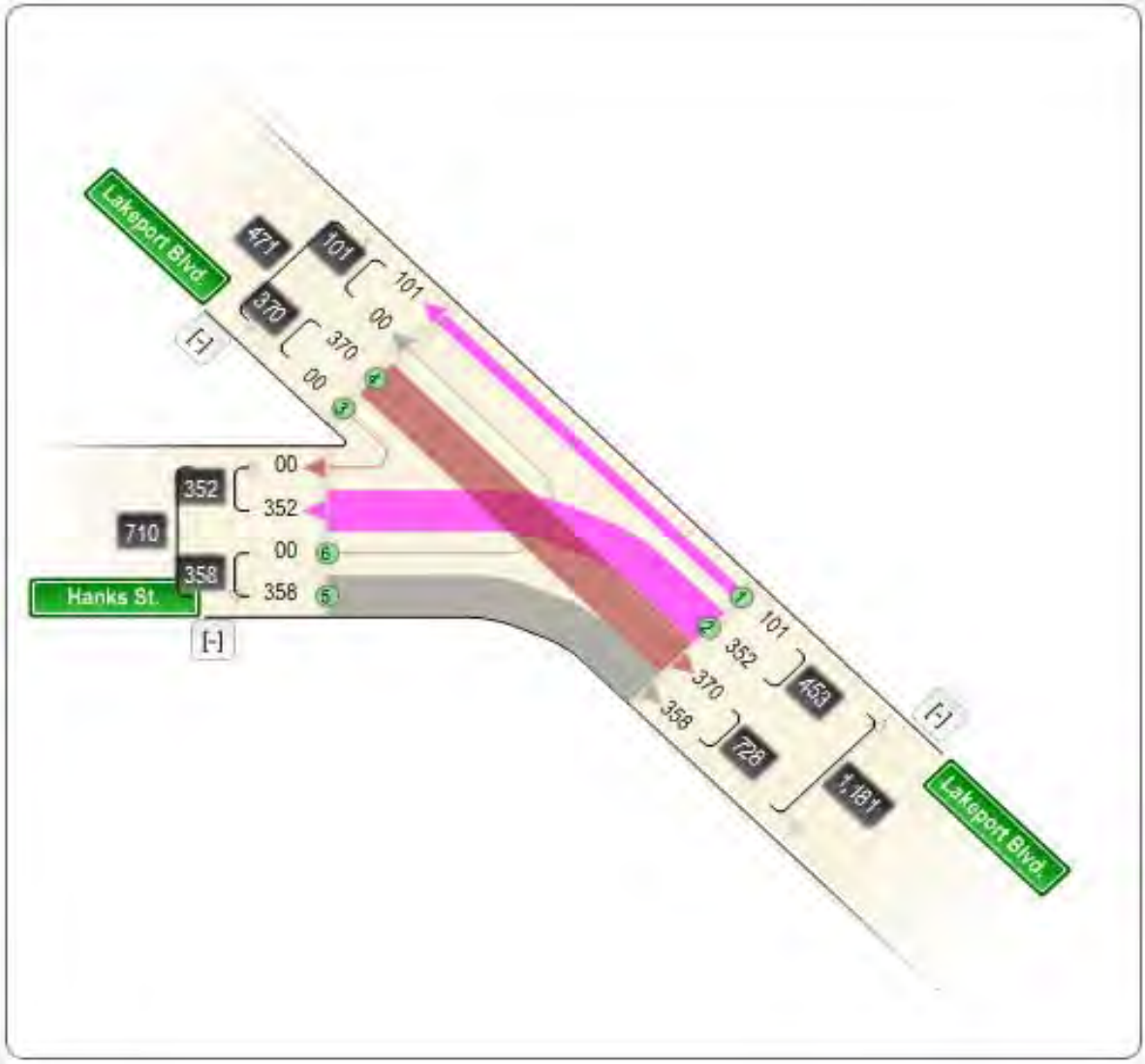
Date: 4/6/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18522010
Street Number: 3983
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Lakeport Blvd. @ Hanks St. 3 hr count
no turning movements w>n & n>w (not allowed?0
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

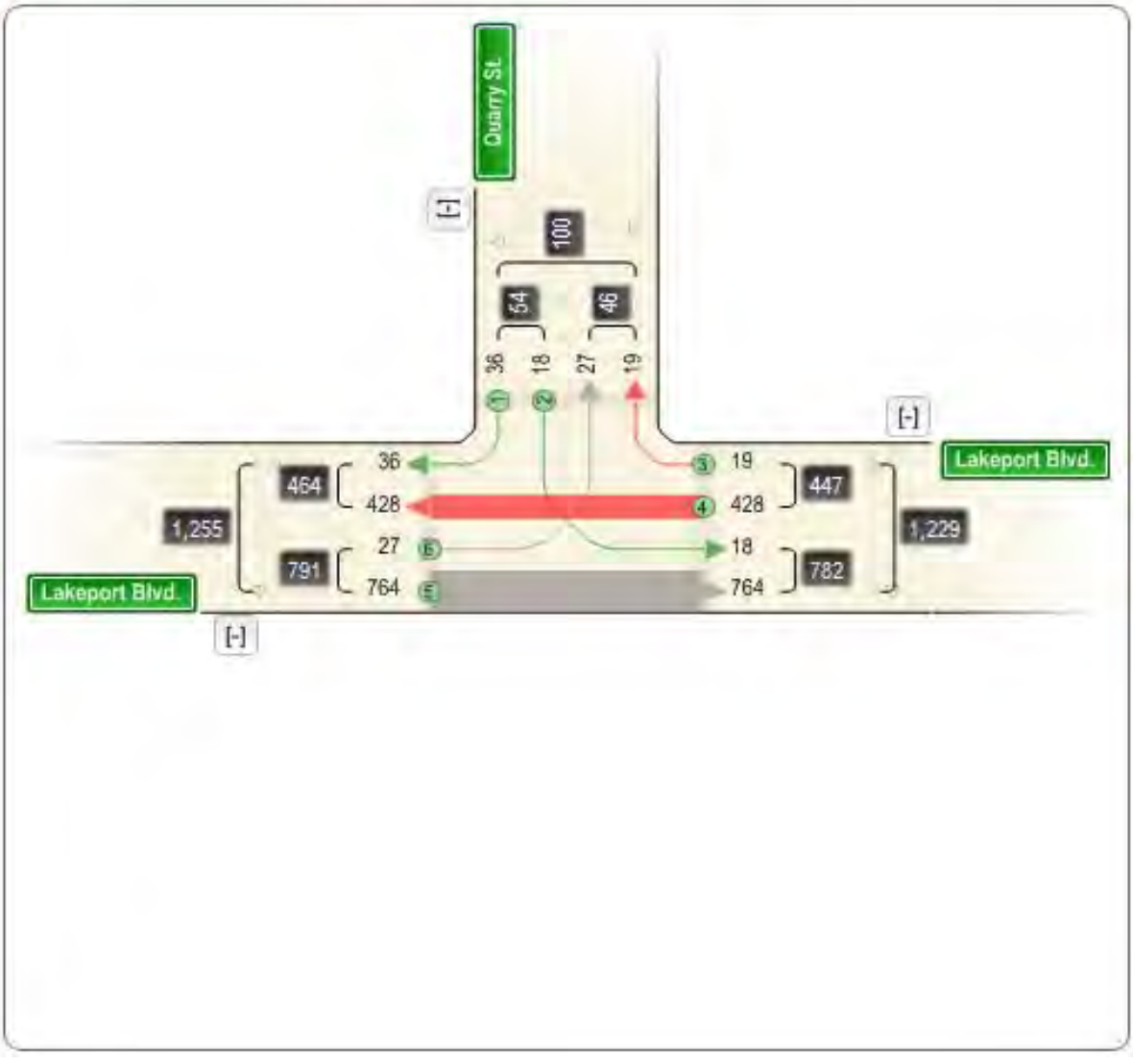
Date: 4/7/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18652010
Street Number: 3983
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Lakeport Blvd. @ Quarry St. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

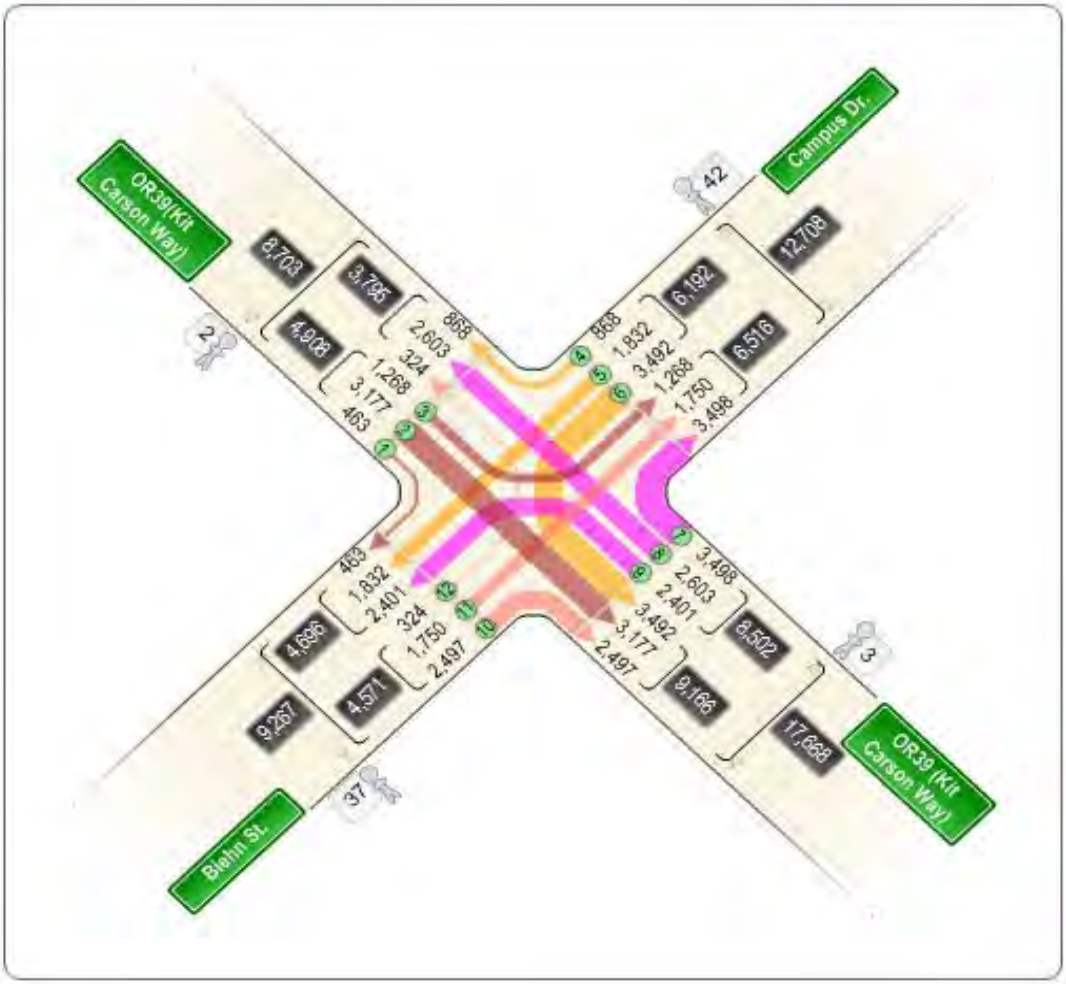
Date: 7/20/2010-7/21/2010
Hours: 7/20/2010 11:00 AM-7/21/2010 11:00 AM
Weather: Clear

Source

Site Number: 18642010
Mile Point: -6.41
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39(Kit Carson Way) @ Campus Dr. & Biehn St (Campus Dr.- east) Biehn St. - west) site 2473 - nw leg site 2474- se leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 2/22/2010
Hours: 2:00 PM-6:00 PM
Weather: Clear

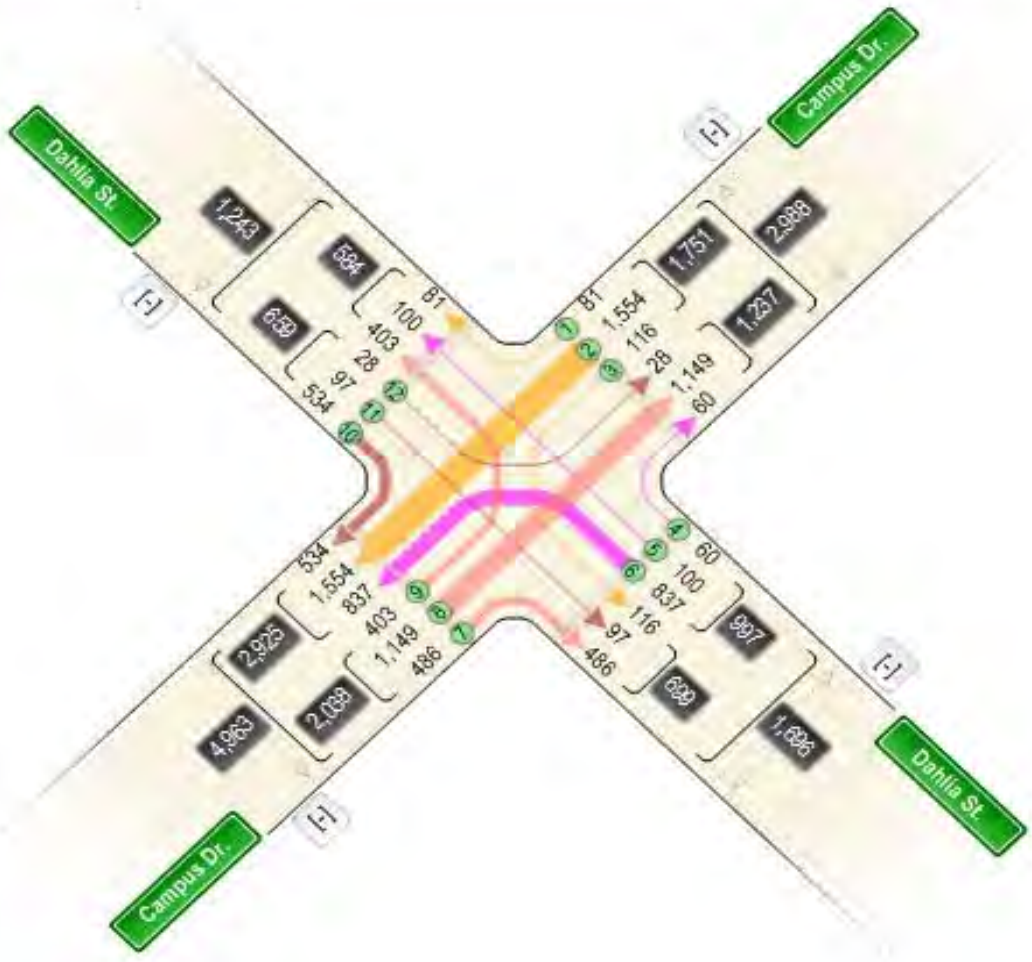
Source

Site Number: 18202010
Street Number: 3982
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Campus Dr. @ Dahlia St.

4 hr count volume only
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

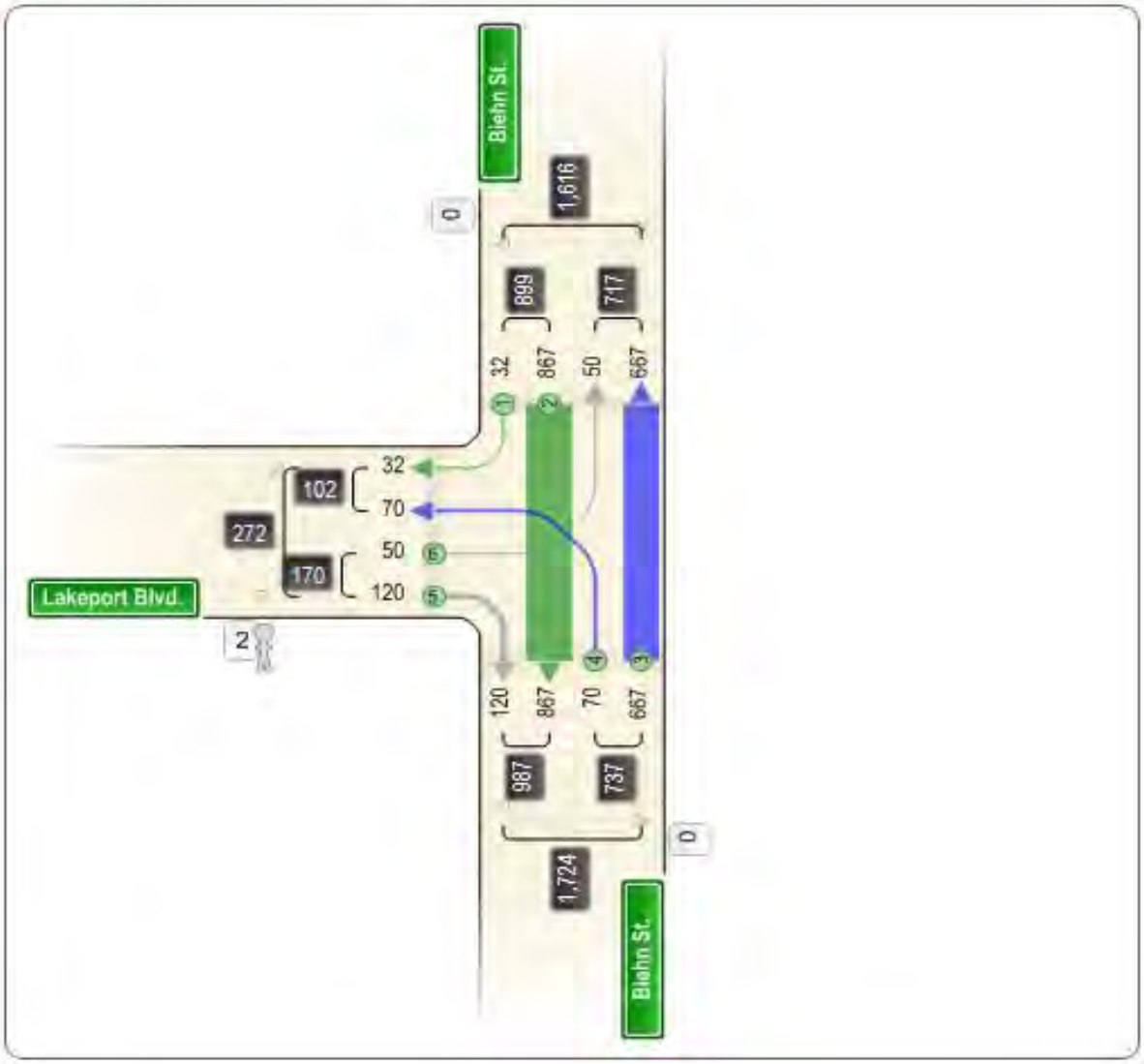
Date: 4/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18662010
Street Number: 3983
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Lakeport Blvd. @ Biehn St. 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

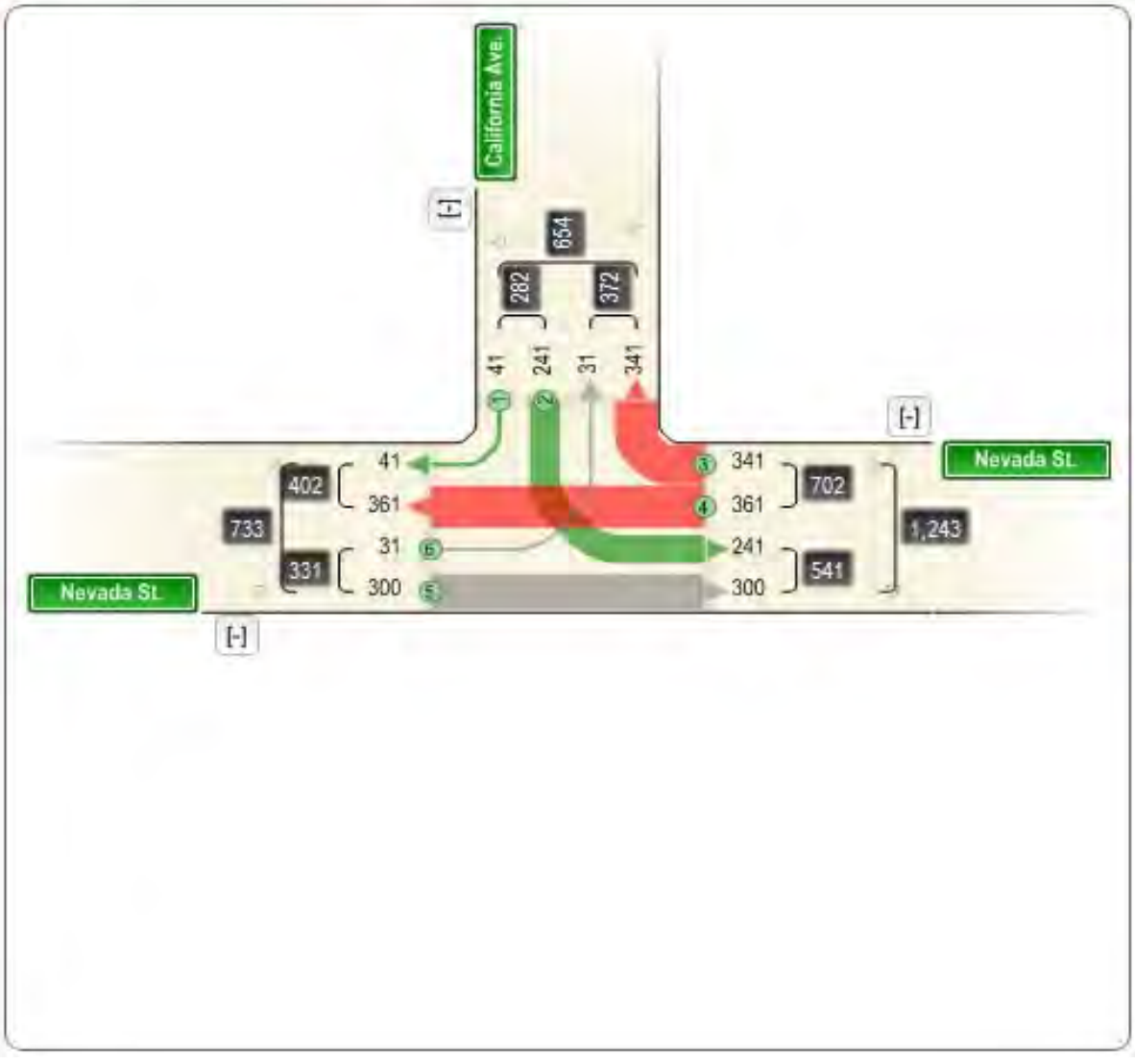
Date: 4/26/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18592010
Street Number: 3908
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Nevada St. @ California Ave. 3hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

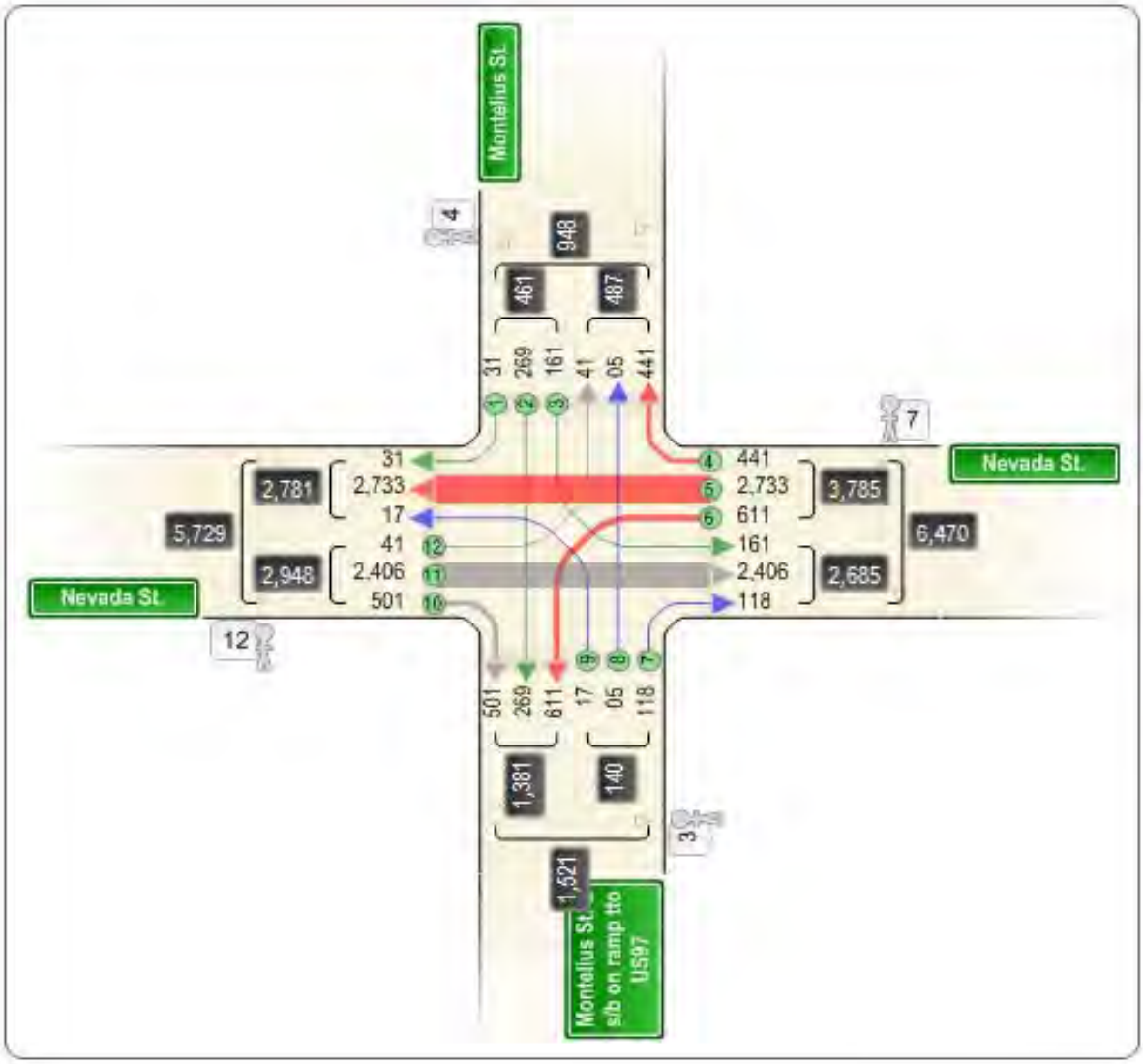
Date: 5/17/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18232010
Mile Point: 273.80
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 s/b on ramp at Nevada St. Intch. & Montelius St. s/b on ramp site - 16387
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 5/17/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18222010
Mile Point: 273.74
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 s/b off ramp to Nevada St. - site 16386
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

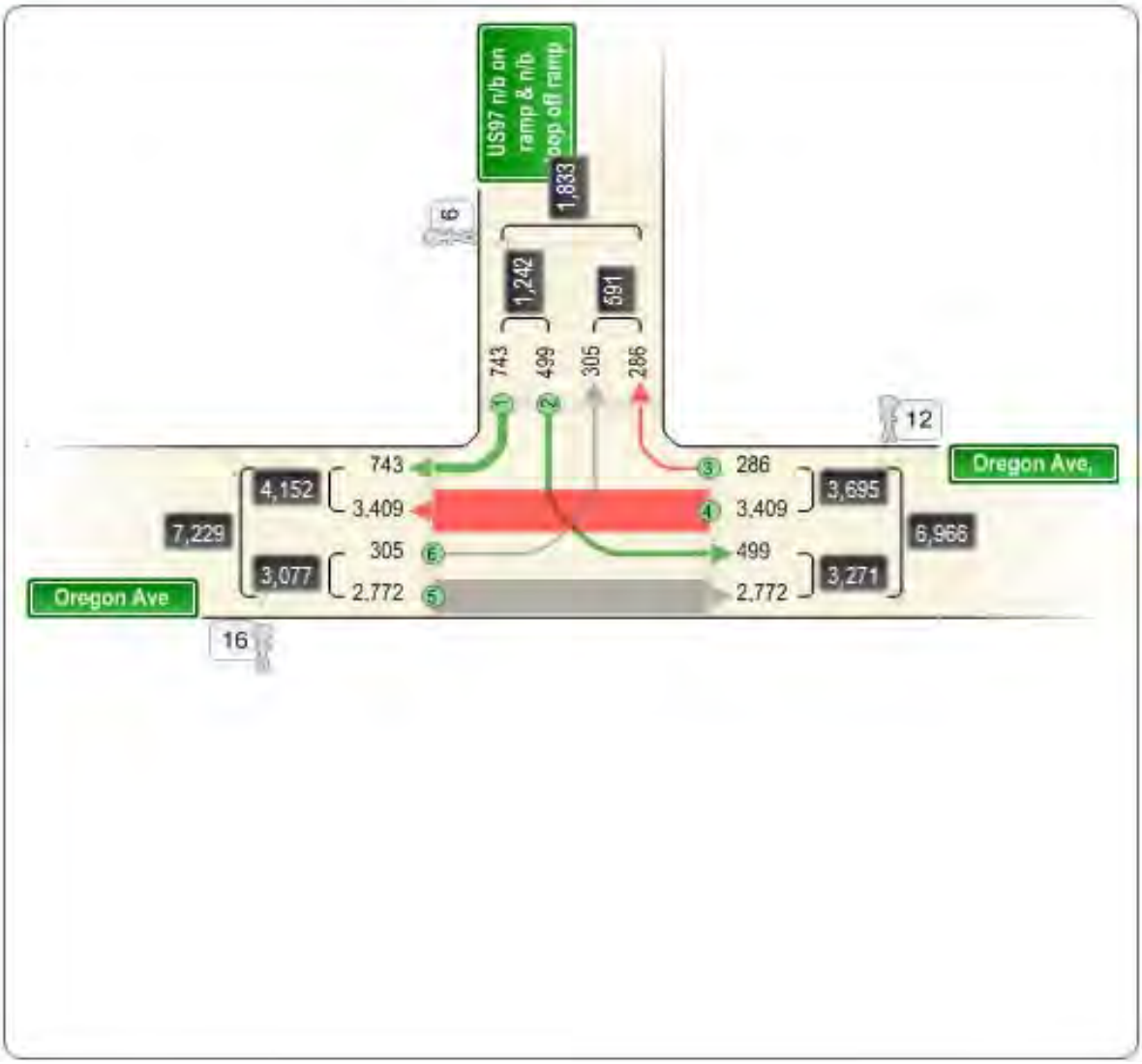
Date: 5/19/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

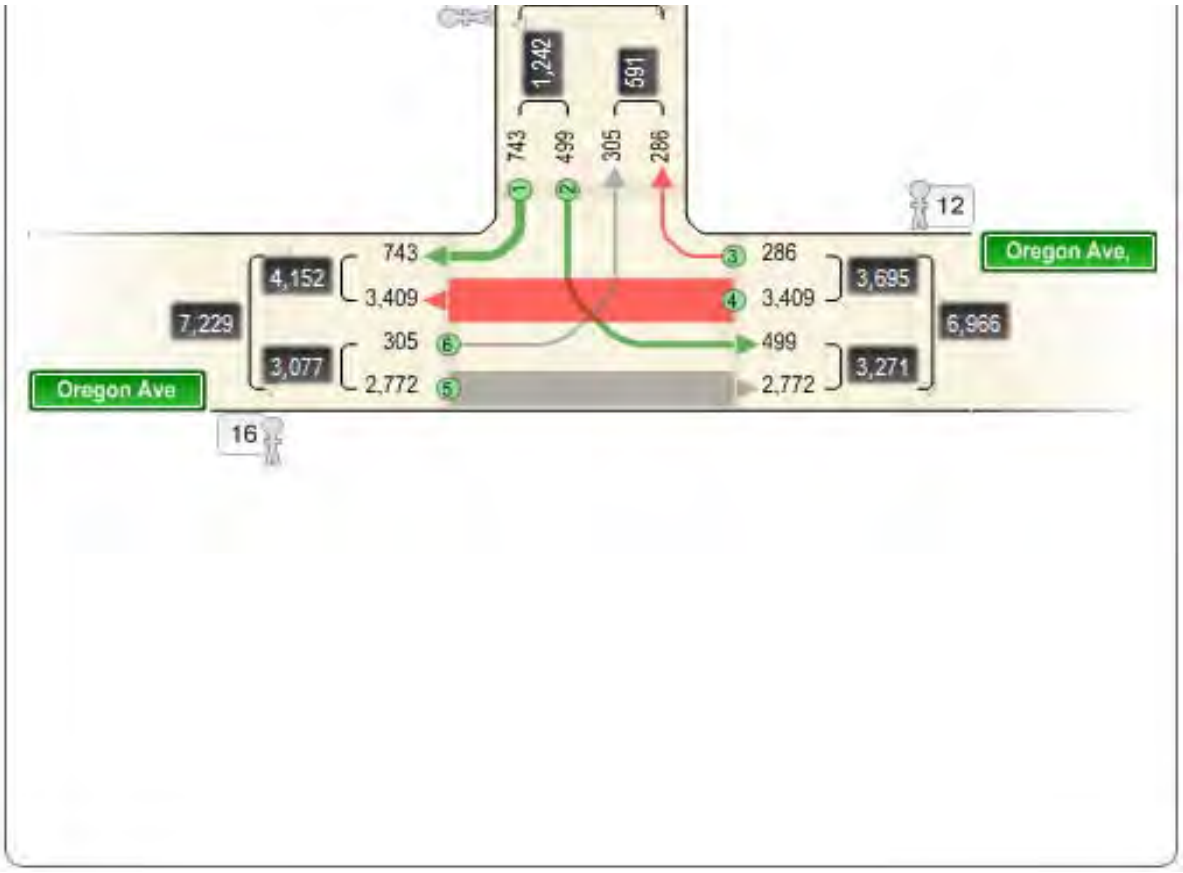
Source

Site Number: 18372010
Mile Point: 273.20
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: US97 n/b ramps @ Nevada St. Intch.
n/b on ramp site 16390
n/b off ramp site 16389
County: Klamath
City: Klamath Falls




1,242
591
743
499
305
286
12
Oregon Ave,
743
4,152
3,409
7,229
305
3,077
2,772
286
3,695
3,409
6,966
499
3,271
2,772
Oregon Ave
16

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

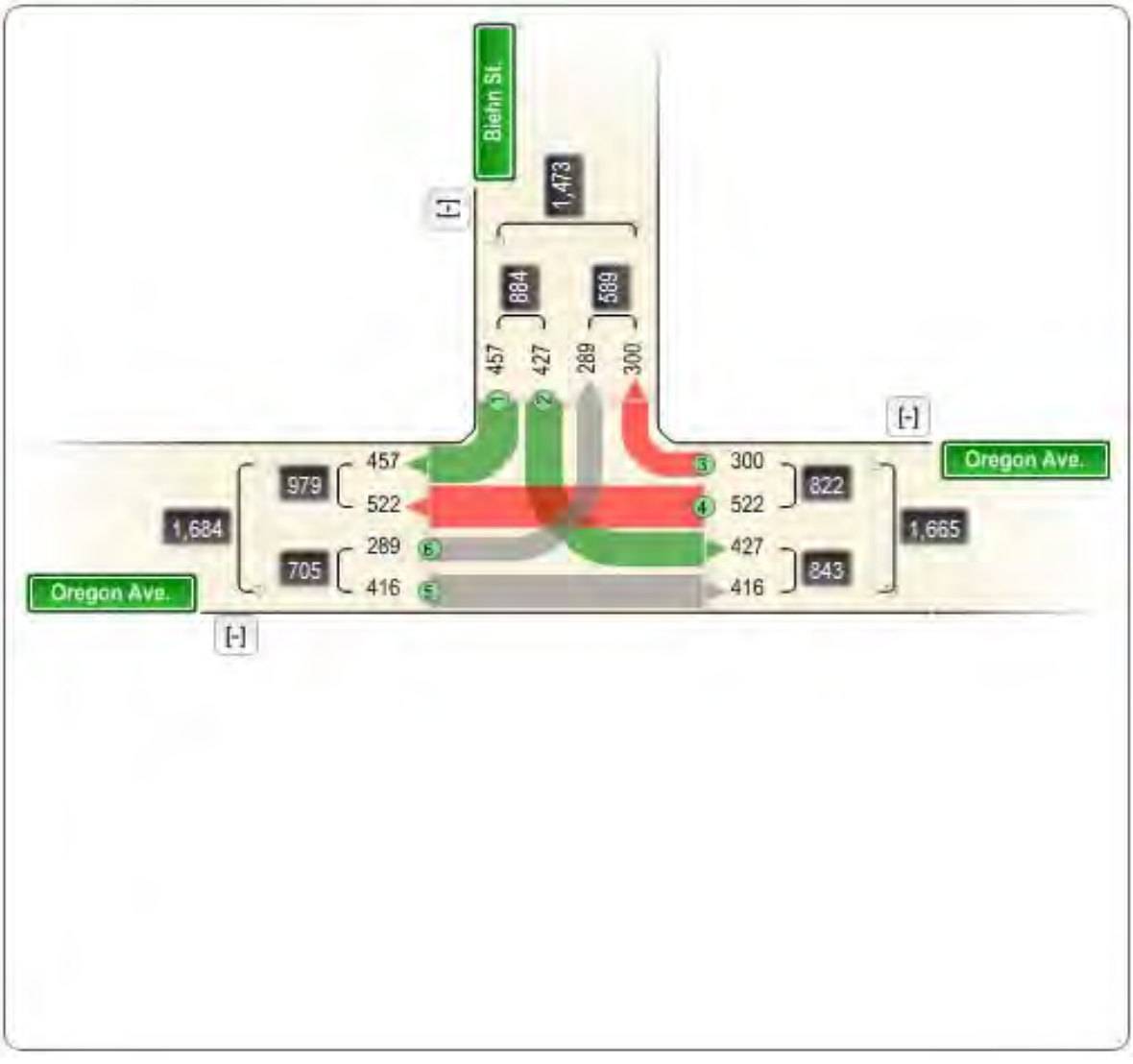
Date: 4/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18532010
Street Number: 3968
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Biehn St. @ Oregon Ave. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

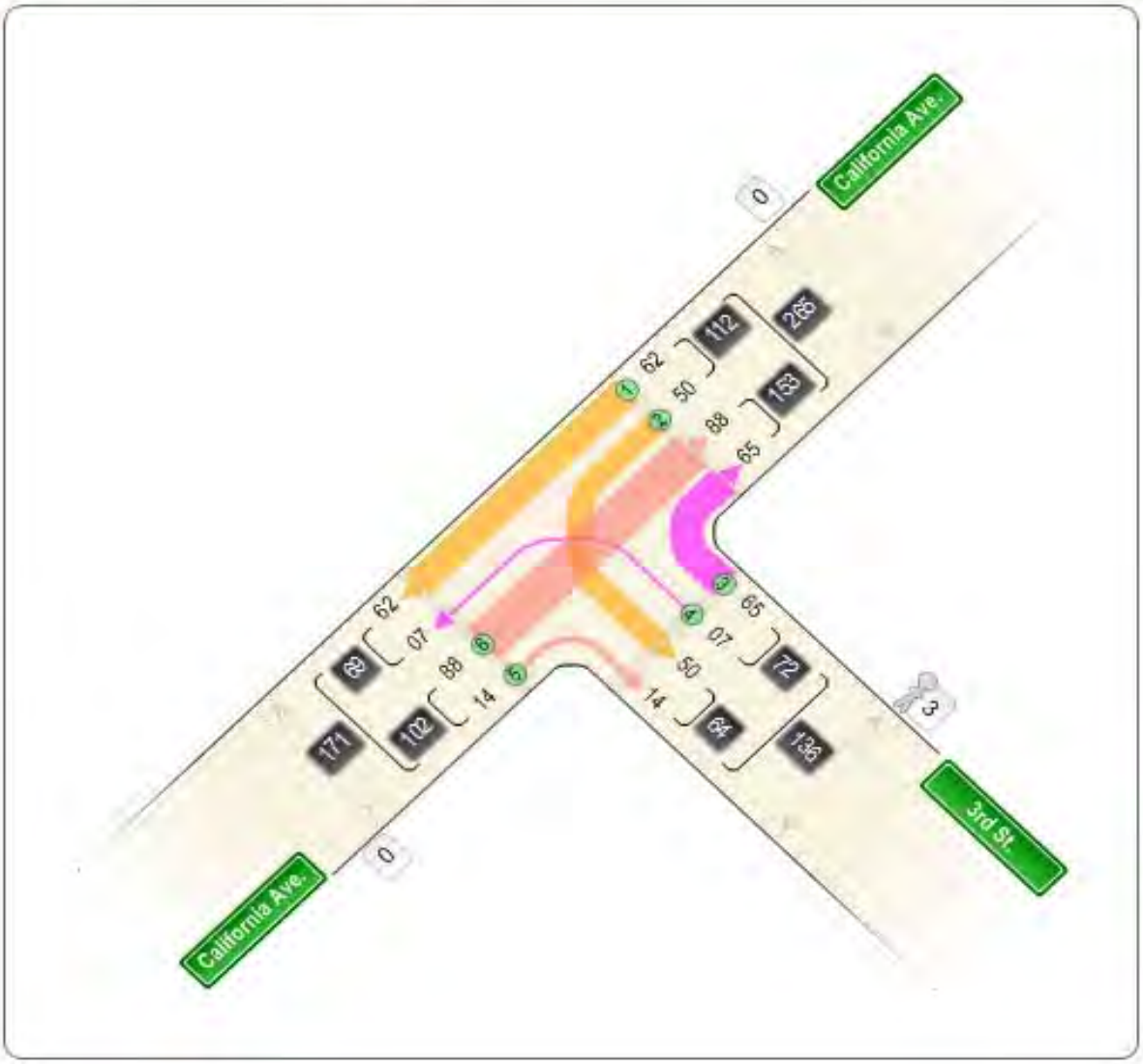
Date: 4/12/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18772010
Street Number: 3975
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: California Ave. @ 3rd St. 3 hr count
County: Klamath
City: Klamath Falls



OR 39 & Portland Ave

	Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles		
	12	13	14	23	24	21	34	31	32	41	42	43
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
04:30-04:45P	14	244	5	1	0	2	7	135	3	1	3	8
04:45-05:00P	5	224	7	2	1	1	6	120	6	2	1	11
05:00-05:15P	10	294	2	1	2	5	17	145	6	2	1	3
05:15-05:30P	5	275	5	0	1	0	12	137	5	1	3	11

	Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV %		
	12	13	14	23	24	21	34	31	32	41	42	43
	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
04:30-04:45P	0	2	0	0	0	0	0	3	0	0	0	0
04:45-05:00P	0	3	0	0	0	0	0	3	0	0	0	0
05:00-05:15P	0	2	0	0	0	0	0	5	0	0	0	0
05:15-05:30P	0	2	0	0	0	0	0	4	20	0	0	0

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

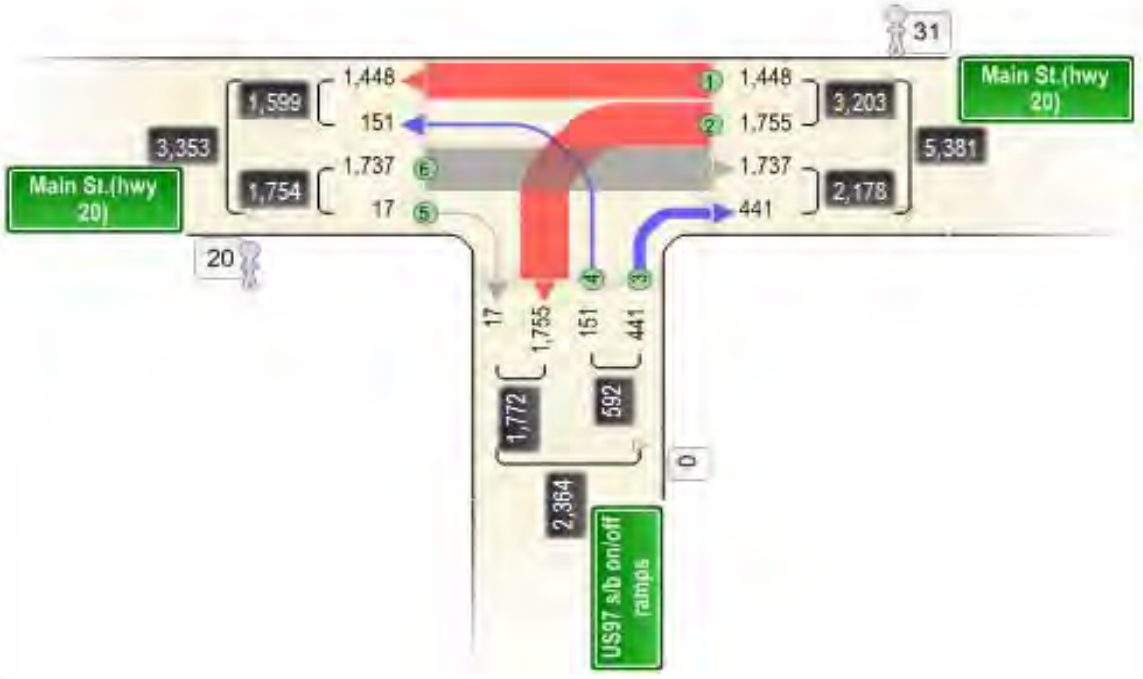
Date: 5/13/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18442010
Mile Point: 0.10
Street Number: 020
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Main St.(hwy 20) s/b ramps @ US97 site 16825(s/b on ramp) 0020AA
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

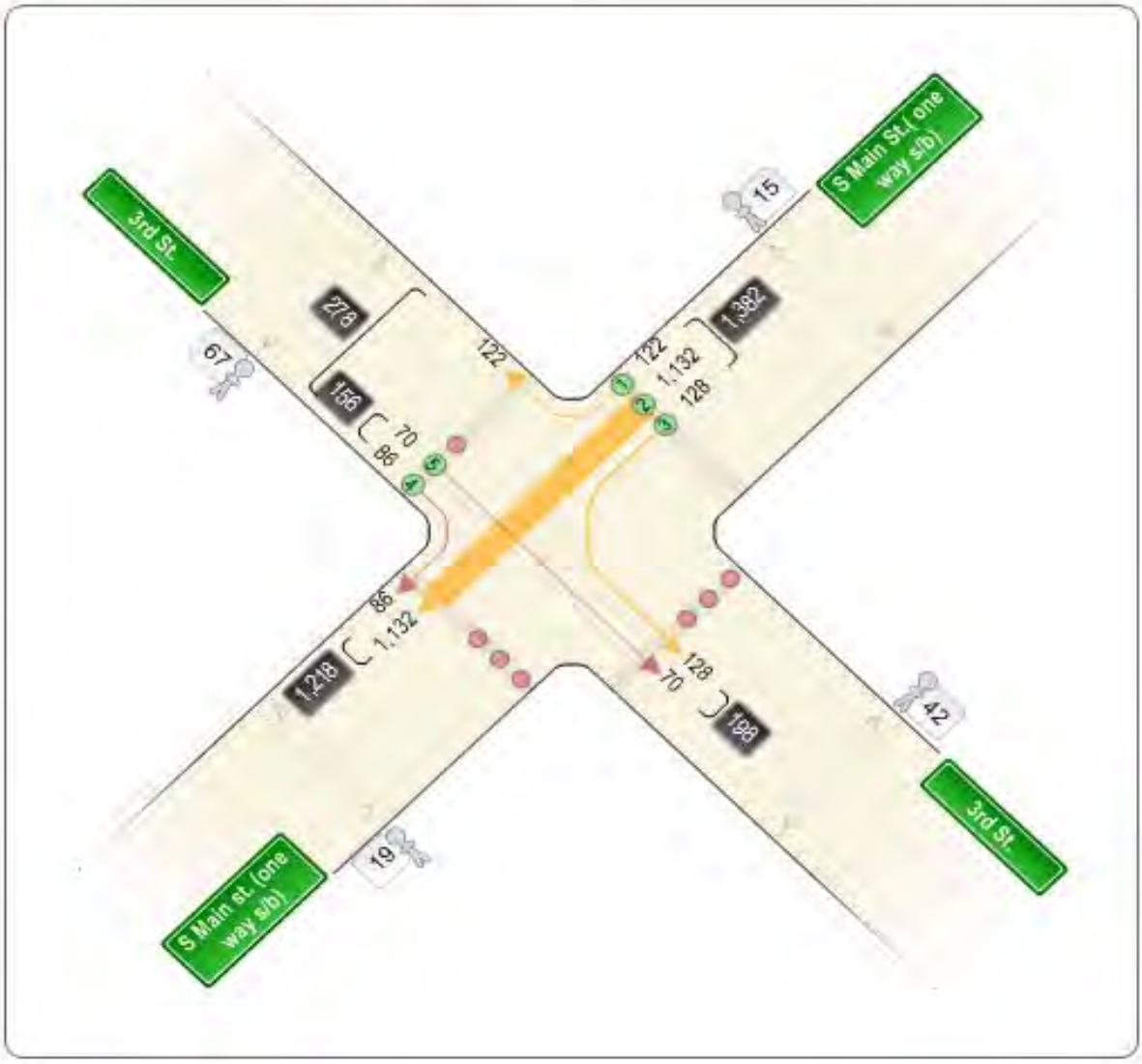
Date: 4/13/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18802010
Street Number: 529
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: S Main St.(one way s/b) @ 3rd St.(one way e/b east leg) 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

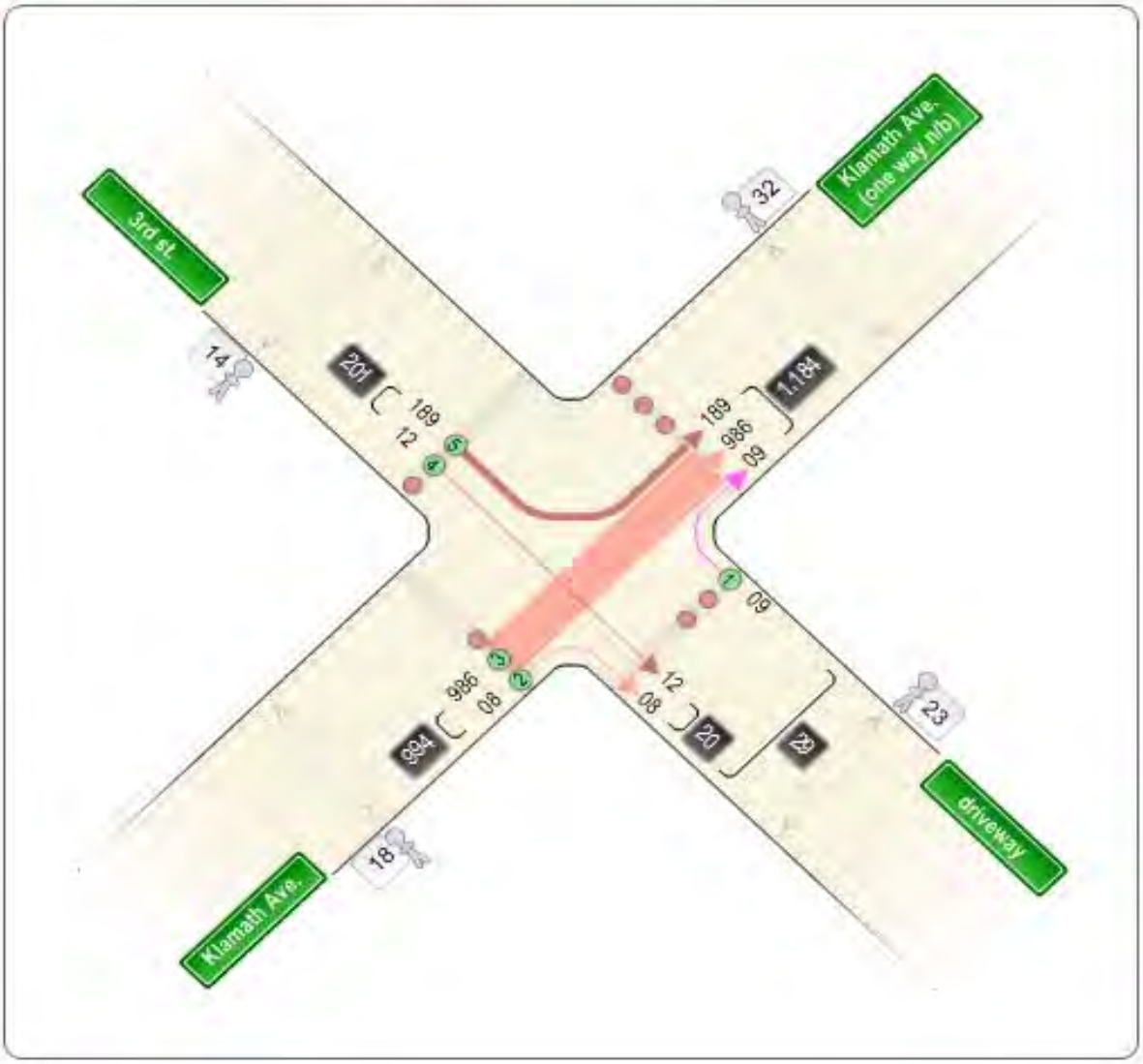
Date: 4/26/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18812010
Street Number: 528
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Ave.(one way n/b) @ 3rd St(.one way e/b)
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

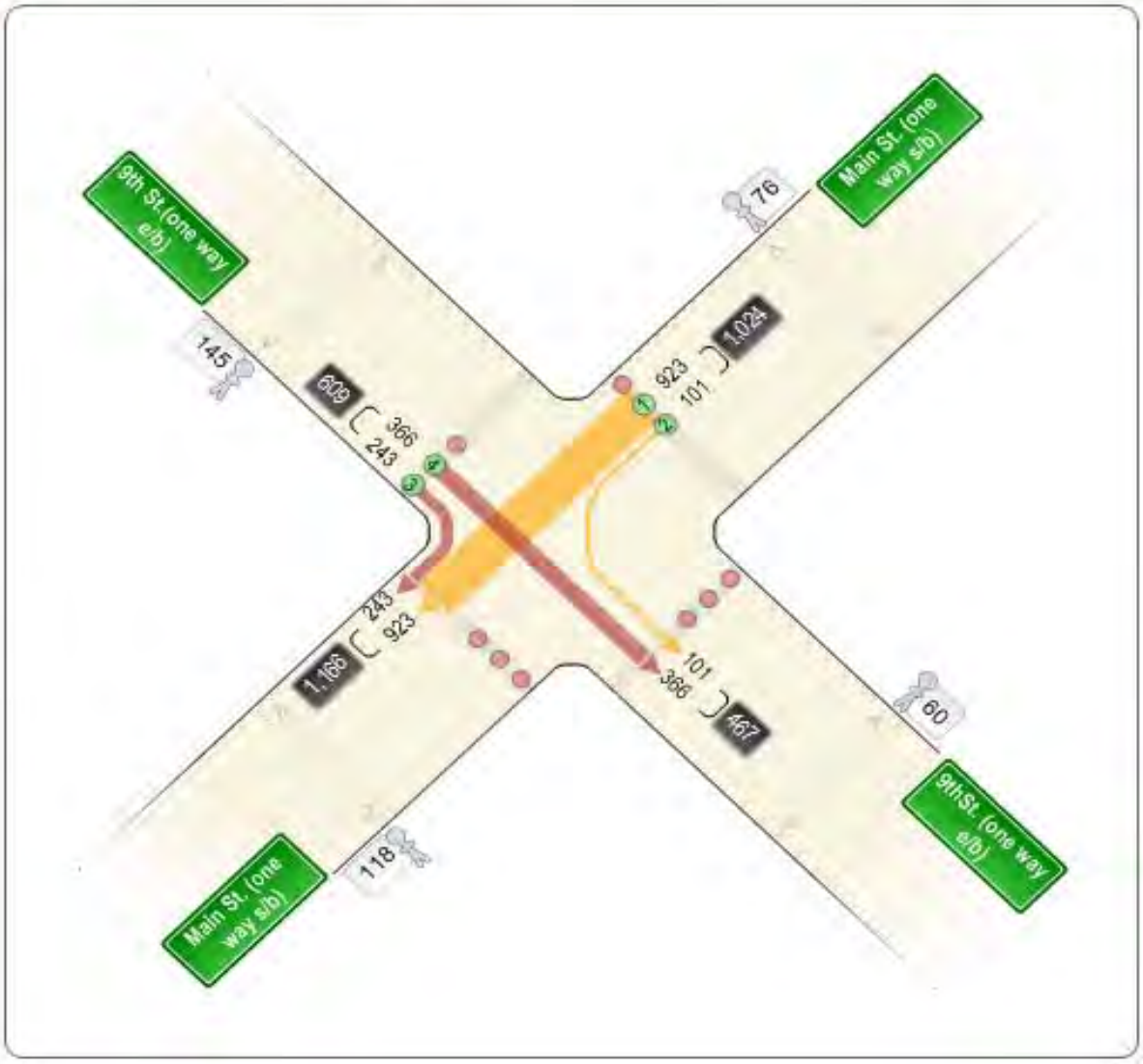
Date: 4/13/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18842010
Street Number: 529
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Mian St.(one way s/b) @ 9th St. (one way e/b) 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

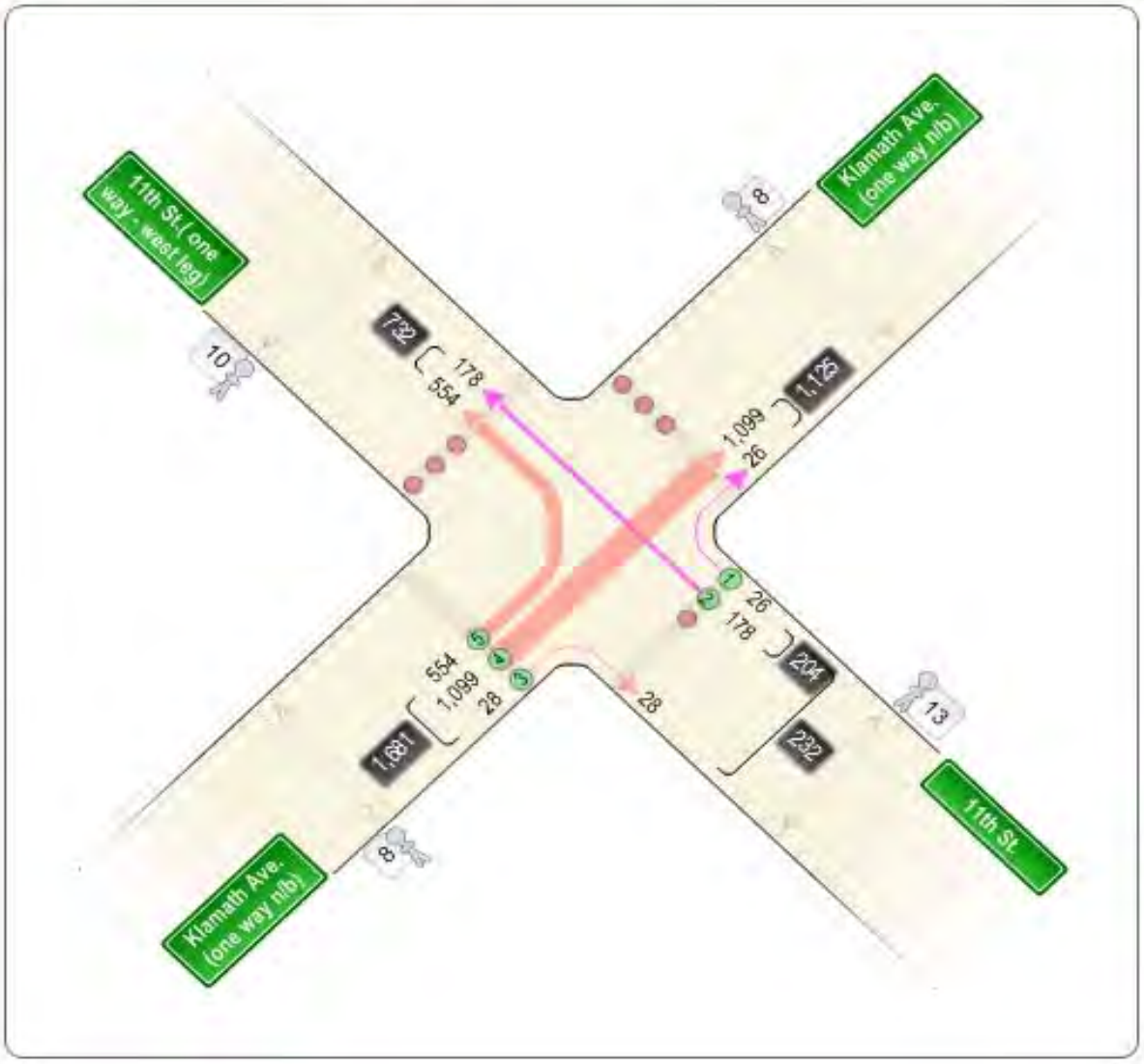
Date: 4/13/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18862010
Street Number: 528
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Ave. (one way n/b) @ 11th St. (one way w/b west leg)
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

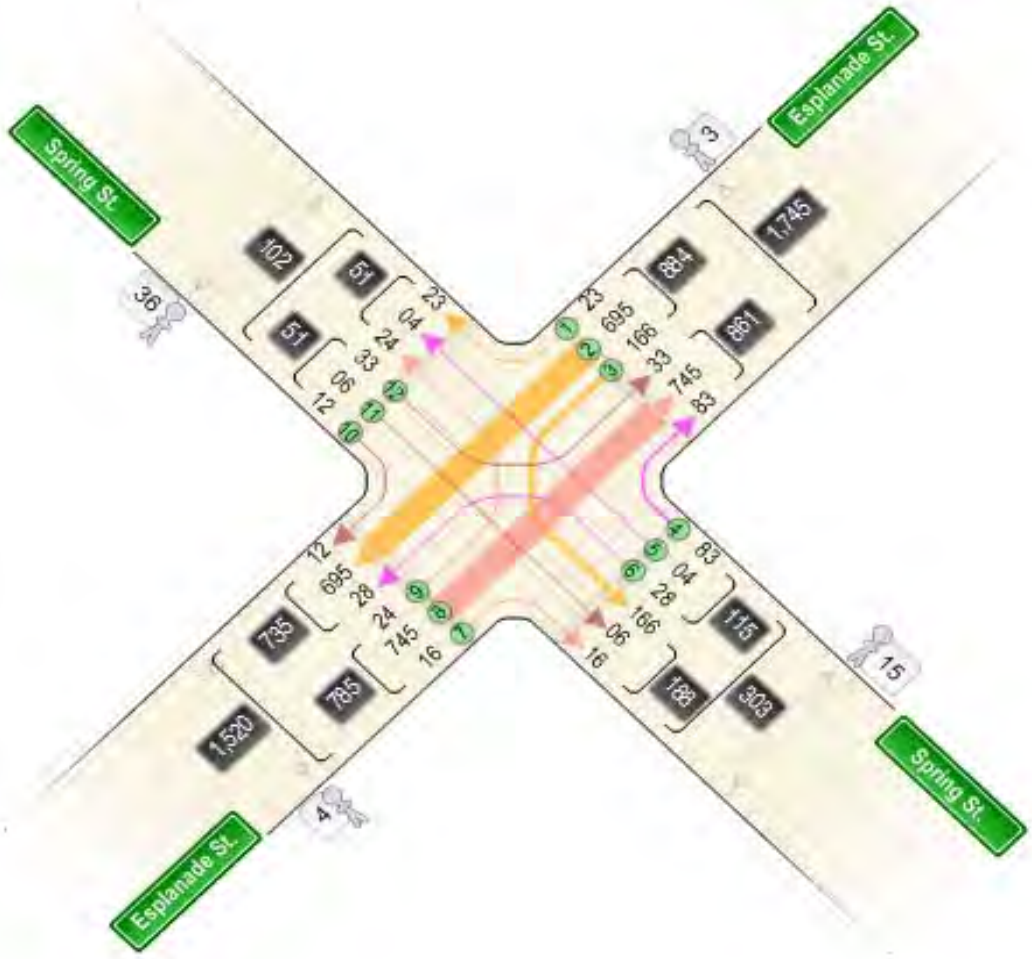
Date: 4/26/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18832010
Street Number: 526
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Esplanade St. @ Spring St. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

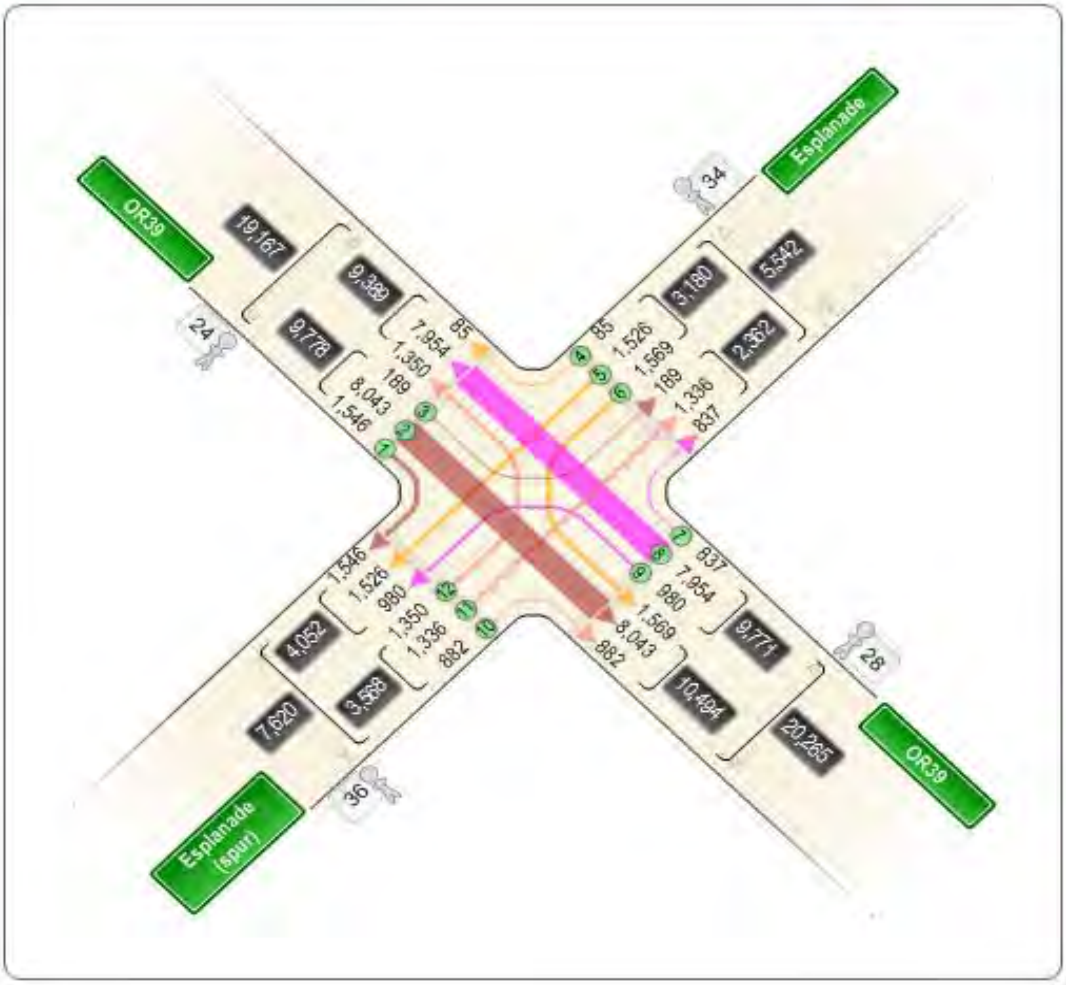
Date: 3/8/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18152010
Mile Point: -4.97
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Falls-Malin Hwy (OR39) @ Esplanade Spur(Y-4.97)
site 2475 - west leg
site 2476 - east leg site 2504 - spur
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

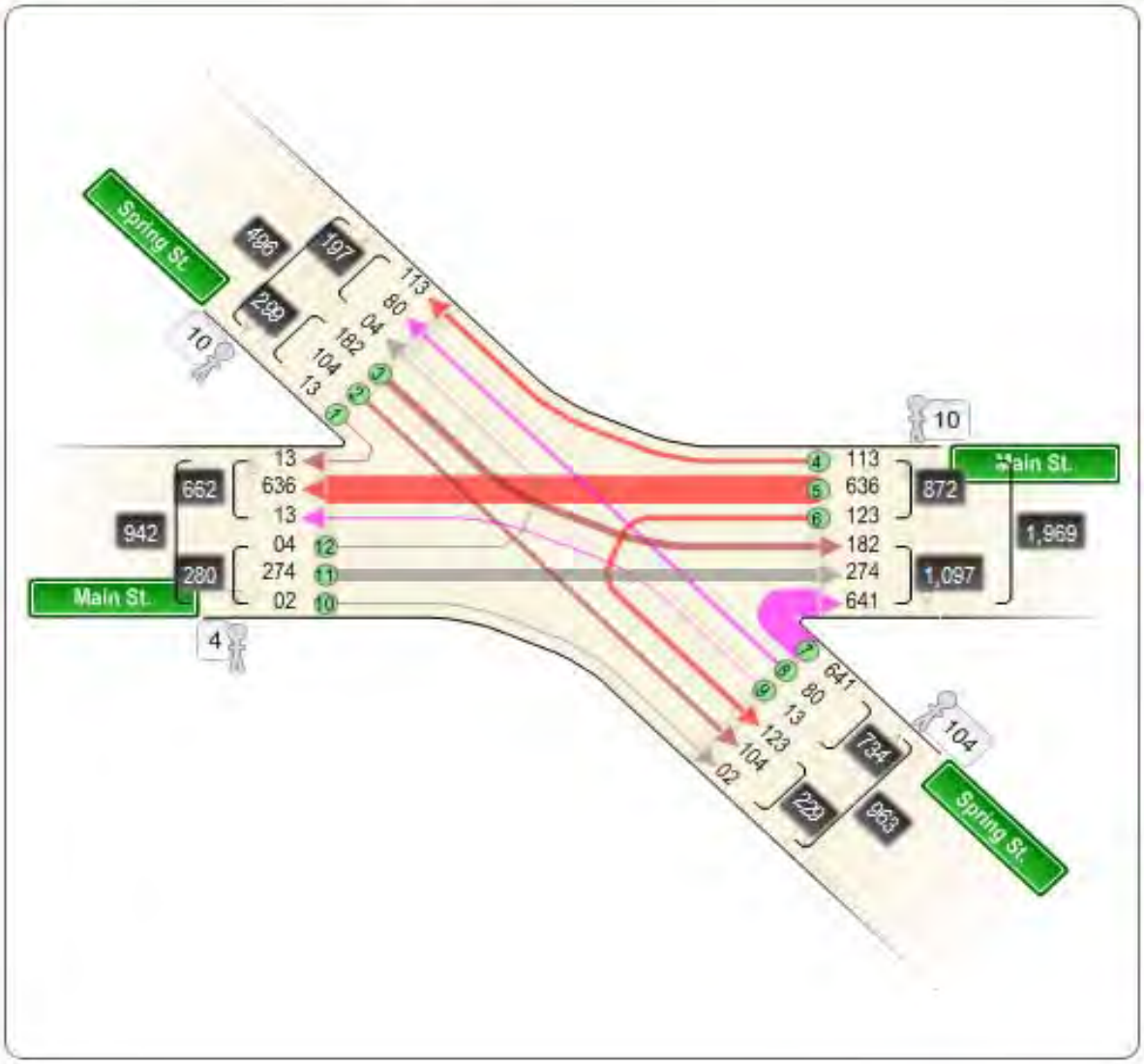
Date: 4/26/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18602010
Street Number: 3966
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Main St. @ Spring St. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

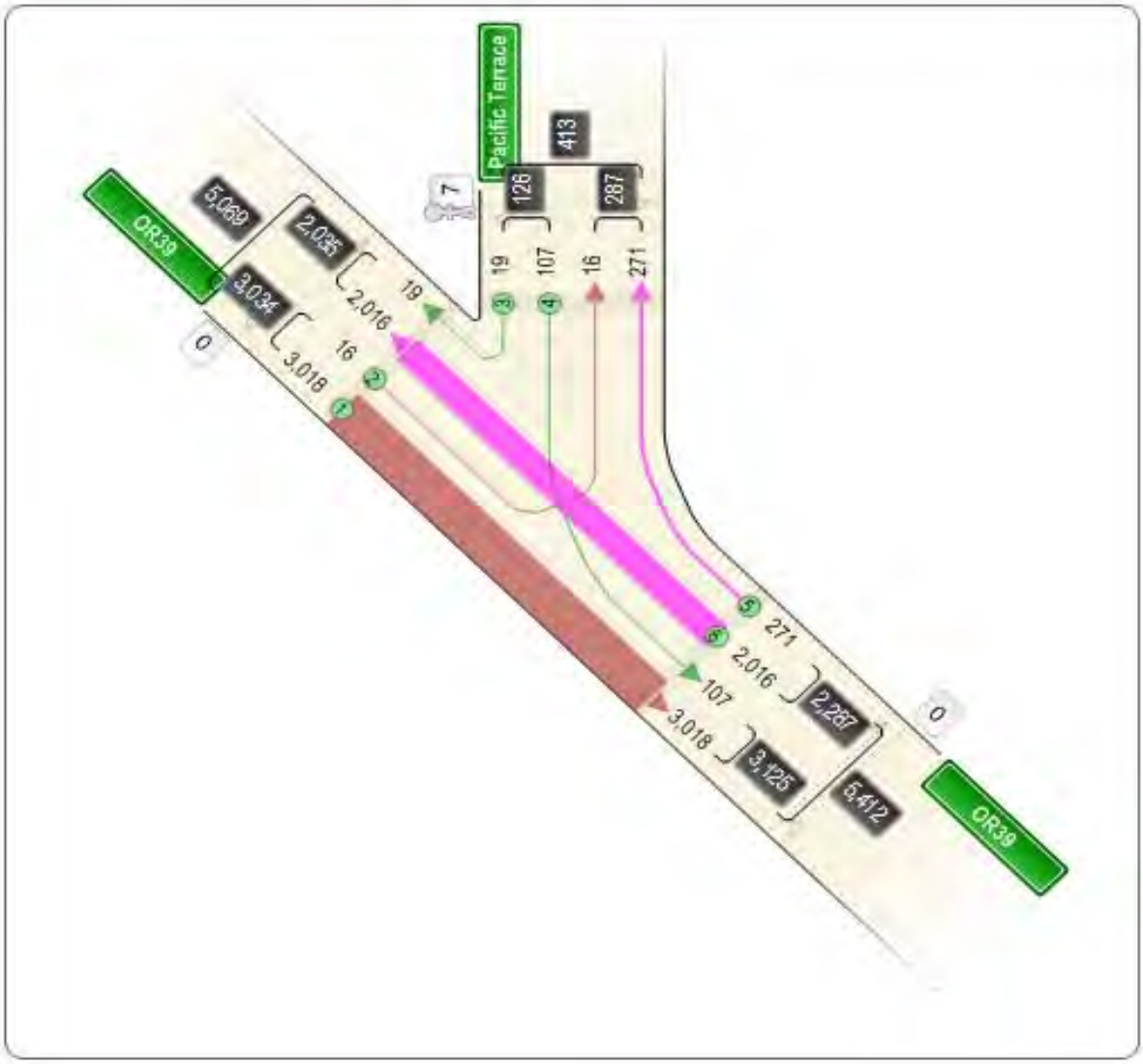
Date: 4/6/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18382010
Mile Point: -4.64
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39 @ Pacific Terrace site 2477 - west leg 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

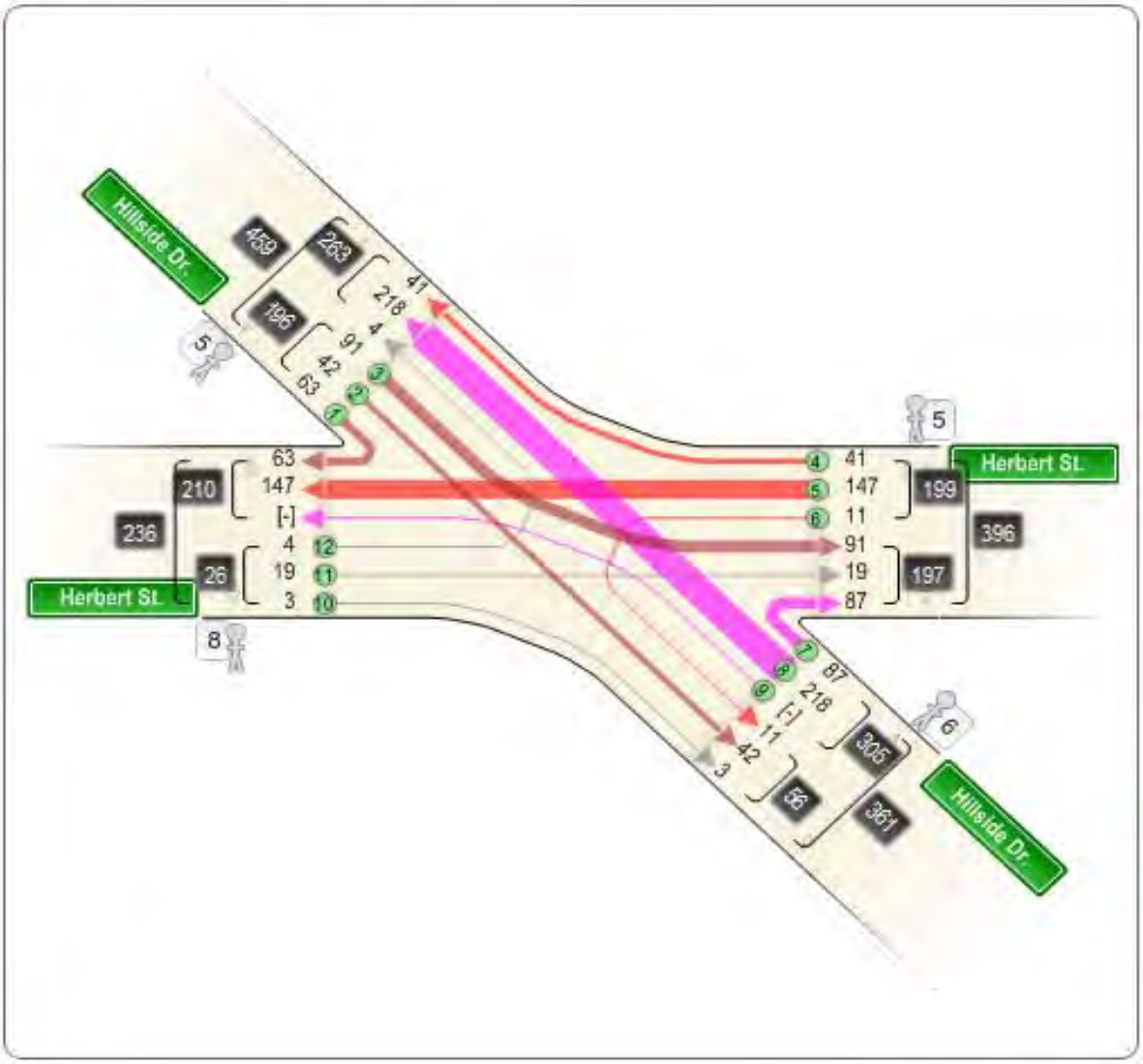
Date: 3/4/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18092010
Street Number: 3977
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Hillside Dr. @ Herbert St.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

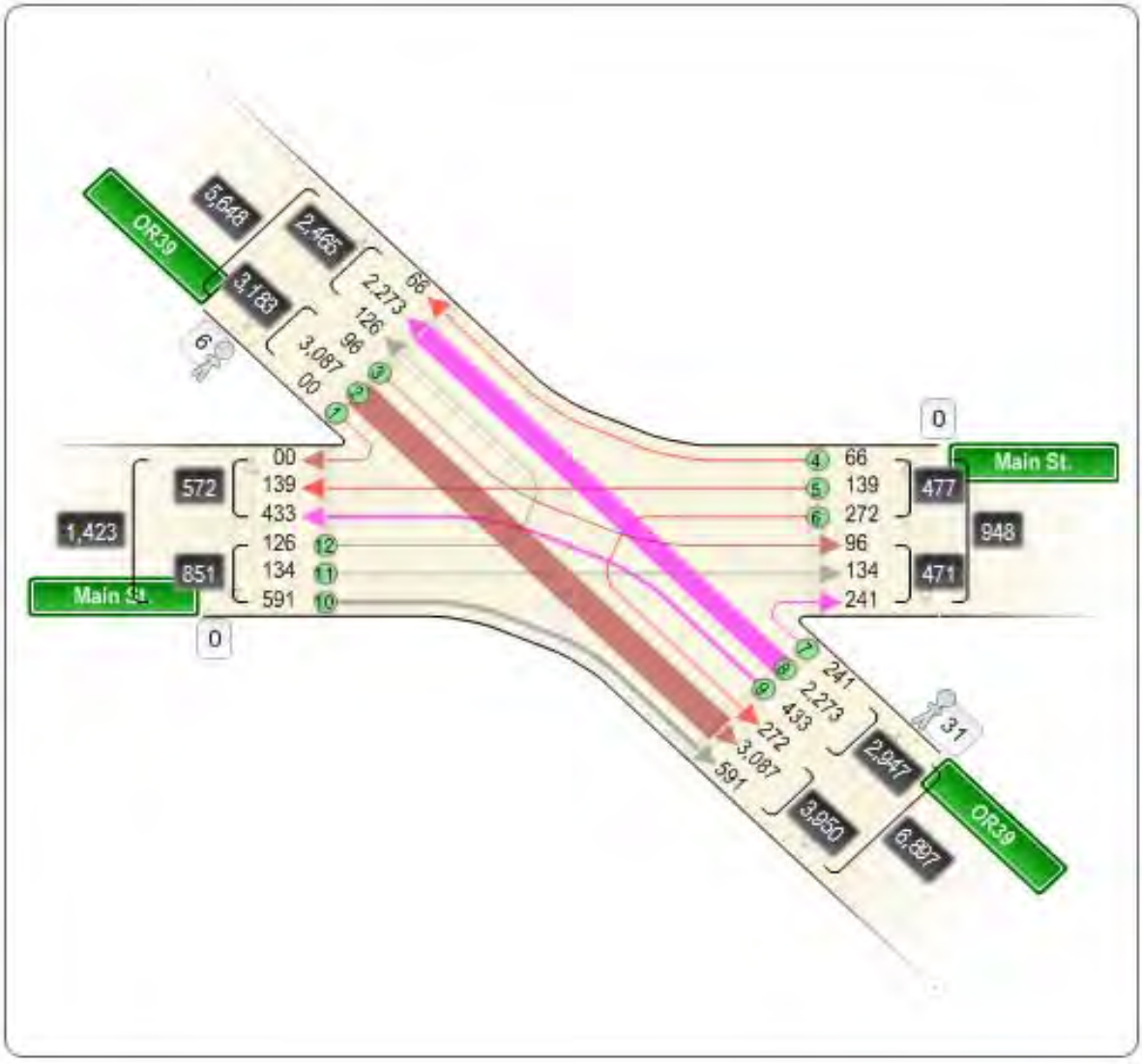
Date: 4/7/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18742010
Mile Point: -4.46
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39 @ Main St. 3 hr count site 2477 nw leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 3/3/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear;Cloudy

Source

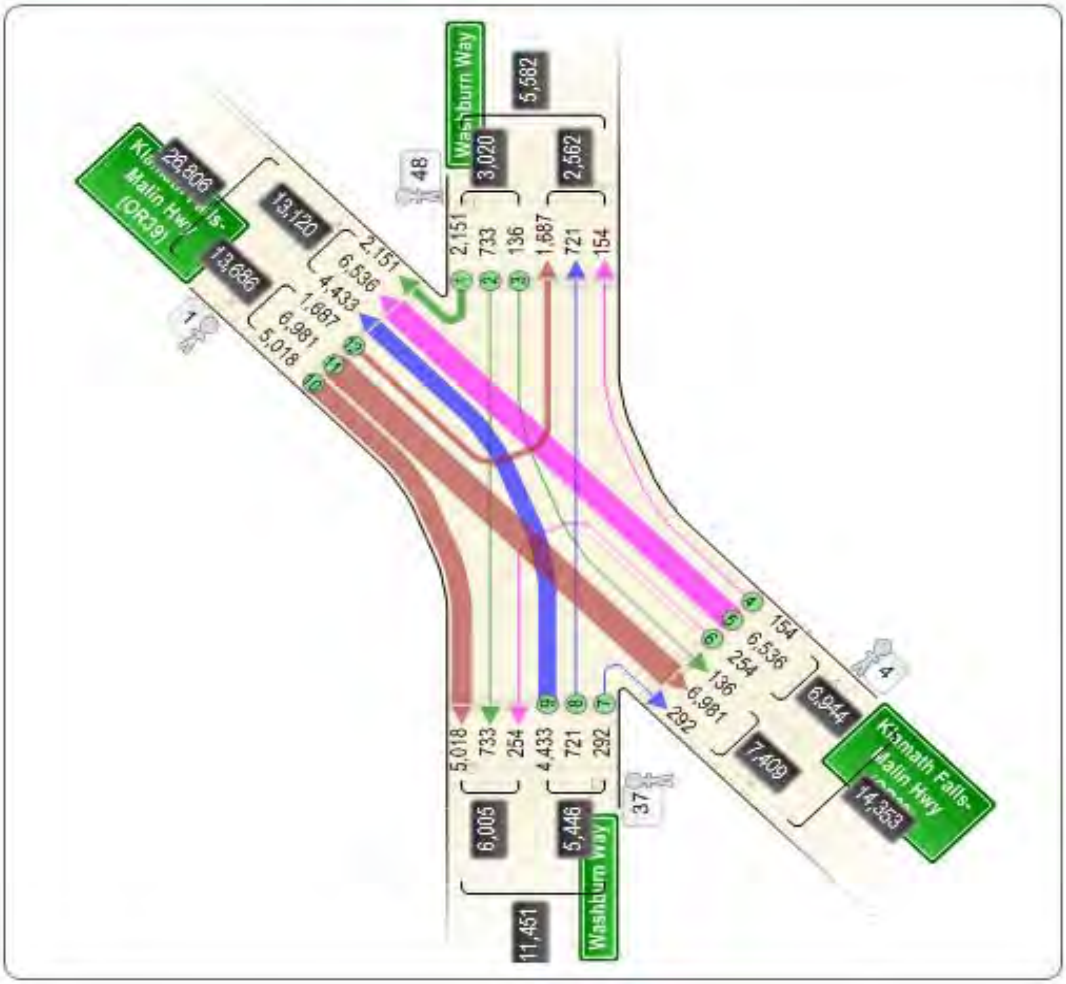
Site Number: 18052010
Mile Point: -3.93
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Falls - Malin Hwy(OR39) @ Washburn Way

site 2479 - east leg

count location #21
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

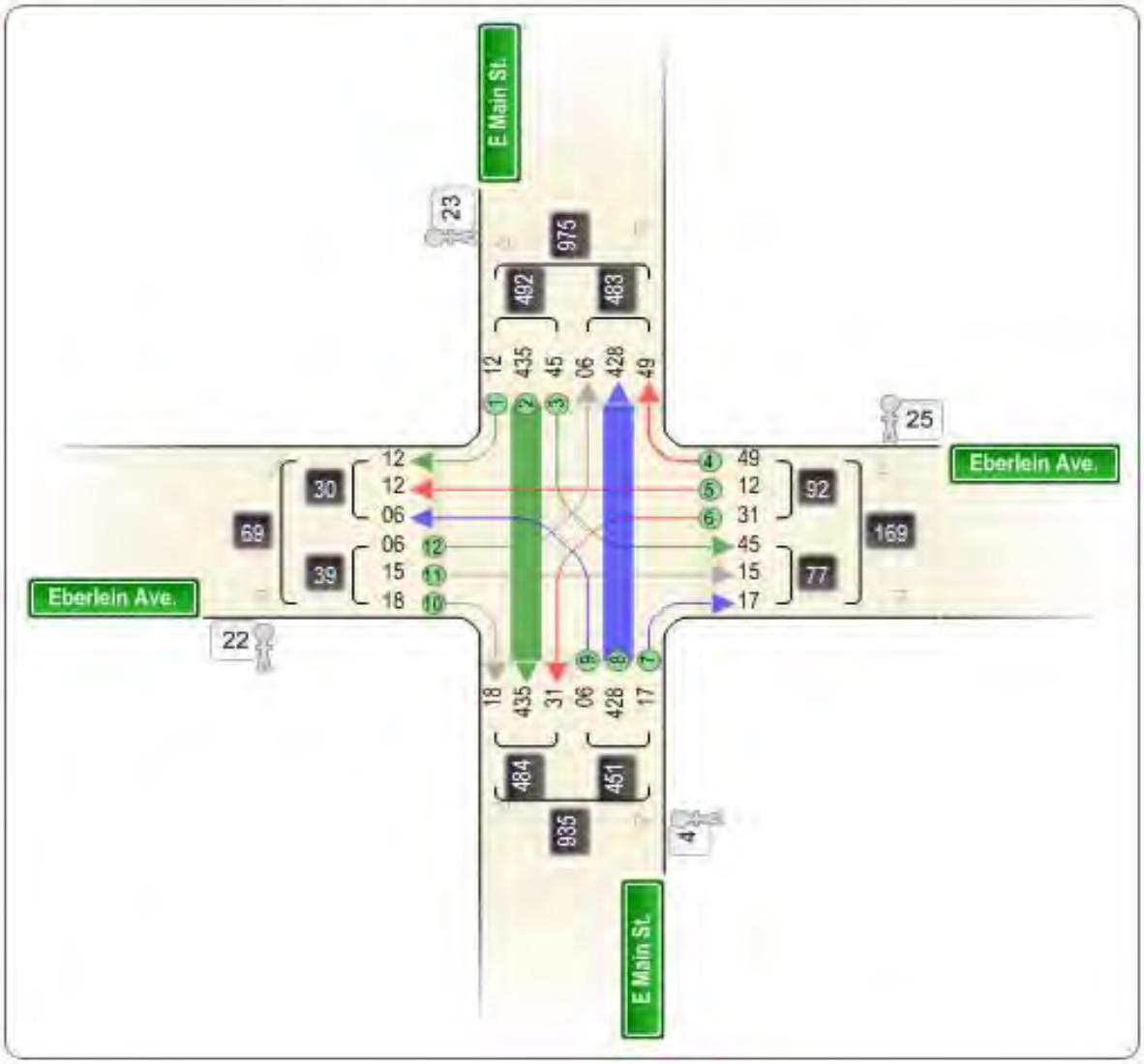
Date: 5/4/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18612010
Street Number: 3967
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: E Main St. @ Eberlein Ave. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

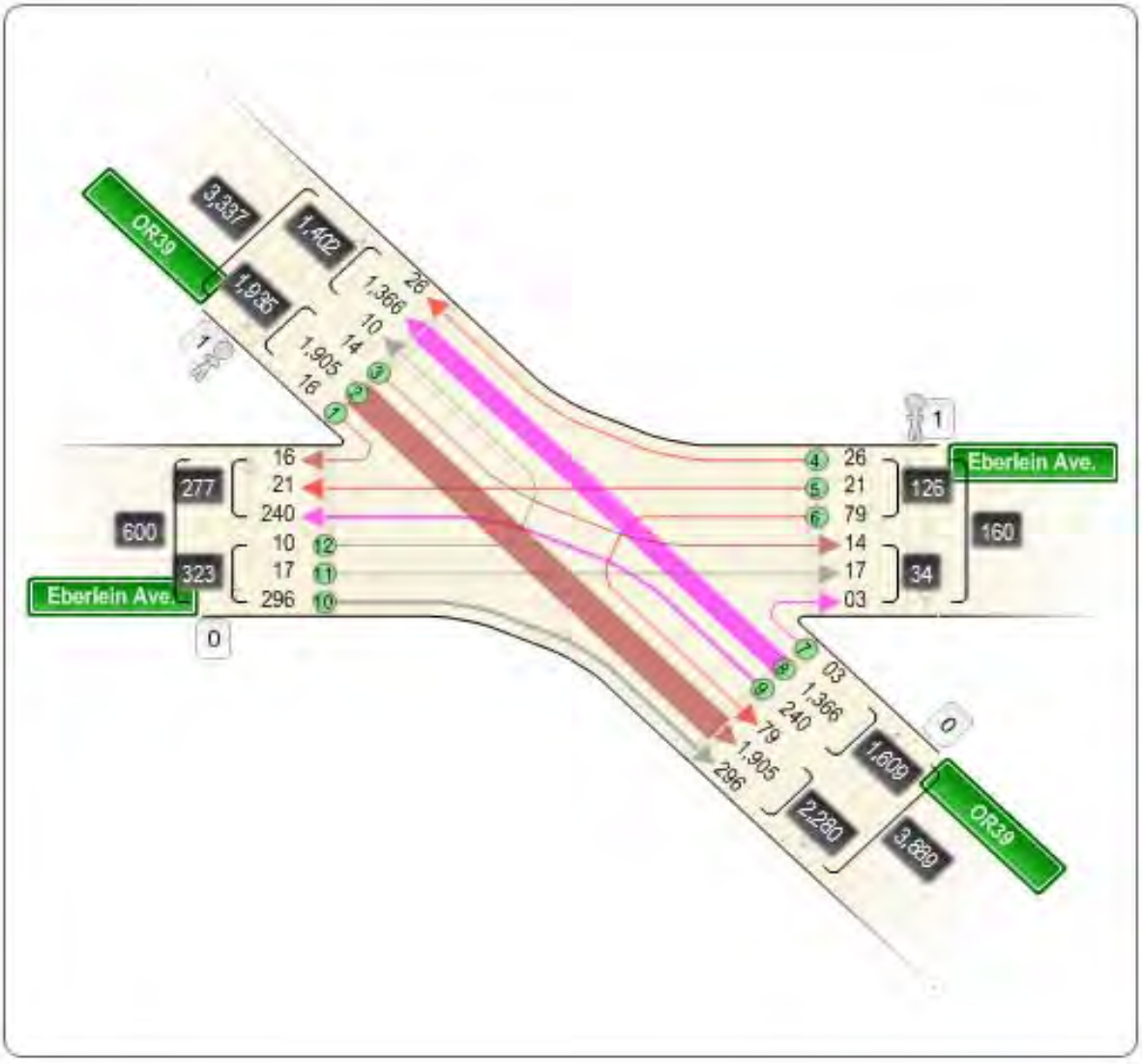
Date: 4/6/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18822010
Mile Point: -3.24
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39 @ Eberlein Ave. 3 hr count site 2480 - west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 4/14/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

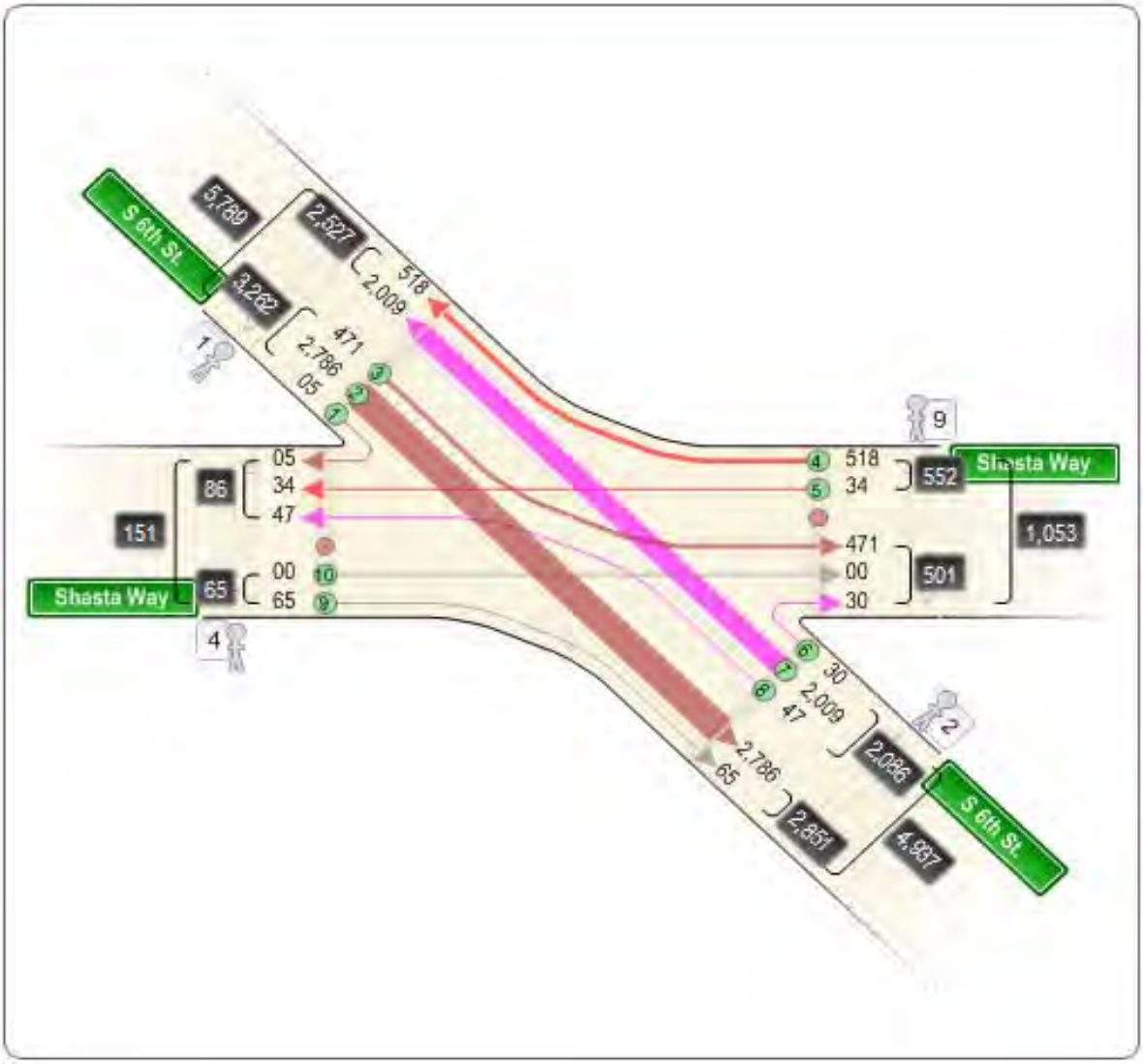
Source

Site Number: 18792010
Street Number: 528
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: S 6th St. @ Shasta Way - 3 hr count

E>ES & W>NW restricted left turns
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

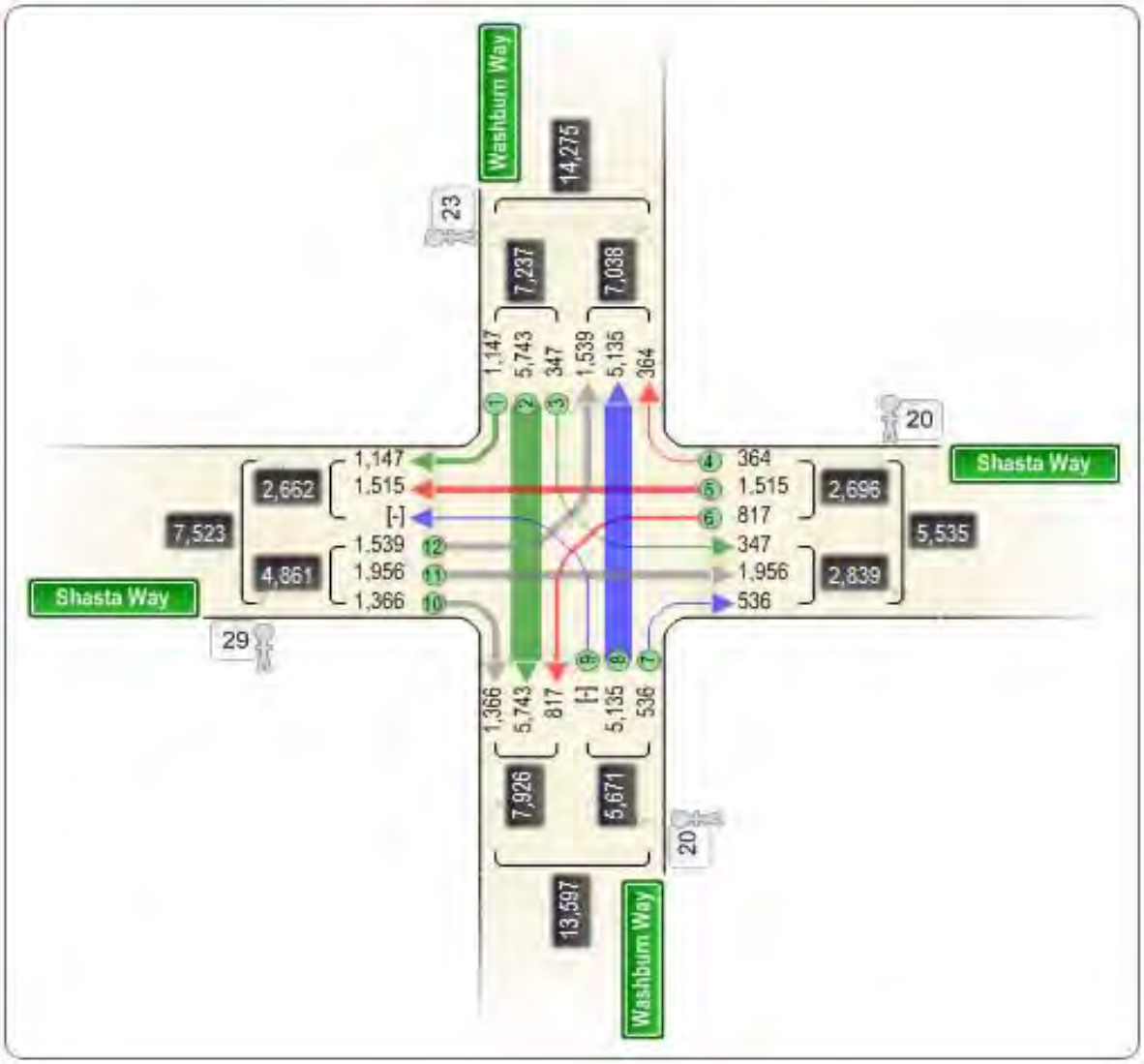
Date: 3/2/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear

Source

Site Number: 18122010
Street Number: 3965
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Washburn Way @ Shasta Way
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

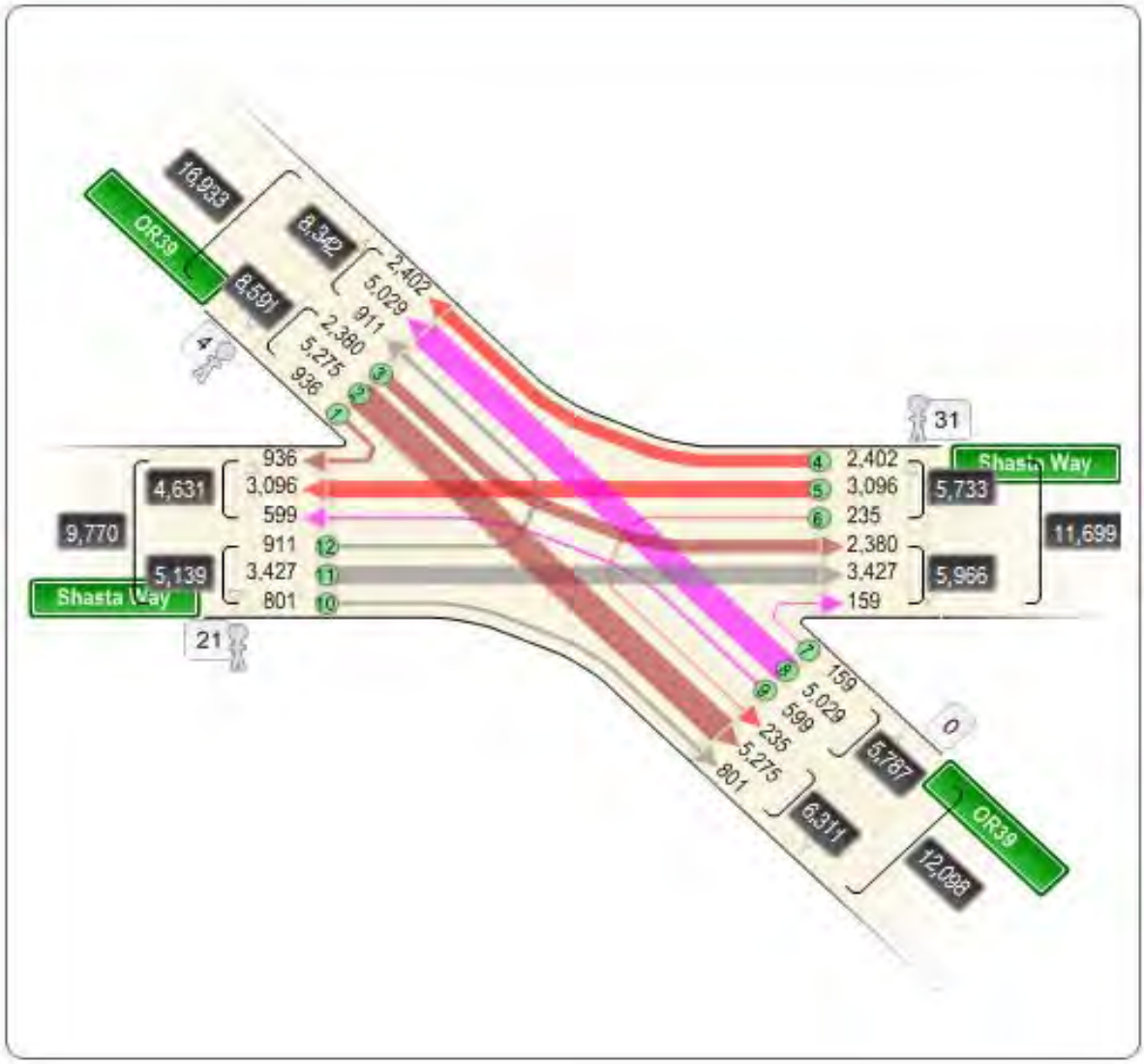
Date: 5/11/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear

Source

Site Number: 18212010
Mile Point: -2.89
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39 @ Shasta Way
site 2480 - northwest leg site 2481 - southeast leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

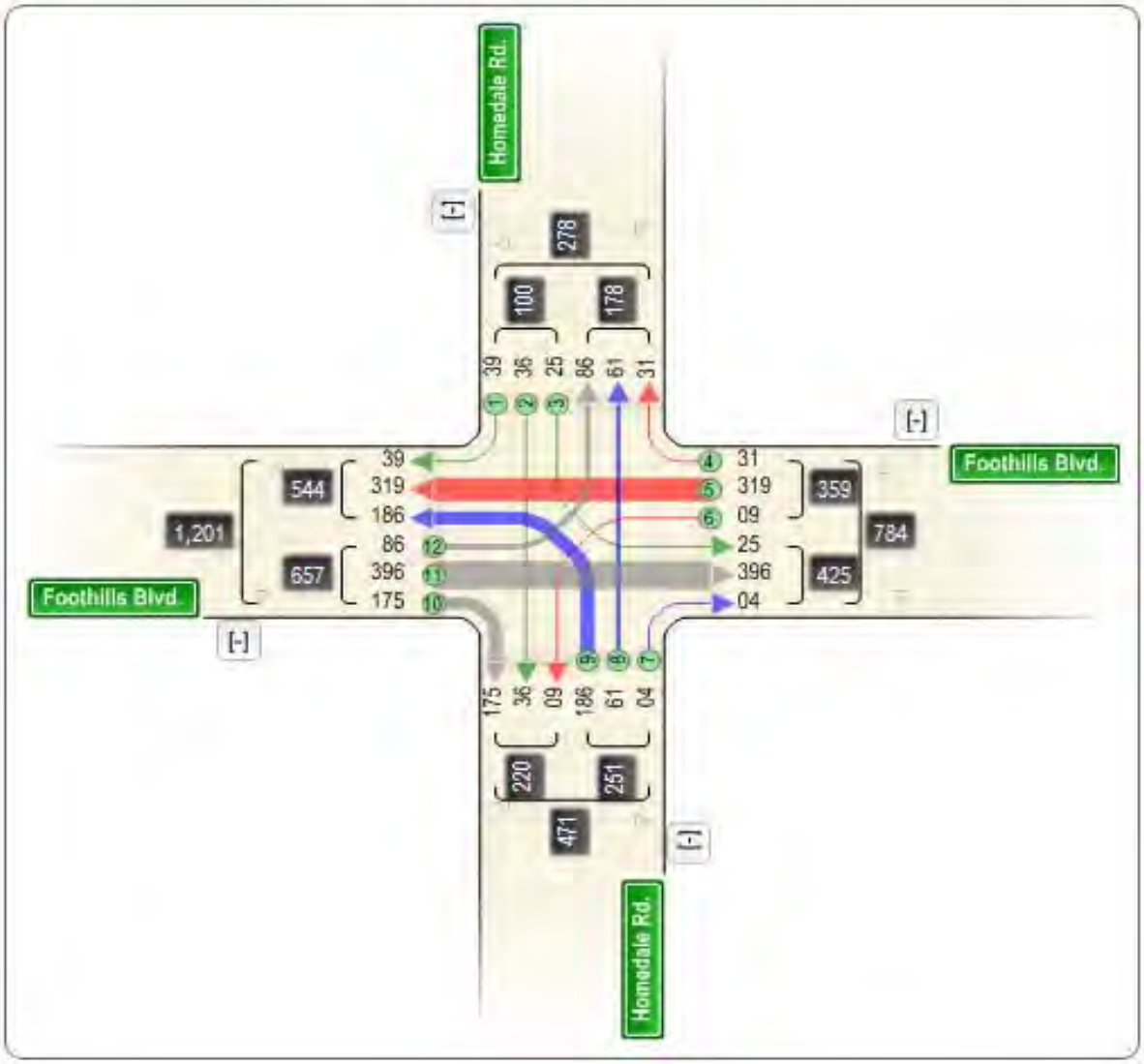
Date: 5/3/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18482010
Street Number: 3965
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Foothills Blvd. @ Homedale Rd. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

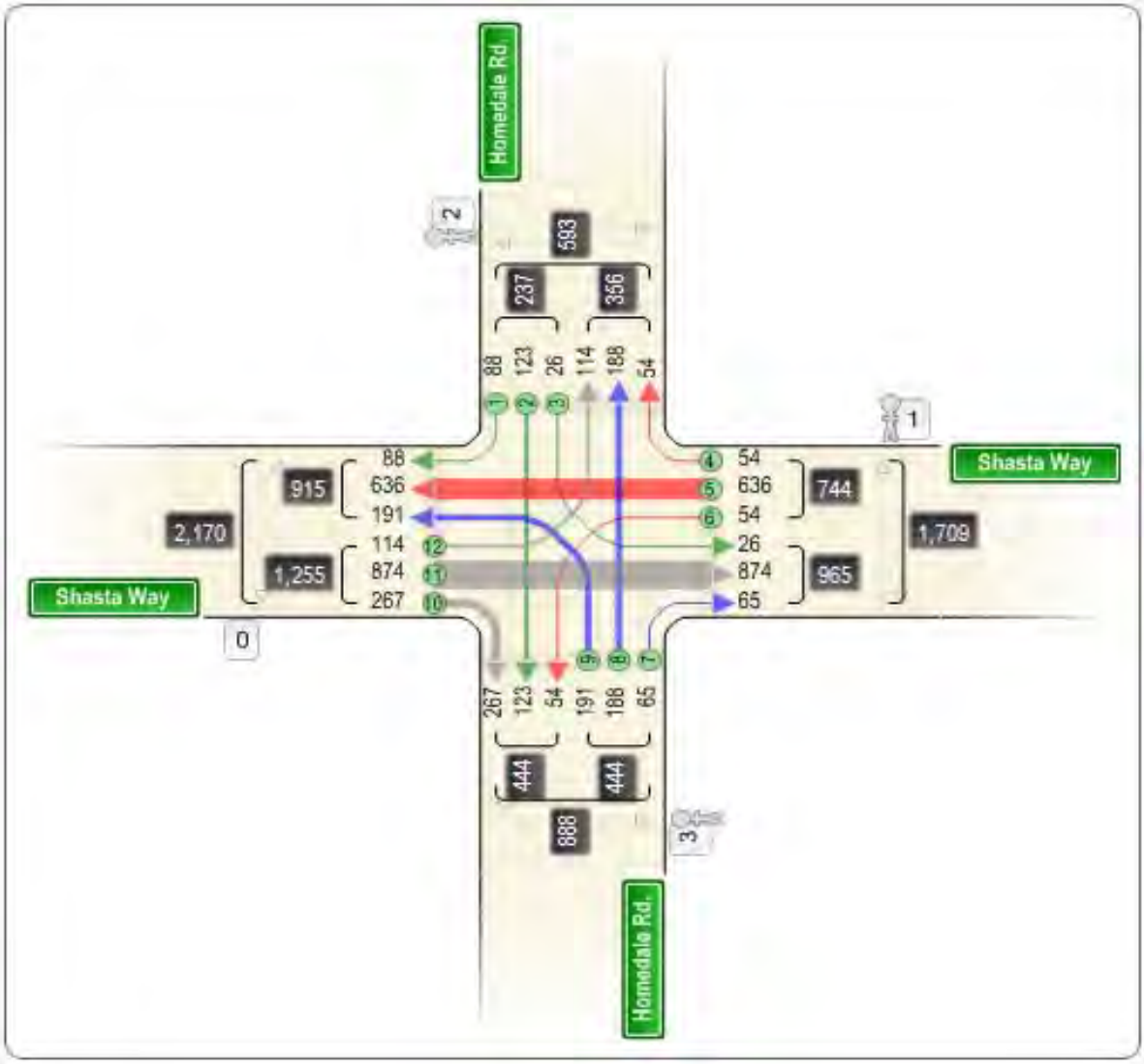
Date: 5/31/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18312010
Street Number: 3969
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Homedale Rd. @ Shasta Way
3 hr count 3-6PM
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

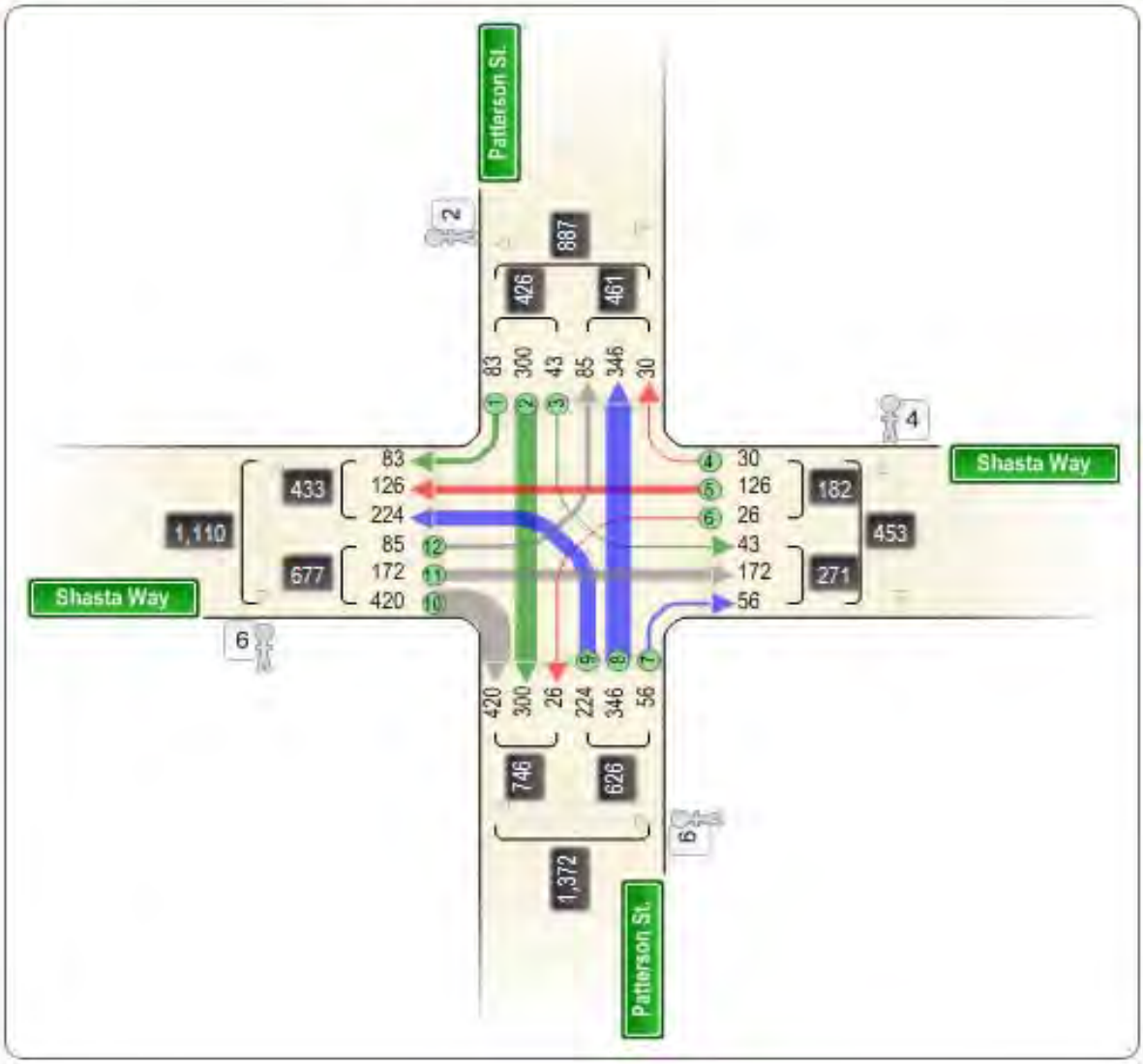
Date: 5/3/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18462010
Street Number: 3964
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Shasta Way @ Patterson St.
County: Klamath
City: Klamath Falls



Type of peak hour being reported: Intersection Peak

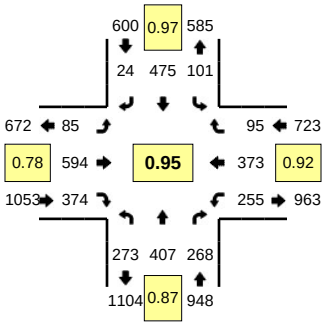
Method for determining peak hour: Total Entering Volume

LOCATION: Washburn Way -- S 6th St

QC JOB #: 10541101

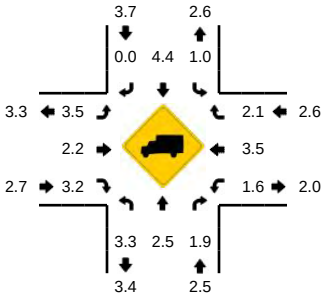
CITY/STATE: Klamath Falls, OR

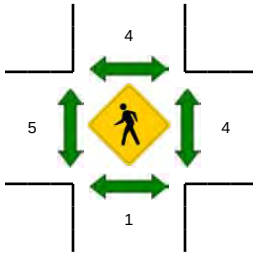
DATE: 9/30/2010

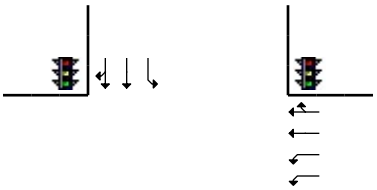


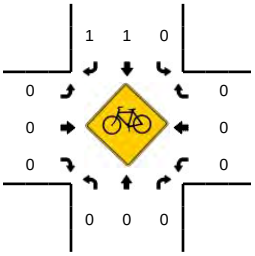
Peak-Hour: 4:20 PM -- 5:20 PM

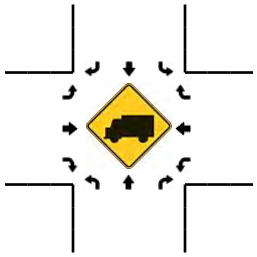
Peak 15-Min: 5:05 PM -- 5:20 PM

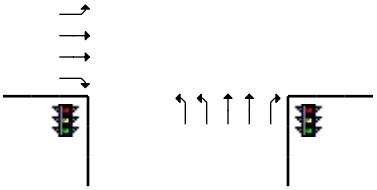


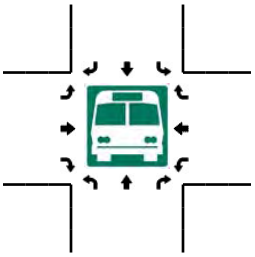












5-Min Count Period Beginning At	Washburn Way (Northbound)				Washburn Way (Southbound)				S 6th St (Eastbound)				S 6th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	35	51	23	0	10	30	2	0	8	34	18	0	30	40	7	0	288	
4:05 PM	21	29	31	0	14	30	2	0	10	36	42	0	13	30	6	0	264	
4:10 PM	25	28	20	0	8	46	2	0	4	48	30	0	32	39	8	0	290	
4:15 PM	36	36	24	0	10	34	0	0	6	28	17	0	16	33	2	0	242	
4:20 PM	24	29	26	0	7	37	3	0	11	45	32	0	14	40	2	0	270	
4:25 PM	29	52	27	0	7	55	3	0	4	41	32	0	28	32	5	0	315	
4:30 PM	21	22	17	0	8	37	0	0	8	34	32	0	30	35	8	0	252	
4:35 PM	12	34	28	0	5	43	1	0	5	56	26	1	14	37	14	0	276	
4:40 PM	32	26	15	0	5	27	7	0	6	35	28	0	11	21	1	0	214	
4:45 PM	15	34	21	0	7	55	3	0	8	45	18	1	28	32	5	0	272	
4:50 PM	20	41	19	0	8	37	0	0	6	62	42	0	30	35	8	0	308	
4:55 PM	28	27	24	0	5	43	1	0	9	47	22	0	14	37	14	0	271	3262
5:00 PM	27	29	32	0	12	51	1	0	3	33	23	0	25	29	8	0	273	3247
5:05 PM	21	42	16	0	13	32	1	0	9	64	40	0	28	22	11	0	299	3282
5:10 PM	17	26	24	0	10	20	2	0	6	84	44	0	12	32	14	0	291	3283
5:15 PM	27	45	19	0	14	38	2	0	8	48	35	0	21	21	5	0	283	3324
5:20 PM	12	37	15	0	11	33	1	0	8	36	19	0	29	30	6	0	237	3291
5:25 PM	31	25	14	0	11	24	4	0	5	44	23	0	22	33	11	0	247	3223
5:30 PM	15	38	12	0	6	42	4	0	3	31	19	0	20	33	9	0	232	3203
5:35 PM	27	25	19	0	14	27	1	0	5	43	13	0	13	33	8	0	228	3155
5:40 PM	17	30	12	0	9	34	5	0	14	28	19	0	24	36	6	0	234	3175
5:45 PM	19	28	9	0	7	33	0	0	3	28	23	1	21	28	4	0	204	3107
5:50 PM	16	32	15	0	10	33	6	0	9	19	17	0	26	13	5	0	201	3000
5:55 PM	19	32	10	0	5	28	3	0	1	29	23	0	14	31	12	0	207	2936

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	260	452	236	0	148	360	20	0	92	784	476	0	244	300	120	0	3492
Heavy Trucks	4	8	12		0	16	0		8	12	16		0	8	0		84
Pedestrians		0				8				12				4			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/13/2010 8:04 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Type of peak hour being reported: Intersection Peak

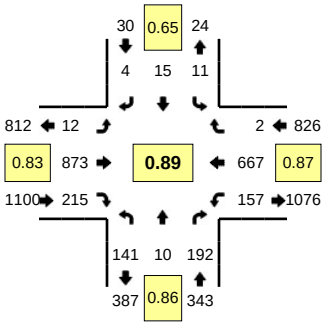
Method for determining peak hour: Total Entering Volume

LOCATION: Altamont Dr -- S 6th St

QC JOB #: 10541115

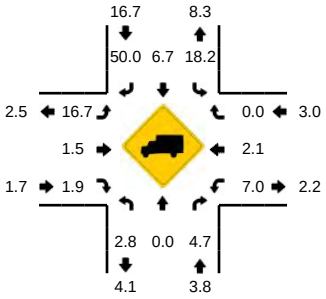
CITY/STATE: Klamath Falls, OR

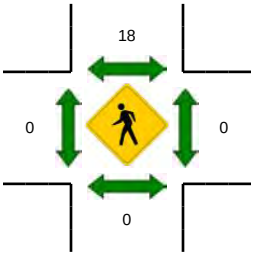
DATE: 9/30/2010

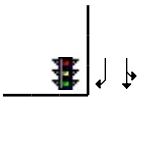


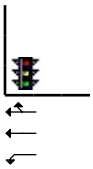
Peak-Hour: 4:30 PM -- 5:30 PM

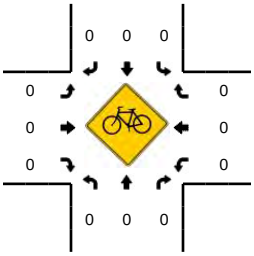
Peak 15-Min: 5:00 PM -- 5:15 PM

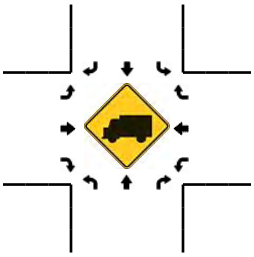


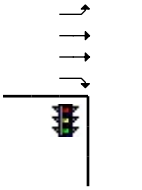




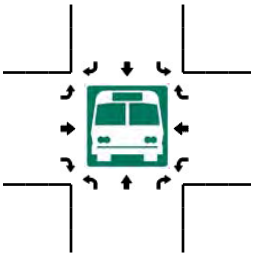












5-Min Count Period Beginning At	Altamont Dr (Northbound)				Altamont Dr (Southbound)				S 6th St (Eastbound)				S 6th St (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	14	1	11	0	2	1	0	0	0	63	15	0	18	51	0	0	176	
4:05 PM	10	1	10	0	0	0	0	0	1	66	13	0	16	71	0	0	188	
4:10 PM	13	0	16	0	0	2	2	0	0	67	15	0	15	74	0	0	204	
4:15 PM	11	0	12	0	2	1	0	0	1	50	16	0	10	71	0	0	174	
4:20 PM	16	2	9	0	3	2	3	0	1	62	12	0	13	63	0	0	186	
4:25 PM	16	1	7	0	1	0	0	0	1	63	20	0	16	46	0	0	171	
4:30 PM	13	0	7	0	1	0	0	0	0	57	23	0	17	55	0	0	173	
4:35 PM	12	0	16	0	0	0	1	0	2	74	19	0	16	57	1	0	198	
4:40 PM	6	0	18	0	0	3	0	0	0	74	12	0	11	48	0	0	172	
4:45 PM	13	0	12	0	2	0	2	0	1	58	9	0	19	66	0	0	182	
4:50 PM	14	1	18	0	1	1	0	0	2	80	13	0	8	67	0	0	205	
4:55 PM	11	3	18	0	1	0	0	0	2	59	23	0	10	43	1	0	171	2200
5:00 PM	10	2	14	0	2	3	0	0	0	66	22	0	16	67	0	0	202	2226
5:05 PM	11	1	22	0	2	3	1	0	0	87	18	0	13	57	0	0	215	2253
5:10 PM	14	0	20	0	0	1	0	0	2	104	20	0	19	48	0	0	228	2277
5:15 PM	12	1	20	0	0	0	0	0	2	83	17	0	11	49	0	0	195	2298
5:20 PM	11	0	11	0	2	4	0	0	1	58	20	0	8	56	0	0	171	2283
5:25 PM	14	2	16	0	0	0	0	0	0	73	19	0	9	54	0	0	187	2299
5:30 PM	8	2	16	0	1	0	0	0	0	50	16	0	12	54	0	0	159	2285
5:35 PM	4	1	8	0	0	1	0	0	0	70	15	0	11	54	0	0	164	2251
5:40 PM	7	0	4	0	1	1	0	0	1	56	13	0	11	54	0	0	148	2227
5:45 PM	10	0	16	0	1	0	1	0	0	60	20	0	15	53	0	0	176	2221
5:50 PM	10	0	5	0	2	1	0	0	1	56	23	0	13	38	0	0	149	2165
5:55 PM	7	0	11	0	0	0	0	0	0	61	11	0	7	40	0	0	137	2131

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	140	12	224	0	16	28	4	0	8	1028	240	0	192	688	0	0	2580
Heavy Trucks	0	0	12		0	0	0		4	16	4		0	8	0		44
Pedestrians		0				24				0				0			24
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/13/2010 2:06 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

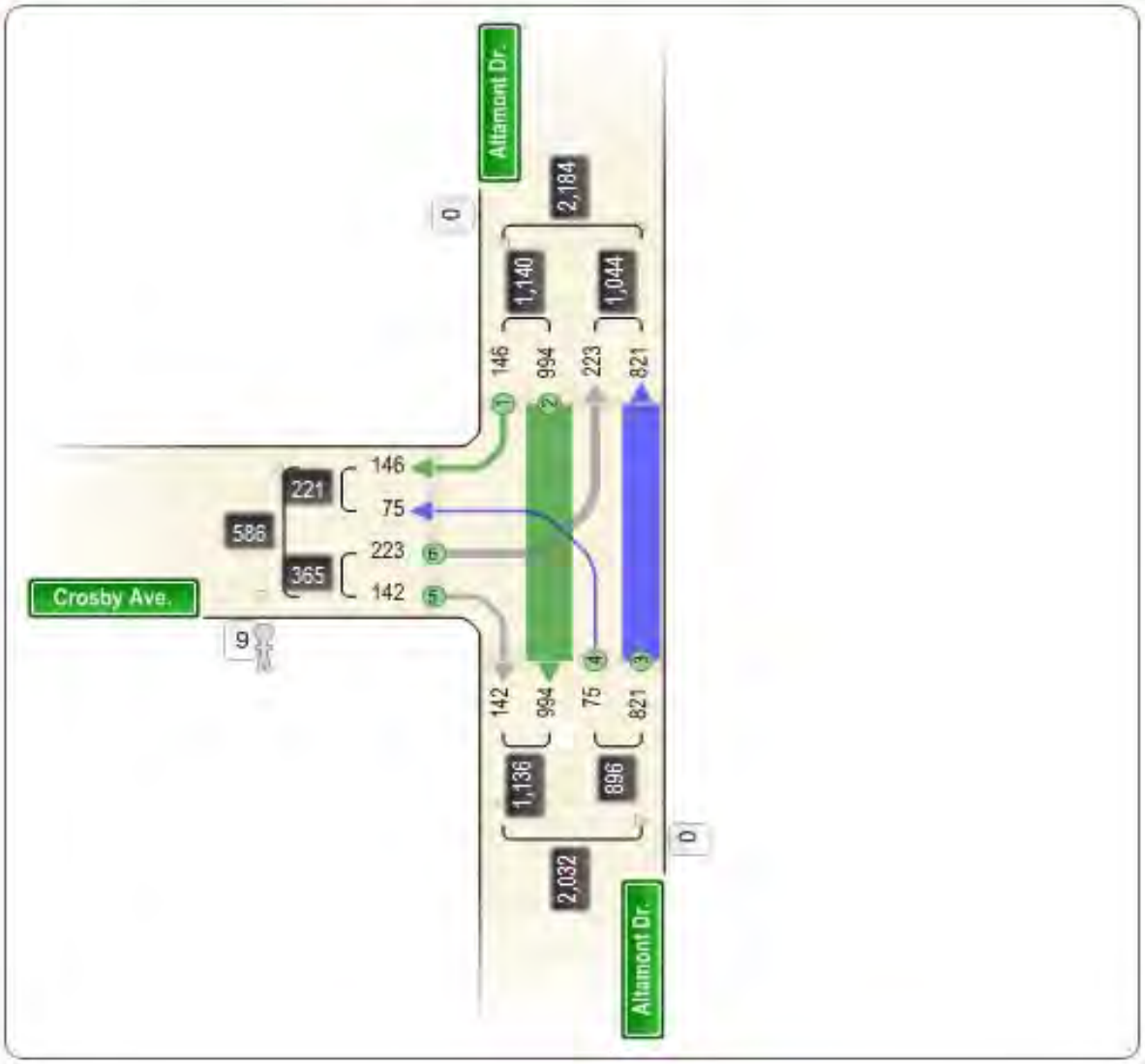
Date: 4/19/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18572010
Street Number: 3979
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Altamont Dr. @ Crosby Ave. 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

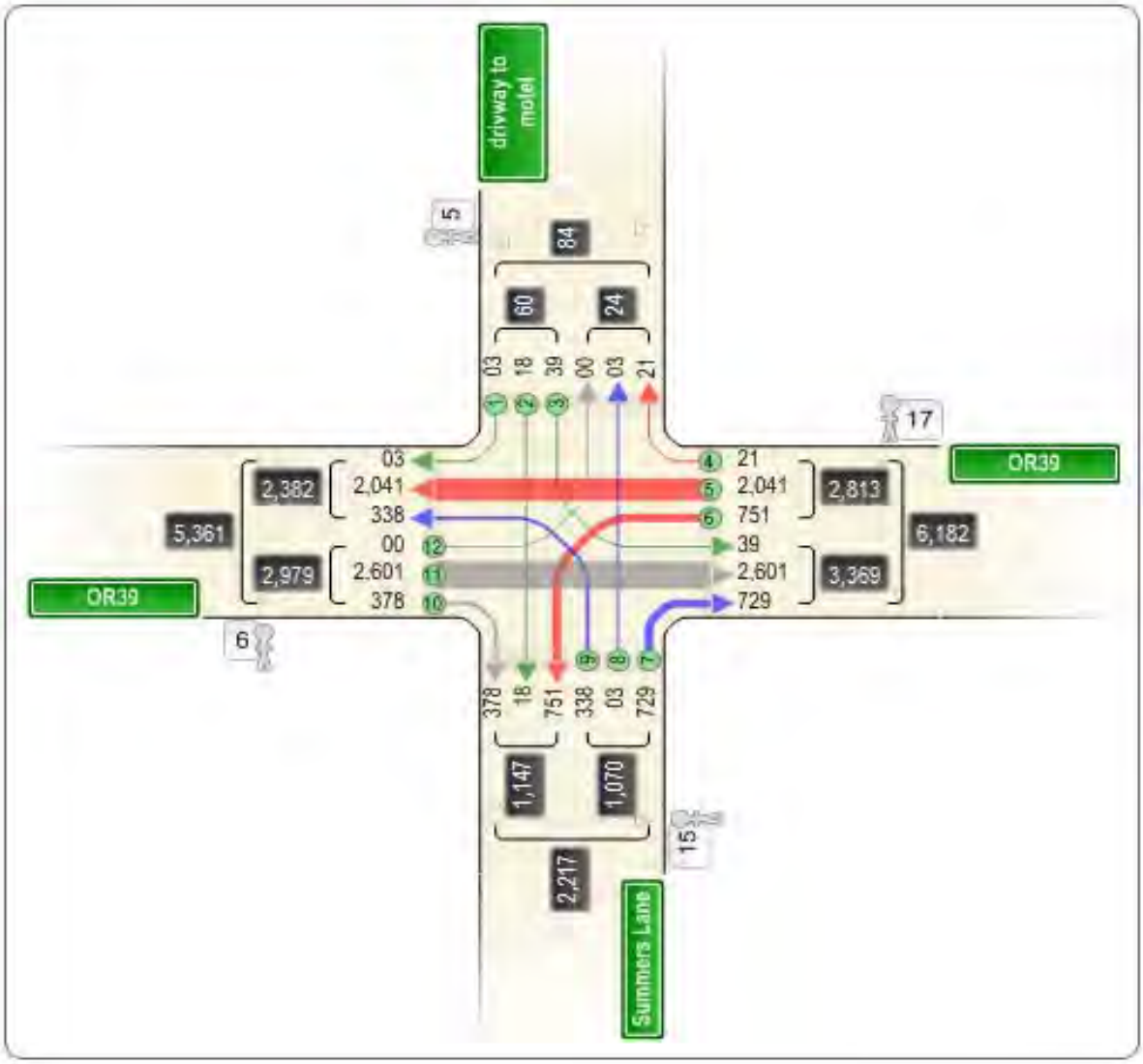
Date: 4/14/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18452010
Mile Point: 3.22
Street Number: 020
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Falls-Lakeview Hwy(OR39) @ Summers Lane - 3 hr count site 1572 - west leg
County: Klamath
City: Klamath Falls



Type of peak hour being reported: Intersection Peak

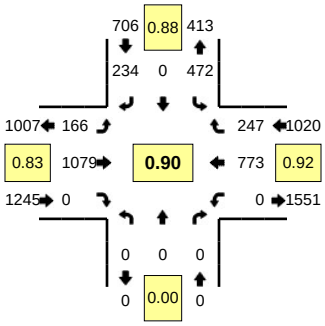
Method for determining peak hour: Total Entering Volume

LOCATION: S 6th St -- OR 39

QC JOB #: 10541107

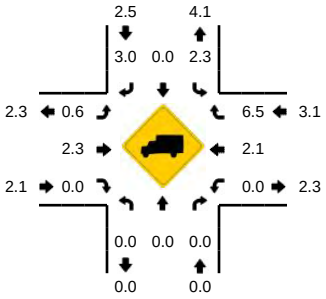
CITY/STATE: Klamath Falls, OR

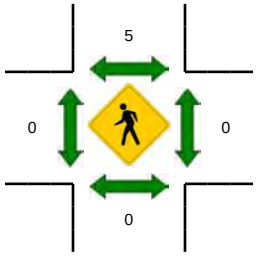
DATE: 9/30/2010



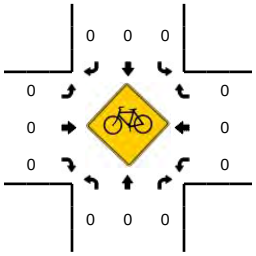
Peak-Hour: 4:35 PM -- 5:35 PM

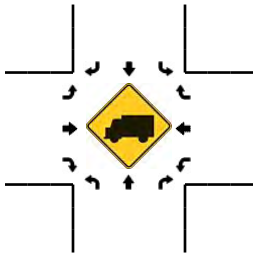
Peak 15-Min: 5:05 PM -- 5:20 PM



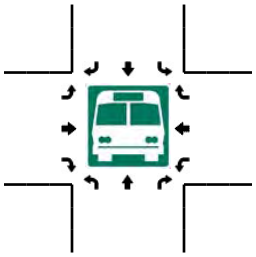












5-Min Count Period Beginning At	S 6th St (Northbound)				S 6th St (Southbound)				OR 39 (Eastbound)				OR 39 (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	0	0	0	0	35	0	17	0	13	78	0	0	0	53	18	0	214	
4:05 PM	0	0	0	0	19	0	18	0	10	83	0	0	0	75	19	0	224	
4:10 PM	0	0	0	0	36	0	14	0	15	66	0	0	0	77	17	0	225	
4:15 PM	0	0	0	0	17	0	17	0	16	73	0	0	0	72	15	0	210	
4:20 PM	0	0	0	0	39	0	21	0	10	70	0	0	0	57	18	0	215	
4:25 PM	0	0	0	0	25	0	23	0	18	75	0	0	0	51	23	0	215	
4:30 PM	0	0	0	0	21	0	17	0	13	64	0	0	0	55	17	0	187	
4:35 PM	0	0	0	0	43	0	22	0	13	78	0	0	0	63	21	0	240	
4:40 PM	0	0	0	0	50	0	15	0	13	86	0	0	0	62	24	0	250	
4:45 PM	0	0	0	0	33	0	19	0	10	97	0	0	0	71	17	0	247	
4:50 PM	0	0	0	0	37	0	22	0	16	83	0	0	0	60	20	0	238	
4:55 PM	0	0	0	0	34	0	14	0	9	73	0	0	0	61	23	0	214	2679
5:00 PM	0	0	0	0	44	0	15	0	13	85	0	0	0	68	23	0	248	2713
5:05 PM	0	0	0	0	34	0	27	0	15	106	0	0	0	79	23	0	284	2773
5:10 PM	0	0	0	0	38	0	24	0	20	106	0	0	0	58	19	0	265	2813
5:15 PM	0	0	0	0	45	0	32	0	13	113	0	0	0	54	15	0	272	2875
5:20 PM	0	0	0	0	48	0	14	0	16	101	0	0	0	60	17	0	256	2916
5:25 PM	0	0	0	0	32	0	17	0	9	74	0	0	0	66	24	0	222	2923
5:30 PM	0	0	0	0	34	0	13	0	19	77	0	0	0	71	21	0	235	2971
5:35 PM	0	0	0	0	29	0	17	0	13	69	0	0	0	70	30	0	228	2959
5:40 PM	0	0	0	0	35	0	17	0	13	66	0	0	0	62	18	0	211	2920
5:45 PM	0	0	0	0	28	0	24	0	15	80	0	0	0	64	7	0	218	2891
5:50 PM	0	0	0	0	25	0	10	0	12	75	0	0	0	48	15	0	185	2838
5:55 PM	0	0	0	0	29	0	14	0	6	68	0	0	0	48	18	0	183	2807

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	468	0	332	0	192	1300	0	0	0	764	228	0	3284
Heavy Trucks	0	0	0		8	0	12		4	28	0		0	12	12		76
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Railroad																	
Stopped Buses																	

Comments:

Report generated on 10/13/2010 8:04 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 4/14/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18552010
Mile Point: 3.36
Street Number: 020
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Falls-lakeview Hwy(OR39/140) @ Fargo St. 3 hr count site 1574- west leg
County: Klamath
City: Klamath Falls



Type of peak hour being reported: Intersection Peak

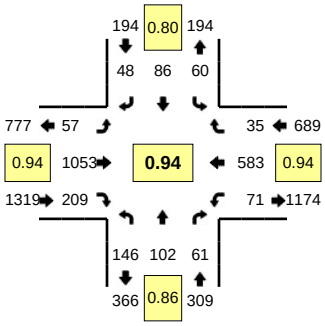
Method for determining peak hour: Total Entering Volume

LOCATION: Homedale St -- S 6th St (OR 39)

QC JOB #: 10274309

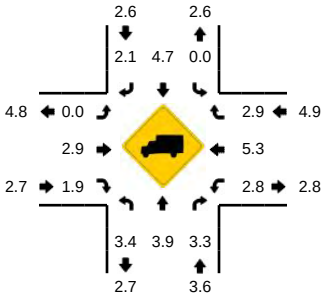
CITY/STATE: Klamath Falls, OR

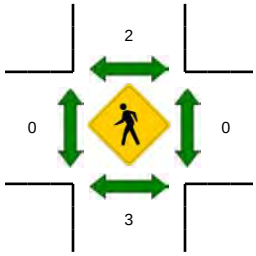
DATE: 8/7/2007

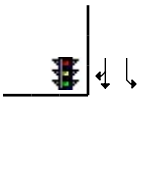


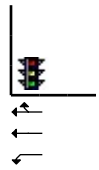
Peak-Hour: 4:30 PM -- 5:30 PM

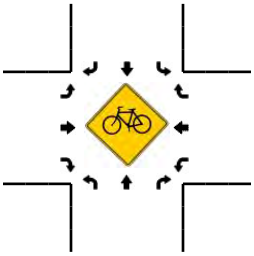
Peak 15-Min: 5:15 PM -- 5:30 PM

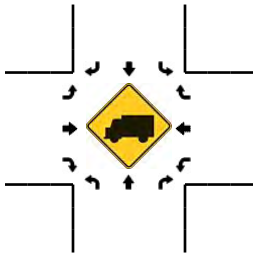


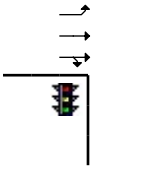




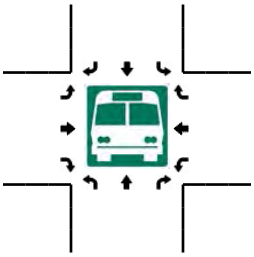












15-Min Count Period Beginning At	Homedale St (Northbound)				Homedale St (Southbound)				S 6th St (OR 39) (Eastbound)				S 6th St (OR 39) (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
4:00 PM	45	25	23	0	24	14	12	0	14	227	49	0	23	170	8	0	634	
4:15 PM	45	27	28	0	14	21	6	0	23	235	37	0	18	162	11	0	627	
4:30 PM	36	26	11	0	14	13	14	0	10	250	53	0	14	153	12	0	606	
4:45 PM	41	18	20	0	9	22	8	0	20	259	41	0	18	155	8	0	619	2486
5:00 PM	26	22	11	0	23	27	15	0	19	258	60	0	11	143	5	0	620	2472
5:15 PM	43	36	19	0	14	24	11	0	8	286	55	0	28	132	10	0	666	2511
5:30 PM	39	22	20	0	17	15	9	0	9	252	47	0	22	132	11	0	595	2500
5:45 PM	42	18	22	0	18	24	12	0	20	195	37	0	20	139	4	0	551	2432

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	172	144	76	0	56	96	44	0	32	1144	220	0	112	528	40	0	2664
Heavy Trucks	0	12	4		0	4	4		0	20	8		0	12	4		68
Pedestrians		8				0				0				0			8
Bicycles																	
Railroad																	
Stopped Buses																	

Comments:

Report generated on 12/28/2010 8:43 AM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net)

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

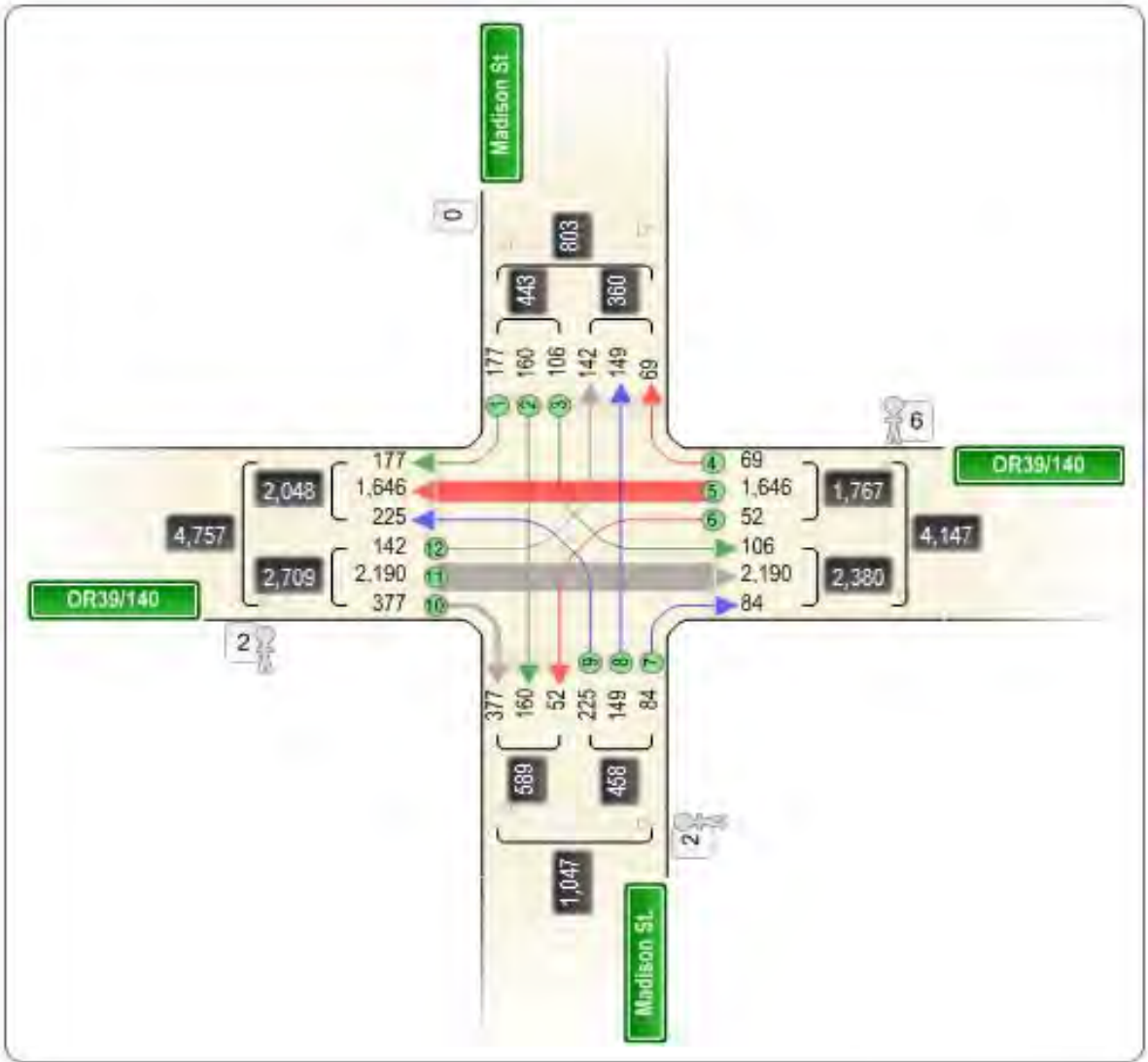
Date: 5/4/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18632010
Mile Point: 4.25
Street Number: 020
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39/140 @ Madison St. site 1577 w/leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

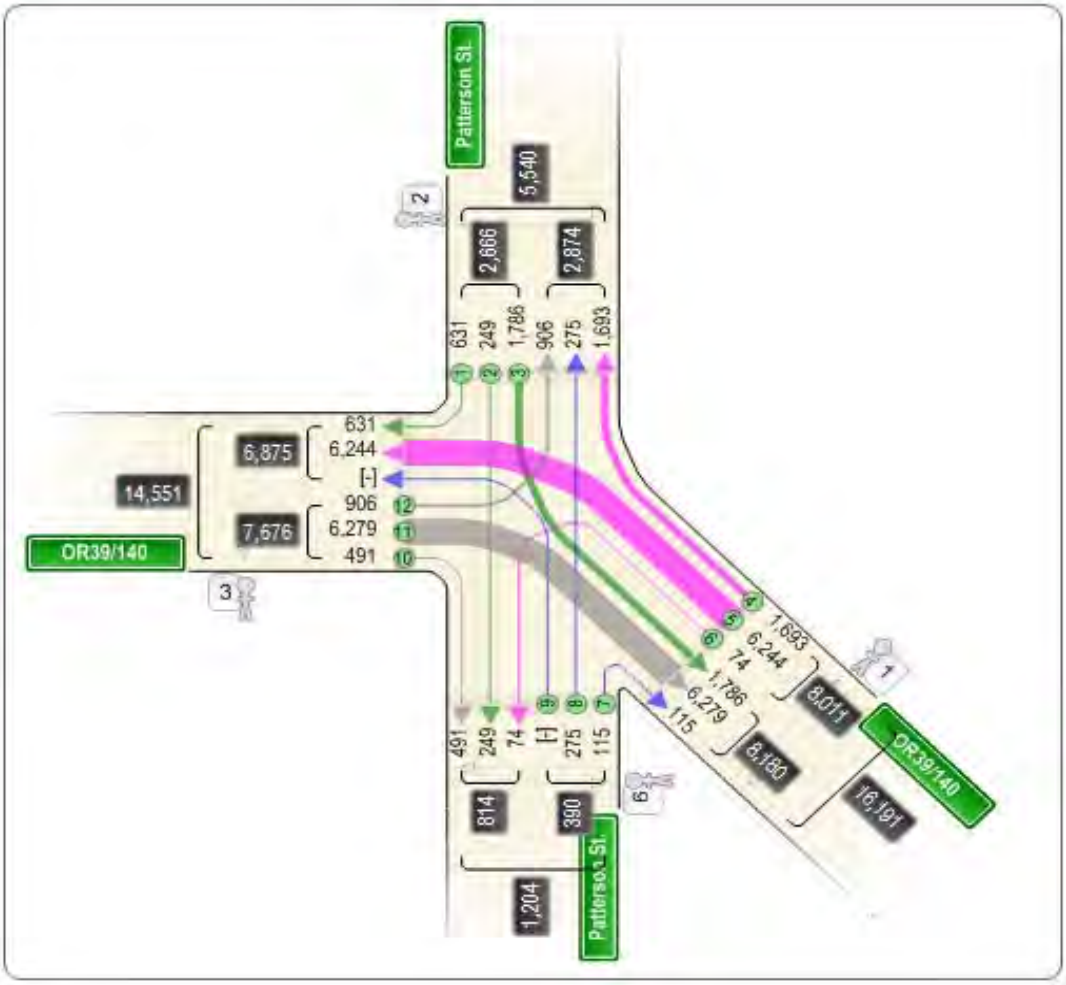
Date: 3/31/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy;Snow

Source

Site Number: 18072010
Mile Point: -1.02
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Klamath Falls-Malin Hwy(OR39/140) @ Patterson St.
site 1577 - west leg
hwy 50 common alignment with hwy 20
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

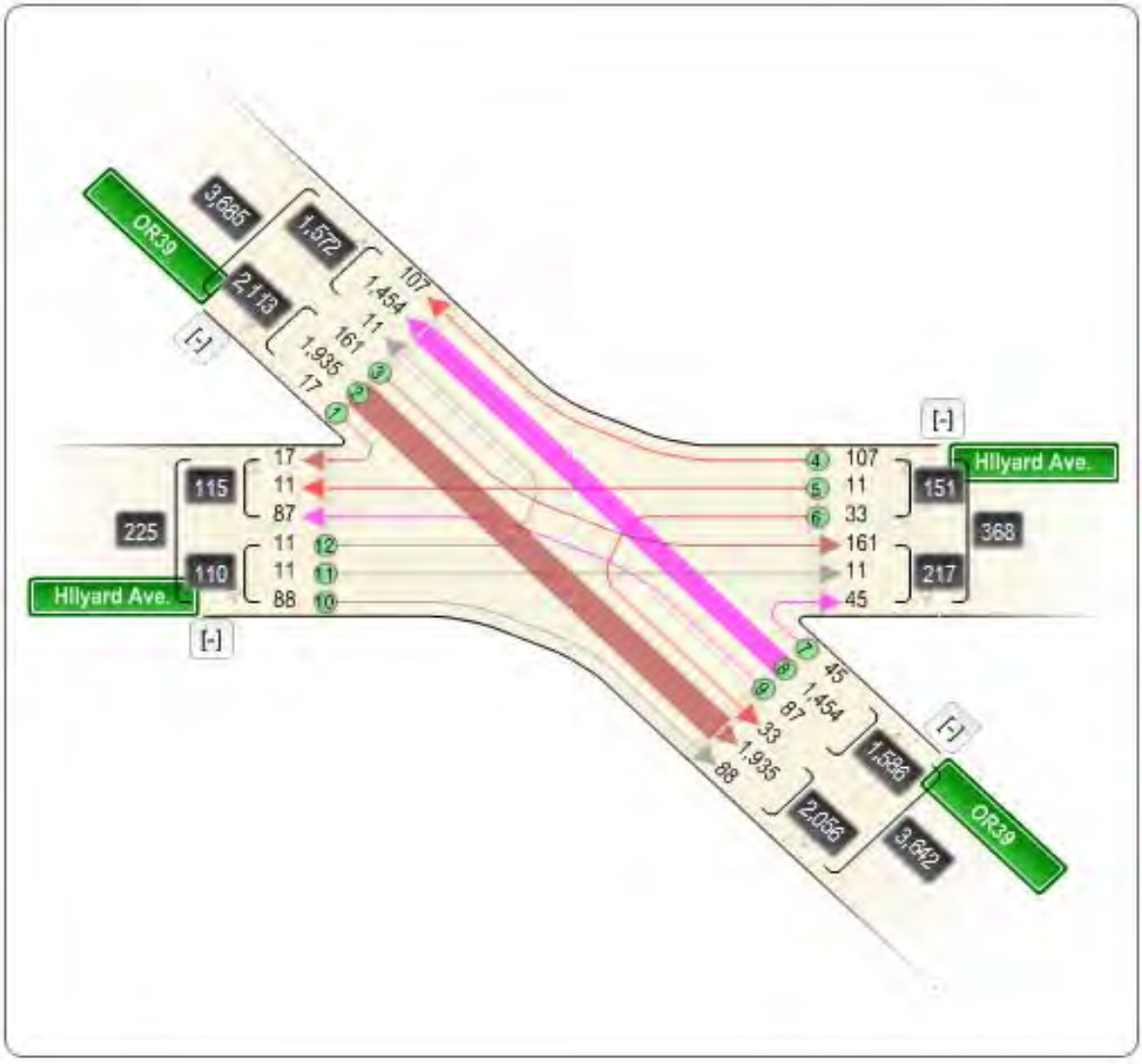
Date: 5/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18672010
Mile Point: -0.34
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR 39 @ Hilyard Ave. 3 hr count (coomon alignment with hwy 20)
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

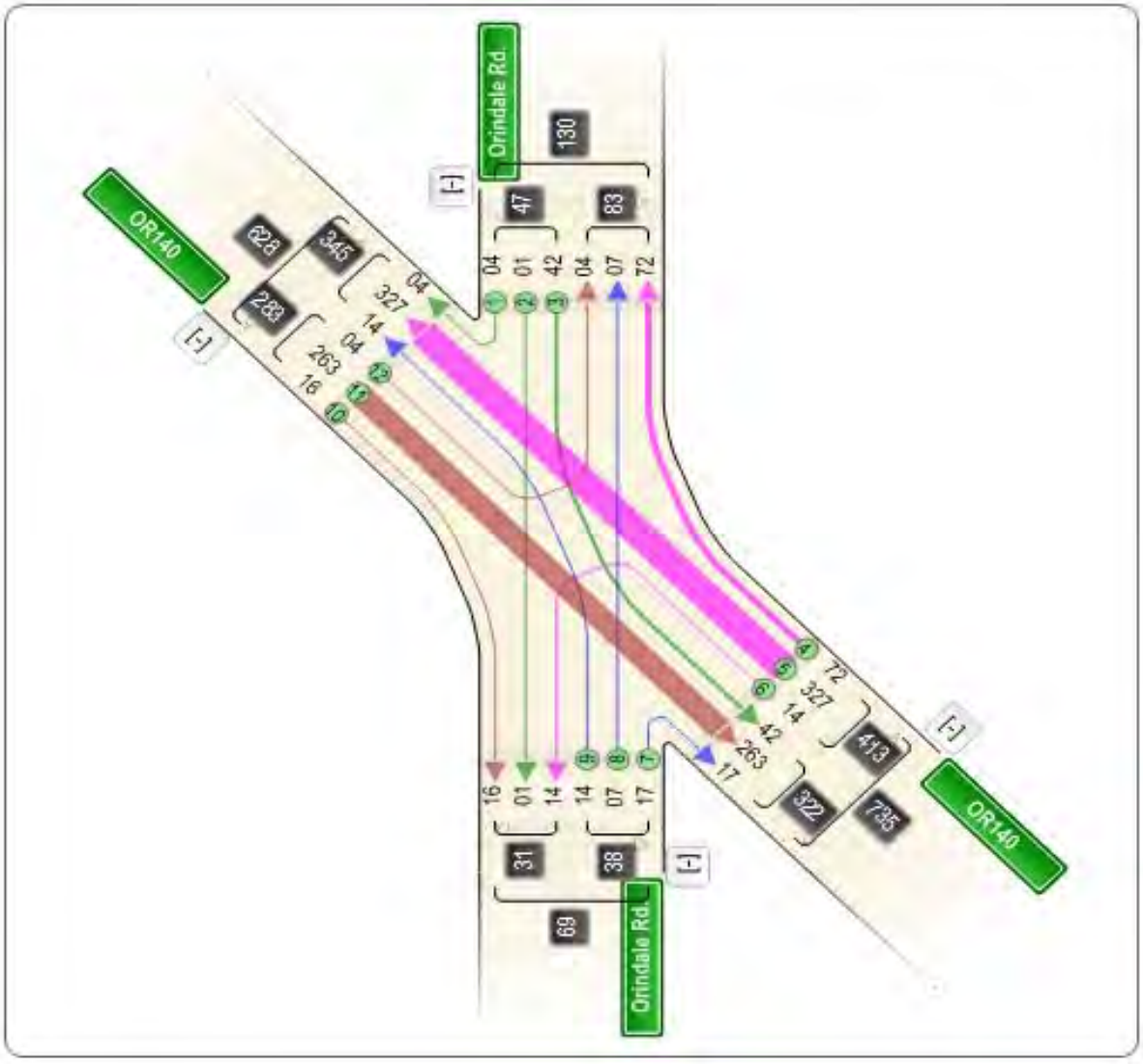
Date: 5/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18502010
Mile Point: 67.22
Street Number: 270
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Orindale Rd. - 3 hr count site 4045- west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

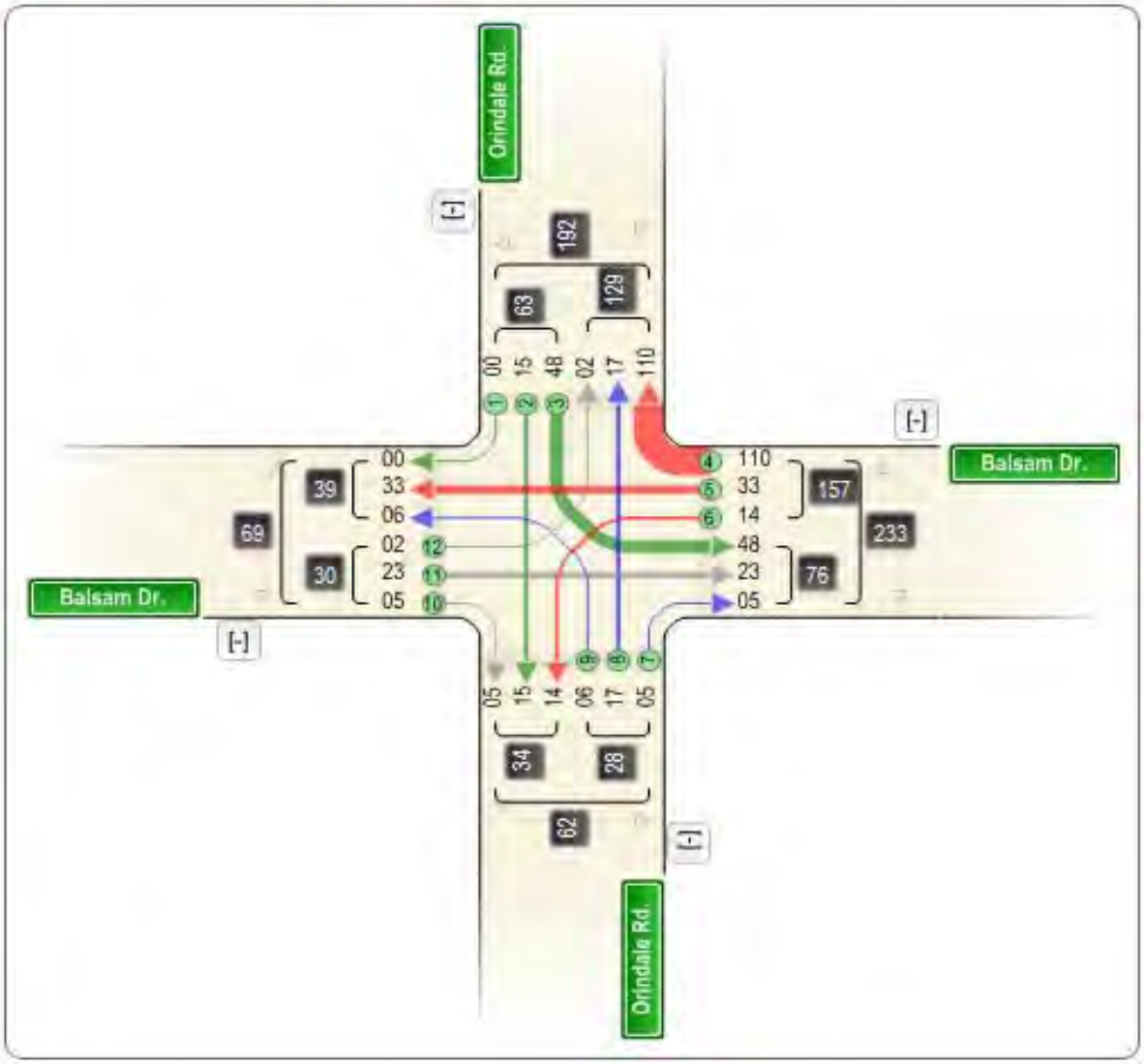
Date: 4/12/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18492010
Street Number: 3963
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Orindale Rd. @ Balsam Dr. 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

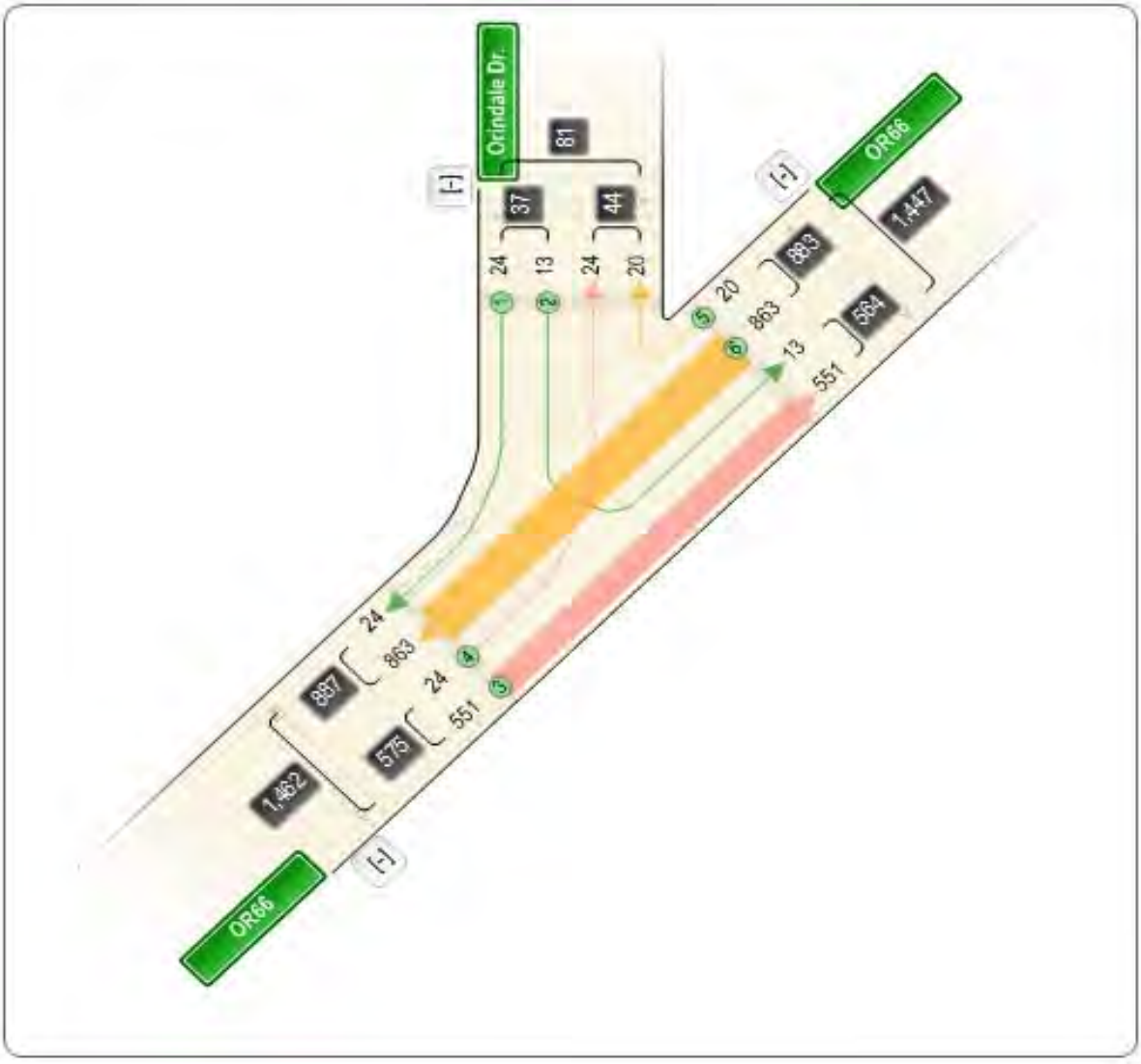
Date: 5/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18702010
Mile Point: 57.81
Street Number: 021
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR66 @ Orindale Dr. 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

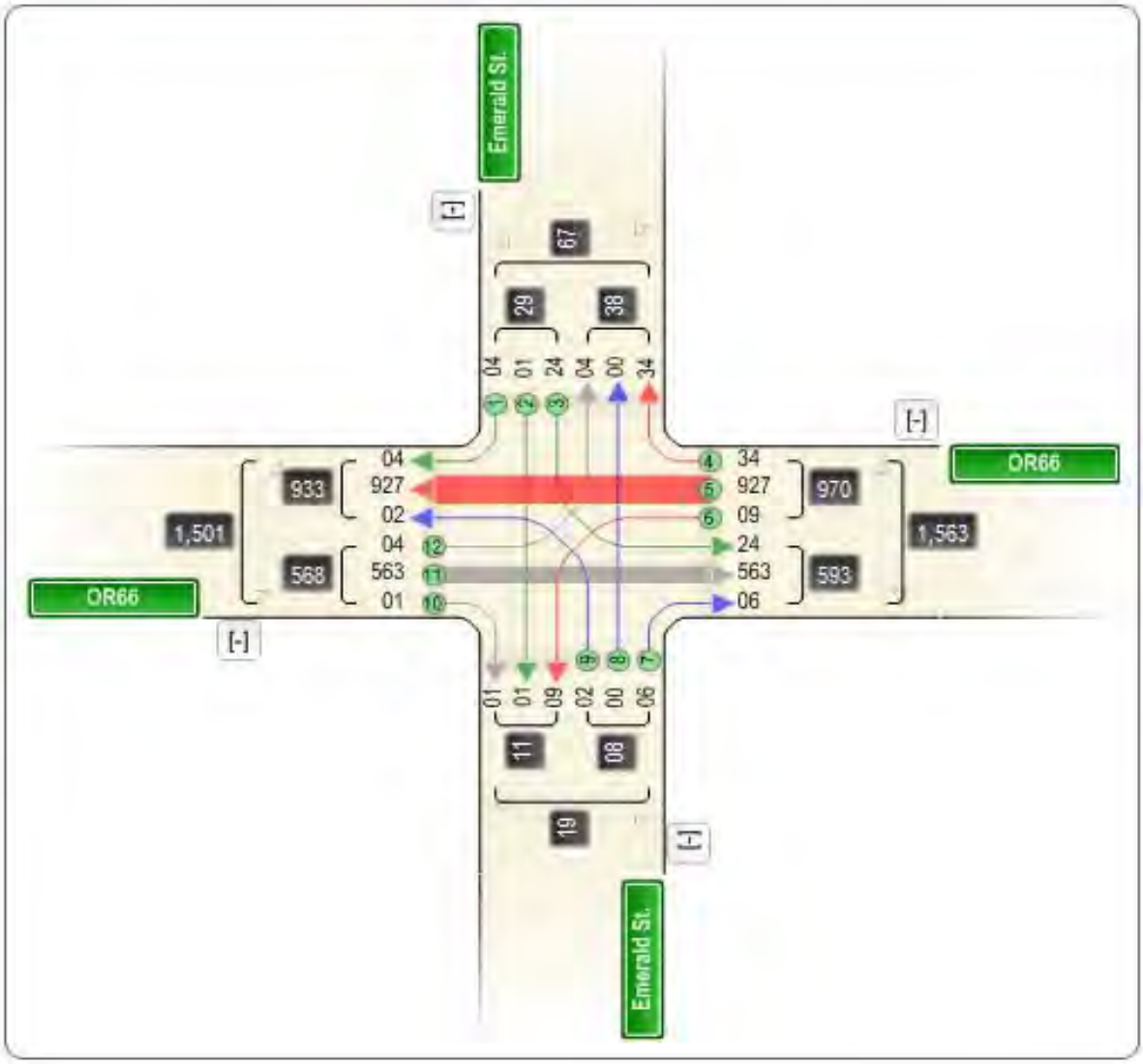
Date: 4/28/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18412010
Mile Point: 58.41
Street Number: 021
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR66 @ Emerald St.
3hr count site 1264 west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

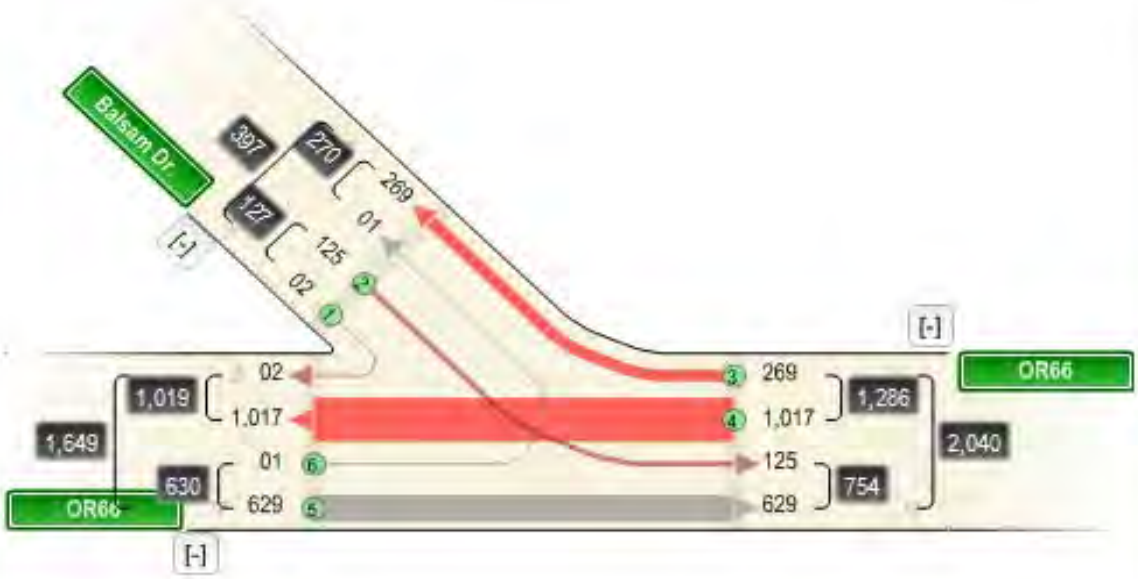
Date: 4/28/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18692010
Mile Point: 58.79
Street Number: 021
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR66 @ Balsam Dr. - 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 2/23/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear;Snow

Source

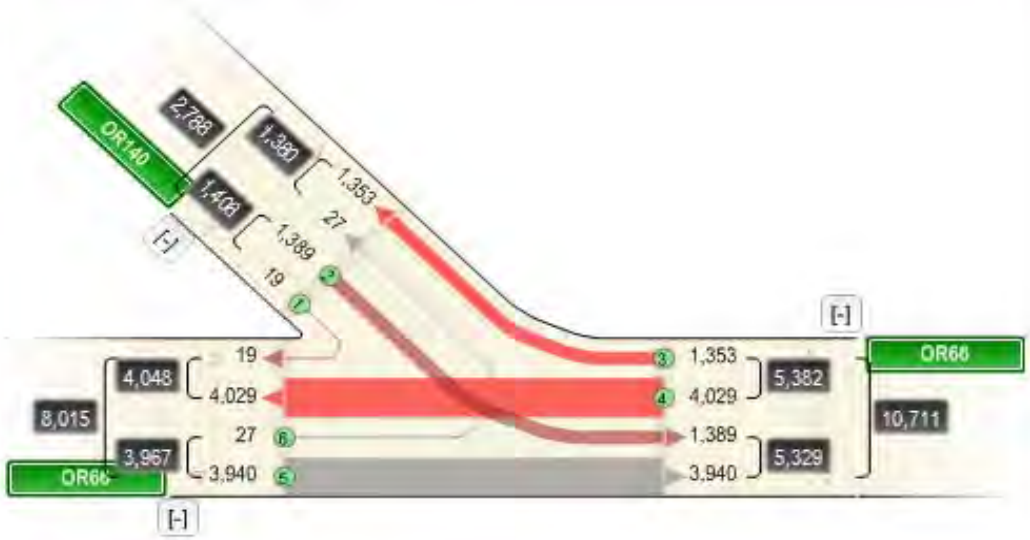
Site Number: 18032010
Mile Point: 58.86
Street Number: 021
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Green Springs Hwy(OR66) @ Lake of The Woods Hwy(OR140)

hwy 21 = site 1622 - east leg
hwy 270 = site 4045 north leg

County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 2/24/2010
Hours: 6:00 AM-10:00 PM
Weather:

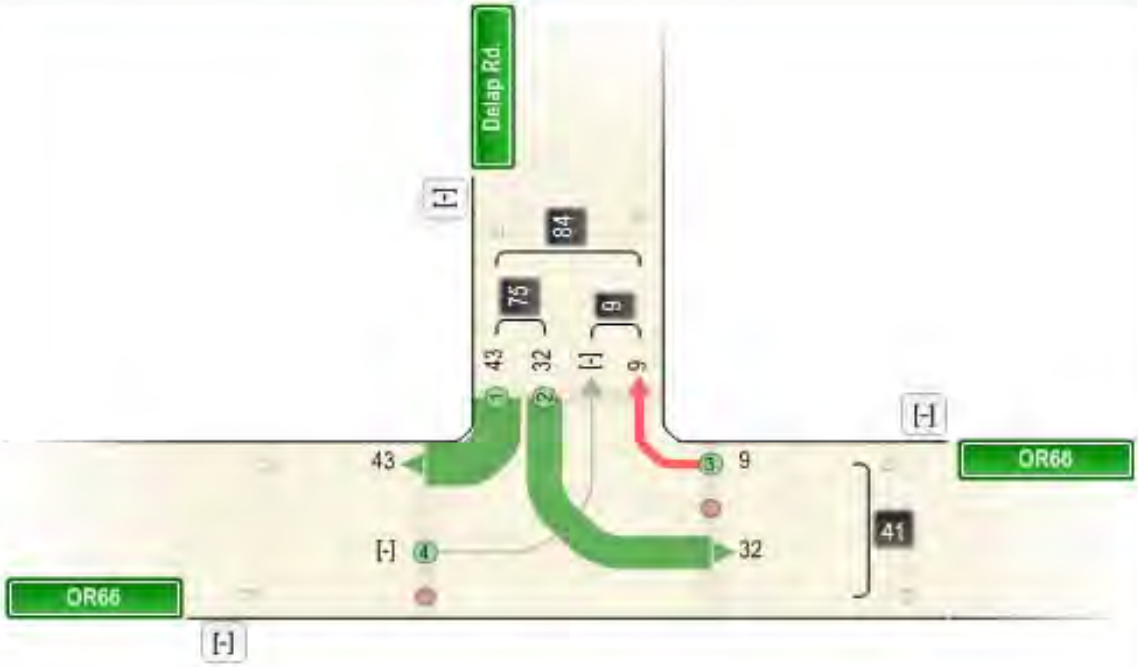
Source

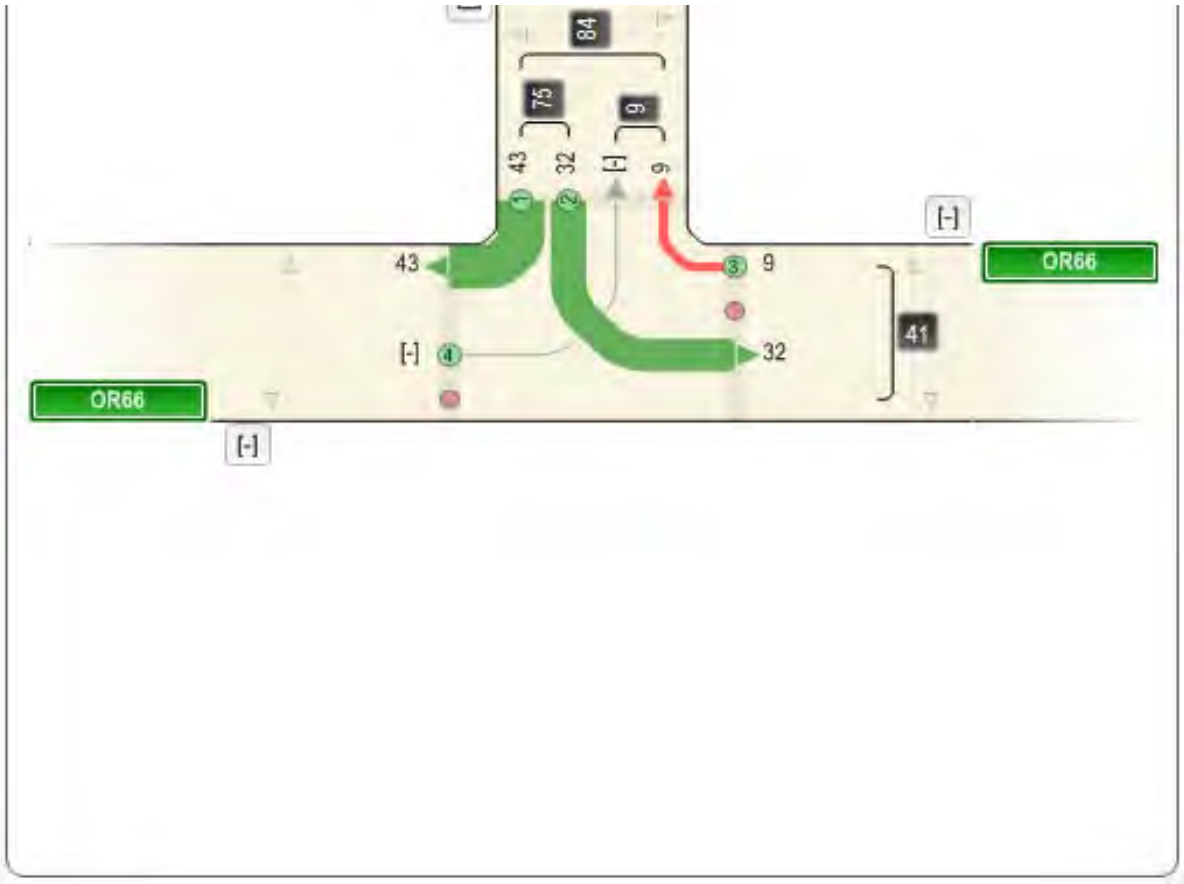
Site Number: 18132010
Mile Point: 58.94
Street Number: 021
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR66 @ Delap Rd.

turning movements only
site 1264 - east leg
County: Klamath
City: Klamath Falls




84
75
9
43
32
[-]
9
[-]
OR66
43
9
41
[-]
32
OR66
[-]

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 2/24/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear;Snow

Source

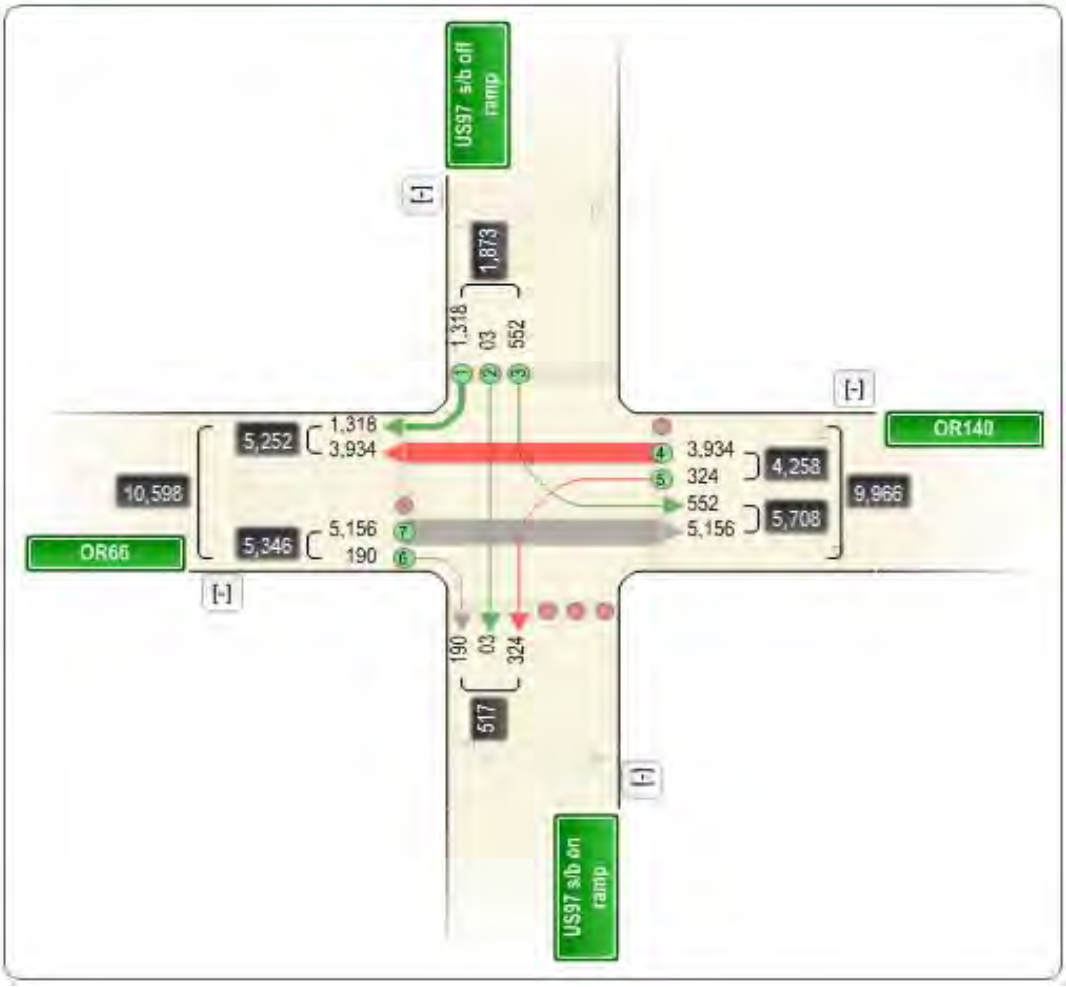
Site Number: 18012010
Mile Point: 276.88
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: The Dalles- California Hwy(US97) s/b ramps @ Green Springs Hwy (OR66) &
S Klamath Falls Hwy(OR140)

s/b off ramp = site16828
s/b on ramp - site 16831 0021AC

County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 6/16/2010
Hours: 6:00 AM-10:00 PM
Weather: Clear

Source

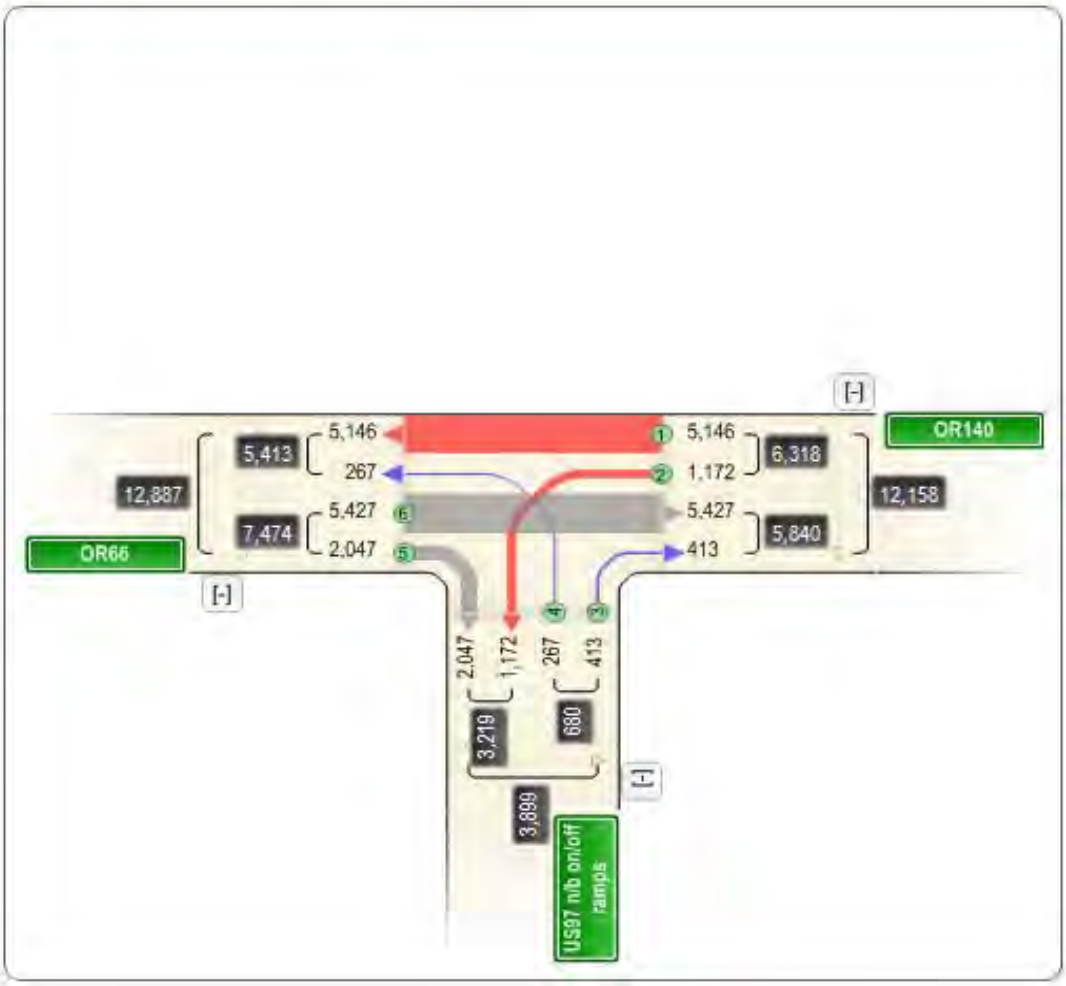
Site Number: 18022010
Mile Point: 276.88
Street Number: 004
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: The Dalles-California hwy(US97) n/b ramps at OR66 & OR140

n/b on ramp site 16394 004BC
n/b off ramp site 16394 004BB

County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 4/27/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

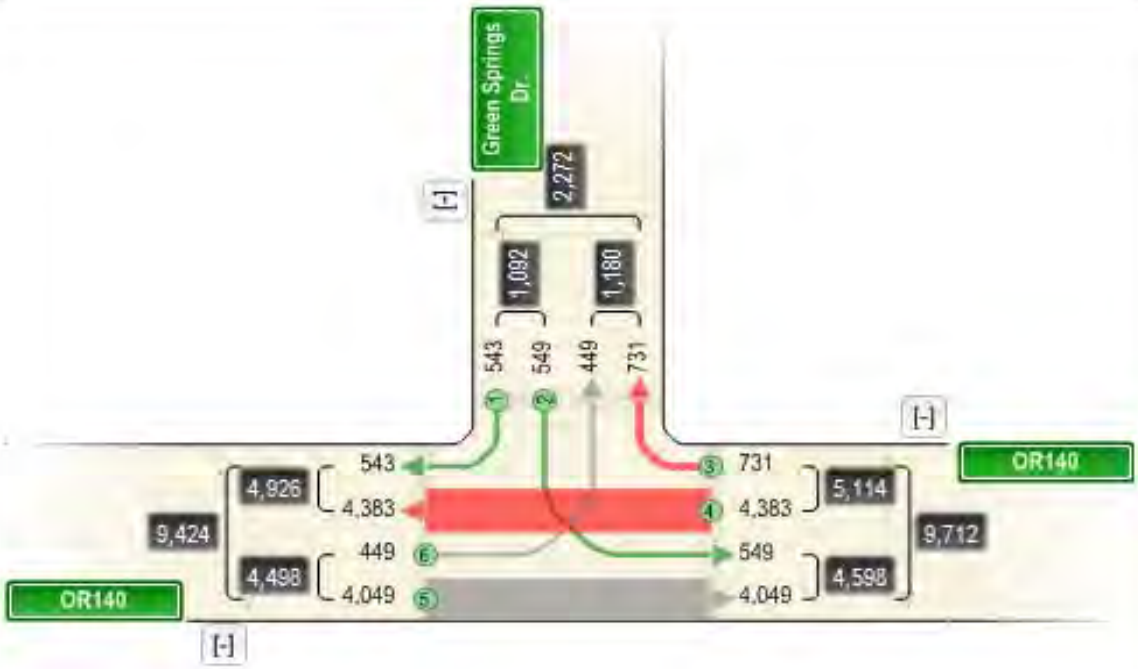
Source

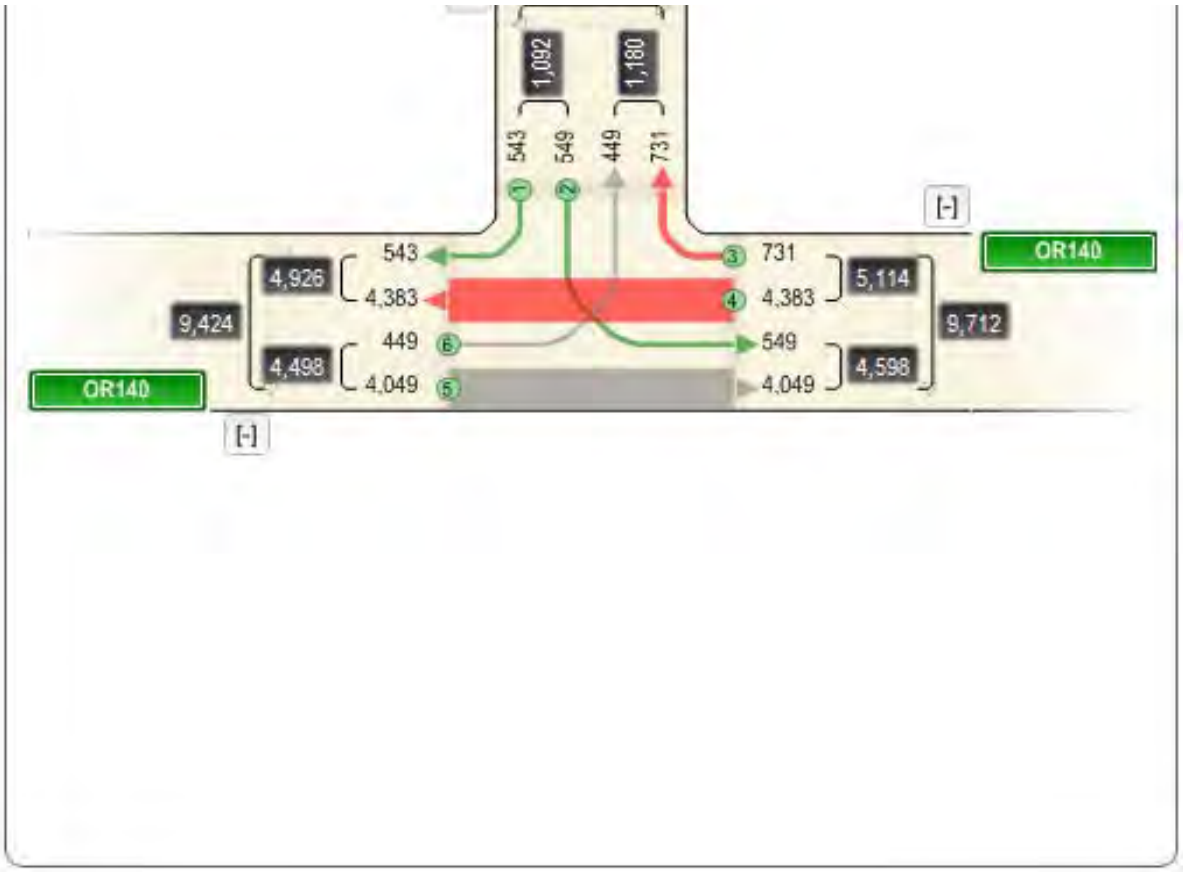
Site Number: 18342010
Mile Point: 0.16
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Green Springs Dr.

site 4545 - west leg
County: Klamath
City: Klamath Falls

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449
731
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OR140
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731
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5,114
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9,424
9,712
449
549
4,498
4,598
4,049
4,049
OR140
[-]

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

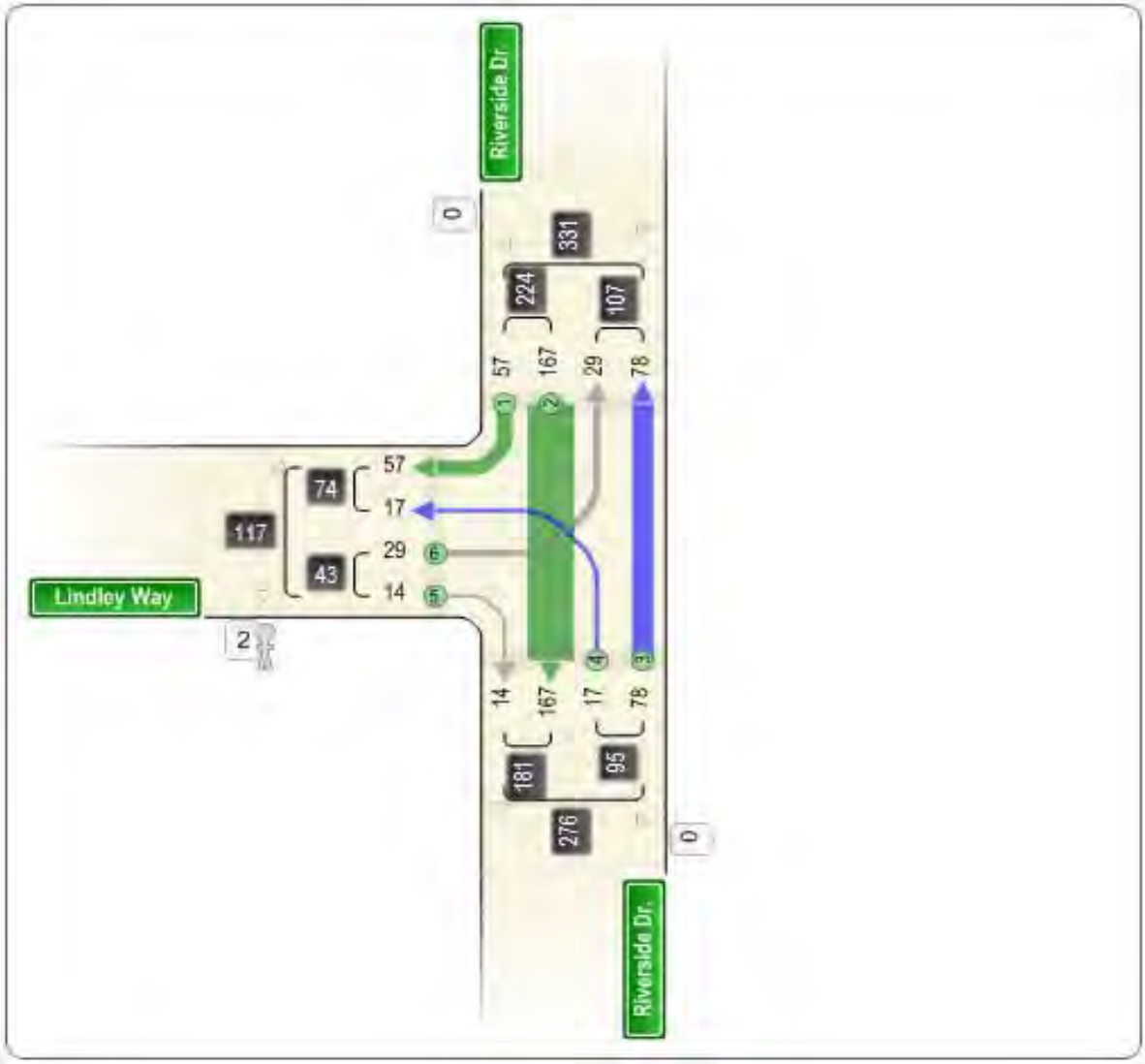
Date: 4/12/2010
Hours: 3:00 PM-6:00 PM
Weather: Clear

Source

Site Number: 18512010
Street Number: 3972
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Riverside Dr. @ Lindley Way 3 hr count
Riverside Dr. becomes frontage road south of Lindley way
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

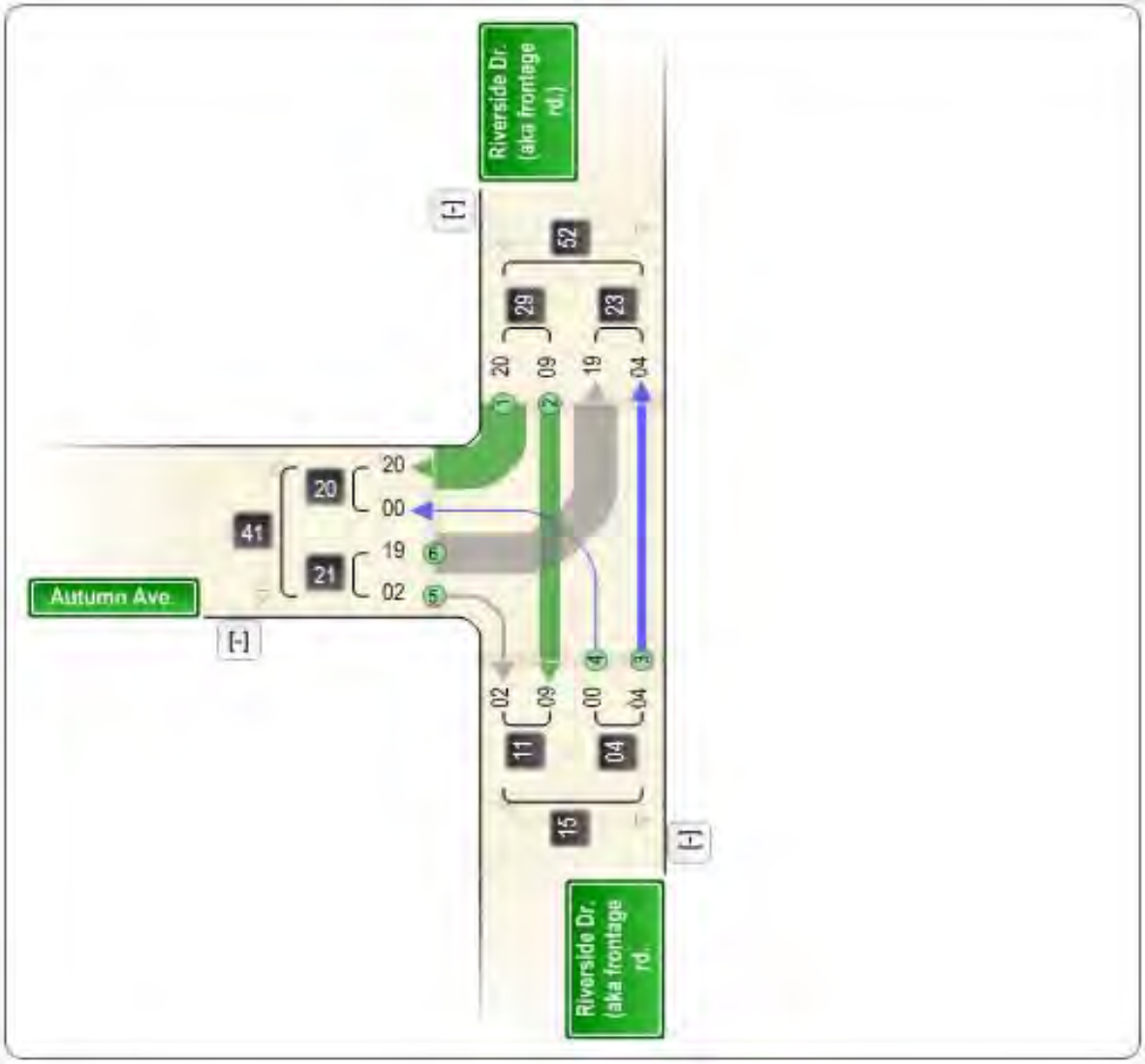
Date: 4/12/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18352010
Street Number: 3972
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Riverside Drive(aka frontage rd.) @ Autumn Ave, 3 hour count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 5/12/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18182010
Street Number: 3972
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Green Springs Drive @ Dover Ave.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

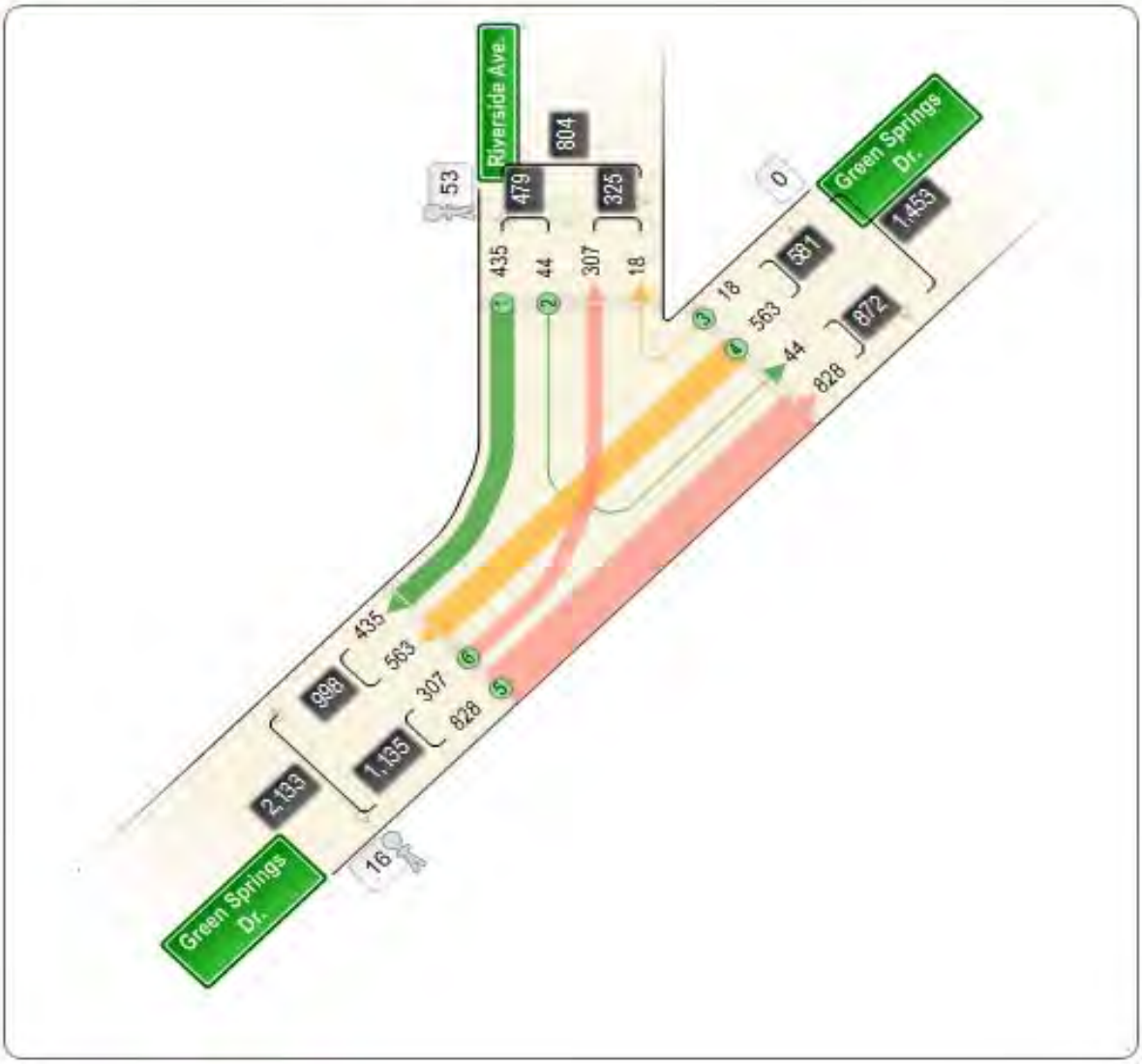
Date: 5/12/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18192010
Street Number: 3972
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Green Springs Dr. @ Riverside Ave.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

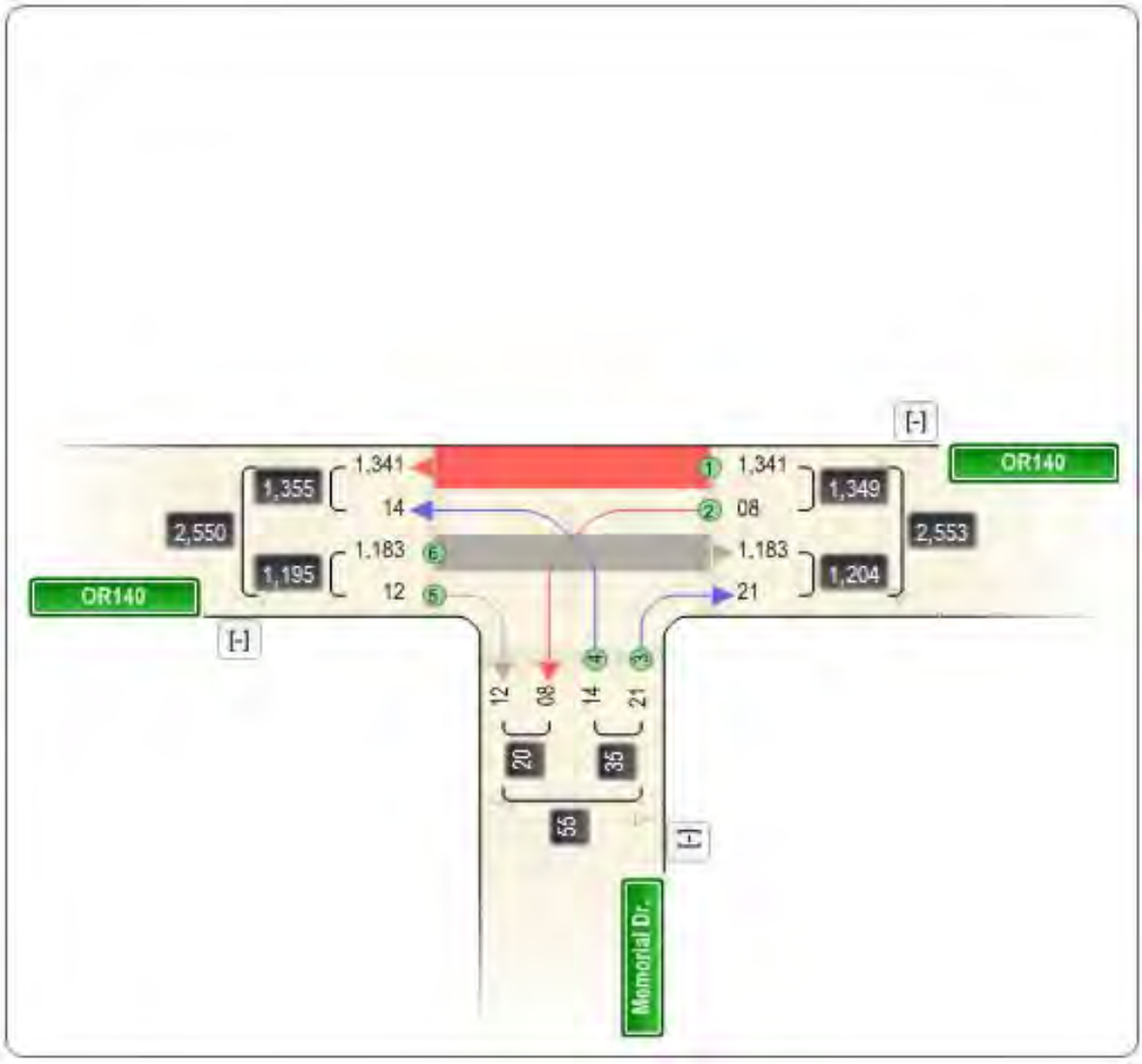
Date: 4/28/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18752010
Mile Point: 0.64
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Memorial Dr. 3 hr count site 4545 west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

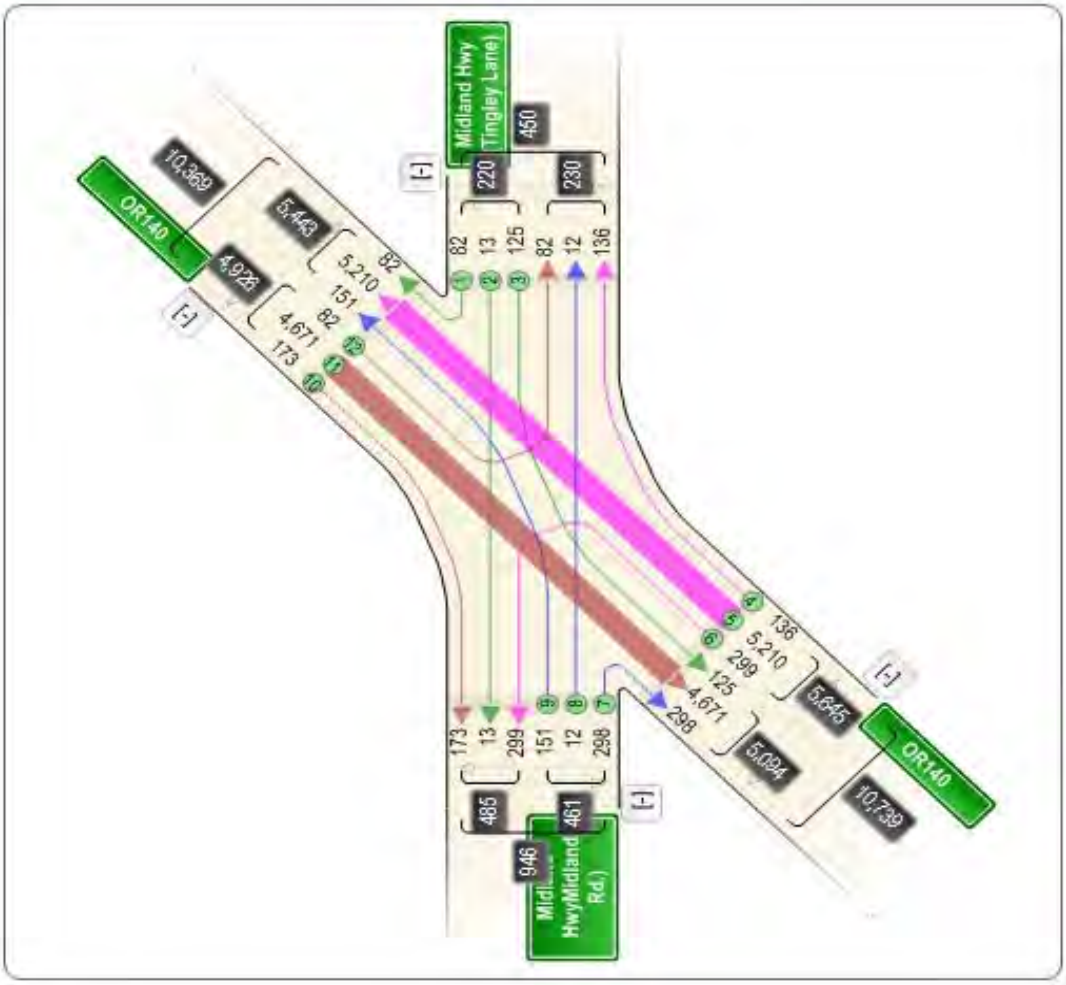
Date: 4/28/2010-4/29/2010
Hours: 4/28/2010 9:00 AM-4/29/2010 9:00 AM
Weather: Cloudy

Source

Site Number: 18622010
Mile Point: 1.56
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: S Klamath Falls Hwy(OR140)) @ Midland Hwy(Tingley Lane) site 4546 - nw leg site 4547 - se leg site 4528- n leg site 4531 - south leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

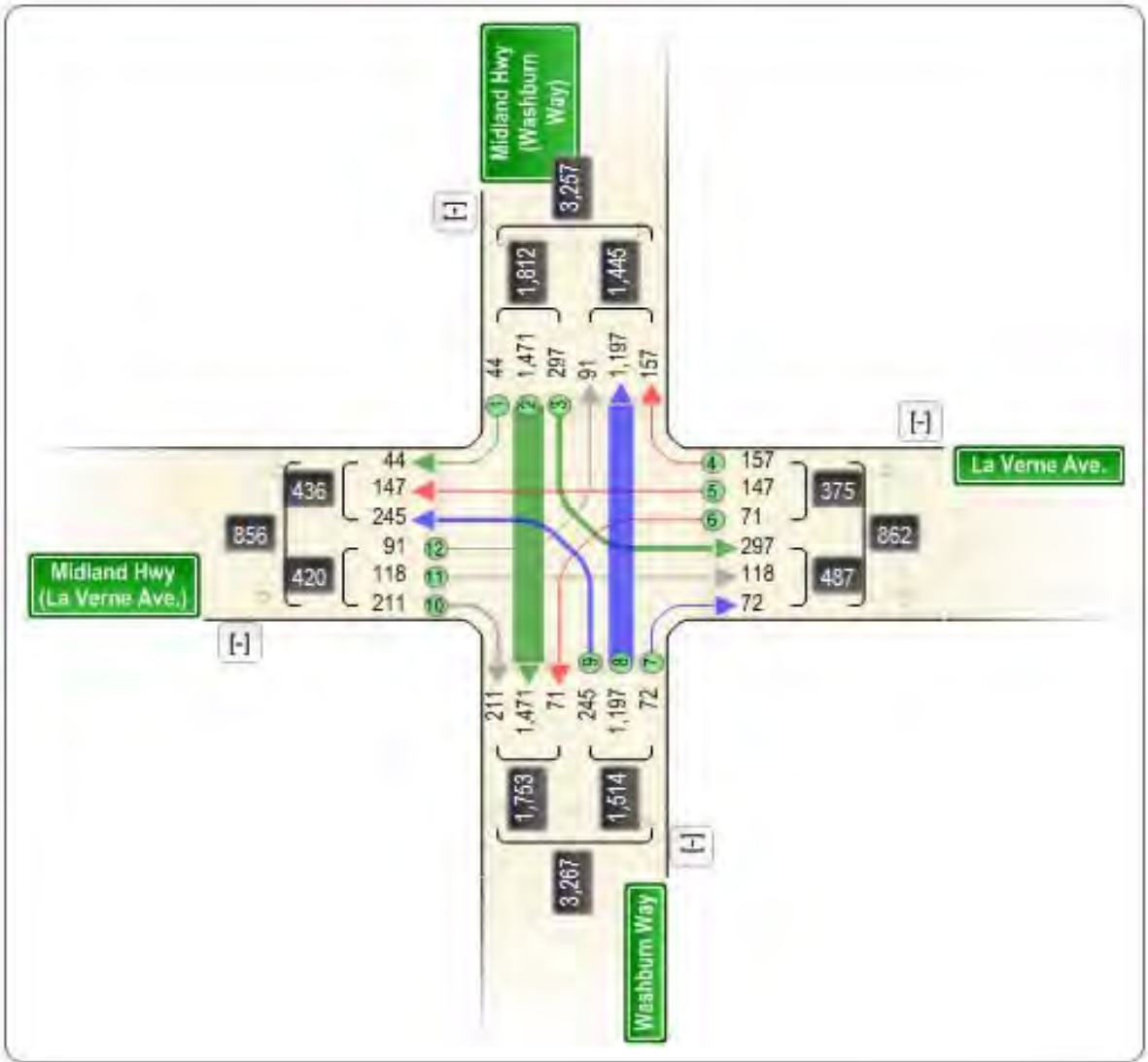
Date: 4/27/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18782010
Mile Point: 1.33
Street Number: 420
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Midland Hwy(La Verne Ave.) @ Washburn Way
3 hr count site 4528 - west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

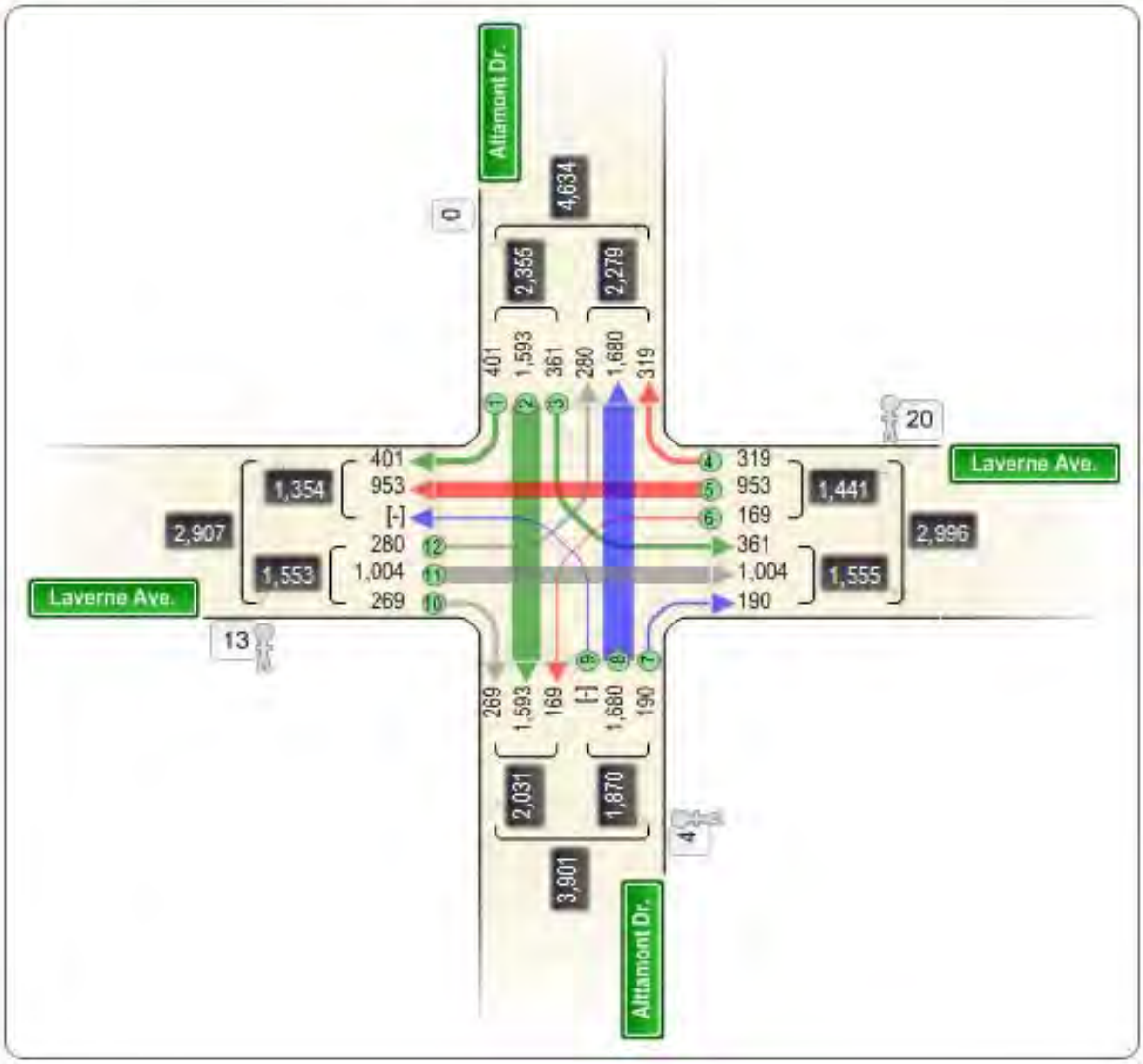
Date: 3/3/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18142010
Street Number: 3979
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Altamont Dr. @ Laverne Ave.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

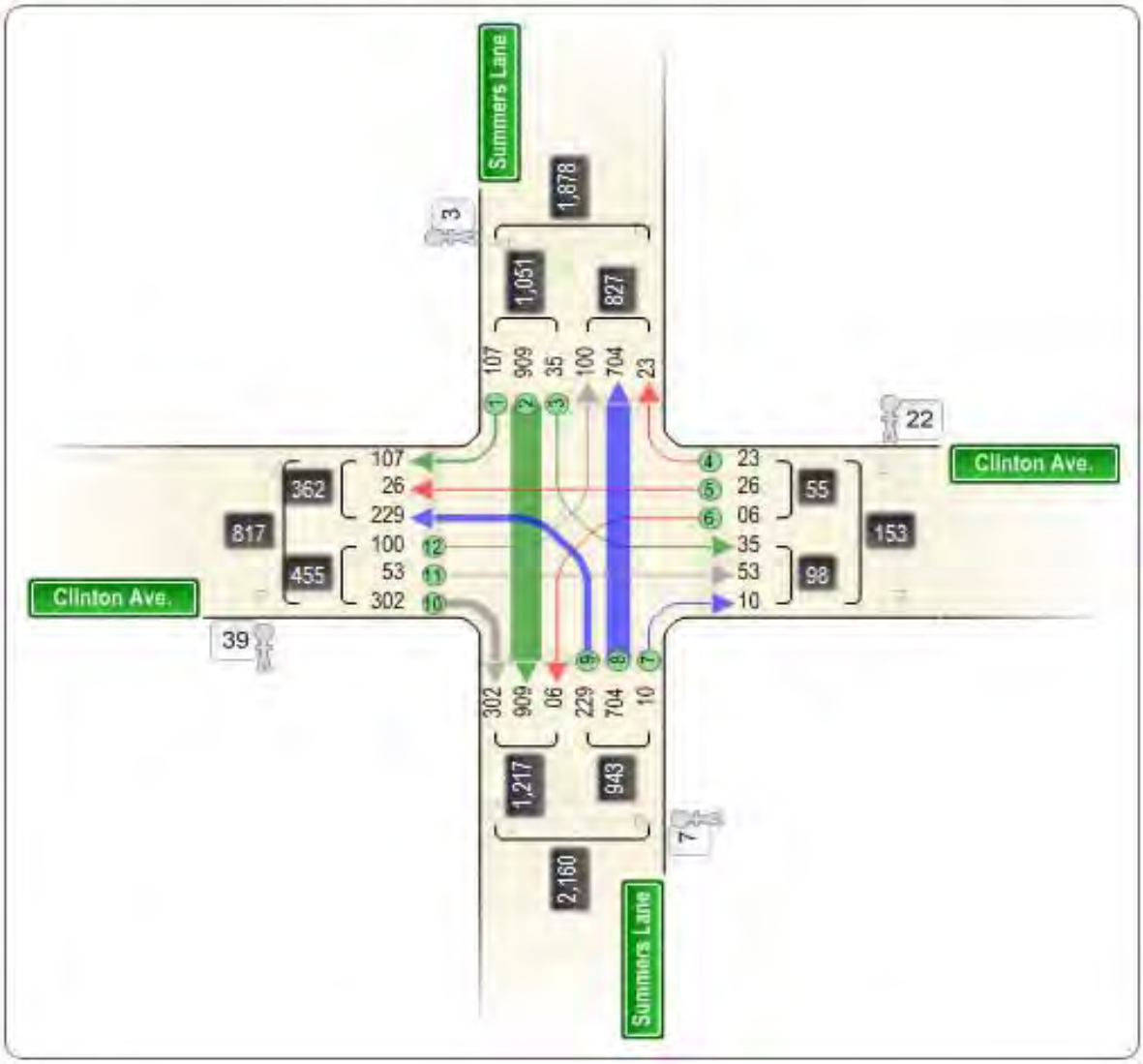
Date: 4/19/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18762010
Street Number: 3970
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Summers Lane @ Clinton Ave. 3hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

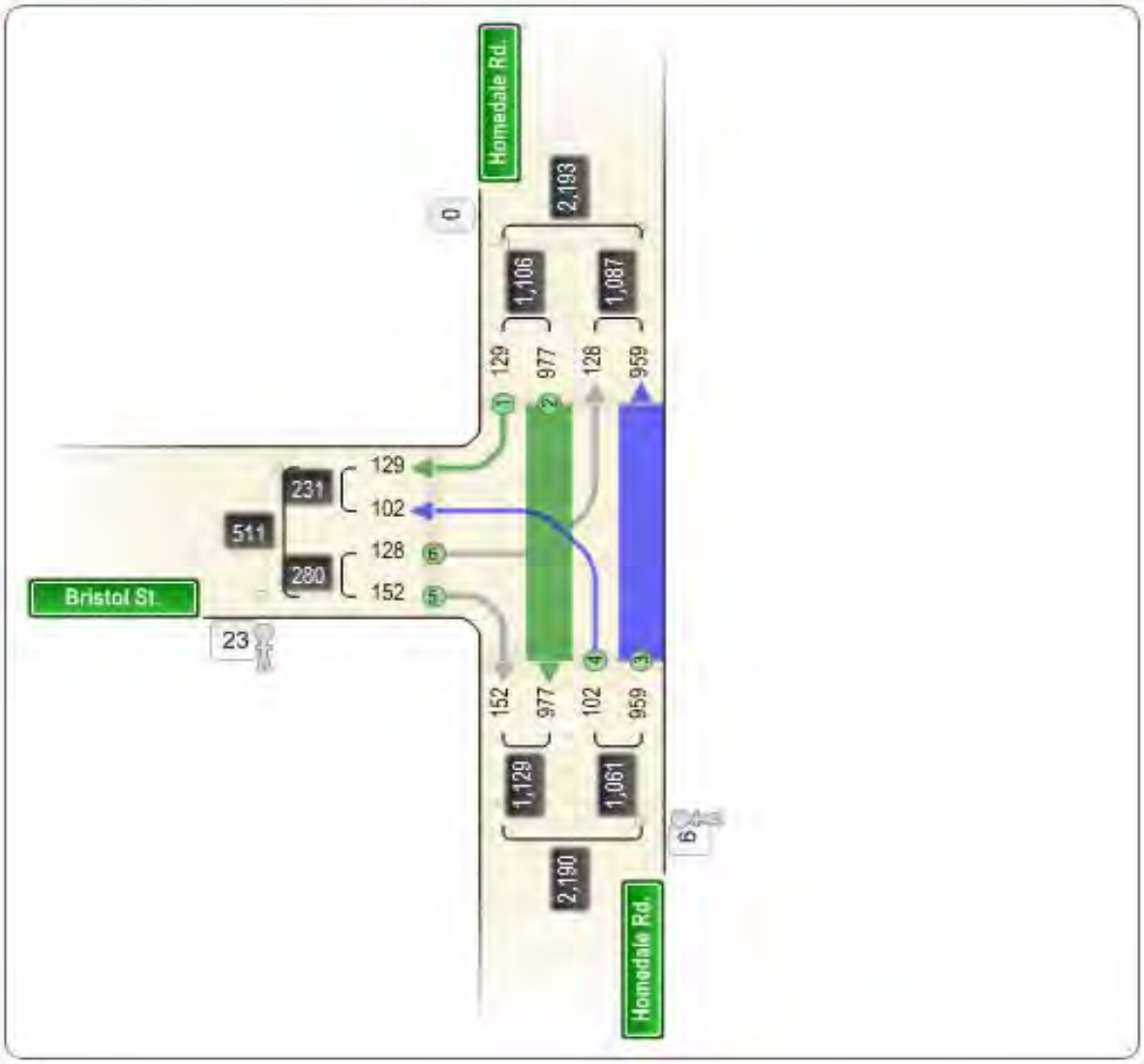
Date: 5/3/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18472010
Street Number: 3969
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Homedale Rd. @ Bristol St. 3 hr count
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

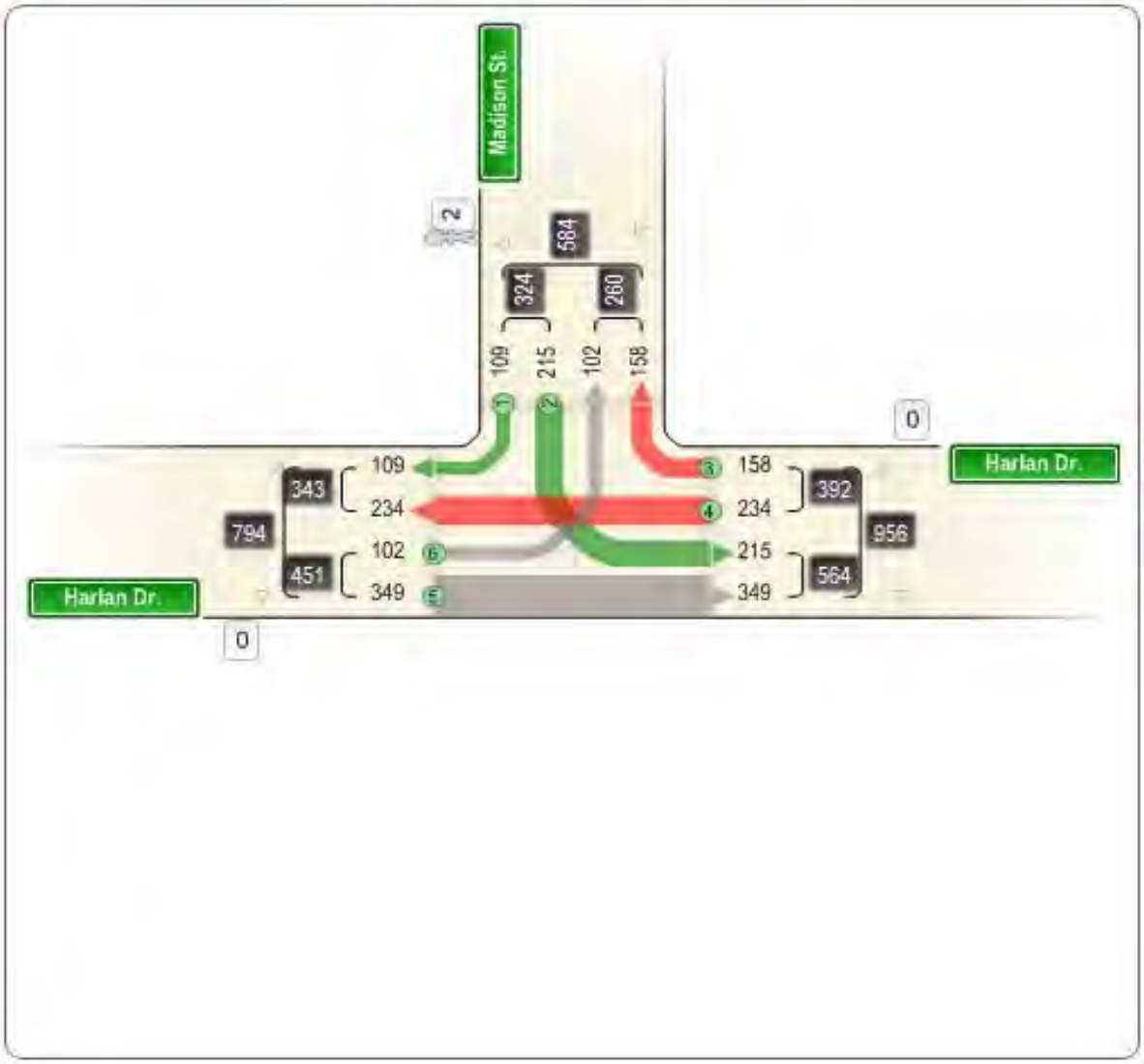
Date: 4/19/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18562010
Street Number: 8140
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: Madison St. @ Harlan Dr. 3 hr count
County: Klamath
City: Klamath Falls



OR 39 & OR 140

	Southbound Vehicles			Westbound Vehicles			Northbound Vehicles			Eastbound Vehicles		
	12	13	14	23	24	21	34	31	32	41	42	43
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
04:00-05:00P	342	279	0	56	0	175	0	240	67	0	0	0
05:00-06:00P	413	326	0	63	0	144	0	247	79	0	0	0

	Southbound HV %			Westbound HV %			Northbound HV %			Eastbound HV %		
	12	13	14	23	24	21	34	31	32	41	42	43
	SB LT	SB TH	SB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	EB LT	EB TH	EB RT
04:00-05:00P	5	9	0	36	0	7	0	8	15	0	0	0
05:00-06:00P	3	4	0	21	0	8	0	7	11	0	0	0

Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

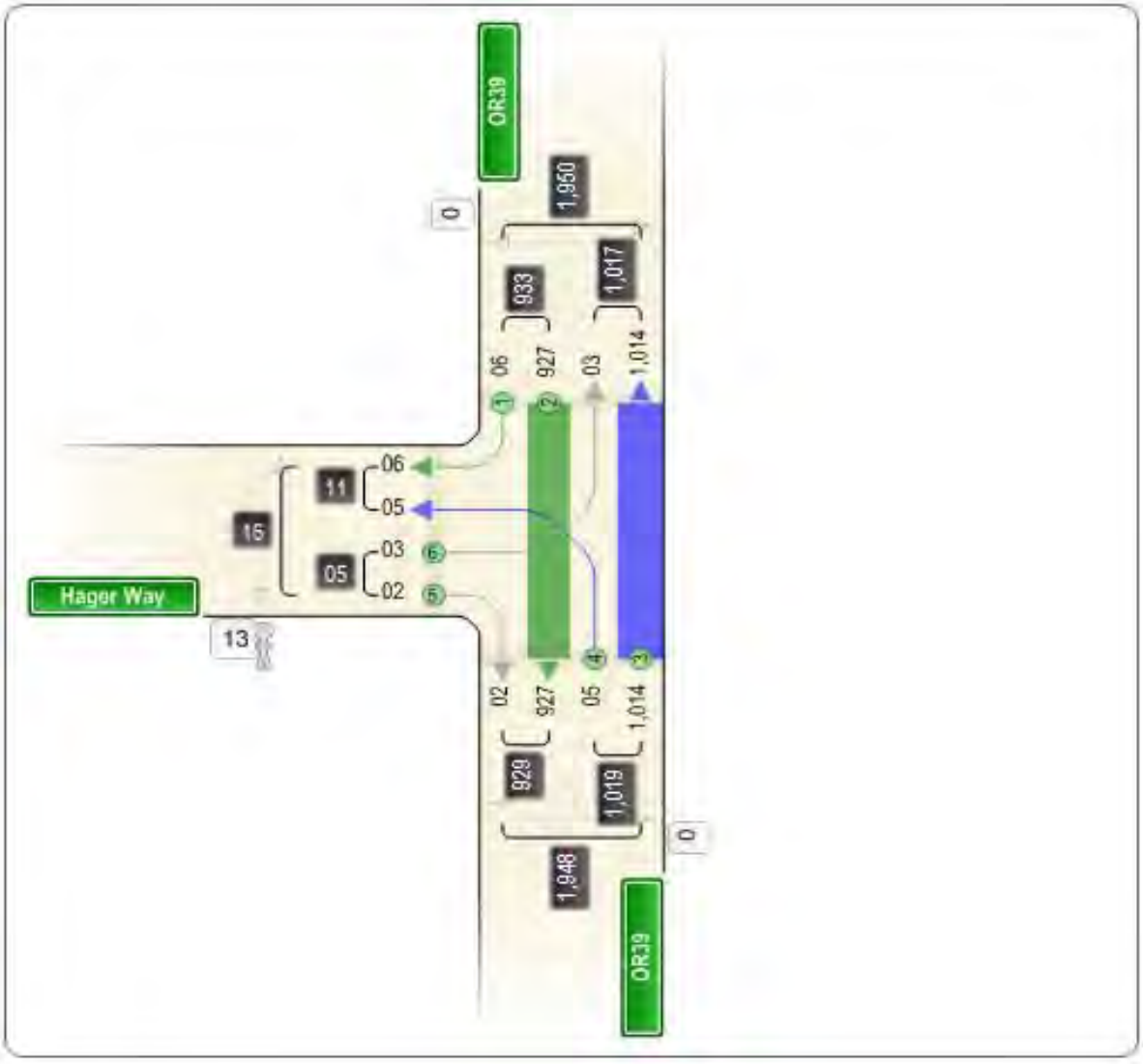
Date: 5/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18712010
Mile Point: 0.31
Street Number: 050
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR39 @ Hager Way - 3 hr count site 2483 - north leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

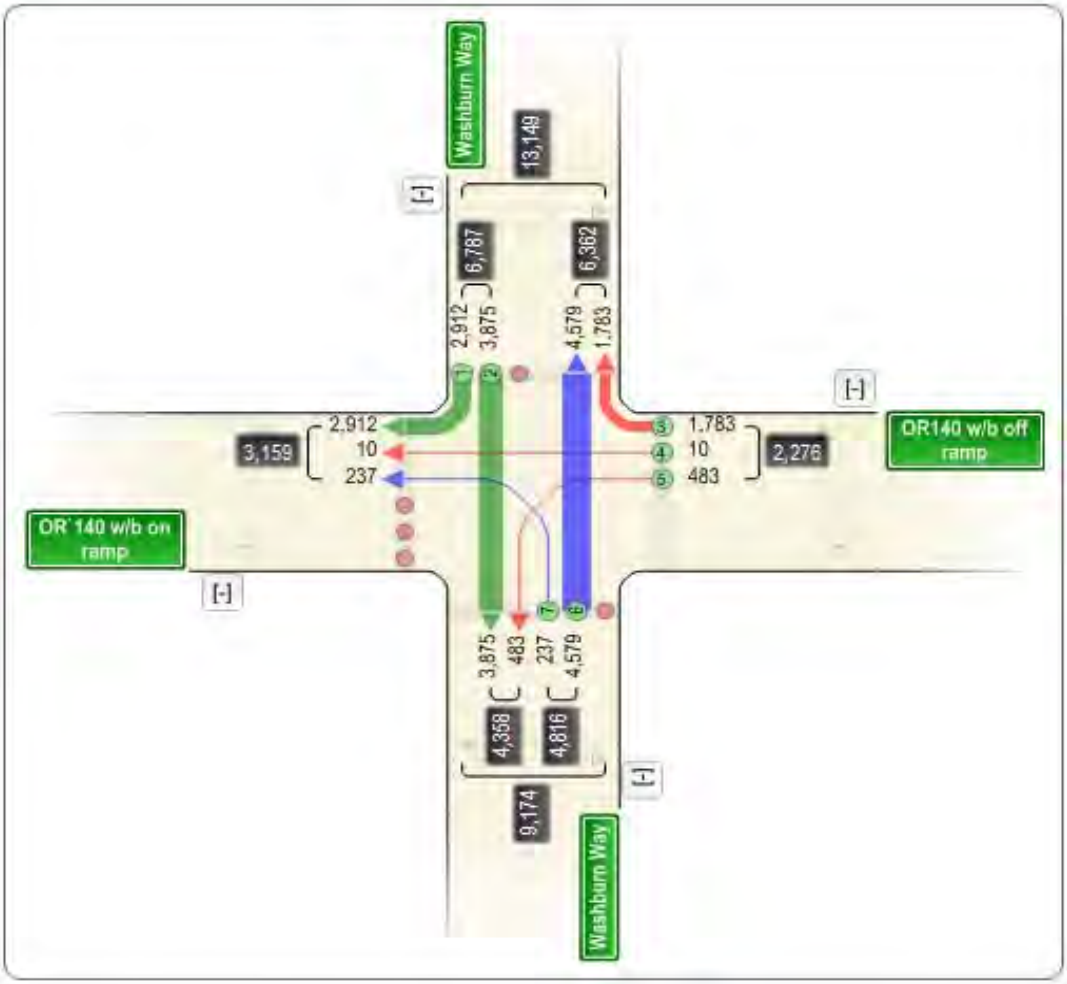
Date: 5/11/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18262010
Mile Point: 2.80
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: South Klamath Falls Hwy(OR140) w/b on/off ramps @Washburn Wa
site 15181 424AD w/b off ramp
site 15182 424AE w/b on ramp
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 5/19/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

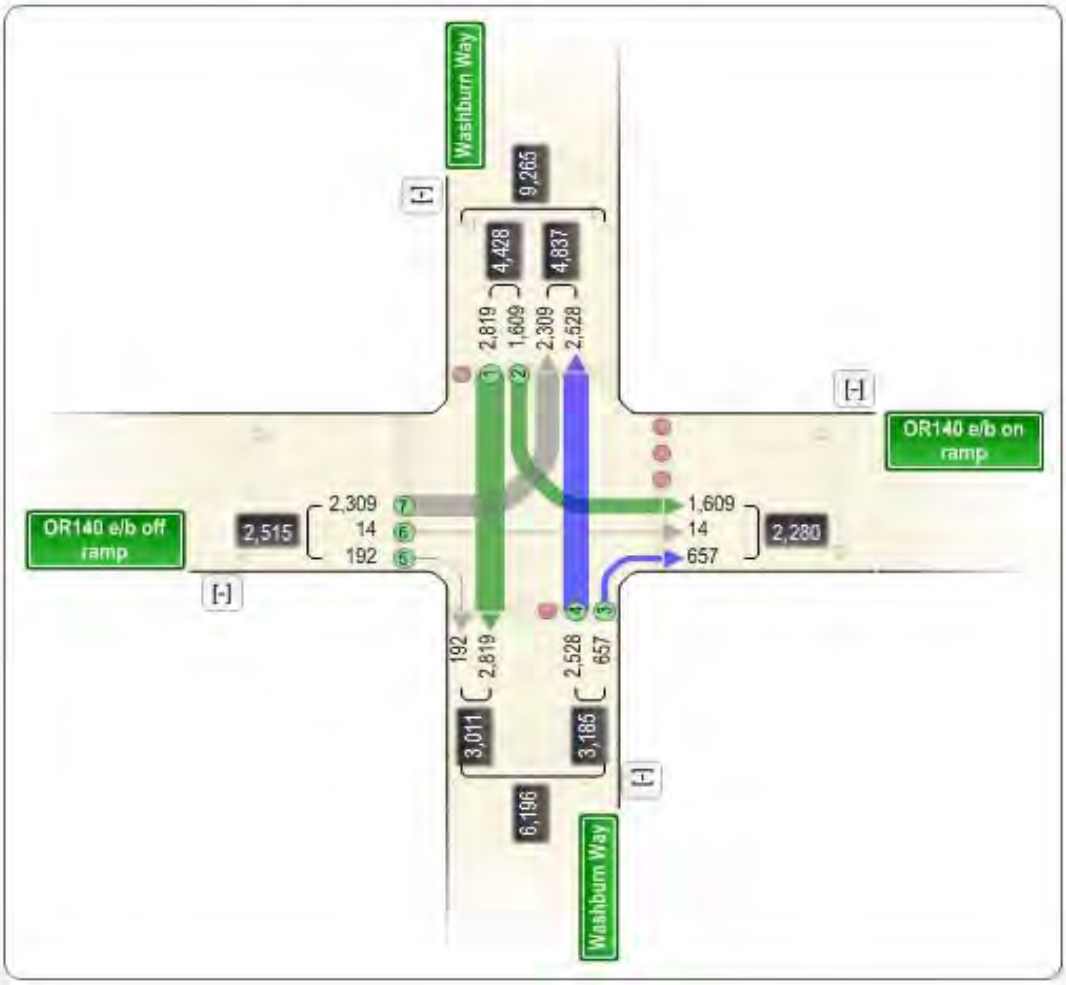
Site Number: 18332010
Mile Point: 2.68
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 e/b on/off ramps @ Washburn Way

e/b off ramp 424AA site 15178
e/b on ramp 424AC site 15180

County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

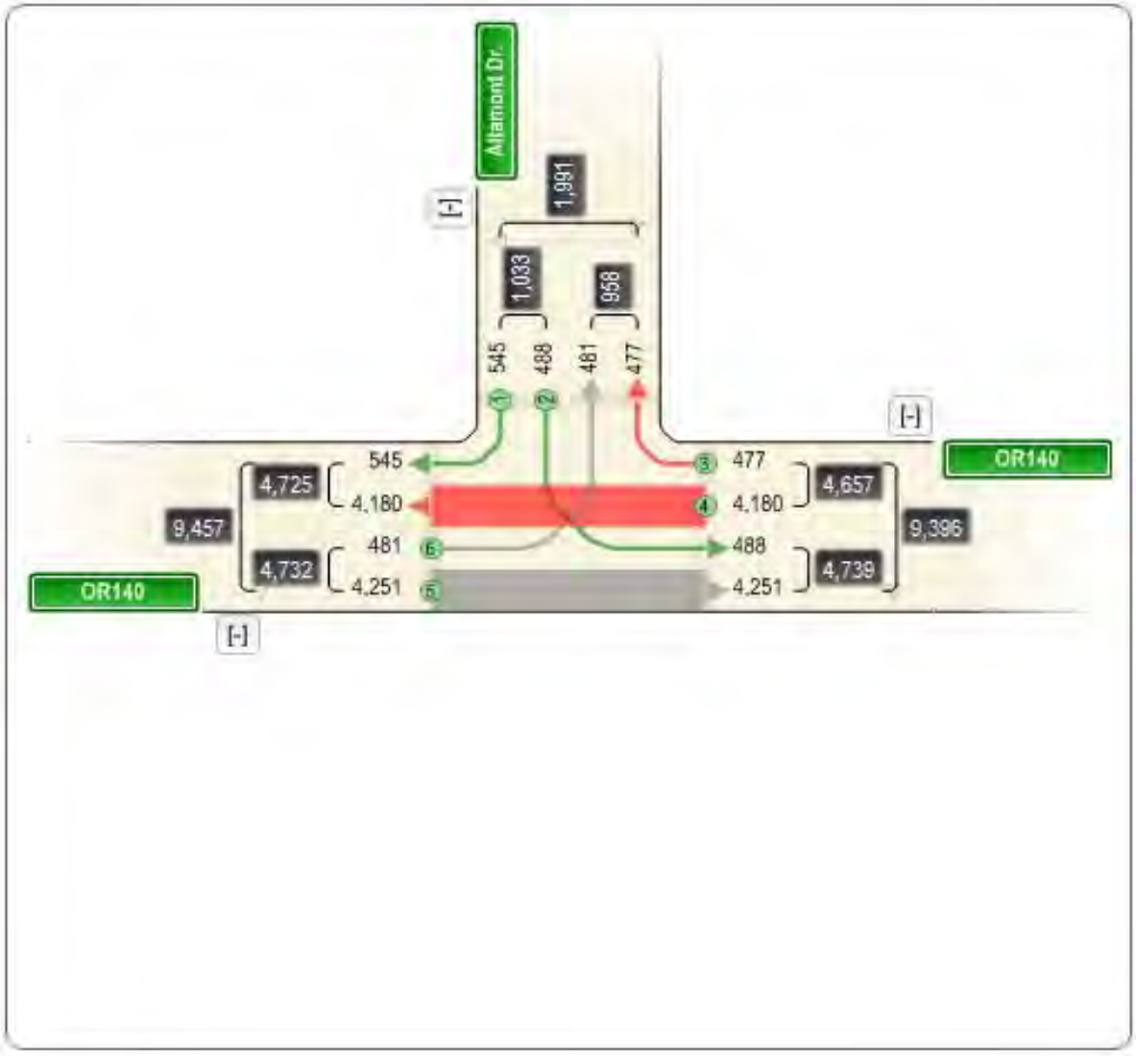
Date: 4/20/2010-4/21/2010
Hours: 4/20/2010 9:00 AM-4/21/2010 9:00 AM
Weather: Cloudy

Source

Site Number: 18542010
Mile Point: 3.37
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: S Klamath Falls Hwy(OR140) @ Altamont Dr.
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

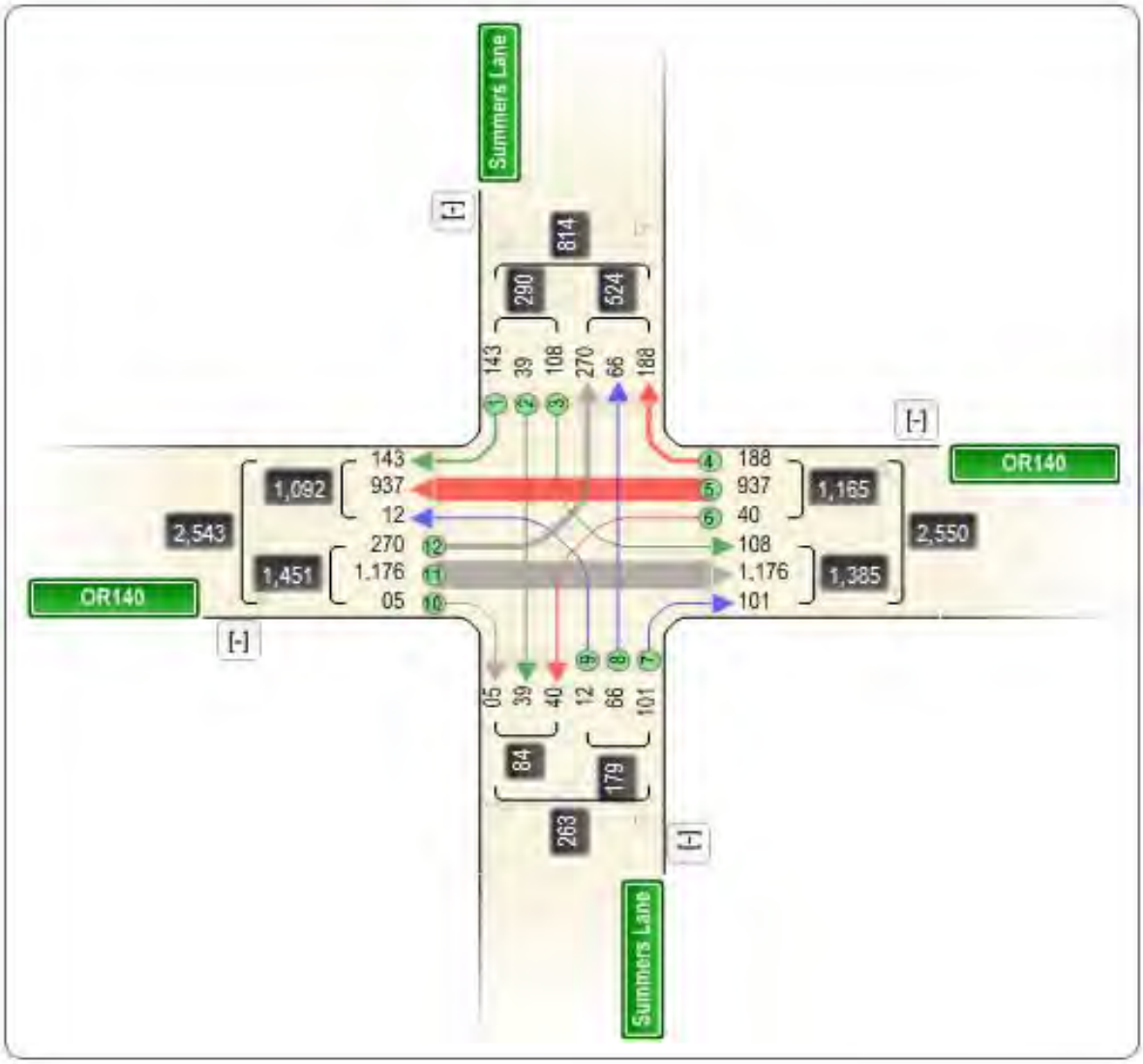
Date: 5/5/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18392010
Mile Point: 3.87
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Summers Lane 3 hr count site 4549- west leg site 4550 - east leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

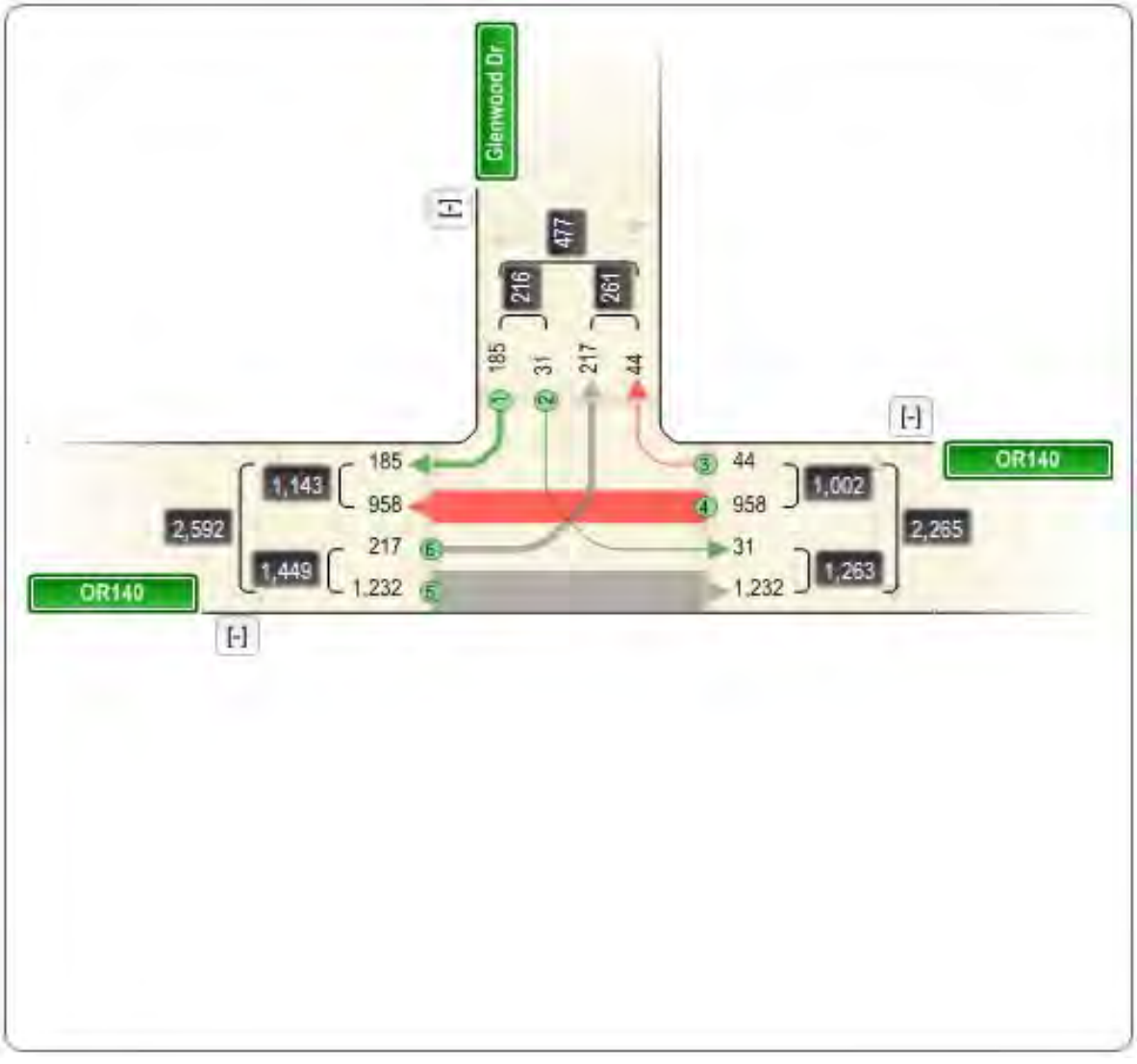
Date: 4/20/2010
Hours: 3:00 PM-6:00 PM
Weather: Cloudy

Source

Site Number: 18582010
Mile Point: 4.32
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Glenwood Dr. 3 hr count site 4551 - west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

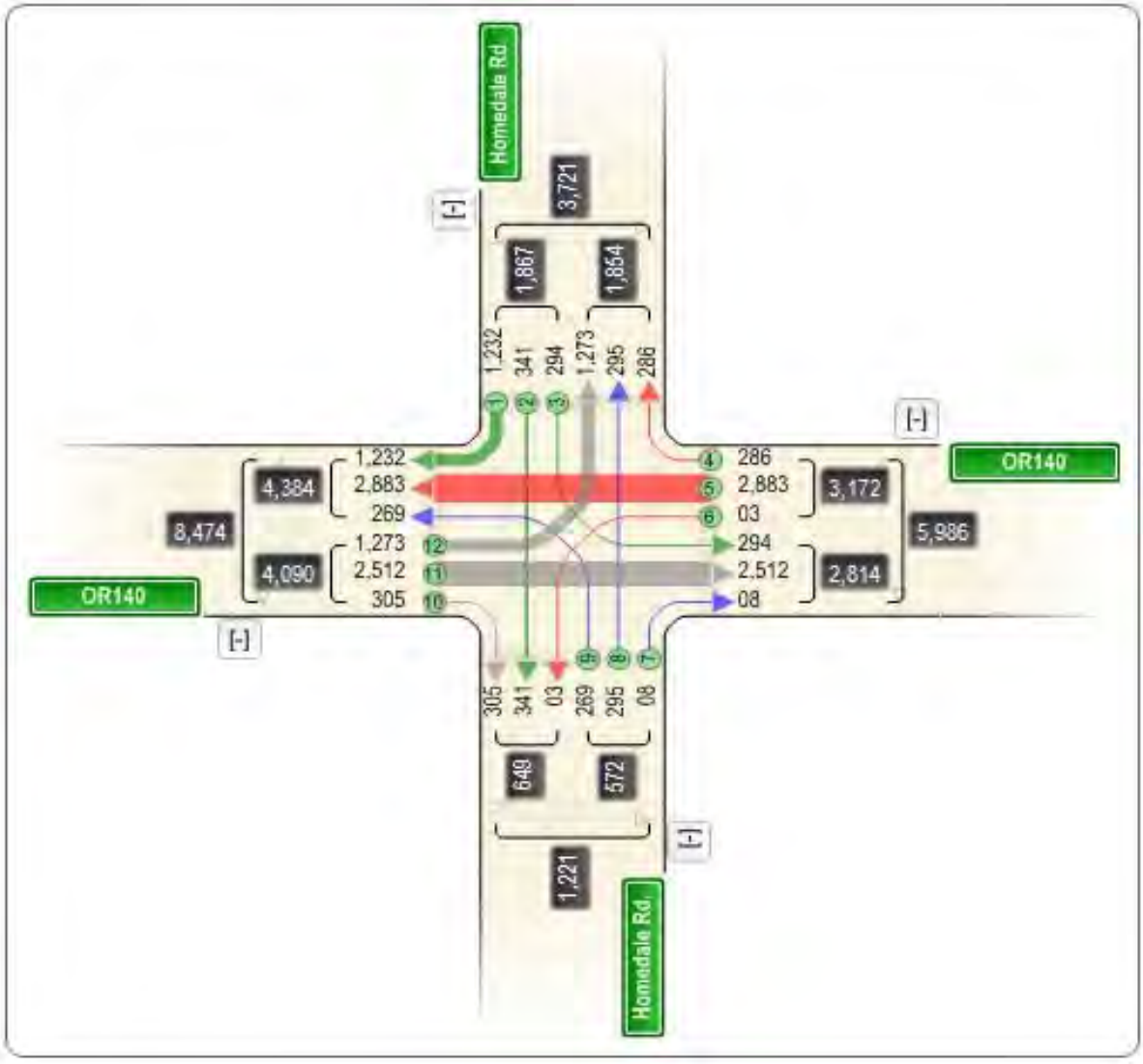
Date: 4/20/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy;Snow

Source

Site Number: 18432010
Mile Point: 4.63
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

Source Description

Location Description: OR140 @ Homedale Rd. - west leg
County: Klamath
City: Klamath Falls



Transportation Development Division
Transportation System Monitoring Unit
Vehicular Volume

Time settings

Date: 3/3/2010
Hours: 6:00 AM-10:00 PM
Weather: Cloudy

Source

Site Number: 18062010
Mile Point: 5.97
Street Number: 424
Vehicle Type: Vehicles
Crossing Flow: Pedestrians

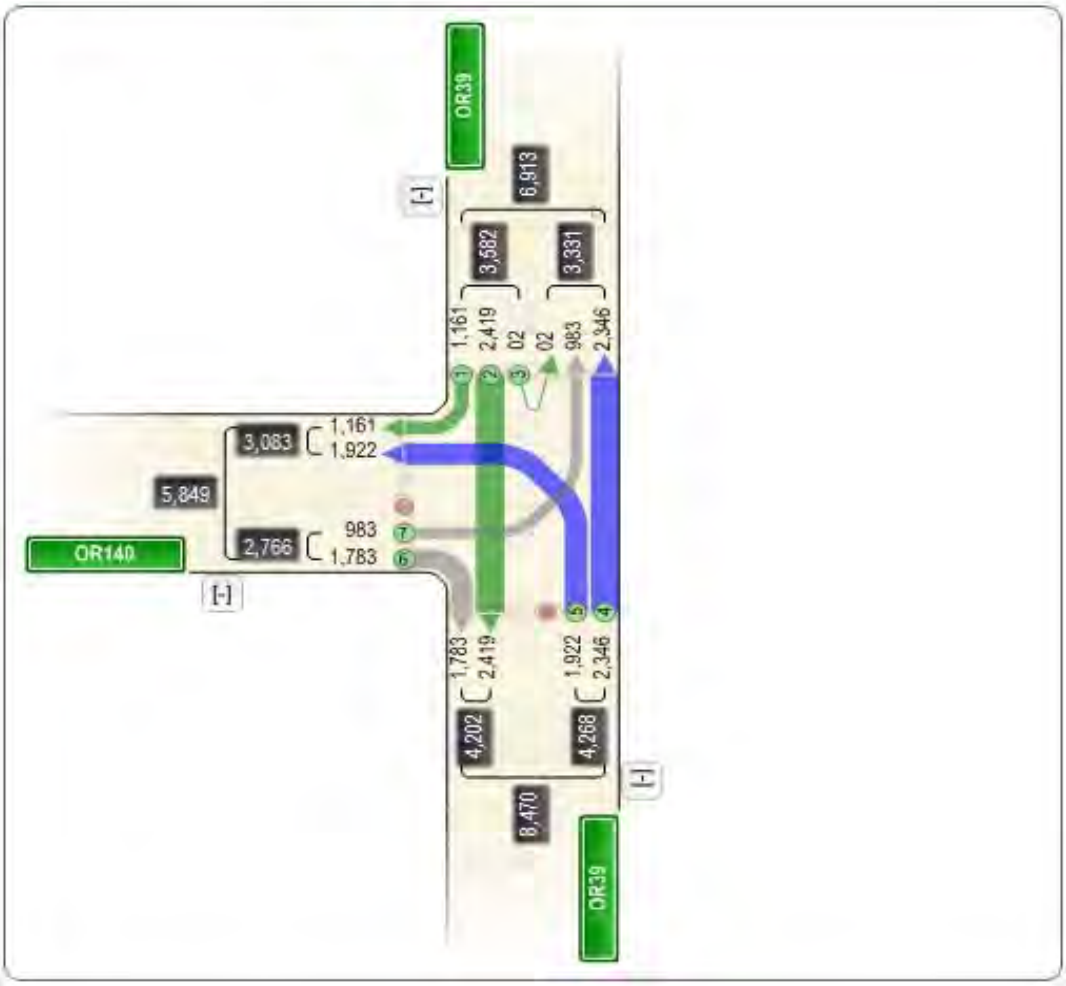
Source Description

Location Description: South Klamath Falls hwy(OR140) @ Klamath Falls-Malin Hwy(OR39)

hwy 39 = mp 1.78

site 4552 - west leg
site 2484 - north leg
site 2485 - south leg

County: Klamath
City: Klamath Falls



APPENDIX B – METHODOLOGY MEMORANDUM

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

MEMORANDUM

Date: March 9, 2011 Project #: 11172.0

To: Peter Schuytema, P.E., ODOT TPAU
CC: Project Management Team

From: Marc Butorac, P.E., Erin Ferguson, and Matt Kittelson
Project: City of Klamath Falls Transportation System Plan Update
Subject: Project Methodology & Key Assumptions

The purpose of this memorandum is to document the methodology and key assumptions to be used in preparation of the existing and future conditions analyses for the City of Klamath Falls Transportation System Plan (TSP) Update. The methodologies included in this memorandum are based on guidance provided in the Oregon Department of Transportation (ODOT) *Transportation System Plan Guidelines* (Reference 1) and the *Analysis Procedures Manual* (APM – Reference 2) as they relate to small urban areas.

STUDY INTERSECTIONS

Traffic counts were conducted by ODOT over a several month period during the early months of 2010 at the study intersections. These counts were conducted as part of the effort for this TSP update as well as the Greensprings IAMP. Table 1 below includes a list of the study intersections for this project, the date the traffic count was collected, and the specific count type conducted for each location. At a minimum, peak hour turning movement counts were collected in 15 minute intervals at each location during the evening peak period.

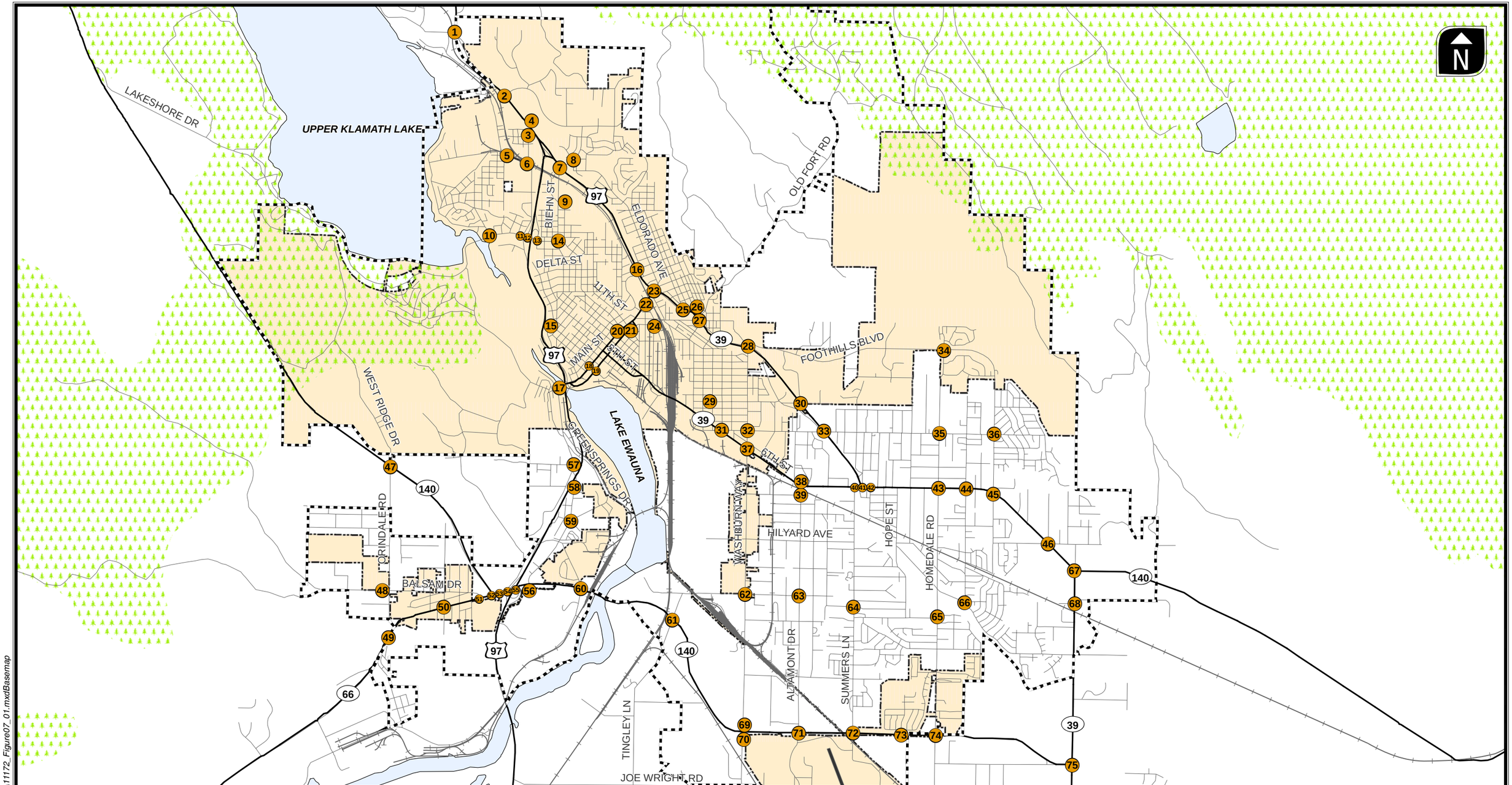
Table 1 Traffic Counts Summary

Intersection	Count Date	Count Type
1. US 97 &* Lakeport Blvd	4/7/2010	3 Hour Peak Count
2. US 97 & Dan O'Brien Way	5/17/2010	3 Hour Peak Count
3. US 97 SB & Coli Ave	5/13/2010	16 Hour Count
4. US 97 NB & Coli Ave	5/13/2010	16 Hour Count
5. Lakeport Blvd & Hanks St	4/6/2010	3 Hour Peak Count
6. Quarry St & Lakeport Blvd	4/7/2010	3 Hour Peak Count
7. OR 39 & Biehn St/Campus Dr	7/20/2010	16 Hour Count
8. Dahila St & Campus Dr	2/22/2010	4 Hour Peak Count
9. Biehn St & Lakeport Blvd	4/5/2010	3 Hour Peak Count
10. California Ave & Nevada St	4/26/2010	3 Hour Peak Count
11. Montelius St & Nevada St	5/17/2010	16 Hour Count

Intersection	Count Date	Count Type
12. US 97 SB Off-Ramp & Nevada St	5/17/2010	16 Hour Count
13. US 97 NB Ramps & Oregon Ave	5/19/2010	16 Hour Count
14. Biehn St & Oregon Ave	4/5/2010	3 Hour Peak Count
15. 3rd St & California Ave	4/12/2010	3 Hour Peak Count
16. OR 39 & Portland St	4/15/2009	24 Hour Count
17. US 97 SB Ramps & Main St	5/13/2010	16 Hour Count
18. 3rd St & Main St	4/13/2010	3 Hour Peak Count
19. 3rd St & Klamath Ave	4/26/2010	3 Hour Peak Count
20. 9th St & Main St	4/13/2010	3 Hour Peak Count
21. 11th St & Klamath Ave	4/13/2010	3 Hour Peak Count
22. Spring St & Esplanade St	4/26/2010	3 Hour Peak Count
23. Esplanade St & OR 39	3/8/2010	16 Hour Count
24. Spring St & Main St	4/26/2010	3 Hour Peak Count
25. Pacific Terrace & OR 39	4/6/2010	3 Hour Peak Count
26. Hillside Dr & Hubert St	3/4/2010	16 Hour Count
27. OR 39 & Main St	4/7/2010	3 Hour Peak Count
28. Washburn Way & OR 39	3/3/2010	16 Hour Count
29. E Main St & Eberlein Ave	5/4/2010	3 Hour Peak Count
30. OR 39 & Eberlein Ave	4/6/2010	3 Hour Peak Count
31. S 6th St & Shasta Way	4/14/2010	3 Hour Peak Count
32. Washburn Way & Shasta Way	3/2/2010	16 Hour Count
33. OR 39 & Shasta Way	5/11/2010	16 Hour Count
34. Homedale Rd & Foothills Blvd	5/3/2010	3 Hour Peak Count
35. Homedale Rd & Shasta Way	5/31/2010	3 Hour Peak Count – Volume Only
36. Patterson St & Shasta Way	5/3/2010	3 Hour Peak Count – Volume Only
37. Washburn Way & S 6th St	2010 9 30	2 Hour Peak Count
38. Altamont Dr & S 6th St	2010 9 30	2 Hour Peak Count
39. Altamont Dr & Crosby Ave	4/19/2010	3 Hour Peak Count
40. Summers Ln & S 6th St	4/14/2010	3 Hour Peak Count
41. OR 39 & s 6th St	2010 9 30	2 Hour Peak Count
42. Fargo St & OR 39	4/14/2010	3 Hour Peak Count
43. Homedale Rd & OR 39	8/7/2007	2 Hour Count
44. Madison St & OR 39	5/4/2010	3 Hour Peak Count
45. Patterson St & OR 39	3/31/2010	16 Hour Count
46. OR 39 & Hilyard Ave	5/5/2010	3 Hour Peak Count
47. Orindale Rd & OR 140	5/5/2010	3 Hour Peak Count

Intersection	Count Date	Count Type
48. Orindale Rd & Balsam Dr	4/12/2010	3 Hour Peak Count
49. Orindale Rd & OR 66	5/5/2010	3 Hour Peak Count
50. Emerald St & OR 66	4/28/2010	3 Hour Peak Count
51. Balsam Dr & OR 66	4/28/2010	3 Hour Peak Count
52. OR 140 & OR 66	2/23/2010	16 Hour Count
53. Delap Rd & OR 66	2/24/2010	16 Hour Count
54. US 97 SB Ramps & OR 140	2/24/2010	16 Hour Count
55. US 97 NB Ramps & OR 140	6/61/2010	16 Hour Count
56. Green Springs Dr & OR 140	4/27/2010	3 Hour Peak Count
57. Riverside Dr & Lindley Way	4/12/2010	3 Hour Peak Count
58. Riverside Dr & Autumn Ave	4/12/2010	3 Hour Peak Count
59. Green Springs Dr & Dover Ave	5/12/2010	16 Hour Count
60. Memorial Dr & OR 140	4/28/2010	3 Hour Peak Count
61. Midland Hwy & OR 140	4/28/2010	3 Hour Peak Count
62. Washburn Way & Laverne Ave	4/27/2010	3 Hour Peak Count
63. Altamont Dr & Laverne Ave	3/3/2010	16 Hour Count
64. Summers Ln & Clinton Ave	4/19/2010	3 Hour Peak Count
65. Homedale Rd & Bristol St	5/3/2010	3 Hour Peak Count
66. Madison St & Harlan Dr	4/19/2010	3 Hour Peak Count
67. OR 39 & OR 140 (Big Y)	8/27/2007	24 Hour Count
68. OR 39 & Hager Way	5/5/2010	3 Hour Peak Count
69. Washburn Way & OR 140 WB Ramps	5/11/2010	16 Hour Count
70. Washburn Way & OR 140 EB Ramps	5/19/2010	16 Hour Count
71. Altamont Dr & OR 140	4/20/2010	3 Hour Peak Count
72. Summers Ln & OR 140	5/5/2010	3 Hour Peak Count
73. Glenwood Dr & OR 140	4/20/2010	3 Hour Peak Count
74. Homedale Rd & OR 140	4/20/2010	3 Hour Peak Count
75. OR 39 & OR 140	3/3/2010	16 Hour Count

Figure 1 shows the location of each of the study intersections.



Legend

- UGB
- City Limits
- ## Study Intersection

Study Intersections

Figure 1

H:\profile\11172 - Klamath Falls TSP\gis\11172_Figure07_01.mxdBasemap

PM Peak Hour Development

Because the travel demand model that will be used to generate the future conditions analysis will produce traffic volumes representative of a 1-hour weekday p.m. peak that is assumed to occur between 3:00 and 6:00 p.m., intersections were assumed to peak within this time frame. A system-wide peak hour factor was found to occur between 4:30 and 5:30 p.m. As such, the analysis for this study considers traffic volumes for each intersection during that time period. Table 2 below shows total entering volumes for all study intersections by time period.

Table 2 PM Peak Hour Development

All Study Intersections		
Time	**Total Entering Volumes**	**% Dif from Peak**
3:00-4:00	62,429	-15.08%
3:15-4:15	64,534	-12.21%
3:30-4:30	66,119	-10.06%
3:45-4:45	67,376	-8.35%
4:00-5:00	68,849	-6.34%
4:15-5:15	71,163	-3.19%
4:30-5:30	**73,511**	0.00%
4:45-5:45	72,118	-1.89%
5:00-6:00	69,620	-5.29%

Intersection Operational Standards

ODOT Facilities

ODOT uses volume-to-capacity (V/C) ratio standards to assess intersections operations. Table 6 of the *Oregon Highway Plan* (OHP - Reference 3) and Table 10-1 of the *Oregon Highway Design Manual* (HDM – Reference 4) provide maximum volume-to-capacity ratios for all signalized and unsignalized intersections outside the Metro area. The OHP ratios are used to evaluate existing and future no-build conditions, while the HDM ratios are used in the creation of future TSP alternatives which involve projects along state highways.

City of Klamath Falls and Klamath County Facilities

The City of Klamath Falls and Klamath County have established LOS "E" for the poorest operating approach as the performance standard for unsignalized intersections and LOS "D" as the performance standard for signalized intersections. The performance of the study intersections under control of either of these jurisdictions will be compared to these performance standards

Study Intersections

The performance standards for each study intersection, based on the criteria listed above, are displayed in Table 3 below.

Table 3 Summary of Intersection Performance Standards

Intersection	Jurisdiction	Control	Performance Standard	
			Control Standard	HDM Standard
1. US 97 &* Lakeport Blvd	ODOT	Stop-Controlled	0.90 v/c	0.70
2. US 97 & Dan O'Brien Way	ODOT	Stop-Controlled	0.90 v/c	0.70
3. US 97 SB & Coli Ave	ODOT	Stop-Controlled	0.90 v/c	0.70
4. US 97 NB & Coli Ave	ODOT	Stop-Controlled	0.90 v/c	0.70
5. Lakeport Blvd & Hanks St	City of Klamath Falls	Yield-Controlled	LOS "E"	-
6. Quarry St & Lakeport Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"	-
7. OR 39 & Biehn St/Campus Dr	ODOT	Signalized	0.70 v/c	-
8. Dahila St & Campus Dr	City of Klamath Falls	Signalized	LOS "D"	-
9. Biehn St & Lakeport Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"	-
10. California Ave & Nevada St	City of Klamath Falls	Stop-Controlled	LOS "E"	-
11. Montelius St & Nevada St	City of Klamath Falls	Stop-Controlled	LOS "E"	-
12. US 97 SB Off-Ramp & Nevada St	ODOT	Stop-Controlled	0.85 v/c	0.80
13. US 97 NB Ramps & Oregon Ave	ODOT	Stop-Controlled	0.85 v/c	0.80
14. Biehn St & Oregon Ave	City of Klamath Falls	Stop-Controlled	LOS "E"	-
15. 3rd St & California Ave	City of Klamath Falls	Stop-Controlled	LOS "E"	-
16. OR 39 & Portland St	ODOT	Stop-Controlled	0.75 v/c	0.75
17. US 97 SB Ramps & Main St	ODOT	Stop-Controlled	0.85 v/c	0.80
18. 3rd St & Main St	City of Klamath Falls	Stop-Controlled	LOS "E"	-
19. 3rd St & Klamath Ave	City of Klamath Falls	Stop-Controlled	LOS "E"	-
20. 9th St & Main St	City of Klamath Falls	Signalized	LOS "D"	-
21. 11th St & Klamath Ave	City of Klamath Falls	Stop-Controlled	LOS "E"	-
22. Spring St & Esplanade St	ODOT	Stop-Controlled	0.90 v/c	0.80
23. Esplanade St & OR 39	ODOT	Signalized	0.85 v/c	-
24. Spring St & Main St	City of Klamath Falls	Signalized	LOS "D"	-

Intersection	Jurisdiction	Control	Performance Standard	
			Control Standard	HDM Standard
25. Pacific Terrace & OR 39	ODOT	Signalized	0.85 v/c	-
26. Hillside Dr & Hubert St	City of Klamath Falls	Stop-Controlled	LOS "E"	-
27. OR 39 & Main St	ODOT	Signalized	0.85 v/c	-
28. Washburn Way & OR 39	ODOT, Klamath County, Klamath Falls	Signalized	0.75 v/c	-
29. E Main St & Eberlein Ave	City of Klamath Falls	Stop-Controlled	LOS "E"	-
30. OR 39 & Eberlein Ave	ODOT	Stop-Controlled	0.90 v/c	0.75
31. S 6th St & Shasta Way	City of Klamath Falls	Signalized	LOS "D"	-
32. Washburn Way & Shasta Way	City of Klamath Falls	Signalized	LOS "D"	-
33. OR 39 & Shasta Way	ODOT	Signalized	0.75 v/c	-
34. Homedale Rd & Foothills Blvd	City of Klamath Falls	Stop-Controlled	LOS "E"	-
35. Homedale Rd & Shasta Way	Klamath County	Stop-Controlled	LOS "D"	-
36. Patterson St & Shasta Way	Klamath County	AWSC	LOS "E"	-
37. Washburn Way & S 6th St	City of Klamath Falls	Signalized	LOS "D"	-
38. Altamont Dr & S 6th St	ODOT, Klamath County	Signalized	0.85 v/c	-
39. Altamont Dr & Crosby Ave	Klamath County	Stop-Controlled	LOS "E"	-
40. Summers Ln & S 6th St	ODOT	Signalized	0.85 v/c	-
41. OR 39 & s 6th St	ODOT	Signalized	0.75 v/c	-
42. Fargo St & OR 39	ODOT	Stop-Controlled	0.90 v/c	0.75
43. Homedale Rd & OR 39	ODOT	Signalized	0.85 v/c	-
44. Madison St & OR 39	ODOT	Signalized	0.85 v/c	-
45. Patterson St & OR 39	ODOT	Signalized	0.75 v/c	-
46. OR 39 & Hilyard Ave	ODOT	Stop-Controlled	0.90 v/c	0.75
47. Orindale Rd & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
48. Orindale Rd & Balsam Dr	Klamath County	Stop-Controlled	LOS "E"	-

Intersection	Jurisdiction	Control	Performance Standard	
			Control Standard	HDM Standard
49. Orindale Rd & OR 66	ODOT	Stop-Controlled	0.90 v/c	0.75
50. Emerald St & OR 66	ODOT	Stop-Controlled	0.90 v/c	0.75
51. Balsam Dr & OR 66	ODOT	Stop-Controlled	0.90 v/c	0.75
52. OR 140 & OR 66	ODOT	Signalized	0.70 v/c	-
53. Delap Rd & OR 66	ODOT	Stop-Controlled	0.90 v/c	0.70
54. US 97 SB Ramps & OR 140	ODOT	Stop-Controlled	0.85 v/c	0.70
55. US 97 NB Ramps & OR 140	ODOT	Stop-Controlled	0.85 v/c	0.70
56. Green Springs Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
57. Riverside Dr & Lindley Way	Klamath County	Stop-Controlled	LOS “E”	-
58. Riverside Dr & Autumn Ave	Klamath County	Stop-Controlled	LOS “E”	-
59. Green Springs Dr & Dover Ave	Klamath County	Stop-Controlled	LOS “E”	-
60. Memorial Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
61. Midland Hwy & OR 140	ODOT	Signalized	0.70 v/c	-
62. Washburn Way & Laverne Ave	ODOT, Klamath County, Klamath Falls	Signalized	0.90 v/c or LOS D	-
63. Altamont Dr & Laverne Ave	Klamath County	Stop-Controlled	LOS “E”	-
64. Summers Ln & Clinton Ave	Klamath County	Stop-Controlled	LOS “E”	-
65. Homedale Rd & Bristol St	Klamath County	Stop-Controlled	LOS “E”	-
66. Madison St & Harlan Dr	Klamath County	Stop-Controlled	LOS “E”	-
67. OR 39 & OR 140 (Big Y)	ODOT	Signalized	0.70 v/c	-
68. OR 39 & Hager Way	ODOT	Stop-Controlled	0.90 v/c	0.70
69. Washburn Way & OR 140 WB Ramps	ODOT	Stop-Controlled	0.85 v/c	0.80
70. Washburn Way & OR 140 EB Ramps	ODOT	Stop-Controlled	0.85 v/c	0.80
71. Altamont Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
72. Summers Ln & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70

Intersection	Jurisdiction	Control	Performance Standard	
			Control Standard	HDM Standard
73. Glenwood Dr & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
74. Homedale Rd & OR 140	ODOT	Stop-Controlled	0.90 v/c	0.70
75. OR 39 & OR 140	ODOT	Stop-Controlled	0.70 v/c	0.70

Note: AWSC – All-Way Stop-Controlled

Seasonal Adjustment Factor

30th highest hour design volumes for Klamath Falls were calculated based on the traffic counts collected over the period from February to September in 2010 and the application a seasonal adjustment factor. The APM identifies three methods for identifying seasonal adjustment factors for highway traffic volumes. All three methods utilize information provided by Automatic Traffic Recorders (ATR) located in select locations throughout the State Highway System that collect traffic data 24-hours a day/365 days a year. Each method was evaluated to determine the most appropriate method for the study area. Because an ATR station (18-018) exists within the Klamath Falls Urban Area, information from that station was used to develop seasonal adjustment values for this analysis.

On-Site ATR Method

The On-Site ATR Method requires that the ATR be located within or near the project area. If the ATR is located outside the project area, there should be no major intersections between the ATR and the project area and the Average Annual Daily Traffic (AADT) collected by the ATR must be within 10 percent of the AADT near the project area. *Information on AADT for highway segments throughout Oregon can be found in ODOT's Transportation Volume Tables.*

One ATR station exists within the project study area. That station (18-018) is located on the Klamath Falls-Malin Highway 0.46 miles south of Main Street in Klamath Falls. Other season adjustment methods, including using the seasonal trend Table method or the characteristic table method were evaluated for use on this project. The seasonal trend Table was not used because a trend line that represented annual traffic fluctuations in Klamath Falls is not included in the table. Similarly, the characteristic table method was not used because the method results in lower seasonal adjustment factors than are produced by the ATR station location within Klamath Falls. As such, the on-site ATR method represents the most accurate portrayal of seasonal traffic fluctuations available for the Klamath Falls Urban Area.

The traffic volume data from this ATR station was compared to the counts available at the nearby Washburn Way/OR 39 study intersection. This comparison showed that the count data is within 8 percent of the ATR data. Table 4 below shows the monthly Seasonal Adjustment values calculated from the data provided from this station.

Table 4 On-Site ATR Seasonal Adjustment Values

ATR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
18-018	1.20	1.14	1.12	1.04	1.04	1.02	1.07	1.07	1.05	1.00	1.10	1.21

The traffic counts for this study were collected over a number of months. As such, a singular Seasonal Adjustment value cannot be used. Rather, the values from the table above will be used to adjust each traffic count based upon the month it was collected.

ANALYSIS MODEL PARAMETERS

The bullets below identify the specific sources of data and methodologies we propose to utilize. Analyses of all state facilities will be conducted according to the APM, unless otherwise agreed upon by both ODOT's Transportation Planning and Analysis Unit (TPAU) and the consultant team.

1. *Intersection/Roadway Geometry* (lane numbers and arrangements, cross-section elements, signal phasing, etc.) will be verified for consistency with previous work efforts, reviewed through aerial photography, and confirmed through a site visit. Available as-built data may also be used to verify existing roadway geometry. The analysis models will be built on scaled roadway line work from GIS or aerial photography.

2. *Operational Data* (such as posted speeds, intersection control, parking, transit stops, rail crossings, right-turn on red, etc.) will be field verified. Data will be reviewed during a site visit and supplemented by available GIS data, aerials, photos, and the ODOT Video Log.

3. *Peak Hour Factors* (PHF) will be calculated for each intersection and applied to the existing conditions analyses. PHFs of 0.95 will be used for the year 2035 analysis for high-order facilities (arterials), with 0.90 applied to medium-order facilities (collectors) and 0.85 applied to local roads. If the existing PHF is greater than these default future values, the existing PHF will be applied.

4. *Traffic Volume* development is described above and resulted in counts being adjusted by the factors described in Table 5.

5. *Signal Timing Data* will be requested from the City of Klamath Falls, Klamath County, and ODOT for use in the existing conditions analysis. Signal parameters such as Flash Don't Walk, Walk, and Minimum Times will be retained in the forecast analysis with the signal splits optimized to better serve the future traffic volume patterns. Optimized signal cycle lengths may range between 60 and 120 seconds.

6. Traffic Operations

    a. The 2000 Highway Capacity Manual (HCM) methodology shall be used for intersection analyses of the design hour conditions. The existing and future no-build analysis will utilize Synchro software using HCM reports for signalized and unsignalized intersections. Roundabouts will be analyzed using ODOT's methodology for roundabout operations and will be compared to the results yielded from the findings from the NCHRP 3-65 report. Level-of-service, delay, and volume-to-capacity ratios will be reported at each of the study intersections regardless of roadway jurisdiction.

    b. Queuing analysis methodology will be based on Synchro 95th percentile queue lengths. Microsimulation is not proposed as part of the long-range planning effort.

Traffic Analysis Software and Input Assumptions

Synchro software, Version 7 will be used for the intersection analysis. The reported results will be the level of service, intersection delay, and v/c ratios generated by the HCM report. Analysis assumptions are listed in Table 5.

Table 5 Synchro Operations Parameters/Assumptions

Arterial Intersection Parameters	Existing Conditions
Peak Hour Factor	From traffic counts
Conflicting Bikes and Pedestrian per Hour	From traffic counts, as available
Ideal Saturation Flow Rate (for all movements)[1]	ODOT Facilities: 1,750 passenger cars per hour green per lane City & County Facilities: 1,900 pcphpl
Lane Width	12 feet unless field observations suggest otherwise
Percent Heavy Vehicles	From traffic counts by movement, as available
Bus Blockages	None
Intersection signal phasing and coordination	From ODOT/City/County timing plans
Intersection signal timing optimization limits	Maximum cycle length = 120 seconds
Minimum Green time	From ODOT/City/County timing plans
Yellow and all-red time	From ODOT/City/County timing plans
95th percentile vehicle queues	Synchro HCM summary output

Notes:

[1]There is on-going discussion about the saturation flow rate currently assumed for City and County facilities (1900 pcphpl). ODOT as expressed concern over this assumption; the City and County are currently considering the following options:

a) Use the 1750 pcphpl to be consistent with the default values in the 2010 HCM; this would change the precedent of how City and County are currently conducting and processing traffic operations analysis and results;

b) Keep the 1900 pcphpl assumption to remain consistent with in-process development analysis; and/or

c) Conduct a saturation flow rate study within the Klamath Falls urban area to establish a specific saturation flow rate that would be valid on all facilities.

A resolution regarding the saturation flow rate assumption will be reached at the January 19, 2011 TAC/CAC meeting.

Crash Analyses

The most recent five years of crash data will be reviewed at the study intersections, as available and where reflective of the current configuration. The data will be analyzed for type, severity and location to identify potential crash patterns. In addition, ODOT's top 10% ODOT Safety Priority System sites will be reviewed, as appropriate.

FORECAST YEAR VOLUME DEVELOPMENT

The Klamath Falls area traffic model identifies forecast conditions throughout greater Klamath Falls area and will be used for the Klamath Falls TSP Update. ODOT staff will generate base year travel demand model volumes for the study area to be used as a basis of comparison between existing and forecast conditions. As part of this process, documentation of the planned system improvements, citywide mode splits, and land use assumptions will be obtained by Transportation Analysis Zone (TAZ). This documentation will be reviewed and included as a technical appendix to the analysis work.

NCHRP 255 Methodology

Forecast intersection turning movement volumes will be on the procedures outlined in National Cooperative Highway Research Program (NCHRP) Report 255 (Reference 5). This procedure accounts for a combination of the 30th highest hour volumes measured at the intersections, and base and future year model forecasts from the EMME/2 model. The general methodology to develop the volumes is outlined below.

- The Year 2010 30th highest hour design volumes are used to represent the base volumes. These volumes will directly correlate to base year model volumes.
- The percentage change in the model's base and horizon year traffic volume for each movement is calculated and applied to the 2010 30th highest hour design volumes. Each table reports the existing model and future model volumes, in addition to the percentage change as applied.
- The numerical change (delta) in the model's traffic volumes is also calculated and applied to the 2010 30th highest hour design volumes.
- The results obtained from the percentage and numerical change calculations are averaged to obtain the design hour year 2034 analysis traffic volumes.

Post processing of the traffic volumes will occur on a link basis first. Once the volumes are adjusted, the link volumes will be converted into turn movements at the intersections. This process will be applied to all of the study intersections that exist in the base year model, as available. The reasonableness of the averaging method will be reviewed at each location, especially in instances in which the numerical and percentage change yield significantly different results (which can often occur on very low volume movements in the base model that increase significantly in 2035) or when the existing model differs significantly from the existing turning movement counts. On these occasions, the available data and travel forecasts will be reviewed to determine the appropriate year 2035 analysis volumes. The resulting unbalanced year 2035 volumes will be rounded and balanced, as appropriate, for use in the forecast conditions assessment.

The intersection performance of the 75 study area intersections will be evaluated for both year 2035 No Build and Build conditions. Additional model runs and volume derivations may be required based on the recommended Build conditions.

NEXT STEPS

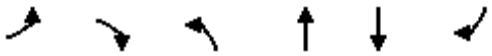
We would like to request concurrence from TPAU, ODOT Region 4, City staff, and County staff on the methodology and key assumptions outlined in this memorandum prior to the preparation of the existing and future conditions analyses.

We trust this memorandum provides adequate documentation of the existing and future conditions methodology. If you have any questions or suggestions, please call us at (503) 228-5230.

REFERENCES

1. Oregon Department of Transportation. *Transportation System Plan Guidelines, 2008.*
2. Oregon Department of Transportation. *Analysis Procedures Manual, 2006.*
3. Oregon Department of Transportation. *Oregon Highway Plan, 1999.*
4. Oregon Department of Transportation. *Highway Design Manual, 2003*.
5. National Cooperative Highway Research Program, Highway traffic Data for Urbanized Area Project Planning and Design (Report 255). 1982.

APPENDIX C – EXISTING CONDITIONS TRAFFIC OPERATIONS AND QUEUING ANALYSIS WORKSHEETS



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	14	20	320	297	7
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	12	16	22	356	330	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	734	334	338			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	734	334	338			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	98			
cM capacity (veh/h)	383	713	1233			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	28	22	356	338
Volume Left	12	22	0	0
Volume Right	16	0	0	8
cSH	517	1233	1700	1700
Volume to Capacity	0.05	0.02	0.21	0.20
Queue Length 95th (ft)	4	1	0	0
Control Delay (s)	12.4	8.0	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.4	0.5		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	28.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	78	15	306	32	8	361
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	81	16	319	33	8	376
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	711	319			352	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	711	319			352	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	80	98			99	
cM capacity (veh/h)	398	727			1218	

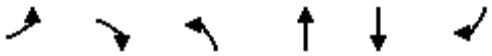
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	97	319	33	8	376
Volume Left	81	0	0	8	0
Volume Right	16	0	33	0	0
cSH	429	1700	1700	1218	1700
Volume to Capacity	0.23	0.19	0.02	0.01	0.22
Queue Length 95th (ft)	21	0	0	1	0
Control Delay (s)	15.8	0.0	0.0	8.0	0.0
Lane LOS	C			A	
Approach Delay (s)	15.8	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	33.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	5	20	61	17	0	0	0	0	1	417	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	0	6	24	73	20	0	0	0	0	1	496	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	510	500	249	277	501	0	499			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	510	500	249	277	501	0	499			0		
tC, single (s)	7.5	6.5	7.0	7.5	6.6	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	100	99	97	88	96	100	100			100		
cM capacity (veh/h)	435	475	741	631	462	1091	1076			1636		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	30	93	249	251
Volume Left	0	73	1	0
Volume Right	24	0	0	2
cSH	667	584	1636	1700
Volume to Capacity	0.04	0.16	0.00	0.15
Queue Length 95th (ft)	3	14	0	0
Control Delay (s)	10.7	12.3	0.0	0.0
Lane LOS	B	B	A	
Approach Delay (s)	10.7	12.3	0.0	
Approach LOS	B	B		

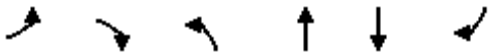
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	30.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	0	78	368	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	7	0	89	418	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386	0	0			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	95			
cM capacity (veh/h)	562	1091	1614			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3
Volume Total	7	89	209	209
Volume Left	7	89	0	0
Volume Right	0	0	0	0
cSH	562	1614	1700	1700
Volume to Capacity	0.01	0.05	0.12	0.12
Queue Length 95th (ft)	1	4	0	0
Control Delay (s)	11.5	7.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	11.5	1.3		
Approach LOS	B			

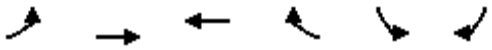
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	21.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	154	137	15	140	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.74	0.74	0.74	0.74	0.74	0.74
Hourly flow rate (vph)	0	208	185	20	189	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	580	189	189			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	580	189	189			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	87			
cM capacity (veh/h)	416	855	1385			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	208	205	189
Volume Left	0	185	0
Volume Right	208	0	0
cSH	855	1385	1700
Volume to Capacity	0.24	0.13	0.11
Queue Length 95th (ft)	24	12	0
Control Delay (s)	10.6	7.3	0.0
Lane LOS	B	A	
Approach Delay (s)	10.6	7.3	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	37.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	318	149	6	6	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	10	436	204	8	8	12
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	212				663	208
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212				663	208
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	99
cM capacity (veh/h)	1370				426	837

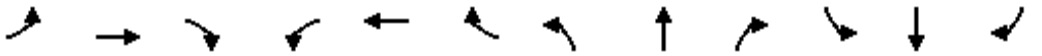
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	445	212	21
Volume Left	10	0	8
Volume Right	0	8	12
cSH	1370	1700	604
Volume to Capacity	0.01	0.12	0.03
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.2	0.0	11.2
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.2
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		



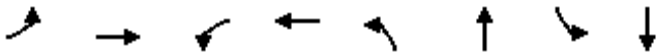
Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	24	136	317	469	263	202	215	156	85	321	34
v/c Ratio	0.09	0.49	0.63	0.57	0.61	0.62	0.23	0.29	0.44	0.57	0.12
Control Delay	37.8	44.3	10.8	33.9	36.7	44.5	28.7	6.9	48.6	40.1	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	44.3	10.8	33.9	36.7	44.5	28.7	6.9	48.6	40.1	13.8
Queue Length 50th (ft)	11	69	0	115	119	103	50	0	44	86	0
Queue Length 95th (ft)	40	158	82	221	263	220	101	50	113	166	28
Internal Link Dist (ft)		1581			573		723			1374	
Turn Bay Length (ft)	200		550	275		250		150	225		150
Base Capacity (vph)	794	820	877	1156	598	629	1528	767	583	1444	688
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.03	0.17	0.36	0.41	0.44	0.32	0.14	0.20	0.15	0.22	0.05

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	128	298	441	149	98	190	202	147	80	302	32
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1716	1488	3225	1636		1646	3197	1444	1525	3023	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1716	1488	3225	1636		1646	3197	1444	1525	3023	1408
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	24	136	317	469	159	104	202	215	156	85	321	34
RTOR Reduction (vph)	0	0	266	0	13	0	0	0	110	0	0	27
Lane Group Flow (vph)	24	136	51	469	250	0	202	215	46	85	321	7
Confl. Peds. (#/hr)							2		5	5		2
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	4%	1%	9%	10%	3%
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	14.3	14.3	14.3	22.5	22.5		17.6	26.0	26.0	9.3	17.7	17.7
Effective Green, g (s)	14.3	14.3	14.3	22.5	22.5		17.6	26.0	26.0	9.3	17.7	17.7
Actuated g/C Ratio	0.16	0.16	0.16	0.25	0.25		0.20	0.29	0.29	0.10	0.20	0.20
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	267	275	239	814	413		325	933	421	159	601	280
v/s Ratio Prot	0.01	c0.08		0.15	c0.15		c0.12	0.07		0.06	c0.11	
v/s Ratio Perm			0.03						0.03			0.00
v/c Ratio	0.09	0.49	0.21	0.58	0.60		0.62	0.23	0.11	0.53	0.53	0.02
Uniform Delay, d1	31.9	34.1	32.5	29.1	29.4		32.7	24.0	23.1	37.8	32.0	28.7
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	1.4	0.4	1.0	2.5		3.7	0.1	0.1	3.4	0.9	0.0
Delay (s)	32.0	35.5	33.0	30.1	31.9		36.4	24.1	23.2	41.3	32.9	28.8
Level of Service	C	D	C	C	C		D	C	C	D	C	C
Approach Delay (s)		33.6			30.7			28.2			34.2	
Approach LOS		C			C			C			C	

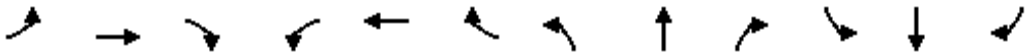
Intersection Summary			
HCM Average Control Delay	31.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.57		
Actuated Cycle Length (s)	89.1	Sum of lost time (s)	17.0
Intersection Capacity Utilization	56.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	144	559	25	577	336	57	6	238
v/c Ratio	0.60	0.45	0.20	0.72	0.92	0.07	0.06	0.50
Control Delay	48.5	19.6	46.6	37.8	69.1	16.2	45.8	14.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.5	19.6	46.6	37.8	69.1	16.2	45.8	14.9
Queue Length 50th (ft)	79	94	14	160	190	13	3	30
Queue Length 95th (ft)	134	147	39	205	#366	45	15	87
Internal Link Dist (ft)		573		312		272		307
Turn Bay Length (ft)	225		225		150		150	
Base Capacity (vph)	365	1439	365	1454	365	786	365	473
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.39	0.07	0.40	0.92	0.07	0.02	0.50

Intersection Summary

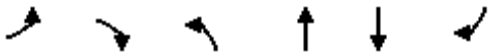
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	117	300	153	20	445	23	272	35	11	5	34	159
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.96		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3156		1662	3301		1662	1686		1662	1534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3156		1662	3301		1662	1686		1662	1534	
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	144	370	189	25	549	28	336	43	14	6	42	196
RTOR Reduction (vph)	0	55	0	0	4	0	0	7	0	0	133	0
Lane Group Flow (vph)	144	504	0	25	573	0	336	50	0	6	105	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	13.3	34.9		3.1	24.7		20.2	42.6		1.2	23.6	
Effective Green, g (s)	13.3	34.9		3.1	24.7		20.2	42.6		1.2	23.6	
Actuated g/C Ratio	0.14	0.36		0.03	0.25		0.21	0.44		0.01	0.24	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	226	1126		53	834		343	734		20	370	
v/s Ratio Prot	c0.09	0.16		0.02	c0.17		c0.20	0.03		0.00	c0.07	
v/s Ratio Perm												
v/c Ratio	0.64	0.45		0.47	0.69		0.98	0.07		0.30	0.28	
Uniform Delay, d1	40.0	24.1		46.5	33.1		38.6	16.1		47.9	30.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.8	0.3		6.5	2.4		42.6	0.2		8.3	1.9	
Delay (s)	45.7	24.4		53.0	35.4		81.2	16.2		56.2	32.1	
Level of Service	D	C		D	D		F	B		E	C	
Approach Delay (s)		28.7			36.2			71.7			32.7	
Approach LOS		C			D			E			C	

Intersection Summary			
HCM Average Control Delay	40.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	97.8	Sum of lost time (s)	16.0
Intersection Capacity Utilization	63.5%	ICU Level of Service	B
Analysis Period (min)	15		

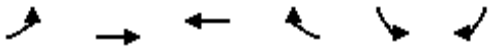
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	36	18	245	338	12
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	16	39	19	263	363	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	672	370	376			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	672	370	376			
tC, single (s)	6.5	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.3			
p0 queue free %	96	94	98			
cM capacity (veh/h)	407	674	1160			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	55	283	376
Volume Left	16	19	0
Volume Right	39	0	13
cSH	564	1160	1700
Volume to Capacity	0.10	0.02	0.22
Queue Length 95th (ft)	8	1	0
Control Delay (s)	12.1	0.7	0.0
Lane LOS	B	A	
Approach Delay (s)	12.1	0.7	0.0
Approach LOS	B		

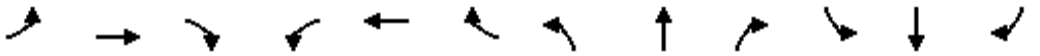
Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	40.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	17	102	148	126	84	17
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	20	117	170	145	97	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	170				326	170
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	170				326	170
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				85	98
cM capacity (veh/h)	1419				659	879

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	137	170	145	116
Volume Left	20	0	0	97
Volume Right	0	0	145	20
cSH	1419	1700	1700	688
Volume to Capacity	0.01	0.10	0.09	0.17
Queue Length 95th (ft)	1	0	0	15
Control Delay (s)	1.2	0.0	0.0	11.3
Lane LOS	A			B
Approach Delay (s)	1.2	0.0		11.3
Approach LOS				B

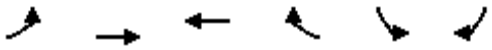
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	193	30	56	266	24	1	0	12	17	44	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	2	235	37	68	324	29	1	0	15	21	54	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	354			272			752	749	254	749	752	341
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	354			272			752	749	254	749	752	341
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.3
p0 queue free %	100			95			100	100	98	93	83	99
cM capacity (veh/h)	1216			1303			272	324	790	304	310	705

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	274	68	354	16	78
Volume Left	2	68	0	1	21
Volume Right	37	0	29	15	4
cSH	1216	1303	1700	689	316
Volume to Capacity	0.00	0.05	0.21	0.02	0.25
Queue Length 95th (ft)	0	4	0	2	24
Control Delay (s)	0.1	7.9	0.0	10.3	20.1
Lane LOS	A	A		B	C
Approach Delay (s)	0.1	1.3		10.3	20.1
Approach LOS				B	C

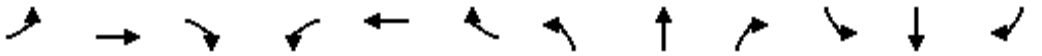
Intersection Summary				
Average Delay	2.9			
Intersection Capacity Utilization	48.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	222	328	0	14	18
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	0	261	386	0	16	21
Pedestrians		2				
Lane Width (ft)		12.0				
Walking Speed (ft/s)		4.0				
Percent Blockage		0				
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	386				647	195
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	386				647	195
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	97
cM capacity (veh/h)	1184				408	819

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	261	193	193	38
Volume Left	0	0	0	16
Volume Right	0	0	0	21
cSH	1700	1700	1700	569
Volume to Capacity	0.15	0.11	0.11	0.07
Queue Length 95th (ft)	0	0	0	5
Control Delay (s)	0.0	0.0	0.0	11.8
Lane LOS				B
Approach Delay (s)	0.0	0.0		11.8
Approach LOS				B

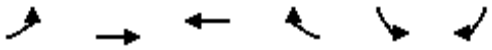
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	23.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	220	0	0	263	24	0	0	0	31	0	65
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	17	229	0	0	274	25	0	0	0	32	0	68
Pedestrians		1			3						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	275			229			618	537	232	553	550	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	275			229			618	537	232	553	550	288
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			100			100	100	100	92	100	91
cM capacity (veh/h)	1299			1351			364	447	810	430	440	747

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	17	229	299	0	0	32	68
Volume Left	17	0	0	0	0	32	0
Volume Right	0	0	25	0	0	0	68
cSH	1299	1700	1351	1700	1700	430	747
Volume to Capacity	0.01	0.13	0.00	0.00	0.00	0.08	0.09
Queue Length 95th (ft)	1	0	0	0	0	6	7
Control Delay (s)	7.8	0.0	0.0	0.0	0.0	14.0	10.3
Lane LOS	A			A	A	B	B
Approach Delay (s)	0.5		0.0	0.0		11.5	
Approach LOS				A		B	

Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	32.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	118	137	196	96	158	167
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	123	143	204	100	165	174
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	304				643	254
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	304				643	254
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				59	78
cM capacity (veh/h)	1257				397	784

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	266	304	339
Volume Left	123	0	165
Volume Right	0	100	174
cSH	1257	1700	532
Volume to Capacity	0.10	0.18	0.64
Queue Length 95th (ft)	8	0	111
Control Delay (s)	4.3	0.0	22.9
Lane LOS	A		C
Approach Delay (s)	4.3	0.0	22.9
Approach LOS			C

Intersection Summary			
Average Delay	9.8		
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	32	4	16	13	1	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	39	5	20	16	1	29
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			46		98	43
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			46		98	43
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	97
cM capacity (veh/h)			1572		893	1031

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	44	35	30
Volume Left	0	20	1
Volume Right	5	0	29
cSH	1700	1572	1024
Volume to Capacity	0.03	0.01	0.03
Queue Length 95th (ft)	0	1	2
Control Delay (s)	0.0	4.1	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	4.1	8.6
Approach LOS			A

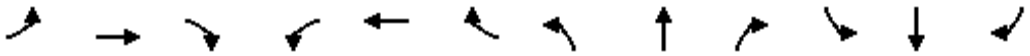
Intersection Summary			
Average Delay		3.7	
Intersection Capacity Utilization		18.4%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	140	2	214	108	10	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79
Hourly flow rate (vph)	177	3	271	137	13	38
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			180		863	178
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			180		863	178
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			80		95	96
cM capacity (veh/h)			1384		262	852

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	180	271	137	51
Volume Left	0	271	0	13
Volume Right	3	0	0	38
cSH	1700	1384	1700	545
Volume to Capacity	0.11	0.20	0.08	0.09
Queue Length 95th (ft)	0	18	0	8
Control Delay (s)	0.0	8.2	0.0	12.3
Lane LOS		A		B
Approach Delay (s)	0.0	5.5		12.3
Approach LOS				B

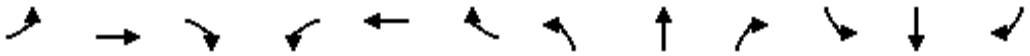
Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	43	408	43	0	0	0	0	23	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	0	0	57	544	57	0	0	0	0	31	44
Pedestrians					3			21				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					0			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	601			21			467	737	24	690	708	301
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	601			21			467	737	24	690	708	301
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	100	91	94
cM capacity (veh/h)	986			1580			398	330	1032	321	343	701

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	329	329	0	75
Volume Left	57	0	0	0
Volume Right	0	57	0	44
cSH	1580	1700	1700	490
Volume to Capacity	0.04	0.19	0.00	0.15
Queue Length 95th (ft)	3	0	0	13
Control Delay (s)	1.5	0.0	0.0	13.7
Lane LOS	A		A	B
Approach Delay (s)	0.8		0.0	13.7
Approach LOS			A	B

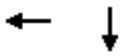
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	29.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	358	2	0	0	0	0	0	5	62	4	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	411	2	0	0	0	0	0	6	71	5	0
Pedestrians		9			22			15				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		1			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			429			439	428	244	233	429	9
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			429			439	428	244	233	429	9
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	90	99	100
cM capacity (veh/h)	1636			1127			488	516	753	695	515	1069

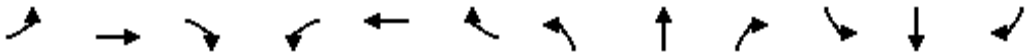
Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	206	208	6	76
Volume Left	0	0	0	71
Volume Right	0	2	6	0
cSH	1636	1700	753	680
Volume to Capacity	0.00	0.12	0.01	0.11
Queue Length 95th (ft)	0	0	1	9
Control Delay (s)	0.0	0.0	9.8	11.0
Lane LOS			A	B
Approach Delay (s)	0.0		9.8	11.0
Approach LOS			A	B

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	29.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	WBT	SBT
Lane Group Flow (vph)	405	261
v/c Ratio	0.30	0.20
Control Delay	8.2	5.4
Queue Delay	0.0	0.0
Total Delay	8.2	5.4
Queue Length 50th (ft)	27	11
Queue Length 95th (ft)	47	26
Internal Link Dist (ft)	289	239
Turn Bay Length (ft)		
Base Capacity (vph)	1343	1306
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.30	0.20

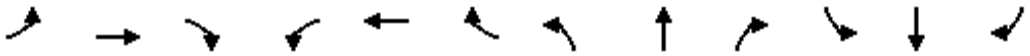
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	35	321	0	0	0	0	0	143	87
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						1.00	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3305						3116	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3305						3116	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	0	0	0	40	365	0	0	0	0	0	162	99
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	0	0	59	0
Lane Group Flow (vph)	0	0	0	0	384	0	0	0	0	0	202	0
Confl. Peds. (#/hr)			15	15					22	22		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm								
Protected Phases					8						6	
Permitted Phases				8								
Actuated Green, G (s)					16.0						16.0	
Effective Green, g (s)					16.0						16.0	
Actuated g/C Ratio					0.40						0.40	
Clearance Time (s)					4.0						4.0	
Lane Grp Cap (vph)					1322						1246	
v/s Ratio Prot											c0.06	
v/s Ratio Perm					0.12							
v/c Ratio					0.29						0.16	
Uniform Delay, d1					8.1						7.7	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.6						0.3	
Delay (s)					8.7						8.0	
Level of Service					A						A	
Approach Delay (s)		0.0			8.7			0.0			8.0	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.23		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	28.0%	ICU Level of Service	A
Analysis Period (min)	15		

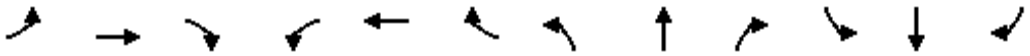
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	201	420	9	0	0	0	0	78	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	258	538	12	0	0	0	0	100	15	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			550			1060	1060	275	850	1065	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			550			1060	1060	275	850	1065	0
tC, single (s)	4.1			4.1			7.5	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	84			100			100	47	98	100	100	100
cM capacity (veh/h)	1622			1030			159	190	705	131	189	1091

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	258	359	191	115
Volume Left	258	0	0	0
Volume Right	0	0	12	15
cSH	1622	1700	1700	211
Volume to Capacity	0.16	0.21	0.11	0.55
Queue Length 95th (ft)	14	0	0	73
Control Delay (s)	7.6	0.0	0.0	41.0
Lane LOS	A			E
Approach Delay (s)	2.4			41.0
Approach LOS				E

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	24.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	280	6	59	227	7	10	0	29	20	2	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	6	337	7	71	273	8	12	0	35	24	2	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					694							
pX, platoon unblocked												
vC, conflicting volume	282			345			773	777	341	804	777	278
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	282			345			773	777	341	804	777	278
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			96	100	95	91	99	100
cM capacity (veh/h)	1292			1187			299	309	706	274	309	766

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	345	71	282	47	30
Volume Left	6	0	71	0	12	24
Volume Right	0	7	0	8	35	4
cSH	1292	1700	1187	1700	524	300
Volume to Capacity	0.00	0.20	0.06	0.17	0.09	0.10
Queue Length 95th (ft)	0	0	5	0	7	8
Control Delay (s)	7.8	0.0	8.2	0.0	12.5	18.3
Lane LOS	A		A		B	C
Approach Delay (s)	0.1		1.7		12.5	18.3
Approach LOS					B	C

Intersection Summary				
Average Delay	2.3			
Intersection Capacity Utilization	33.9%	ICU Level of Service		A
Analysis Period (min)	15			

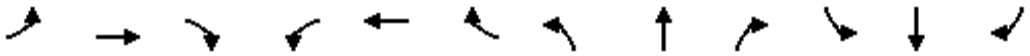


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	24	1230	78	610	76	139	288	189	128
v/c Ratio	0.22	1.02	0.48	0.44	0.12	0.38	0.75	0.64	0.41
Control Delay	60.3	66.5	61.8	27.2	7.9	41.6	51.1	55.0	46.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	66.5	61.8	27.2	7.9	41.6	51.1	55.0	46.8
Queue Length 50th (ft)	17	~512	54	170	2	85	177	128	82
Queue Length 95th (ft)	51	#880	119	293	38	164	318	232	159
Internal Link Dist (ft)		1231		435			614		612
Turn Bay Length (ft)	175		200		200	225		150	
Base Capacity (vph)	312	1210	306	1389	643	536	551	546	572
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.08	1.02	0.25	0.44	0.12	0.26	0.52	0.35	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



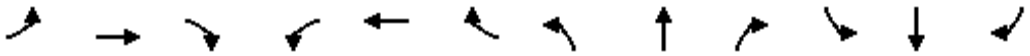
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	23	1003	153	73	573	71	131	156	115	178	116	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3207		1630	3260	1417	1630	1629		1662	1739	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3207		1630	3260	1417	1630	1629		1662	1739	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	24	1067	163	78	610	76	139	166	122	189	123	5
RTOR Reduction (vph)	0	7	0	0	0	42	0	19	0	0	1	0
Lane Group Flow (vph)	24	1223	0	78	610	34	139	269	0	189	127	0
Confl. Peds. (#/hr)	4		6	6		4	2		2	2		2
Heavy Vehicles (%)	0%	1%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2						
Actuated Green, G (s)	4.5	42.4		9.1	47.0	47.0	24.7	24.7		19.5	19.5	
Effective Green, g (s)	4.5	42.4		9.1	47.0	47.0	24.7	24.7		19.5	19.5	
Actuated g/C Ratio	0.04	0.38		0.08	0.42	0.42	0.22	0.22		0.17	0.17	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	67	1217		133	1372	596	360	360		290	304	
v/s Ratio Prot	0.01	c0.38		c0.05	0.19		0.09	c0.17		c0.11	0.07	
v/s Ratio Perm						0.02						
v/c Ratio	0.36	1.01		0.59	0.44	0.06	0.39	0.75		0.65	0.42	
Uniform Delay, d1	52.2	34.6		49.5	23.1	19.2	37.0	40.6		42.9	41.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	27.0		6.5	0.3	0.1	0.9	8.8		5.7	1.3	
Delay (s)	55.5	61.7		55.9	23.4	19.3	38.0	49.4		48.7	42.3	
Level of Service	E	E		E	C	B	D	D		D	D	
Approach Delay (s)		61.6			26.3			45.7			46.1	
Approach LOS		E			C			D			D	

Intersection Summary			
HCM Average Control Delay	47.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	111.7	Sum of lost time (s)	16.0
Intersection Capacity Utilization	80.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	134	55	271	52	39	334	135
v/c Ratio	0.20	0.14	0.39	0.08	0.06	0.42	0.24
Control Delay	8.8	8.8	10.6	3.5	7.8	3.3	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.8	8.8	10.6	3.5	7.8	3.3	9.0
Queue Length 50th (ft)	18	7	40	0	5	0	17
Queue Length 95th (ft)	38	20	72	11	15	25	38
Internal Link Dist (ft)	420		1076		613		813
Turn Bay Length (ft)		200				150	
Base Capacity (vph)	678	402	700	612	662	790	559
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.14	0.39	0.08	0.06	0.42	0.24

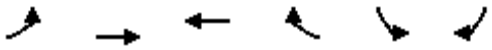
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	109	0	45	222	43	3	29	274	66	38	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0	4.0		4.0	4.0		4.0	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes		1.00		0.98	1.00	1.00		1.00	1.00		1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00	1.00		0.99	1.00		0.97	
Satd. Flow (prot)		1699		1424	1750	1452		1681	1473		1607	
Flt Permitted		1.00		0.67	1.00	1.00		0.98	1.00		0.84	
Satd. Flow (perm)		1696		1006	1750	1452		1654	1473		1383	
Peak-hour factor, PHF	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Adj. Flow (vph)	1	133	0	55	271	52	4	35	334	80	46	9
RTOR Reduction (vph)	0	0	0	0	0	31	0	0	200	0	5	0
Lane Group Flow (vph)	0	134	0	55	271	21	0	39	134	0	130	0
Confl. Peds. (#/hr)	3		23	23		3						
Heavy Vehicles (%)	0%	3%	0%	14%	0%	0%	0%	4%	1%	2%	8%	14%
Turn Type	Perm			Perm		Perm	Perm		Perm	Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)		16.0		16.0	16.0	16.0		16.0	16.0		16.0	
Effective Green, g (s)		16.0		16.0	16.0	16.0		16.0	16.0		16.0	
Actuated g/C Ratio		0.40		0.40	0.40	0.40		0.40	0.40		0.40	
Clearance Time (s)		4.0		4.0	4.0	4.0		4.0	4.0		4.0	
Lane Grp Cap (vph)		678		402	700	581		662	589		553	
v/s Ratio Prot					c0.15							
v/s Ratio Perm		0.08		0.05		0.01		0.02	0.09		c0.09	
v/c Ratio		0.20		0.14	0.39	0.04		0.06	0.23		0.23	
Uniform Delay, d1		7.8		7.6	8.5	7.3		7.4	7.9		7.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.7		0.7	1.6	0.1		0.2	0.9		1.0	
Delay (s)		8.5		8.3	10.1	7.4		7.5	8.8		8.9	
Level of Service		A		A	B	A		A	A		A	
Approach Delay (s)		8.5			9.5			8.7			8.9	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	9.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.31		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

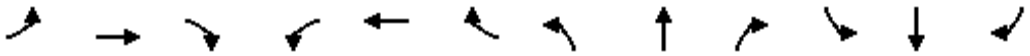
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	1201	692	95	33	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	1264	728	100	35	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			1013			
pX, platoon unblocked	0.97				0.97	0.97
vC, conflicting volume	828				1425	414
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	751				1369	322
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				74	99
cM capacity (veh/h)	838				134	656

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	7	632	632	486	343	44
Volume Left	7	0	0	0	0	35
Volume Right	0	0	0	0	100	9
cSH	838	1700	1700	1700	1700	162
Volume to Capacity	0.01	0.37	0.37	0.29	0.20	0.27
Queue Length 95th (ft)	1	0	0	0	0	26
Control Delay (s)	9.3	0.0	0.0	0.0	0.0	35.4
Lane LOS	A					E
Approach Delay (s)	0.1			0.0		35.4
Approach LOS						E

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	3	0	0	7	3	3	30	5	8	2	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	0	4	0	0	10	4	4	41	7	11	3	4
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	88	84	5	83	83	46	7			49		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88	84	5	83	83	46	7			49		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	99	100	100			99		
cM capacity (veh/h)	883	802	1084	898	803	1029	1627			1570		

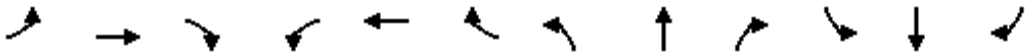
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	14	52	18
Volume Left	0	0	4	11
Volume Right	0	4	7	4
cSH	802	860	1627	1570
Volume to Capacity	0.01	0.02	0.00	0.01
Queue Length 95th (ft)	0	1	0	1
Control Delay (s)	9.5	9.3	0.6	4.5
Lane LOS	A	A	A	A
Approach Delay (s)	9.5	9.3	0.6	4.5
Approach LOS	A	A		

Intersection Summary				
Average Delay	3.2			
Intersection Capacity Utilization	13.7%	ICU Level of Service	A	
Analysis Period (min)	15			



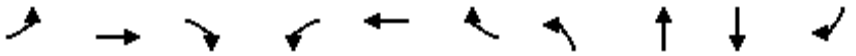
Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	111	296	147	150	800	91	43	1221
v/c Ratio	0.48	0.61	0.38	0.57	0.39	0.09	0.30	0.72
Control Delay	40.8	10.0	32.8	44.2	10.0	2.9	45.8	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.8	10.0	32.8	44.2	10.0	2.9	45.8	20.1
Queue Length 50th (ft)	53	0	33	72	98	0	21	217
Queue Length 95th (ft)	116	68	69	164	235	24	65	495
Internal Link Dist (ft)	990		799		689			423
Turn Bay Length (ft)		350		450		200	300	
Base Capacity (vph)	547	746	916	457	2184	1035	403	2114
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.40	0.16	0.33	0.37	0.09	0.11	0.58

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	42	58	266	85	35	13	135	720	82	39	1099	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.99		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00		0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1674	1445		3062		1662	3197	1473	1539	3292	
Flt Permitted		0.81	1.00		0.73		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1392	1445		2317		1662	3197	1473	1539	3292	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	47	64	296	94	39	14	150	800	91	43	1221	0
RTOR Reduction (vph)	0	0	248	0	8	0	0	0	34	0	0	0
Lane Group Flow (vph)	0	111	48	0	139	0	150	800	57	43	1221	0
Confl. Peds. (#/hr)	2		8	8		2						
Heavy Vehicles (%)	0%	4%	1%	5%	0%	0%	0%	4%	1%	8%	1%	0%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		13.4	13.4		13.4		12.8	51.9	51.9	4.7	43.8	
Effective Green, g (s)		13.4	13.4		13.4		12.8	51.9	51.9	4.7	43.8	
Actuated g/C Ratio		0.16	0.16		0.16		0.16	0.63	0.63	0.06	0.53	
Clearance Time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Vehicle Extension (s)		2.5	2.5		3.0		2.5	4.3	4.3	2.5	4.3	
Lane Grp Cap (vph)		226	235		376		258	2011	927	88	1748	
v/s Ratio Prot							c0.09	0.25		0.03	c0.37	
v/s Ratio Perm		c0.08	0.03		0.06				0.04			
v/c Ratio		0.49	0.20		0.37		0.58	0.40	0.06	0.49	0.70	
Uniform Delay, d1		31.4	29.9		30.8		32.4	7.6	5.9	37.7	14.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.2	0.3		0.6		2.8	0.2	0.0	3.1	1.4	
Delay (s)		32.7	30.2		31.4		35.1	7.8	5.9	40.8	15.8	
Level of Service		C	C		C		D	A	A	D	B	
Approach Delay (s)		30.9			31.4			11.6			16.7	
Approach LOS		C			C			B			B	

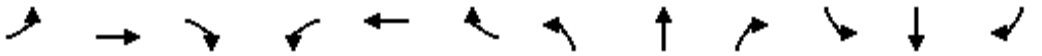
Intersection Summary			
HCM Average Control Delay	17.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	70.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	256	958	560	19	564	9	259	255	90	182
v/c Ratio	0.80	0.67	0.64	0.22	0.75	0.03	0.71	0.71	0.38	0.50
Control Delay	56.0	26.8	11.6	52.3	41.1	25.9	43.2	42.2	39.7	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.0	26.8	11.6	52.3	41.1	25.9	43.2	42.2	39.7	10.6
Queue Length 50th (ft)	128	183	44	10	144	2	131	126	45	0
Queue Length 95th (ft)	#379	#548	#271	40	#347	18	265	257	99	56
Internal Link Dist (ft)		740			600			372	238	
Turn Bay Length (ft)	280		200	375		100				100
Base Capacity (vph)	321	1431	875	88	753	330	620	614	661	680
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.67	0.64	0.22	0.75	0.03	0.42	0.42	0.14	0.27

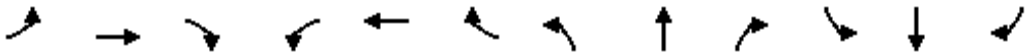
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	230	862	504	17	508	8	375	61	26	14	67	164
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (prot)	1662	3260	1473	1662	3292	1433	1579	1556			1735	1488
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (perm)	1662	3260	1473	1662	3292	1433	1579	1556			1735	1488
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	256	958	560	19	564	9	417	68	29	16	74	182
RTOR Reduction (vph)	0	0	234	0	0	4	0	4	0	0	0	158
Lane Group Flow (vph)	256	958	326	19	564	5	259	251	0	0	90	24
Confl. Peds. (#/hr)	6					6						
Heavy Vehicles (%)	0%	2%	1%	0%	1%	0%	0%	7%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	16.9	38.4	38.4	1.6	23.1	23.1	20.1	20.1			12.0	12.0
Effective Green, g (s)	16.9	38.4	38.4	1.6	23.1	23.1	20.1	20.1			12.0	12.0
Actuated g/C Ratio	0.19	0.43	0.43	0.02	0.26	0.26	0.22	0.22			0.13	0.13
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	312	1389	628	30	844	367	352	347			231	198
v/s Ratio Prot	c0.15	c0.29		0.01	0.17		c0.16	0.16			c0.05	
v/s Ratio Perm			0.22			0.00						0.02
v/c Ratio	0.82	0.69	0.52	0.63	0.67	0.01	0.74	0.72			0.39	0.12
Uniform Delay, d1	35.1	21.0	19.1	44.0	30.1	25.0	32.5	32.4			35.7	34.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	15.7	1.4	0.7	36.3	2.0	0.0	7.8	7.3			1.1	0.3
Delay (s)	50.9	22.5	19.8	80.3	32.1	25.0	40.3	39.7			36.8	34.7
Level of Service	D	C	B	F	C	C	D	D			D	C
Approach Delay (s)		25.7			33.5			40.0			35.4	
Approach LOS		C			C			D			D	

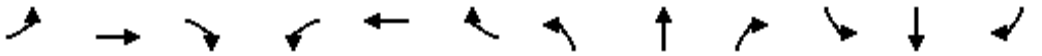
Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	90.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	61.0%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	6	3	9	4	12	1	127	5	15	165	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	2	7	3	10	4	13	1	140	5	16	181	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	377	364	184	368	364	142	187			145		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377	364	184	368	364	142	187			145		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	98	99	99	100			99		
cM capacity (veh/h)	567	560	863	559	560	911	1400			1450		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	12	27	146	203
Volume Left	2	10	1	16
Volume Right	3	13	5	5
cSH	621	687	1400	1450
Volume to Capacity	0.02	0.04	0.00	0.01
Queue Length 95th (ft)	1	3	0	1
Control Delay (s)	10.9	10.5	0.1	0.7
Lane LOS	B	B	A	A
Approach Delay (s)	10.9	10.5	0.1	0.7
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	31.0%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	7	114	33	6	8	109	463	0	5	747	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	1	8	123	35	6	9	117	498	0	5	803	6
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1309	1546	402	1271	1553	249	810			498		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1309	1546	402	1271	1553	249	810			498		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	92	80	58	93	99	86			100		
cM capacity (veh/h)	99	98	604	84	97	757	812			1077		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	131	51	117	249	249	0	5	402	402	6
Volume Left	1	35	117	0	0	0	5	0	0	0
Volume Right	123	9	0	0	0	0	0	0	0	6
cSH	452	102	812	1700	1700	1700	1077	1700	1700	1700
Volume to Capacity	0.29	0.50	0.14	0.15	0.15	0.00	0.00	0.24	0.24	0.00
Queue Length 95th (ft)	30	55	13	0	0	0	0	0	0	0
Control Delay (s)	16.2	71.3	10.2	0.0	0.0	0.0	8.4	0.0	0.0	0.0
Lane LOS	C	F	B				A			
Approach Delay (s)	16.2	71.3	1.9				0.1			
Approach LOS	C	F								

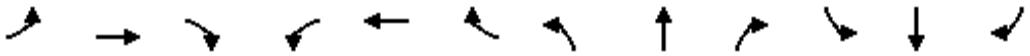
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	53.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	35	15	177	16	722	220	1200
v/c Ratio	0.06	0.07	0.53	0.10	0.55	0.52	0.53
Control Delay	0.2	25.5	11.3	28.1	15.0	25.8	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.2	25.5	11.3	28.1	15.0	25.8	6.3
Queue Length 50th (ft)	0	5	0	5	93	62	59
Queue Length 95th (ft)	0	21	51	23	154	#156	231
Internal Link Dist (ft)		1198			1475		2486
Turn Bay Length (ft)				200		200	
Base Capacity (vph)	901	771	748	879	3012	440	2374
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.02	0.24	0.02	0.24	0.50	0.51

Intersection Summary

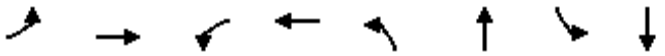
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	34	0	14	170	15	686	7	211	1152	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Lane Util. Factor			1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt			0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)			1488		1750	1473	1662	3224		1662	3260	
Flt Permitted			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)			1488		1750	1473	1662	3224		1662	3260	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	35	0	15	177	16	715	7	220	1200	0
RTOR Reduction (vph)	0	0	31	0	0	156	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	4	0	15	21	16	721	0	220	1200	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	2%	0%
Turn Type			Perm			Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)			7.1		7.1	7.1	1.2	26.7		14.6	40.1	
Effective Green, g (s)			7.1		7.1	7.1	1.2	26.7		14.6	40.1	
Actuated g/C Ratio			0.12		0.12	0.12	0.02	0.44		0.24	0.66	
Clearance Time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Vehicle Extension (s)			2.5		2.5	2.5	2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)			173		204	172	33	1413		398	2147	
v/s Ratio Prot					0.01		0.01	0.22		c0.13	c0.37	
v/s Ratio Perm			0.00			c0.01						
v/c Ratio			0.02		0.07	0.12	0.48	0.51		0.55	0.56	
Uniform Delay, d1			23.8		24.0	24.1	29.5	12.4		20.3	5.6	
Progression Factor			1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2			0.0		0.1	0.2	7.9	0.6		1.3	0.5	
Delay (s)			23.9		24.1	24.3	37.5	13.0		21.6	6.2	
Level of Service			C		C	C	D	B		C	A	
Approach Delay (s)		23.9			24.3			13.5			8.6	
Approach LOS		C			C			B			A	

Intersection Summary			
HCM Average Control Delay	11.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	60.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	53.3%	ICU Level of Service	A
Analysis Period (min)	15		

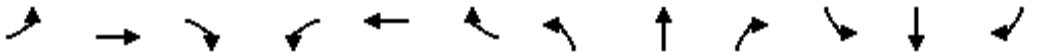
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	113	342	89	249	145	582	25	661
v/c Ratio	0.56	0.72	0.49	0.61	0.58	0.39	0.20	0.65
Control Delay	54.7	40.5	53.5	40.0	50.5	19.0	52.0	31.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.7	40.5	53.5	40.0	50.5	19.0	52.0	31.0
Queue Length 50th (ft)	64	167	50	124	81	107	14	173
Queue Length 95th (ft)	149	#395	122	264	174	207	49	284
Internal Link Dist (ft)		1198		3644		786		1700
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	286	583	284	589	487	1786	491	1720
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.59	0.31	0.42	0.30	0.33	0.05	0.38

Intersection Summary

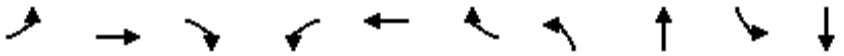
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	103	179	132	81	203	24	132	493	36	23	510	92
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	1595		1599	1655		1646	3260		1662	3217	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	1595		1599	1655		1646	3260		1662	3217	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	113	197	145	89	223	26	145	542	40	25	560	101
RTOR Reduction (vph)	0	19	0	0	3	0	0	3	0	0	12	0
Lane Group Flow (vph)	113	323	0	89	246	0	145	579	0	25	649	0
Heavy Vehicles (%)	3%	4%	1%	4%	4%	5%	1%	1%	0%	0%	1%	1%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	11.4	26.2		8.4	23.2		13.8	42.0		2.7	30.9	
Effective Green, g (s)	11.4	26.2		8.4	23.2		13.8	42.0		2.7	30.9	
Actuated g/C Ratio	0.12	0.28		0.09	0.25		0.15	0.45		0.03	0.33	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.5		2.5	4.5	
Lane Grp Cap (vph)	197	448		144	412		243	1468		48	1065	
v/s Ratio Prot	0.07	c0.20		c0.06	0.15		c0.09	0.18		0.02	c0.20	
v/s Ratio Perm												
v/c Ratio	0.57	0.72		0.62	0.60		0.60	0.39		0.52	0.61	
Uniform Delay, d1	38.7	30.2		40.9	30.9		37.1	17.1		44.7	26.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	5.3		6.6	1.9		3.3	0.3		7.6	1.3	
Delay (s)	41.9	35.5		47.5	32.9		40.4	17.4		52.2	27.5	
Level of Service	D	D		D	C		D	B		D	C	
Approach Delay (s)		37.1			36.7			22.0			28.4	
Approach LOS		D			D			C			C	

Intersection Summary			
HCM Average Control Delay	29.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.64		
Actuated Cycle Length (s)	93.3	Sum of lost time (s)	14.0
Intersection Capacity Utilization	63.6%	ICU Level of Service	B
Analysis Period (min)	15		

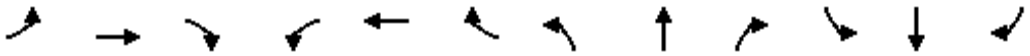
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	70	401	101	20	245	167	48	378	249	812
v/c Ratio	0.43	0.69	0.19	0.18	0.56	0.33	0.34	0.48	0.68	0.59
Control Delay	52.3	37.2	16.1	51.9	39.3	9.8	52.2	31.9	48.2	24.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.3	37.2	16.1	51.9	39.3	9.8	52.2	31.9	48.2	24.1
Queue Length 50th (ft)	36	177	17	10	123	8	25	93	124	186
Queue Length 95th (ft)	101	#458	74	42	266	70	77	161	#357	332
Internal Link Dist (ft)		3644			2006			2561		1710
Turn Bay Length (ft)	370		130	275		130	350		300	
Base Capacity (vph)	274	585	542	366	630	659	366	1747	366	1764
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.69	0.19	0.05	0.39	0.25	0.13	0.22	0.68	0.46

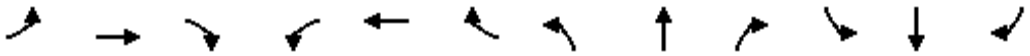
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	66	377	95	19	230	157	45	342	13	234	668	95
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1699	1473	1662	1636	1473	1662	3172		1662	3197	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	1699	1473	1662	1636	1473	1662	3172		1662	3197	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	70	401	101	20	245	167	48	364	14	249	711	101
RTOR Reduction (vph)	0	0	35	0	0	107	0	2	0	0	8	0
Lane Group Flow (vph)	70	401	66	20	245	60	48	376	0	249	804	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	3%	1%	0%	7%	1%	0%	4%	8%	0%	2%	0%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	7.9	32.4	32.4	2.6	27.1	27.1	5.2	25.0		20.7	40.5	
Effective Green, g (s)	7.9	32.4	32.4	2.6	27.1	27.1	5.2	25.0		20.7	40.5	
Actuated g/C Ratio	0.08	0.33	0.33	0.03	0.28	0.28	0.05	0.25		0.21	0.41	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4.6		2.5	4.6	
Lane Grp Cap (vph)	134	561	486	44	451	407	88	808		350	1319	
v/s Ratio Prot	c0.04	c0.24		0.01	0.15		0.03	0.12		c0.15	c0.25	
v/s Ratio Perm			0.04			0.04						
v/c Ratio	0.52	0.71	0.14	0.45	0.54	0.15	0.55	0.47		0.71	0.61	
Uniform Delay, d1	43.3	28.8	23.1	47.1	30.3	26.8	45.3	30.9		36.0	22.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.8	4.0	0.1	5.3	1.1	0.1	5.4	0.8		6.2	1.1	
Delay (s)	46.1	32.9	23.2	52.4	31.3	26.9	50.7	31.7		42.2	23.7	
Level of Service	D	C	C	D	C	C	D	C		D	C	
Approach Delay (s)		32.8			30.6			33.9			28.1	
Approach LOS		C			C			C			C	

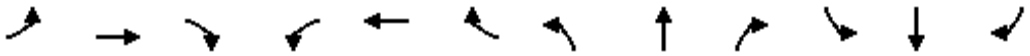
Intersection Summary			
HCM Average Control Delay	30.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.66		
Actuated Cycle Length (s)	98.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	31	178	78	5	114	16	69	26	1	10	16	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77	0.77
Hourly flow rate (vph)	40	231	101	6	148	21	90	34	1	13	21	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	169			332			545	544	282	501	584	158
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	169			332			545	544	282	501	584	158
tC, single (s)	4.1			4.1			7.1	6.5	7.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	4.2	3.5	4.0	3.3
p0 queue free %	97			99			79	92	100	97	95	99
cM capacity (veh/h)	1421			1238			418	434	572	442	412	892

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	40	332	6	169	125	45
Volume Left	40	0	6	0	90	13
Volume Right	0	101	0	21	1	12
cSH	1421	1700	1238	1700	423	489
Volume to Capacity	0.03	0.20	0.01	0.10	0.29	0.09
Queue Length 95th (ft)	2	0	0	0	30	8
Control Delay (s)	7.6	0.0	7.9	0.0	17.0	13.1
Lane LOS	A		A		C	B
Approach Delay (s)	0.8		0.3		17.0	13.1
Approach LOS					C	B

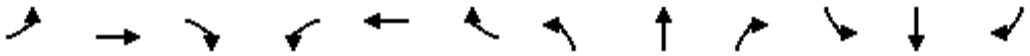
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	41.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	54	340	116	23	226	21	65	84	23	9	47	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	60	378	129	26	251	23	72	93	26	10	52	30
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	274			507			921	888	442	884	941	263
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	274			507			921	888	442	884	941	263
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			98			63	65	96	94	79	96
cM capacity (veh/h)	1300			1069			194	265	620	178	247	771

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	60	507	26	274	72	119	92
Volume Left	60	0	26	0	72	0	10
Volume Right	0	129	0	23	0	26	30
cSH	1300	1700	1069	1700	194	303	301
Volume to Capacity	0.05	0.30	0.02	0.16	0.37	0.39	0.31
Queue Length 95th (ft)	4	0	2	0	40	45	32
Control Delay (s)	7.9	0.0	8.5	0.0	34.3	24.4	22.2
Lane LOS	A		A		D	C	C
Approach Delay (s)	0.8		0.7		28.1		22.2
Approach LOS					D		C

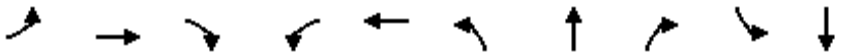
Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	52.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	34	74	165	11	45	8	89	135	19	17	134	28
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	42	92	206	14	56	10	111	169	24	21	168	35

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	43	299	80	111	193	21	203
Volume Left (vph)	43	0	14	111	0	21	0
Volume Right (vph)	0	206	10	0	24	0	35
Hadj (s)	0.50	-0.45	0.04	0.50	-0.09	0.50	-0.12
Departure Headway (s)	6.6	5.6	6.5	6.6	6.0	6.7	6.1
Degree Utilization, x	0.08	0.47	0.15	0.20	0.32	0.04	0.34
Capacity (veh/h)	514	605	502	517	568	500	557
Control Delay (s)	9.0	12.3	10.6	10.1	10.6	8.8	11.0
Approach Delay (s)	11.9		10.6	10.4		10.8	
Approach LOS	B		B	B		B	

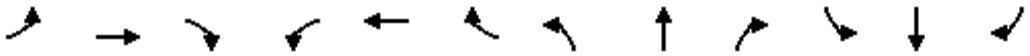
Intersection Summary				
Delay	11.1			
HCM Level of Service	B			
Intersection Capacity Utilization	40.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	90	639	383	287	510	286	422	265	118	503
v/c Ratio	0.50	0.62	0.55	0.62	0.46	0.62	0.56	0.49	0.62	0.77
Control Delay	62.3	37.2	8.3	54.2	29.8	54.1	42.5	7.8	67.1	53.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.3	37.2	8.3	54.2	29.8	54.1	42.5	7.8	67.1	53.1
Queue Length 50th (ft)	65	210	16	107	143	106	152	0	86	190
Queue Length 95th (ft)	133	328	111	173	236	172	222	70	#187	289
Internal Link Dist (ft)		1475			3089		1209			786
Turn Bay Length (ft)	300		200	300		300		200	200	
Base Capacity (vph)	363	1273	776	718	1272	853	1319	742	222	868
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.25	0.50	0.49	0.40	0.40	0.34	0.32	0.36	0.53	0.58

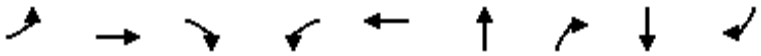
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	83	588	352	264	364	105	263	388	244	109	440	23
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1599	3260	1439	3162	3114		3131	3228	1434	1630	3176	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1599	3260	1439	3162	3114		3131	3228	1434	1630	3176	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	639	383	287	396	114	286	422	265	118	478	25
RTOR Reduction (vph)	0	0	239	0	16	0	0	0	202	0	2	0
Lane Group Flow (vph)	90	639	144	287	494	0	286	422	63	118	501	0
Confl. Peds. (#/hr)	4		1	1		4	7		4	4		7
Heavy Vehicles (%)	4%	2%	2%	2%	3%	2%	3%	3%	2%	2%	4%	0%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	12.8	36.4	36.4	16.8	40.4		16.9	26.9	26.9	13.4	23.4	
Effective Green, g (s)	12.8	36.4	36.4	16.8	40.4		16.9	26.9	26.9	13.4	23.4	
Actuated g/C Ratio	0.11	0.32	0.32	0.15	0.36		0.15	0.24	0.24	0.12	0.21	
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0		3.5	3.5	3.5	3.5	2.5	
Lane Grp Cap (vph)	180	1045	461	468	1108		466	765	340	192	655	
v/s Ratio Prot	0.06	c0.20		c0.09	c0.16		c0.09	c0.13		0.07	c0.16	
v/s Ratio Perm			0.10						0.04			
v/c Ratio	0.50	0.61	0.31	0.61	0.45		0.61	0.55	0.18	0.61	0.76	
Uniform Delay, d1	47.3	32.6	29.1	45.3	28.0		45.2	38.0	34.6	47.6	42.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.6	1.5	0.8	2.5	0.6		2.5	1.0	0.3	6.0	5.1	
Delay (s)	49.9	34.1	29.9	47.8	28.6		47.8	39.0	34.9	53.6	47.5	
Level of Service	D	C	C	D	C		D	D	C	D	D	
Approach Delay (s)		33.9			35.5			40.4			48.7	
Approach LOS		C			D			D			D	

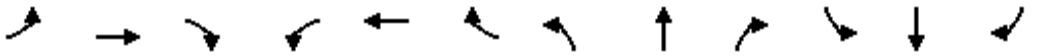
Intersection Summary			
HCM Average Control Delay	38.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	113.5	Sum of lost time (s)	31.0
Intersection Capacity Utilization	66.6%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	13	981	242	176	751	169	216	29	4
v/c Ratio	0.12	0.62	0.30	0.70	0.35	0.65	0.46	0.10	0.02
Control Delay	36.7	20.6	4.6	47.0	8.7	39.4	6.7	22.8	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	20.6	4.6	47.0	8.7	39.4	6.7	22.8	13.2
Queue Length 50th (ft)	6	184	5	83	65	79	0	12	0
Queue Length 95th (ft)	23	#347	53	144	189	120	44	28	7
Internal Link Dist (ft)		3089			2238	365		358	
Turn Bay Length (ft)	150		150	250			100		280
Base Capacity (vph)	266	1571	812	295	2150	398	606	451	325
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.62	0.30	0.60	0.35	0.42	0.36	0.06	0.01

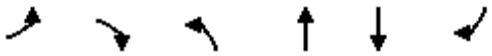
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	12	873	215	157	667	2	141	10	192	11	15	4
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.98	1.00
Satd. Flow (prot)	1421	3292	1458	1554	3258			1626	1417		1537	992
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.72	1.00		0.88	1.00
Satd. Flow (perm)	1421	3292	1458	1554	3258			1223	1417		1388	992
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	13	981	242	176	749	2	158	11	216	12	17	4
RTOR Reduction (vph)	0	0	117	0	0	0	0	0	170	0	0	3
Lane Group Flow (vph)	13	981	125	176	751	0	0	169	46	0	29	1
Confl. Peds. (#/hr)	18					18						
Heavy Vehicles (%)	17%	1%	2%	7%	2%	0%	3%	0%	5%	18%	7%	50%
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		4
Actuated Green, G (s)	1.5	38.1	38.1	12.9	49.5			17.0	17.0		17.0	17.0
Effective Green, g (s)	1.5	38.1	38.1	12.9	49.5			17.0	17.0		17.0	17.0
Actuated g/C Ratio	0.02	0.48	0.48	0.16	0.62			0.21	0.21		0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	27	1568	694	251	2016			260	301		295	211
v/s Ratio Prot	0.01	c0.30		c0.11	0.23							
v/s Ratio Perm			0.09					c0.14	0.03		0.02	0.00
v/c Ratio	0.48	0.63	0.18	0.70	0.37			0.65	0.15		0.10	0.00
Uniform Delay, d1	38.9	15.6	12.0	31.7	7.6			28.8	25.6		25.3	24.8
Progression Factor	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	9.5	1.9	0.6	7.9	0.5			5.7	0.2		0.1	0.0
Delay (s)	48.4	17.5	12.6	39.7	8.1			34.5	25.9		25.5	24.8
Level of Service	D	B	B	D	A			C	C		C	C
Approach Delay (s)		16.9			14.1			29.7			25.4	
Approach LOS		B			B			C			C	

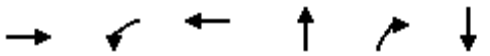
Intersection Summary			
HCM Average Control Delay	17.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	96	46	20	281	367	33
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	105	51	22	309	403	36
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)					445	
pX, platoon unblocked						
vC, conflicting volume	774	421	440			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	774	421	440			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	71	92	98			
cM capacity (veh/h)	359	636	1105			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	156	331	440
Volume Left	105	22	0
Volume Right	51	0	36
cSH	418	1105	1700
Volume to Capacity	0.37	0.02	0.26
Queue Length 95th (ft)	42	2	0
Control Delay (s)	18.6	0.7	0.0
Lane LOS	C	A	
Approach Delay (s)	18.6	0.7	0.0
Approach LOS	C		

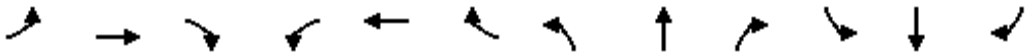
Intersection Summary			
Average Delay	3.4		
Intersection Capacity Utilization	49.4%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1251	326	793	135	267	26
v/c Ratio	0.71	0.68	0.34	0.59	0.56	0.11
Control Delay	26.3	34.3	5.8	40.0	8.1	25.0
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	26.3	34.3	6.1	40.0	8.1	25.0
Queue Length 50th (ft)	187	148	61	66	0	11
Queue Length 95th (ft)	#341	237	140	101	51	27
Internal Link Dist (ft)	190		278	1114		287
Turn Bay Length (ft)						
Base Capacity (vph)	1755	479	2316	388	630	414
Starvation Cap Reductn	0	0	921	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.71	0.68	0.57	0.35	0.42	0.06

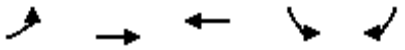
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	973	141	290	700	5	120	0	238	15	7	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Lane Util. Factor		0.91		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.99		1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.98		1.00	1.00			1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)		4585		1646	3225			1646	1465		1610	
Flt Permitted		1.00		0.95	1.00			0.74	1.00		0.82	
Satd. Flow (perm)		4585		1646	3225			1283	1465		1363	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	1093	158	326	787	6	135	0	267	17	8	1
RTOR Reduction (vph)	0	19	0	0	1	0	0	0	219	0	1	0
Lane Group Flow (vph)	0	1232	0	326	792	0	0	135	48	0	25	0
Confl. Peds. (#/hr)	2		8	8		2			3	3		
Heavy Vehicles (%)	0%	2%	0%	1%	3%	0%	1%	0%	0%	7%	0%	0%
Turn Type				Prot			Perm		Perm	Perm		
Protected Phases		2		1	6			8			8	
Permitted Phases							8		8	8		
Actuated Green, G (s)		31.2		24.0	59.2			14.8	14.8		14.8	
Effective Green, g (s)		31.2		24.0	59.2			14.8	14.8		14.8	
Actuated g/C Ratio		0.38		0.29	0.72			0.18	0.18		0.18	
Clearance Time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Vehicle Extension (s)		4.5		2.5	5.6			2.5	2.5		2.5	
Lane Grp Cap (vph)		1734		479	2314			230	263		245	
v/s Ratio Prot		c0.27		c0.20	0.25							
v/s Ratio Perm								c0.11	0.03		0.02	
v/c Ratio		0.71		0.68	0.34			0.59	0.18		0.10	
Uniform Delay, d1		21.8		25.9	4.4			31.0	28.7		28.3	
Progression Factor		1.00		1.00	1.00			1.00	1.00		1.00	
Incremental Delay, d2		2.5		3.6	0.4			3.1	0.2		0.1	
Delay (s)		24.3		29.5	4.8			34.2	29.0		28.4	
Level of Service		C		C	A			C	C		C	
Approach Delay (s)		24.3			12.0			30.7			28.4	
Approach LOS		C			B			C			C	

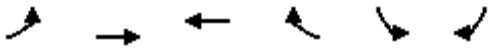
Intersection Summary			
HCM Average Control Delay	20.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.67		
Actuated Cycle Length (s)	82.5	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.9%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	180	1198	1124	516	267
v/c Ratio	0.71	0.51	0.47	0.86	0.54
Control Delay	54.4	7.0	14.7	54.3	8.9
Queue Delay	0.0	1.7	0.0	0.0	0.0
Total Delay	54.4	8.7	14.7	54.3	8.9
Queue Length 50th (ft)	110	156	144	163	0
Queue Length 95th (ft)	170	194	200	#235	65
Internal Link Dist (ft)		278	332	531	
Turn Bay Length (ft)				300	
Base Capacity (vph)	346	2363	2387	632	502
Starvation Cap Reductn	0	932	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.52	0.84	0.47	0.82	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	160	1066	757	243	459	238
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5	4.5		4.0	4.0
Lane Util. Factor	1.00	0.95	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1646	3260	4409		3162	1444
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1646	3260	4409		3162	1444
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	180	1198	851	273	516	267
RTOR Reduction (vph)	0	0	51	0	0	216
Lane Group Flow (vph)	180	1198	1073	0	516	51
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	1%	2%	3%	7%	2%	3%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	15.5	72.5	53.0		19.0	19.0
Effective Green, g (s)	15.5	72.5	53.0		19.0	19.0
Actuated g/C Ratio	0.16	0.72	0.53		0.19	0.19
Clearance Time (s)	4.0	4.5	4.5		4.0	4.0
Vehicle Extension (s)	2.5	6.3	4.5		2.5	2.5
Lane Grp Cap (vph)	255	2364	2337		601	274
v/s Ratio Prot	c0.11	c0.37	0.24		c0.16	
v/s Ratio Perm						0.04
v/c Ratio	0.71	0.51	0.46		0.86	0.19
Uniform Delay, d1	40.1	6.0	14.6		39.2	34.0
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	8.0	0.8	0.7		11.5	0.2
Delay (s)	48.1	6.8	15.3		50.7	34.2
Level of Service	D	A	B		D	C
Approach Delay (s)		12.2	15.3		45.1	
Approach LOS		B	B		D	

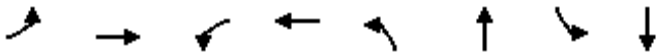
Intersection Summary			
HCM Average Control Delay	21.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	59.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1430	76	23	885	34	18
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1554	83	25	962	37	20
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	412					
pX, platoon unblocked			0.85		0.85	0.85
vC, conflicting volume			1637		2127	818
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1393		1970	427
tC, single (s)			4.2		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			94		17	96
cM capacity (veh/h)			404		44	479

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1036	601	25	481	481	57
Volume Left	0	0	25	0	0	37
Volume Right	0	83	0	0	0	20
cSH	1700	1700	404	1700	1700	65
Volume to Capacity	0.61	0.35	0.06	0.28	0.28	0.87
Queue Length 95th (ft)	0	0	5	0	0	103
Control Delay (s)	0.0	0.0	14.5	0.0	0.0	182.0
Lane LOS			B			F
Approach Delay (s)	0.0		0.4			182.0
Approach LOS						F

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	55.5%	ICU Level of Service	B
Analysis Period (min)	15		

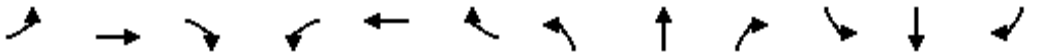


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	65	1437	81	703	166	185	68	152
v/c Ratio	0.41	0.99	0.49	0.47	0.79	0.64	0.47	0.67
Control Delay	41.6	46.4	44.1	17.8	61.2	35.0	45.5	40.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.6	46.4	44.1	17.8	61.2	35.0	45.5	40.3
Queue Length 50th (ft)	31	~411	39	124	81	71	34	59
Queue Length 95th (ft)	69	#628	81	211	#177	128	70	107
Internal Link Dist (ft)		3201		1243		756		743
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	188	1454	188	1481	220	353	229	356
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.99	0.43	0.47	0.75	0.52	0.30	0.43

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

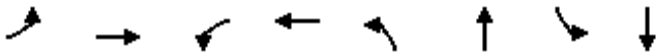
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	61	1127	224	76	624	37	156	109	65	64	92	51
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3103		1614	3144		1599	1598		1662	1657	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3103		1614	3144		1599	1598		1662	1657	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	65	1199	238	81	664	39	166	116	69	68	98	54
RTOR Reduction (vph)	0	18	0	0	4	0	0	28	0	0	27	0
Lane Group Flow (vph)	65	1419	0	81	699	0	166	157	0	68	125	0
Heavy Vehicles (%)	0%	5%	2%	3%	5%	3%	4%	3%	4%	0%	0%	0%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	6.6	36.2		7.1	36.7		10.5	13.3		6.9	9.7	
Effective Green, g (s)	6.6	36.2		7.1	36.7		10.5	13.3		6.9	9.7	
Actuated g/C Ratio	0.08	0.45		0.09	0.46		0.13	0.17		0.09	0.12	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		0.2	0.2	
Lane Grp Cap (vph)	137	1404		143	1442		210	266		143	201	
v/s Ratio Prot	0.04	c0.46		c0.05	0.22		c0.10	c0.10		0.04	0.08	
v/s Ratio Perm												
v/c Ratio	0.47	1.01		0.57	0.48		0.79	0.59		0.48	0.62	
Uniform Delay, d1	35.0	21.9		35.0	15.1		33.7	30.8		34.8	33.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.9	26.8		4.1	1.2		17.6	2.9		0.9	4.2	
Delay (s)	36.9	48.7		39.1	16.2		51.2	33.8		35.7	37.6	
Level of Service	D	D		D	B		D	C		D	D	
Approach Delay (s)		48.2			18.6			42.0			37.0	
Approach LOS		D			B			D			D	

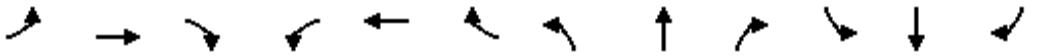
Intersection Summary			
HCM Average Control Delay	38.4	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	80.0	Sum of lost time (s)	16.5
Intersection Capacity Utilization	77.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	51	1032	22	621	79	79	50	128
v/c Ratio	0.39	0.44	0.21	0.28	0.69	0.34	0.32	0.53
Control Delay	51.6	7.2	48.2	8.0	69.2	32.2	43.0	32.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	7.2	48.2	8.0	69.2	32.2	43.0	32.9
Queue Length 50th (ft)	31	80	14	75	49	34	29	49
Queue Length 95th (ft)	67	242	38	141	93	72	61	99
Internal Link Dist (ft)		1243		1262		460		794
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	192	2348	199	2197	180	350	242	352
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.44	0.11	0.28	0.44	0.23	0.21	0.36

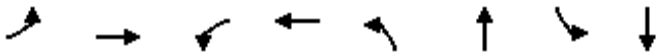
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	47	793	156	20	547	24	73	50	23	46	58	60
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.95		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3158		1662	3207		1599	1667		1630	1577	
Flt Permitted	0.95	1.00		0.95	1.00		0.53	1.00		0.71	1.00	
Satd. Flow (perm)	1599	3158		1662	3207		898	1667		1210	1577	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	862	170	22	595	26	79	54	25	50	63	65
RTOR Reduction (vph)	0	11	0	0	2	0	0	18	0	0	40	0
Lane Group Flow (vph)	51	1021	0	22	619	0	79	61	0	50	88	0
Heavy Vehicles (%)	4%	3%	1%	0%	3%	4%	4%	0%	0%	2%	0%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	7.1	71.6		3.1	67.6		12.8	12.8		12.8	12.8	
Effective Green, g (s)	7.1	71.6		3.1	67.6		12.8	12.8		12.8	12.8	
Actuated g/C Ratio	0.07	0.72		0.03	0.68		0.13	0.13		0.13	0.13	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	114	2261		52	2168		115	213		155	202	
v/s Ratio Prot	c0.03	c0.32		0.01	0.19			0.04			0.06	
v/s Ratio Perm							c0.09			0.04		
v/c Ratio	0.45	0.45		0.42	0.29		0.69	0.28		0.32	0.44	
Uniform Delay, d1	44.6	6.0		47.6	6.5		41.7	39.5		39.7	40.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.0	0.7		4.0	0.3		14.5	0.5		0.9	1.1	
Delay (s)	46.6	6.6		51.6	6.8		56.1	40.0		40.5	41.4	
Level of Service	D	A		D	A		E	D		D	D	
Approach Delay (s)		8.5			8.4			48.1			41.1	
Approach LOS		A			A			D			D	

Intersection Summary			
HCM Average Control Delay	14.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	54.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

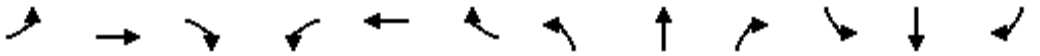


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	133	755	9	675	22	26	231	90
v/c Ratio	0.31	0.33	0.07	0.47	0.14	0.12	1.28	0.33
Control Delay	21.6	4.9	30.6	15.2	28.7	21.1	190.4	16.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	4.9	30.6	15.2	28.7	21.1	190.4	16.8
Queue Length 50th (ft)	43	44	4	104	8	6	~129	13
Queue Length 95th (ft)	83	111	16	148	27	26	#248	50
Internal Link Dist (ft)		1262		3552		693		561
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	494	2281	499	1444	157	225	181	275
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.33	0.02	0.47	0.14	0.12	1.28	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

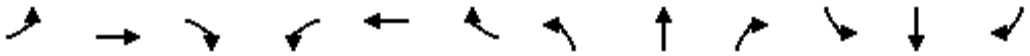
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	117	610	55	8	452	142	19	14	9	203	30	49
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3225		1662	3127		1498	1518		1630	1587	
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00		0.74	1.00	
Satd. Flow (perm)	1646	3225		1662	3127		1101	1518		1270	1587	
Peak-hour factor, PHF	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Adj. Flow (vph)	133	693	62	9	514	161	22	16	10	231	34	56
RTOR Reduction (vph)	0	5	0	0	41	0	0	9	0	0	48	0
Lane Group Flow (vph)	133	750	0	9	634	0	22	17	0	231	42	0
Heavy Vehicles (%)	1%	2%	0%	0%	3%	1%	11%	14%	0%	2%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	19.2	46.2		1.3	28.3		10.0	10.0		10.0	10.0	
Effective Green, g (s)	19.2	46.2		1.3	28.3		10.0	10.0		10.0	10.0	
Actuated g/C Ratio	0.27	0.66		0.02	0.40		0.14	0.14		0.14	0.14	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.5		2.5	4.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	451	2129		31	1264		157	217		181	227	
v/s Ratio Prot	0.08	c0.23		0.01	c0.20			0.01			0.03	
v/s Ratio Perm							0.02			c0.18		
v/c Ratio	0.29	0.35		0.29	0.50		0.14	0.08		1.28	0.19	
Uniform Delay, d1	20.1	5.3		33.9	15.6		26.2	26.0		30.0	26.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.5		3.8	1.4		0.3	0.1		160.0	0.3	
Delay (s)	20.3	5.7		37.7	17.0		26.5	26.1		190.0	26.7	
Level of Service	C	A		D	B		C	C		F	C	
Approach Delay (s)		7.9			17.3			26.3			144.2	
Approach LOS		A			B			C			F	

Intersection Summary			
HCM Average Control Delay	34.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	70.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	54.8%	ICU Level of Service	A
Analysis Period (min)	15		

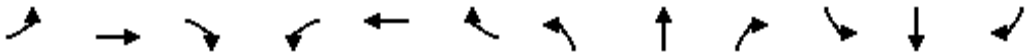
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	34	5	6	38	26	522	18	59	694	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	6	6	40	6	7	45	31	614	21	69	816	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1376	1656	412	1276	1649	318	825			635		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1376	1656	412	1276	1649	318	825			635		
tC, single (s)	7.5	6.9	7.0	7.5	6.8	7.0	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.2	3.3	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	93	92	93	94	91	93	96			93		
cM capacity (veh/h)	84	72	586	101	75	675	789			958		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	58	31	409	226	69	544	280
Volume Left	6	6	31	0	0	69	0	0
Volume Right	40	45	0	0	21	0	0	8
cSH	236	264	789	1700	1700	958	1700	1700
Volume to Capacity	0.22	0.22	0.04	0.24	0.13	0.07	0.32	0.16
Queue Length 95th (ft)	20	20	3	0	0	6	0	0
Control Delay (s)	24.5	22.4	9.7	0.0	0.0	9.1	0.0	0.0
Lane LOS	C	C	A			A		
Approach Delay (s)	24.5	22.4	0.4			0.7		
Approach LOS	C	C						

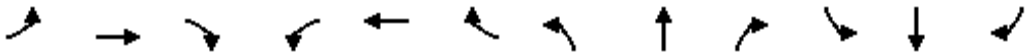
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	38.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	94	4	3	122	26	3	3	9	17	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	4	113	5	4	147	31	4	4	11	20	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	178			118			278	308	116	290	280	147
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	178			118			278	308	116	290	280	147
tC, single (s)	4.1			4.4			7.4	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.8	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	97	100	100
cM capacity (veh/h)	1410			1299			613	606	942	653	629	905

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	122	151	31	18	22
Volume Left	4	4	0	4	20
Volume Right	5	0	31	11	1
cSH	1410	1299	1700	773	663
Volume to Capacity	0.00	0.00	0.02	0.02	0.03
Queue Length 95th (ft)	0	0	0	2	3
Control Delay (s)	0.2	0.2	0.0	9.8	10.6
Lane LOS	A	A		A	B
Approach Delay (s)	0.2	0.2		9.8	10.6
Approach LOS				A	B

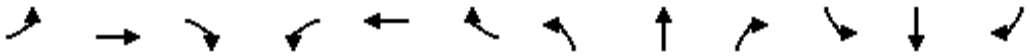
Intersection Summary				
Average Delay	1.4			
Intersection Capacity Utilization	22.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	7	2	5	11	42	2	7	2	15	6	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66	0.66
Hourly flow rate (vph)	0	11	3	8	17	64	3	11	3	23	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	80			14			80	108	12	84	77	48
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	80			14			80	108	12	84	77	48
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	99	100	97	99	100
cM capacity (veh/h)	1530			1618			902	783	1074	892	813	1026

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	14	88	17	32
Volume Left	0	8	3	23
Volume Right	3	64	3	0
cSH	1530	1618	845	868
Volume to Capacity	0.00	0.00	0.02	0.04
Queue Length 95th (ft)	0	0	2	3
Control Delay (s)	0.0	0.7	9.3	9.3
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.7	9.3	9.3
Approach LOS			A	A

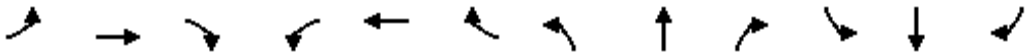
Intersection Summary				
Average Delay	3.4			
Intersection Capacity Utilization	18.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	166	0	0	347	5	0	0	0	6	0	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	5	177	0	0	369	5	0	0	0	6	0	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	374			177			564	562	177	559	559	372
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	374			177			564	562	177	559	559	372
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	100	99	100	99
cM capacity (veh/h)	1092			1412			433	437	872	441	438	679

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	5	177	0	374	0	14
Volume Left	5	0	0	0	0	6
Volume Right	0	0	0	5	0	7
cSH	1092	1700	1700	1700	1700	543
Volume to Capacity	0.00	0.10	0.00	0.22	0.00	0.03
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	11.8
Lane LOS	A				A	B
Approach Delay (s)	0.2		0.0		0.0	11.8
Approach LOS					A	B

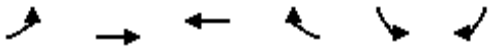
Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	30.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	2	168	0	6	366	6	1	0	1	9	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	2	202	0	7	441	7	1	0	1	11	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	448			202			667	670	202	667	666	445
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	448			202			667	670	202	667	666	445
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	97	100	100
cM capacity (veh/h)	1123			1285			372	378	843	372	380	618

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	205	455	2	12
Volume Left	2	7	1	11
Volume Right	0	7	1	1
cSH	1123	1285	516	387
Volume to Capacity	0.00	0.01	0.00	0.03
Queue Length 95th (ft)	0	0	0	2
Control Delay (s)	0.1	0.2	12.0	14.6
Lane LOS	A	A	B	B
Approach Delay (s)	0.1	0.2	12.0	14.6
Approach LOS			B	B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	189	429	104	49	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	205	466	113	53	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			570			
pX, platoon unblocked	0.98				0.98	0.98
vC, conflicting volume	579				626	290
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	537				584	243
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				88	100
cM capacity (veh/h)	1023				430	751

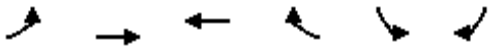
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	103	103	311	268	54
Volume Left	0	0	0	0	53
Volume Right	0	0	0	113	1
cSH	1700	1700	1700	1700	434
Volume to Capacity	0.06	0.06	0.18	0.16	0.13
Queue Length 95th (ft)	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	14.5
Lane LOS					B
Approach Delay (s)	0.0		0.0		14.5
Approach LOS					B

Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	26.5%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBT	WBT	SBL
Lane Group Flow (vph)	287	807	151
v/c Ratio	0.15	0.42	0.37
Control Delay	7.6	8.6	16.3
Queue Delay	0.0	0.0	0.0
Total Delay	7.6	8.6	16.3
Queue Length 50th (ft)	16	51	30
Queue Length 95th (ft)	56	156	71
Internal Link Dist (ft)	490	240	1823
Turn Bay Length (ft)			275
Base Capacity (vph)	2936	2663	1100
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.10	0.30	0.14

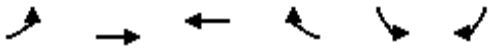
Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	0	238	533	137	125	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)		5.0	5.0		4.5	
Lane Util. Factor		0.95	0.95		1.00	
Frt		1.00	0.97		1.00	
Flt Protected		1.00	1.00		0.95	
Satd. Flow (prot)		3137	3128		1484	
Flt Permitted		1.00	1.00		0.95	
Satd. Flow (perm)		3137	3128		1484	
Peak-hour factor, PHF	0.83	0.83	0.83	0.83	0.83	0.83
Adj. Flow (vph)	0	287	642	165	151	0
RTOR Reduction (vph)	0	0	19	0	0	0
Lane Group Flow (vph)	0	287	788	0	151	0
Heavy Vehicles (%)	0%	6%	2%	7%	12%	0%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)		26.6	26.6		10.6	
Effective Green, g (s)		26.6	26.6		10.6	
Actuated g/C Ratio		0.57	0.57		0.23	
Clearance Time (s)		5.0	5.0		4.5	
Vehicle Extension (s)		3.0	3.0		3.0	
Lane Grp Cap (vph)		1787	1782		337	
v/s Ratio Prot		0.09	c0.25		c0.10	
v/s Ratio Perm						
v/c Ratio		0.16	0.44		0.45	
Uniform Delay, d1		4.8	5.8		15.5	
Progression Factor		1.00	1.00		1.00	
Incremental Delay, d2		0.0	0.2		1.0	
Delay (s)		4.8	6.0		16.5	
Level of Service		A	A		B	
Approach Delay (s)		4.8	6.0		16.5	
Approach LOS		A	A		B	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	46.7	Sum of lost time (s)	9.5
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		

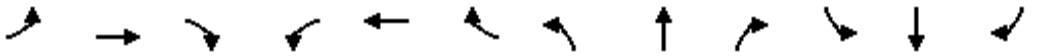
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	363	667	0	5	3
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.55	0.55	0.55	0.55	0.55	0.55
Hourly flow rate (vph)	0	660	1213	0	9	5
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		320				
pX, platoon unblocked					0.99	
vC, conflicting volume	1213				1543	606
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1213				1532	606
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	99
cM capacity (veh/h)	582				109	445

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	0	330	330	808	404	15
Volume Left	0	0	0	0	0	9
Volume Right	0	0	0	0	0	5
cSH	1700	1700	1700	1700	1700	152
Volume to Capacity	0.00	0.19	0.19	0.48	0.24	0.10
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	31.2
Lane LOS						D
Approach Delay (s)	0.0			0.0		31.2
Approach LOS						D

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	356	12	10	499	0	0	0	0	55	0	168
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Hourly flow rate (vph)	0	475	16	13	665	0	0	0	0	73	0	224
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		760										
pX, platoon unblocked												
vC, conflicting volume	665			475			842	1175	245	929	1167	333
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	665			475			842	1175	245	929	1167	333
tC, single (s)	4.1			4.8			7.5	6.5	6.9	7.8	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			99			100	100	100	64	100	66
cM capacity (veh/h)	933			893			171	190	761	202	192	666

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	316	174	13	333	333	73	224
Volume Left	0	0	13	0	0	73	0
Volume Right	0	16	0	0	0	0	224
cSH	1700	1700	893	1700	1700	202	666
Volume to Capacity	0.19	0.10	0.01	0.20	0.20	0.36	0.34
Queue Length 95th (ft)	0	0	1	0	0	39	37
Control Delay (s)	0.0	0.0	9.1	0.0	0.0	32.6	13.1
Lane LOS			A			D	B
Approach Delay (s)	0.0		0.2			17.9	
Approach LOS						C	

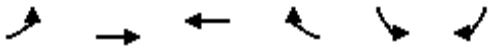
Intersection Summary				
Average Delay	3.7			
Intersection Capacity Utilization	32.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	290	121	73	496	13	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	132	79	539	14	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			315		743	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			315		743	315
tC, single (s)			4.3		7.1	7.1
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			93		95	95
cM capacity (veh/h)			1186		302	660

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	315	132	79	270	270	14	35
Volume Left	0	0	79	0	0	14	0
Volume Right	0	132	0	0	0	0	35
cSH	1700	1700	1186	1700	1700	302	660
Volume to Capacity	0.19	0.08	0.07	0.16	0.16	0.05	0.05
Queue Length 95th (ft)	0	0	5	0	0	4	4
Control Delay (s)	0.0	0.0	8.3	0.0	0.0	17.5	10.8
Lane LOS			A			C	B
Approach Delay (s)	0.0		1.1			12.7	
Approach LOS						B	

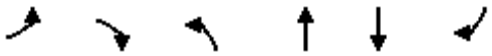
Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	34.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	29	293	525	64	72	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	31	315	565	69	77	47
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	633				976	317
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	633				976	317
tC, single (s)	4.2				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				68	93
cM capacity (veh/h)	932				238	679

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	31	315	376	257	125
Volume Left	31	0	0	0	77
Volume Right	0	0	0	69	47
cSH	932	1700	1700	1700	316
Volume to Capacity	0.03	0.19	0.22	0.15	0.39
Queue Length 95th (ft)	3	0	0	0	45
Control Delay (s)	9.0	0.0	0.0	0.0	23.6
Lane LOS	A				C
Approach Delay (s)	0.8		0.0		23.6
Approach LOS					C

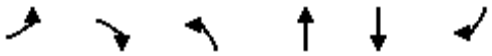
Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	38.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	11	1	6	24	64	22
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	13	1	7	28	75	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	131	88	101			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	131	88	101			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	864	976	1504			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	14	35	101
Volume Left	13	7	0
Volume Right	1	0	26
cSH	873	1504	1700
Volume to Capacity	0.02	0.00	0.06
Queue Length 95th (ft)	1	0	0
Control Delay (s)	9.2	1.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.2	1.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	17.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	5	2	0	2	3	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.62	0.62	0.62	0.62	0.62	0.62
Hourly flow rate (vph)	8	3	0	3	5	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	15	11	18			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	15	11	18			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	1009	1075	1612			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	11	3	18
Volume Left	8	0	0
Volume Right	3	0	13
cSH	1027	1612	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: Existing

Greensprings Dr / Dover Ave / Riverside Dr
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Greensprings Dr											
3L	L	2	0.0	0.078	6.6	LOS A	0.4	11.2	0.15	0.66	25.8
8L	T	31	4.0	0.077	0.2	LOS A	0.4	11.2	0.15	0.05	28.7
8T	R	85	7.0	0.077	6.1	LOS A	0.4	11.2	0.15	0.53	26.1
Approach		118	6.1	0.077	4.6	LOS A	0.4	11.2	0.15	0.41	26.7
North East: Greensprings Dr											
17T	L	56	11.0	0.036	7.3	LOS A	0.0	0.0	0.00	1.00	24.8
14R	T	1	0.0	0.036	6.2	LOS A	0.0	0.0	0.00	0.69	26.1
14R	R	2	0.0	0.036	6.9	LOS A	0.0	0.0	0.00	0.67	25.8
Approach		59	10.4	0.036	5.1	LOS A	0.0	0.0	0.00	0.98	24.9
North: Riverside Dr											
7L	L	3	0.0	0.027	7.4	LOS A	0.1	3.5	0.15	1.00	23.5
4T	T	36	0.0	0.027	7.4	LOS A	0.1	3.5	0.15	0.89	23.8
4R	R	1	0.0	0.026	7.4	LOS A	0.1	3.5	0.15	0.89	23.7
Approach		41	0.0	0.027	7.4	LOS A	0.1	3.5	0.15	0.90	23.8
West: Dover Ave											
5L	L	1	0.0	0.005	9.3	LOS A	0.0	0.7	0.24	0.91	23.0
2T	T	1	0.0	0.005	9.3	LOS A	0.0	0.7	0.24	0.85	23.1
2R	R	2	0.0	0.005	9.3	LOS A	0.0	0.7	0.24	0.84	22.9
Approach		5	0.0	0.005	9.3	LOS A	0.0	0.7	0.24	0.86	23.0
All Vehicles		223	6.0	0.078	5.9	NA	0.4	11.2	0.11	0.66	25.6

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.

Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (HCM).

Approach LOS values are based on the worst delay for any vehicle movement.

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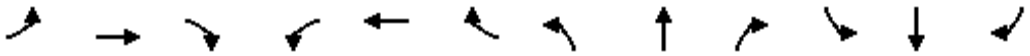
SIDRA INTERSECTION



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	423	2	0	456	0	3	0	6	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	470	2	0	507	0	3	0	7	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	507			472			978	978	471	984	979	507
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	507			472			978	978	471	984	979	507
tC, single (s)	4.1			4.1			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			100			99	100	99	100	100	100
cM capacity (veh/h)	1069			1100			232	253	563	227	252	570

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	472	507	10	0
Volume Left	0	0	3	0
Volume Right	2	0	7	0
cSH	1069	1100	381	1700
Volume to Capacity	0.00	0.00	0.03	0.00
Queue Length 95th (ft)	0	0	2	0
Control Delay (s)	0.0	0.0	14.7	0.0
Lane LOS			B	A
Approach Delay (s)	0.0	0.0	14.7	0.0
Approach LOS			B	A

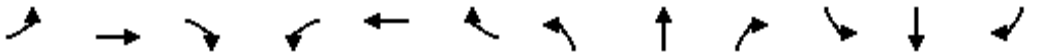
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBL	WBT	NBT	SBT
Lane Group Flow (vph)	6	461	20	510	50	10
v/c Ratio	0.04	0.69	0.09	0.75	0.09	0.02
Control Delay	8.3	17.3	8.8	20.2	4.8	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	17.3	8.8	20.2	4.8	6.7
Queue Length 50th (ft)	1	79	3	91	2	1
Queue Length 95th (ft)	6	#192	12	#221	15	7
Internal Link Dist (ft)		811		851	554	781
Turn Bay Length (ft)	350		300			
Base Capacity (vph)	146	669	220	680	588	554
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.04	0.69	0.09	0.75	0.09	0.02

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



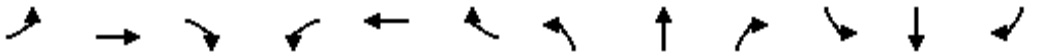
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	6	431	12	19	485	5	14	1	33	7	0	3
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	1.00			0.91			0.96	
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.97	
Satd. Flow (prot)	1108	1667		1433	1697			1474			1478	
Flt Permitted	0.31	1.00		0.37	1.00			0.95			0.90	
Satd. Flow (perm)	365	1667		551	1697			1419			1379	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	6	449	12	20	505	5	15	1	34	7	0	3
RTOR Reduction (vph)	0	2	0	0	1	0	0	20	0	0	2	0
Lane Group Flow (vph)	6	459	0	20	509	0	0	30	0	0	8	0
Heavy Vehicles (%)	50%	4%	25%	16%	3%	0%	14%	0%	3%	14%	0%	0%
Turn Type	Perm			Perm			Perm			Perm		
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Effective Green, g (s)	16.0	16.0		16.0	16.0			16.0			16.0	
Actuated g/C Ratio	0.40	0.40		0.40	0.40			0.40			0.40	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Grp Cap (vph)	146	667		220	679			568			552	
v/s Ratio Prot		0.28			c0.30							
v/s Ratio Perm	0.02			0.04				c0.02			0.01	
v/c Ratio	0.04	0.69		0.09	0.75			0.05			0.01	
Uniform Delay, d1	7.3	9.9		7.5	10.3			7.4			7.2	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.5	5.7		0.8	7.5			0.2			0.0	
Delay (s)	7.8	15.6		8.3	17.8			7.5			7.3	
Level of Service	A	B		A	B			A			A	
Approach Delay (s)		15.5			17.4			7.5			7.3	
Approach LOS		B			B			A			A	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	170	153	102	635	142	681	16
v/c Ratio	0.42	0.42	0.33	0.40	0.42	0.41	0.02
Control Delay	14.8	18.1	27.1	14.5	27.5	14.0	7.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.8	18.1	27.1	14.5	27.5	14.0	7.7
Queue Length 50th (ft)	22	26	26	68	36	72	0
Queue Length 95th (ft)	68	74	84	165	110	178	11
Internal Link Dist (ft)	1132	2558		6451		1685	
Turn Bay Length (ft)			275		350		100
Base Capacity (vph)	828	786	616	2041	616	2083	966
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.19	0.17	0.31	0.23	0.33	0.02

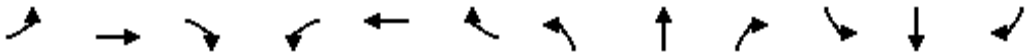
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	19	41	78	26	44	54	83	488	27	115	552	13
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt		0.92			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1597			1615		1646	3166		1646	3228	1488
Flt Permitted		0.96			0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1537			1487		1646	3166		1646	3228	1488
Peak-hour factor, PHF	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Adj. Flow (vph)	23	51	96	32	54	67	102	602	33	142	681	16
RTOR Reduction (vph)	0	68	0	0	41	0	0	4	0	0	0	9
Lane Group Flow (vph)	0	102	0	0	112	0	102	631	0	142	681	7
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%	1%	4%	8%	1%	3%	0%
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)		8.6			8.6		6.8	22.8		7.6	23.6	23.6
Effective Green, g (s)		8.6			8.6		6.8	22.8		7.6	23.6	23.6
Actuated g/C Ratio		0.17			0.17		0.13	0.45		0.15	0.46	0.46
Clearance Time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		2.5			2.5		2.5	4.5		2.5	4.5	4.5
Lane Grp Cap (vph)		259			251		219	1415		245	1494	689
v/s Ratio Prot							0.06	0.20		c0.09	c0.21	
v/s Ratio Perm		0.07			c0.08							0.00
v/c Ratio		0.39			0.45		0.47	0.45		0.58	0.46	0.01
Uniform Delay, d1		18.9			19.1		20.4	9.7		20.2	9.3	7.4
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.7			0.9		1.1	0.4		2.7	0.4	0.0
Delay (s)		19.6			20.0		21.6	10.1		22.9	9.7	7.4
Level of Service		B			B		C	B		C	A	A
Approach Delay (s)		19.6			20.0			11.7			11.9	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	13.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.44		
Actuated Cycle Length (s)	51.0	Sum of lost time (s)	7.5
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	26	109	34	19	72	19	21	148	15	44	187	31
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	27	114	35	20	75	20	22	154	16	46	195	32
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	566	516	211	601	524	162	227			170		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	566	516	211	601	524	162	227			170		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	74	96	94	83	98	98			97		
cM capacity (veh/h)	358	436	834	307	432	888	1353			1390		

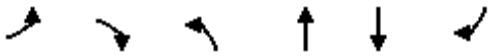
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	176	115	192	273
Volume Left	27	20	22	46
Volume Right	35	20	16	32
cSH	465	440	1353	1390
Volume to Capacity	0.38	0.26	0.02	0.03
Queue Length 95th (ft)	44	26	1	3
Control Delay (s)	17.4	16.1	1.0	1.5
Lane LOS	C	C	A	A
Approach Delay (s)	17.4	16.1	1.0	1.5
Approach LOS	C	C		

Intersection Summary				
Average Delay	7.3			
Intersection Capacity Utilization	43.0%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	41	19	109	2	11	10	75	241	4	10	344	38
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Hourly flow rate (vph)	47	22	124	2	12	11	85	274	5	11	391	43
Pedestrians		18			8			1			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	917	910	432	1004	929	286	452			286		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	917	910	432	1004	929	286	452			286		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	79	91	80	99	95	98	92			99		
cM capacity (veh/h)	218	247	618	152	241	751	1102			1279		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	192	26	85	278	11	434
Volume Left	47	2	85	0	11	0
Volume Right	124	11	0	5	0	43
cSH	383	319	1102	1700	1279	1700
Volume to Capacity	0.50	0.08	0.08	0.16	0.01	0.26
Queue Length 95th (ft)	68	7	6	0	1	0
Control Delay (s)	23.5	17.3	8.5	0.0	7.8	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	23.5	17.3	2.0		0.2	
Approach LOS	C	C				

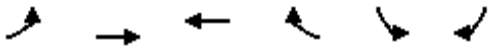
Intersection Summary				
Average Delay	5.6			
Intersection Capacity Utilization	54.4%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	50	48	31	320	346	40
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83
Hourly flow rate (vph)	60	58	37	386	417	48
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	901	441	465			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	901	441	465			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	80	91	97			
cM capacity (veh/h)	301	621	1107			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	60	58	37	386	465
Volume Left	60	0	37	0	0
Volume Right	0	58	0	0	48
cSH	301	621	1107	1700	1700
Volume to Capacity	0.20	0.09	0.03	0.23	0.27
Queue Length 95th (ft)	18	8	3	0	0
Control Delay (s)	20.0	11.4	8.4	0.0	0.0
Lane LOS	C	B	A		
Approach Delay (s)	15.8		0.7		0.0
Approach LOS	C				

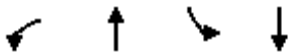
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	22	144	85	65	84	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	26	169	100	76	99	41
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	176				359	138
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	176				359	138
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	98				84	95
cM capacity (veh/h)	1412				630	900

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	195	176	99	41
Volume Left	26	0	99	0
Volume Right	0	76	0	41
cSH	1412	1700	630	900
Volume to Capacity	0.02	0.10	0.16	0.05
Queue Length 95th (ft)	1	0	14	4
Control Delay (s)	1.1	0.0	11.8	9.2
Lane LOS	A		B	A
Approach Delay (s)	1.1	0.0	11.0	
Approach LOS			B	

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	233	367	465	367
v/c Ratio	0.67	0.78	0.80	0.31
Control Delay	23.6	37.4	35.7	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	23.6	37.4	35.7	5.6
Queue Length 50th (ft)	45	143	185	44
Queue Length 95th (ft)	115	#339	#435	137
Internal Link Dist (ft)	1985	1504		1756
Turn Bay Length (ft)				
Base Capacity (vph)	595	566	666	1336
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.39	0.65	0.70	0.27

Intersection Summary

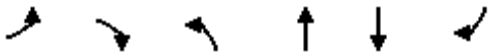
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	67	154	264	85	442	349
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.91		0.97		1.00	1.00
Flt Protected	0.98		1.00		0.95	1.00
Satd. Flow (prot)	1395		1568		1614	1683
Flt Permitted	0.98		1.00		0.95	1.00
Satd. Flow (perm)	1395		1568		1614	1683
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	162	278	89	465	367
RTOR Reduction (vph)	106	0	13	0	0	0
Lane Group Flow (vph)	127	0	354	0	465	367
Heavy Vehicles (%)	21%	8%	7%	11%	3%	4%
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	12.3		20.8		25.4	50.2
Effective Green, g (s)	12.3		20.8		25.4	50.2
Actuated g/C Ratio	0.17		0.30		0.36	0.71
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	243		463		581	1198
v/s Ratio Prot	c0.09		c0.23		c0.29	0.22
v/s Ratio Perm						
v/c Ratio	0.52		0.77		0.80	0.31
Uniform Delay, d1	26.4		22.6		20.3	3.7
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	2.0		7.4		7.8	0.1
Delay (s)	28.5		30.0		28.0	3.9
Level of Service	C		C		C	A
Approach Delay (s)	28.5		30.0			17.4
Approach LOS	C		C			B

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	70.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

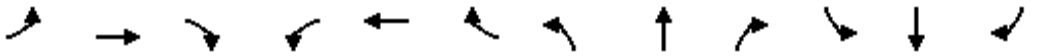
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	4	346	336	3
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Hourly flow rate (vph)	1	1	4	368	357	3
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	736	359	361			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	736	359	361			
tC, single (s)	6.4	6.2	4.4			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	100	100	100			
cM capacity (veh/h)	388	690	1081			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	2	4	368	361
Volume Left	1	4	0	0
Volume Right	1	0	0	3
cSH	497	1081	1700	1700
Volume to Capacity	0.00	0.00	0.22	0.21
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	12.3	8.3	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.3	0.1		0.0
Approach LOS	B			

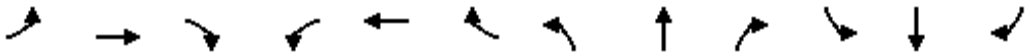
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	29.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	30	1	128	26	391	0	0	405	366
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	0	34	1	147	30	449	0	0	466	421
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	975	975	466	975	975	449	466			449		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	975	975	466	975	975	449	466			449		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	85	100	76	97			100		
cM capacity (veh/h)	172	247	601	228	247	612	1085			1122		

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	36	147	30	449	466	421
Volume Left	34	0	30	0	0	0
Volume Right	0	147	0	0	0	421
cSH	228	612	1085	1700	1700	1700
Volume to Capacity	0.16	0.24	0.03	0.26	0.27	0.25
Queue Length 95th (ft)	14	23	2	0	0	0
Control Delay (s)	23.6	12.7	8.4	0.0	0.0	0.0
Lane LOS	C	B	A			
Approach Delay (s)	14.9		0.5		0.0	
Approach LOS	B					

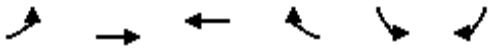
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	45.9%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	188	3	9	0	0	0	0	229	61	188	247	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	198	3	9	0	0	0	0	241	64	198	260	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			16									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	897	897	260	903	897	241	260			241		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	897	897	260	903	897	241	260			241		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	13	99	99	100	100	100	100			85		
cM capacity (veh/h)	228	239	784	225	239	803	1316			1320		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	211	241	64	198	260
Volume Left	198	0	0	198	0
Volume Right	9	0	64	0	0
cSH	239	1700	1700	1320	1700
Volume to Capacity	0.88	0.14	0.04	0.15	0.15
Queue Length 95th (ft)	182	0	0	13	0
Control Delay (s)	74.6	0.0	0.0	8.2	0.0
Lane LOS	F			A	
Approach Delay (s)	74.6	0.0		3.5	
Approach LOS	F				

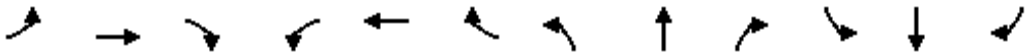
Intersection Summary				
Average Delay	17.8			
Intersection Capacity Utilization	45.9%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	38	494	349	41	76	56
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	537	379	45	83	61
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	424				1021	402
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	424				1021	402
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				67	91
cM capacity (veh/h)	1146				253	644

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	41	537	424	83	61
Volume Left	41	0	0	83	0
Volume Right	0	0	45	0	61
cSH	1146	1700	1700	253	644
Volume to Capacity	0.04	0.32	0.25	0.33	0.09
Queue Length 95th (ft)	3	0	0	34	8
Control Delay (s)	8.3	0.0	0.0	25.9	11.2
Lane LOS	A			D	B
Approach Delay (s)	0.6		0.0	19.7	
Approach LOS				C	

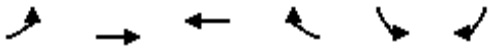
Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	40.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	96	428	1	8	289	63	3	21	31	37	9	49
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	108	481	1	9	325	71	3	24	35	42	10	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	396			482			1100	1111	481	1121	1076	360
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	396			482			1100	1111	481	1121	1076	360
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			99			98	87	94	71	95	92
cM capacity (veh/h)	1174			1091			156	186	583	143	199	689

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	108	482	9	396	62	42	65
Volume Left	108	0	9	0	3	42	0
Volume Right	0	1	0	71	35	0	55
cSH	1174	1700	1091	1700	297	143	499
Volume to Capacity	0.09	0.28	0.01	0.23	0.21	0.29	0.13
Queue Length 95th (ft)	8	0	1	0	19	28	11
Control Delay (s)	8.4	0.0	8.3	0.0	20.3	40.0	13.3
Lane LOS	A		A		C	E	B
Approach Delay (s)	1.5		0.2		20.3	23.7	
Approach LOS					C	C	

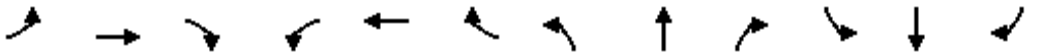
Intersection Summary				
Average Delay	4.1			
Intersection Capacity Utilization	46.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	88	466	321	13	11	57
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	104	548	378	15	13	67
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	393				1141	385
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	393				1141	385
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				94	90
cM capacity (veh/h)	1171				204	662

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	104	548	393	80
Volume Left	104	0	0	13
Volume Right	0	0	15	67
cSH	1171	1700	1700	486
Volume to Capacity	0.09	0.32	0.23	0.16
Queue Length 95th (ft)	7	0	0	15
Control Delay (s)	8.4	0.0	0.0	13.9
Lane LOS	A			B
Approach Delay (s)	1.3		0.0	13.9
Approach LOS				B

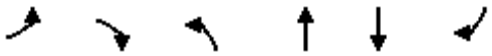
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	150	272	47	0	232	32	19	22	1	18	31	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	169	306	53	0	261	36	21	25	1	20	35	91
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	297			358			1038	966	332	935	974	279
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	297			358			1038	966	332	935	974	279
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			100			85	89	100	90	84	88
cM capacity (veh/h)	1270			1211			144	218	714	203	217	765

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	169	358	0	297	47	55	91
Volume Left	169	0	0	0	21	20	0
Volume Right	0	53	0	36	1	0	91
cSH	1270	1700	1700	1700	179	212	765
Volume to Capacity	0.13	0.21	0.00	0.17	0.26	0.26	0.12
Queue Length 95th (ft)	11	0	0	0	25	25	10
Control Delay (s)	8.3	0.0	0.0	0.0	32.1	27.8	10.3
Lane LOS	A				D	D	B
Approach Delay (s)	2.6		0.0		32.1	16.9	
Approach LOS					D	C	

Intersection Summary				
Average Delay	5.3			
Intersection Capacity Utilization	43.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	127	194	147	193	266	100
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	132	202	153	201	277	104
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	836	329	381			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	836	329	381			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	54	71	87			
cM capacity (veh/h)	290	708	1161			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	132	202	153	201	381
Volume Left	132	0	153	0	0
Volume Right	0	202	0	0	104
cSH	290	708	1161	1700	1700
Volume to Capacity	0.46	0.29	0.13	0.12	0.22
Queue Length 95th (ft)	56	29	11	0	0
Control Delay (s)	27.4	12.1	8.6	0.0	0.0
Lane LOS	D	B	A		
Approach Delay (s)	18.2		3.7		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	6.9		
Intersection Capacity Utilization	48.3%	ICU Level of Service	A
Analysis Period (min)	15		

APPENDIX D – CRASH ANALYSIS INFORMATION

The following pages present the supplement information regarding the crash analysis conducted as part of the Klamath Falls Urban Area TSP existing conditions analysis. This appendix is organized into the following subsections.

- Detailed Crash Review – This subsection presents the detailed crash review of the six intersections with crash rates higher than their critical rate. These intersections are:
    - OR 39 & Eberlein Avenue
    - Washburn Way & Shasta Way
    - Altamont Drive & Laverne Avenue
    - OR 140 & Summers Lane
    - OR 140 & Homedale Drive
    - OR 140 & OR 39 (south of the Big Y)
- ODOT Statewide Priority Index System (SPIS) Map
- Crash Rate Calculations
- ODOT Crash Data Files

Detailed Crash Review

OR 39 & Eberlein Avenue

The OR 39 & Eberlein Avenue intersection is a two-way stop-controlled intersection located in the north eastern portion of Klamath Falls. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 39 is oriented northwest to southeast intersecting Eberlein Avenue at a less than 90 degree angle.
- Left-turn and right-turn lanes are provided on the north- and southbound approaches on OR 39.
- The minor street approaches of Eberlein Avenue are stop controlled.
- The minor street approaches of Eberlein Avenue are offset from each other approximately 60 feet measured centerline to centerline.

Exhibit 2 is an aerial view of the intersection illustrating the physical characteristics noted above particularly the offset minor street approaches of Eberlein Avenue and intersection skew.

Exhibit 2 OR 39 & Eberlein Avenue



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes reported at the intersection occurred when vehicles traveling west to east across the intersection failed to yield to vehicles on OR 39; and
- The majority of crashes reported at the intersection occurred under conditions when the pavement was wet due to rain, snow or ice.

Based on the types of crashes occurring and weather conditions, motorists on the eastbound approach (travel west to east) may have difficulty seeing and/or judging the speeds of on-coming vehicles particularly in inclement weather conditions. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct sight distance and 85th percentile speed studies** to confirm sufficient sight distance is available given prevailing vehicle speeds.
- **Consult NCHRP Report 613** *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* for treatments to reduce prevailing vehicle speeds to the desired speed.
- **Realign the intersection** to provide more sight distance and ease the driving task for motorists on the eastbound approach. The minor street approaches would be aligned with each other and adjusted to intersect OR 39 at closer to a 90-degree angle.
- **Investigate feasibility of a roundabout** at the intersection after the intersection is realigned. A roundabout would help reduce speeds and would eliminate the crossing conflict, which has historically resulted in the majority of intersection crashes. National research based on roundabout controlled intersections across the United States indicate roundabouts reduce total crashes by approximately 71% and injury crashes by 87% compared to a two-way stop-controlled intersection[6]. Similarly, national research indicates roundabouts reduce total crashes by 48% and injury crashes by 78% compared to traffic signals[6].

Potential activities or countermeasures to help reduce crashes are particularly important to investigate prior to future development around the intersection that would contribute to the traffic volumes on Eberlein Avenue. It is the Eberlein Avenue approaches that are offset, skewed, and may create a challenging situation for drivers to see and react to motorists on OR 39; adding more traffic to these approaches without further investigating potential countermeasures and/or implementing countermeasures may result in additional crashes.

Washburn Way & Shasta Way

The Washburn Way & Shasta Way intersection is controlled by a traffic signal. Washburn Way provides north-south connectivity through Klamath Falls east of the railroad tracks and Shasta Way provides east-west connectivity from the eastern edge of urban growth boundary to South

[6] American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual (HSM), 1st Edition, 2010.*

6th Street. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- Left-turn lanes are provided on all four approaches to the intersection.
- Washburn Way and Shasta Way intersect at approximately a 90-degree angle.
- Washburn Way/Shasta Way intersection is the first traffic signal on Washburn Way when traveling southbound.

Exhibit 3 is an aerial view of the intersection illustrating the physical characteristics noted above.

Exhibit 3 Washburn Way & Shasta Way



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes at the intersection occurred when motorists traveling southbound on Washburn Way disregarded the traffic signal and/or failed to obey the traffic signal; and
- The remaining crashes reported at the intersection occurred when motorists traveling southbound on Washburn Way failed to stop to avoid rear ending southbound vehicles already stopped at the traffic signal.

Based on the types of crashes occurring, motorists on the southbound approach may have difficulty seeing the southbound traffic signal heads. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct field visit** to confirm traffic signal head visibility on the southbound approach.

- **Consider installing** near-side traffic signal heads for approaching vehicles to increase the visibility of the traffic control light.

Altamont Drive & Laverne Drive

The Altamont Drive & Laverne Drive intersection is a two-way stop controlled intersection. Altamont Drive provides north-south connectivity from South 6th Street to the Klamath Falls Airport. Laverne Drive provides east-west connectivity through a residential area from Crest Street to Washburn Way (Midland Highway). The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- Altamont Drive has a two-lane cross-section; turn lanes are not provided at the intersection.
- Laverne Avenue is the minor street at the intersection and is controlled by stop signs on the east- and westbound approaches.
- Laverne Avenue has a two-lane cross-section; turn lanes are not provided at the intersection.
- Altamont Drive and Laverne Avenue intersect at approximately 90-degrees.

Exhibit 4 is an aerial view of the intersection from Google Earth (the consultant team is working with City to obtain a higher quality aerial of this intersection for the final report) illustrating the physical characteristics noted above.

Exhibit 4 Altamont Drive & Laverne Drive



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes at the intersection occurred when motorists traveling westbound entered the intersection in front of oncoming southbound traffic; and
- The remaining crashes reported at the intersection occurred when motorists traveling west or eastbound on Laverne Avenue failed to stop at the stop sign.

Based on the types of crashes occurring, motorists on the west- and eastbound approaches may have difficulty seeing the southbound traffic and/or judging the speed of vehicles approaching from the north and heading south. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct sight distance and 85th percentile speed studies** to confirm sufficient sight distance is available given prevailing vehicle speeds.
- **Consult NCHRP Report 613** *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* for treatments to reduce prevailing vehicle speeds to the desired speed.
- **Investigate feasibility of a roundabout** at the intersection. The 90-degree intersection of the two streets and the existing traffic volumes at the intersection indicate a roundabout may be a feasible and valuable improvement. A roundabout would help reduce speeds and would eliminate the crossing conflict, which has historically resulted in the majority of intersection crashes. National research based on roundabout controlled intersections across the United States indicate roundabouts reduce total crashes by approximately 71% and injury crashes by 87% compared to a two-way stop-controlled intersection[7]. The crash reduction compared to traffic signals is 48% for total crashes and 78% for injury crashes[7].

OR 140 & Summers Lane

The OR 140 & Summers Lane intersection is a two-way stop controlled intersection. OR 140 (Southside Expressway) provides east-west connectivity through the southern portion of the Klamath Falls urban area. Summers Lane provides north-south connectivity from South 6th Street to Klamath Falls Airport. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 140 has a two-lane cross-section with left-turn pockets provided on the east- and westbound approaches.
- Summers Lane is the minor street at the intersection and is controlled by stop signs on the north- and southbound approaches.
- Summers Lane has a two-lane cross-section; an exclusive left-turn lane is provided on the southbound approach.
- OR 140 and Summer Lane intersect at approximately 90-degrees.

[7] American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual (HSM), 1st Edition, 2010.*

- The intersection is approximately 0.70 miles from the OR 140 & Washburn Way (Midland Highway) Interchange on and off ramps.
- The intersection is approximately 400 feet from an at-grade railroad crossing on OR 140.

Exhibit 5 is an aerial view of the intersection from Google Earth (the consultant team is working with City to obtain a higher quality aerial of this intersection for the final report) illustrating the physical characteristics noted above.

Exhibit 5 OR 140 & Summers Lane



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes at the intersection occurred when motorists traveling southbound entered the intersection in front of oncoming eastbound or westbound traffic; and
- The remaining crashes reported at the intersection occurred when motorists traveling southbound on Summers Lane ran the stop sign and/or were traveling too fast for conditions and could not stop.

Based on the types of crashes occurring, motorists on the south- and northbound approaches may have difficulty seeing west- and eastbound traffic on OR 140 and/or judging the speed of vehicles approaching from the west and/or east. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct sight distance and 85th percentile speed studies** to confirm sufficient sight distance is available given prevailing vehicle speeds.
- **Consult NCHRP Report 613** *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* for treatments to reduce prevailing vehicle speeds to the desired speed.

- **Investigate feasibility of a roundabout** at the intersection. The 90-degree intersection of the two streets and the existing traffic volumes at the intersection indicate a roundabout may be a feasible and valuable interim improvement until traffic volumes warrant other actions or the proposed future interchange at Homedale Road & OR 140 (identified in the 1998 Klamath Falls Urban Area Transportation System Plan) is constructed. Special consideration would need to be given to the proximity of the at-grade railroad crossings on OR 140 and Summers Lane south of OR 140. A roundabout would help reduce speeds and would eliminate the crossing conflict, which has historically resulted in the majority of crashes at this intersection. National research conducted in the United States indicates roundabouts reduce total crashes by approximately 71% and injury crashes by 87% compared to a two-way stop-controlled intersection[8]. The crash reduction compared to traffic signals is 48% for total crashes and 78% for injury crashes[8].

OR 140 & Homedale Road

The OR 140 & Homedale Road intersection is a two-way stop controlled intersection. OR 140 (Southside Expressway) provides east-west connectivity through the southern portion of the Klamath Falls urban area. Homedale Road provides north-south connectivity from Foothills Boulevard to beyond the southern boundary of the urban area. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 140 has a two-lane cross-section with left-turn pockets provided on the east- and westbound approaches.
- Homedale Road is the minor street at the intersection and is controlled by stop signs on the north- and southbound approaches.
- Homedale has a two-lane cross-section; an exclusive left-turn lane is provided on the southbound approach.
- OR 140 and Homedale Road intersect at approximately 90-degrees.

Exhibit 6 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above (a higher quality aerial will be obtained for the final report).

[8] American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual (HSM), 1st Edition, 2010.*

Exhibit 6 OR 140 & Homedale Road



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes at the intersection occurred when motorists traveling southbound entered the intersection in front of oncoming eastbound or westbound traffic; and
- The remaining crashes reported at the intersection occurred when motorists were traveling too fast for weather conditions (e.g., ice, snow).

Based on the types of crashes occurring, motorists on the south- and northbound approaches may have difficulty seeing west- and eastbound traffic on OR 140 and/or judging the speed of vehicles approaching from the west and/or east. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct sight distance and 85th percentile speed studies** to confirm sufficient sight distance is available given prevailing vehicle speeds.
- **Consult NCHRP Report 613** *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* for treatments to reduce prevailing vehicle speeds to the desired speed.
- **Investigate feasibility of a traffic signal** at the intersection. ODOT has indicated a traffic signal may be an interim measure at this location until traffic volumes warrant implementing the proposed future interchange previously identified in the 1998 Klamath Falls Urban Area TSP. Traffic signals
- **Investigate feasibility of a roundabout** at the intersection. The 90-degree intersection of the two streets and the existing traffic volumes at the intersection indicate a roundabout may be a feasible and valuable interim improvement until traffic volumes warrant implementing the proposed future interchange previously identified in the 1998 Klamath Falls Urban Area Transportation System Plan. A roundabout would help reduce speeds

and have been shown to reduce crashes. National research indicates roundabouts reduce total crashes by approximately 71% and injury crashes by 87% compared to a two-way stop-controlled intersection[9]. The crash reduction compared to traffic signals is 48% for total crashes and 78% for injury crashes[9].

OR 140 & OR 39

The OR 140 & OR 39 intersection is a two-way stop controlled intersection. OR 140 (Southside Expressway) provides east-west connectivity through the southern portion of the Klamath Falls urban area. OR 39 provides north-south connectivity along and through the eastern portion of the Klamath Falls urban area. The physical characteristics of the intersection, trends from ODOT crash data, and potential countermeasures are discussed below.

The basic physical characteristics of the intersection are noted below.

- OR 39 & OR 140 is a four legged intersection; however it functions more like a three-legged intersection because the westbound approach is a low-volume private residential driveway.
- OR 140 is the stop controlled eastbound approach and has exclusive left-turn and right-turn lanes.
- The OR 39 approaches (i.e., the north- and southbound approaches) are uncontrolled.
- OR 140 and OR 39 intersect at approximately 90-degrees.

Exhibit 6 is an aerial view of the intersection from Google Earth illustrating the physical characteristics noted above.

[9] American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual (HSM), 1st Edition, 2010.*

Exhibit 6 OR 140 & OR 39



In reviewing the ODOT crash data in more detail, the following trends were identified:

- The majority of crashes at the intersection occurred when motorists on the eastbound approach entered the intersection in front of oncoming north- or southbound traffic; and
- The remaining majority of crashes reported at the intersection occurred when motorists were traveling too fast for weather conditions (e.g., ice, snow, fog).

Based on the types of crashes occurring, motorists on the eastbound approaches may have difficulty seeing north- and southbound traffic on OR 39 and/or judging the speed of vehicles approaching from the north and/or south. Potential activities or countermeasures that may help reduce crashes include:

- **Conduct sight distance and 85th percentile speed studies** to confirm sufficient sight distance is available given prevailing vehicle speeds.
- **Consult NCHRP Report 613** *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* for treatments to reduce prevailing vehicle speeds to the desired speed.
- **Investigate feasibility of a roundabout** at the intersection. The 90-degree intersection of the two streets and the existing traffic volumes at the intersection indicate a roundabout may be a feasible and valuable improvement. A roundabout would help reduce speeds and have been shown to reduce crashes. National research in the United States indicates roundabouts reduce total crashes by approximately 71% and injury crashes by 87% compared to a two-way stop-controlled intersection[10]. Compared to traffic signals crashes tend to be 48% for total crashes and 78% for injury crashes [10].

[10] American Association of State Highway Transportation Officials (AASHTO). *Highway Safety Manual (HSM), 1st Edition, 2010.*

ODOT Statewide Priority Index System (SPIS) Map

The follow page illustrates the SPIS sites in the Klamath Falls urban area; this information was obtained at: http://www.oregon.gov/ODOT/TDATA/gis/odotmaps.shtml#SPIS_SIP_Maps.

PROJECT SAFETY MANAGEMENT SYSTEM

2010 (using 2007 - 2009 crashes)

KLAMATH FALLS VICINITY

SAFETY PRIORITY INDEX SYSTEM (SPIS)
SPIS SITE PERCENTILES

- *85% - 89.99%*
- *90% - 94.99%*
- *95% - 100%*

SAFETY INVESTMENT PROGRAM (SIP)
SEGMENT RATINGS

NUMBER OF FATAL AND SERIOUS INJURY CRASHES PER 5 MILE SEGMENT OR EQUIVALENT

- *0 Crashes (Cat. 1)*
- *1-2 Crashes (Cat. 2)*
- *3-5 Crashes (Cat. 3)*
- *6-9 Crashes (Cat. 4)*
- *10+ Crashes (Cat. 5)*

ROUTES

INT. *U.S.* *OR*

97
140
97B
97
Klamath Falls
39
140
140
66
97
Midland
140

NORTH

0 0.75 1.5 *Miles*

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Crash Rate Calculations

The following page presents the crash rate and critical crash rate calculations spreadsheet.

Signalized	1	0.25	Average Crash Rate for Intersections with Traffic Signals
Not Applicable	2	0.00	
Unsignalized Intersections	3	0.18	Average Crash Rate for Unsignalized Intersections

INTERSECTION CRASH RATES CALCULATOR

INT	Peak Hour	Daily Vol.	5-Year TEV	5-Year MEV	Crash Total	Crash/Year	Intersection Type	Crash Rate	Critical Rate	Over Critical
US 97 & Lakeport Boulevard	673	6730	12282250	12.3	0	0.0	3	0.00	0.37	0
US 97 & Dan O'Brien Way	803	8030	14654750	14.7	3	0.6	3	0.20	0.35	0
US 97 SB & Coli Avenue	525	5250	9581250	9.6	0	0.0	3	0.00	0.40	0
US 97 NB & Coli Avenue	452	4520	8249000	8.2	1	0.2	3	0.12	0.41	0
Lakeport Boulevard & Hanks Street	448	4480	8176000	8.2	0	0.0	3	0.00	0.42	0
Quarry Street & Lakeport Boulevard	497	4970	9070250	9.1	2	0.4	3	0.22	0.40	0
OR 39 & Biehn Street/Campus Drive	2,096	20960	38252000	38.3	8	1.6	1	0.21	0.38	0
Dahila Street & Campus Drive	1,581	15810	28853250	28.9	6	1.2	1	0.21	0.40	0
Biehn Street & Lakeport Boulevard	667	6670	12172750	12.2	2	0.4	3	0.16	0.37	0
California Avenue & Nevada Street	498	4980	9088500	9.1	3	0.6	3	0.33	0.40	0
Montelius Street & Nevada Street	653	6530	11917250	11.9	1	0.2	3	0.08	0.37	0
US 97 SB Off-Ram & Nevada Street	585	5850	10676250	10.7	0	0.0	3	0.00	0.39	0
US 97 NB Off-Ramp & Oregon Avenue	622	6220	11351500	11.4	0	0.0	3	0.00	0.38	0
Biehn Street & Oregon Avenue	875	8750	15968750	16.0	2	0.4	3	0.13	0.35	0
3rd Street & California Avenue	93	930	1697250	1.7	1	0.2	3	0.59	0.70	0
OR 39 & Portland Street	Not Available	Not Available	Not Available	Not Available	10	2.0	3	Not Available	Not Available	Not Available
US 97 SB Ramps & Main Street	505	5050	9216250	9.2	1	0.2	3	0.11	0.40	0
3rd Street & Main Street	553	5530	10092250	10.1	1	0.2	3	0.10	0.39	0
3rd Street & Klamath Avenue	433	4330	7902250	7.9	1	0.2	3	0.13	0.42	0
9th Street & Main Street	588	5880	10731000	10.7	4	0.8	1	0.37	0.50	0
11th Street & Klamath Avenue	722	7220	13176500	13.2	0	0.0	3	0.00	0.36	0
Spring Street and Esplanade Street	652	6520	11899000	11.9	1	0.2	3	0.08	0.37	0
Esplanade Street & OR 39	2,603	26030	47504750	47.5	11	2.2	1	0.23	0.37	0
Spring Street & Main Street	841	8410	15348250	15.3	5	1.0	1	0.33	0.46	0
Pacific Terrace & OR 39	2,039	20390	37211750	37.2	0	0.0	1	0.00	0.38	0
Hillside Drive & Herbert Street	68	680	1241000	1.2	1	0.2	3	0.73	0.79	0
OR 39 & Main Street	2,578	25780	47048500	47.0	10	2.0	1	0.21	0.37	0
Wasburn Way & OR 39	2,843	28430	51884750	51.9	7	1.4	1	0.13	0.36	0
E Main Street & Eberlein Avenue	358	3580	6533500	6.5	2	0.4	3	0.31	0.44	0
OR 39 & Eberlein Avenue	1,503	15030	27429750	27.4	9	1.8	3	0.33	0.31	1
S 6th Street & Shasta Way	2,292	22920	41829000	41.8	4	0.8	1	0.10	0.38	0
Washburn Way & Shasta Way	2015	20150	36773750	36.8	16	3.2	1	0.44	0.39	1
OR 39 & Shasta Way	2347	23470	42832750	42.8	14	2.8	1	0.33	0.38	0
Homedale Road & Foothills Boulevard	557	5570	10165250	10.2	0	0.0	3	0.00	0.39	0
Homedale Road & Shasta Way	1041	10410	18998250	19.0	2	0.4	1	0.11	0.44	0
Patterson Street & Shasta Way	764	7640	13943000	13.9	1	0.2	3	0.07	0.36	0
Washburn Way & S 6th Street	3223	32230	58819750	58.8	16	3.2	1	0.27	0.36	0
Altamont Drive & S 6th Street	2299	22990	41956750	42.0	9	1.8	1	0.21	0.38	0
Altamont Drive & Crosby Avenue	847	8470	15457750	15.5	3	0.6	3	0.19	0.35	0
Summers Lane & S 6th Street	2493	24930	45497250	45.5	15	3.0	1	0.33	0.37	0
OR 39 & S 6th Street	2923	29230	53344750	53.3	0	0.0	1	0.00	0.36	0
Fargo Street & OR 39	2469	24690	45059250	45.1	4	0.8	3	0.09	0.28	0
Homedale Rd & OR 39	2680	26800	48910000	48.9	13	2.6	1	0.27	0.37	0
Madison Street & OR 39	1904	19040	34748000	34.7	11	2.2	1	0.32	0.39	0
Patterson Street & OR 39	1714	17140	31280500	31.3	12	2.4	1	0.38	0.40	0
OR 39 & Hilyard Avenue	1423	14230	25969750	26.0	4	0.8	3	0.15	0.31	0
Orindale Road & OR 140	288	2880	5256000	5.3	0	0.0	3	0.00	0.48	0
Orindale Road & Balsam Drive	102	1020	1861500	1.9	0	0.0	3	0.00	0.68	0
Orindale Road & OR 66	538	5380	9818500	9.8	2	0.4	3	0.20	0.39	0
Emerald Street & OR 66	562	5620	10256500	10.3	0	0.0	3	0.00	0.39	0
Balsam Drive & OR 66	773	7730	14107250	14.1	0	0.0	3	0.00	0.36	0
OR 140 & OR 66	1034	10340	18870500	18.9	6	1.2	1	0.32	0.44	0
Delap Road & OR 66	1039	10390	18961750	19.0	2	0.4	3	0.11	0.33	0
US 97 SB Ramps & OR 140	1102	11020	20111500	20.1	0	0.0	3	0.00	0.33	0
US 97 NB Ramps & OR 140	1027	10270	18742750	18.7	3	0.6	3	0.16	0.33	0
Green Springs Drive & OR 140	1029	10290	18779250	18.8	5	1.0	3	0.27	0.33	0
Riverside Drive & Lindley Way	131	1310	2390750	2.4	0	0.0	3	0.00	0.62	0
Riverside Drive & Autumn Avenue	21	210	383250	0.4	0	0.0	3	0.00	1.29	0
Green Springs Drive & Dover Avenue	197	1970	3595250	3.6	0	0.0	3	0.00	0.54	0
Memorial Drive & OR 140	891	8910	16260750	16.3	2	0.4	3	0.12	0.35	0
Midland Highway & OR 140	1020	10200	18615000	18.6	8	1.6	1	0.43	0.44	0
Washburn Way & Laverne Avenue	1544	15440	28178000	28.2	9	1.8	1	0.32	0.40	0
Altamont Drive & Laverne Avenue	731	7310	13340750	13.3	15	3.0	3	1.12	0.36	1
Summers Lane & Clinton Avenue	909	9090	16589250	16.6	4	0.8	3	0.24	0.34	0
Homedale Road & Bristol Street	838	8380	15293500	15.3	3	0.6	3	0.20	0.35	0
Madison Street & Harlan Drive	438	4380	7993500	8.0	1	0.2	3	0.13	0.42	0
OR 39 & OR 140	1360	13600	24820000	24.8	2	0.4	1	0.08	0.41	0
OR 39 & Hager Way	693	6930	12647250	12.6	0	0.0	3	0.00	0.37	0
Washburn Way & OR 140 WB Ramps	1348	13480	24601000	24.6	2	0.4	3	0.08	0.31	0
Washburn Way & OR 140 EB Ramps	928	9280	16936000	16.9	3	0.6	3	0.18	0.34	0
Altamont Drive & OR 140	1057	10570	19290250	19.3	4	0.8	3	0.21	0.33	0
Summers Lane & OR 140	1040	10400	18980000	19.0	11	2.2	3	0.58	0.33	1
Glenwood Drive & OR 140	959	9590	17501750	17.5	1	0.2	3	0.06	0.34	0
Homedale Road & OR 140	911	9110	16625750	16.6	6	1.2	3	0.36	0.34	1
OR 39 & OR 140	1032	10320	18834000	18.8	15	3.0	3	0.80	0.33	1

NOTES:
Anything that is not colored is an entered value (from data/research). Colored cells have formulas to perform calculations.
Calculations:

Daily Volumes: Peak Hour x 1.10
5-Year TEV: Daily Volume x 365 x 5
5-Year MEV: 5-Year Volume x 1,000,000
Crash/Year: Crash Total / 5
Crash Rate: Crash Total / 5-Year MEV
Critical Rate: Average Crash Rate Per Intersection Type x (1.645 x (Average Crash Rate Per Intersection Type x 1,000,000 / 5-Year TEV)^.05) + (1 / 2 x 5-Year TEV)

ODOT Crash Data Files

The following pages are the ODOT crash data files received for the study intersections and key roadway segments in the Klamath Falls urban area.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

11th Street @ Klamath Avenue
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

3rd Street @ California Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2005														
REAR-END	0	1	0	1	0	1	0	0	1	0	1	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	0	1	0	1	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	0	1	0	1	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

3rd Street @ California Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00059	Y	N	N			01/02/2005	17	CALIFORNIA AVE	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											01
NO RPT						Sun	0	3RD ST	NE		STOP SIGN	N	ICE	REAR		PRVTE	NE SW									001		00
						4P			06	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		026	017		01
																							OR>25					
															02	NONE 0	STOP											
																PRVTE	NE SW									012		00
																PSNGR CAR		01	DRVR	INJC	27	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

3rd Street @ Klamath Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2006 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

3rd Street @ Klamath Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00934	N	N	N			11/27/2006	14	KLAMATH AVE	INTER	3-LEG	N	N	SNOW	S-OTHER	01	NONE 0	TURN-L											08
						Mon	0	3RD ST	NE		UNKNOWN	N	ICE	TURN		PRVTE	NW NE										000	00
						2A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		007	000		08
																							OR<25					
															02	NONE 0	TURN-L											
																PRVTE	NW NE									000		00
																PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

3rd Street @ Main Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2006 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

3rd Street @ Main Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00096	N	N	N			01/18/2006	17	MAIN ST	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT											07
NO RPT						Wed	0	3RD ST	SE		STOP SIGN	N	WET	REAR		PRVTE	SE NW									000		00
						4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SE NW									012		00
																PSNGR CAR		01	DRVR	NONE	37	M	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NO<5	01	F			000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

6th Street @ Shasta Way

January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	1	2	3	0	1	0	2	1	2	1	3	0	0
2008 TOTAL	0	1	2	3	0	1	0	2	1	2	1	3	0	0
YEAR: 2007														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	3	4	0	1	0	3	1	3	1	4	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

6th Street @ Shasta Way

January 1, 2005 through December 31,2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00377	N	N	N	N	N	05/22/2008	16	SHASTA WAY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											10
CITY						Thu	0	6TH ST	E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W										000	00
						5P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	84	M	OR-Y		026	000		10
																							OR<25					
															02	NONE	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	INJC	44	M	OR-Y		000	000		00
																							OR<25					
00850	N	N	N			12/15/2008	16	SHASTA WAY	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Mon	0	6TH ST	E		TRF SIGNAL	N	ICE	REAR		PRVTE	E W										000	00
						6P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	NONE	24	M	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NONE	02	F			000	000		00
																		03	PSNG	NONE	01	F			000	000		00
00476	N	N	N			07/22/2008	16	SHASTA WAY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07,27
CITY						Tue	0	6TH ST	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE NW										000	00
						5P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		043	038		07,27
																							OR<25					
															02	NONE	STOP											
																PRVTE	SE NW									011		00
																PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		000	000		00
																							OR<25					
00495	N	N	N			06/21/2007	16	SHASTA WAY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT						Thu	0	6TH ST	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E										000	00
						12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		014	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	49	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

9th Street @ Main Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2007														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2006														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
2006 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	1
YEAR: 2005														
ANGLE	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	3	4	0	2	0	3	1	3	1	4	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

9th Street @ Main Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00014	N	N	N			01/07/2008	16	MAIN ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
CITY						Mon	0	9TH ST	NE		TRF SIGNAL	N	ICE	REAR		PRVTE	NE SW									001		00
						2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	50	F	NONE		043	000		07
																							OR<25					
															02	NONE	STOP											
																PRVTE	NE SW									011		00
																PSNGR CAR		01	DRVR	NONE	67	M	OR-Y		000	000		00
																							OR<25					
00810	N	N	Y			10/08/2006	16	MAIN ST	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 0	TURN-L										040,053	10
CITY						Sun	0	9TH ST	NW		TRF SIGNAL	N	DRY	FIX		PRVTE	NW NE									000	040,053	00
						3A			05	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		080,002,081	000		10
																							OR<25					
00688	N	N	N			08/10/2007	14	MAIN ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY						Fri	0	9TH ST	CN		ONE-WAY	N	DRY	ANGL		PRVTE	NE SW									000		00
						3P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y		020	000		04
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	NW SE									000		00
																PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000		00
																							OR<25					
00509	N	N	N			07/15/2005	16	MAIN ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NONE						Fri	0	9TH ST	CN		ONE-WAY	N	DRY	ANGL		PRVTE	NE SW									000		00
						4P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	F	OR-Y		020	000		04
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	NW SE									000		00
																PSNGR CAR		01	DRVR	NONE	39	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	INJB	00	M			000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Altamont Drive @ Crosby Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2006														
NON-COLLISION	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FINAL TOTAL	0	2	1	3	0	2	0	3	0	2	1	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Altamont Drive @ Crosby Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00271	N	N	N			4/17/2007	2.72	ALTAMONT DR	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT									013		07
COUNTY						Tue			W		STOP SIGN	N	DRY	REAR		PRVTE	W E									000		00
						11A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	56	F	OR-Y		043,026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									011	013	00
																PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STRGHT											
																PRVTE	N S									022		00
																PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		000	000		00
																							OR<25					
00191	N	Y	N			3/2/2005	2.72	ALTAMONT DR	INTER	3-LEG	N	N	CLD	BIKE	01	NONE 0	TURN-L											10
COUNTY						Wed			CN		STOP SIGN	N	DRY	TURN		PRVTE	W N									015		00
						6P			03	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		000	000		00
																							OR<25					
																	TURN-L	01	BIKE	INJB	46	M			015,060	040		10
																	S W											
00394	N	N	N			4/26/2006	2.72	ALTAMONT DR	INTER	3-LEG	N	N	CLR	OVERTURN	01	NONE 0	STRGHT										010		26
NO RPT						Wed			CN		STOP SIGN	N	DRY	NCOL		PRVTE	N S									007	010	26
						5P			03	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJB	24	M	OR-Y		000	000		26
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Altamont Drive @ Laverne Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	2	2	4	0	3	1	3	1	4	0	4	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	2	3	5	0	3	1	4	1	5	0	5	0	0
YEAR: 2008														
ANGLE	0	0	2	2	0	0	0	0	2	1	1	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	2	3	0	2	0	1	2	2	1	3	0	0
YEAR: 2007														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2006														
ANGLE	0	1	2	3	0	1	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	1	0	1	0	0
2006 TOTAL	0	2	2	4	0	2	0	2	2	4	0	4	0	0
YEAR: 2005														
ANGLE	0	2	0	2	0	6	0	1	1	2	0	2	0	0
2005 TOTAL	0	2	0	2	0	6	0	1	1	2	0	2	0	0
FINAL TOTAL	0	7	8	15	0	13	1	8	7	14	1	15	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Altamont Drive @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00960	N	N	N	N	N	12/16/2007	0.50	00862	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											03,10
COUNTY						Sun			CN		STOP SIGN	N	WET	ANGL		PRVTE	S N										000		00
						11A			00	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	STRGHT											
																PRVTE	W E										088		00
																PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		021	017		03,10
																								OR<25				
00127	Y	N	N			1/27/2006	1.80	ALTAMONT DR	INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE 0	TURN-R											01
COUNTY						Fri			W		STOP SIGN	N	ICE	TURN		PRVTE	N W										001		00
						8A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		001,007,026	017		01
																								OR<25				
															02	NONE 0	STOP											
																PRVTE	W E										011		00
																PSNGR CAR		01	DRVR	INJB	28	F	OR-Y		000	000		00
																								OR<25				
																		02	PSNG	NO<5	03	F			000	000		00
00884	N	N	N			12/15/2008	1.80	ALTAMONT DR	INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Mon			CN		STOP SIGN	N	SNO	ANGL		PRVTE	N S										000		00
						4P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	35	F	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	STRGHT											
																PRVTE	W E										015		00
																PSNGR CAR		01	DRVR	NONE	00	M	UNK		028	000		02
																								OR<25				
00240	N	N	N			3/17/2006	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						Fri			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S										000		00
						1P			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	STRGHT											
																PRVTE	E W										015		00
																PSNGR CAR		01	DRVR	NONE	81	F	OR-Y		028	000		02
																								OR<25				
00233	N	N	N			3/25/2006	0.50	LAVERNE AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						Sat			CN		STOP SIGN	N	WET	ANGL		PRVTE	E W										015		00
						10A			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		028	000		02
																								OR<25				
															02	NONE 0	STRGHT											
																PRVTE	N S										000		00
																PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
																								OR<25				

KLAMATH COUNTY

Altamont Drive @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00427	N	N	N			5/11/2006	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						Thu			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S										000		00
						7P			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	24	F	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	STRGHT											
																PRVTE	E W									015		00
																PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		028	000		02
																								OR>25				
00336	N	N	N			5/8/2009	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										013	02
COUNTY						Fri			CN		STOP SIGN	N	DRY	ANGL		RENTL	E W									015		00
						5P			01	0		N	DAY	PDO		TRUCK		01	DRVR	NONE	75	M	OTH-Y		028	000		02
																								N-RES				
															02	NONE	STRGHT											
																PRVTE	N S									007	013	00
																PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		000	000		00
																								OR<25				
															03	NONE	BACK											
																PRVTE	E S									018		00
																PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		000	000		00
																								OR<25				
00867	N	N	N		N	11/3/2005	0.50	LAVERNE AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT										079,013	02
COUNTY						Thu			CN		STOP SIGN	N	WET	ANGL		PRVTE	S N									000	079	00
						12P			02	99		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		000	000		00
																								OR<25				
															02	NONE	STRGHT											
																PRVTE	E W									015	013	00
																PSNGR CAR		01	DRVR	INJB	72	M	OR-Y		028	000		02
																								OR<25				
															03	NONE	STOP											
																PRVTE	W E									011		00
																PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																								OR<25				
00099	N	N	N	N	N	2/2/2009	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										082	02
COUNTY						Mon			CN		STOP SIGN	N	DRY	ANGL		PRVTE	S N									000		00
						2P			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		000	000		00
																								OR<25				
															02	NONE	STRGHT											
																PRVTE	E W									015		00
																PSNGR CAR		01	DRVR	INJA	59	F	OR-Y		028	000	082	02
																								OR<25				

KLAMATH COUNTY

Altamont Drive @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	SWORK	DATE / DAY / TIME	MILEPNT DIST FROM INTERSECT	COUNTY ROADS FIRST / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00694	N	N	N	N	N	10/18/2009	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						Sun			CN		STOP SIGN	N	DRY	TURN		PRVTE	S N										000		00
						3P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	TURN-R											
																PRVTE	E N									015		00
																PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		028	000		02
																							OR<25					
00867	N	N	N	N	N	12/22/2009	0.50	LAVERNE AVE	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										088	02
COUNTY						Tue			CN		STOP SIGN	N	ICE	ANGL		PRVTE	N S									000		00
						9A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	74	M	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	W E									015	088	00
																PSNGR CAR		01	DRVR	NONE	86	M	OR-Y		028	000		02
																							OR<25					
00062	Y	N	N			1/9/2008	0.50	LAVERNE AVE	INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE	STRGHT											01,03
NONE						Wed			CN		STOP SIGN	N	ICE	ANGL		PRVTE	S N									000		00
						8P			04	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																							OR<25					
															02	NONE	STRGHT											
																PRVTE	W E									001		00
																PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		047,021	000		01,03
																							OR<25					
00645	N	N	N			9/14/2008	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	TURN-L										010,001	08
COUNTY						Sun			CN		NONE	N	DRY	TURN		PRVTE	N E									000		00
						2P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y		004,010	000		08
																							OR<25					
															02	NONE	STRGHT											
																PRVTE	S N									007	010	00
																MTRCYCLE		01	DRVR	INJB	23	M	SUSP		000	000		00
																							OR<25					
																		02	PSNG	INJB	27	F			000	000	001	00
00540	N	N	N			8/7/2009	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										057,079,088	03
COUNTY						Fri			CN		STOP SIGN	N	DRY	ANGL		PRVTE	W E									000	088	00
						10A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	78	F	OR-Y		021	000		03
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	S N									000	057,079	00
																PSNGR CAR		01	DRVR	INJB	24	F	OR-Y		000	000		00
																							OR<25					

KLAMATH COUNTY

Altamont Drive @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00803	N	N	N			10/11/2005	0.50	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013,079	02
COUNTY						Tue	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	S N									000		00
						3P			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	INJB	29	F			000	000		00
																		03	PSNG	NO<5	04	F			000	000		00
															02	NONE 0	STRGHT											
																PRVTE	W E									015	013,079	00
																PSNGR CAR		01	DRVR	INJB	85	M	OR-Y		028	000		02
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	E W									011		00
																PSNGR CAR		01	DRVR	INJC	38	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	INJC	43	M			000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Altamont Drive @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
TURNING MOVEMENTS	0	1	0	1	0	1	1	0	1	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	1	1	0	1	1	0	1	0	0
YEAR: 2006														
TURNING MOVEMENTS	0	0	1	1	0	0	1	1	0	1	0	1	0	0
2006 TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0
YEAR: 2005														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2005 TOTAL	0	1	1	2	0	1	0	2	0	1	1	2	0	0
FINAL TOTAL	0	2	2	4	0	2	2	3	1	3	1	4	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Altamont Drive @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
80071	N	N	N			09/16/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
COUNTY						Fri		0	0		N		STOP SIGN	N	DRY	REAR		PRVTE	N S											00
						11A	KLAM FLS UA	3.37			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		026	000		07
																									OR<25					
																	02	NONE 0	STOP											
																		PRVTE	N S									011		00
																		PSNGR CAR		01	DRVR	INJC	52	M	OR-Y		000	000		00
																									OR<25					
00822	N	N	N			10/17/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
STATE						Mon		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	E W									000		00
						11P	KLAM FLS UA	3.37			01	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	N E									015		00
																		PSNGR CAR		01	DRVR	NONE	24	M	OTH-Y		028	000		02
																									N-RES					
00812	N	N	N			10/10/2006	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Tue		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	E W									000		00
						7A	KLAM FLS UA	3.37			01	0		N	DAY	PDO		TRUCK		01	DRVR	NONE	20	M	OR-Y		000	000		00
																									OR<25					
																	02	NONE 0	TURN-L											
																		PRVTE	N E									015		00
																		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		028	026		02
																									OR<25					
00349	N	N	N	N	N	05/02/2009	KLAMATH	1	14		INTER	3-LEG	N	N	RAIN	S-1TURN	01	NONE	STRGHT										010,001	08
STATE						Sat		0	0		CN		UNKNOWN	N	WET	TURN		PRVTE	W E									007	010	00
						10A	KLAM FLS UA	3.37			04	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJB	68	M	OR-Y		000	000	001	00
																									OR<25					
																	02	NONE 1	TURN-L											
																		PRVTE	W N									000		00
																		SEMI TOW		01	DRVR	NONE	57	M	OR-Y		006	000		08
																									OR>25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Balsam Drive @ OR 66 (Hwy 021)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Biehn Street @ Lakeport Boulevard

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Biehn Street @ Lakeport Boulevard

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00332	N	N	N	N	N	04/18/2008	17	BIEHN ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT										07
CITY						Fri	0	LAKEPORT BLVD	S		NONE	N	DRY	REAR		PRVTE	N S									000		00
						3P			05	0		Y	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		043	000		07
																							OR<25					
															02	NONE	STOP										
																PRVTE	N S									012		00
																PSNGR CAR		01	DRVR	INJC	40	F	OR-Y		000	000		00
																							OR<25					
00128	N	N	N			02/16/2005	17	BIEHN ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										013	07,27
STATE						Wed	0	LAKEPORT BLVD	S		UNKNOWN	N	DRY	REAR		PRVTE	S N									000		00
						4P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		016,043,026	038		07,27
																							OR<25					
															02	NONE 0	STOP										
																PRVTE	S N									011	013	00
																PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP										
																PRVTE	S N									012		00
																PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Biehn Street @ Oregon Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2005														
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
FINAL TOTAL	0	0	2	2	0	0	0	2	0	1	1	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Biehn Street @ Oregon Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00195	N	N	N			03/04/2005	17	BIEHN ST	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Fri	0	OREGON AVE	W		STOP SIGN	N	DRY	REAR		PRVTE	W E									000	00
						6A			06	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y		026	000		07
																							OR<25				
															02	NONE 0	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		000	000	00
																							OR<25				
00987	N	N	N			10/09/2009	17	BIEHN ST	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	TURN-L										02
CITY						Fri	0	OREGON AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									015	00
						8A			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		028	000		02
																							OR<25				
															02	NONE	STRGHT										
																PRVTE	E W									000	00
																PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		000	000	00
																							OR<25				

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

California Avenue @ Nevada Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR: 2007														
REAR-END	0	1	0	1	0	1	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
FINAL TOTAL	0	1	2	3	0	1	0	1	2	2	1	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

CITY OF KLAMATH FALLS, KLAMATH COUNTY

California Avenue @ Nevada Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00291	N	N	N			04/19/2007	17	CALIFORNIA AVE	INTER	3-LEG	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT										013	10
CITY						Thu	0	NEVADA AVE	SW		UNKNOWN	N	WET	REAR		PRVTE	SW NE										088		22
						9A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y		017,026	000		10
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SW NE									011	013	00
																PSNGR CAR		01	DRVR	INJB	29	M	OR-Y		000	000		00
																							OR<25					
															03	NONE 0	STOP											
																PRVTE	SW NE									012		00
																PSNGR CAR		01	DRVR	NONE	62	M	OR-Y		000	000		00
																							OR<25					
00120	N	Y	N			01/27/2008	17	CALIFORNIA AVE	INTER	3-LEG	N	N	SNOW	ANGL-STP	01	NONE	TURN-R											08
NO RPT						Sun	0	NEVADA AVE	NW		NONE	N	SNO	TURN		PRVTE	E NW									001		00
						5P			06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y		001	000		08
																							OR<25					
															02	NONE	STOP											
																PRVTE	NW SE									011		00
																PSNGR CAR		01	DRVR	NONE	51	M	OR-Y		000	000		00
																							OR<25					
00299	N	N	N			04/20/2007	17	CALIFORNIA AVE	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
						Fri	0	NEVADA AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	NW E									015		00
						1P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		028	000		02
																							UNK					
															02	NONE 0	TURN-L											
																PRVTE	W N									000		00
																PSNGR CAR		01	DRVR	NONE	36	M	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Dahlia Street @ Campus Drive

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2006														
REAR-END	0	1	1	2	0	1	0	0	2	1	1	2	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	2	0	2	0	0
2006 TOTAL	0	1	3	4	0	1	0	0	4	3	1	4	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	5	6	0	1	0	2	4	5	1	6	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Dahlia Street @ Campus Drive

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00271	N	N	N			03/10/2006	16	CAMPUS DR	INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE 0	STRGHT											07
						Fri	0	DAHLIA ST	SW		STOP SIGN	N	SNO	REAR		PRVTE	SW NE									000	00
						8A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	SW NE									011		00
																PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000		00
																							OR<25					
00671	N	N	N			08/08/2005	19	CAMPUS DR	INTER	CROSS	N	N	CLR	S-OTHER	01	NONE	TURN-L											07
NONE						Mon	0	DAHLIA ST	NW		UNKNOWN	N	DRY	TURN		PRVTE	SW NW									000	00
						12P			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y		026	000		07
																							OR<25					
															02	NONE	TURN-L											
																PRVTE	SW NW									013		00
																PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		000	000		00
																							OR<25					
00104	Y	N	N			01/20/2006	16	CAMPUS DR	INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE 0	TURN-R											01
						Fri	0	DAHLIA ST	NW		STOP SIGN	N	ICE	TURN		PRVTE	NE NW									001		00
						12P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	23	M	OR-Y		001,007	000		01
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	NW SE									012		00
																PSNGR CAR		01	DRVR	NONE	41	F	OR-Y		000	000		00
																							OR<25					
00152	N	N	N			01/31/2006	16	CAMPUS DR	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07
						Tue	0	DAHLIA ST	NW		STOP SIGN	N	WET	REAR		PRVTE	NW SE									000		00
						5P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	NW SE									012		00
																PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		000	000		00
																							OR<25					
00253	N	N	N			03/28/2006	19	CAMPUS DR	INTER	CROSS	N	N	RAIN	S-OTHER	01	NONE 0	TURN-R											13
						Tue	0	DAHLIA ST	CN		STOP SIGN	N	WET	TURN		PRVTE	NW SW									015		00
						2P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	59	F	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	TURN-R											
																PRVTE	NW SW									015		00
																PSNGR CAR		01	DRVR	NONE	64	F	OR-Y		031,045	000		13
																							OR<25					
00727	N	N	N			10/08/2009	16	CAMPUS DR	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
CITY						Thu	0	DAHLIA ST	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SW NE									000		00
						10A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y		020	000		04
																							OR<25					

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Dahlia Street @ Campus Drive

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0	STRGHT											
																PRVTE	NW SE									000		00
																PSNGR CAR		01	DRVR	NONE	33	F	OR-Y	000		000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Delap Road @ OR 66 (Hwy 021)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
FIXED / OTHER OBJECT	0	0	1	1	0	0	1	0	1	1	0	1	0	1
2005 TOTAL	0	0	1	1	0	0	1	0	1	1	0	1	0	1
FINAL TOTAL	0	1	1	2	0	1	1	1	1	2	0	2	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Delap Road @ OR 66 (Hwy 021)

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00996	N	N	N			12/01/2005	17	E MAIN ST	INTER	CROSS	N	Y	SNOW	FIX OBJ	01	NONE 1	TURN-R										077,059	08
CITY						Thu	0	EBERLEIN AVE	E		UNKNOWN	N	SNO	FIX		PRVTE	S E									000	077,059	00
						8A			06	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	49	M	OR-Y OR<25		002,080,081	000		08
00212	N	N	N			02/08/2006	17	E MAIN ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013,058,088	02
CITY						Wed	0	EBERLEIN AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W E								015		00
						2P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT									000	013,058,088	00
																PRVTE	N S											
																PSNGR CAR		01	DRVR	INJC	64	F	OR-Y OR<25		000	000		00
															03	NONE 0	PRKD-P									008		00
																PRVTE	W E											
																PSNGR CAR												
															04	NONE 0	PRKD-P									008		00
																PRVTE	E W											
																PSNGR CAR												

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

E. Main Street @ Eberlein Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
FIXED / OTHER OBJECT	0	0	1	1	0	0	1	0	1	1	0	1	0	1
2005 TOTAL	0	0	1	1	0	0	1	0	1	1	0	1	0	1
FINAL TOTAL	0	1	1	2	0	1	1	1	1	2	0	2	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

E. Main Street @ Eberlein Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00996	N	N	N			12/01/2005	17	E MAIN ST	INTER	CROSS	N	Y	SNOW	FIX OBJ	01	NONE 1	TURN-R										077,059	08
CITY						Thu	0	EBERLEIN AVE	E		UNKNOWN	N	SNO	FIX		PRVTE	S E									000	077,059	00
						8A			06	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	49	M	OR-Y OR<25		002,080,081	000		08
00212	N	N	N			02/08/2006	17	E MAIN ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013,058,088	02
CITY						Wed	0	EBERLEIN AVE	CN		STOP SIGN	N	DRY	ANGL		PRVTE	W E								015		00
						2P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	N S									000	013,058,088	00
																PSNGR CAR		01	DRVR	INJC	64	F	OR-Y OR<25		000	000		00
															03	NONE 0	PRKD-P											
																PRVTE	W E									008		00
																PSNGR CAR												
															04	NONE 0	PRKD-P											
																PRVTE	E W									008		00
																PSNGR CAR												

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Emerald Street @ OR 66 (Hwy 021)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Esplanage Street @ Spring Street

January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	1	0	1	0	0
2007 TOTAL	0	1	0	1	0	2	0	0	1	1	0	1	0	0
FINAL TOTAL	0	1	0	1	0	2	0	0	1	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Esplanage Street @ Spring Street

January 1, 2005 through December 31,2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
01004	N	N	N			12/27/2007	16	ESPLANADE ST	INTER	3-LEG	N	N	SNOW	O-1TURN	01	NONE 0	STRGHT											02
CITY						Thu	0	SPRING ST	CN		UNKNOWN	N	SNO	TURN		PRVTE	NE SW									000		00
						1P			02	0		Y	DAY	INJ		PSNGR CAR		01	DRVR	NONE	46	F	OR-Y		000	000		00
																								OR<25				
																		02	PSNG	INJA	26	F			000	000		00
																		03	PSNG	INJA	09	M			000	000		00
															02	NONE 0	TURN-L											
																PRVTE	SW NW									000		00
																PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		004	000		02
																							OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Fargo Street @ OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2008														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	0	1	1	0	1	0	1
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2008 TOTAL	0	0	2	2	0	0	0	1	1	2	0	2	0	1
YEAR: 2005														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	3	4	0	2	0	3	1	4	0	4	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Fargo Street @ OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00933	Y	N	N			12/18/2008	KLAMATH	1	14		INTER	3-LEG	N	Y	SNOW	FIX OBJ	01	NONE	STRGHT										040,059,092	01,26
NONE						Thu		0	0		W		UNKNOWN	N	ICE	FIX		PRVTE	E W									007	040,059,092	26
						3P	KLAM FLS UA	3.36			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	33	F	OR-Y OR<25		047,081	017		01
00592	N	N	N			08/17/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											013	07
NONE						Wed		0	0		W		STOP SIGN	N	DRY	REAR		PRVTE	W E									000		00
						7P	KLAM FLS UA	3.36			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		042	000		07
																	02	NONE 0	TURN-R											
																		PRVTE	W S									000	013	00
																		PSNGR CAR		01	DRVR	INJC	28	F	OTH-Y N-RES		000	000		00
																				02	PSNG	INJC	18	F			000	000		00
																				03	PSNG	NO<5	03	F			000	000		00
																	03	NONE 0	STOP											
																		PRVTE	S N									022		00
																		PSNGR CAR		01	DRVR	NONE	59	M	OTH-Y N-RES		000	000		00
00362	Y	N	N			05/03/2008	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT												01
NONE						Sat		0	0		W		UNKNOWN	N	DRY	REAR		PRVTE	W E									000		00
						10A	KLAM FLS UA	3.36			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		026	000		01
																	02	NONE	STOP											
																		PRVTE	W E									011		00
																		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y OR<25		000	000		00
00496	N	N	N			07/28/2009	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	TURN-L												02
STATE						Tue		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	S W									015		00
						4P	KLAM FLS UA	3.36			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		028	000		02
																	02	NONE	STRGHT											
																		PRVTE	E W									000		00
																		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Glenwood Drive @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Glenwood Drive @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00096	N	N	N			01/09/2005	KLAMATH	1	14		INTER	3-LEG	N		N	CLR	O-1TURN	01	NONE 0	STRGHT										02
NONE						Sun	KLAMATH FALLS	0	0	GLENWOOD DR	CN		TRF SIGNAL		N	ICE	TURN		PRVTE	E W										00
						11A	KLAM FLS UA	4.32		SOUTHSIDE BYPASS	02	0			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		000	000	00
																	02	NONE 0	TURN-L										00
																		PRVTE	W N									000	
																		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y OR<25		004,028	000	02

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Greensprings Drive @ Dover Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Green Springs Drive @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	1	0	1	1	0	1	0	0
2009 TOTAL	0	0	2	2	0	0	1	0	2	1	1	2	0	0
YEAR: 2008														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	1	1	2	0	0
2008 TOTAL	0	1	1	2	0	1	0	1	1	1	1	2	0	0
YEAR: 2006														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2006 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	4	5	0	1	1	2	3	3	2	5	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Green Springs Drive @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V# / VEH TYPE / OWNER	SPCL USE / TRLR QTY	MOVE / FROM / TO	P# / PRTC TYPE / INJ SVRTY	AGE	SEX	LICNS / RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00824	N	N	N			10/03/2006	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07
NO RPT						Tue	KLAMATH FALLS	0 0		GREEN SPRINGS DR	W		UNKNOWN	N	DRY	REAR		PRVTE	W E								000		00
						8A	KLAM FLS UA	0.16		SOUTHSIDE BYPASS	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	51	M	OR-Y OR<25		026	000		07
																	02	NONE 0	STOP								011		00
																		PRVTE	W E										
																		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y OR<25		000	000		00
00927	Y	N	N			12/18/2008	KLAMATH	1	14		INTER	3-LEG	N	N	SNOW	ANGL-STP	01	NONE	TURN-R									08,01
NONE						Thu	KLAMATH FALLS	0 0		GREEN SPRINGS DR	W		STOP SIGN	N	SNO	TURN		PRVTE	N W								001		00
						5P	KLAM FLS UA	0.16		SOUTHSIDE BYPASS	06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	26	F	OR-Y OR<25		001,047	017		08,01
																	02	NONE	STOP								012		00
																		PRVTE	W E										
																		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y OR<25		000	000		00
00369	N	N	N	N	N	05/12/2008	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	STRGHT									02
STATE						Mon	KLAMATH FALLS	0 0		GREEN SPRINGS DR	CN		STOP SIGN	N	DRY	TURN		PRVTE	E W								000	079	00
						6A	KLAM FLS UA	0.16		SOUTHSIDE BYPASS	01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJA	43	M	OR-Y OR<25		000	000		00
																	02	NONE	TURN-L								015		00
																		PRVTE	N E										
																		PSNGR CAR		01	DRVR	NONE	25	M	OR-Y OR<25		028	000		02
00137	N	N	N	N	N	02/10/2009	KLAMATH	1	14		INTER	3-LEG	N	N	SNOW	S-OTHER	01	NONE 1	TURN-R									08
COUNTY						Tue	KLAMATH FALLS	0 0		GREEN SPRINGS DR	CN		STOP SIGN	N	SNO	TURN		PRVTE	N W								000		00
						5P	KLAM FLS UA	0.16		SOUTHSIDE BYPASS	01	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	47	M	OTH-Y N-RES		006,010	000		08
																	02	NONE	TURN-R								000		00
																		PRVTE	N W										
																		PSNGR CAR		01	DRVR	NONE	47	F	OR-Y OR<25		000	000		00
90980	Y	N	N	N	N	12/11/2009	KLAMATH	1	14		INTER	3-LEG	N	N	SNOW	ANGL-OTH	01	NONE	STRGHT									01,03
STATE						Fri	KLAMATH FALLS	0 0		GREEN SPRINGS DR	CN		STOP SIGN	N	ICE	ANGL		PRVTE	N S								001		00
						4P	KLAM FLS UA	0.16		SOUTHSIDE BYPASS	03	0		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y OR<25		047,021	017		01,03
																	02	NONE	STRGHT								000		00
																		PRVTE	W E										
																		PSNGR CAR		01	DRVR	NONE	32	F	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Hillside Avenue @ Herbert Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Hillside Avenue @ Herbert Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00172	N	N	N			02/09/2005	17	HERBERT ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NONE						Wed	0	HILLSIDE AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W E									015		00
						8A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		028	000		02
																								OR>25				
															02	NONE 0	TURN-L											
																PRVTE	SE W									000		00
																PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Homedale Road@ 6th Street (Hwy 020)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	1	0	1	0	1	0	1
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	2	3	0	1	0	3	0	3	0	3	0	1
YEAR: 2008														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	1	1	2	0	1	1	1	1	1	1	2	0	0
2008 TOTAL	0	1	2	3	0	1	1	1	2	2	1	3	0	0
YEAR: 2007														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2006														
ANGLE	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2006 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
YEAR: 2005														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	2	3	0	1	0	2	1	2	1	3	0	0
2005 TOTAL	0	2	2	4	0	2	0	3	1	3	1	4	0	0
FINAL TOTAL	0	4	9	13	0	4	1	10	3	11	2	13	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Homedale Road@ 6th Street (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00121	N	N	N			01/27/2008	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / E / 06	CROSS / 0	N / TRF SIGNAL	N / N / N	SNOW / SNO / DLIT	ANGL-STP / TURN / PDO	01	NONE / PRVTE / PSNGR CAR	TURN-R / S / E	01	DRVR	NONE	00	M	OR-Y OR<25		001	001 / 000		08 / 00 / 08
NONE						Sun																							00
						6P	KLAM FLS UA										02	NONE / PRVTE / PSNGR CAR	STOP / E / W	01	DRVR	NONE	67	F	OR-Y OR<25		000	012 / 000		00 / 00
01057	Y	N	N			12/18/2005	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / S / 06	CROSS / 0	N / TRF SIGNAL	N / N / N	SNOW / ICE / DAY	ANGL-OTH / TURN / PDO	01	NONE 0 / PRVTE / PSNGR CAR	TURN-R / W / S	01	DRVR	NONE	54	M	OR-Y OR<25		001,006,026	001 / 017		08,01 / 00 / 08,01
COUNTY						Sun																							00
						12P	KLAM FLS UA										02	NONE 0 / PRVTE / PSNGR CAR	STOP / S / N	01	DRVR	NONE	62	F	OR-Y OR<25		000	012 / 000		00 / 00
00451	N	N	N	N	N	07/10/2009	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / W / 05	CROSS / 0	N / TRF SIGNAL	Y / N / N	CLR / DRY / DAY	FIX OBJ / FIX / INJ	01	NONE / PRVTE / PSNGR CAR	STRGHT / W / E	01	DRVR	NONE	53	F	SUSP OR<25		017,081	007 / 017	053,092 / 053,092	10,22,26 / 22 / 10
STATE						Fri																							00
						5P	KLAM FLS UA										02	PSNG	INJC	02	PSNG	INJC	56	F			000	000		00
00815	N	N	N			10/30/2007	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / CN / 01	CROSS / 0	N / TRF SIGNAL	N / N / N	CLR / DRY / DAY	ANGL-OTH / ANGL / PDO	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / N / S	01	DRVR	NONE	80	F	OR-Y OR<25		000	000 / 000		04 / 00 / 00
NONE						Tue																							00
						3P	KLAM FLS UA										02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / E / W	01	DRVR	NONE	00	U	UNK UNK		020	000 / 000		00 / 04
00665	N	N	N			08/05/2005	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / CN / 02	CROSS / 0	N / TRF SIGNAL	N / N / N	CLR / DRY / DAY	O-1TURN / TURN / INJ	01	NONE / PRVTE / PSNGR CAR	TURN-L / W / N	01	DRVR	NONE	19	M	OR-Y OR<25		020	000 / 038		04,27 / 00 / 04
STATE						Fri																							00
						5P	KLAM FLS UA										02	NONE / PRVTE / PSNGR CAR	STRGHT / E / W	01	DRVR	INJB	63	M	OR-Y OR<25		000	088 / 000		00 / 00
00808	N	N	N			10/14/2005	KLAMATH	1 / 0 / 4.00	14 / 0		INTER / CN / 02	CROSS / 0	N / TRF SIGNAL	N / N / N	CLR / DRY / DLIT	ANGL-OTH / TURN / PDO	01	NONE 0 / UNKN / PSNGR CAR	TURN-L / W / N	01	DRVR	NONE	00	U	UNK UNK		028	000		02,10 / 00 / 02,10
STATE						Fri																							00
						6A	KLAM FLS UA																							

020 KLAMATH FALLS-LAKEVIEW

Homedale Road@ 6th Street (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	DRUG	ALC	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																	02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / S N	01	DRVR	NONE	53	F	OR-Y / OR>25		000	000	00
00221	N	N	N			02/14/2006 / Tue / 5P	KLAMATH / KLAM FLS UA	1 14 / 0 0 / 4.00			INTER / CN / 02	CROSS / 0	N / TRF SIGNAL	N / N / N	CLD / DRY / DAY	ANGL-OTH / ANGL / PDO	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / E W	01	DRVR	NONE	38	M	OR-Y / OR<25		097	000	00
																	02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / S N	01	DRVR	NONE	42	M	OR-Y / OR<25		097	000	00
00224	N	N	N			02/14/2006 / Tue / 5P	KLAMATH / KLAM FLS UA	1 14 / 0 0 / 4.00			INTER / CN / 02	CROSS / 0	N / TRF SIGNAL	N / N / N	CLR / DRY / DAY	ANGL-OTH / ANGL / PDO	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / S N	01	DRVR	NONE	42	M	OR-Y / OR<25		020	000	04
STATE																													00
																	02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / E W	01	DRVR	NONE	38	M	OR-Y / OR<25		000	000	00
00823	N	N	N			11/05/2008 / Wed / 10A	KLAMATH / KLAM FLS UA	1 14 / 0 0 / 4.00			INTER / CN / 03	CROSS / 0	N / TRF SIGNAL	N / N / N	CLD / WET / DAY	ANGL-OTH / ANGL / PDO	01	NONE / PRVTE / PSNGR CAR	STRGHT / W E	01	DRVR	NONE	00	M	OR-Y / OR<25		020	038	04
NONE																													00
																	02	NONE / PRVTE / PSNGR CAR	STRGHT / N S	01	DRVR	NONE	57	F	OR-Y / OR<25		000	000	00
00641	N	N	N	N	N	09/09/2008 / Tue / 8A	KLAMATH / KLAM FLS UA	1 14 / 0 0 / 4.00			INTER / CN / 04	CROSS / 0	N / STOP SIGN	N / N / N	CLR / DRY / DAY	ANGL-OTH / TURN / INJ	01	NONE / PRVTE / PSNGR CAR	TURN-L / S W	01	DRVR	INJB	73	F	OR-Y / OR<25		028	015	02
STATE																													00
																	02	NONE 1 / PRVTE / SEMI TOW	STRGHT / W E	01	DRVR	NONE	51	M	OTH-Y / N-RES		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Homedale Road@ 6th Street (Hwy 020)

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00418	N	N	N			6/12/2005	8.30	HOMEDALE RD	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	STRGHT											07
STATE						Sun			N		STOP SIGN	N	DRY	REAR		PRVTE	N S										000	00
						1P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		043	000		07
															02	NONE	TURN-R											
																PRVTE	N W									013		00
																PSNGR CAR		01	DRVR	NONE	31	F	OR-Y OR<25		000	000		00
																		02	PSNG	INJC	10	M			000	000		00
00405	N	N	N			6/9/2009	8.30	HOMEDALE RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											06
NO RPT						Tue			S		TRF SIGNAL	N	DRY	SS-O		PRVTE	S N									000	013	00
						2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		031	000		06
															02	NONE	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	49	F	OR-Y OR<25		000	000		00
															03	NONE	STOP											
																PRVTE	S N									022		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
00854	N	N	N	N	N	11/16/2009	8.30	HOMEDALE RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											27
STATE						Mon			S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
						2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	64	M	OR-Y OR<25		026	038		27
															02	NONE 0	STOP											
																PRVTE	S N									011		00
																PSNGR CAR		01	DRVR	NONE	22	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Homedale Road @ Bristol Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	2	0	2	0	0
2005 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
FINAL TOTAL	0	1	2	3	0	1	0	2	1	3	0	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Homedale Road @ Bristol Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00396	N	N	N			6/6/2009	7.12	HOMEDALE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	TURN-R											02,08
NONE						Sat			S		UNKNOWN	N	DRY	TURN		PRVTE	W S									000		00
						8A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	15	F	OR-Y		028,001	000		02,08
																								OR<25				
															02	NONE	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	NONE	00	U	UNK		000	000		00
																							UNK					
00970	N	N	N			11/30/2005	7.12	HOMEDALE RD	INTER	3-LEG	N	N	SNOW	ANGL-OTH	01	NONE 0	TURN-R											08
NONE						Wed	0		CN		STOP SIGN	N	SNO	TURN		PRVTE	N W									001		00
						4P			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		001,007	000		08
																							UNK					
															02	NONE 0	TURN-R											
																PRVTE	W S									000		00
																PSNGR CAR		01	DRVR	NONE	17	F	OR-Y		000	000		00
																							OR<25					
00145	N	N	N			2/11/2005	7.12	HOMEDALE RD	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
COUNTY						Fri		BRISTOL AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	W N									015		00
						8A			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	61	F	OR-Y		028	000		02
																							OR<25					
															02	NONE 0	TURN-L											
																PRVTE	S W									000		00
																PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																							OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Homedale Road @ Foothill Boulevard
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Homedale Road @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	1	1	2	0	1	0	2	0	1	1	2	0	0
2009 TOTAL	0	1	1	2	0	1	0	2	0	1	1	2	0	0
YEAR: 2007														
ANGLE	0	0	1	1	0	0	0	1	0	0	1	1	0	0
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	2	2	0	0	0	2	0	1	1	2	0	0
YEAR: 2006														
ANGLE	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR: 2005														
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	0	1	1	0	1	0	1
2005 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	1
FINAL TOTAL	0	3	3	6	0	4	0	5	1	4	2	6	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Homedale Road @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00093	N	N	N		01/08/2005	KLAMATH	1	14		INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 0	STRGHT											040,079	26
NONE					Sat		0	0		N		STOP SIGN	N	ICE	FIX		PRVTE	E W										007	040,079	26
					11A	KLAM FLS UA	4.63			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y OR<25		081	000		26
																			02	PSNG	INJC	57	F			000	000		00
00419	N	N	N	N	05/04/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1TURN	01	NONE 0	STRGHT												07
COUNTY					Fri		0	0		N		STOP SIGN	N	DRY	REAR		PRVTE	N S										000		00
					4P	KLAM FLS UA	4.63			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	38	M	OR-Y OR<25		042	000		07
																02	NONE 0	TURN-R										013		00
																	PRVTE	N W										000		00
																	PSNGR CAR		01	DRVR	NONE	46	F	OR-Y OR<25		000			
00660	N	N	N		08/29/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT												02
STATE					Tue		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W										000		00
					7P	KLAM FLS UA	4.63			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	56	M	OR-Y OR>25		000	000		00
																02	NONE 0	STRGHT										015		00
																	PRVTE	N S										000		00
																	PSNGR CAR		01	DRVR	INJC	60	M	OR-Y OR<25		028	000		02
00454	N	N	N	N	06/14/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT												02
STATE					Thu		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W										000		00
					10P	KLAM FLS UA	4.63			01	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR<25		000	000		00
																02	NONE 0	STRGHT										015		00
																	PRVTE	N S										000		00
																	PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		028	000		02
00216	N	N	N	N	03/25/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	STRGHT												02
STATE					Wed		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S										015		00
					1P	KLAM FLS UA	4.63			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y OR<25		028	000		02
																02	NONE	STRGHT										000		00
																	PRVTE	E W										000		00
																	PSNGR CAR		01	DRVR	NONE	24	M	OR-Y OR<25		000	000		00
00680	N	N	N	N	10/31/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT												02
STATE					Sat		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	E W										000		00
					7P	KLAM FLS UA	4.63			01	0		N	DARK	INJ		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y OR>25		000	000		00

424 SOUTH KLAMATH FALLS

Homedale Road @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCOHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# FC COMPNT / MLG TYP / MILEPNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE / PRVTE / PSNGR CAR	0 / STRGHT / N S									015	00
																			01	DRVR	INJB	18	F	OR-Y / OR<25		028	000	02
																			02	PSNG	NO<5	01	F			000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Homedale Road @ Shasta Way

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	0	1	1	0	1	0	1
2006 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	1
YEAR: 2005														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	2	0	2	0	2	0	1	1	2	0	2	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Homedale Road @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00062	N	N	N			1/20/2006	2.01	SHASTA	WY	INTER	CROSS	N	Y	CLD	FIX OBJ	01	NONE 0	STRGHT										088	26
COUNTY						Fri				W		STOP SIGN	N	ICE	FIX		PRVTE	E W										007 088	26
						9A				05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	27	F	OR-Y OR<25		080,081	000		26
																			02	PSNG	NO<5	01	F			000	000		00
00805	N	N	N			10/12/2005	2.01	SHASTA	WY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
COUNTY						Wed	0			CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S										015	00
						1P				01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	44	F	OR-Y OR<25		028	000		02
																02	NONE 0	STRGHT										000		00
																	PRVTE	E W												
																	PSNGR CAR		01	DRVR	INJC	58	M	OR-Y OR<25		000	000		00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Lakeport Boulevard @ Hanks Street
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Madison Street @ Harlan Drive

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Madison Street @ Harlan Drive

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00921	Y	N	N			12/16/2008	0.81	HARLAN	DR	INTER	3-LEG	N	N	CLR	ANGL-STP	01	NONE 0	TURN-R											01
NO RPT						Tue	0			N		UNKNOWN	N	ICE	TURN		PRVTE	SE N											00
						8A				06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y OR<25		080,007,026	000		01
																02	NONE 0	STOP											
																	PRVTE	N S										011	00
																	PSNGR CAR		01	DRVR	NONE	58	F	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Madison Street @ OR 39/140 (Hwy 020)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	2	0	2	0	2	0	1	1	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2009 TOTAL	0	3	0	3	0	3	0	2	1	3	0	3	0	0
YEAR: 2007														
ANGLE	0	2	0	2	0	2	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2007 TOTAL	0	3	0	3	0	4	0	3	0	3	0	3	0	0
YEAR: 2006														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	3	0	3	0	4	1	2	1	1	2	3	0	0
2006 TOTAL	0	3	1	4	0	4	1	2	2	1	3	4	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	10	1	11	0	12	1	8	3	8	3	11	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Madison Street @ OR 39/140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00677	N	N	N			08/10/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	TURN-L										08
STATE						Wed		0	0		CN		UNKNOWN	N	DRY	TURN		PRVTE	S W									000	00
						5P	KLAM FLS UA	4.25			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		004	000	08
																									OR<25				
																	02	NONE	STRGHT										
																		PRVTE	N S									000	00
																		PSNGR CAR		01	DRVR	INJB	54	F	OR-Y		000	000	00
																									OR<25				
00646	N	N	N			08/24/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	TURN-L										02
STATE						Thu		0	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S W									000	00
						10P	KLAM FLS UA	4.25			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		028,004	000	02
																									OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N S									000	00
																		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000	00
																									OR<25				
00855	N	N	N			10/17/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT										02
COUNTY						Tue		0	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N S									000	00
						11P	KLAM FLS UA	4.25			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	21	M	OR-Y		000	000	00
																									OR<25				
																				02	PSNG	INJC	20	F			000	000	00
																	02	NONE 0	TURN-L										
																		PRVTE	S W									000	00
																		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		004,028	000	02
																									OR<25				
00136	N	N	N	N	N	02/14/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										04
STATE						Wed		0	0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	E W									000	00
						1P	KLAM FLS UA	4.25			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y		097	000	00
																									OR<25				
																	02	NONE 0	STRGHT										
																		PRVTE	N S									000	00
																		PSNGR CAR		01	DRVR	INJC	77	F	OR-Y		097	000	00
																									OR<25				
00403	N	N	N	N	N	06/08/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										04
STATE						Mon		0	0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	N S									000	00
						1P	KLAM FLS UA	4.25			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	66	M	OR-Y		000	000	00
																									OR<25				
																	02	NONE	STRGHT										
																		PRVTE	E W									000	00
																		PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		020	000	04
																									OR<25				
																				02	PSNG	NO<5	02	M			000	000	00

020 KLAMATH FALLS-LAKEVIEW

Madison Street @ OR 39/140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCOHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00943	Y	N	N	N	N	12/12/2009	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE 0	STRGHT										124,093	04,01
STATE						Sat		0	0		CN		TRF SIGNAL	N	ICE	ANGL		PRVTE	E W								001		00
						11A	KLAM FLS UA	4.25			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	44	M	OR-Y OR<25		020	017		04,01
																	02	NONE 0	STRGHT											
																		PRVTE	N S									000		00
																		PSNGR CAR		01	DRVR	INJC	52	F	OR-Y OR<25		000	000	093	00
00362	N	N	N			04/15/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLD	O-1TURN	01	NONE 0	STRGHT										059,053	10,04
STATE						Sat		0	0		CN		TRF SIGNAL	N	WET	TURN		RENTL	E W								000		00
						8A	KLAM FLS UA	4.25			02	0		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	20	M	OR-Y OR<25		016,020	000		10,04
																	02	NONE 0	TURN-L											
																		PRVTE	W N									000		00
																		PSNGR CAR		01	DRVR	INJC	51	F	OR-Y OR<25		000	000		00
00492	N	N	N			06/20/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NO RPT						Wed		0	0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	E W								000		00
						1P	KLAM FLS UA	4.25			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	24	M	OR-Y OR<25		000	000		00
																	02	NONE 0	STRGHT											
																		PRVTE	S N									000		00
																		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y OR<25		020	000		04
00501	N	N	N			06/26/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NO RPT						Tue		0	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N S								000		00
						8A	KLAM FLS UA	4.25			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y OR<25		020	000		04
																	02	NONE 0	TURN-L											
																		PRVTE	W N									000		00
																		PSNGR CAR		01	DRVR	INJB	20	F	OR-Y OR<25		000	000		00
																				02	PSNG	INJB	01	M			000	000		00
00935	N	N	N			11/27/2006	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Mon		0	0		CN		UNKNOWN	N	ICE	ANGL		PRVTE	S N								000		00
						7P	KLAM FLS UA	4.25			04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR<25		028	000		02
																	02	NONE 0	STRGHT											
																		PRVTE	W E									000		00
																		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y OR<25		000	000		00

020 KLAMATH FALLS-LAKEVIEW

Madison Street @ OR 39/140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT MLG / MILEPNT	FC TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00125	N	N	N	N	N	02/07/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	TURN-L										08,02
STATE						Sat		0	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N E									000	00
						2P	KLAM FLS UA	4.25			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		004,028	000	08,02
																	02	NONE	STRGHT										
																		PRVTE	S N									000	00
																		PSNGR CAR		01	DRVR	INJC	55	M	OR-Y OR<25		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Main Street (Hwy 020) @ US 97 (Hwy 004)NB ramps

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2005														
ANGLE	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FIXED / OTHER OBJECT	0	1	0	1	0	1	0	1	0	0	1	1	0	1
2005 TOTAL	0	2	0	2	0	2	0	2	0	0	2	2	0	1
FINAL TOTAL	0	2	1	3	0	2	0	3	0	1	2	3	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Main Street (Hwy 020) @ US 97 (Hwy 004)NB ramps
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00630	Y	N	N			08/27/2005	KLAMATH	1	14		INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE	STRGHT										053	01,10
CITY						Sat	KLAMATH FALLS	0 0		MAIN ST	NE		UNKNOWN	N	DRY	FIX		PRVTE	SW NE									088	053	00
						8P	KLAM FLS UA	0.11		PAYNE ALLEY	05	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	16	M	NONE OR<25		051,047	000		01
																				02	PSNG	INJC	17	M			000	000		00
00391	N	N	N			05/10/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT						Tue	KLAMATH FALLS	0 0		MAIN ST	CN		STOP SIGN	N	DRY	ANGL		PRVTE	SE NW									015		00
						8P	KLAM FLS UA	0.11		PAYNE ALLEY	03	0		N	DUSK	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		028	000		02
																	02	NONE 0	STRGHT											
																		PRVTE	SW NE									000		00
																		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y OR<25		000	000		00
																				02	PSNG	INJC	31	F			000	000		00
00854	N	N	N	N	Y	11/07/2007	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											10
CITY						Wed	KLAMATH FALLS	0 0		E MAIN ST	N		L-TURN REF	N	DRY	REAR		PRVTE	N S									000		00
						7A	KLAM FLS UA	0.19		K FALLS-LAKEVIEW HY	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y OR<25		026	026		10
																	02	NONE 0	STOP											
																		PRVTE	N S									011		00
																		PSNGR CAR		01	DRVR	NONE	35	F	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Main Street @ Spring Street

January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
FIXED / OTHER OBJECT	0	1	1	2	0	2	2	2	0	2	0	2	0	2
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	1	2	3	0	2	2	3	0	3	0	3	0	2
YEAR: 2005														
TURNING MOVEMENTS	0	1	1	2	0	1	0	2	0	2	0	2	0	0
2005 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
FINAL TOTAL	0	2	3	5	0	3	2	5	0	5	0	5	0	2

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Main Street @ Spring Street

January 1, 2005 through December 31,2009

SER# / INVEST	SPE	ALC	DRG	SCH	WOR	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00324	N	N	N	N	N	04/10/2007	17	MAIN ST	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 1	TURN-R										046,005,080	08,10
CITY						Tue	0	SPRING ST	E		UNKNOWN	N	DRY	FIX		PRVTE	SE E									088	046	00
						4P			06	0		N	DAY	INJ		SEMI TOW		01	DRVR	NONE	57	M	OR-Y OR>25		002,080,081	000		08,10
																	STRGHT E W	01	PED	INJC	28	F		09	000	040	005	00
																	STRGHT E W	02	PED	INJC	24	F		09	000	040	005	00
00282	N	N	N	N	N	04/28/2007	16	MAIN ST	INTER	CROSS	N	Y	CLR	FIX OBJ	01	NONE 1	TURN-R										040,052	08
CITY						Sat	0	SPRING ST	SE		TRF SIGNAL	N	DRY	FIX		PRVTE	SE E									000	040,052	00
						2P			06	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	27	F	OTH-Y N-RES		002	000		08
00361	N	N	N			05/17/2005	17	MAIN ST	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L											02
CITY						Tue	0	SPRING ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W NW									015		00
						3P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	51	F	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	SE NW									000		00
																PSNGR CAR		01	DRVR	NONE	23	M	OR-Y OR<25		000	000		00
00636	N	N	N			08/30/2005	17	MAIN ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	TURN-L											08
CITY						Tue	0	SPRING ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E SE									000		00
						5P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		004,052	000		08
															02	NONE	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	INJC	30	F	OR-Y OR<25		000	000		00
00535	N	N	N	N	N	07/05/2007	16	MAIN ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R											02
CITY						Thu	0	SPRING ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE E									016		00
						10A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y OR<25		028	000		02
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	NONE	77	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Memorial Drive @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Memorial Drive @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00370	N	N	N	N	N	06/25/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										013	27
STATE						Thu		0	0		E		UNKNOWN	N	DRY	REAR		PRVTE	E W									000	013	00
						4P	KLAM FLS UA	0.64			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	18	F	OR-Y OR<25		016,026	038		27
																	02	NONE	STOP											
																		PRVTE	E W									012		00
																		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y OR<25		000	000		00
																	03	NONE	STRGHT											
																		PRVTE	W E									022		00
																		PSNGR CAR		01	DRVR	NONE	46	M	OR-Y OR<25		000	000		00
00662	N	N	N			08/03/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE	TURN-L											06
STATE						Wed		0	0		CN		NO-PASS-ZN	N	DRY	TURN		PRVTE	E S									000		00
						4P	KLAM FLS UA	0.64			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y OR<25		000	000		00
																	02	NONE	STRGHT											
																		PRVTE	E W									000		00
																		PSNGR CAR		01	DRVR	NONE	31	M	OR-Y OR<25		031,036	000		06

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Midland Hwy (Hwy 420) @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
TURNING MOVEMENTS	0	1	1	2	0	1	1	2	0	2	0	2	0	0
2007 TOTAL	0	1	1	2	0	1	1	2	0	2	0	2	0	0
YEAR: 2006														
FIXED / OTHER OBJECT	0	1	0	1	0	2	0	0	1	0	1	1	0	1
2006 TOTAL	0	1	0	1	0	2	0	0	1	0	1	1	0	1
YEAR: 2005														
ANGLE	0	4	0	4	0	7	1	4	0	4	0	4	0	0
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	4	1	5	0	7	1	5	0	5	0	5	0	0
FINAL TOTAL	0	6	2	8	0	10	2	7	1	7	1	8	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

420 MIDLAND

Midland Hwy (Hwy 420) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00821	Y	N	N	N	N	10/13/2007	KLAMATH	1	17		INTER	CROSS	N	N	FOG	O-1TURN	01	NONE 1	STRGHT											30
COUNTY						Sat		0	0		CN		UNKNOWN	N	DRY	TURN		PRVTE	E W										000	00
						8A	KLAM FLS UA	2.14			04	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	U	UNK		050	000		30
																									UNK					
																	02	NONE 0	TURN-L											
																		PRVTE	W N										000	00
																		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		028	000		02
																									OR<25					

424 SOUTH KLAMATH FALLS

Midland Hwy (Hwy 420) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCOHL	DRUGS	SCHL WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00723	N	N	N		09/13/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	FIX OBJ	01	NONE 0	TURN-L										057,058	08
STATE					Tue		0	0		S		UNKNOWN	N	DRY	FIX		PRVTE	E S									000	057,058	00
					3P	KLAM FLS UA	1.56			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y OR<25		002,080,081	000		08
00536	Y	N	N	N	07/06/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										001	02
STATE					Fri		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	E W									000		00
					11A	KLAM FLS UA	1.56			01	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	21	M	N-VAL OR<25		047	000	001	01
																02	NONE 0	TURN-L											
																	PRVTE	N E									015		00
																	PSNGR CAR		01	DRVR	NONE	73	M	OR-Y OR<25		028	000		02
00196	N	N	N		03/07/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											03,10
STATE					Mon		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	SE NW									000		00
					12P	KLAM FLS UA	1.56			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	36	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	44	M			000	000		00
																			03	PSNG	NO<5	03	F			000	000		00
																02	NONE 0	STRGHT											
																	UNKN	SW NE									000		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		021,028	000		03,10
00286	N	N	N		04/01/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
NO RPT					Fri		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	NE SW									015		00
					9A	KLAM FLS UA	1.56			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y OR<25		028	000		02
																02	NONE 0	STRGHT											
																	PRVTE	NW SE									000		00
																	PSNGR CAR		01	DRVR	INJC	19	M	OR-Y OR<25		000	000		00
00327	N	N	N		04/22/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										013	27,02
STATE					Fri		0	0		CN		FLASHBCN-R	N	DRY	ANGL		PRVTE	N S									015	013	00
					11A	KLAM FLS UA	1.56			03	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	57	M	OTH-Y N-RES		016,028	038		27,02
																			02	PSNG	INJB	78	M			000	000		00
																02	NONE 1	STRGHT											
																	PRVTE	W E									000		00
																	SEMI TOW		01	DRVR	INJC	47	M	OR-Y OR>25		000	000		00
																03	NONE 0	STOP											
																	PRVTE	E W									012		00
																	PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		000	000		00

424 SOUTH KLAMATH FALLS

Midland Hwy (Hwy 420) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCS	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00794	N	N	N			10/04/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											02
STATE						Tue		0	0		CN		STOP SIGN	N	DRY	ANGL		PRVTE	NW SE										000		00
						4P	KLAM FLS UA	1.56			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	21	M	OR-Y OR>25		000	000		00
																				02	PSNG	INJB	35	M			000	000		00
																	02	NONE 0	STRGHT											
																		PRVTE	NE SW									015		00
																		PSNGR CAR		01	DRVR	NONE	89	M	OR-Y OR<25		028	000		02
00045	N	N	N			01/12/2006	KLAMATH	1	14		INTER	CROSS	N	Y	RAIN	FIX OBJ	01	NONE 0	STRGHT											057,013	10
STATE						Thu		0	0		CN		STOP SIGN	N	WET	FIX		PRVTE	W E									088	057,013	21
						5P	KLAM FLS UA	1.56			04	0		N	DARK	INJ		PSNGR CAR		01	DRVR	INJB	23	M	OR-Y OR<25		000	000		00
																				02	PSNG	INJB	23	M			000	000		00
																	02	NONE 0	STRGHT											
																		PRVTE	E W									022		00
																		PSNGR CAR		01	DRVR	NONE	34	M	OR-Y OR<25		017,080	017		10

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Montelius Street @ Nevada Street (Hwy 004)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2006														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Montelius Street @ Nevada Street (Hwy 004)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00242	N	N	N			03/17/2006	17	MONTELIUS ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											03
CITY						Fri	0	NEVADA AVE	CN		STOP SIGN	N	DRY	TURN		PRVTE	N E									000		00
						9A			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	48	F	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	INJB	36	F	OR-Y		021,028	000		03
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39/140 (Hwy 020) @ Hilyard Avenue / Vermont Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	0
YEAR: 2008														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	1	0	0	1	1	0	1
MISCELLANEOUS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2008 TOTAL	0	0	2	2	0	0	0	2	0	0	2	2	0	1
YEAR: 2006														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2006 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
FINAL TOTAL	0	1	3	4	0	1	0	3	1	1	3	4	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

OR 39/140 (Hwy 020) @ Hilyard Avenue / Vermont Street
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS / RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00867	Y	N	N			12/09/2008	KLAMATH	1	14		INTER	3-LEG	N	Y	CLR	FIX OBJ	01	NONE	TURN-L										053,095	01,08
NO RPT						Tue		0	0		N		UNKNOWN	N	DRY	FIX		PRVTE	W N									001	053,095	00
						12A	KLAM FLS UA	5.19			05	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y OR<25		047,081,001	017		01,08
00604	N	N	N			08/15/2008	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANIMAL	01	NONE	STRGHT										035	12
NO RPT						Fri		0	0		W		UNKNOWN	N	DRY	OTH		PRVTE	E W									000	035	00
						3A	KLAM FLS UA	5.19			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	39	F	OR-Y OR<25		000	000		12
00964	N	N	N	N	N	12/08/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT											02
STATE						Tue		0	0		CN		STOP SIGN	N	ICE	ANGL		PRVTE	E W									007		00
						11A	KLAM FLS UA	5.19			01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	60	M	OR-Y OR<25		000	000		00
																	02	NONE	STRGHT											
																		PRVTE	N S									015		00
																		PSNGR CAR		01	DRVR	INJC	68	F	OR-Y OR<25		028	000		02
00213	N	N	N			02/09/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R										043	02
STATE						Thu		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	W SE									015		00
						6P	KLAM FLS UA	5.19			03	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y OR<25		028	000		02
																	02	NONE 0	STRGHT											
																		PRVTE	NW SE									088		00
																		PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Biehn Street / Campus Drive

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2008														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2007														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	2	0	2	0	3	0	2	0	2	0	2	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2007 TOTAL	0	2	2	4	0	3	0	4	0	3	1	4	0	0
YEAR: 2006														
TURNING MOVEMENTS	0	1	1	2	0	1	0	1	1	2	0	2	0	0
2006 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
FINAL TOTAL	0	5	3	8	0	6	0	7	1	7	1	8	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Biehn Street / Campus Drive
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	VEH TYPE	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT		CAUSE
00238	N	N	N		03/08/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	TURN-R													07,10
CITY					Thu	KLAMATH FALLS	0	0	CAMPUS DR	NE		R-TURN ALL	N	DRY	REAR			PRVTE	SE NE										000			00
					4P	KLAM FLS UA	- 6.41		CRATER LK PKY	09	1		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	52	F	OR-Y		043		000			07
																				OR<25											
																	02	NONE	0	STOP												
																		PRVTE		SE NE									011			00
																		PSNGR CAR			01	DRVR	INJB	20	F	OR-Y		009	000			10
																				OR<25											
00093	N	N	N		02/24/2009	KLAMATH	2	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE		STRGHT														07
NONE					Tue	KLAMATH FALLS	0	0	CAMPUS DR	SE		TRF SIGNAL	N	DRY	REAR			PRVTE	SE NW										000			00
					11A	KLAM FLS UA	- 6.41		CRATER LK PKY	06	1		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	00	F	UNK		026		000			07
																				UNK											
																	02	NONE		STOP												
																		PRVTE		SE NW									011			00
																		PSNGR CAR			01	DRVR	INJC	36	F	OR-Y		000	000			00
																				OR<25											
00323	N	N	N		04/10/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	0	STRGHT													013		07
CITY					Tue	KLAMATH FALLS	0	0	CAMPUS DR	SW		TRF SIGNAL	N	DRY	REAR			PRVTE	SW NE										000			00
					8A	KLAM FLS UA	- 6.41		CRATER LK PKY	09	1		N	DAY	INJ			PSNGR CAR		01	DRVR	INJC	32	F	OR-Y		043,026		000			07
																				OR<25											
																	02	NONE	0	STOP												
																		PRVTE		SW NE									011	013		00
																		PSNGR CAR			01	DRVR	INJC	25	F	OR-Y		000	000			00
																				OR<25											
																	03	NONE	0	STOP												
																		PRVTE		SW NE									022			00
																		PSNGR CAR			01	DRVR	NONE	45	F	OR-Y		000	000			00
																				OR<25											
00031	N	N	N	N	N	01/05/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	0	STRGHT													04
CITY						Fri	KLAMATH FALLS	0	0	BIEHN ST	CN		TRF SIGNAL	N	DRY	TURN			PRVTE	NW SE										000			00
						8P	KLAM FLS UA	- 6.41		CRATER LK PKY	03	0		N	DLIT	PDO			PSNGR CAR		01	DRVR	NONE	26	F	OTH-Y		020		000			04
																				N-RES											
																	02	NONE	0	TURN-L												
																		PRVTE		SE S									000			00
																		PSNGR CAR			01	DRVR	NONE	17	M	OTH-Y		000	000			00
																				N-RES											
00084	N	N	N	N	N	01/21/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT													04
CITY						Sun	KLAMATH FALLS	0	0	CAMPUS DR	CN		TRF SIGNAL	N	DRY	ANGL			PRVTE	NW SE										000			00
						10A	KLAM FLS UA	- 6.41		CRATER LK PKY	03	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	84	M	OR-Y		020		000			04
																				OR<25											
																	02	NONE	0	STRGHT												
																		PRVTE		NE SW									000	053		00
																		PSNGR CAR			01	DRVR	NONE	19	F	OR-Y		000	000			00
																				OR>25											

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Biehn Street / Campus Drive
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT MLG / MILEPNT	FC TYP	CONN # FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00759	N	N	N		09/03/2006	KLAMATH	1 14			INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT											040,010,001	04
CITY					Sun	KLAMATH FALLS	0 0	CAMPUS DR		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SE NW										001	010	00
					7A	KLAM FLS UA	- 6.41	CRATER LK PKY		04	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	55	M	OR-Y OR>25		020	000		04
																	02	NONE 0	TURN-L											
																		PRVTE	NW NE									000	040	00
																		PSNGR CAR		01	DRVR	NONE	66	M	OR-Y OR<25		000	000		00
00948	N	N	N	N	N	11/29/2006	KLAMATH	1 14			INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT												04
CITY					Wed	KLAMATH FALLS	0 0	CAMPUS DR		CN		TRF SIGNAL	N	ICE	TURN		PRVTE	SE NW										000		00
					11A	KLAM FLS UA	- 6.41	CRATER LK PKY		04	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	F	OR-Y OR<25		000	000		00
																	02	NONE 0	TURN-L											
																		PRVTE	NW NE									000		00
																		PSNGR CAR		01	DRVR	NONE	45	F	OTH-Y N-RES		004	000		04

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

OR 39 (Hwy 050) @ Biehn Street / Campus Drive
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00383	N	N	N			05/17/2008	16	BIEHN ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											10,27
NO RPT						Sat	0	CRATER LK PKY	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
						3P			09	2		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	19	M	OR-Y		026	038		10
																							OR<25					
															02	NONE	STOP											
																PRVTE	SW NE									011		00
																PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Eberlein Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2009 TOTAL	0	1	1	2	0	1	0	0	2	1	1	2	0	0
YEAR: 2007														
TURNING MOVEMENTS	0	2	0	2	0	6	0	1	1	2	0	2	0	0
2007 TOTAL	0	2	0	2	0	6	0	1	1	2	0	2	0	0
YEAR: 2006														
ANGLE	0	1	1	2	0	1	0	1	1	2	0	2	0	0
REAR-END	0	1	0	1	0	1	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	0	1	0	1	1	0	0
2006 TOTAL	0	3	1	4	0	4	0	1	3	2	2	4	0	0
YEAR: 2005														
REAR-END	0	1	0	1	0	1	0	0	1	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	0
FINAL TOTAL	0	7	2	9	0	12	0	2	7	6	3	9	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Eberlein Avenue
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	VEH TYPE	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00859	Y	N	N			11/08/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE	0	STRGHT										07,01
NONE						Tue	KLAMATH FALLS	0 0		FOOTHILL BLVD	E		TRF SIGNAL	N	ICE	REAR		PRVTE		E W									001	00
						7A	KLAM FLS UA	- 3.21		K FALLS-MALIN HY	06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	52	F	OR-Y OR<25		026	000	07,01
																	02	NONE	0	STOP										
																		PRVTE		E W									011	00
																		PSNGR CAR			01	DRVR	INJB	42	F	OR-Y OR<25		000	000	00
01066	N	N	N	N	N	12/13/2006	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	ANGL-STP	01	NONE	0	TURN-L										08
CITY						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	SE		STOP SIGN	N	WET	TURN		PRVTE		E SE									000	00
						5P	KLAM FLS UA	- 3.21		EBERLEIN AVE	06	0		N	DARK	INJ		PSNGR CAR			01	DRVR	NONE	45	M	OR-Y OR<25		007	000	08
																	02	NONE	0	STOP										
																		PRVTE		SE NW									012	00
																		PSNGR CAR			01	DRVR	NONE	28	F	OR-Y OR<25		000	000	00
																					02	PSNG	INJC	04	M			000	000	00
																					03	PSNG	INJB	10	M			000	000	00
00717	Y	N	N	N	N	09/04/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	TURN-R										08,30,32
CITY						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	SE		STOP SIGN	N	WET	TURN		PRVTE		W SE									000	00
						12P	KLAM FLS UA	- 3.21		EBERLEIN AVE	06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	16	M	OR-Y OR<25		050,001,052	000	08,30,32
																	02	NONE	0	STRGHT										
																		PRVTE		SE NW									000	00
																		PSNGR CAR			01	DRVR	INJC	18	F	OR-Y OR<25		000	000	00
																					02	PSNG	INJC	18	M			000	000	00
																					03	PSNG	INJC	17	F			000	000	00
																					04	PSNG	INJC	41	F			000	000	00
00977	Y	N	N			12/11/2009	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE		TURN-R										01,08
CITY						Fri	KLAMATH FALLS	0 0		CRATER LK PKY	W		NONE	N	ICE	TURN		PRVTE		NW W									001	00
						6P	KLAM FLS UA	- 3.21		EBERLEIN AVE	06	0		N	DARK	PDO		PSNGR CAR			01	DRVR	NONE	58	M	OR-Y OR<25		047,080,001	017	01,08
																	02	NONE		STRGHT										
																		PRVTE		W E									000	00
																		PSNGR CAR			01	DRVR	NONE	34	F	OR-Y OR<25		000	000	00
00085	N	N	N			01/17/2006	KLAMATH	1	14		INTER	3-LEG	N	N	SNOW	S-STRGHT	01	NONE	0	STRGHT										02
NO RPT						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	NW		STOP SIGN	N	ICE	REAR		PRVTE		SE NW									000	00
						6P	KLAM FLS UA	- 3.21		EBERLEIN AVE	05	0		N	DARK	INJ		PSNGR CAR			01	DRVR	NONE	42	M	OR-Y OR<25		000	000	00
																	02	NONE	0	TURN-L										
																		PRVTE		W NW									015	00
																		PSNGR CAR			01	DRVR	INJC	44	M	OR-Y OR<25		028	000	02

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Eberlein Avenue
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00957	N	N	N			12/31/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY						Mon	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	DRY	TURN		PRVTE	NW SE									000	00
						12P	KLAM FLS UA	- 3.21		EBERLEIN AVE	01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	30	M	OR-Y		000	000	00
																										OR<25			
																	02	NONE 0	TURN-L									015	00
																		PRVTE	SW NW										
																		PSNGR CAR		01	DRVR	INJB	17	M	OR-Y		028	000	02
																										OR<25			
00251	N	N	N			03/28/2006	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE 0	STRGHT										02
COUNTY						Tue	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	WET	ANGL		PRVTE	SE NW									000	00
						3P	KLAM FLS UA	- 3.21		EBERLEIN AVE	02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	30	F	OR-Y		000	000	00
																										OR>25			
																	02	NONE 0	STRGHT									015	00
																		PRVTE	E W										
																		PSNGR CAR		01	DRVR	NONE	50	F	OR-Y		028	000	02
																										OR<25			
00770	N	N	N			09/14/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
CITY						Thu	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	DRY	ANGL		PRVTE	NW SE									000	00
						2P	KLAM FLS UA	- 3.21		EBERLEIN AVE	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	25	M	OR-Y		000	000	00
																										OR<25			
																	02	NONE 0	STRGHT									015	00
																		PRVTE	W E										
																		PSNGR CAR		01	DRVR	NONE	70	M	OR-Y		028	000	02,10
																										OR<25			
00384	N	N	N	N	N	06/05/2009	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT										02
CITY						Fri	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	WET	ANGL		PRVTE	NW SE									000	00
						2P	KLAM FLS UA	- 3.21		EBERLEIN AVE	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	63	F	OR-Y		000	000	00
																										OR<25			
																	02	NONE	STRGHT									015	00
																		PRVTE	W E										
																		PSNGR CAR		01	DRVR	INJC	60	F	OR-Y		028	000	02
																										OR<25			

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Hager Way
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Main Street
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
HEAD-ON	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	1	2	0	1	0	2	0	1	1	2	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2009 TOTAL	0	2	3	5	0	2	0	5	0	4	1	5	0	0
YEAR: 2007														
REAR-END	0	1	2	3	0	1	0	3	0	2	1	3	0	0
2007 TOTAL	0	1	2	3	0	1	0	3	0	2	1	3	0	0
YEAR: 2005														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
FINAL TOTAL	0	4	6	10	0	4	0	10	0	8	2	10	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Main Street
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT		CAUSE
00970	N	N	N			12/09/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1STOP	01	NONE	STRGHT												05
CITY						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	SE		L-TURN REF	N	DRY	HEAD		PRVTE	NW SE									088			00
						9A	KLAM FLS UA	- 4.46		MAIN ST	06	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	22	F	OR-Y OR<25		039,080	026			05
																	02	NONE	STOP												
																		PRVTE	SE NW									012			00
																		PSNGR CAR		01	DRVR	NONE	73	F	OR-Y OR<25		000	000			00
00653	N	N	N			09/27/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NO RPT						Sun	KLAMATH FALLS	0 0		CRATER LK PKY	SW		YIELD	N	DRY	REAR		PRVTE	SW NE									000			00
						3A	KLAM FLS UA	- 4.46		MAIN ST	06	1		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	35	M	OR-Y OR<25		026	000			07
																	02	NONE 0	STOP												
																		PRVTE	SW NE									013			00
																		PSNGR CAR		01	DRVR	INJB	44	M	OR-Y OR<25		000	000			00
00185	N	N	N			02/28/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											004		07
NO RPT						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									000			00
						6P	KLAM FLS UA	- 4.46		MAIN ST	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	37	F	OR-Y OR<25		026	000			07
																	02	NONE 0	STOP												
																		PRVTE	NW SE									011	004		00
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000			00
00719	N	N	N			09/04/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												07
NONE						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									000			00
						4P	KLAM FLS UA	- 4.46		MAIN ST	09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	28	F	OR-Y OR<25		014	000			07
																	02	NONE 0	STOP												
																		PRVTE	NW SE									011			00
																		PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000			00
00357	N	N	N			06/16/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	STRGHT												07
NO RPT						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	NW		STOP SIGN	N	DRY	REAR		PRVTE	SW NE									000			00
						12P	KLAM FLS UA	- 4.46		MAIN ST	09	2		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		026	000			07
																	02	NONE	STOP												
																		PRVTE	SW E									013			00
																		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y OR<25		000	000			00
00593	N	N	N	N	N	08/26/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											013		13
CITY						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	CN		UNKNOWN	N	DRY	SS-O		PRVTE	NW SE									000			26
						5P	KLAM FLS UA	- 4.46		MAIN ST	01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	F	OR-Y OR<25		045	000			13

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Main Street
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCOHL	DRUGS	SCHL WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / NW SE	01	DRVR	NONE	44	M	OR-Y / OR<25		000	000	013	00
																											000		00
																03	NONE 0 / PRVTE / PSNGR CAR	STOP / SE NW	01	DRVR	NONE	50	F	OR-Y / OR<25		000	011		00
																											000		00
00401 CITY	N	N	N		05/05/2005 Thu 4P	KLAMATH KLAMATH FALLS KLAM FLS UA	1 14 0 0 - 4.46		K FALLS-MALIN HY MAIN ST	INTER CN 03	CROSS 0	N NONE	N CLD N DRY N DAY	S-STRGHT REAR PDO	01	NONE 0 / PRVTE / OTH BUS	STRGHT / NW SE	01	DRVR	NONE	45	F	OR-Y / OR<25		000	000		04 00 00
																02	NONE 0 / PRVTE / PSNGR CAR	TURN-R / W S	01	DRVR	NONE	89	M	OR-Y / OR<25		020,028	000		00 04
																											000		00
00741 CITY	N	N	N		10/15/2009 Thu 11A	KLAMATH KLAMATH FALLS KLAM FLS UA	1 14 0 0 - 4.46		CRATER LK PKY MAIN ST	INTER CN 03	CROSS 1	N TRF SIGNAL	N CLR N DRY N DAY	ANGL-OTH TURN INJ	01	NONE 0 / PRVTE / PSNGR CAR	TURN-L / SE W	01	DRVR	NONE	17	M	OR-Y / OR<25		028	000		02 00 02
																02	NONE 0 / PRVTE / PSNGR CAR	TURN-L / E SE	01	DRVR	INJC	38	M	OR-Y / OR<25		000	000		00 00
00294 NONE	N	N	N		04/06/2005 Wed 5P	KLAMATH KLAMATH FALLS KLAM FLS UA	1 14 0 0 - 4.46		K FALLS-MALIN HY MAIN ST	INTER CN 04	CROSS 0	N TRF SIGNAL	N CLR N DRY N DAY	ANGL-OTH ANGL INJ	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / SE NW	01	DRVR	NONE	53	F	OR-Y / OR<25		016,020	000		27,04 00 27,04
																02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / W E	01	DRVR	INJC	62	F	OR-Y / OR<25		000	000		00 00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

OR 39 (Hwy 050) @ Main Street

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00426	N	N	N			05/09/2007	16	CRATER LK PKY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE						Wed	0	MAIN ST	W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000	00
						5P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000		07
																							UNK					
															02	NONE 0	STOP										
																PRVTE	W E									011	00
																PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		000	000		00
																							OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	0	1	1	0	1	0	1
REAR-END	0	1	1	2	0	2	0	0	2	0	2	2	0	0
2009 TOTAL	0	1	2	3	0	2	0	0	3	1	2	3	0	1
YEAR: 2008														
TURNING MOVEMENTS	0	1	1	2	0	2	0	0	2	1	1	2	0	0
2008 TOTAL	0	1	1	2	0	2	0	0	2	1	1	2	0	0
YEAR: 2007														
TURNING MOVEMENTS	0	3	1	4	0	10	0	4	0	3	1	4	0	0
2007 TOTAL	0	3	1	4	0	10	0	4	0	3	1	4	0	0
YEAR: 2006														
FIXED / OTHER OBJECT	0	0	2	2	0	0	0	2	0	2	0	2	0	2
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	2	3	0	1	0	3	0	3	0	3	0	2
YEAR: 2005														
TURNING MOVEMENTS	0	1	2	3	0	1	0	3	0	3	0	3	0	0
2005 TOTAL	0	1	2	3	0	1	0	3	0	3	0	3	0	0
FINAL TOTAL	0	7	8	15	0	16	0	10	5	11	4	15	0	3

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V# / VEH TYPE	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00139	Y	N	N	N	N	02/10/2009	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / N / 05	3-LEG / 0	N / UNKNOWN	Y / N / N	SNOW / SNO / DAY	FIX OBJ / FIX / PDO	01	NONE / PRVTE / PSNGR CAR	STRGHT / S / N	01	DRVR	NONE	53	M	OR-Y / OR<25		047,081		079,010	01
STATE						Tue																					001	079,010	00
						4P	KLAM FLS UA																				017		01
00063	N	Y	N	N	N	01/18/2007	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / S / 06	CROSS / 0	N / STOP SIGN	N / N / N	CLR / DRY / DAY	ANGL-OTH / TURN / INJ	01	NONE / PRVTE / PSNGR CAR	0 / TURN-R / W S	01	DRVR	INJB	59	M	OR-Y / OR<25		001,007			08
STATE						Thu																					000		00
						11A	KLAM FLS UA																				000		08
																	02	NONE / PRVTE / PSNGR CAR	0 / STRGHT / S N	01	DRVR	INJB	32	M	OR-Y / OR<25		000		000	00
																											000		00
																				02	PSNG	INJB	48	M			000		000	00
00133	N	N	N			02/10/2009	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / S / 06	3-LEG / 0	N / L-TURN REF	N / N / N	SNOW / SNO / DARK	S-1STOP / REAR / PDO	01	NONE / PRVTE / PSNGR CAR	STRGHT / S N	01	DRVR	NONE	17	M	OR-Y / OR<25		026			07
NONE						Tue																					001		00
						7P	KLAM FLS UA																				000		07
																	02	NONE / PRVTE / PSNGR CAR	STOP / S N	01	DRVR	NONE	50	F	OR-Y / OR<25		000		012	00
																											000		000	00
00515	N	N	N			06/26/2006	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / W / 06	3-LEG / 0	N / UNKNOWN	Y / N / N	CLR / DRY / DAY	FIX OBJ / FIX / PDO	01	NONE / PRVTE / PSNGR CAR	0 / TURN-L / S W	01	DRVR	NONE	49	F	OR-Y / OR<25		002,081		057	08
STATE						Mon																					000	057	00
						1P	KLAM FLS UA																				038		08
00739	N	N	N			09/24/2006	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / W / 06	CROSS / 0	N / UNKNOWN	Y / N / N	CLR / DRY / DAY	FIX OBJ / FIX / PDO	01	NONE / PRVTE / PSNGR CAR	0 / TURN-L / S W	01	DRVR	NONE	57	F	OR-Y / OR<25		002,080,081		057	08
STATE						Sun																					088	057	00
						6P	KLAM FLS UA																				026		08
00837	N	N	N			10/12/2006	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / CN / 01	3-LEG / 0	N / STOP SIGN	N / N / N	CLR / DRY / DAY	ANGL-OTH / TURN / INJ	01	NONE / PRVTE / PSNGR CAR	0 / TURN-L / W N	01	DRVR	NONE	19	M	OR-Y / OR<25		028			02
STATE						Thu																					015		00
						8A	KLAM FLS UA																				000		02
																	02	NONE / PRVTE / PSNGR CAR	0 / TURN-L / S W	01	DRVR	INJC	41	F	OR-Y / OR<25		000		000	00
																											000		000	00
00908	N	N	N	N	N	11/21/2007	KLAMATH	1 / 0 / 1.78	14 / 0		INTER / CN / 01	3-LEG / 0	N / STOP SIGN	N / N / N	CLD / DRY / DAY	ANGL-OTH / TURN / PDO	01	NONE / PRVTE / PSNGR CAR	0 / TURN-L / W N	01	DRVR	NONE	31	M	OR-Y / OR<25		028			02
STATE						Wed																					015		00
						4P	KLAM FLS UA																				000		02

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																02	NONE 0	TURN-L										
																	PRVTE	S W									000	00
																	PSNGR CAR		01	DRVR	NONE	25	F	OR-Y		000	000	00
																								OR<25				
00443	N	N	N	N	06/03/2008	KLAMATH	1	14		INTER	3-LEG	N	N	RAIN	O-1TURN	01	NONE	TURN-L										02
STATE					Tue		0	0		CN		UNKNOWN	N	WET	TURN		PRVTE	W N									000	00
					8A	KLAM FLS UA	1.78			02	0		Y	DAY	INJ		PSNGR CAR		01	DRVR	INJC	46	M	OR-Y		004,028	000	02
																								OR<25				
																02	NONE	STRGHT										
																	PRVTE	E W									018	00
																	PSNGR CAR		01	DRVR	INJC	52	F	OR-Y		000	000	00
																								OR<25				
00482	N	N	N		06/28/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										02
STATE					Tue		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	W N									015	00
					5P	KLAM FLS UA	1.78			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	64	M	OTH-Y		028	000	02
																								N-RES				
																02	NONE 0	STRGHT										
																	PRVTE	N S									000	00
																	PSNGR CAR		01	DRVR	NONE	60	M	OR-Y		000	000	00
																								OR<25				
00654	N	N	N		08/01/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										02
STATE					Mon		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									088	00
					3P	KLAM FLS UA	1.78			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000	00
																								OR>25				
																02	NONE	TURN-L										
																	PRVTE	W N									015	00
																	PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		028	000	02
																								OR<25				
00722	N	N	N	N	09/07/2007	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT										02
STATE					Fri		0	0		CN		STOP SIGN	N	DRY	TURN		PRVTE	N S									000	00
					7A	KLAM FLS UA	1.78			03	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	INJC	17	M	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	15	M			000	000	00
																02	NONE 0	TURN-L										
																	PRVTE	W N									015	00
																	PSNGR CAR		01	DRVR	INJC	17	F	OR-Y		028	000	02
																								OR<25				
																			02	PSNG	INJB	16	F			000	000	00
																			03	PSNG	INJB	13	F			000	000	00
00761	N	N	N	N	09/22/2007	KLAMATH	1	14		INTER	3-LEG	N	N	CLD	ANGL-OTH	01	NONE 0	STRGHT										02
STATE					Sat		0	0		CN		FLASHBCN-A	N	DRY	TURN		PRVTE	N S									000	00
					2P	KLAM FLS UA	1.78			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	37	M	OR-Y		000	000	00
																								OR<25				
																			02	PSNG	INJC	31	M			000	000	00

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	TURN-L W N						OTH-Y N-RES		018	015 000		00 02
00750 STATE	N	N	N			09/19/2005 Mon 2P	KLAMATH KLAM FLS UA	1 14 0 0 1.78			INTER CN 04	CROSS 0	N STOP SIGN	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	46	F	OR-Y OR<25		000	000	010	02 00 00
																	02	NONE 0 PRVTE MTRCYCLE	TURN-L W N	01	DRVR	NONE	64	M	OR-Y OR>25		028	015 000	010	00 02
00184 NO RPT	N	N	N			02/06/2008 Wed 8P	KLAMATH KLAM FLS UA	1 14 0 0 1.78			INTER CN 04	3-LEG 0	N STOP SIGN	N N N	CLD WET DLIT	ANGL-OTH TURN PDO	01	NONE PRVTE PSNGR CAR	TURN-L W N	01	DRVR	NONE	00	F	UNK UNK		028	015 000		02 00 02
																	02	NONE PUBLC SCHL BUS	STRGHT S N	01	DRVR	NONE	66	M	OR-Y OR>25		000	000 000		00 00

424 SOUTH KLAMATH FALLS

OR 39 (Hwy 050) @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00043	N	N	N			01/13/2009	KLAMATH	1	14		INTER	3-LEG	N	N	FOG	S-1STOP	01	NONE	STRGHT										07
NONE						Tue		0	0		W		STOP SIGN	N	ICE	REAR		PRVTE	W E									001	00
						7A	KLAM FLS UA	5.97			06	0		N	DAWN	INJ		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y OR<25		026	000	07
																	02	NONE	STOP										
																		PRVTE	W E									011	00
																		PSNGR CAR		01	DRVR	INJC	40	F	OR-Y OR<25		000	000	00
																				02	PSNG	INJC	14	F			000	000	00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Shasta Way
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	2	2	4	0	3	0	4	0	3	1	4	0	0
2009 TOTAL	0	2	2	4	0	3	0	4	0	3	1	4	0	0
YEAR: 2008														
FIXED / OTHER OBJECT	0	1	0	1	0	2	0	0	1	1	0	1	0	1
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2008 TOTAL	0	2	0	2	0	4	0	1	1	2	0	2	0	1
YEAR: 2007														
ANGLE	0	1	1	2	0	2	0	1	1	1	1	2	0	0
REAR-END	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2007 TOTAL	0	1	2	3	0	2	0	2	1	1	2	3	0	0
YEAR: 2006														
REAR-END	0	1	2	3	0	2	0	2	1	3	0	3	0	0
2006 TOTAL	0	1	2	3	0	2	0	2	1	3	0	3	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	1	2	0	2	0	1	1	1	1	2	0	0
2005 TOTAL	0	1	1	2	0	2	0	1	1	1	1	2	0	0
FINAL TOTAL	0	7	7	14	0	13	0	10	4	10	4	14	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Shasta Way
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00637	N	N	N		08/30/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-OTHER	01	NONE	TURN-L											08
NONE					Tue		0	0		N		TRF SIGNAL	N	DRY	TURN		PRVTE	W N										000		00
					6P	KLAM FLS UA	- 2.89			05	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	83	F	OR-Y OR<25		007	000		08
																02	NONE	TURN-R											
																	PRVTE	E N									000		00
																	PSNGR CAR		01	DRVR	NONE	56	F	OR-Y OR<25		000	000		00
00958	Y	N	N		12/23/2008	KLAMATH	1	14		INTER	CROSS	N	Y	SNOW	FIX OBJ	01	NONE	TURN-L											055	01,08
NO RPT					Tue		0	0		N		TRF SIGNAL	N	ICE	FIX		PRVTE	W N									001	055	00
					11A	KLAM FLS UA	- 2.89			05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	18	M	OR-Y OR<25		047,001,081	017		01,08
																			02	PSNG	INJB	16	F			000	000		00
00763	Y	N	N	N	11/22/2008	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE	TURN-L											092	01,26
STATE					Sat		0	0		N		TRF SIGNAL	N	DRY	TURN		PRVTE	W N									007	092	26
					3P	KLAM FLS UA	- 2.89			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR>25		047,080	017		01
																			02	PSNG	INJC	23	M			000	000		00
																02	NONE	STOP											
																	PRVTE	N S									012		00
																	PSNGR CAR		01	DRVR	INJC	23	F	OR-Y OR<25		000	000		00
																			02	PSNG	NO<5	03	F			000	000		00
																			03	PSNG	NO<5	01	F			000	000		00
00249	N	Y	N	N	04/26/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											013	10
STATE					Sun		0	0		N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000		00
					10P	KLAM FLS UA	- 2.89			06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	42	M	OR-Y OR<25		026	038		10
																02	NONE	STOP											
																	PRVTE	N S									011	013	00
																	PSNGR CAR		01	DRVR	INJC	70	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	75	M			000	000		00
																03	NONE	STOP											
																	PRVTE	N S									011		00
																	PSNGR CAR		01	DRVR	NONE	00	U	UNK UNK		000	000		00
00596	N	N	N	N	08/27/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT												27
STATE					Thu		0	0		N		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									000		00
					11A	KLAM FLS UA	- 2.89			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	85	M	OR-Y OR<25		016,026	038		27
																02	NONE 1	STOP											
																	PRVTE	NW SE									011		00
																	PSNGR CAR		01	DRVR	NONE	16	M	OR-Y OR<25		000	000		00

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Shasta Way
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00929	Y	N	N	N	N	11/30/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT									01
COUNTY						Fri		0 0			E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000	00
						10P	KLAM FLS UA	- 2.89			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		047,042	000	01
																	02	NONE 0	STRGHT									006	00
																		PRVTE	E W										
																		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y OR<25		000	000	00
00654	N	N	N	N	N	09/16/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07
STATE						Wed		0 0			E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000	00
						6P	KLAM FLS UA	- 2.89			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		043,026	026	07
																	02	NONE 0	STRGHT									006	00
																		PRVTE	E W										
																		MTRCYCLE		01	DRVR	INJB	57	M	OR-Y OR<25		000	000	00
00613	N	N	N			07/26/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									27,07
						Wed		0 0			SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE NW									000	00
						2P	KLAM FLS UA	- 2.89			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y OR<25		016,026	038	27,07
																	02	NONE 0	STOP									011	00
																		PRVTE	SE NW										
																		PSNGR CAR		01	DRVR	NONE	79	F	OR-Y OR<25		000	000	00
00410	N	N	N			05/13/2005	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	O-1TURN	01	NONE 0	STRGHT									04
STATE						Fri		0 0			CN		TRF SIGNAL	N	WET	TURN		PRVTE	NW SE									000	00
						9P	KLAM FLS UA	- 2.89			01	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJB	20	M	OR-Y OR<25		020	000	04
																	02	NONE 0	TURN-L									000	00
																		PRVTE	SW W										
																		PSNGR CAR		01	DRVR	INJB	20	M	OR-Y OR<25		000	000	00
00745	N	N	N			09/28/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT									07,10
STATE						Thu		0 0			CN		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000	00
						5P	KLAM FLS UA	- 2.89			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y OR<25		043,026	000	07,10
																	02	NONE 0	STOP									011	00
																		PRVTE	E W										
																		PSNGR CAR		01	DRVR	NONE	41	F	OR-Y OR<25		009	000	10
00041	N	N	N	N	N	01/08/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT									04
STATE						Mon		0 0			CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	SE NW									000	00
						6P	KLAM FLS UA	- 2.89			02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	82	M	OR-Y OR<25		000	000	00

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Shasta Way
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / LIGHT	SURF / CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																				02	PSNG	INJC	83	F			000	000		00
																	02	NONE 0 PRVTE	STRGHT E W									000		00
																		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		016,020	000		04
00621 NO RPT	N	N	N			08/19/2007 Sun 7A	KLAMATH KLAM FLS UA	1 14 0 0 - 2.89			INTER CN 03	CROSS 0	N TRF SIGNAL	N N N	RAIN WET DAY	ANGL-OTH ANGL PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT N S	01	DRVR	NONE	45	M	OR-Y OR<25		020	001 000	068 068	04 00 04
																	02	NONE 0 PRVTE	STRGHT W E									000		00
																		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

OR 39 (Hwy 050) @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00825	N	N	N			10/5/2006	0.94	SHASTA	WY	INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE 0	STRGHT											07
						Thu				W		TRF SIGNAL	N	WET	REAR		PRVTE	W E										000	00
						8A				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	36	M	OR-Y OR<25		026	000		07
																02	NONE 0	STOP											
																	PRVTE	W E										011	00
																	PSNGR CAR		01	DRVR	INJC	55	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	55	F			000	000		00
00487	N	N	N			7/23/2009	0.94	SHASTA	WY	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NONE						Thu				W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E										000	00
						6P				06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		014,026	000		07
																02	NONE	STOP											
																	PRVTE	W E										011	00
																	PSNGR CAR		01	DRVR	NONE	43	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 (Hwy 050) @ Washburn Way / Foothills Boulevard

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	0	1	1	0	0	0	0	1	0	1	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	0
YEAR: 2008														
REAR-END	0	2	0	2	0	2	0	1	1	0	2	2	0	0
2008 TOTAL	0	2	0	2	0	2	0	1	1	0	2	2	0	0
YEAR: 2007														
TURNING MOVEMENTS	0	2	0	2	0	3	0	2	0	2	0	2	0	0
2007 TOTAL	0	2	0	2	0	3	0	2	0	2	0	2	0	0
YEAR: 2006														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2006 TOTAL	0	0	2	2	0	0	0	1	1	2	0	2	0	0
FINAL TOTAL	0	4	3	7	0	5	0	4	3	4	3	7	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Washburn Way / Foothills Boulevard
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	VEH TYP	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00546	N	N	N	N	N	07/13/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-R										013	33,04
CITY						Fri	KLAMATH FALLS	0 0		CRATER LK PKY	S		TRF SIGNAL	N	DRY	TURN			PRVTE	W S								000		00
						3P	KLAM FLS UA	- 3.93		WASHBURN WAY	05	0		N	DAY	INJ			PSNGR CAR		01	DRVR	NONE	68	F	OR-Y OR<25		051,020	000		33,04
																	02	NONE	0	STRGHT									000	013	00
																			PRVTE	N S											
																			PSNGR CAR		01	DRVR	INJC	52	F	OR-Y OR<25		000	000		00
																	03	NONE	0	STOP									012		00
																			PRVTE	S N											
																			PSNGR CAR		01	DRVR	INJC	51	M	OR-Y OR<25		000	000		00
00146	Y	N	N			01/31/2006	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE	0	STRGHT											07,01
						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	W		TRF SIGNAL	N	ICE	REAR			PRVTE	W E								001		00
						4P	KLAM FLS UA	- 3.93		WASHBURN WAY	06	0		N	DAY	PDO			PSNGR CAR		01	DRVR	NONE	38	F	OR-Y OR<25		026	017		07,01
																	02	NONE	0	STOP									011		00
																			PRVTE	W E											
																			PSNGR CAR		01	DRVR	NONE	51	M	OR-Y OR<25		000	000		00
00326	N	N	N			04/29/2008	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE		STRGHT											07,27
NO RPT						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	W		TRF SIGNAL	N	DRY	REAR			PRVTE	W E								000		00
						8P	KLAM FLS UA	- 3.93		WASHBURN WAY	06	0		N	DUSK	INJ			PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		026	038		07,27
																	02	NONE		STOP									011		00
																			PRVTE	W E											
																			PSNGR CAR		01	DRVR	INJC	55	M	OR-Y OR<25		000	000		00
00849	N	N	N			12/14/2008	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE		STRGHT											07
NO RPT						Sun	KLAMATH FALLS	0 0		CRATER LK PKY	W		L-GRN-SIG	N	SNO	REAR			PRVTE	W E								000		00
						8P	KLAM FLS UA	- 3.93		WASHBURN WAY	06	0		N	DLIT	INJ			PSNGR CAR		01	DRVR	NONE	43	F	OR-Y OR<25		014,026	000		07
																	02	NONE		STOP									012		00
																			PRVTE	W E											
																			PSNGR CAR		01	DRVR	INJC	43	M	OR-Y OR<25		000	000		00
00105	N	N	N	N	N	02/10/2009	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	ANGL-OTH	01	NONE		STRGHT											04
CITY						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	CN		TRF SIGNAL	N	ICE	ANGL			PRVTE	E W								001		00
						8P	KLAM FLS UA	- 3.93		FOOTHILL BLVD	01	0		N	DLIT	PDO			PSNGR CAR		01	DRVR	NONE	20	M	OR-Y OR<25		020	000		04
																	02	NONE		STRGHT									000		00
																			PRVTE	N S											
																			PSNGR CAR		01	DRVR	NONE	35	M	OR-Y OR<25		000	000		00

050 KLAMATH FALLS-MALIN

OR 39 (Hwy 050) @ Washburn Way / Foothills Boulevard
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	WORK	SCHL	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT MLG / MILEPNT	FC TYP	CONN # FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00428	N	N	N			05/12/2006	KLAMATH	1 14			INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	TURN-L										02
NO RPT						Fri	KLAMATH FALLS	0 0		CRATER LK PKY	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E S									000	00
						7P	KLAM FLS UA	- 3.93		WASHBURN WAY	03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	78	F	OR-Y OR<25		004,028	000	02
																	02	NONE 0	STRGHT										
																		PRVTE	W E									000	00
																		PSNGR CAR		01	DRVR	NONE	26	F	OR-Y OR<25		000	000	00
00371	N	N	N	N	N	05/29/2007	KLAMATH	1 14			INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L										04
CITY						Tue	KLAMATH FALLS	0 0		CRATER LK PKY	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S W									000	00
						5P	KLAM FLS UA	- 3.93		WASHBURN WAY	04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	18	F	OTH-Y N-RES		020	000	04
																	02	NONE 0	TURN-L										
																		PRVTE	W N									000	00
																		PSNGR CAR		01	DRVR	INJB	42	M	OR-Y OR<25		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 39 @ OR 140

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	1	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0
FINAL TOTAL	0	1	1	2	0	2	1	2	0	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW OR 39 @ OR 140
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT MLG / MILEPNT	FC TYP	CONN # FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL TRAF- CNTL	OFFRD RNDBT / DRVWY	WTHR / LIGHT	SURF	CRASH TYP COLL TYP SVRTY	V#	SPCL USE TRLR QTY OWNER VEH TYPE	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00370	N	N	N	N	N	05/12/2008	KLAMATH	1 14			INTER	3-LEG	N	N	CLR	S-OTHER	01	NONE	TURN-L												07
STATE						Mon		0 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N E										000		00
						1P	KLAM FLS UA	5.54			01	1		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	39	M	OR-Y		043		000		07
																									OR<25						
																		02	NONE	STOP											
																			PRVTE	N E									023		00
																			PSNGR CAR		01	DRVR	INJC	48	M	OR-Y		000	000		00
																										OR<25					
00464	N	N	N			06/20/2005	KLAMATH	1 14			INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT												04
STATE						Mon		0 0			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S N										000		00
						7A	KLAM FLS UA	5.54			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		020,016		038		04
																										OR<25					
																		02	LOG 1	TURN-L											
																			PRVTE	E S									000		00
																			SEMI TOW		01	DRVR	NONE	71	M	OR-Y		000	000		00
																										OR>25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

OR 66 (Hwy 021) @ OR 140 (Hwy 270)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
NON-COLLISION	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2008														
REAR-END	0	1	1	2	0	1	0	1	1	2	0	2	0	0
2008 TOTAL	0	1	1	2	0	1	0	1	1	2	0	2	0	0
YEAR: 2007														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2006														
REAR-END	0	0	1	1	0	0	1	1	0	1	0	1	0	0
2006 TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	0	1	0	3	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	3	0	1	0	1	0	1	0	0
FINAL TOTAL	0	2	4	6	0	4	1	5	1	6	0	6	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

021 GREEN SPRINGS

OR 66 (Hwy 021) @ OR 140 (Hwy 270)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00345	N	N	N			04/09/2007	KLAMATH	1 / 0	14 / 0		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE / 0 / PRVTE	STRGHT / E / W						OR-Y			000		07
STATE						Mon					NE		TRF SIGNAL	N	DRY	REAR		PRVTE	E W											00
						4P	KLAM FLS UA	58.86			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR<25		043,026	000		07
																	02	NONE / 0 / PRVTE	STOP / E W									011		00
																		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y / OR<25		000	000		00
00440	Y	N	N	N	N	07/06/2009	KLAMATH	1 / 0	14 / 0		INTER	3-LEG	N	N	CLR	OVERTURN	01	NONE / 1 / PRVTE	TURN-R / E N											021,022	32,01
STATE						Mon					E		TRF SIGNAL	N	DRY	NCOL		PRVTE										088	021,022	00
						3P	KLAM FLS UA	58.86			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	24	M	OR-Y / OR<25		085,047,052	017		32,01
00666	N	N	N			08/31/2006	KLAMATH	1 / 0	14 / 0		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE / 0 / PRVTE	STRGHT / W E												27,07
STATE						Thu					W		TRF SIGNAL	N	DRY	REAR		PRVTE										000		00
						9A	KLAM FLS UA	58.86			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y / OR<25		043,016,026	000		27,07
																	02	NONE / 1 / PRVTE	STRGHT / W E									006		00
																		SEMI TOW		01	DRVR	NONE	47	M	OR-Y / OR>25		000	000		00
00556	N	N	N			08/21/2008	KLAMATH	1 / 0	14 / 0		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT / W E												07
NO RPT						Thu					W		TRF SIGNAL	N	DRY	REAR		PRVTE										000		00
						6A	KLAM FLS UA	58.86			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	37	F	OR-Y / OR<25		026	026		07
																	02	NONE	STOP / W E									011		00
																		PRVTE / PSNGR CAR		01	DRVR	INJC	17	F	OR-Y / OR<25		000	000		00
00608	N	N	N			08/20/2005	KLAMATH	1 / 0	14 / 0		INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE	TURN-L / W N												08
STATE						Sat					CN		TRF SIGNAL	N	DRY	TURN		PRVTE										000		00
						11A	KLAM FLS UA	58.86			02	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	41	F	OTH-Y / N-RES		004	000		08
																	02	NONE	STRGHT / E W									000		00
																		PSNGR CAR		01	DRVR	INJB	68	F	OR-Y / OR<25		000	000		00
																				02	PSNG	INJB	73	M			000	000		00

270 LAKE OF THE WOODS
OR 66 (Hwy 021) @ OR 140 (Hwy 270)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / TYP / MILEPNT	FC	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00938	Y	N	N			12/19/2008	KLAMATH	1 14			INTER	3-LEG	N	N	SNOW	S-1STOP	01	NONE	STRGHT										01
NONE						Fri		0 0			W		TRF SIGNAL	N	ICE	REAR		PRVTE	W E									001	00
						3P	KLAM FLS UA	68.76			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		047,026	017	01
																	02	NONE	STOP										
																		PRVTE	W E									012	00
																		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y OR<25		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Orindale Road @ Balsam Drive

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Orindale Road @ OR 140 (Hwy 270)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2007 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2006														
TURNING MOVEMENTS	0	1	0	1	0	3	1	0	1	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	3	1	0	1	1	0	1	0	0
FINAL TOTAL	0	2	0	2	0	4	1	1	1	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

270 LAKE OF THE WOODS

Orindale Road @ OR 140 (Hwy 270)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00264	Y	N	N			03/03/2006	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	ANGL-STP	01	NONE 0	TURN-R										08,01
STATE						Fri		0	0		N		STOP SIGN	N	ICE	TURN		PRVTE	E N									001	00
						12P	KLAM FLS UA	67.22			06	0		N	DAY	INJ		SEMI TOW		01	DRVR	INJC	23	M	OTH-Y OR<25		001,080,007	000	08,01
																				02	PSNG	INJC	19	M			000	000	00
																	02	NONE 0	STOP										
																		PRVTE	N S									011	00
																		PSNGR CAR		01	DRVR	INJC	57	M	OR-Y OR<25		000	000	00
00336	N	N	N			04/04/2007	KLAMATH	1	14		INTER	3-LEG	N	N	CLD	S-STRGHT	01	NONE 0	STRGHT										07
STATE						Wed		0	0		E		UNKNOWN	N	DRY	REAR		PRVTE	E W									000	00
						8A	KLAM FLS UA	67.22			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	27	F	OTH-Y N-RES		043,042	000	07
																	02	NONE 0	TURN-L										
																		PRVTE	E S									006	00
																		PSNGR CAR		01	DRVR	NONE	37	M	OR-Y OR>25		000	000	00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Pacific Terrace @ OR 39 (Hwy 050)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Patterson Street @ OR 39 (Hwy 050) / OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2008														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	1	2	0	1	0	2	0	2	0	2	0	0
2008 TOTAL	0	2	1	3	0	2	0	3	0	3	0	3	0	0
YEAR: 2006														
ANGLE	0	0	3	3	0	0	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2006 TOTAL	0	0	5	5	0	0	0	4	1	5	0	5	0	0
YEAR: 2005														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	2	3	0	1	0	3	0	3	0	3	0	0
FINAL TOTAL	0	3	9	12	0	3	0	10	2	12	0	12	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Patterson Street @ OR 39 (Hwy 050) / OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	VEH TYPE	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00974	N	N	N			12/11/2009	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	S-1STOP	01	NONE		STRGHT											07
NO RPT						Fri		0	0		E		TRF SIGNAL	N	ICE	REAR		PRVTE		E W									001		00
						1P	KLAM FLS UA	4.50			06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	M	OR-Y OR>25		026	000		07
																	02	NONE		STOP											
																		PRVTE		E W									011		00
																		PSNGR CAR			01	DRVR	NONE	54	F	OR-Y OR<25		000	000		00
																					02	PSNG	NO<5	01	M			000	000		00
00222	N	N	N			02/14/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-OTHER	01	NONE	0	TURN-R											08
NO RPT						Tue		0	0		W		TRF SIGNAL	N	DRY	TURN		PRVTE		N W									088		00
						11A	KLAM FLS UA	4.50			05	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	76	M	OTH-Y N-RES		001,007	000		08
																	02	NONE	0	TURN-L											
																		PRVTE		S W									000		00
																		PSNGR CAR			01	DRVR	NONE	18	F	OR-Y OR>25		000	000		00
00299	N	N	N			04/09/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	0	STRGHT											02
STATE						Sat		0	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE		E W									000	013	00
						11A	KLAM FLS UA	4.50			02	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	47	M	OR-Y OR<25		000	000		00
																	02	NONE	0	TURN-L											
																		PRVTE		W N									000		00
																		PSNGR CAR			01	DRVR	NONE	78	F	OR-Y OR<25		004,028	000		02
																	03	NONE	0	STRGHT											
																		PRVTE		E W									022		00
																		PSNGR CAR			01	DRVR	NONE	32	F	OR-Y OR<25		000	000		00
00501	N	N	N			06/20/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT											04
NO RPT						Tue		0	0		CN		TRF SIGNAL	N	DRY	ANGL		PRVTE		S N									000		00
						6P	KLAM FLS UA	4.50			02	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	32	F	OR-Y OR<25		000	000		00
																					02	PSNG	NO<5	01	F			000	000		00
																					03	PSNG	NO<5	01	F			000	000		00
																	02	NONE	0	STRGHT											
																		PRVTE		E W									000		00
																		PSNGR CAR			01	DRVR	NONE	00	M	OTH-Y N-RES		020	000		04
01030	N	N	N	N	N	12/01/2006	KLAMATH	1	14		INTER	CROSS	N	N	FOG	ANGL-OTH	01	NONE	0	STRGHT											04
STATE						Fri		0	0		CN		TRF SIGNAL	N	ICE	ANGL		PRVTE		W E									000		00
						7A	KLAM FLS UA	4.50			03	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	18	F	OR-Y OR<25		020	000		04

020 KLAMATH FALLS-LAKEVIEW

Patterson Street @ OR 39 (Hwy 050) / OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	DALCS	RSUGH	WCORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / LIGHT	SURF	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT N S						OR-Y OR<25		000	00
																				01	DRVR	NONE	40	F			000	000	00
00518	N N N N N				07/01/2008 Tue 6A	KLAMATH KLAM FLS UA	1 14 0 0 4.50			INTER CN 03	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE PRVTE PSNGR CAR	TURN-L N E								OR-Y OR<25		000	04 00 00
																	02	NONE PRVTE PSNGR CAR	STRGHT W E						OR-Y OR<25		000	00
																				01	DRVR	NONE	80	M			020	000	04
00130	N N N				02/17/2005 Thu 1P	KLAMATH KLAM FLS UA	1 14 0 0 4.50			INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL PDO	01	NONE 0 PRVTE PSNGR CAR	TURN-L N E								OR-Y OR<25		000	02 00 02
COUNTY																	02	NONE 0 PRVTE PSNGR CAR	STRGHT S N						OR-Y OR<25		000	00
																				01	DRVR	NONE	58	F			000	000	00
00573	N N N				07/07/2006 Fri 6P	KLAMATH KLAM FLS UA	1 14 0 0 4.50			INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N								OR-Y OR<25		000	04 00 00
																				02	PSNG	NO<5	01	M			000	000	00
																	02	NONE 0 PRVTE PSNGR CAR	STRGHT W E						OR-Y OR<25		000	00
																				01	DRVR	NONE	35	F			020	000	04
00741	N N N				09/26/2006 Tue 7A	KLAMATH KLAM FLS UA	1 14 0 0 4.50			INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH TURN PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT W E								OR-Y OR<25		000	04 00 04
NO RPT																	02	NONE 0 PRVTE PSNGR CAR	TURN-L N E						OR-Y OR<25		000	00
																				01	DRVR	NONE	40	M			000	000	00
00100	N N N N N				01/18/2008 Fri 7A	KLAMATH KLAM FLS UA	1 14 0 0 4.50			INTER CN 04	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	O-1TURN TURN INJ	01	NONE PRVTE PSNGR CAR	TURN-L N E								OR-Y OR<25		000	04 00 04
STATE																				01	DRVR	NONE	37	F			020	000	04

020 KLAMATH FALLS-LAKEVIEW

Patterson Street @ OR 39 (Hwy 050) / OR 140 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCOHL	DRUGS	SCHL BUS	WORK ZN	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	02	NONE / / PRVTE / PSNGR CAR	STRGHT / S / N						OR-Y / OR<25				000	00
																				01	DRVR	INJC	35	F			000	000	000	00
00200	N	N	N	N	N	02/15/2008	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE / / PRVTE / PSNGR CAR	STRGHT / S / N												04
STATE						Fri		0	0		CN		TRF SIGNAL	N	DRY	ANGL												000	00
						7A	KLAM FLS UA	4.50			04	0		N	DAY	INJ				01	DRVR	INJC	24	F	OR-Y / OR<25		000	000	000	00
																	02	NONE / / PRVTE / PSNGR CAR	STRGHT / W / E										000	00
																				01	DRVR	NONE	55	F	OR-Y / OR<25		020	000	000	04
00137	N	N	N			02/24/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE / 0 / PRVTE / PSNGR CAR	STRGHT / W / E												07
STATE						Thu		0	0		W		TRF SIGNAL	N	DRY	REAR												000	00
						7A	KLAM FLS UA	4.51			06	0		N	DAY	INJ				01	DRVR	NONE	59	F	OR-Y / OR<25		043,026	000	000	07
																	02	NONE / 0 / PRVTE / PSNGR CAR	STOP / W / E										011	00
																				01	DRVR	INJC	51	F	OR-Y / OR<25		000	000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Patterson Street @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00212	N	N	N	N	N	3/23/2007	2.51	SHASTA	WY	INTER	CROSS	N	N	CLR	O-OTHER	01	NONE 1	BACK											10
NO RPT						Fri				CN		STOP SIGN	N	DRY	BACK		PRVTE	E W										088	00
						8A				03	0		N	DAWN	PDO		SEMI TOW		01	DRVR	NONE	59	M	OR-Y		011	000		10
																									OR<25				
																02	NONE 0	STRGHT											
																	PRVTE	W E										000	00
																	PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		000	000		00
																									OR<25				

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Portland Street @ OR 39 (Hwy 050)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
PEDESTRIAN	0	1	0	1	0	1	0	0	1	0	1	1	0	0
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2008 TOTAL	0	1	1	2	0	1	0	0	2	1	1	2	0	0
YEAR: 2007														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	2	0	2	0	2	0	2	0	2	0	2	0	0
2007 TOTAL	0	3	0	3	0	4	0	3	0	3	0	3	0	0
YEAR: 2006														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
REAR-END	0	2	0	2	0	2	0	2	0	1	1	2	0	0
2006 TOTAL	0	2	1	3	0	2	0	2	1	2	1	3	0	0
YEAR: 2005														
ANGLE	0	0	1	1	0	0	0	1	0	1	0	1	0	0
REAR-END	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2005 TOTAL	0	0	2	2	0	0	0	1	1	2	0	2	0	0
FINAL TOTAL	0	6	4	10	0	7	0	6	4	8	2	10	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

050 KLAMATH FALLS-MALIN

Portland Street @ OR 39 (Hwy 050)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00400	N	N	N			05/04/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											07,27
NO RPT						Wed	KLAMATH FALLS	0 0		K FALLS-MALIN HY	NW		TRF SIGNAL	N	WET	REAR		PRVTE	NW SE									000		00
						4P	KLAM FLS UA	- 5.22		PORTLAND ST	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y OR>25		026,016	000		07,27
																	02	NONE 0	STOP											
																		PRVTE	NW SE									011		00
																		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		000	000		00
89897	N	N	N			08/30/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											004	07
CITY						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	NW		STOP SIGN	N	DRY	REAR		PRVTE	NW SE									000		00
						5P	KLAM FLS UA	- 5.22		PORTLAND ST	06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	20	M	OTH-Y N-RES		043,026	000		07
																	02	NONE 0	STOP											
																		PRVTE	NW SE									011	004	00
																		PSNGR CAR		01	DRVR	INJB	49	F	OR-Y OR<25		000	000		00
00840	N	N	N	N	N	10/08/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											013,004	07
CITY						Mon	KLAMATH FALLS	0 0		CRATER LK PKY	NW		NONE	N	DRY	REAR		PRVTE	NW SE									000		00
						8A	KLAM FLS UA	- 5.22		PORTLAND ST	06	6		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		043	000		07
																	02	NONE 0	STOP											
																		PRVTE	NW SE									011	013	00
																		PSNGR CAR		01	DRVR	NONE	15	M	OR-Y OR<25		000	000		00
																				02	PSNG	INJC	07	F			000	000		00
																	03	NONE 0	STOP											
																		PRVTE	NW SE									011	004	00
																		PSNGR CAR		01	DRVR	INJC	53	F	OR-Y OR<25		000	000		00
00017	Y	N	N	Y	N	01/09/2008	KLAMATH	1	14		INTER	CROSS	N	N	SNOW	PED	01	NONE	STRGHT												01,19
CITY						Wed	KLAMATH FALLS	0 0		CRATER LK PKY	NW		FLASHBCN-A	N	SNO	PED		PRVTE	NW SE									001		00
						8P	KLAM FLS UA	- 5.22		PORTLAND ST	06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y OR<25		047	000		01
																			STRGHT NE SW	01	PED	INJB	39	M		01	000	035		19
00698	N	N	N	Y	N	10/02/2008	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	S-1STOP	01	NONE	STRGHT											013	07,32
CITY						Thu	KLAMATH FALLS	0 0		CRATER LK PKY	NW		FLASHBCN-A	N	WET	REAR		PRVTE	NW SE									001	013	00
						4P	KLAM FLS UA	- 5.22		PORTLAND ST	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	31	F	OR-Y OR<25		043,052	000		07,32
																	02	NONE	STOP											
																		PRVTE	NW SE									011		00
																		PSNGR CAR		01	DRVR	NONE	36	F	OR-Y OR<25		000	000		00

050 KLAMATH FALLS-MALIN

Portland Street @ OR 39 (Hwy 050)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	DRUG	ALC	SCH	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																	03	NONE / PRVTE / PSNGR CAR	STOP / NW SE	01	DRVR	NONE	59	F	OR-Y / OR<25		000	022		00
																												000		00
00917	N	N	N			11/27/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE / 0 / PRVTE	TURN-R / NE NW										015		02
NONE						Tue	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	DRY	TURN		PRVTE											015		00
						3P	KLAM FLS UA	- 5.22		PORTLAND ST	01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	00	F	UNK / UNK		028	000		02
																	02	NONE / 0 / PRVTE	STRGHT / SE NW										000		00
																		PSNGR CAR		01	DRVR	INJC	36	F	UNK / OR<25		000	000		00
00959	N	N	N			11/03/2006	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE / 0 / PRVTE	STRGHT / SE NW										000		02
CITY						Fri	KLAMATH FALLS	0	0	CRATER LK PKY	CN		FLASHBCN-A	N	WET	ANGL		PRVTE											000		00
						9A	KLAM FLS UA	- 5.22		01971 UNKNOWN NAME	02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y / OR<25		000	000		00
																	02	NONE / 0 / PRVTE	STRGHT / SW NE										015		00
																		PSNGR CAR		01	DRVR	NONE	19	F	OR-Y / OR<25		028	000		02
00458	N	N	N			06/02/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE / 0 / PRVTE	TURN-L / NE SE										000		10
CITY						Sat	KLAMATH FALLS	0	0	CRATER LK PKY	CN		STOP SIGN	N	DRY	TURN		PRVTE											000		00
						12P	KLAM FLS UA	- 5.22		PORTLAND ST	03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	53	M	OR-Y / OR<25		000	000		00
																	02	NONE / 0 / PRVTE	STRGHT / SW NE										000		00
																		PSNGR CAR		01	DRVR	INJC	65	F	OR-Y / OR<25		010	000		10
00125	N	N	N			02/21/2005	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE / 0 / PRVTE	STRGHT / SW NE										015		02
CITY						Mon	KLAMATH FALLS	0	0	K FALLS-MALIN HY	CN		STOP SIGN	N	DRY	ANGL		PRVTE											015		00
						12P	KLAM FLS UA	- 5.22		PORTLAND ST	04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y / OR<25		028	000		02
																	02	NONE / 0 / PRVTE	STRGHT / NW SE										000		00
																		PSNGR CAR		01	DRVR	NONE	21	F	OR-Y / OR>25		000	000		00
01020	N	N	N			12/05/2006	KLAMATH	1	14		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE / 0 / PRVTE	STRGHT / NW SE										000		07
						Tue	KLAMATH FALLS	0	0	CRATER LK PKY	CN		UNKNOWN	N	DRY	REAR		PRVTE											000		00
						7P	KLAM FLS UA	- 5.22		PORTLAND ST	04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y / OR<25		026	000		07
																	02	NONE / 0 / PRVTE	STOP / NW SE										011	004	00
																		PSNGR CAR		01	DRVR	INJC	26	F	OR-Y / OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Quarry Street @ Lakeport Boulevard

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	0	2	2	0	0	0	2	0	2	0	2	0	0
2008 TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0
FINAL TOTAL	0	0	2	2	0	0	0	2	0	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Quarry Street @ Lakeport Boulevard

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00198	N	N	N			02/14/2008	17	LAKEPORT BLVD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT											10,27
CITY						Thu	0	QUARRY ST	NW		NONE	N	DRY	REAR		PRVTE	NW SE									000		00
						7A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	48	M	OR-Y		016,026	026		10
																							OR<25					
															02	NONE	STOP											
																PRVTE	NW SE									012		00
																PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																							OR<25					
00396	Y	N	N	N	N	05/23/2008	17	LAKEPORT BLVD	INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE	STRGHT											01,07
CITY						Fri	0	QUARRY ST	NW		UNKNOWN	N	DRY	REAR		PRVTE	NW SE									000		00
						2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		047,043	000		01,07
																							UNK					
															02	NONE	TURN-L											
																PRVTE	NW N									000		00
																PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		000	000		00
																							OR<25					
															03	NONE	STRGHT											
																PRVTE	NW SE									022		00
																PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		043	000		07
																							OR<25					
															04	NONE	STRGHT											
																PRVTE	NW SE									022		00
																PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		043	000		07
																							OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Riverside Drive @ Green Springs Drive / Dover Avenue
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Riverside Drive @ Autumn Avenue
January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Riverside Drive @ Lindley Way
January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Summers Lane @ Clinton Avenue
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	1	2	0	1	0	2	0	2	0	2	0	0
YEAR: 2008														
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	1	0	1	0	0
2008 TOTAL	0	1	0	1	0	1	0	0	1	1	0	1	0	0
YEAR: 2007														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	0	1	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	0	1	1	0	0
FINAL TOTAL	0	2	2	4	0	2	0	3	1	3	1	4	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

KLAMATH COUNTY

Summers Lane @ Clinton Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	SWORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00203	N	N	N	N	N	3/16/2007	1.17	0854A		INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE 0	TURN-R											08,10
NO RPT						Fri				W		STOP SIGN	N	DRY	TURN		PRVTE	N W										088	00
						8P				06	0		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		001,007,026	000		08,10
																									UNK				
																02	NONE 0	STOP											
																	PRVTE	W E									011		00
																	PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		000	000		00
																									OR<25				
00595	N	N	N	N	N	8/27/2009	1.17	0854A		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											001	02
COUNTY						Thu				CN		STOP SIGN	N	DRY	ANGL		PRVTE	N S									000		00
						12P				03	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	40	M	OR-Y		000	000	001	00
																									OR<25				
																02	NONE 0	STRGHT											
																	PRVTE	W E									015		00
																	PSNGR CAR		01	DRVR	NONE	29	F	OR-Y		028	000		02
																									OR<25				
00731	N	N	N	N	N	10/10/2009	1.17	0854A		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L												02
COUNTY						Sat				CN		STOP SIGN	N	DRY	TURN		PRVTE	W N									015		00
						3P				03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		028	000		02
																									OR<25				
																02	NONE 0	STRGHT											
																	PRVTE	N S									000		00
																	PSNGR CAR		01	DRVR	NONE	72	M	OR-Y		000	000		00
																									OR<25				
00302	N	N	N	N	N	2/18/2008	1.17	0854A		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	STRGHT												02
COUNTY						Mon				CN		STOP SIGN	N	WET	TURN		PRVTE	W E									015		00
						3P				04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	43	M	OTH-Y		028	000		02
																									N-RES				
																02	NONE	TURN-L											
																	PRVTE	S W									000		00
																	PSNGR CAR		01	DRVR	INJC	24	F	OR-Y		000	000		00
																									OR<25				

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Summers Lane @ Hilyard Avenue
January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	4	0	1	0	1	0	1	0	0
2009 TOTAL	0	1	0	1	0	4	0	1	0	1	0	1	0	0
YEAR: 2007														
REAR-END	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2007 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
YEAR: 2006														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	3	0	3	0	7	0	3	0	3	0	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Summers Lane @ Hilyard Avenue

January 1, 2005 through December 31,2009

SER# / INVEST	SPEC	ALC	DRUGL	SCHL	SWORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00628	N	N	N			8/22/2006	1.89	0854A		INTER	CROSS	N	N	CLR	S-STRGHT	01	NONE 0	STRGHT											27,07
CITY						Tue				N		TRF SIGNAL	N	DRY	REAR		PRVTE	N S										000		00
						10A				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	37	F	OR-Y OR<25		043,016,042	000		27,07
																02	POLCE 0 PUBLC	TURN-R N W									006		00
																	PSNGR CAR		01	DRVR	INJC	45	M	OR-Y OR<25		000	000		00
00279	N	N	N			4/25/2007	2.26	0854A		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
						Wed	0			NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW										000		00
						3P				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y OR<25		026	000		07
																			02	PSNG	NO<5	04	M			000	000		00
																02	NONE 0 PRVTE	STOP NE SW									011		00
																	PSNGR CAR		01	DRVR	INJC	17	M	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	14	F			000	000		00
00651	N	N	N	Y	N	9/29/2009	2.26	0854A		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										013		10
COUNTY						Tue				S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N										000		00
						5P				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	17	M	OR-Y OR<25		026	017		10
																02	NONE 0 PRVTE	STOP S N									011	013	00
																	PSNGR CAR		01	DRVR	INJB	17	M	OR-Y OR<25		000	000		00
																03	NONE 0 PRVTE	STOP S N									011	013	00
																	PSNGR CAR		01	DRVR	INJC	26	M	OR-Y OR<25		000	000		00
																			02	PSNG	NO<5	01	F			000	000		00
																04	NONE 0 PRVTE	STOP S N									011	013	00
																	PSNGR CAR		01	DRVR	INJC	18	M	OR-Y OR<25		000	000		00
																05	NONE 0 PRVTE	STOP S N									011		00
																	PSNGR CAR		01	DRVR	NONE	17	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Summers Lane @ OR 39 (Hwy 020)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
ANGLE	0	1	1	2	0	1	0	1	1	1	1	2	0	0
REAR-END	0	3	0	3	0	6	0	3	0	3	0	3	0	0
2009 TOTAL	0	4	1	5	0	7	0	4	1	4	1	5	0	0
YEAR: 2008														
REAR-END	0	2	0	2	0	2	1	1	1	1	1	2	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2008 TOTAL	0	2	1	3	0	2	1	2	1	2	1	3	0	0
YEAR: 2007														
ANGLE	0	1	0	1	0	3	0	1	0	1	0	1	0	0
REAR-END	0	2	1	3	0	5	0	2	1	3	0	3	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	3	2	5	0	8	0	4	1	5	0	5	0	0
YEAR: 2006														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2006 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
YEAR: 2005														
SIDESWIPE - OVERTAKING	0	1	0	1	0	1	0	1	0	0	1	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	1	0	0	1	1	0	0
FINAL TOTAL	0	11	4	15	0	19	1	12	3	12	3	15	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW

Summers Lane @ OR 39 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	VEH TYPE	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00997	Y	N	N			12/26/2007	KLAMATH	1	16		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	0	STRGHT										124	01,07
STATE						Wed		0	0		UN		TRF SIGNAL	N	ICE	REAR		PRVTE		W E									000	124	00
						2P	KLAM FLS UA	3.22			06	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	19	F	OTH-Y N-RES		047,026	017		01,07
																	02	NONE	0	STOP									011		00
																		PRVTE		W E									000		00
																		PSNGR CAR			01	DRVR	INJC	23	M	OR-Y OR<25		000			
																					02	PSNG	INJC	18	M			000			
																					03	PSNG	INJC	19	F			000			
00018	N	N	N			01/23/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE	0	STRGHT											13
STATE						Sun		0	0		E		TRF SIGNAL	N	DRY	SS-O		PRVTE		E W									000		00
						6A	KLAM FLS UA	3.22			06	0		N	DARK	INJ		PSNGR CAR			01	DRVR	NONE	43	M	OR-Y OR>25		045	000	082	13
																	02	NONE	0	STOP									012		00
																		PRVTE		E W									000		00
																		PSNGR CAR			01	DRVR	INJC	56	M	OR-Y OR<25		000			
00685	N	N	N	N	N	08/10/2007	KLAMATH	1	16		INTER	3-LEG	N	N	CLR	S-STRGHT	01	NONE	0	STRGHT											07
STATE						Fri		0	0		E		TRF SIGNAL	N	DRY	REAR		PRVTE		E W									000		00
						10A	KLAM FLS UA	3.22			06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	19	F	OR-Y OR<25		043	000		07
																	02	NONE	0	STRGHT									006		00
																		PRVTE		E W									000		00
																		PSNGR CAR			01	DRVR	NONE	64	F	OR-Y OR<25		000			
																	03	NONE	0	STRGHT									022		00
																		PRVTE		E W									000		00
																		PSNGR CAR			01	DRVR	NONE	71	F	OR-Y OR<25		043			07
00034	Y	N	N	N	N	01/05/2008	KLAMATH	1	16		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE	1	STRGHT											01
STATE						Sat		0	0		E		TRF SIGNAL	N	ICE	REAR		PRVTE		E W									001		00
						5P	KLAM FLS UA	3.22			06	0		N	DLIT	INJ		SEMI TOW			01	DRVR	NONE	23	M	OR-Y OR<25		047,026	000		01
																	02	NONE		STOP									011		00
																		PRVTE		E W									000		00
																		PSNGR CAR			01	DRVR	INJC	44	F	OR-Y OR<25		000			
00561	N	N	N	N	N	08/24/2008	KLAMATH	1	16		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE		STRGHT											07
COUNTY						Sun		0	0		E		L-GRN-SIG	N	DRY	REAR		PRVTE		E W									000		00
						4P	KLAM FLS UA	3.22			06	0		Y	DAY	INJ		PSNGR CAR			01	DRVR	NONE	64	M	OR-Y OR<25		043	026		07

020 KLAMATH FALLS-LAKEVIEW

Summers Lane @ OR 39 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF-CNTL	OFFRD / RNDBT / DRVWY	WTHR / LIGHT	SURF	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
																		02	NONE / PRVTE / PSNGR CAR	STOP / E W	01	DRVR	INJB	60	F	OR-Y OR<25		000	012 / 000		00 / 00
00377 STATE	N	N	N	N	N	06/30/2009 / Tue / 12P	KLAMATH / KLAM FLS UA	1 / 0 / 3.22	16 / 0		INTER / E / 06	3-LEG / 0	N / TRF SIGNAL	N / N / Y	N / DRY / DAY	CLR / DRY / INJ	S-1STOP / REAR / INJ	01	NONE / PRVTE / PSNGR CAR	STRGHT / E W	01	DRVR	NONE	20	M	OR-Y OR<25		043	000		07 / 00 / 07
																		02	NONE / PRVTE / PSNGR CAR	STOP / E W	01	DRVR	INJC	44	M	OR-Y OR<25		000	011 / 000		00 / 00
00473 STATE	N	N	N	N	N	07/16/2009 / Thu / 4P	KLAMATH / KLAM FLS UA	1 / 0 / 3.22	16 / 0		INTER / E / 06	3-LEG / 0	N / TRF SIGNAL	N / N / N	N / DRY / DAY	CLR / DRY / DAY	BIKE / ANGL / INJ	01	NONE / PRVTE / PSNGR CAR	STRGHT / E W	01	DRVR	NONE	65	M	OR-Y OR<25		000	000	082	04,12 / 00 / 00
																				STRGHT / S N	01	BIKE	INJC	15	F		01	040	035		04,12
00122 STATE	N	N	N	N	N	02/06/2007 / Tue / 3P	KLAMATH / KLAM FLS UA	1 / 0 / 3.22	16 / 0		INTER / CN / 03	CROSS / 0	N / STOP SIGN	N / N / N	N / DRY / DAY	CLD / DRY / DAY	ANGL-OTH / ANGL / INJ	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / W E	01	DRVR	INJB	62	F	OTH-Y N-RES		000	000	093	02 / 00 / 00
																					02	PSNG	INJB	67	F			000	000		00
																		02	NONE 0 / PRVTE / PSNGR CAR	STRGHT / N S	01	DRVR	INJC	19	M	OR-Y OR<25		028	015 / 000	093	00 / 02
00436 COUNTY	N	N	N	N	N	05/14/2007 / Mon / 1P	KLAMATH / KLAM FLS UA	1 / 0 / 3.22	16 / 0		INTER / CN / 03	3-LEG / 0	N / L-GRN-SIG	N / N / N	N / DRY / DAY	CLR / DRY / DAY	O-1TURN / TURN / PDO	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / W E	01	DRVR	NONE	91	F	OR-Y OR<25		020	000		04 / 00 / 04
																		02	NONE 0 / PUBLC / PSNGR CAR	TURN-L / E S	01	DRVR	NONE	45	M	OR-Y OR<25		000	000 / 000		00 / 00
00917 STATE	N	N	N	N	N	11/22/2006 / Wed / 10A	KLAMATH / KLAM FLS UA	1 / 0 / 3.22	16 / 0		INTER / CN / 04	3-LEG / 0	N / TRF SIGNAL	N / N / N	N / DRY / DAY	CLR / DRY / DAY	ANGL-OTH / TURN / INJ	01	NONE 0 / PRVTE / PSNGR CAR	STRGHT / W E	01	DRVR	INJC	22	F	OR-Y OR<25		028	000		02 / 00 / 02
																		02	NONE 0 / PRVTE / PSNGR CAR	TURN-L / S W	01	DRVR	NONE	55	F	OR-Y OR<25		000	015 / 000		00 / 00

020 KLAMATH FALLS-LAKEVIEW

Summers Lane @ OR 39 (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT MLG / TYP / MILEPNT	CONN # FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00565	N	N	N	N	N	08/27/2008	KLAMATH	1 16		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										04
STATE						Wed		0 0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W E									000	00
						6P	KLAM FLS UA	3.22		04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	26	M	OR-Y OR<25		020,003	026	04
																02	NONE	TURN-L										
																	PRVTE	S W									000	00
																	PSNGR CAR		01	DRVR	NONE	59	F	OR-Y OR<25		000	000	00
00149	N	N	N			02/13/2009	KLAMATH	1 16		INTER	3-LEG	N	N	SNOW	ANGL-OTH	01	NONE	STRGHT										04
NONE						Fri		0 0		CN		TRF SIGNAL	N	SNO	ANGL		PRVTE	S N									018	00
						7A	KLAM FLS UA	3.22		04	0		Y	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y OR<25		020	000	04
																02	NONE	STRGHT										
																	PRVTE	W E									000	00
																	PSNGR CAR		01	DRVR	NONE	39	M	OR-Y OR<25		000	000	00
00703	N	N	N	N	N	10/28/2009	KLAMATH	1 16		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT										07
STATE						Wed		0 0		E		TRF SIGNAL	N	DRY	REAR		PRVTE	W E									000	00
						12P	KLAM FLS UA	3.23		05	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	89	F	OR-Y OR<25		043,026	000	07
																02	NONE 0	STOP										
																	PRVTE	W E									011	00
																	PSNGR CAR		01	DRVR	INJC	59	F	OR-Y OR<25		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Summers Lane @ OR 39 (Hwy 020)

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	SWORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00279	N	N	N			4/25/2007	2.26	0854A		INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
						Wed	0			NE		TRF SIGNAL	N	DRY	REAR		PRVTE	NE SW										000		00
						3P				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y OR<25		026	000		07
																			02	PSNG	NO<5	04	M			000	000		00
																02	NONE 0	STOP											
																	PRVTE	NE SW									011		00
																	PSNGR CAR		01	DRVR	INJC	17	M	OR-Y OR<25		000	000		00
																			02	PSNG	INJC	14	F			000	000		00
00651	N	N	N	Y	N	9/29/2009	2.26	0854A		INTER	3-LEG	N	N	CLD	S-1STOP	01	NONE 0	STRGHT											013	10
COUNTY						Tue				S		TRF SIGNAL	N	DRY	REAR		PRVTE	S N									000		00
						5P				06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	17	M	OR-Y OR<25		026	017		10
																02	NONE 0	STOP											
																	PRVTE	S N									011	013	00
																	PSNGR CAR		01	DRVR	INJB	17	M	OR-Y OR<25		000	000		00
																03	NONE 0	STOP											
																	PRVTE	S N									011	013	00
																	PSNGR CAR		01	DRVR	INJC	26	M	OR-Y OR<25		000	000		00
																			02	PSNG	NO<5	01	F			000	000		00
																04	NONE 0	STOP											
																	PRVTE	S N									011	013	00
																	PSNGR CAR		01	DRVR	INJC	18	M	OR-Y OR<25		000	000		00
																05	NONE 0	STOP											
																	PRVTE	S N									011		00
																	PSNGR CAR		01	DRVR	NONE	17	M	OR-Y OR<25		000	000		00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Summers Lane @ OR 140 (Hwy 424)
January 1, 2005 through December 31,2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	2	2	4	0	3	0	4	0	4	0	4	0	0
2009 TOTAL	0	3	2	5	0	4	0	5	0	5	0	5	0	0
YEAR: 2008														
TURNING MOVEMENTS	1	0	0	1	1	1	0	1	0	0	1	1	0	0
2008 TOTAL	1	0	0	1	1	1	0	1	0	0	1	1	0	0
YEAR: 2007														
ANGLE	0	4	0	4	0	9	0	4	0	3	1	4	0	0
2007 TOTAL	0	4	0	4	0	9	0	4	0	3	1	4	0	0
YEAR: 2005														
ANGLE	0	1	0	1	0	5	0	0	1	0	1	1	0	0
2005 TOTAL	0	1	0	1	0	5	0	0	1	0	1	1	0	0
FINAL TOTAL	1	8	2	11	1	19	0	10	1	8	3	11	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Summers Lane @ OR 140 (Hwy 424)
January 1, 2005 through December 31,2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00236	N	N	N			03/05/2007	KLAMATH	1 14			INTER	CROSS	N		N CLR	ANGL-OTH	01	NONE 0	STRGHT										03
CITY						Mon	KLAMATH FALLS	0 0		SUMMERS LN	CN		STOP SIGN		N DRY	ANGL		PRVTE	E W									000	00
						10A	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	01	0			N DAY	INJ		PSNGR CAR		01	DRVR	INJB	61	M	OR-Y OR<25		000	000	00
																	02	NONE 0	STRGHT										
																		PRVTE	N S									000	00
																		PSNGR CAR		01	DRVR	INJA	67	F	OTH-Y N-RES		021	000	03
00250	N	N	N			04/27/2009	KLAMATH	1 14			INTER	CROSS	N		N CLR	ANGL-OTH	01	NONE	STRGHT										02
CITY						Mon	KLAMATH FALLS	0 0		SUMMER LN	CN		STOP SIGN		N DRY	TURN		PRVTE	E W									000	00
						2P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	01	0			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y OR<25		000	000	00
																	02	NONE	TURN-L										
																		PRVTE	N E									015	00
																		PSNGR CAR		01	DRVR	NONE	82	M	OR-Y OR<25		028	000	02
00334	N	N	N	N	N	05/07/2009	KLAMATH	1 14			INTER	CROSS	N		N CLR	ANGL-OTH	01	NONE	STRGHT										02,10
STATE						Thu	KLAMATH FALLS	0 0		SUMMER LN	CN		STOP SIGN		N DRY	TURN		PRVTE	E W									000	00
						4P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	01	0			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	47	M	OR-Y OR<25		010	000	10
																	02	NONE	TURN-L										
																		PRVTE	N E									015	00
																		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y OR<25		028	000	02
00502	N	N	N	N	N	07/31/2009	KLAMATH	1 14			INTER	CROSS	N		N CLR	ANGL-OTH	01	NONE	TURN-L										02
STATE						Fri	KLAMATH FALLS	0 0		SUMMER LN	CN		STOP SIGN		N DRY	TURN		PRVTE	N E									015	00
						1P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	01	0			N DAY	INJ		PSNGR CAR		01	DRVR	INJB	80	F	OR-Y OR<25		028	000	02
																	02	NONE	STRGHT										
																		PRVTE	E W									007	00
																		PSNGR CAR		01	DRVR	INJB	19	M	OR-Y OR<25		000	000	00
00019	N	N	N	N	N	01/10/2007	KLAMATH	1 14			INTER	CROSS	N		N CLD	ANGL-OTH	01	NONE 0	STRGHT										02
STATE						Wed	KLAMATH FALLS	0 0		SUMMERS LN	CN		STOP SIGN		N DRY	ANGL		PRVTE	N S									015	00
						1P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	03	0			N DAY	INJ		PSNGR CAR		01	DRVR	INJC	20	M	OR-Y OR<25		028	000	02
																				02	PSNG	INJC	23	M			000	000	00
																				03	PSNG	INJC	25	F			000	000	00
																	02	NONE 0	STRGHT										
																		PRVTE	W E									000	00
																		PSNGR CAR		01	DRVR	INJC	31	M	OR-Y OR>25		000	000	00
																				02	PSNG	INJC	26	M			000	000	00

424 SOUTH KLAMATH FALLS

Summers Lane @ OR 140 (Hwy 424)
January 1, 2005 through December 31,2009

SER# / INVEST	SPEED	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / LIGHT	SURF	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00322	N	N	N	N	N	04/09/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	STRGHT											02
CITY						Mon	KLAMATH FALLS	0 0		SUMMERS LN	CN		STOP SIGN	N	DRY	ANGL		PRVTE		W E								000			00
						3P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	34	F	OR-Y OR<25		000	000		00
																					02	PSNG	NO<5	01	F			000	000		00
																		02	NONE	0	STRGHT										
																			PRVTE		N S								015		00
																			PSNGR CAR			01	DRVR	NONE	66	M	OR-Y OR<25		028	000		02
00349	N	N	N	N	N	05/21/2008	KLAMATH	1	14		INTER	CROSS	N	N	CLD	O-1TURN	01	NONE		TURN-L											02
CITY						Wed	KLAMATH FALLS	0 0		SUMMERS LN	CN		NONE	N	DRY	TURN		PRVTE		E S								000			00
						5A	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	03	0		N	DAWN	FAT		PSNGR CAR			01	DRVR	INJB	37	M	OR-Y OR<25		004,028	000		02
																		02	NONE		STRGHT										
																			PRVTE		W E								000		00
																			PSNGR CAR			01	DRVR	KILL	26	M	OR-Y OR<25		000	000		00
00534	Y	N	N			08/03/2009	KLAMATH	1	14		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	0	TURN-L											02,01
CITY						Mon	KLAMATH FALLS	0 0		SUMMER LN	CN		STOP SIGN	N	DRY	TURN		PRVTE		W N								000			00
						1P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	03	0		N	DAY	INJ		PSNGR CAR			01	DRVR	NONE	22	M	OR-Y OR<25		000	000		00
																		02	NONE	0	STRGHT										
																			PRVTE		N S								015		00
																			PSNGR CAR			01	DRVR	NONE	88	M	OR-Y OR<25		028,047	000		02,01
																						02	PSNG	INJC	90	F			000	000		00
00939	N	N	N	N	N	11/25/2005	KLAMATH	1	14		INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	0	STRGHT											02
STATE						Fri	KLAMATH FALLS	0 0		SUMMER LN	CN		STOP SIGN	N	WET	ANGL		PRVTE		W E								000			00
						5A	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	04	0		N	DARK	INJ		OTHER			01	DRVR	INJB	38	F	OR-Y OR<25		000	000		00
																						02	PSNG	INJC	40	M			000	000		00
																						03	PSNG	INJC	08	F			000	000		00
																		02	NONE	0	STRGHT										
																			PRVTE		S N								000		00
																			OTHER			01	DRVR	INJC	58	M	OR-Y N-RES		028	000		02
																						02	PSNG	INJA	51	F			000	000		00
00434	N	N	N	N	N	05/12/2007	KLAMATH	1	14		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	0	STRGHT											084	02
CITY						Sat	KLAMATH FALLS	0 0		SUMMERS LN	CN		STOP SIGN	N	DRY	ANGL		PRVTE		S N								015			00
						9P	KLAM FLS UA	3.87		SOUTHSIDE BYPASS	04	0		N	DARK	INJ		PSNGR CAR			01	DRVR	NONE	16	F	OR-Y OR<25		028	000	084	02
																		02	NONE	0	STRGHT										
																			PRVTE		W E								001		00
																			PSNGR CAR			01	DRVR	INJB	23	F	OR-Y OR<25		000	000		00

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Summers Lane @ OR 140 (Hwy 424)

January 1, 2005 through December 31,2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00326	N	N	N			05/14/2009	17	SUMMER LN	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										093	07,27
NO RPT						Thu	0	SOUTHSIDE BYPASS	N		STOP SIGN	N	DRY	REAR		PRVTE	N S									000		00
						11A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	37	F	OR-Y		016,014,026	038	093	07,27
																							OR<25					
															02	NONE	STOP											
																PRVTE	N S									011		00
																PSNGR CAR		01	DRVR	INJC	28	F	OR-Y		000	000		00
																							OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) @ Dan Obrien Way

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
FIXED / OTHER OBJECT	0	0	1	1	0	0	0	0	1	0	1	1	0	1
2008 TOTAL	0	0	1	1	0	0	0	0	1	0	1	1	0	1
YEAR: 2007														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
FINAL TOTAL	0	0	3	3	0	0	0	1	2	2	1	3	0	1

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

004 THE DALLES-CALIFORNIA

US 97 (Hwy 004) @ Dan Obrien Way
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00081	N	N	N			01/07/2005	KLAMATH	1	14		INTER	3-LEG	N	N	SNOW	ANGL-STP	01	NONE 0	TURN-R											08
NO RPT						Fri	KLAMATH FALLS	0	0	DAN OBRIEN WAY	E		STOP SIGN	N	ICE	TURN		PRVTE	S E									001		00
						11A	KLAM FLS UA	272.20		THE DALLES-CAL HY	06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		001	000		08
																										OR<25					
																				02	PSNG	NO<5	03	M			000	000		00
																				03	PSNG	NO<5	04	M			000	000		00
																	02	NONE 0	STOP											
																		PRVTE	E W									011		00
																		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		000	000		00
																									OR>25					
00193	N	N	N			02/11/2008	KLAMATH	1	14		INTER	3-LEG	N	Y	FOG	FIX OBJ	01	NONE	STRGHT											077,092	10,26
NONE						Mon	KLAMATH FALLS	0	0	DAN OBRIEN WAY	NW		UNKNOWN	N	ICE	FIX		PRVTE	NW SE									007	077,092	26
						5A	KLAM FLS UA	272.20		THE DALLES-CAL HY	06	0		Y	DARK	PDO		PSNGR CAR		01	DRVR	NONE	16	F	OR-Y		081	000		10
																									OR<25					
00306	N	N	N			04/23/2007	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE 0	TURN-L											02	
STATE						Mon	KLAMATH FALLS	0	0	DAN OBRIEN WAY	CN		UNKNOWN	N	DRY	TURN		PRVTE	SE SW									000		00
						4P	KLAM FLS UA	272.20		THE DALLES-CAL HY	03	0		Y	DAY	PDO		PSNGR CAR		01	DRVR	NONE	75	M	OR-Y		004,028	000		02
																									OR<25					
																	02	NONE 0	STRGHT											
																		PRVTE	NW SE									000		00
																		PSNGR CAR		01	DRVR	NONE	42	F	OR-Y		000	000		00
																									OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Northbound Ramp @ OR 140 (Hwy 424)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
TURNING MOVEMENTS	0	0	1	1	0	0	1	0	1	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	1	0	1	1	0	1	0	0
YEAR: 2005														
REAR-END	0	0	1	1	0	0	0	0	1	0	1	1	0	0
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	2	2	0	0	0	1	1	1	1	2	0	0
FINAL TOTAL	0	0	3	3	0	0	1	1	2	2	1	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

US 97 (Hwy 004) Northbound Ramp @ OR 140 (Hwy 424)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP / LEPNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00113	N	N	N	N	N	02/10/2007	KLAMATH	1	14		INTER	3-LEG	N	N	RAIN	ANGL-OTH	01	NONE 0	TURN-L									02
COUNTY						Sat		0	0		CN		FLASHBCN-R	N	WET	TURN		PRVTE	SE SW									015	00
						8A	KLAM FLS UA	0.06			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		028	000	02
																									UNK				
																	02	NONE 1	STRGHT										
																		PRVTE	NE SW									000	00
																		SEMI TOW		01	DRVR	NONE	51	M	OR-Y		000	000	00
																									OR<25				
00388	N	N	N			05/07/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE 0	STRGHT										13,08
NONE						Sat		0	0		CN		REG-SIGN	N	DRY	TURN		PRVTE	W E									000	00
						4P	KLAM FLS UA	0.06			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	54	M	OR-Y		007,045	000	13,08
																									OR<25				
																	02	NONE 0	TURN-L									088	00
																		PRVTE	E S										
																		PSNGR CAR		01	DRVR	NONE	65	F	OR-Y		000	000	00
																									OR<25				
00066	N	N	N			01/03/2005	KLAMATH	1	14		INTER	3-LEG	N	N	CLR	S-1TURN	01	NONE 0	TURN-R										27
STATE						Mon		0	0		CN		STOP SIGN	N	ICE	REAR		PRVTE	S E									000	00
						6P	KLAM FLS UA	0.06			04	1		N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		016,026	038	27
																									OR>25				
																	02	NONE 0	STOP									013	00
																		PRVTE	S E										
																		PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		000	000	00
																									OR<25				

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Southbound @ Coli Avenue
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Northbound Ramp @ Oregon Avenue/ Tunnel Street
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Southbound Off Ramp @ Nevada Street

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Southbound Ramps @ Main Street (Hwy 020)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2007 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

020 KLAMATH FALLS-LAKEVIEW — US 97 (Hwy 004) Southbound Ramps @ Main Street (Hwy 020)
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALC	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00463	N	N	N			06/06/2007	KLAMATH	1	14		INTER	3-LEG	N		N	CLR	ANGL-STP	01	NONE	0	TURN-L									08
NO RPT						Wed	KLAMATH FALLS	0	0	MAIN ST	N		STOP SIGN		N	DRY	TURN		PRVTE		W N								000	00
						12P	KLAM FLS UA	- 0.01		EB K FALLS-LAKEVIEW	06	0			N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	00	U	UNK UNK		000	000	00
																		02	NONE	0	STOP									
																			PRVTE		N S								011	00
																			PSNGR CAR			01	DRVR	NONE	37	M	OR-Y OR<25		002	000	08

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 (Hwy 004) Southbound Ramps @ OR 140 (Hwy 021)

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR:														
TOTAL														
FINAL TOTAL														

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

US 97 Northbound (Hwy 004) @ Coli Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

004 THE DALLES-CALIFORNIA

US 97 Northbound (Hwy 004) @ Coli Avenue
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
00596	N	N	N			08/09/2008	KLAMATH	2	14		INTER	3-LEG	N		N	CLR	S-1STOP	01	NONE	STRGHT										07
NO RPT						Sat	KLAMATH FALLS	0	0	COLI AVE	SE		UNKNOWN		N	DRY	REAR		PRVTE	SE NW									000	00
						10A	KLAM FLS UA	272.56		THE DALLES-CAL HY	06	0			N	DAY	PDO		MTRCYCLE		01	DRVR	NONE	00	M	OTH-Y N-RES		026	000	07
																		02	NONE	STOP										
																			PRVTE	SE NW									012	00
																			PSNGR CAR		01	DRVR	NONE	37	F	OTH-Y N-RES		000	000	00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Washburn Way @ Laverne Avenue

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	2	0	1	0	0	1	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	0	1	1	0	0
2009 TOTAL	0	2	0	2	0	3	0	1	1	0	2	2	0	0
YEAR: 2008														
ANGLE	0	0	1	1	0	0	0	0	1	1	0	1	0	0
2008 TOTAL	0	0	1	1	0	0	0	0	1	1	0	1	0	0
YEAR: 2007														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	1	2	0	1	0	2	0	1	1	2	0	0
2007 TOTAL	0	1	2	3	0	1	0	3	0	2	1	3	0	0
YEAR: 2006														
TURNING MOVEMENTS	0	1	1	2	0	3	0	1	1	1	1	2	0	0
2006 TOTAL	0	1	1	2	0	3	0	1	1	1	1	2	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	0	1	1	0	0	0	1	0	1	0	1	0	0
2005 TOTAL	0	0	1	1	0	0	0	1	0	1	0	1	0	0
FINAL TOTAL	0	4	5	9	0	7	0	6	3	5	4	9	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

KLAMATH COUNTY

Washburn Way @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY / FIRST / SECOND	ROADS / STREET / STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS / (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00088	Y	N	N	N	N	1/23/2007	0.00	0854A		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-R											03,01
NO RPT						Tue				CN		STOP SIGN	N	DRY	TURN		PRVTE	E N										001	00
						8A				02	0		N	DAWN	PDO		PSNGR CAR		01	DRVR	NONE	17	F	OR-Y OR<25		021,047,080	017		03,01
																02	NONE 0	STRGHT											
																	PRVTE	S N										000	00
																	PSNGR CAR		01	DRVR	NONE	18	F	OR-Y OR<25		000	000		00
00721	N	N	N			9/7/2007	0.00	LAVERNE AVE		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Fri				E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W										000	00
						12P				06	6		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y OR<25		026	000		07
																02	NONE 0	STOP											
																	PRVTE	E W										011	00
																	PSNGR CAR		01	DRVR	NONE	55	F	OR-Y OR<25		000	000		00
00178	N	N	N			2/27/2006	0.00	LAVERNE AVE		INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-R											02,08
COUNTY						Mon				S		UNKNOWN	N	WET	TURN		PRVTE	W S										000	00
						8P				05	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	17	M	OR-Y OR<25		028,007	000		02,08
																02	NONE 0	STRGHT											
																	PRVTE	N S										000	00
																	PSNGR CAR		01	DRVR	INJB	53	F	OR-Y OR<25		000	000		00
																			02	PSNG	INJB	14	M			000	000		00
																			03	PSNG	INJC	13	F			000	000		00
00879	N	N	N	N	N	12/18/2009	0.00	LAVERNE AVE		INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											32
COUNTY						Fri				W		TRF SIGNAL	N	DRY	REAR		PRVTE	W E										000	00
						5P				06	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	49	F	OR-Y OR>25		052	000		32
																02	NONE 0	STOP											
																	PRVTE	W E										011	00
																	PSNGR CAR		01	DRVR	INJC	57	M	OTH-Y OR<25		000	000		00
																			02	PSNG	INJC	56	F			000	000		00
00668	N	N	N	N	N	8/2/2007	0.00	LAVERNE AVE		INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT											02
STATE						Thu				CN		TRF SIGNAL	N	DRY	TURN		PRVTE	N S										000	00
						11A				01	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	62	M	OTH-Y N-RES		000	000		00
																02	NONE 0	TURN-L											
																	PRVTE	S W										000	00
																	PSNGR CAR		01	DRVR	NONE	74	M	OR-Y OR>25		004	000		02

KLAMATH COUNTY

Washburn Way @ Laverne Avenue

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUGL	SCHL	WORK	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS FIRST / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00217	N	N	N			2/11/2006	0.00	LAVERNE AVE	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT											02
NO RPT						Sat			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E W										000	00
						4P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	TURN-L											
																PRVTE	W N										000	00
																PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		004,028	000		02
																								OR<25				
00980	N	N	N			12/31/2008	0.00	LAVERNE AVE	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NO RPT						Wed			CN		TRF SIGNAL	N	WET	ANGL		PRVTE	E W										000	00
						12P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	U	UNK		020	000		04
																								UNK				
															02	NONE 0	STRGHT											
																PRVTE	S N										000	00
																PSNGR CAR		01	DRVR	NONE	41	M	OR-Y		000	000		00
																								OR<25				
00825	N	N	N	N	N	11/17/2009	0.00	LAVERNE AVE	INTER	CROSS	N	N	SLT	O-1TURN	01	NONE 0	TURN-L											02
COUNTY						Tue			CN		TRF SIGNAL	N	WET	TURN		PRVTE	W N										000	00
						6P			02	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	21	M	OR-Y		004,028	000		02
																								OR>25				
															02	NONE 0	STRGHT											
																PRVTE	E W										000	00
																PSNGR CAR		01	DRVR	INJB	23	F	OR-Y		000	000		00
																								OR<25				
00300	N	N	N			4/11/2005	0.00	LAVERNE AVE	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	STRGHT											02
COUNTY						Mon	0		CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S N										000	00
						12P			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		000	000		00
																								OR<25				
															02	NONE 0	TURN-L											
																PRVTE	N E										000	00
																PSNGR CAR		01	DRVR	NONE	40	F	OR-Y		004,028	000		02
																								OR<25				

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Patterson Street @ Shasta Way
January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2007														
BACKING	0	0	1	1	0	0	1	1	0	0	1	1	0	0
2007 TOTAL	0	0	1	1	0	0	1	1	0	0	1	1	0	0
FINAL TOTAL	0	0	1	1	0	0	1	1	0	0	1	1	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Washburn Way @ OR 140 (Hwy 424) EB ramp

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2008														
REAR-END	0	0	1	1	0	0	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	1	0	1	0	3	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	1	2	0	3	0	2	0	2	0	2	0	0
YEAR: 2005														
TURNING MOVEMENTS	0	1	0	1	0	1	0	1	0	1	0	1	0	0
2005 TOTAL	0	1	0	1	0	1	0	1	0	1	0	1	0	0
FINAL TOTAL	0	2	1	3	0	4	0	3	0	3	0	3	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Washburn Way @ OR 140 (Hwy 424) EB ramp
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCHL	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP / PNT	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00682	N	N	N			08/15/2005	KLAMATH	1	16	2	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											08
COUNTY						Mon		6	0		CN		L-GRN-SIG	N	DRY	TURN		PRVTE	S N										000		00
						4P	KLAM FLS UA	2.70			04	1		N	DAY	INJ		PSNGR CAR		01	DRVR	INJB	27	F	OR-Y OR<25		000	000		00
																	02	NONE	TURN-L											
																		PRVTE	N E										000		00
																		PSNGR CAR		01	DRVR	NONE	67	M	OR-Y OR<25		004	000		08
00686	N	N	N	N	N	07/29/2008	KLAMATH	1	16	2	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
COUNTY						Tue		6	0		CN		NONE	N	DRY	TURN		PRVTE	S N										007		00
						3P	KLAM FLS UA	2.70			04	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	22	F	OR-Y OR<25		000	000		00
																				02	PSNG	INJC	05	M			000	000		00
																	02	NONE	TURN-L											
																		PRVTE	N E										000		00
																		PSNGR CAR		01	DRVR	INJB	60	F	OR-Y OR<25		004,028	000		02
00588	N	N	N			08/01/2008	KLAMATH	1	16	1	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NO RPT						Fri		6	0		W		STOP SIGN	N	DRY	REAR		PRVTE	W E										000		00
						UNK	KLAM FLS UA	2.85			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y OR<25		026	000		07
																	02	NONE	STOP											
																		PRVTE	W E										012		00
																		PSNGR CAR		01	DRVR	NONE	58	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Washburn Way @ OR 140 (Hwy 424) WB ramp

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
TURNING MOVEMENTS	0	0	1	1	0	0	1	1	0	1	0	1	0	0
2009 TOTAL	0	0	1	1	0	0	1	1	0	1	0	1	0	0
YEAR: 2008														
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	1	0	1	0	0
2008 TOTAL	0	1	0	1	0	2	0	1	0	1	0	1	0	0
FINAL TOTAL	0	1	1	2	0	2	1	2	0	2	0	2	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

424 SOUTH KLAMATH FALLS

Washburn Way @ OR 140 (Hwy 424) WB ramp
January 1, 2005 through December 31, 2009

SER# / INVEST	SPEED	ALCS	DRUGS	SCHL	WORK	DATE / DAY / TIME	COUNTY / CITY / URBAN AREA	RD# / COMPNT / MLG / MILEPNT	FC / TYP	CONN # / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CNTL	OFFRD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00512	N	N	N	N	N	07/15/2008	KLAMATH	1 16	2		INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT											02
COUNTY						Tue		6 0			CN		STOP SIGN	N	DRY	TURN		PRVTE	S N										007	00
						2P	KLAM FLS UA	2.91			02	1		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	19	F	OR-Y OR<25		000	000		00
																	02	NONE	TURN-L											
																		PRVTE	E S										015	00
																		PSNGR CAR		01	DRVR	INJC	21	F	OR-Y OR<25		028	000		02
00441	N	N	N			07/16/2009	KLAMATH	1 16	2		INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE	TURN-R											02
NONE						Thu		6 0			CN		OFCR/FLAG	N	DRY	TURN		PRVTE	E N										000	00
						12P	KLAM FLS UA	2.91			02	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	26	F	OTH-Y N-RES		028	000		02
																	02	NONE 1	STRGHT											
																		PRVTE	S N										000	00
																		SEMI TOW		01	DRVR	NONE	49	M	OR-Y OR<25		000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Washburn Way @ Shasta Way

January 1, 2005 through December 31, 2009

COLLISION TYPE	FATAL CRASHES	NON-FATAL CRASHES	PROPERTY DAMAGE ONLY	TOTAL CRASHES	PEOPLE KILLED	PEOPLE INJURED	TRUCKS	DRY SURF	WET SURF	DAY	DARK	INTER-SECTION	INTER-SECTION RELATED	OFF-ROAD
YEAR: 2009														
REAR-END	0	1	0	1	0	1	0	1	0	1	0	1	0	0
TURNING MOVEMENTS	0	0	2	2	0	0	0	0	2	2	0	2	0	0
2009 TOTAL	0	1	2	3	0	1	0	1	2	3	0	3	0	0
YEAR: 2008														
ANGLE	0	1	0	1	0	1	0	1	0	1	0	1	0	0
REAR-END	0	1	0	1	0	1	0	0	1	1	0	1	0	0
2008 TOTAL	0	2	0	2	0	2	0	1	1	2	0	2	0	0
YEAR: 2007														
ANGLE	1	1	1	3	1	2	0	2	1	3	0	3	0	0
REAR-END	0	2	0	2	0	2	0	0	2	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	1	0	0	1	0	1	1	0	0
2007 TOTAL	1	4	1	6	1	5	0	2	4	5	1	6	0	0
YEAR: 2006														
ANGLE	0	0	2	2	0	0	0	1	1	2	0	2	0	0
TURNING MOVEMENTS	0	1	0	1	0	2	0	1	0	0	1	1	0	0
2006 TOTAL	0	1	2	3	0	2	0	2	1	2	1	3	0	0
YEAR: 2005														
REAR-END	0	2	0	2	0	2	0	2	0	2	0	2	0	0
2005 TOTAL	0	2	0	2	0	2	0	2	0	2	0	2	0	0
FINAL TOTAL	1	10	5	16	1	12	0	8	8	14	2	16	0	0

Note: Legislative changes to DMV's vehicle crash reporting requirements, effective 01/01/2004, may result in fewer property damage only crashes being eligible for inclusion in the Statewide Crash Data File.

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Washburn Way @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
00236	N	N	N			03/31/2005	16	SHASTA WAY	INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											27
NONE						Thu	0	WASHBURN WAY	N		TRF SIGNAL		N DRY	REAR		PRVTE	N S									000		00
						1P			06	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		026,016	038		27
																								OR<25				
															02	NONE 0	STOP											
																PRVTE	N S									012		00
																PSNGR CAR		01	DRVR	INJC	32	F	OR-Y		000	000		00
																								OR<25				
00059	N	N	N	N	N	01/16/2007	16	SHASTA WAY	INTER	CROSS	N		N SNOW	S-1STOP	01	NONE 0	STRGHT											07
						Tue	0	WASHBURN WAY	N		TRF SIGNAL		N SNO	REAR		PRVTE	N S									000		00
						4P			06	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		026	000		07
																								OR<25				
															02	NONE 0	STOP											
																PRVTE	N S									011	004	00
																PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000		00
																								OR<25				
90057	N	N	N			01/16/2007	16	SHASTA WAY	INTER	CROSS	N		N SNOW	S-1STOP	01	NONE 0	STRGHT											07
						Tue	0	WASHBURN WAY	N		TRF SIGNAL		N SNO	REAR		PRVTE	N S									000		00
						4P			06	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	55	M	OR-Y		026	000		07
																								OR<25				
															02	NONE 0	STOP											
																PRVTE	N S									011	004	00
																PSNGR CAR		01	DRVR	INJC	18	F	OR-Y		000	000		00
																								OR<25				
00899	N	N	N			12/20/2008	16	SHASTA WAY	INTER	CROSS	N		N SNOW	S-1STOP	01	NONE 0	STRGHT											07
NONE						Sat	0	WASHBURN WAY	N		TRF SIGNAL		N ICE	REAR		PRVTE	N S									001		00
						1P			06	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	F	OTH-Y		026	000		07
																								N-RES				
															02	NONE 0	STOP											
																PRVTE	N S									011		00
																PSNGR CAR		01	DRVR	INJC	22	F	OR-Y		000	000		00
																								OR<25				
00913	Y	N	N			12/22/2009	16	SHASTA WAY	INTER	CROSS	N		N SNOW	ANGL-OTH	01	NONE 0	TURN-R											01
NONE						Tue	0	WASHBURN WAY	E		TRF SIGNAL		N SNO	TURN		PRVTE	S E									000	124	00
						10A			06	0			N DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OTH-Y		047,080	017		01
																								N-RES				
															02	NONE 0	STOP											
																PRVTE	E S									012		00
																PSNGR CAR		01	DRVR	NONE	50	F	OR-Y		000	000		00
																								OR<25				
00581	N	N	N			07/26/2005	16	SHASTA WAY	INTER	CROSS	N		N CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE						Tue	0	WASHBURN WAY	S		TRF SIGNAL		N DRY	REAR		PRVTE	S N									000		00
						9A			06	0			N DAY	INJ		PSNGR CAR		01	DRVR	NONE	49	M	OR-Y		026	000		07
																								OR<25				

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Washburn Way @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
															02	NONE 0 PRVTE PSNGR CAR	STOP S N						OR-Y OR<25			011 000		00 00
00590	N	N	N			08/25/2009 Tue 1P	16 0	SHASTA WAY WASHBURN WAY	INTER S 06	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT S N	01	DRVR	INJB	86	M	OR-Y OR<25		014	000		32
CITY																												00
																												32
															02	NONE 0 PUBLC PSNGR CAR	STOP S N						OR-Y OR<25			011 000		00 00
00874	N	N	N			10/30/2006 Mon 9A	16 0	SHASTA WAY WASHBURN WAY	INTER CN 01	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL PDO	01	NONE 0 PRVTE PSNGR CAR	STRGHT N S	01	DRVR	NONE	58	F	OR-Y OR<25		016,020	038	093	27,07
CITY																											093	27,07
																										000		00
															02	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	34	M	OR-Y OR<25		000	000		00 00
00001	N	N	N			02/12/2007 Mon 8A	16 0	SHASTA WAY WASHBURN WAY	INTER CN 01	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL FAT	01	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	NONE	56	M	OR-Y OR<25		000	000		04
CITY																											054	04
																										000		00
															02	NONE 0 PRVTE PSNGR CAR	STRGHT N S	01	DRVR	KILL	36	M	OR-Y OR<25		020	000	054	00 04
																		02	PSNG	INJC	17	M			000	000		00
00215	N	N	N	N	N	03/26/2007 Mon 10A	17 0	SHASTA WAY WASHBURN WAY	INTER CN 01	CROSS 0	N TRF SIGNAL	N N N	RAIN WET DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	INJC	63	F	OR-Y OR<25		000	000		04 00 02
															02	NONE 0 PRVTE PSNGR CAR	STRGHT N S	01	DRVR	NONE	68	F	OR-Y OR<25		020	000		00 04
00771	N	N	N			11/17/2008 Mon 10A	16 0	SHASTA WAY WASHBURN WAY	INTER CN 01	CROSS 0	N TRF SIGNAL	N N N	CLR DRY DAY	ANGL-OTH ANGL INJ	01	NONE 0 PRVTE PSNGR CAR	STRGHT N S	01	DRVR	NONE	58	F	OR-Y OR<25		020	000		04 00 04
															02	NONE 0 PRVTE PSNGR CAR	STRGHT E W	01	DRVR	INJC	50	F	OR-Y OR<25		000	000		00 00

CITY OF KLAMATH FALLS, KLAMATH COUNTY

Washburn Way @ Shasta Way

January 1, 2005 through December 31, 2009

SER# / INVEST	SPEC	ALC	DRUG	SCHL	WORK	DATE / DAY / TIME	CLASS / DIST FROM	CITY STREET / FIRST STREET / SECOND STREET	RD CHAR / DIRECT / LOCTN	INT-TYP (MEDIAN) / LEGS (#LANES)	INT-REL / TRAF- / CONTL	OFF-RD / RNDBT / DRVWY	WTHR / SURF / LIGHT	CRASH TYP / COLL TYP / SVRTY	V#	SPCL USE / TRLR QTY / OWNER / VEH TYPE	MOVE / FROM / TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN	EVENT	CAUSE
01054	N	N	N			12/06/2006	16	SHASTA WAY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
NO RPT						Wed	0	WASHBURN WAY	CN		TRF SIGNAL	N	ICE	ANGL		PRVTE	N S										000		00
						7A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	45	M	OR-Y		020	000		04
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		000	000		00
																							OR<25					
01136	N	N	N			12/29/2006	17	SHASTA WAY	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE 0	TURN-L											02
NO RPT						Fri	0	WASHBURN WAY	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E S									000		00
						5P			03	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	INJC	19	M	OR-Y		004	000		02
																							OR<25					
																		02	PSNG	INJB	19	M			000	000		00
															02	NONE 0	STRGHT											
																PRVTE	W E									000		00
																PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		000	000		00
																							OR<25					
00151	N	N	N	N	N	02/19/2007	17	SHASTA WAY	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE 0	STRGHT											04
COUNTY						Mon	0	WASHBURN WAY	CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W E									000		00
						11A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	23	F	OR-Y		000	000		00
																							OR<25					
															02	NONE 0	STRGHT											
																PRVTE	N S									000		00
																PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		020	000		04
																							OR<25					
00851	N	N	N	N	N	11/30/2009	16	SHASTA WAY	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE 0	TURN-L											08
CITY						Mon	0	WASHBURN WAY	CN		TRF SIGNAL	N	WET	TURN		PRVTE	S W									000		00
						8A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	F	OR-Y		002	000		08
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	W E									012		00
																PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		000	000		00
																							OR<25					
00181	N	N	N			02/28/2007	16	SHASTA WAY	INTER	CROSS	N	N	UNK	O-1TURN	01	NONE 0	TURN-L											02
NO RPT						Wed	0	WASHBURN WAY	CN		TRF SIGNAL	N	SNO	TURN		PRVTE	N E									000		00
						11P			04	0		N	DLIT	INJ		PSNGR CAR		01	DRVR	NONE	00	M	UNK		004	000		02
																							UNK					
															02	NONE 0	STRGHT											
																PRVTE	S N									000		00
																PSNGR CAR		01	DRVR	INJC	38	M	OR-Y		000	000		00
																							OR<25					

ACTION CODE TRANSLATION LIST

ACTION CODE	SHORT DESCRIPTION	LONG DESCRIPTION
000	NONE	NO ACTION OR NON-WARRANTED
001	SKIDDED	SKIDDED
002	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE
003	LOAD OVR	OVERHANGING LOAD STRUCK ANOTHER VEHICLE, ETC.
006	SLOW DN	SLOWED DOWN
007	AVOIDING	AVOIDING MANEUVER
008	PAR PARK	PARALLEL PARKING
009	ANG PARK	ANGLE PARKING
010	INTERFERE	PASSENGER INTERFERING WITH DRIVER
011	STOPPED	STOPPED IN TRAFFIC NOT WAITING TO MAKE A LEFT TURN
012	STP/L TRN	STOPPED BECAUSE OF LEFT TURN SIGNAL OR WAITING, ETC.
013	STP TURN	STOPPED WHILE EXECUTING A TURN
015	GO A/STOP	PROCEED AFTER STOPPING FOR A STOP SIGN/FLASHING RED.
016	TRN A/RED	TURNED ON RED AFTER STOPPING
017	LOSTCTRL	LOST CONTROL OF VEHICLE
018	EXIT DWY	ENTERING STREET OR HIGHWAY FROM ALLEY OR DRIVEWAY
019	ENTR DWY	ENTERING ALLEY OR DRIVEWAY FROM STREET OR HIGHWAY
020	STR ENTR	BEFORE ENTERING ROADWAY, STRUCK PEDESTRIAN, ETC. ON SIDEWALK OR SHOULDER
021	NO DRVR	CAR RAN AWAY - NO DRIVER
022	PREV COL	STRUCK, OR WAS STRUCK BY, VEHICLE OR PEDESTRIAN IN PRIOR COLLISION BEFORE ACC. STABILIZED
023	STALLED	VEHICLE STALLED
024	DRVR DEAD	DEAD BY UNASSOCIATED CAUSE
025	FATIGUE	FATIGUED, SLEEPY, ASLEEP
026	SUN	DRIVER BLINDED BY SUN
027	HDLGHTS	DRIVER BLINDED BY HEADLIGHTS
028	ILLNESS	PHYSICALLY ILL
029	THRU MED	VEHICLE CROSSED, PLUNGED OVER, OR THROUGH MEDIAN BARRIER
030	PURSUIT	PURSUING OR ATTEMPTING TO STOP ANOTHER VEHICLE
031	PASSING	PASSING SITUATION
032	PRKOFFRD	VEHICLE PARKED BEYOND CURB OR SHOULDER
033	CROS MED	VEHICLE CROSSED EARTH OR GRASS MEDIAN
034	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
035	X W/ SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
036	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
037	BTWN INT	CROSSING BETWEEN INTERSECTIONS
038	DISTRACT	DRIVER'S ATTENTION DISTRACTED
039	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
040	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
041	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
042	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
043	PLAYINRD	PLAYING IN STREET OR ROAD
044	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
045	WORK ON	WORKING IN ROADWAY OR ALONG SHOULDER
050	LAY ON RD	STANDING OR LYING IN ROADWAY
051	ENT OFFRD	ENTERING / STARTING IN TRAFFIC LANE FROM OFF-ROAD
088	OTHER	OTHER ACTION
099	UNK	UNKNOWN ACTION

CAUSE CODE TRANSLATION LIST

CAUSE CODE	SHORT DESCRIPTION	LONG DESCRIPTION
00	NO CODE	NO CAUSE ASSOCIATED AT THIS LEVEL
01	TOO-FAST	TOO FAST FOR CONDITIONS (NOT EXCEED POSTED SPEED
02	NO-YIELD	DID NOT YIELD RIGHT-OF-WAY
03	PAS-STOP	PASSED STOP SIGN OR RED FLASHER
04	DIS--RAG	DISREGARDED R-A-G TRAFFIC SIGNAL.
05	LEFT-CTR	DROVE LEFT OF CENTER ON TWO-WAY ROAD
06	IMP-OVER	IMPROPER OVERTAKING
07	TOO-CLOS	FOLLOWED TOO CLOSELY
08	IMP-TURN	MADE IMPROPER TURN
09	DRINKING	ALCOHOL OR DRUG INVOLVED
10	OTHR-IMP	OTHER IMPROPER DRIVING
11	MECH-DEF	MECHANICAL DEFECT
12	OTHER	OTHER (NOT IMPROPER DRIVING)
13	IMP LN C	IMPROPER CHANGE OF TRAFFIC LANES
14	DIS TCD	DISREGARDED OTHER TRAFFIC CONTROL DEVICE
15	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY
16	FATIGUE	DRIVER DROWSY/FATIGUED/SLEEPY
18	IN RDWY	NON-MOTORIST ILLEGALLY IN ROADWAY
19	NT VISBL	NON-MOTORIST CLOTHING NOT VISIBLE
20	IMP PKNG	VEHICLE IMPROPERLY PARKED
21	DEF STER	DEFECTIVE STEERING MECHANISM
22	DEF BRKE	INADEQUATE OR NO BRAKES
24	LOADSHFT	VEHICLE LOST LOAD OR LOAD SHIFTED
25	TIREFAIL	TIRE FAILURE
26	PHANTOM	PHANTOM / NON-CONTACT VEHICLE
27	INATTENT	INATTENTION
30	SPEED	DRIVING IN EXCESS OF POSTED SPEED
31	RACING	SPEED RACING (PER PAR)
32	CARELESS	CARELESS DRIVING (CITATION ISSUED)
33	RECKLESS	RECKLESS DRIVING (CITATION ISSUED)
34	AGGRESV	AGGRESSIVE DRIVING (PER PAR)
35	RD RAGE	ROAD RAGE (PER PAR)

COLLISION TYPE CODE TRANSLATION LIST

COLL CODE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OTH	MISCELLANEOUS
-	BACK	BACKING
0	PED	PEDESTRIAN
1	ANGL	ANGLE
2	HEAD	HEAD-ON
3	REAR	REAR-END
4	SS-M	SIDESWIPE - MEETING
5	SS-O	SIDESWIPE - OVERTAKING
6	TURN	TURNING MOVEMENT
7	PARK	PARKING MANEUVER
8	NCOL	NON-COLLISION
9	FIX	FIXED OBJECT OR OTHER OBJECT

CRASH TYPE CODE TRANSLATION LIST

CRASH TYPE	SHORT DESCRIPTION	LONG DESCRIPTION
&	OVERTURN	OVERTURNED
0	NON-COLL	OTHER NON-COLLISION
1	OTH RDWY	MOTOR VEHICLE ON OTHER ROADWAY
2	PRKD MV	PARKED MOTOR VEHICLE
3	PED	PEDESTRIAN
4	TRAIN	RAILWAY TRAIN
6	BIKE	PEDALCYCLIST
7	ANIMAL	ANIMAL
8	FIX OBJ	FIXED OBJECT
9	OTH OBJ	OTHER OBJECT
A	ANGL-STP	ENTERING AT ANGLE - ONE VEHICLE STOPPED
B	ANGL-OTH	ENTERING AT ANGLE - ALL OTHERS
C	S-STRGHT	FROM SAME DIRECTION - BOTH GOING STRAIGHT
D	S-1TURN	FROM SAME DIRECTION - ONE TURN, ONE STRAIGHT
E	S-1STOP	FROM SAME DIRECTION - ONE STOPPED
F	S-OTHER	FROM SAME DIRECTION-ALL OTHERS, INCLUDING PARKING
G	O-STRGHT	FROM OPPOSITE DIRECTION - BOTH GOING STRAIGHT
H	O-1TURN	FROM OPPOSITE DIRECTION - ONE TURN, ONE STRAIGHT
I	O-1STOP	FROM OPPOSITE DIRECTION - ONE STOPPED
J	O-OTHER	FROM OPPOSITE DIRECTION-ALL OTHERS INCL. PARKING

DRIVER LICENSE CODE TRANSLATION LIST

LIC CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NOT LICENSED (HAD NEVER BEEN LICENSED)
1	OR-Y	VALID OREGON LICENSE
2	OTH-Y	VALID LICENSE, OTHER STATE OR COUNTRY
3	SUSP	SUSPENDED/REVOKED

DRIVER RESIDENCE CODE TRANSLATION LIST

RES CODE	SHORT DESC	LONG DESCRIPTION
1	OR<25	OREGON RESIDENT WITHIN 25 MILE OF HOME
2	OR>25	OREGON RESIDENT 25 OR MORE MILES FROM HOME
3	OR-?	OREGON RESIDENT - UNKNOWN DISTANCE FROM HOME
4	N-RES	NON-RESIDENT
9	UNK	UNKNOWN IF OREGON RESIDENT

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
000	NONE	NO ERROR
001	WIDE TRN	WIDE TURN
002	CUT CORN	CUT CORNER ON TURN
003	FAIL TRN	FAILED TO OBEY MANDATORY TRAFFIC TURN SIGNAL, SIGN OR LANE MARKINGS
004	L IN TRF	LEFT TURN IN FRONT OF ONCOMING TRAFFIC
005	L PROHIB	LEFT TURN WHERE PROHIBITED
006	FRM WRNG	TURNED FROM WRONG LANE
007	TO WRONG	TURNED INTO WRONG LANE
008	ILLEG U	U-TURNED ILLEGALLY
009	IMP STOP	IMPROPERLY STOPPED IN TRAFFIC LANE
010	IMP SIG	IMPROPER SIGNAL OR FAILURE TO SIGNAL
011	IMP BACK	BACKING IMPROPERLY (NOT PARKING)
012	IMP PARK	IMPROPERLY PARKED
013	UNPARK	IMPROPER START LEAVING PARKED POSITION
014	IMP STRT	IMPROPER START FROM STOPPED POSITION
015	IMP LGHT	IMPROPER OR NO LIGHTS (VEHICLE IN TRAFFIC)
016	INATTENT	FAILED TO DIM LIGHTS (UNTIL 4/1/97) / INATTENTION (AFTER 4/1/97)
017	UNSF VEH	DRIVING UNSAFE VEHICLE (NO OTHER ERROR APPARENT)
018	OTH PARK	ENTERING, EXITING PARKED POSITION WITH INSUFFICIENT CLEARANCE OR OTHER IMPROPER PARKING MANEUVER
019	DIS DRIV	DISREGARDED OTHER DRIVER'S SIGNAL
020	DIS SGNL	DISREGARDED TRAFFIC SIGNAL
021	RAN STOP	DISREGARDED STOP SIGN OR FLASHING RED
022	DIS SIGN	DISREGARDED WARNING SIGN, FLARES OR FLASHING AMBER
023	DIS OFCR	DISREGARDED POLICE OFFICER OR FLAGMAN
024	DIS EMER	DISREGARDED SIREN OR WARNING OF EMERGENCY VEHICLE
025	DIS RR	DISREGARDED RR SIGNAL, RR SIGN, OR RR FLAGMAN
026	REAR-END	FAILED TO AVOID STOPPED OR PARKED VEHICLE AHEAD OTHER THAN SCHOOL BUS
027	BIKE ROW	DID NOT HAVE RIGHT-OF-WAY OVER PEDALCYCLIST
028	NO ROW	DID NOT HAVE RIGHT-OF-WAY
029	PED ROW	FAILED TO YIELD RIGHT-OF-WAY TO PEDESTRIAN
030	PAS CURV	PASSING ON A CURVE
031	PAS WRNG	PASSING ON THE WRONG SIDE
032	PAS TANG	PASSING ON STRAIGHT ROAD UNDER UNSAFE CONDITIONS
033	PAS X-WK	PASSED VEHICLE STOPPED AT CROSSWALK FOR PEDESTRIAN
034	PAS INTR	PASSING AT INTERSECTION
035	PAS HILL	PASSING ON CREST OF HILL
036	N/PAS ZN	PASSING IN "NO PASSING" ZONE
037	PAS TRAF	PASSING IN FRONT OF ONCOMING TRAFFIC
038	CUT-IN	CUTTING IN (TWO LANES - TWO WAY ONLY)
039	WRNGSIDE	DRIVING ON WRONG SIDE OF THE ROAD
040	THRU MED	DRIVING THROUGH SAFETY ZONE OR OVER ISLAND
041	F/ST BUS	FAILED TO STOP FOR SCHOOL BUS

ERROR CODE TRANSLATION LIST

ERROR CODE	SHORT DESCRIPTION	FULL DESCRIPTION
042	F/SLO MV	FAILED TO DECREASE SPEED FOR SLOWER MOVING VEHICLE
043	TO CLOSE	FOLLOWING TOO CLOSELY (MUST BE ON OFFICER'S REPORT)
044	STRDL LN	STRADDLING OR DRIVING ON WRONG LANES
045	IMP CHG	IMPROPER CHANGE OF TRAFFIC LANES
046	WRNG WAY	WRONG WAY ON ONE-WAY ROADWAY (VEHICLE IS DELIBERATELY TRAVELING ON WRONG SIDE)
047	BASCRULE	DRIVING TOO FAST FOR CONDITIONS (NOT EXCEEDING POSTED SPEED)
048	OPN DOOR	OPENED DOOR INTO ADJACENT TRAFFIC LANE
049	IMPEDING	IMPEDING TRAFFIC
050	SPEED	DRIVING IN EXCESS OF POSTED SPEED
051	RECKLESS	RECKLESS DRIVING (PER PAR)
052	CARELESS	CARELESS DRIVING (PER PAR)
053	RACING	SPEED RACING (PER PAR)
054	X N/SGNL	CROSSING AT INTERSECTION - NO TRAFFIC SIGNAL PRESENT
055	X W/SGNL	CROSSING AT INTERSECTION - TRAFFIC SIGNAL PRESENT
056	DIAGONAL	CROSSING AT INTERSECTION - DIAGONALLY
057	BTWN INT	CROSSING BETWEEN INTERSECTIONS
059	W/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER WITH TRAFFIC
060	A/TRAF-S	WALKING, RUNNING, RIDING, ETC., ON SHOULDER FACING TRAFFIC
061	W/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT WITH TRAFFIC
062	A/TRAF-P	WALKING, RUNNING, RIDING, ETC., ON PAVEMENT FACING TRAFFIC
063	PLAYINRD	PLAYING IN STREET OR ROAD
064	PUSH MV	PUSHING OR WORKING ON VEHICLE IN ROAD OR ON SHOULDER
065	WK IN RD	WORKING IN ROADWAY OR ALONG SHOULDER
070	LAYON RD	STANDING OR LYING IN ROADWAY
073	DIS POL	DISREGARDING POLICE (ELUDING)
080	FAIL LN	FAILED TO MAINTAIN LANE
081	OFF RD	RAN OFF ROAD
082	NO CLEAR	DRIVER MISJUDGED CLEARANCE
083	OVRSTEER	OVER CORRECTING
084	NOT USED	CODE NOT IN USE
085	OVRLOAD	OVERLOADING OR IMPROPER LOADING OF VEHICLE WITH CARGO OR PASSENGERS
097	UNA DIS TC	UNABLE TO DETERMINE WHICH DRIVER DISREGARDED TRAFFIC CONTROL DEVICE

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
001	FEL/JUMP	OCCUPANT FELL, JUMPED OR WAS EJECTED FROM MOVING VEHICLE
002	INTERFER	PASSENGER INTERFERED WITH DRIVER
003	BUG INTF	ANIMAL OR INSECT IN VEHICLE INTERFERED WITH DRIVER
004	PED INV	PEDESTRIAN INVOLVED (NON-PEDESTRIAN ACCIDENT)
005	SUB-PED	"SUB-PED": PEDESTRIAN INJURED SUBSEQUENT TO COLLISION, ETC.
006	BIKE INV	TRICYCLE-BICYCLE INVOLVED
007	HITCHIKR	HITCHHIKER (SOLICITING A RIDE)
008	PSNGR TOW	PASSENGER BEING TOWED OR PUSHED ON CONVEYANCE
009	ON/OFF V	GETTING ON OR OFF STOPPED OR PARKED VEHICLE (OCCUPANTS ONLY)
010	SUB OTRN	OVERTURNED AFTER FIRST HARMFUL EVENT
011	MV PUSHD	VEHICLE BEING PUSHED
012	MV TOWED	VEHICLE TOWED OR HAD BEEN TOWING ANOTHER VEHICLE
013	FORCED	VEHICLE FORCED BY IMPACT INTO ANOTHER VEHICLE, PEDALCYCLIST OR PEDESTRIAN
014	SET MOTN	VEHICLE SET IN MOTION BY NON-DRIVER (CHILD RELEASED BRAKES, ETC.)
015	RR ROW	AT OR ON RAILROAD RIGHT-OF-WAY (NOT LIGHT RAIL)
016	LT RL ROW	AT OR ON LIGHT-RAIL RIGHT-OF-WAY
017	RR HIT V	TRAIN STRUCK VEHICLE
018	V HIT RR	VEHICLE STRUCK TRAIN
019	HIT RR CAR	VEHICLE STRUCK RAILROAD CAR ON ROADWAY
020	JACKNIFE	JACKKNIFE; TRAILER OR TOWED VEHICLE STRUCK TOWING VEHICLE
021	TRL OTRN	TRAILER OR TOWED VEHICLE OVERTURNED
022	CN BROKE	TRAILER CONNECTION BROKE
023	DETACH TRL	DETACHED TRAILING OBJECT STRUCK OTHER VEHICLE, NON-MOTORIST, OR OBJECT
024	V DOOR OPN	VEHICLE DOOR OPENED INTO ADJACENT TRAFFIC LANE
025	WHEELOFF	WHEEL CAME OFF
026	HOOD UP	HOOD FLEW UP
028	LOAD SHIFT	LOST LOAD, LOAD MOVED OR SHIFTED
029	TIREFAIL	TIRE FAILURE
030	PET	PET: CAT, DOG AND SIMILAR
031	LVSTOCK	STOCK: COW, CALF, BULL, STEER, SHEEP, ETC.
032	HORSE	HORSE, MULE, OR DONKEY
033	HRSE&RID	HORSE AND RIDER
034	GAME	WILD ANIMAL, GAME (INCLUDES BIRDS; NOT DEER OR ELK)
035	DEER ELK	DEER OR ELK, WAPITI
036	ANML VEH	ANIMAL-DRAWN VEHICLE
037	CULVERT	CULVERT, OPEN LOW OR HIGH MANHOLE
038	ATENUATN	IMPACT ATTENUATOR
039	PK METER	PARKING METER
040	CURB	CURB (ALSO NARROW SIDEWALKS ON BRIDGES)
041	JIGGLE	JIGGLE BARS OR TRAFFIC SNAKE FOR CHANNELIZATION
042	GDRL END	LEADING EDGE OF GUARDRAIL
043	GARDRAIL	GUARD RAIL (NOT METAL MEDIAN BARRIER)
044	BARRIER	MEDIAN BARRIER (RAISED OR METAL)
045	WALL	RETAINING WALL OR TUNNEL WALL
046	BR RAIL	BRIDGE RAILING (ON BRIDGE AND APPROACH)
047	BR ABUT	BRIDGE ABUTMENT (APPROACH ENDS)
048	BR COLMN	BRIDGE PILLAR OR COLUMN (EVEN THOUGH STRUCK PROTECTIVE GUARD RAIL FIRST)
049	BR GIRDR	BRIDGE GIRDER (HORIZONTAL STRUCTURE OVERHEAD)
050	ISLAND	TRAFFIC RAISED ISLAND
051	GORE	GORE
052	POLE UNK	POLE - TYPE UNKNOWN
053	POLE UTL	POLE - POWER OR TELEPHONE
054	ST LIGHT	POLE - STREET LIGHT ONLY
055	TRF SGNL	POLE - TRAFFIC SIGNAL AND PED SIGNAL ONLY
056	SGN BRDG	POLE - SIGN BRIDGE
057	STOPSIGN	STOP OR YIELD SIGN
058	OTH SIGN	OTHER SIGN, INCLUDING STREET SIGNS
059	HYDRANT	HYDRANT

EVENT CODE TRANSLATION LIST

EVENT CODE	SHORT DESCRIPTION	LONG DESCRIPTION
060	MARKER	DELINEATOR OR MARKER (REFLECTOR POSTS)
061	MAILBOX	MAILBOX
062	TREE	TREE, STUMP OR SHRUBS
063	VEG OHED	TREE BRANCH OR OTHER VEGETATION OVERHEAD, ETC.
064	WIRE/CBL	WIRE OR CABLE ACROSS OR OVER THE ROAD
065	TEMP SGN	TEMPORARY SIGN OR BARRICADE IN ROAD, ETC.
066	PERM SGN	PERMANENT SIGN OR BARRICADE IN/OFF ROAD
067	SLIDE	SLIDES, ROCKS OFF OR ON ROAD, FALLING ROCKS
068	FRGN OBJ	FOREIGN OBSTRUCTION/DEBRIS IN ROAD (NOT GRAVEL)
069	EQP WORK	EQUIPMENT WORKING IN/OFF ROAD
070	OTH EQP	OTHER EQUIPMENT IN OR OFF ROAD (INCLUDES PARKED TRAILER, BOAT)
071	MAIN EQP	WRECKER, STREET SWEEPER, SNOW PLOW OR SANDING EQUIPMENT
072	OTHER WALL	ROCK, BRICK OR OTHER SOLID WALL
073	IRRGL PVMT	SPEED BUMP, OTHER BUMP, POTHOLE OR PAVEMENT IRREGULARITY (PER PAR)
075	CAVE IN	BRIDGE OR ROAD CAVE IN
076	HI WATER	HIGH WATER
077	SNO BANK	SNOW BANK
078	HOLE	CHUCKHOLE IN ROAD, LOW OR HIGH SHOULDER AT PAVEMENT EDGE
079	DITCH	CUT SLOPE OR DITCH EMBANKMENT
080	OBJ F MV	STRUCK BY ROCK OR OTHER OBJECT SET IN MOTION BY OTHER VEHICLE (INCL. LOST LOADS)
081	FLY-OBJ	STRUCK BY OTHER MOVING OR FLYING OBJECT
082	VEH HID	VEHICLE OBSCURED VIEW
083	VEG HID	VEGETATION OBSCURED VIEW
084	BLDG HID	VIEW OBSCURED BY FENCE, SIGN, PHONE BOOTH, ETC.
085	WIND GUST	WIND GUST
086	IMMERSED	VEHICLE IMMERSED IN BODY OF WATER
087	FIRE/EXP	FIRE OR EXPLOSION
088	FENC/BLD	FENCE OR BUILDING, ETC.
089	OTH ACDT	ACCIDENT RELATED TO ANOTHER SEPARATE ACCIDENT
090	TO 1 SIDE	TWO-WAY TRAFFIC ON DIVIDED ROADWAY ALL ROUTED TO ONE SIDE
092	PHANTOM	OTHER (PHANTOM) NON-CONTACT VEHICLE (ON PAR OR REPORT)
093	CELL-POL	CELL PHONE (ON PAR OR DRIVER IN USE)
094	VIOL GDL	TEENAGE DRIVER IN VIOLATION OF GRADUATED LICENSE PGM
095	GUY WIRE	GUY WIRE
096	BERM	BERM (EARTHEN OR GRAVEL MOUND)
097	GRAVEL	GRAVEL IN ROADWAY
098	ABR EDGE	ABRUPT EDGE
099	CELL-WTN	CELL PHONE USE WITNESSED BY OTHER PARTICIPANT
100	UNK FIXD	UNKNOWN TYPE OF FIXED OBJECT
101	OTHER OBJ	OTHER OR UNKNOWN OBJECT, NOT FIXED
104	OUTSIDE V	PASSENGER RIDING ON VEHICLE EXTERIOR
105	PEDAL PSGR	PASSENGER RIDING ON PEDALCYCLE
106	MAN WHLCHR	PEDESTRIAN IN NON-MOTORIZED WHEELCHAIR
107	MTR WHLCHR	PEDESTRIAN IN MOTORIZED WHEELCHAIR
110	N-MTR	NON-MOTORIST STRUCK VEHICLE
111	S CAR VS V	STREET CAR/TROLLEY (ON RAILS AND/OR OVERHEAD WIRE SYSTEM) STRUCK VEHICLE
112	V VS S CAR	VEHICLE STRUCK STREET CAR/TROLLEY (ON RAILS AND/OR OVERHEAD WIRE SYSTEM)
113	S CAR ROW	AT OR ON STREET CAR/TROLLEY RIGHT-OF-WAY
114	RR EQUIP	VEHICLE STRUCK RAILROAD EQUIPMENT (NOT TRAIN) ON TRACKS
120	WIRE BAR	WIRE OR CABLE MEDIAN BARRIER
124	SLIPPERY	SLIDING OR SWERVING DUE TO WET, ICY, SLIPPERY OR LOOSE SURFACE
125	SHLDR	SHOULDER GAVE WAY

FUNCTIONAL CLASSIFICATION TRANSLATION LIST

FUNC CLASS	DESCRIPTION
01	RURAL PRINCIPAL ARTERIAL - INTERSTATE
02	RURAL PRINCIPAL ARTERIAL - OTHER
06	RURAL MINOR ARTERIAL
07	RURAL MAJOR COLLECTOR
08	RURAL MINOR COLLECTOR
09	RURAL LOCAL
11	URBAN PRINCIPAL ARTERIAL - INTERSTATE
12	URBAN PRINCIPAL ARTERIAL - OTHER FREEWAYS AND EXP
14	URBAN PRINCIPAL ARTERIAL - OTHER
16	URBAN MINOR ARTERIAL
17	URBAN COLLECTOR
19	URBAN LOCAL
78	UNKNOWN RURAL SYSTEM
79	UNKNOWN RURAL NON-SYSTEM
98	UNKNOWN URBAN SYSTEM
99	UNKNOWN URBAN NON-SYSTEM

HIGHWAY COMPONENT TRANSLATION LIST

CODE	DESCRIPTION
0	MAINLINE STATE HIGHWAY
1	COUPLET
3	FRONTAGE ROAD
6	CONNECTION
8	HIGHWAY - OTHER

INJURY SEVERITY CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
1	KILL	FATAL INJURY
2	INJA	INCAPACITATING INJURY - BLEEDING, BROKEN BONES
3	INJB	NON-INCAPACITATING INJURY
4	INJC	POSSIBLE INJURY - COMPLAINT OF PAIN
5	PRI	DIED PRIOR TO CRASH
7	NO<5	NO INJURY - 0 TO 4 YEARS OF AGE

LIGHT CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	DAY	DAYLIGHT
2	DLIT	DARKNESS - WITH STREET LIGHTS
3	DARK	DARKNESS - NO STREET LIGHTS
4	DAWN	DAWN (TWILIGHT)
5	DUSK	DUSK (TWILIGHT)

MEDIAN TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	NONE	NO MEDIAN
1	RSDMD	SOLID MEDIAN BARRIER
2	DIVMD	EARTH, GRASS OR PAVED MEDIAN

MILEAGE TYPE CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
0	REGULAR MILEAGE
T	TEMPORARY
Y	SPUR
Z	OVERLAPPING

MOVEMENT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	STRGHT	STRAIGHT AHEAD
2	TURN-R	TURNING RIGHT
3	TURN-L	TURNING LEFT
4	U-TURN	MAKING A U-TURN
5	BACK	BACKING
6	STOP	STOPPED IN TRAFFIC
7	PRKD-P	PARKED - PROPERLY
8	PRKD-I	PARKED - IMPROPERLY

PEDESTRIAN LOCATION CODE TRANSLATION LIST

CODE	LONG DESCRIPTION
00	AT INTERSECTION - NOT IN ROADWAY
01	AT INTERSECTION - INSIDE CROSSWALK
02	AT INTERSECTION - IN ROADWAY, OUTSIDE CROSSWALK
03	AT INTERSECTION - IN ROADWAY, XWALK AVAIL UNKNWN
04	NOT AT INTERSECTION - IN ROADWAY
05	NOT AT INTERSECTION - ON SHOULDER
06	NOT AT INTERSECTION - ON MEDIAN
07	NOT AT INTERSECTION - WITHIN TRAFFIC RIGHT-OF-WAY
08	NOT AT INTERSECTION - IN BIKE PATH
09	NOT-AT INTERSECTION - ON SIDEWALK
10	OUTSIDE TRAFFICWAY BOUNDARIES
15	NOT AT INTERSECTION - INSIDE MID-BLOCK CROSSWALK
18	OTHER, NOT IN ROADWAY
99	UNKNOWN LOCATION

ROAD CHARACTER CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	INTER	INTERSECTION
2	ALLEY	DRIVEWAY OR ALLEY
3	STRGHT	STRAIGHT ROADWAY
4	TRANS	TRANSITION
5	CURVE	CURVE (HORIZONTAL CURVE)
6	OPENAC	OPEN ACCESS OR TURNOUT
7	GRADE	GRADE (VERTICAL CURVE)
8	BRIDGE	BRIDGE STRUCTURE
9	TUNNEL	TUNNEL

PARTICIPANT TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	OCC	UNKNOWN OCCUPANT TYPE
1	DRVR	DRIVER
2	PSNG	PASSENGER
3	PED	PEDESTRIAN
4	CONV	PEDESTRIAN USING A PEDESTRIAN CONVEYA
5	PTOW	PEDESTRIAN TOWING OR TRAILERING AN OB
6	BIKE	PEDALCYCLIST
7	BTOW	PEDALCYCLIST TOWING OR TRAILERING AN
8	PRKD	OCCUPANT OF A PARKED MOTOR VEHICLE
9	UNK	UNKNOWN TYPE OF NON-MOTORIST

TRAFFIC CONTROL DEVICE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
000	NONE	NO CONTROL
001	TRF SIGNAL	TRAFFIC SIGNALS
002	FLASHBCN-R	FLASHING BEACON - RED (STOP)
003	FLASHBCN-A	FLASHING BEACON - AMBER (SLOW)
004	STOP SIGN	STOP SIGN
005	SLOW SIGN	SLOW SIGN
006	REG-SIGN	REGULATORY SIGN
007	YIELD	YIELD SIGN
008	WARNING	WARNING SIGN
009	CURVE	CURVE SIGN
010	SCHL X-ING	SCHOOL CROSSING SIGN OR SPECIAL SIGNAL
011	OFCR/FLAG	POLICE OFFICER, FLAGMAN - SCHOOL PATROL
012	BRDG-GATE	BRIDGE GATE - BARRIER
013	TEMP-BARR	TEMPORARY BARRIER
014	NO-PASS-ZN	NO PASSING ZONE
015	ONE-WAY	ONE-WAY STREET
016	CHANNEL	CHANNELIZATION
017	MEDIAN BAR	MEDIAN BARRIER
018	PILOT CAR	PILOT CAR
019	SP PED SIG	SPECIAL PEDESTRIAN SIGNAL
020	X-BUCK	CROSSBUCK
021	THR-GN-SIG	THROUGH GREEN ARROW OR SIGNAL
022	L-GRN-SIG	LEFT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
023	R-GRN-SIG	RIGHT TURN GREEN ARROW, LANE MARKINGS, OR SIGNAL
024	WIGWAG	WIGWAG OR FLASHING LIGHTS W/O DROP-ARM GATE
025	X-BUCK WRN	CROSSBUCK AND ADVANCE WARNING
026	WW W/ GATE	FLASHING LIGHTS WITH DROP-ARM GATES
027	OVRHD SGNL	SUPPLEMENTAL OVERHEAD SIGNAL (RR XING ONLY)
028	SP RR STOP	SPECIAL RR STOP SIGN
029	ILUM GRD X	ILLUMINATED GRADE CROSSING
037	RAMP METER	METERED RAMPS
038	RUMBLE STR	RUMBLE STRIP
090	L-TURN REF	LEFT TURN REFUGE (WHEN REFUGE IS INVOLVED)
091	R-TURN ALL	RIGHT TURN AT ALL TIMES SIGN, ETC.
092	EMR SGN/FL	EMERGENCY SIGNS OR FLARES
093	ACCEL LANE	ACCELERATION OR DECELERATION LANES
094	R-TURN PRO	RIGHT TURN PROHIBITED ON RED AFTER STOPPING

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

VEHICLE TYPE CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
01	PSNGR CAR	PASSENGER CAR, PICKUP, ETC.
02	BOBTAIL	TRUCK TRACTOR WITH NO TRAILERS (BOBTAIL)
03	FARM TRCTR	FARM TRACTOR OR SELF-PROPELLED FARM EQUIPMENT
04	SEMI TOW	TRUCK TRACTOR WITH TRAILER/MOBILE HOME IN TOW
05	TRUCK	TRUCK WITH NON-DETACHABLE BED, PANEL, ETC.
06	MOPED	MOPED, MINIBIKE, MOTOR SCOOTER, OR MOTOR BICYCLE
07	SCHL BUS	SCHOOL BUS (INCLUDES VAN)
08	OTH BUS	OTHER BUS
09	MTRCYCLE	MOTORCYCLE
10	OTHER	OTHER: FORKLIFT, BACKHOE, ETC.
11	MOTRHOME	MOTORHOME
12	TROLLEY	MOTORIZED STREET CAR/TROLLEY (NO RAILS/WIRES)
13	ATV	ATV
14	MTRSCTR	MOTORIZED SCOOTER
15	SNOWMOBILE	SNOWMOBILE
99	UNKNOWN	UNKNOWN VEHICLE TYPE

WEATHER CONDITION CODE TRANSLATION LIST

CODE	SHORT DESC	LONG DESCRIPTION
0	UNK	UNKNOWN
1	CLR	CLEAR
2	CLD	CLOUDY
3	RAIN	RAIN
4	SLT	SLEET
5	FOG	FOG
6	SNOW	SNOW
7	DUST	DUST
8	SMOK	SMOKE
9	ASH	ASH

Appendix 2D
Technical Memorandum #4: Future Conditions

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TECHNICAL MEMORANDUM #4
FUTURE CONDITIONS ANALYSIS

Date: March 9, 2011 Project #: 11172

To: Mark Willrett, City of Klamath Falls and Stan Strickland, Klamath County
Cc: Project Management Team

From: Marc Butorac, PE, Erin Ferguson and Matt Kittelson
Project: Klamath Falls Urban Area Transportation System Plan Update
Subject: Technical Memorandum #4 Future Conditions Analysis

This memorandum summarizes the results of the future "No-Build" traffic conditions analysis for the Klamath Falls Urban Area Transportation System Plan (TSP) Update. The analysis includes evaluating how the study intersections will operate in the year 2035 assuming growth and development occur without any modifications to the transportation system.

The following sections present the model assumptions included in the intersection operations, provide a description of the methodology used to develop forecast traffic volumes at the study intersections, and discuss the results of the operations analyses. Future funding forecasts and funding options for future transportation system improvements are also discussed below.

MODEL POPULATION AND EMPLOYMENT GROWTH ASSUMPTIONS

This section documents the population and employment assumptions for the future traffic conditions analysis contained in the Klamath Falls 2002 Travel Demand Model. The model uses these assumptions to generate estimated future traffic volumes on the roadways within the Klamath Falls urban area. The link volumes are post processed (the methodology used to post-process the volumes is discussed below) and used in the future transportation conditions analysis. There are two fundamental pieces of information that influence how the future traffic volumes change relative to existing traffic volumes. One piece of information is the magnitude the population and employment opportunities change. The second piece of information is where within the study area the changes occur. Both of these elements are discussed below.

The Oregon Department of Transportation (ODOT) Transportation Planning Analysis Unit (TPAU) maintains and operates the Klamath Falls 2002 Model; TPAU provided the information on the model assumption as well as the future traffic roadway volumes. Table 1 summarizes the total percent change and yearly average percent change in population and employment from the model base year, 2008, to the model future year, 2037.

Table 1 Percent Change in Population and Employment for Klamath Falls Urban Area

Model Attribute	2008 Model Value	2037 Model Value	Increase	Total Percent Increase	Average Yearly Percent Increase
Households	**18,818**	**22,911**	**4,093**	**21.75%**	**0.75%**
All Employment Types	**19,951**	**24,024**	**4,073**	**20.42%**	**0.70%**
Agricultural Employment	357	357	0	0.00%	0.00%
Industrial Employment	2,014	2,031	17	0.84%	0.03%
Retail Employment	2,771	3,410	639	23.06%	0.80%
Service Employment	9,169	11,298	2,129	23.22%	0.80%
Education Employment	1,669	2,216	547	32.77%	1.13%
Government Employment	1,617	2,042	425	26.28%	0.91%
Other Employment	2,354	2,670	316	13.42%	0.46%

From Table 1, it is evident the population (as represented by the number of households) is anticipated to grow approximately the same amount as employment opportunities in the area. The largest growth in employment in terms of number of jobs is estimated to occur in service related employment, while the larges percent increases are forecasted for education and government related employment.

The location of the population and employment opportunities are organized by Transportation Analysis Zones (TAZ) within the model. Each TAZ has certain characteristics related to the number of households and employment opportunities within it. In reviewing the population growth per TAZ, the highest estimated increase in number of households is estimated to occur in the areas:

- North of downtown and southwest of US 97 (Dalles-California Highway);
- Immediately southwest of downtown;
- Southwest of the OR 66/OR 140 intersection;
- South along OR 140 (Southside Expressway); and
- East along Foothills Boulevard and Patterson Street.

A similar review of the employment forecasts indicates the highest increase in employment opportunities is estimated to occur in the areas:

- Adjacent to the Oregon Institute of Technology (OIT) Campus;
- Around and at the Klamath Falls Airport;
- Downtown Klamath Falls;
- Adjacent to and near Washburn Way and South 6th Street; and
- Adjacent to and near Foothills Boulevard and Patterson Street.

Given the forecasted increases in college students, education related employment as well as retail and service related employment, the general locations of the highest increases for households and employment opportunities seem reasonable and consistent.

The following section presents the future transportation conditions analysis using the traffic volumes estimated from the population and employment forecasts.

FUTURE TRANSPORTATION CONDITIONS

The following describes the weekday p.m. peak hour traffic volume development and the projected weekday p.m. peak hour traffic operations under year 2035 traffic conditions.

Traffic Volume Forecast

The turning movement counts provided by the Oregon Department of Transportation (ODOT) for the existing conditions analysis were used in conjunction with the link volumes provided by ODOT TPAU to derive future turning movements at the study intersections. The link volumes shown in the base year 2008 and future year 2037 TPAU traffic models were distributed at study intersections based on the existing distribution shown in the ODOT counts to derive base and future year turning movements at the study intersections. The existing, base, and future year turning movements were then used to derive future year *adjusted* turning movements following one of three methods outlined in the National Cooperative Highway Research Program Report 255 (NCHRP - Reference 1). The three methods are applied as follows:

- **Ratio Method:** For each turning movement the existing count volume is divided by the base model volume. The result is then multiplied by the future model volume to derive an *adjusted* volume that takes into account the difference between the model and the observed count. The results of this method were used as inputs to the Average Method described below, but were not used directly.
- **Difference Method:** Similar to the Ratio Method, for each turning movement the base model volume is subtracted from the existing count volume. The result is then added to the future model volume to derive a future *adjusted* volume that takes into account the net difference between the model and the observed count. The results of this method were used on occasion in place of the Average Method as described below.
- **Average Method:** This method is the most widely used method that averages the results of the ratio and the difference methods. In areas where high model volumes cause the Ratio Method, and thereby the Average Method, to results in unreasonably high *adjusted* volumes, the Difference Method is used. In areas low models volumes cause the Ratio Method, and thereby the Average Method, to results in unreasonably low *adjusted* volumes, the Difference Method is used.

The resulting turning movements were used in the traffic operations analysis as described below. *Attachment "A" contains the base and future year model outputs from the TPAU transportation demand model.*

Figure 1 shows the future 2035 year No Build traffic volumes. *Attachment "B" shows the forecasted peak hour growth for each intersection.*

YEAR 2035 FORECAST INTERSECTION OPERATIONS

As can be seen in Figure 1, 16 study intersections are forecasted to operate in excess of the applicable performance standard under 2035 conditions. A more detailed discussion of each can be found below. All operations analysis described in this report were performed in accordance with the procedures in the *2000 Highway Capacity Manual* (Reference 2). *Attachment "C" contains the operational analysis worksheets for the 2035 future conditions analysis.*

The ODOT study intersections were also evaluated against Highway Design Manual (HDM) standards for none stop-controlled movements. Based on these standards, the intersection of Fargo Street and OR 39 is forecasted to exceed applicable standards. Further discussion is included below.

Intersection 7. OR 39 / Biehn Street / Campus Drive

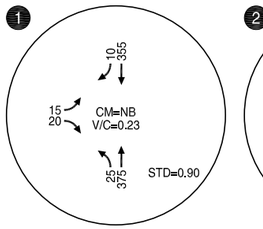
OR 39 and Biehn Street / Campus Drive is a signalized intersection located just south of the OR 39 / US 97 diverge point. This four-legged signalized intersection serves as a major access point to and from the Oregon Institute of Technology (OIT) campus and the Sky Lakes Medical Center. This location is forecasted to operate with a v/c ratio of 0.73, exceeding the ODOT mobility standard of 0.70. This high v/c ratio is due to demand from all approaches, particularly in the westbound direction.

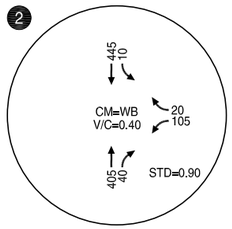
Intersection 14. Biehn Street / Oregon Avenue

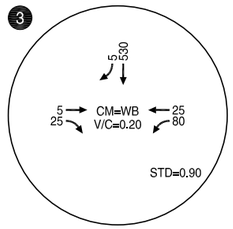
Biehn Street and Oregon Avenue, located to the east of the US 97 / Oregon Avenue interchange, is a 3-legged stop-controlled intersection. This location is forecasted to operate at LOS "F" under 2035 conditions, exceeding the City of Klamath Falls threshold for unsignalized intersections of LOS "E". This high LOS is due to an increase in demand southbound on Biehn St, which is the stop-controlled approach.

Intersection 23. Esplanade Drive / OR 39

Esplanade Drive and OR 39 is a four-way signalized intersection that connects downtown Klamath Falls with OR 39 (Crater Lake Parkway). This location is forecasted to operate with a v/c ratio of 0.95, exceeding the ODOT mobility standard at this location of 0.85. This v/c ratio is due to heavy through movements along OR 39 and high demand expected for the southbound left-turn from Esplanade Drive to OR 39.

1 US 97/ LAKEPORT BLVD


2 US 97/ DAN O'BRIEN WAY


3 US 97 SB/ COLI AVE


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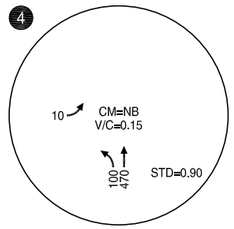
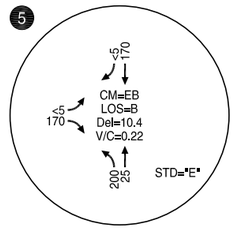
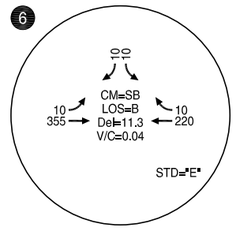
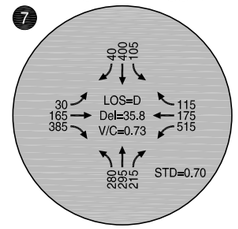
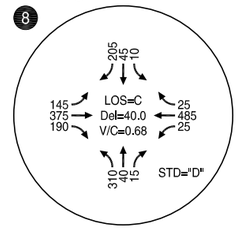
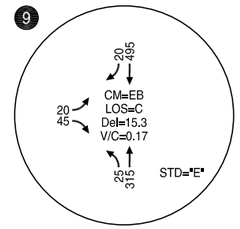


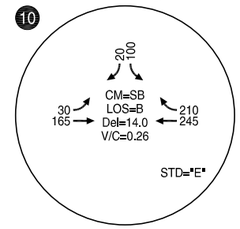
5 LAKEPORT BLVD/ HANKS ST


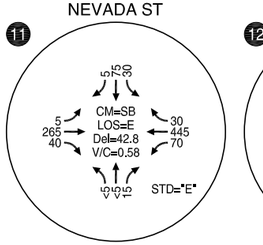
6 QUARRY ST/ LAKEPORT BLVD


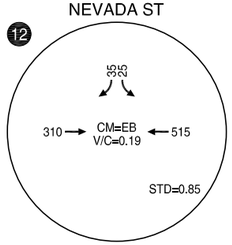
7 OR 39/ BIEHN ST / CAMPUS DR


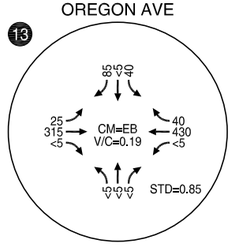
8 DAHLIA ST/ CAMPUS DR


9 BIEHN ST/ LAKEPORT BLVD


10 CALIFORNIA AVE/ NEVADA ST


11 MONTELIOUS ST/ NEVADA ST


12 US 97 SB OFF-RAMP/ NEVADA ST


13 US 97 NB RAMPS/ OREGON AVE


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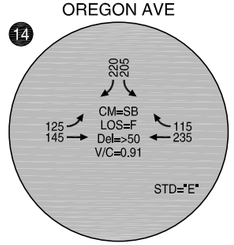
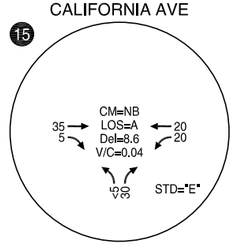
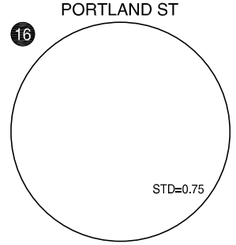
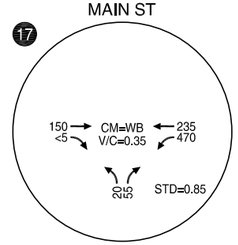
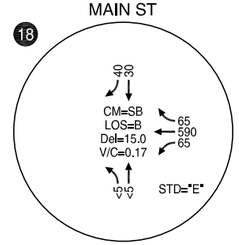
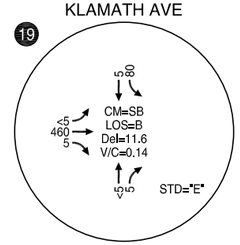


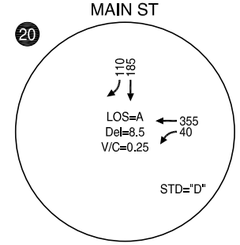
15 3RD ST/ CALIFORNIA AVE


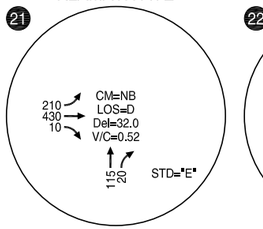
16 OR 39/ PORTLAND ST


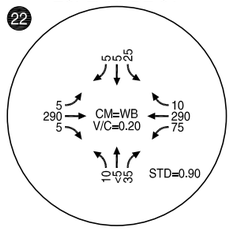
17 US 97 SB RAMPS/ MAIN ST


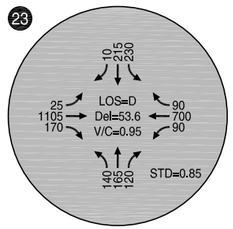
18 3RD ST/ MAIN ST


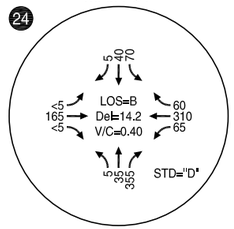
19 3RD ST/ KLAMATH AVE


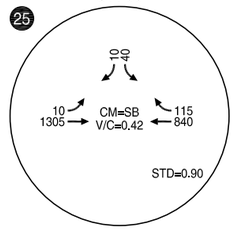
20 9TH ST/ MAIN ST


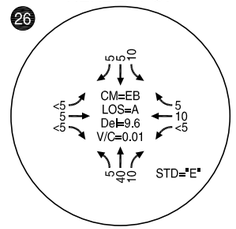
21 11TH ST/ KLAMATH AVE


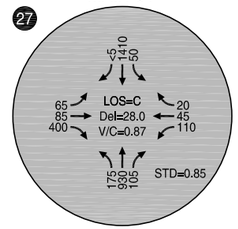
22 SPRING ST/ ESPLANADE ST


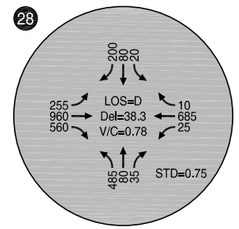
23 ESPLANADE DR/ OR 39


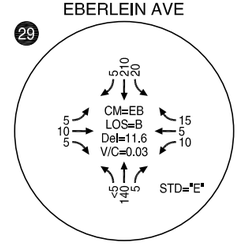
24 SPRING ST/ MAIN ST


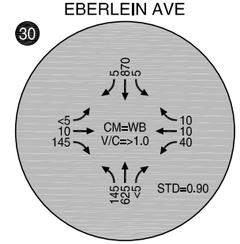
25 PACIFIC TERRACE/ OR 39


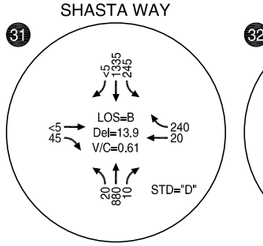
26 HILLSIDE DR/ HERBERT ST


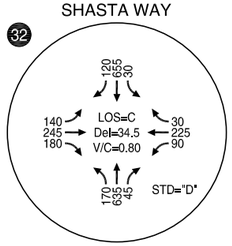
27 OR 39/ MAIN ST


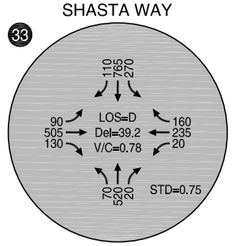
28 WASHBURN WAY/ OR 39


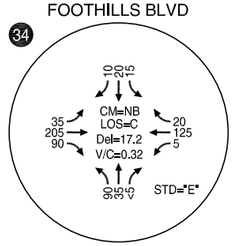
29 E MAIN ST/ EBERLEIN AVE


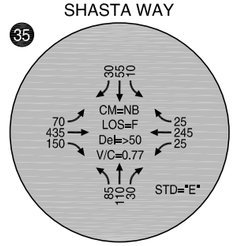
30 OR 39/ EBERLEIN AVE


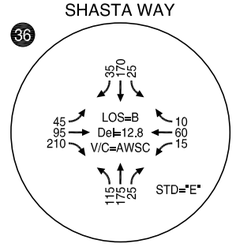
31 S 6TH ST/ SHASTA WAY


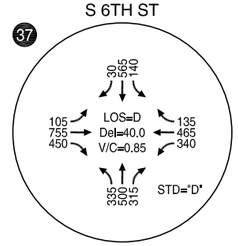
32 WASHBURN WAY/ SHASTA WAY


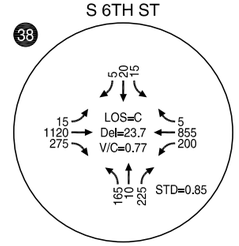
33 OR 39/ SHASTA WAY


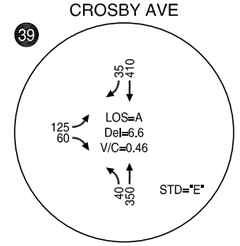
34 HOMEDALE RD/ FOOTHILLS BLVD


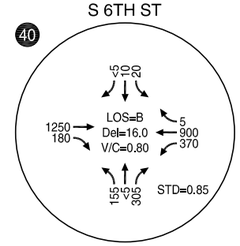
35 HOMEDALE RD/ SHASTA WAY


36 PATTERSON ST/ SHASTA WAY


37 WASHBURN WAY/ S 6TH ST


38 ALTAMONT DR/ S 6TH ST


39 ALTAMONT DR/ CROSBY AVE


40 SUMMERS LN/ S 6TH ST


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Future Year 2035 "No Build" Traffic Conditions Weekday PM Peak Hour

Figure 1a

H:\profile\11172 - Klamath Falls TSP\11172_Fig01_dwg comment update.dwg Mar 09, 2011 - 11:54am - openbnd Layout Tab: 1a

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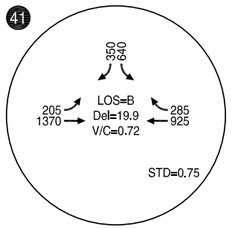
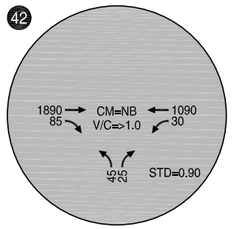
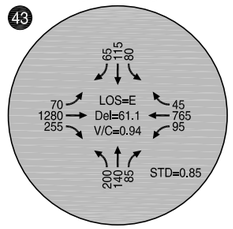
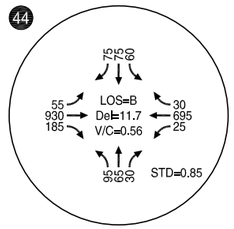
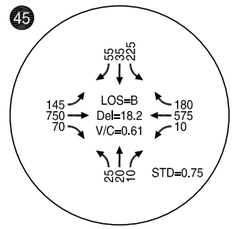
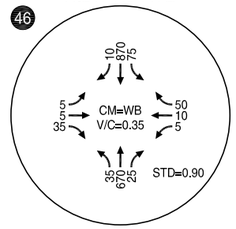


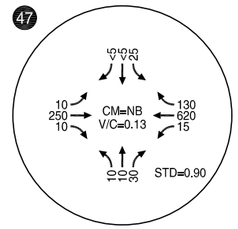
42 FARGO ST/ OR 39


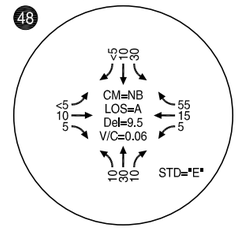
43 HOMEDALE RD/ OR 39/140


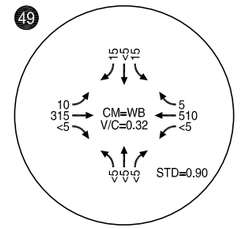
44 MADISON ST/ OR 39


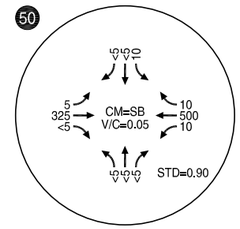
45 PATTERSON DR/ OR 39


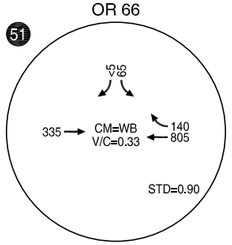
46 OR 39/ HILYARD AVE


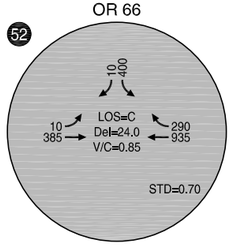
47 ORINDALE RD/ OR 140


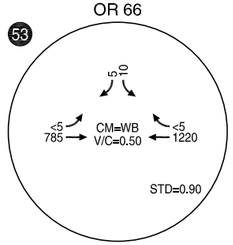
48 ORINDALE RD/ BALSAM DR


49 ORINDALE DR/ OR 66


50 EMERALD ST/ OR 66


51 BALSAM DR/ OR 66


52 OR 140/ OR 66


53 DELAP RD/ OR 66


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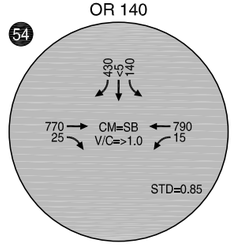

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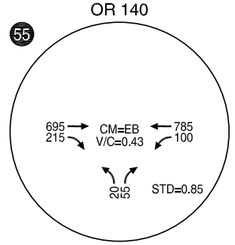
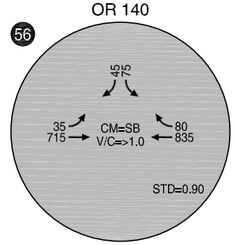


56 GREENSPRINGS DR/ OR 140


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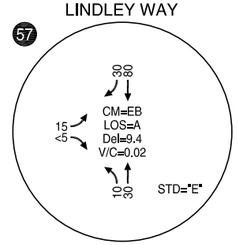

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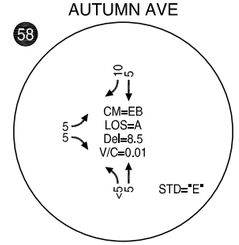
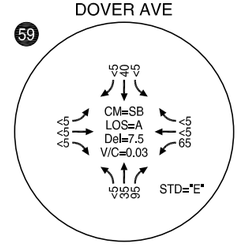


59 GREENSPRINGS DR/ DOVER AVE


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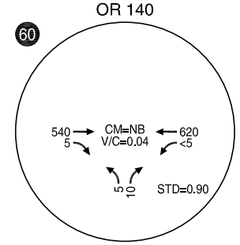
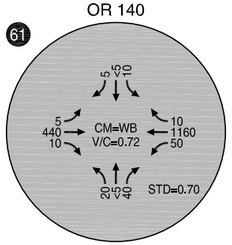
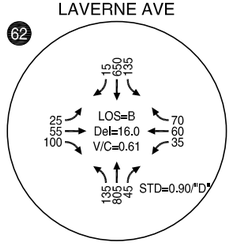
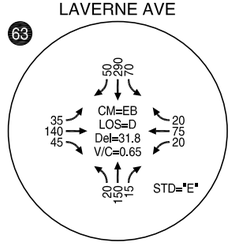


61 MIDLAND HWY/ OR 140


62 WASHBURN WAY/ LAVERNE AVE


63 ALTAMONT DR/ LAVERNE AVE


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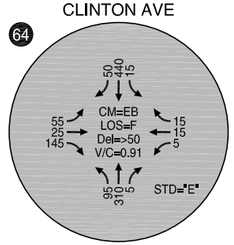

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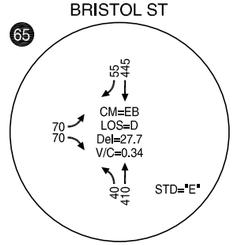

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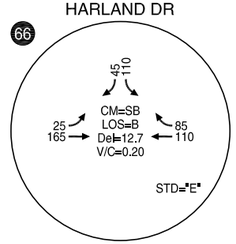
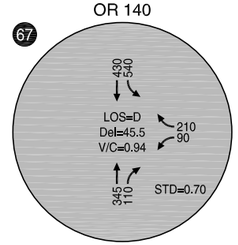
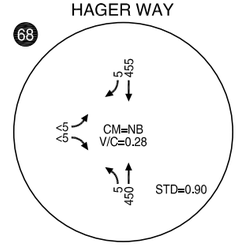
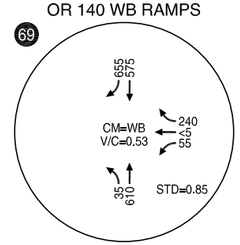


67 OR 39/ OR 140


68 OR 39/ HAGER WAY


69 WASHBURN WAY/ OR 140 WB RAMPS


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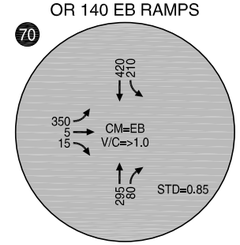

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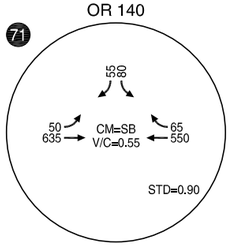

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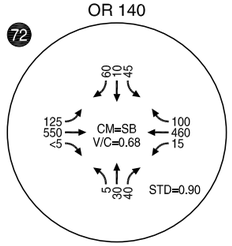
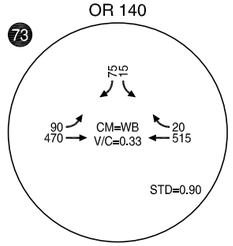


73 GLENWOOD DR/ OR 140


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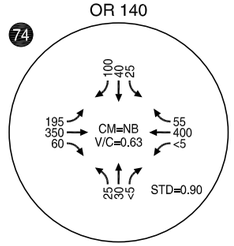

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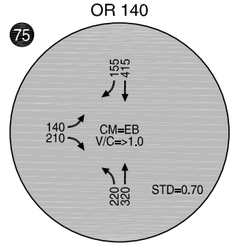


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Future Year 2035 "No Build" Traffic Conditions Weekday PM Peak Hour

Figure 1b

H:\profile\11172 - Klamath Falls TSP\11172_Fig01_dwg comment update.dwg Mar 09, 2011 - 11:54am - openbnd Layout Tab: 1b

Intersection 27. OR 39 / Main Street

OR 39 and Main Street is a four-legged signalized intersection that is expected to operate with a v/c ratio of 0.87 under future conditions, exceeding the ODOT mobility standard at this location of 0.85. This v/c ratio is due to heavy demand along OR 39, particularly in the through direction.

Intersection 28. Washburn Way / OR 39

Washburn Way and OR 39 is a four-legged signalized intersection that is expected to operate with a v/c ratio of 0.78 under future conditions, exceeding the ODOT mobility standard at this location of 0.75. This high v/c ratio is due to high northbound left-turn vehicles conflicting with heavy demand along OR 39.

Intersection 30. OR 39 / Eberlein Avenue

OR 39 and Eberlein Avenue is a four-legged stop-controlled intersection located along Crater Lake Highway. This location is forecasted to operate with a v/c ratio of in excess of 1.00 under future conditions, which exceeds the ODOT mobility standard for this location of 0.90. This high v/c ratio comes as the result of high demand from Eberlein Avenue to proceed southbound on OR 39.

Intersection 33. OR 39 / Shasta Way

OR 39 and Shasta Way is a four-legged signalized intersection which is forecasted to operate with a v/c ratio of 0.79, which is in excess of the ODOT mobility standard for this location of 0.75. This v/c ratio is the result of increasing demand on all four approaches. This intersection is expected to continue to be critical location for travelers traveling from neighborhoods in the east to activity centers in the west who use the Shasta Way corridor, including the Washburn Way corridor and downtown Klamath Falls.

Intersection 35. Homedale Road / Shasta Way

Homedale Road and Shasta Way is a four-legged unsignalized intersection located north of OR 39. The northbound approach at this intersection is forecasted to operate at LOS "F", which exceeds the Klamath County performance threshold for this location of LOS "E". This location operates poorly due to increasing demand northbound on Homedale Road conflicting with demand on Shasta Way. Like the intersection of OR 39 and Shasta Way, this location is expected to serve increasing demand from travelers on the Shasta Way corridor into the future.

Intersection 42. Fargo Street / OR 39

Fargo Street and Oregon 39 is a three-legged unsignalized intersection located just east of the OR 39 and South 6th Street intersection. The northbound approach at the intersection is forecasted to

operate with a v/c ratio in excess of 1.00 under future year conditions, exceeding the ODOT mobility standard for this location of 0.90. Given the close proximity of this intersection to the intersections of OR 39 and South 6th Street, this intersection will likely experience queue spillback from that location that will make turns from the side-street location increasingly challenging into the future.

This intersection also is forecasted to exceed applicable HDM standards in the eastbound direction. This movement is expected to operate with a v/c ratio of 0.78, exceeding the applicable standard of 0.75.

Intersection 43. Homedale Road / OR 39/140

Homedale Road and OR 39/140 is a four-legged signalized intersection that is forecasted to operate with a v/c ratio of 0.94 under future conditions, exceeding the ODOT mobility standard for this location of 0.85. This v/c ratio is the result of heavy demand along the OR 39/140 mainline and relatively high demand from the side-streets for left-turns and through-movements, especially in the northbound direction. This intersection is currently part of the a coordinated signal system along the South 6th Street/OR 39 corridor.

Intersection 52. OR 140 / OR 66

OR 140 and OR 66 is a three-legged signalized intersection that is forecasted to operate with a v/c ratio of 0.85 under future year conditions, which exceeds the ODOT mobility standard for this location of 0.70. This high v/c ratio is due to increasing traffic demand at this location, especially the single lane southbound left-turn lane, which is expected to have a demand of 400 vehicles during the weekday p.m. peak hour. This intersection is located directly west of the US 97 / OR 140 interchange and will likely be included in the forthcoming Greensprings IAMP study.

Intersection 54. US 97 SB Ramps / OR 140

US 97 SB Ramps and OR 140 is a three-legged ramp terminal intersection and is part of the US 97 / OR 140 interchange. The southbound stop-controlled approach is forecasted to operate with a v/c ratio in excess of 1.00, which exceeds the ODOT mobility standard for this location of 0.85. This high v/c ratio is the result of over a future demand of over 420 vehicles for the southbound right-turn lane and over 140 vehicles for the southbound left-turn lane during the peak hour. Like the intersection of OR 140 and OR 66, this intersection will likely be included in the forthcoming Greensprings IAMP study.

Intersection 56. Greensprings Drive / OR 140

Greensprings Drive and OR 140 is a three-legged unsignalized intersection whose southbound approach is forecasted to operate with a v/c ratio in excess of 1.00, which is in excess of the ODOT mobility standard for this location of 0.85. This v/c ratio is the result of moderate

southbound demand conflicting with high through volumes on OR 140. Like previous locations discussed, this intersection will likely be included in the forthcoming Greensprings IAMP study.

Intersection 61. Midland Highway / OR 140

Midland Highway and OR 140 is a four-legged unsignalized intersection that is forecasted to exceed the ODOT mobility standard for this location of 0.70. The uncontrolled westbound approach is expected to operate with a v/c ratio of 0.72 due to high through volumes.

Intersection 64. Summers Lane / Clinton Avenue

Summers Lane and Clinton Avenue is a four-legged unsignalized intersection. The eastbound approach is forecasted to operate at LOS "F" in the future, which exceeds the Klamath County performance threshold for this location of LOS "E". This location serves mostly local trips from nearby neighborhoods as wells as north-south trips on Summers Lane between South 6th Street and OR 140.

Intersection 67. OR 39 / OR 140

OR 39 and OR 140 is a three-legged signalized intersection that is forecasted to operate with a v/c ratio of 0.94 under future conditions, exceeding the ODOT mobility standard for this location of 0.70. This v/c ratio is the result of heavy demand for the southbound left-turn movement, which is projected to be approximately 540 vehicles during the peak hour under future conditions. This intersection is the northern diverge point for the shared alignment of OR 39 and OR 140.

Intersection 70. Washburn Way / OR 140 EB Ramps

Washburn Way and OR 140 EB Ramps is a ramp terminal intersection that is part of the Washburn Way / OR 140 interchange. This intersection is reported to operate in excess of the applicable 0.85 in existing conditions and this is further exacerbated under future conditions. As stated in the existing conditions analysis, this intersection is included in a STIP project aimed at signalizing the ramp terminals at this interchange.

Intersection 75. OR 140 / OR 39

OR 140 and OR 39 is a three-legged unsignalized intersection. This location is the southern diverge point of the shared alignment of OR 140 and OR 39 on the east side of Klamath Falls. The OR 140 eastbound approach is forecasted to operate with a v/c ratio of 0.96, which exceeds the ODOT mobility standard for this location of 0.70. This location has a high v/c ratio because of consistent demand from all approach of this intersection.

Traffic Signal Warrants

Signal warrant analyses were conducted at the nine unsignalized intersection that are forecasted to exceed the applicable performance standard under future conditions. The results of those analyses can be found in Table 2 below. *Attachment "D" contains the traffic signal warrant analysis worksheets.*

Table 2 Future Year Signal Warrant Analysis

Intersection	Signal Warrant		
	Peak Hour	Four-Hour	Eight-Hour
14. Biehn St / Oregon Ave	Met	Met	Not Met
30. OR 39 / Eberlein Ave[1]	Met	Met	Met
35. Homedale Rd / Shasta Way	Met	Met	Not Met
42. Fargo St / OR 39	Not Met	Not Met	Not Met
54. US 97 SB Ramps / OR 140	Met	Met	Met
56. Green Springs Dr / OR 140	Met	Met	Met
64. Summers Ln / Clinton Ave	Met	Met	Not Met
70. Washburn Way / OR 140 EB Ramps	Met	Met	Met
75. OR 39 / OR 140	Met	Met	Met

Note: [1]Warrant met due to high eastbound right-turn volume. Further consideration should be given

Based on ODOT guidance, only intersections that exceed the Eight-Hour signal warrant under future conditions should be considered for signal installation. Based on these criteria, 5 of the 9 intersections listed above meet signal warrants.

Summary of 2035 Baseline Traffic Conditions

Below is a summary of the major findings of the future conditions operational analysis.

- 16 of the 75 study intersections were found to operate in excess of applicable performance standards under future conditions.
- 12 of the 16 intersections that do not meet performance standards under future conditions are located on state facilities.
- Of the 16 study intersections that did not meet performance standards, 9 were unsignalized locations.
- Of the 9 unsignalized locations that did not meet performance standards, 5 met the eight-hour signal warrant.
- Overall, moderate growth is traffic volumes are expected to occur within the Klamath Falls Urban Area. As such, limited operational issues have been identified under the future conditions analysis.

TRANSPORTATION PLANNED FUNDING SOURCES

Capital projects as well as operations and maintenance of roadways within the Klamath Falls Urban Area are funded through the City of Klamath Falls Street Division and Klamath County Public Works. The planned transportation funding sources for the City of Klamath Falls Street Division and Klamath County Public Works currently include:

- Surface Transportation Program (STP) funds through ODOT;
- Federal Forest Receipts,
- Gas taxes,
- Franchise fees,
- Specific area System Development Charges (SDC), and
- Motor vehicle apportionments.

Technical Memorandum #3 Existing Conditions documents the recent historical funding amounts from each source above. In general, these funds are anticipated to provide approximately the same amount of revenue as previous recent years. The primary exception to that assumption is the Federal Forest Receipts funds, which are expected to end in two years. A discussion of forecasted funds from the sources above is below.

Forecasted Funds

The forecasted funds reflect a decline for the City and County primarily due to the forecasted end to the Federal Forest Receipt funds.

City of Klamath Falls Street Division - Historically, the City has had approximately $450,000 available for capital projects and $1.7 million per year for operations and maintenance. Monies from the Federal Forest Receipts comprise approximately 17% ($370,000) of their funding and the federal forest receipts funds are expected to cease in two years. Without alternative funding sources, the City's funds will likely decrease.

Klamath County Public Works - Klamath County Public Works Department budget has been steadily declining in recent years from a high of $14.8 million in 2008 to $12.7 million in 2010. The declining trend is forecasted to continue with an anticipated 2013 budget of $6.1 million. Similar to the City, the primary cause of the decrease is the decreasing amount of funds from Federal Forest Receipts. In 2010, Federal Forest Receipts comprised 70% ($8,883,833) of Klamath County's budget. To maintain funds near current values, the County will also need to consider alternative funding sources.

Potential Funding Sources

Potential new funding sources that could help close the gap left by the Federal Forest Receipts are discussed below in Table 3.

Table 3 Potential Funding Sources

Funding Source	Description	Benefits
User Fee	Fees tacked onto a monthly utility bill or tied to the annual registration of a vehicle to pay for improvements, expansion, and maintenance to the street system. This may be a more equitable assessment given the varying fuel efficiency of vehicles. Regardless of fuel efficiency, passenger vehicles do equal damage to the street system. The cost of implementing such a system could be prohibitive given the need to track the number of vehicle miles traveled in every vehicle. Additionally, a user fee specific to a single jurisdiction does not account for the street use from vehicles registered in other jurisdictions.	Primarily Street Improvements
Street Utility Fees/Road Maintenance Fee	The fee is based on the number of trips a particular land use generates and is usually collected through a regular utility bill. For the communities in Oregon that have adopted this approach, it provides a stable source of revenue to pay for street maintenance allowing for safe and efficient movement of people, goods, and services.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails
Local Fuel Tax	A local tax assessed on fuel purchased within the jurisdiction that has assessed the tax. Some would argue that this tax is unfair given the increased fuel efficiency of today's vehicles. On the other hand, the tax could potentially generate revenue while encouraging fuel efficiency and lessening impacts to the environment.	Primarily Street Improvements
Systems Development Charges (SDCs)	SDCs are fees assessed on development for their impacts on public infrastructure. City of Klamath Falls currently has SDCs in place for one area of the City; expanding their application could generate additional revenue.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Stormwater SDCs, Grants, and Loans	SDCs, Grants, and Loans obtained for the purposes of making improvements to stormwater management facilities. Some jurisdictions in Oregon have used these tools to finance the construction and maintenance of Green Streets.	Primarily Street Improvements

Funding Source	Description	Benefits
Local Sales Tax	A tax assessed on the purchase of goods and services within a specific location. A sales tax could be assessed only on auto-related goods and services to generate revenue for transportation-related improvements.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Optional Tax	A tax that is paid at the option of the taxpayer to fund improvements. Usually not a legislative requirement to pay the tax and paid at the time other taxes are collected, optional taxes are usually less controversial and easily collected since they require the taxpayer to decide whether or not to pay the additional tax.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Parking In-lieu Fees	Fees that are assessed to developers that cannot or do not want to provide the parking for development.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Sponsorship	Financial backing of a public-interest program or project by a firm, as a means of enhancing its corporate image. This has been used by local transit providers to help offset the cost of providing transit services and maintaining transit related improvements.	Transit Facilities
Incentives	An enticement such as bonus densities and flexibility in design in exchange for a public benefit. Examples might include a Commute Trip Reduction (CTR) program, or transit facilities in exchange for bonus densities.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit

Funding Source	Description	Benefits
Public/Private Partnerships	Rarely used for transportation facilities, public/private partnerships are agreements between public and private partners that can benefit from the same improvements. They have been used in several places around the country to provide public transportation amenities within the public right-of-way in exchange for operational revenue from the facilities. These partnerships could be used to provide services such as charging stations, public parking lots, bicycle lockers, or carshare facilities.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit
Tax Increment Financing (TIF)	A tool cities use to create special districts (tax increment areas) and to make public improvements within those districts that will generate private-sector development. During a defined period, the tax base is frozen at the predevelopment level. Property taxes for that period can be waived or continue to be paid, but taxes derived from increases in assessed values (the tax increment) resulting from new development either go into a special fund created to retire bonds issued to originate the development or leverage future improvements. A number of small-to-medium sized communities in Oregon have implemented, or are considering implementing, urban renewal districts that will result in a TIF revenue stream.	System-wide transportation facilities including: • Streets • Sidewalks • Bike lanes • Trails • Transit

Table 3 is not an all-inclusive list of alternative funding sources. Each of these financing tools requires focused research to ensure that it is the right fit for the community, and can be closely matched with achieving the objectives of the TSP update.

REFERENCES

1. National Cooperative Highway Research Program, Highway traffic Data for Urbanized Area Project Planning and Design (Report 255). 1982.
2. Transportation Research Board. *Highway Capacity Manual*. 2000.

APPENDICES

Appendix A – TPAU Model Outputs

Appendix B – Project Growth by Movement Figure

Appendix C – 2035 Future Conditions Operational Analysis Worksheets

Appendix D – Traffic Signal Warrant Analysis

Appendices
Draft Technical Memorandum #4 Future Conditions

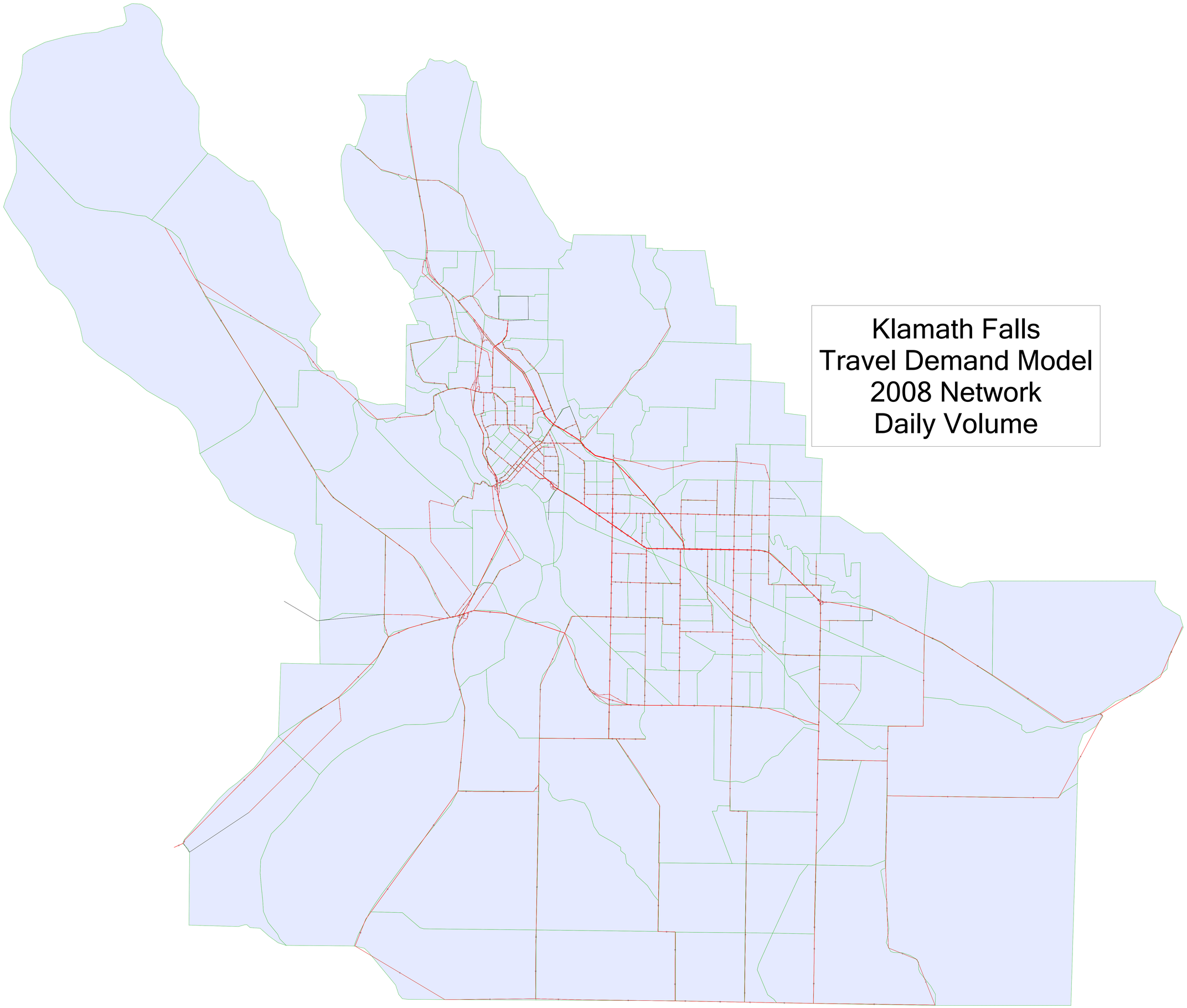
APPENDIX A – TPAU MODEL OUTPUTS

APPENDIX B – PROJECTED GROWTH BY MOVEMENT FIGURE

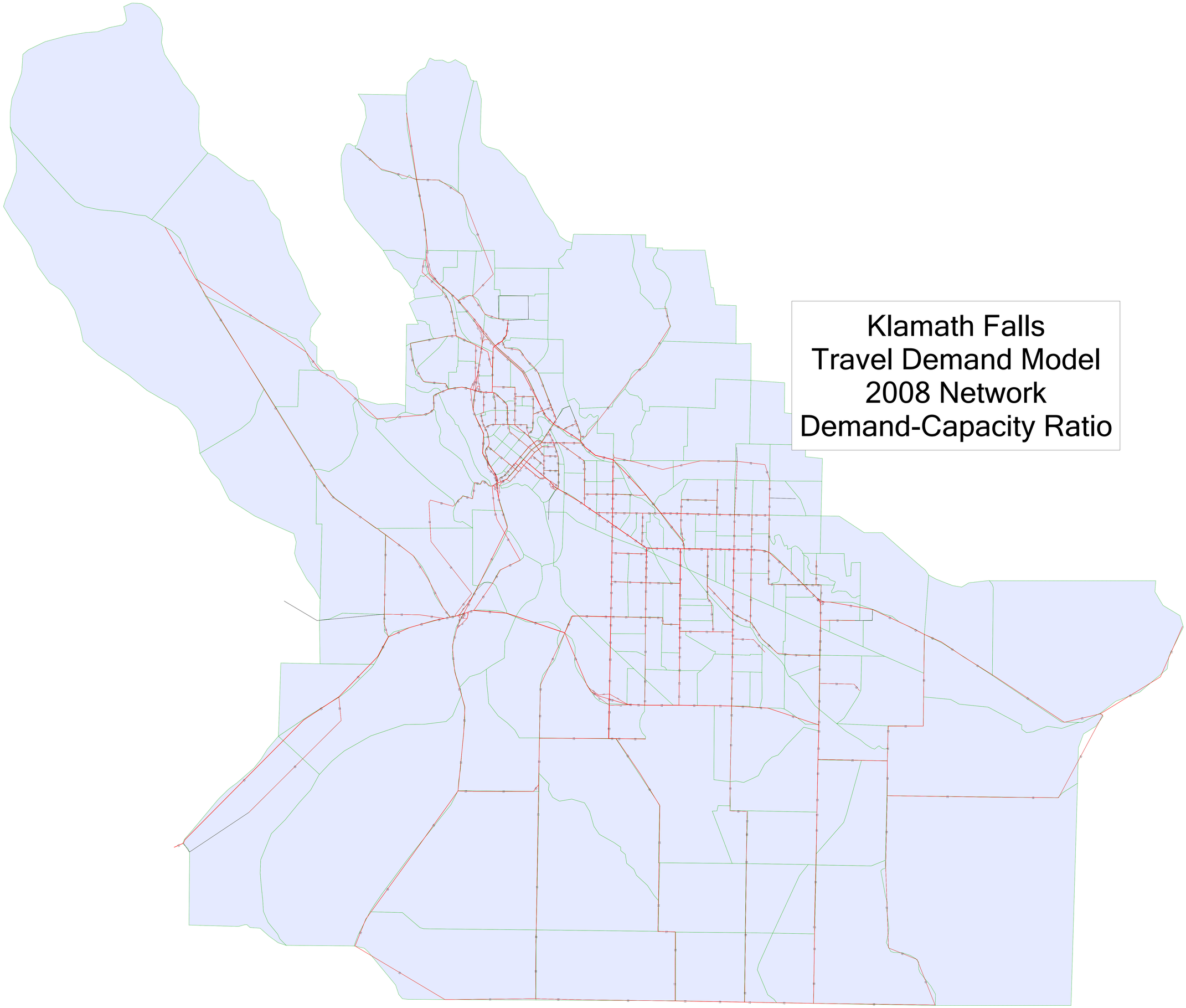
APPENDIX C - 2035 FUTURE CONDITIONS OPERATIONAL ANALYSIS WORKSHEETS

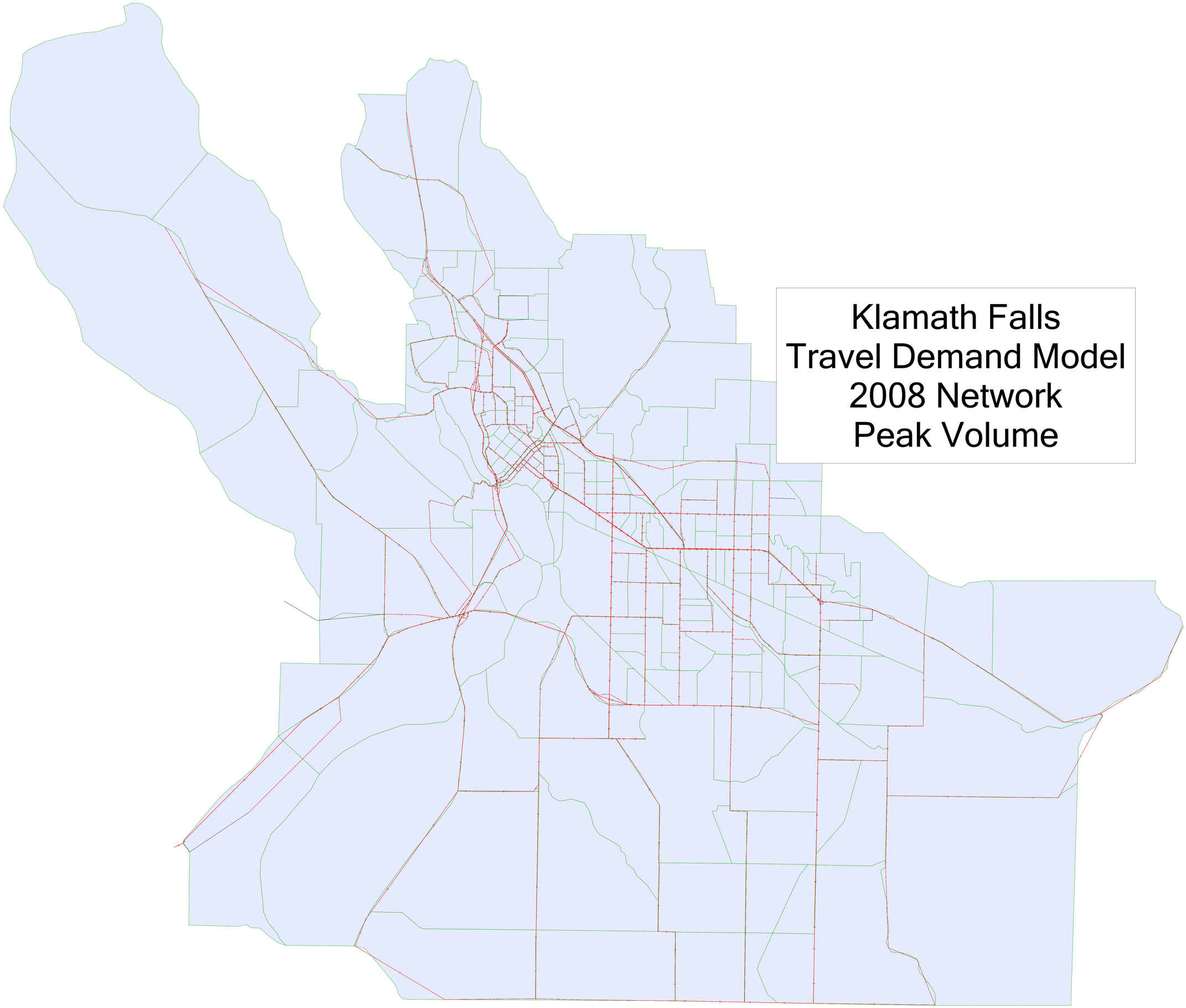
APPENDIX D - TRAFFIC SIGNAL WARRANT ANALYSIS

APPENDIX A – TPAU MODEL OUTPUTS


Klamath Falls
Travel Demand Model
2008 Network
Daily Volume

Klamath Falls
Travel Demand Model
2008 Network
Demand-Capacity Ratio

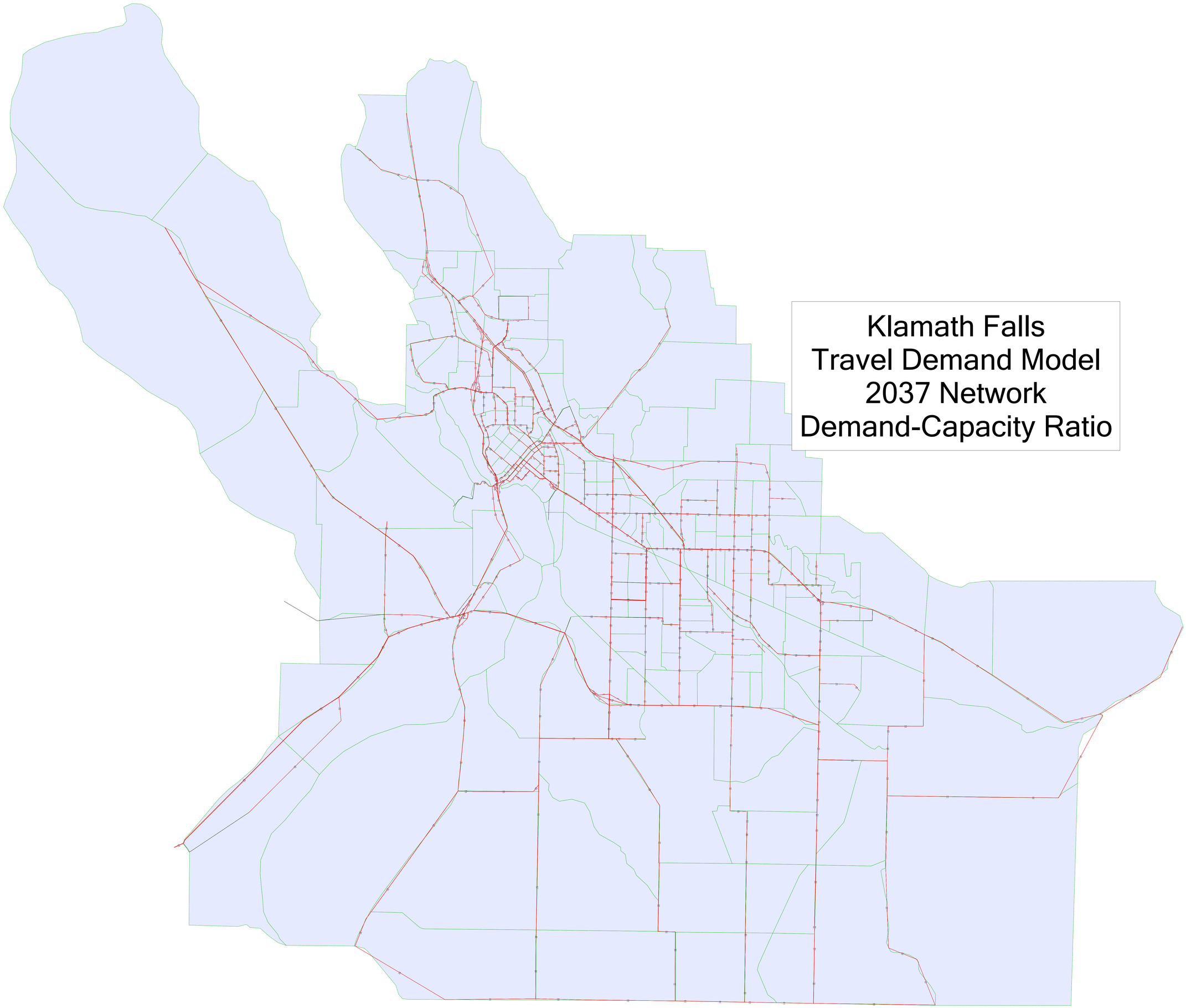




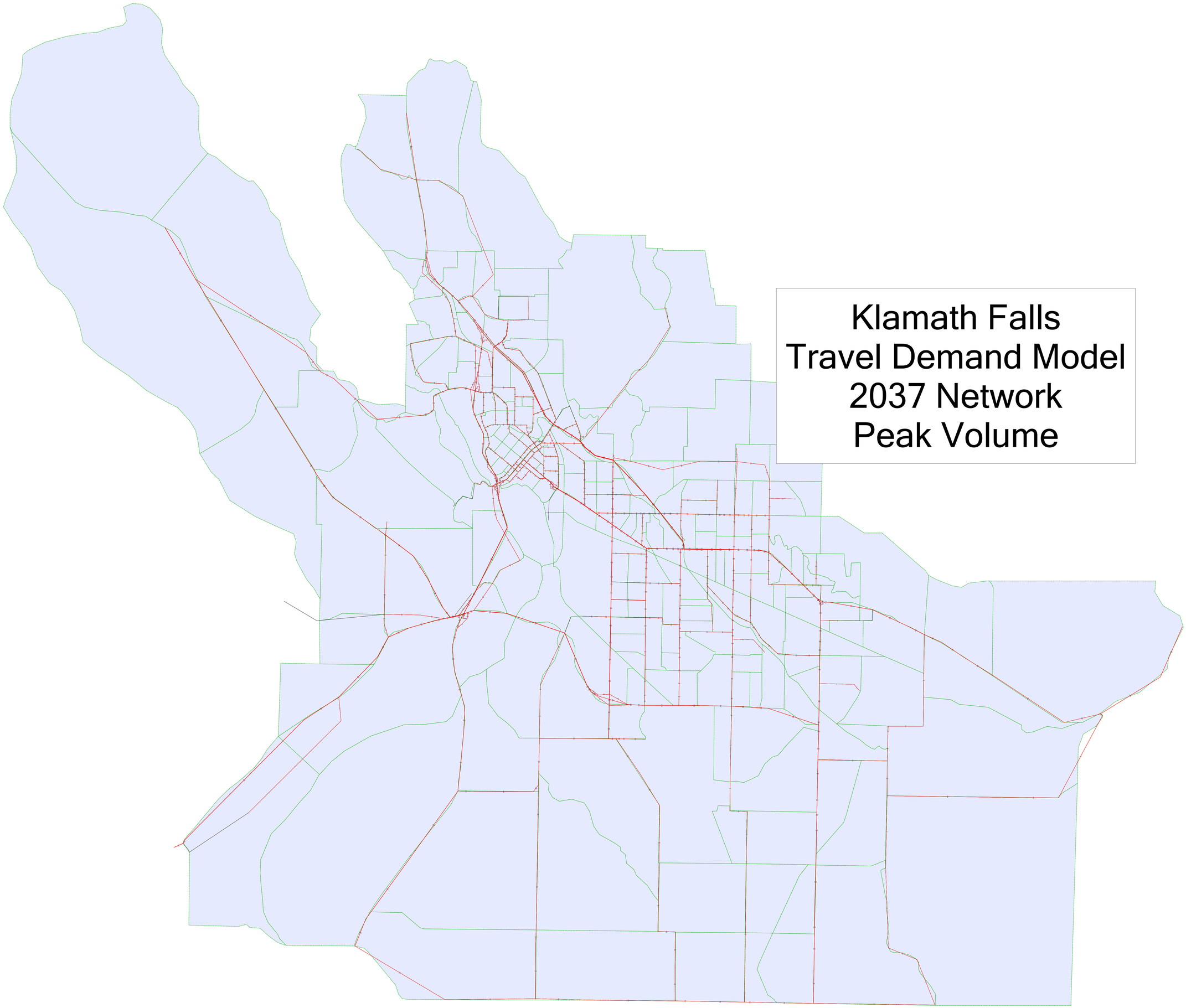
Klamath Falls
Travel Demand Model
2008 Network
Peak Volume

Klamath Falls
Travel Demand Model
2037 Network
Daily Volume

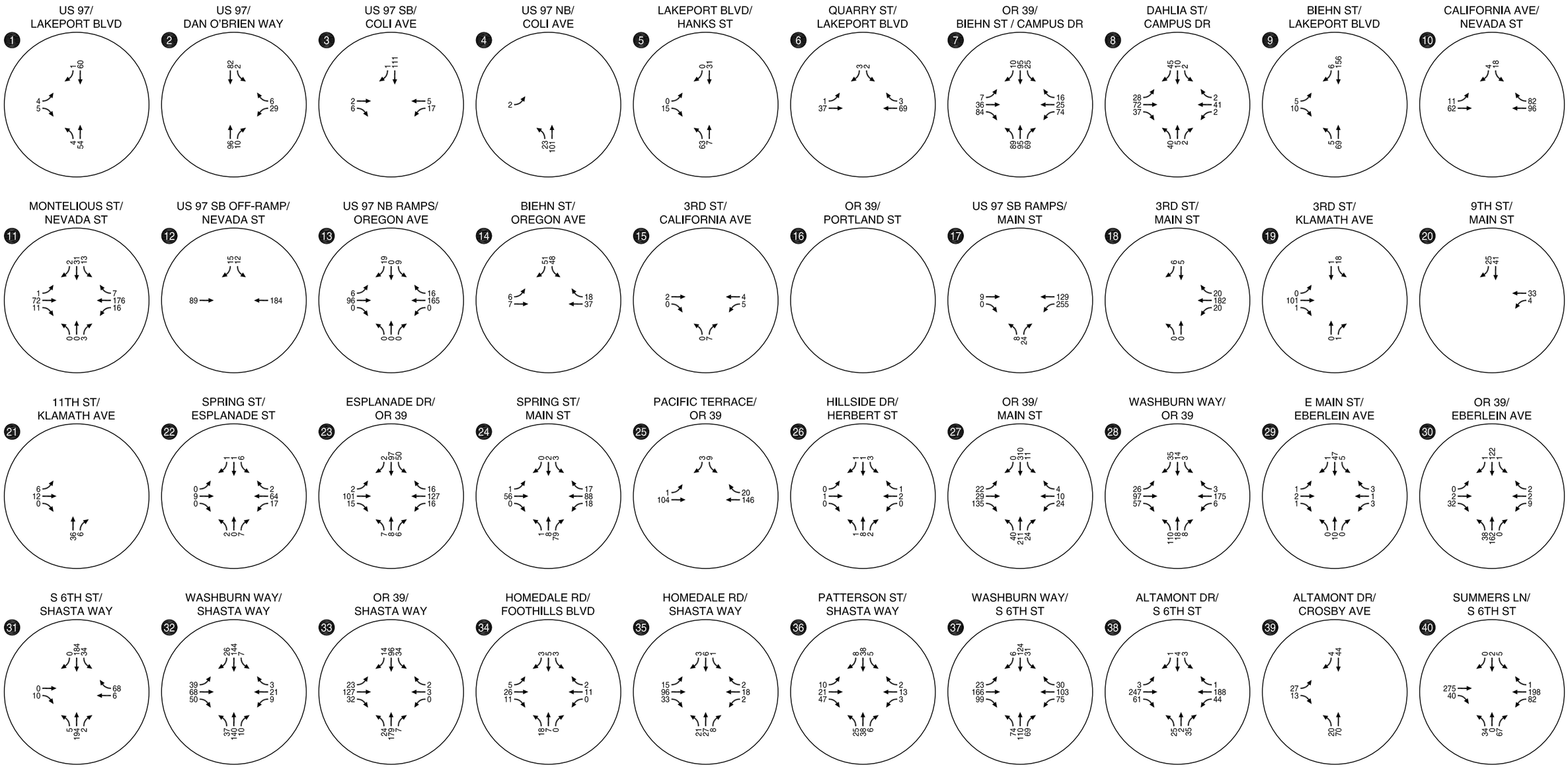
Klamath Falls
Travel Demand Model
2037 Network
Demand-Capacity Ratio



Klamath Falls
Travel Demand Model
2037 Network
Peak Volume



APPENDIX B – PROJECTED GROWTH BY MOVEMENT FIGURE

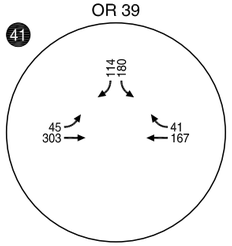


Project Traffic Growth by Movement 2010 - 2035

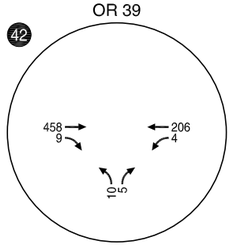
Figure 2a

H:\proj\file\11172 - Klamath Falls TSP\11172_Fig02_dwg.dwg Mar 09, 2011 - 11:59am - openbnd Layout Tab: 2a

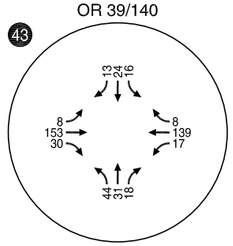
41 S 6TH ST/ OR 39



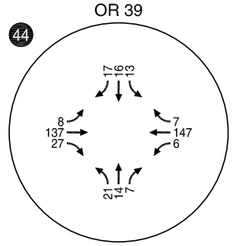
42 FARGO ST/ OR 39



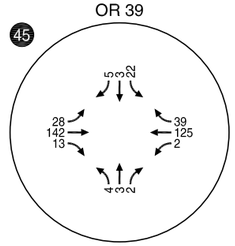
43 HOMEDALE RD/ OR 39/140



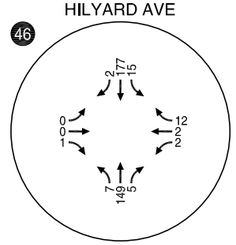
44 MADISON ST/ OR 39



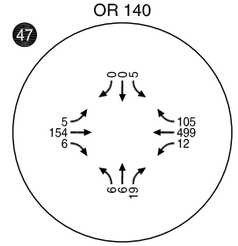
45 PATTERSON DR/ OR 39



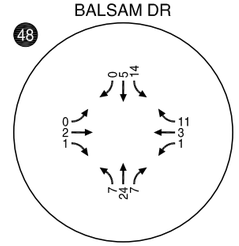
46 OR 39/ HILYARD AVE



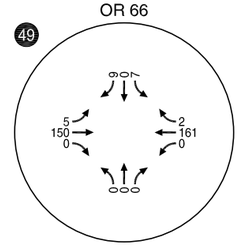
47 ORINDALE RD/ OR 140



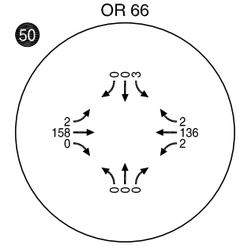
48 ORINDALE RD/ BALSAM DR



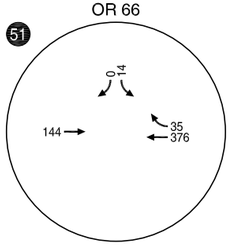
49 ORINDALE DR/ OR 66



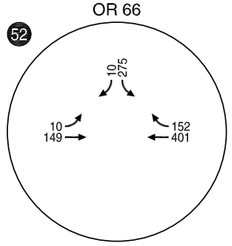
50 EMERALD ST/ OR 66



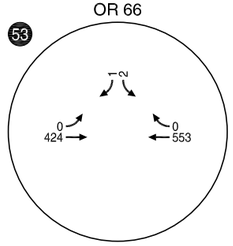
51 BALSAM DR/ OR 66



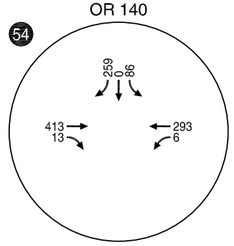
52 OR 140/ OR 66



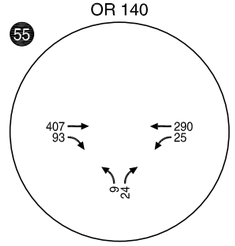
53 DELAP RD/ OR 66



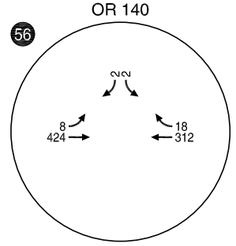
54 US 97 SB RAMPS/ OR 140



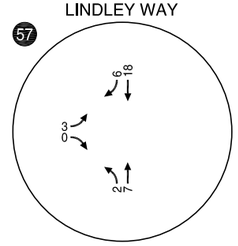
55 US 97 NB RAMPS/ OR 140



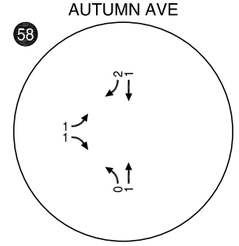
56 GREENSPRINGS DR/ OR 140



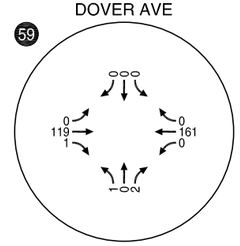
57 RIVERSIDE DR/ LINDLEY WAY



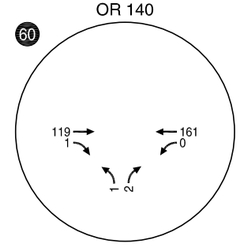
58 RIVERSIDE DR/ AUTUMN AVE



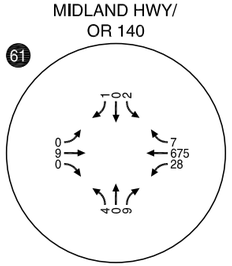
59 GREENSPRINGS DR/ DOVER AVE



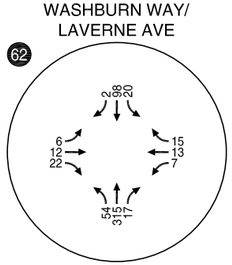
60 MEMORIAL DR/ OR 140



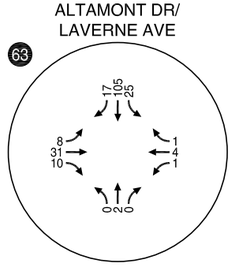
61 MIDLAND HWY/ OR 140



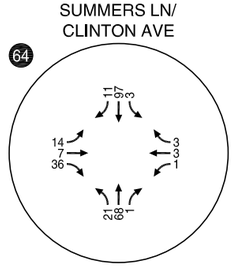
62 WASHBURN WAY/ LAVERNE AVE



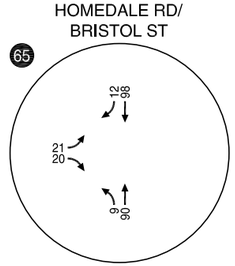
63 ALTAMONT DR/ LAVERNE AVE



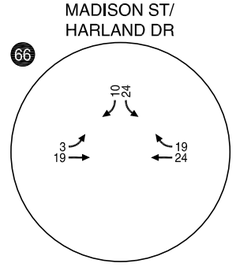
64 SUMMERS LN/ CLINTON AVE



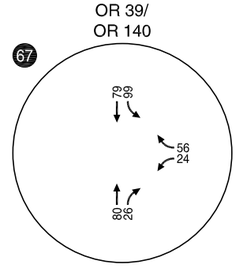
65 HOMEDALE RD/ BRISTOL ST



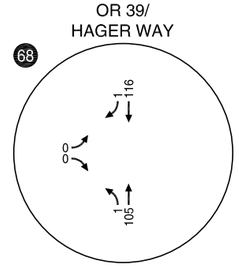
66 MADISON ST/ HARLAND DR



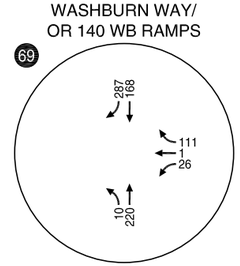
67 OR 39/ OR 140



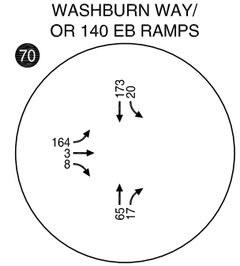
68 OR 39/ HAGER WAY



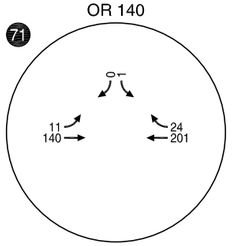
69 WASHBURN WAY/ OR 140 WB RAMPS



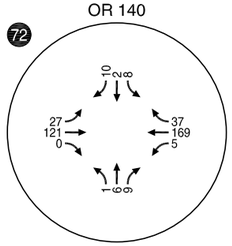
70 WASHBURN WAY/ OR 140 EB RAMPS



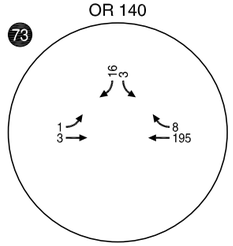
71 ALTAMONT DR/ OR 140



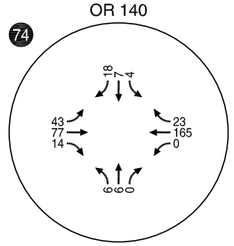
72 SUMMERS LN/ OR 140



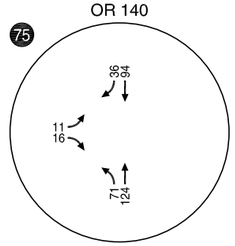
73 GLENWOOD DR/ OR 140



74 HOMEDALE RD/ OR 140



75 OR 39/ OR 140



Project Traffic Growth by Movement 2010 - 2035

Figure 2b

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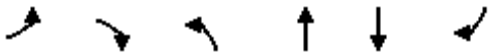
APPENDIX C - 2035 FUTURE CONDITIONS OPERATIONAL ANALYSIS WORKSHEETS



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	20	25	374	357	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	21	26	394	376	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	826	380	384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826	380	384			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	98			
cM capacity (veh/h)	337	671	1185			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	37	26	394	384
Volume Left	16	26	0	0
Volume Right	21	0	0	8
cSH	471	1185	1700	1700
Volume to Capacity	0.08	0.02	0.23	0.23
Queue Length 95th (ft)	6	2	0	0
Control Delay (s)	13.3	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.3	0.5		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	107	22	403	42	10	444
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	111	23	420	44	10	462
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	903	420			464	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	903	420			464	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	64	96			99	
cM capacity (veh/h)	306	638			1108	

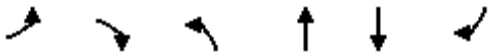
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	134	420	44	10	462
Volume Left	111	0	0	10	0
Volume Right	23	0	44	0	0
cSH	336	1700	1700	1108	1700
Volume to Capacity	0.40	0.25	0.03	0.01	0.27
Queue Length 95th (ft)	47	0	0	1	0
Control Delay (s)	22.7	0.0	0.0	8.3	0.0
Lane LOS	C			A	
Approach Delay (s)	22.7	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	39.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	7	27	78	23	0	0	0	0	1	528	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	7	28	82	24	0	0	0	0	1	556	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	572	559	279	312	561	0	559			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	572	559	279	312	561	0	559			0		
tC, single (s)	7.5	6.5	7.0	7.5	6.6	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	100	98	96	86	94	100	100			100		
cM capacity (veh/h)	390	440	709	590	426	1091	1022			1636		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	36	106	279	281
Volume Left	0	82	1	0
Volume Right	28	0	0	3
cSH	630	542	1636	1700
Volume to Capacity	0.06	0.20	0.00	0.17
Queue Length 95th (ft)	5	18	0	0
Control Delay (s)	11.1	13.3	0.0	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.1	13.3	0.0	
Approach LOS	B	B		

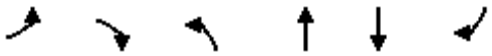
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	35.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	8	0	101	469	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	106	494	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	459	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	459	0	0			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	93			
cM capacity (veh/h)	500	1091	1614			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3
Volume Total	8	106	247	247
Volume Left	8	106	0	0
Volume Right	0	0	0	0
cSH	500	1614	1700	1700
Volume to Capacity	0.02	0.07	0.15	0.15
Queue Length 95th (ft)	1	5	0	0
Control Delay (s)	12.3	7.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.3	1.3		
Approach LOS	B			

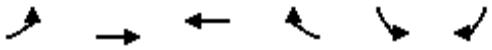
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	24.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	170	200	23	171	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	189	222	26	190	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	660	190	190			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	660	190	190			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	78	84			
cM capacity (veh/h)	362	854	1384			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	189	248	190
Volume Left	0	222	0
Volume Right	189	0	0
cSH	854	1384	1700
Volume to Capacity	0.22	0.16	0.11
Queue Length 95th (ft)	21	14	0
Control Delay (s)	10.4	7.4	0.0
Lane LOS	B	A	
Approach Delay (s)	10.4	7.4	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	355	219	9	8	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	394	243	10	9	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	253				661	248
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	253				661	248
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1324				428	795

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	403	253	22
Volume Left	9	0	9
Volume Right	0	10	13
cSH	1324	1700	592
Volume to Capacity	0.01	0.15	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.2	0.0	11.3
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.3
Approach LOS			B

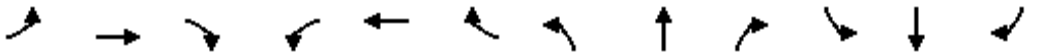
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	37.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	33	173	403	543	304	294	313	228	111	419	44
v/c Ratio	0.12	0.61	0.73	0.76	0.79	0.81	0.30	0.37	0.58	0.71	0.14
Control Delay	34.5	45.5	14.7	41.9	47.6	53.2	26.3	5.7	51.4	41.9	11.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.5	45.5	14.7	41.9	47.6	53.2	26.3	5.7	51.4	41.9	11.3
Queue Length 50th (ft)	17	96	20	155	154	163	75	0	63	123	0
Queue Length 95th (ft)	44	169	120	#245	#311	#315	121	54	124	183	29
Internal Link Dist (ft)		1581			573		723			1374	
Turn Bay Length (ft)	200		550	275		250		150	225		150
Base Capacity (vph)	369	381	614	790	424	422	1082	639	249	741	378
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	0.45	0.66	0.69	0.72	0.70	0.29	0.36	0.45	0.57	0.12

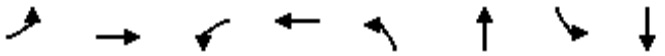
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	164	383	516	175	114	279	297	217	105	398	42
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1716	1488	3225	1636		1646	3197	1444	1525	3023	1408
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1716	1488	3225	1636		1646	3197	1444	1525	3023	1408
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	173	403	543	184	120	294	313	228	111	419	44
RTOR Reduction (vph)	0	0	305	0	23	0	0	0	155	0	0	35
Lane Group Flow (vph)	33	173	98	543	281	0	294	313	73	111	419	9
Confl. Peds. (#/hr)							2		5	5		2
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	4%	1%	9%	10%	3%
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	14.6	14.6	14.6	19.5	19.5		19.4	28.4	28.4	9.3	18.3	18.3
Effective Green, g (s)	14.6	14.6	14.6	19.5	19.5		19.4	28.4	28.4	9.3	18.3	18.3
Actuated g/C Ratio	0.16	0.16	0.16	0.22	0.22		0.22	0.32	0.32	0.10	0.21	0.21
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	273	282	245	708	359		360	1022	462	160	623	290
v/s Ratio Prot	0.02	c0.10		0.17	c0.17		c0.18	0.10		0.07	c0.14	
v/s Ratio Perm			0.07						0.05			0.01
v/c Ratio	0.12	0.61	0.40	0.77	0.78		0.82	0.31	0.16	0.69	0.67	0.03
Uniform Delay, d1	31.6	34.5	33.2	32.5	32.6		33.0	22.8	21.6	38.4	32.5	28.2
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	3.9	1.1	5.0	10.6		13.3	0.2	0.2	12.3	2.9	0.0
Delay (s)	31.8	38.4	34.3	37.5	43.2		46.4	22.9	21.8	50.6	35.4	28.2
Level of Service	C	D	C	D	D		D	C	C	D	D	C
Approach Delay (s)		35.3			39.5			30.9			37.8	
Approach LOS		D			D			C			D	

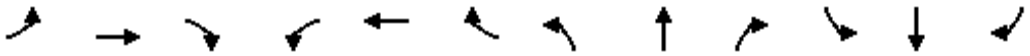
Intersection Summary			
HCM Average Control Delay	35.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	88.8	Sum of lost time (s)	17.0
Intersection Capacity Utilization	68.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	161	626	26	570	347	58	9	277
v/c Ratio	0.89	0.55	0.21	0.78	0.92	0.07	0.07	0.53
Control Delay	80.4	19.2	37.0	34.8	60.1	10.3	33.9	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	80.4	19.2	37.0	34.8	60.1	10.3	33.9	10.5
Queue Length 50th (ft)	76	87	12	127	159	10	4	19
Queue Length 95th (ft)	#184	166	35	183	#311	36	18	83
Internal Link Dist (ft)		573		312		272		307
Turn Bay Length (ft)	225		225		150		150	
Base Capacity (vph)	181	1133	124	790	384	820	124	522
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.55	0.21	0.72	0.90	0.07	0.07	0.53

Intersection Summary

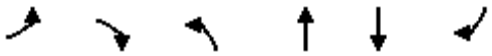
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	145	373	191	23	487	26	312	40	13	8	44	205
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.96		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3156		1662	3300		1662	1687		1662	1534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3156		1662	3300		1662	1687		1662	1534	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	161	414	212	26	541	29	347	44	14	9	49	228
RTOR Reduction (vph)	0	82	0	0	5	0	0	8	0	0	171	0
Lane Group Flow (vph)	161	544	0	26	565	0	347	50	0	9	106	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	8.0	24.6		2.2	18.8		16.8	35.4		1.1	19.7	
Effective Green, g (s)	8.0	24.6		2.2	18.8		16.8	35.4		1.1	19.7	
Actuated g/C Ratio	0.10	0.31		0.03	0.24		0.21	0.45		0.01	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	168	979		46	782		352	753		23	381	
v/s Ratio Prot	c0.10	0.17		0.02	c0.17		c0.21	0.03		0.01	c0.07	
v/s Ratio Perm												
v/c Ratio	0.96	0.56		0.57	0.72		0.99	0.07		0.39	0.28	
Uniform Delay, d1	35.5	22.8		38.1	27.8		31.1	12.5		38.8	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.5	0.7		14.9	3.3		43.8	0.2		10.7	1.8	
Delay (s)	92.0	23.5		53.0	31.2		74.9	12.7		49.4	25.9	
Level of Service	F	C		D	C		E	B		D	C	
Approach Delay (s)		37.5			32.1			66.0			26.6	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.6%	ICU Level of Service	C
Analysis Period (min)	15		

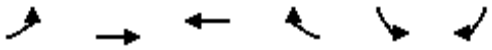
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	21	46	24	314	494	18
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	23	49	26	338	531	19
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	930	541	551			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	930	541	551			
tC, single (s)	6.5	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.3			
p0 queue free %	92	91	97			
cM capacity (veh/h)	283	539	999			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	72	363	551
Volume Left	23	26	0
Volume Right	49	0	19
cSH	420	999	1700
Volume to Capacity	0.17	0.03	0.32
Queue Length 95th (ft)	15	2	0
Control Delay (s)	15.3	0.9	0.0
Lane LOS	C	A	
Approach Delay (s)	15.3	0.9	0.0
Approach LOS	C		

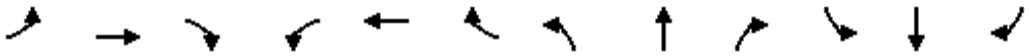
Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	50.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	29	165	245	209	102	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	32	183	272	232	113	24
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	272				520	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	272				520	272
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				77	97
cM capacity (veh/h)	1303				504	771

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	216	272	232	138
Volume Left	32	0	0	113
Volume Right	0	0	232	24
cSH	1303	1700	1700	537
Volume to Capacity	0.02	0.16	0.14	0.26
Queue Length 95th (ft)	2	0	0	25
Control Delay (s)	1.4	0.0	0.0	14.0
Lane LOS	A			B
Approach Delay (s)	1.4	0.0		14.0
Approach LOS				B

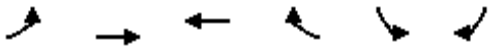
Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	42.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	266	41	72	443	32	1	0	15	31	76	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	296	46	80	492	36	1	0	17	34	84	6
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	528			341			1027	1013	318	1012	1018	512
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	528			341			1027	1013	318	1012	1018	512
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.3
p0 queue free %	100			93			99	100	98	83	60	99
cM capacity (veh/h)	1050			1229			139	224	727	198	212	565

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	344	80	528	18	124
Volume Left	3	80	0	1	34
Volume Right	46	0	36	17	6
cSH	1050	1229	1700	575	214
Volume to Capacity	0.00	0.07	0.31	0.03	0.58
Queue Length 95th (ft)	0	5	0	2	81
Control Delay (s)	0.1	8.1	0.0	11.5	42.8
Lane LOS	A	A		B	E
Approach Delay (s)	0.1	1.1		11.5	42.8
Approach LOS				B	E

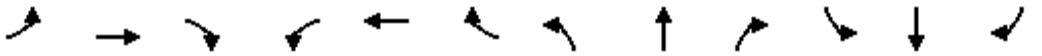
Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	68.7%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	312	513	0	27	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	328	540	0	28	36
Pedestrians		2				
Lane Width (ft)		12.0				
Walking Speed (ft/s)		4.0				
Percent Blockage		0				
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	540				868	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	540				868	272
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	95
cM capacity (veh/h)	1039				295	731

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	328	270	270	64
Volume Left	0	0	0	28
Volume Right	0	0	0	36
cSH	1700	1700	1700	442
Volume to Capacity	0.19	0.16	0.16	0.15
Queue Length 95th (ft)	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	14.5
Lane LOS				B
Approach Delay (s)	0.0	0.0		14.5
Approach LOS				B

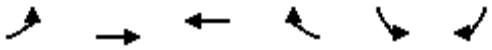
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	29.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	316	0	0	428	41	0	0	0	40	0	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	24	329	0	0	446	43	0	0	0	42	0	89
Pedestrians		1			3						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	447			329			934	824	332	848	845	469
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	447			329			934	824	332	848	845	469
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			100	100	100	85	100	85
cM capacity (veh/h)	1123			1242			207	304	712	270	295	591

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	24	329	489	0	0	42	89
Volume Left	24	0	0	0	0	42	0
Volume Right	0	0	43	0	0	0	89
cSH	1123	1700	1242	1700	1700	270	591
Volume to Capacity	0.02	0.19	0.00	0.00	0.00	0.15	0.15
Queue Length 95th (ft)	2	0	0	0	0	13	13
Control Delay (s)	8.3	0.0	0.0	0.0	0.0	20.7	12.2
Lane LOS	A			A	A	C	B
Approach Delay (s)	0.6		0.0	0.0		14.9	
Approach LOS				A		B	

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	43.0%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	125	144	234	115	206	218
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	130	150	244	120	215	227
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	364				714	304
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	364				714	304
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				40	69
cM capacity (veh/h)	1195				356	736

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	280	364	442
Volume Left	130	0	215
Volume Right	0	120	227
cSH	1195	1700	485
Volume to Capacity	0.11	0.21	0.91
Queue Length 95th (ft)	9	0	262
Control Delay (s)	4.4	0.0	51.2
Lane LOS	A		F
Approach Delay (s)	4.4	0.0	51.2
Approach LOS			F

Intersection Summary			
Average Delay	22.0		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	34	4	22	18	1	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	4	24	20	1	36
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			44		111	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			44		111	42
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		100	97
cM capacity (veh/h)			1574		876	1033

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	42	44	37
Volume Left	0	24	1
Volume Right	4	0	36
cSH	1700	1574	1027
Volume to Capacity	0.02	0.02	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	4.1	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	4.1	8.6
Approach LOS			A

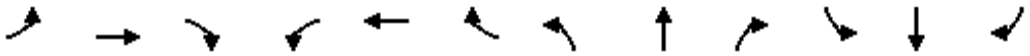
Intersection Summary			
Average Delay		4.0	
Intersection Capacity Utilization		19.0%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	149	2	469	237	18	54
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	157	2	494	249	19	57
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			159		1401	158
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			159		1401	158
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			65		81	94
cM capacity (veh/h)			1408		101	875

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	159	494	249	76
Volume Left	0	494	0	19
Volume Right	2	0	0	57
cSH	1700	1408	1700	300
Volume to Capacity	0.09	0.35	0.15	0.25
Queue Length 95th (ft)	0	40	0	25
Control Delay (s)	0.0	8.9	0.0	21.0
Lane LOS		A		C
Approach Delay (s)	0.0	5.9		21.0
Approach LOS				C

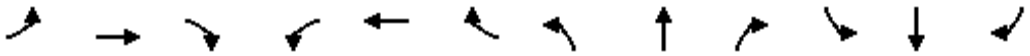
Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	51.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	64	591	64	0	0	0	0	29	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	67	622	67	0	0	0	0	31	41
Pedestrians					3			21				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					0			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	689			21			523	845	24	794	812	345
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	689			21			523	845	24	794	812	345
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	100	90	94
cM capacity (veh/h)	914			1580			358	284	1032	269	297	657

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	378	378	0	72
Volume Left	67	0	0	0
Volume Right	0	67	0	41
cSH	1580	1700	1700	433
Volume to Capacity	0.04	0.22	0.00	0.17
Queue Length 95th (ft)	3	0	0	15
Control Delay (s)	1.6	0.0	0.0	15.0
Lane LOS	A		A	B
Approach Delay (s)	0.8		0.0	15.0
Approach LOS			A	B

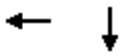
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	36.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	460	3	0	0	0	0	0	6	80	5	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	484	3	0	0	0	0	0	6	84	5	0
Pedestrians		9			22			15				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		1			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			502			512	501	281	270	502	9
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			502			512	501	281	270	502	9
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	87	99	100
cM capacity (veh/h)	1636			1059			432	469	713	654	468	1069

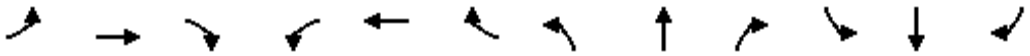
Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	242	245	6	89
Volume Left	0	0	0	84
Volume Right	0	3	6	0
cSH	1636	1700	713	639
Volume to Capacity	0.00	0.14	0.01	0.14
Queue Length 95th (ft)	0	0	1	12
Control Delay (s)	0.0	0.0	10.1	11.6
Lane LOS			B	B
Approach Delay (s)	0.0		10.1	11.6
Approach LOS			B	B

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	32.8%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBT	SBT
Lane Group Flow (vph)	414	313
v/c Ratio	0.31	0.24
Control Delay	8.3	5.5
Queue Delay	0.0	0.0
Total Delay	8.3	5.5
Queue Length 50th (ft)	28	13
Queue Length 95th (ft)	50	31
Internal Link Dist (ft)	289	239
Turn Bay Length (ft)		
Base Capacity (vph)	1343	1317
Starvation Cap Reductn	0	0
Spillback Cap Reductn	0	0
Storage Cap Reductn	0	0
Reduced v/c Ratio	0.31	0.24

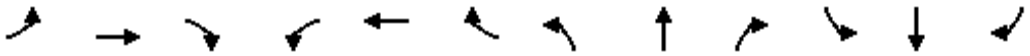
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	39	354	0	0	0	0	0	185	112
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						1.00	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3305						3118	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3305						3118	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	41	373	0	0	0	0	0	195	118
RTOR Reduction (vph)	0	0	0	0	21	0	0	0	0	0	71	0
Lane Group Flow (vph)	0	0	0	0	393	0	0	0	0	0	242	0
Confl. Peds. (#/hr)			15	15					22	22		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm								
Protected Phases					8						6	
Permitted Phases				8								
Actuated Green, G (s)					16.0						16.0	
Effective Green, g (s)					16.0						16.0	
Actuated g/C Ratio					0.40						0.40	
Clearance Time (s)					4.0						4.0	
Lane Grp Cap (vph)					1322						1247	
v/s Ratio Prot											c0.08	
v/s Ratio Perm					0.12							
v/c Ratio					0.30						0.19	
Uniform Delay, d1					8.2						7.8	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.6						0.3	
Delay (s)					8.7						8.2	
Level of Service					A						A	
Approach Delay (s)		0.0			8.7			0.0			8.2	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.25		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	31.3%	ICU Level of Service	A
Analysis Period (min)	15		

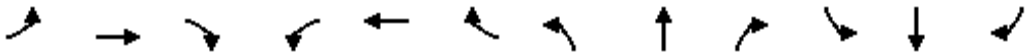
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	208	432	9	0	0	0	0	114	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	219	455	9	0	0	0	0	120	19	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			464			897	897	232	744	902	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			464			897	897	232	744	902	0
tC, single (s)	4.1			4.1			7.5	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	86			100			100	51	97	100	100	100
cM capacity (veh/h)	1622			1108			213	243	752	166	242	1091

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	219	303	161	139
Volume Left	219	0	0	0
Volume Right	0	0	9	19
cSH	1622	1700	1700	268
Volume to Capacity	0.14	0.18	0.09	0.52
Queue Length 95th (ft)	12	0	0	69
Control Delay (s)	7.6	0.0	0.0	32.0
Lane LOS	A			D
Approach Delay (s)	2.4			32.0
Approach LOS				D

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	27.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	290	6	76	292	9	12	0	36	27	3	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	322	7	84	324	10	13	0	40	30	3	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					694							
pX, platoon unblocked	0.99						0.99	0.99		0.99	0.99	0.99
vC, conflicting volume	334			329			836	840	326	872	838	329
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	325			329			831	835	326	867	833	320
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			95	100	94	88	99	99
cM capacity (veh/h)	1236			1203			268	281	720	243	282	720

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	329	84	334	53	38
Volume Left	6	0	84	0	13	30
Volume Right	0	7	0	10	40	4
cSH	1236	1700	1203	1700	507	267
Volume to Capacity	0.00	0.19	0.07	0.20	0.11	0.14
Queue Length 95th (ft)	0	0	6	0	9	12
Control Delay (s)	7.9	0.0	8.2	0.0	12.9	20.7
Lane LOS	A		A		B	C
Approach Delay (s)	0.1		1.7		12.9	20.7
Approach LOS					B	C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	37.0%	ICU Level of Service	A	
Analysis Period (min)	15			

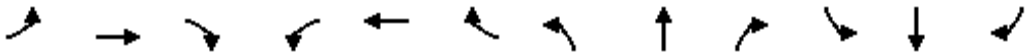


Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	1355	96	745	94	147	305	243	236
v/c Ratio	0.31	1.05	0.86	0.51	0.14	0.45	0.87	0.77	0.71
Control Delay	63.2	73.9	110.5	26.2	5.3	45.5	65.2	60.6	55.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.2	73.9	110.5	26.2	5.3	45.5	65.2	60.6	55.4
Queue Length 50th (ft)	21	~610	74	231	0	98	204	174	165
Queue Length 95th (ft)	53	#770	#183	303	34	166	#362	266	254
Internal Link Dist (ft)		1231		435			614		612
Turn Bay Length (ft)	175		200		200	225		150	
Base Capacity (vph)	95	1289	111	1465	688	359	381	381	400
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.29	1.05	0.86	0.51	0.14	0.41	0.80	0.64	0.59

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



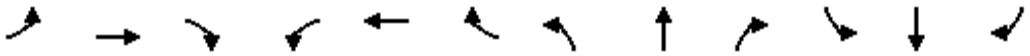
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	1105	168	90	700	88	138	165	121	228	213	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3207		1630	3260	1416	1630	1629		1662	1739	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3207		1630	3260	1416	1630	1629		1662	1739	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	28	1176	179	96	745	94	147	176	129	243	227	9
RTOR Reduction (vph)	0	9	0	0	0	52	0	22	0	0	2	0
Lane Group Flow (vph)	28	1346	0	96	745	42	147	283	0	243	234	0
Confl. Peds. (#/hr)	4		6	6		4	2		2	2		2
Heavy Vehicles (%)	0%	1%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.7	47.2		7.7	51.2	51.2	23.0	23.0		21.7	21.7	
Effective Green, g (s)	3.7	47.2		7.7	51.2	51.2	23.0	23.0		21.7	21.7	
Actuated g/C Ratio	0.03	0.41		0.07	0.44	0.44	0.20	0.20		0.19	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	53	1309		109	1444	627	324	324		312	326	
v/s Ratio Prot	0.02	c0.42		c0.06	c0.23		0.09	c0.17		c0.15	0.13	
v/s Ratio Perm						0.03						
v/c Ratio	0.53	1.03		0.88	0.52	0.07	0.45	0.87		0.78	0.72	
Uniform Delay, d1	55.1	34.2		53.5	23.3	18.5	40.8	44.9		44.7	44.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.2	32.3		50.7	0.4	0.1	1.4	22.3		12.3	7.9	
Delay (s)	64.3	66.5		104.2	23.7	18.5	42.1	67.2		56.9	52.0	
Level of Service	E	E		F	C	B	D	E		E	D	
Approach Delay (s)		66.4			31.4			59.1			54.5	
Approach LOS		E			C			E			D	

Intersection Summary			
HCM Average Control Delay	53.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	115.6	Sum of lost time (s)	20.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



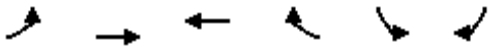
Lane Group	EBT	WBL	WBT	WBR	NBT	NBR	SBT
Lane Group Flow (vph)	185	71	346	68	45	393	130
v/c Ratio	0.32	0.25	0.45	0.10	0.10	0.57	0.36
Control Delay	12.8	18.8	8.9	2.4	12.0	5.7	14.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	12.8	18.8	8.9	2.4	12.0	5.7	14.6
Queue Length 50th (ft)	17	8	35	0	4	0	13
Queue Length 95th (ft)	87	52	104	13	28	50	65
Internal Link Dist (ft)	420		1076		613		813
Turn Bay Length (ft)		200				150	
Base Capacity (vph)	1108	303	1527	1274	1022	1066	819
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.23	0.23	0.05	0.04	0.37	0.16

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	165	0	64	311	61	4	37	354	70	40	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00		0.97	
Satd. Flow (prot)		1699		1458	1750	1453		1681	1473		1608	
Flt Permitted		1.00		0.95	1.00	1.00		0.97	1.00		0.79	
Satd. Flow (perm)		1691		1458	1750	1453		1640	1473		1309	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	183	0	71	346	68	4	41	393	78	44	8
RTOR Reduction (vph)	0	0	0	0	0	34	0	0	292	0	4	0
Lane Group Flow (vph)	0	185	0	71	346	34	0	45	101	0	126	0
Confl. Peds. (#/hr)	3		23	23		3						
Heavy Vehicles (%)	0%	3%	0%	14%	0%	0%	0%	4%	1%	2%	8%	14%
Turn Type	Perm			Prot		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2					6	8		8	4		
Actuated Green, G (s)		11.7		1.9	18.1	18.1		9.4	9.4		9.4	
Effective Green, g (s)		11.7		1.9	18.1	18.1		9.4	9.4		9.4	
Actuated g/C Ratio		0.32		0.05	0.50	0.50		0.26	0.26		0.26	
Clearance Time (s)		4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		542		76	868	721		422	379		337	
v/s Ratio Prot				c0.05	c0.20							
v/s Ratio Perm		0.11				0.02		0.03	0.07		c0.10	
v/c Ratio		0.34		0.93	0.40	0.05		0.11	0.27		0.37	
Uniform Delay, d1		9.5		17.2	5.8	4.7		10.3	10.8		11.1	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.4		80.4	0.3	0.0		0.1	0.4		0.7	
Delay (s)		9.8		97.6	6.1	4.8		10.5	11.2		11.8	
Level of Service		A		F	A	A		B	B		B	
Approach Delay (s)		9.8			19.3			11.1			11.8	
Approach LOS		A			B			B			B	

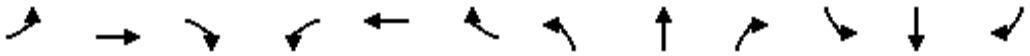
Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	36.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	54.2%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	1305	839	116	42	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	1374	883	122	44	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			1013			
pX, platoon unblocked	0.86				0.86	0.86
vC, conflicting volume	1005				1648	503
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	689				1434	107
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				59	98
cM capacity (veh/h)	789				109	805

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	8	687	687	589	416	57
Volume Left	8	0	0	0	0	44
Volume Right	0	0	0	0	122	13
cSH	789	1700	1700	1700	1700	134
Volume to Capacity	0.01	0.40	0.40	0.35	0.24	0.42
Queue Length 95th (ft)	1	0	0	0	0	46
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	50.1
Lane LOS	A					F
Approach Delay (s)	0.1			0.0		50.1
Approach LOS						F

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	49.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	4	0	0	10	4	4	38	8	12	3	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	4	0	0	11	4	4	42	9	13	3	4
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98	93	6	91	91	48	8			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	93	6	91	91	48	8			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	99	100	100			99		
cM capacity (veh/h)	868	791	1083	885	793	1026	1626			1565		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	16	56	21
Volume Left	0	0	4	13
Volume Right	0	4	9	4
cSH	791	848	1626	1565
Volume to Capacity	0.01	0.02	0.00	0.01
Queue Length 95th (ft)	0	1	0	1
Control Delay (s)	9.6	9.3	0.6	4.6
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.3	0.6	4.6
Approach LOS	A	A		

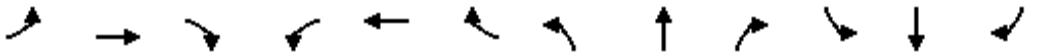
Intersection Summary				
Average Delay	3.3			
Intersection Capacity Utilization	15.2%	ICU Level of Service	A	
Analysis Period (min)	15			



Lane Group	EBT	EBR	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	160	422	181	184	981	112	54	1483
v/c Ratio	0.51	0.88	0.36	0.85	0.53	0.12	0.43	0.89
Control Delay	36.4	39.6	29.0	75.5	15.8	3.1	53.4	30.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.4	39.6	29.0	75.5	15.8	3.1	53.4	30.7
Queue Length 50th (ft)	82	138	43	110	197	0	31	413
Queue Length 95th (ft)	143	#276	73	#249	296	27	73	#640
Internal Link Dist (ft)	990		799		689			423
Turn Bay Length (ft)		350		450		200	300	
Base Capacity (vph)	431	585	680	217	1842	896	151	1665
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.37	0.72	0.27	0.85	0.53	0.13	0.36	0.89

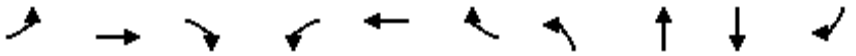
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	65	87	401	109	45	18	175	932	106	51	1409	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00		0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1674	1444		3058		1662	3197	1473	1539	3292	
Flt Permitted		0.80	1.00		0.67		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1365	1444		2128		1662	3197	1473	1539	3292	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	68	92	422	115	47	19	184	981	112	54	1483	0
RTOR Reduction (vph)	0	0	146	0	10	0	0	0	48	0	0	0
Lane Group Flow (vph)	0	160	276	0	171	0	184	981	64	54	1483	0
Confl. Peds. (#/hr)	2		8	8		2						
Heavy Vehicles (%)	0%	4%	1%	5%	0%	0%	0%	4%	1%	8%	1%	0%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		21.2	21.2		21.2		12.0	53.3	53.3	6.4	47.7	
Effective Green, g (s)		21.2	21.2		21.2		12.0	53.3	53.3	6.4	47.7	
Actuated g/C Ratio		0.23	0.23		0.23		0.13	0.57	0.57	0.07	0.51	
Clearance Time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Vehicle Extension (s)		2.5	2.5		3.0		2.5	4.3	4.3	2.5	4.3	
Lane Grp Cap (vph)		310	328		483		214	1824	841	105	1681	
v/s Ratio Prot							c0.11	0.31		0.04	c0.45	
v/s Ratio Perm		0.12	c0.19		0.08				0.04			
v/c Ratio		0.52	0.84		0.35		0.86	0.54	0.08	0.51	0.88	
Uniform Delay, d1		31.6	34.5		30.3		39.9	12.4	9.0	42.0	20.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.1	17.2		0.4		27.1	0.4	0.1	3.1	6.1	
Delay (s)		32.7	51.6		30.8		66.9	12.9	9.1	45.1	26.4	
Level of Service		C	D		C		E	B	A	D	C	
Approach Delay (s)		46.4			30.8			20.3			27.1	
Approach LOS		D			C			C			C	

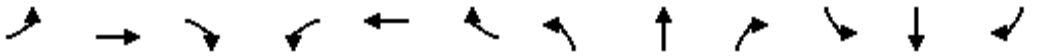
Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	93.4	Sum of lost time (s)	12.5
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	271	1009	591	25	719	13	317	315	104	211
v/c Ratio	0.89	0.70	0.65	0.36	0.89	0.04	0.81	0.81	0.44	0.55
Control Delay	71.7	28.1	10.1	64.0	51.2	24.3	52.7	51.8	44.6	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.7	28.1	10.1	64.0	51.2	24.3	52.7	51.8	44.6	10.9
Queue Length 50th (ft)	164	239	44	15	224	3	186	181	61	0
Queue Length 95th (ft)	#393	#524	233	#54	#432	21	#390	#384	112	60
Internal Link Dist (ft)		740			600			372	238	
Turn Bay Length (ft)	280		200	375		100				100
Base Capacity (vph)	305	1450	912	70	810	356	463	460	508	586
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.89	0.70	0.65	0.36	0.89	0.04	0.68	0.68	0.20	0.36

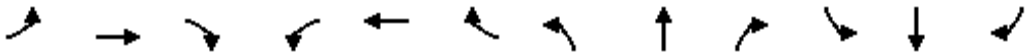
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	257	959	561	24	683	12	485	80	35	18	81	200
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (prot)	1662	3260	1473	1662	3292	1431	1579	1555			1734	1488
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (perm)	1662	3260	1473	1662	3292	1431	1579	1555			1734	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	271	1009	591	25	719	13	511	84	37	19	85	211
RTOR Reduction (vph)	0	0	262	0	0	5	0	5	0	0	0	183
Lane Group Flow (vph)	271	1009	329	25	719	8	317	310	0	0	104	28
Confl. Peds. (#/hr)	6					6						
Heavy Vehicles (%)	0%	2%	1%	0%	1%	0%	0%	7%	0%	0%	0%	0%
Turn Type	Prot		Perm	Prot		Perm	Split			Split		Perm
Protected Phases	5	2		1	6		8	8		4	4	
Permitted Phases			2			6						4
Actuated Green, G (s)	17.7	43.0	43.0	1.4	26.7	26.7	23.9	23.9			13.1	13.1
Effective Green, g (s)	17.7	43.0	43.0	1.4	26.7	26.7	23.9	23.9			13.1	13.1
Actuated g/C Ratio	0.18	0.43	0.43	0.01	0.27	0.27	0.24	0.24			0.13	0.13
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	296	1410	637	23	884	384	380	374			229	196
v/s Ratio Prot	c0.16	0.31		0.02	c0.22		c0.20	0.20			c0.06	
v/s Ratio Perm			0.22			0.01						0.02
v/c Ratio	0.92	0.72	0.52	1.09	0.81	0.02	0.83	0.83			0.45	0.14
Uniform Delay, d1	40.1	23.2	20.6	49.0	34.0	26.7	35.9	35.8			39.8	38.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	31.1	1.8	0.7	216.2	5.8	0.0	14.5	14.4			1.4	0.3
Delay (s)	71.2	24.9	21.3	265.2	39.8	26.8	50.4	50.2			41.3	38.5
Level of Service	E	C	C	F	D	C	D	D			D	D
Approach Delay (s)		30.5			47.0			50.3			39.4	
Approach LOS		C			D			D			D	

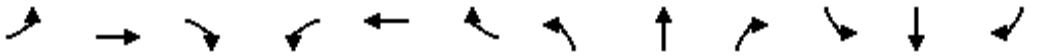
Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	99.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	8	4	12	5	15	1	138	5	21	212	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	9	4	13	5	16	1	152	5	23	233	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	458	442	236	448	442	154	240			157		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458	442	236	448	442	154	240			157		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	97	99	98	100			98		
cM capacity (veh/h)	496	504	808	490	504	897	1339			1435		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	35	158	263
Volume Left	3	13	1	23
Volume Right	4	16	5	7
cSH	558	626	1339	1435
Volume to Capacity	0.03	0.06	0.00	0.02
Queue Length 95th (ft)	2	4	0	1
Control Delay (s)	11.6	11.1	0.1	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	11.1	0.1	0.8
Approach LOS	B	B		

Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	1	9	146	42	8	10	147	626	0	6	870	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	9	154	44	8	11	155	659	0	6	916	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1582	1897	458	1597	1904	329	923			659		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1582	1897	458	1597	1904	329	923			659		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	83	72	0	85	98	79			99		
cM capacity (veh/h)	54	55	555	38	55	672	736			939		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4
Volume Total	164	63	155	329	329	0	6	458	458	7
Volume Left	1	44	155	0	0	0	6	0	0	0
Volume Right	154	11	0	0	0	0	0	0	0	7
cSH	351	48	736	1700	1700	1700	939	1700	1700	1700
Volume to Capacity	0.47	1.33	0.21	0.19	0.19	0.00	0.01	0.27	0.27	0.00
Queue Length 95th (ft)	60	148	20	0	0	0	1	0	0	0
Control Delay (s)	24.0	378.4	11.2	0.0	0.0	0.0	8.9	0.0	0.0	0.0
Lane LOS	C	F	B				A			
Approach Delay (s)	24.0	378.4	2.1				0.1			
Approach LOS	C	F								

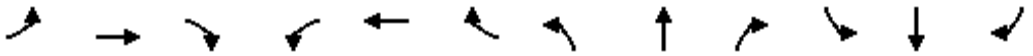
Intersection Summary				
Average Delay	15.0			
Intersection Capacity Utilization	62.3%	ICU Level of Service	B	
Analysis Period (min)	15			



Lane Group	EBR	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	46	22	249	22	926	255	1392
v/c Ratio	0.13	0.10	0.62	0.16	0.68	0.78	0.64
Control Delay	0.8	20.9	12.1	24.4	14.5	39.1	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.8	20.9	12.1	24.4	14.5	39.1	7.1
Queue Length 50th (ft)	0	6	0	6	106	71	76
Queue Length 95th (ft)	0	22	#68	23	160	#169	220
Internal Link Dist (ft)		1198			1475		2486
Turn Bay Length (ft)				200		200	
Base Capacity (vph)	350	216	400	137	1430	342	2182
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.10	0.62	0.16	0.65	0.75	0.64

Intersection Summary

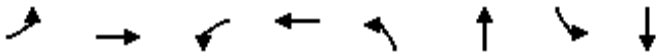
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	44	0	21	239	21	880	9	245	1336	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Lane Util. Factor			1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt			0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)			1488		1750	1473	1662	3224		1662	3260	
Flt Permitted			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)			1488		1750	1473	1662	3224		1662	3260	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	46	0	22	249	22	917	9	255	1392	0
RTOR Reduction (vph)	0	0	41	0	0	220	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	5	0	22	29	22	925	0	255	1392	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	2%	0%
Turn Type			Perm			Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)			6.0		6.0	6.0	0.8	23.8		9.6	32.6	
Effective Green, g (s)			6.0		6.0	6.0	0.8	23.8		9.6	32.6	
Actuated g/C Ratio			0.12		0.12	0.12	0.02	0.46		0.18	0.63	
Clearance Time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Vehicle Extension (s)			2.5		2.5	2.5	2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)			172		202	170	26	1478		307	2048	
v/s Ratio Prot					0.01		0.01	0.29		c0.15	c0.43	
v/s Ratio Perm			0.00			c0.02						
v/c Ratio			0.03		0.11	0.17	0.85	0.63		0.83	0.68	
Uniform Delay, d1			20.4		20.6	20.7	25.5	10.7		20.4	6.3	
Progression Factor			1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2			0.1		0.2	0.3	108.5	1.2		16.8	1.2	
Delay (s)			20.4		20.7	21.0	134.0	11.8		37.2	7.5	
Level of Service			C		C	C	F	B		D	A	
Approach Delay (s)		20.4			21.0			14.7			12.1	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	51.9	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

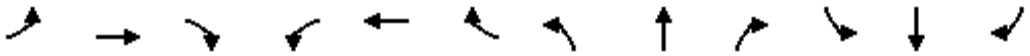
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	149	452	96	266	178	716	33	814
v/c Ratio	0.93	0.84	0.63	0.56	0.84	0.53	0.46	0.85
Control Delay	91.4	36.8	53.2	25.7	67.0	18.8	58.2	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	91.4	36.8	53.2	25.7	67.0	18.8	58.2	34.3
Queue Length 50th (ft)	71	172	44	95	83	138	16	183
Queue Length 95th (ft)	#181	#331	#111	165	#196	194	#54	#289
Internal Link Dist (ft)		1198		3644		786		1700
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	161	580	160	572	212	1358	71	983
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.93	0.78	0.60	0.47	0.84	0.53	0.46	0.83

Intersection Summary

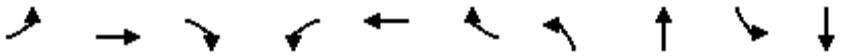
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	247	182	91	225	28	169	634	47	31	655	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	1595		1599	1653		1646	3260		1662	3216	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	1595		1599	1653		1646	3260		1662	3216	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	149	260	192	96	237	29	178	667	49	33	689	125
RTOR Reduction (vph)	0	36	0	0	6	0	0	7	0	0	20	0
Lane Group Flow (vph)	149	416	0	96	260	0	178	709	0	33	794	0
Heavy Vehicles (%)	3%	4%	1%	4%	4%	5%	1%	1%	0%	0%	1%	1%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.1	22.3		5.4	20.6		9.1	29.4		1.7	22.0	
Effective Green, g (s)	7.1	22.3		5.4	20.6		9.1	29.4		1.7	22.0	
Actuated g/C Ratio	0.10	0.31		0.07	0.28		0.12	0.40		0.02	0.30	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.5		2.5	4.5	
Lane Grp Cap (vph)	157	489		119	468		206	1317		39	972	
v/s Ratio Prot	c0.09	c0.26		0.06	0.16		c0.11	0.22		0.02	c0.25	
v/s Ratio Perm												
v/c Ratio	0.95	0.85		0.81	0.55		0.86	0.54		0.85	0.82	
Uniform Delay, d1	32.7	23.7		33.2	22.2		31.2	16.5		35.4	23.5	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	56.0	13.1		30.8	1.1		29.0	0.7		84.0	6.0	
Delay (s)	88.7	36.8		64.0	23.3		60.2	17.2		119.4	29.5	
Level of Service	F	D		E	C		E	B		F	C	
Approach Delay (s)		49.7			34.1			25.8			33.0	
Approach LOS		D			C			C			C	

Intersection Summary			
HCM Average Control Delay	34.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	72.8	Sum of lost time (s)	10.0
Intersection Capacity Utilization	78.9%	ICU Level of Service	D
Analysis Period (min)	15		

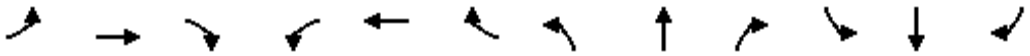
c Critical Lane Group



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	95	532	135	21	246	167	74	570	282	921
v/c Ratio	0.62	0.88	0.23	0.38	0.55	0.32	0.60	0.67	0.84	0.68
Control Delay	62.8	47.8	11.9	68.6	36.2	6.5	66.6	34.9	61.4	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.8	47.8	11.9	68.6	36.2	6.5	66.6	34.9	61.4	25.8
Queue Length 50th (ft)	54	278	20	12	130	0	43	154	160	228
Queue Length 95th (ft)	#139	#556	70	#50	222	49	#120	232	#350	336
Internal Link Dist (ft)		3644			2006			2561		1710
Turn Bay Length (ft)	370		130	275		130	350		300	
Base Capacity (vph)	165	657	619	55	524	586	129	1071	349	1510
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.58	0.81	0.22	0.38	0.47	0.28	0.57	0.53	0.81	0.61

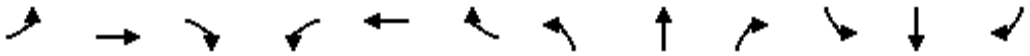
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	90	505	128	20	234	159	70	521	21	268	765	110
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1699	1473	1662	1636	1473	1662	3171		1662	3196	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	1699	1473	1662	1636	1473	1662	3171		1662	3196	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	95	532	135	21	246	167	74	548	22	282	805	116
RTOR Reduction (vph)	0	0	53	0	0	120	0	3	0	0	11	0
Lane Group Flow (vph)	95	532	82	21	246	47	74	567	0	282	910	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	3%	1%	0%	7%	1%	0%	4%	8%	0%	2%	0%
Turn Type	Prot		Perm	Prot		Perm	Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	6.8	32.8	32.8	1.1	27.1	27.1	5.3	25.8		18.6	39.1	
Effective Green, g (s)	6.8	32.8	32.8	1.1	27.1	27.1	5.3	25.8		18.6	39.1	
Actuated g/C Ratio	0.07	0.34	0.34	0.01	0.28	0.28	0.06	0.27		0.19	0.41	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4.6		2.5	4.6	
Lane Grp Cap (vph)	118	582	504	19	463	417	92	854		323	1304	
v/s Ratio Prot	c0.06	c0.31		0.01	0.15		0.04	0.18		c0.17	c0.28	
v/s Ratio Perm			0.06			0.03						
v/c Ratio	0.81	0.91	0.16	1.11	0.53	0.11	0.80	0.66		0.87	0.70	
Uniform Delay, d1	43.8	30.2	21.9	47.3	29.0	25.4	44.7	31.1		37.5	23.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.8	18.9	0.1	242.0	0.9	0.1	37.3	2.4		21.8	2.0	
Delay (s)	74.6	49.1	22.0	289.4	29.9	25.5	82.0	33.5		59.3	25.4	
Level of Service	E	D	C	F	C	C	F	C		E	C	
Approach Delay (s)		47.5			40.8			39.1			33.3	
Approach LOS		D			D			D			C	

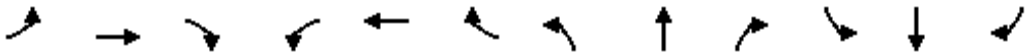
Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	36	205	89	5	125	19	88	33	1	13	22	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	228	99	6	139	21	98	37	1	14	24	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	160			327			533	528	277	488	567	149
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160			327			533	528	277	488	567	149
tC, single (s)	4.1			4.1			7.1	6.5	7.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	4.2	3.5	4.0	3.3
p0 queue free %	97			100			77	92	100	97	94	99
cM capacity (veh/h)	1432			1244			423	444	576	450	422	902

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	40	327	6	160	136	52
Volume Left	40	0	6	0	98	14
Volume Right	0	99	0	21	1	13
cSH	1432	1700	1244	1700	430	498
Volume to Capacity	0.03	0.19	0.00	0.09	0.32	0.10
Queue Length 95th (ft)	2	0	0	0	33	9
Control Delay (s)	7.6	0.0	7.9	0.0	17.2	13.1
Lane LOS	A		A		C	B
Approach Delay (s)	0.8		0.3		17.2	13.1
Approach LOS					C	B

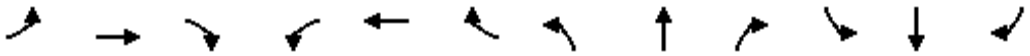
Intersection Summary				
Average Delay	4.7			
Intersection Capacity Utilization	44.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	69	436	149	26	245	24	87	111	32	10	54	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	77	484	166	29	272	27	97	123	36	11	60	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	299			650			1114	1077	567	1078	1147	286
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	299			650			1114	1077	567	1078	1147	286
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			97			23	39	93	87	67	96
cM capacity (veh/h)	1274			946			125	201	527	89	183	749

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	NB 2	SB 1
Volume Total	77	650	29	299	97	159	104
Volume Left	77	0	29	0	97	0	11
Volume Right	0	166	0	27	0	36	33
cSH	1274	1700	946	1700	125	233	210
Volume to Capacity	0.06	0.38	0.03	0.18	0.77	0.68	0.50
Queue Length 95th (ft)	5	0	2	0	113	109	62
Control Delay (s)	8.0	0.0	8.9	0.0	95.4	48.0	38.1
Lane LOS	A		A		F	E	E
Approach Delay (s)	0.8		0.8		66.0		38.1
Approach LOS					F		E

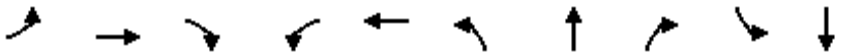
Intersection Summary				
Average Delay	15.3			
Intersection Capacity Utilization	62.7%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	96	212	14	59	10	114	173	26	23	172	36
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	49	107	236	16	66	11	127	192	29	26	191	40

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	49	342	92	127	221	26	231
Volume Left (vph)	49	0	16	127	0	26	0
Volume Right (vph)	0	236	11	0	29	0	40
Hadj (s)	0.50	-0.45	0.04	0.50	-0.09	0.50	-0.12
Departure Headway (s)	6.9	6.0	6.9	6.9	6.3	7.1	6.4
Degree Utilization, x	0.09	0.57	0.18	0.24	0.39	0.05	0.41
Capacity (veh/h)	490	568	468	492	538	474	527
Control Delay (s)	9.4	15.2	11.4	10.9	12.1	9.2	12.7
Approach Delay (s)	14.5		11.4	11.7		12.4	
Approach LOS	B		B	B		B	

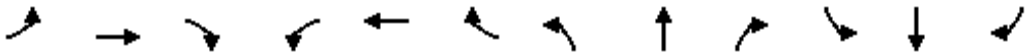
Intersection Summary				
Delay	12.8			
HCM Level of Service	B			
Intersection Capacity Utilization	48.9%	ICU Level of Service		A
Analysis Period (min)	15			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	112	794	475	357	634	355	524	329	147	625
v/c Ratio	0.70	0.91	0.79	0.88	0.67	0.88	0.63	0.56	0.74	0.78
Control Delay	63.8	48.5	22.5	63.3	30.8	63.9	33.0	9.1	62.7	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	63.8	48.5	22.5	63.3	30.8	63.9	33.0	9.1	62.7	38.2
Queue Length 50th (ft)	63	231	92	104	157	104	138	17	82	171
Queue Length 95th (ft)	#150	#372	#275	#196	233	#196	191	90	#185	232
Internal Link Dist (ft)		1475			3089		1209			786
Turn Bay Length (ft)	300		200	300		300		200	200	
Base Capacity (vph)	166	874	604	406	950	402	1017	651	206	999
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.91	0.79	0.88	0.67	0.88	0.52	0.51	0.71	0.63

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	754	451	339	467	135	337	498	313	140	564	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1599	3260	1439	3162	3115		3131	3228	1435	1630	3176	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1599	3260	1439	3162	3115		3131	3228	1435	1630	3176	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	794	475	357	492	142	355	524	329	147	594	31
RTOR Reduction (vph)	0	0	218	0	27	0	0	0	215	0	4	0
Lane Group Flow (vph)	112	794	257	357	607	0	355	524	114	147	621	0
Confl. Peds. (#/hr)	4		1	1		4	7		4	4		7
Heavy Vehicles (%)	4%	2%	2%	2%	3%	2%	3%	3%	2%	2%	4%	0%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	9.0	24.1	24.1	11.5	26.6		11.5	23.2	23.2	10.9	22.6	
Effective Green, g (s)	9.0	24.1	24.1	11.5	26.6		11.5	23.2	23.2	10.9	22.6	
Actuated g/C Ratio	0.10	0.27	0.27	0.13	0.30		0.13	0.26	0.26	0.12	0.25	
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0		3.5	3.5	3.5	3.5	2.5	
Lane Grp Cap (vph)	160	876	387	405	924		401	835	371	198	800	
v/s Ratio Prot	0.07	c0.24		c0.11	0.19		c0.11	0.16		0.09	c0.20	
v/s Ratio Perm			0.18						0.08			
v/c Ratio	0.70	0.91	0.66	0.88	0.66		0.89	0.63	0.31	0.74	0.78	
Uniform Delay, d1	39.0	31.7	29.2	38.4	27.6		38.5	29.4	26.8	38.0	31.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.4	13.5	5.6	19.9	2.3		20.5	1.6	0.6	14.4	4.6	
Delay (s)	52.4	45.3	34.8	58.4	29.8		59.0	31.0	27.3	52.4	35.7	
Level of Service	D	D	C	E	C		E	C	C	D	D	
Approach Delay (s)		42.2			40.1			38.2			38.9	
Approach LOS		D			D			D			D	

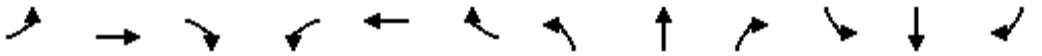
Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	EBR	WBL	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	16	1179	291	212	903	188	239	35	5
v/c Ratio	0.19	0.73	0.35	0.88	0.41	0.70	0.48	0.12	0.02
Control Delay	45.9	23.7	6.6	61.1	7.0	44.8	6.7	25.4	13.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.9	23.7	6.6	61.1	7.0	44.8	6.7	25.4	13.8
Queue Length 50th (ft)	9	264	23	99	57	100	0	16	0
Queue Length 95th (ft)	30	#478	90	#237	144	148	50	35	8
Internal Link Dist (ft)		3089			2238	365		358	
Turn Bay Length (ft)	150		150	250			100		280
Base Capacity (vph)	84	1612	822	242	2190	406	632	455	334
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.73	0.35	0.88	0.41	0.46	0.38	0.08	0.01

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



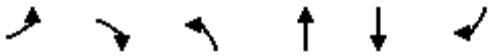
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1120	276	201	855	3	166	12	227	14	19	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.98	1.00
Satd. Flow (prot)	1408	3292	1458	1554	3258			1627	1417		1534	992
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.72	1.00		0.87	1.00
Satd. Flow (perm)	1408	3292	1458	1554	3258			1218	1417		1365	992
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	1179	291	212	900	3	175	13	239	15	20	5
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	186	0	0	4
Lane Group Flow (vph)	16	1179	176	212	903	0	0	188	53	0	35	1
Confl. Peds. (#/hr)	18					18						
Heavy Vehicles (%)	17%	1%	2%	7%	2%	0%	3%	0%	5%	18%	7%	50%
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		4
Actuated Green, G (s)	0.8	40.9	40.9	17.2	57.3			19.9	19.9		19.9	19.9
Effective Green, g (s)	0.8	40.9	40.9	17.2	57.3			19.9	19.9		19.9	19.9
Actuated g/C Ratio	0.01	0.45	0.45	0.19	0.64			0.22	0.22		0.22	0.22
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	13	1496	663	297	2074			269	313		302	219
v/s Ratio Prot	0.01	c0.36		c0.14	0.28							
v/s Ratio Perm			0.12					c0.15	0.04		0.03	0.00
v/c Ratio	1.23	0.79	0.27	0.71	0.44			0.70	0.17		0.12	0.01
Uniform Delay, d1	44.6	20.9	15.2	34.1	8.2			32.3	28.4		28.0	27.3
Progression Factor	1.00	1.00	1.00	0.72	0.75			1.00	1.00		1.00	1.00
Incremental Delay, d2	333.7	4.3	1.0	6.9	0.6			7.7	0.3		0.2	0.0
Delay (s)	378.3	25.1	16.2	31.3	6.8			40.0	28.6		28.2	27.3
Level of Service	F	C	B	C	A			D	C		C	C
Approach Delay (s)		27.2			11.4			33.6			28.1	
Approach LOS		C			B			C			C	

Intersection Summary			
HCM Average Control Delay	22.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.0%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	NBT	SBT
Lane Group Flow (vph)	202	432	493
v/c Ratio	0.44	0.44	0.47
Control Delay	13.2	8.5	8.6
Queue Delay	0.0	0.0	0.0
Total Delay	13.2	8.5	8.6
Queue Length 50th (ft)	25	48	55
Queue Length 95th (ft)	84	159	180
Internal Link Dist (ft)	1116	1139	365
Turn Bay Length (ft)			
Base Capacity (vph)	891	1328	1152
Starvation Cap Reductn	0	0	0
Spillback Cap Reductn	0	0	0
Storage Cap Reductn	0	0	0
Reduced v/c Ratio	0.23	0.33	0.43

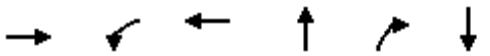
Intersection Summary



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	124	60	41	352	411	37
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.96			1.00	0.99	
Flt Protected	0.97			0.99	1.00	
Satd. Flow (prot)	1597			1717	1699	
Flt Permitted	0.97			0.93	1.00	
Satd. Flow (perm)	1597			1604	1699	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	136	66	45	387	452	41
RTOR Reduction (vph)	34	0	0	0	4	0
Lane Group Flow (vph)	168	0	0	432	489	0
Heavy Vehicles (%)	2%	0%	5%	1%	2%	0%
Turn Type			pm+pt			
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.7			23.0	23.0	
Effective Green, g (s)	8.7			23.0	23.0	
Actuated g/C Ratio	0.22			0.58	0.58	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	350			929	984	
v/s Ratio Prot	c0.10				c0.29	
v/s Ratio Perm				0.27		
v/c Ratio	0.48			0.47	0.50	
Uniform Delay, d1	13.5			4.8	4.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			0.4	0.4	
Delay (s)	14.6			5.2	5.3	
Level of Service	B			A	A	
Approach Delay (s)	14.6			5.2	5.3	
Approach LOS	B			A	A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	39.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.9%	ICU Level of Service	C
Analysis Period (min)	15		

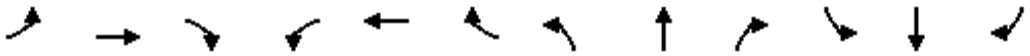
c Critical Lane Group



Lane Group	EBT	WBL	WBT	NBT	NBR	SBT
Lane Group Flow (vph)	1505	392	951	163	321	32
v/c Ratio	0.78	0.93	0.41	0.68	0.60	0.13
Control Delay	12.7	58.8	2.8	47.8	8.4	28.0
Queue Delay	0.0	0.0	0.4	0.0	0.0	0.0
Total Delay	12.7	58.8	3.2	47.8	8.4	28.0
Queue Length 50th (ft)	136	237	24	88	0	15
Queue Length 95th (ft)	#393	#407	63	138	61	35
Internal Link Dist (ft)	190		278	1114		287
Turn Bay Length (ft)						
Base Capacity (vph)	1941	421	2320	354	639	366
Starvation Cap Reductn	0	0	782	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	0.93	0.62	0.46	0.50	0.09

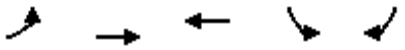
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1248	181	372	898	6	155	0	305	21	9	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Lane Util. Factor		0.91		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.98		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)		4584		1646	3225			1646	1465		1605	
Flt Permitted		1.00		0.95	1.00			0.74	1.00		0.79	
Satd. Flow (perm)		4584		1646	3225			1276	1465		1315	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1314	191	392	945	6	163	0	321	22	9	1
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	261	0	1	0
Lane Group Flow (vph)	0	1486	0	392	951	0	0	163	60	0	31	0
Confl. Peds. (#/hr)	2		8	8		2			3	3		
Heavy Vehicles (%)	0%	2%	0%	1%	3%	0%	1%	0%	0%	7%	0%	0%
Turn Type				Prot			Perm		Perm	Perm		
Protected Phases		2		1	6			8			8	
Permitted Phases							8		8	8		
Actuated Green, G (s)		37.7		23.0	64.7			16.8	16.8		16.8	
Effective Green, g (s)		37.7		23.0	64.7			16.8	16.8		16.8	
Actuated g/C Ratio		0.42		0.26	0.72			0.19	0.19		0.19	
Clearance Time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Vehicle Extension (s)		4.5		2.5	5.6			2.5	2.5		2.5	
Lane Grp Cap (vph)		1920		421	2318			238	273		245	
v/s Ratio Prot		c0.32		c0.24	0.29							
v/s Ratio Perm								c0.13	0.04		0.02	
v/c Ratio		0.77		0.93	0.41			0.68	0.22		0.13	
Uniform Delay, d1		22.5		32.7	5.0			34.1	31.0		30.5	
Progression Factor		0.37		0.99	0.40			1.00	1.00		1.00	
Incremental Delay, d2		2.4		22.5	0.4			7.3	0.3		0.2	
Delay (s)		10.7		54.8	2.4			41.4	31.3		30.7	
Level of Service		B		D	A			D	C		C	
Approach Delay (s)		10.7			17.7			34.7			30.7	
Approach LOS		B			B			C			C	

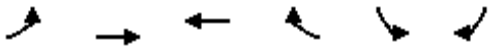
Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	216	1441	1272	673	371
v/c Ratio	0.66	0.68	0.69	0.83	0.58
Control Delay	32.2	4.9	16.4	41.7	6.9
Queue Delay	0.0	1.0	0.1	0.0	0.1
Total Delay	32.2	5.9	16.5	41.7	7.0
Queue Length 50th (ft)	131	41	216	182	0
Queue Length 95th (ft)	m178	98	m247	245	67
Internal Link Dist (ft)		278	332	531	
Turn Bay Length (ft)				300	
Base Capacity (vph)	329	2121	1854	878	669
Starvation Cap Reductn	0	393	0	0	0
Spillback Cap Reductn	0	0	55	0	15
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.83	0.71	0.77	0.57

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	205	1369	924	284	639	352
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5	4.5		4.0	4.0
Lane Util. Factor	1.00	0.95	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1646	3260	4417		3162	1444
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1646	3260	4417		3162	1444
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	1441	973	299	673	371
RTOR Reduction (vph)	0	0	59	0	0	277
Lane Group Flow (vph)	216	1441	1213	0	673	94
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	1%	2%	3%	7%	2%	3%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	18.0	58.6	36.6		22.9	22.9
Effective Green, g (s)	18.0	58.6	36.6		22.9	22.9
Actuated g/C Ratio	0.20	0.65	0.41		0.25	0.25
Clearance Time (s)	4.0	4.5	4.5		4.0	4.0
Vehicle Extension (s)	2.5	6.3	4.5		2.5	2.5
Lane Grp Cap (vph)	329	2123	1796		805	367
v/s Ratio Prot	0.13	c0.44	0.27		c0.21	
v/s Ratio Perm						0.07
v/c Ratio	0.66	0.68	0.68		0.84	0.26
Uniform Delay, d1	33.2	9.8	21.8		31.8	26.8
Progression Factor	0.74	0.35	0.70		1.00	1.00
Incremental Delay, d2	2.9	1.2	1.8		7.4	0.3
Delay (s)	27.4	4.6	17.1		39.2	27.0
Level of Service	C	A	B		D	C
Approach Delay (s)		7.6	17.1		34.9	
Approach LOS		A	B		C	

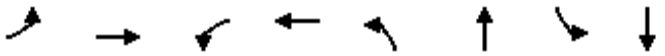
Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	68.9%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	1888	86	28	1091	44	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1987	91	29	1148	46	25
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	412					
pX, platoon unblocked			0.72		0.72	0.72
vC, conflicting volume			2078		2666	1039
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			1716		2535	269
tC, single (s)			4.2		6.8	7.0
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			88		0	95
cM capacity (veh/h)			256		15	515

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1
Volume Total	1325	753	29	574	574	72
Volume Left	0	0	29	0	0	46
Volume Right	0	91	0	0	0	25
cSH	1700	1700	256	1700	1700	22
Volume to Capacity	0.78	0.44	0.12	0.34	0.34	3.21
Queue Length 95th (ft)	0	0	10	0	0	Err
Control Delay (s)	0.0	0.0	20.9	0.0	0.0	Err
Lane LOS			C			F
Approach Delay (s)	0.0		0.5			Err
Approach LOS						F

Intersection Summary			
Average Delay	215.3		
Intersection Capacity Utilization	70.5%	ICU Level of Service	C
Analysis Period (min)	15		



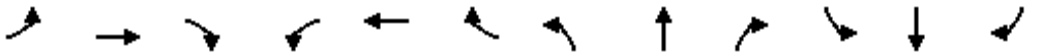
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	73	1614	98	850	211	234	84	189
v/c Ratio	0.49	1.08	0.59	0.56	1.02	0.69	0.56	0.77
Control Delay	45.2	68.1	43.5	25.1	110.5	40.5	53.0	50.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	68.1	43.5	25.1	110.5	40.5	53.0	50.8
Queue Length 50th (ft)	37	~330	55	223	~126	111	47	90
Queue Length 95th (ft)	m56	#769	#124	298	#266	186	90	149
Internal Link Dist (ft)		3201		1243		756		743
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	171	1497	176	1513	206	369	212	359
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	1.08	0.56	0.56	1.02	0.63	0.40	0.53

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

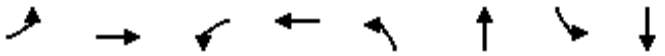
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	1280	254	93	763	45	200	140	83	80	116	64
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3153		1614	3144		1614	1595		1662	1594	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3153		1614	3144		1614	1595		1662	1594	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	73	1347	267	98	803	47	211	147	87	84	122	67
RTOR Reduction (vph)	0	16	0	0	4	0	0	24	0	0	24	0
Lane Group Flow (vph)	73	1598	0	98	846	0	211	210	0	84	165	0
Heavy Vehicles (%)	0%	3%	2%	3%	5%	3%	3%	4%	3%	0%	5%	2%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	7.1	40.7		8.0	41.6		11.5	17.9		6.9	13.3	
Effective Green, g (s)	7.1	40.7		8.0	41.6		11.5	17.9		6.9	13.3	
Actuated g/C Ratio	0.08	0.45		0.09	0.46		0.13	0.20		0.08	0.15	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		0.2	0.2	
Lane Grp Cap (vph)	131	1426		143	1453		206	317		127	236	
v/s Ratio Prot	0.04	c0.51		c0.06	0.27		c0.13	c0.13		0.05	c0.10	
v/s Ratio Perm												
v/c Ratio	0.56	1.12		0.69	0.58		1.02	0.66		0.66	0.70	
Uniform Delay, d1	39.9	24.6		39.8	17.8		39.2	33.3		40.4	36.5	
Progression Factor	0.97	0.81		0.74	1.25		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.9	61.6		11.2	1.6		69.2	4.6		9.6	7.1	
Delay (s)	41.4	81.6		40.5	23.9		108.4	37.9		50.0	43.6	
Level of Service	D	F		D	C		F	D		D	D	
Approach Delay (s)		79.8			25.6			71.3			45.6	
Approach LOS		E			C			E			D	

Intersection Summary			
HCM Average Control Delay	60.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	89.5%	ICU Level of Service	E
Analysis Period (min)	15		

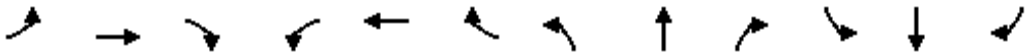
c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	1173	28	765	100	101	63	159
v/c Ratio	0.44	0.53	0.27	0.38	0.72	0.34	0.34	0.52
Control Delay	51.5	3.7	42.6	5.7	61.2	25.7	35.5	26.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	3.7	42.6	5.7	61.2	25.7	35.5	26.2
Queue Length 50th (ft)	35	14	17	107	55	38	33	53
Queue Length 95th (ft)	m38	m66	m35	146	96	72	61	97
Internal Link Dist (ft)		1243		1262		460		794
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	149	2218	111	2037	238	482	319	480
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.53	0.25	0.38	0.42	0.21	0.20	0.33

Intersection Summary

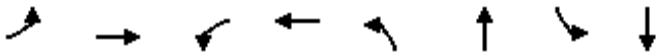
m Volume for 95th percentile queue is metered by upstream signal.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	931	183	27	694	32	95	65	31	60	74	77
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.95		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3159		1662	3205		1599	1664		1630	1576	
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00		0.67	1.00	
Satd. Flow (perm)	1599	3159		1662	3205		854	1664		1148	1576	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	980	193	28	731	34	100	68	33	63	78	81
RTOR Reduction (vph)	0	12	0	0	3	0	0	23	0	0	49	0
Lane Group Flow (vph)	59	1161	0	28	762	0	100	78	0	63	110	0
Heavy Vehicles (%)	4%	3%	1%	0%	3%	4%	4%	0%	0%	2%	0%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.5	60.5		2.4	56.4		14.6	14.6		14.6	14.6	
Effective Green, g (s)	6.5	60.5		2.4	56.4		14.6	14.6		14.6	14.6	
Actuated g/C Ratio	0.07	0.67		0.03	0.63		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	115	2124		44	2008		139	270		186	256	
v/s Ratio Prot	0.04	c0.37		0.02	c0.24			0.05			0.07	
v/s Ratio Perm							c0.12			0.05		
v/c Ratio	0.51	0.55		0.64	0.38		0.72	0.29		0.34	0.43	
Uniform Delay, d1	40.2	7.6		43.4	8.2		35.8	33.1		33.4	34.0	
Progression Factor	1.29	0.42		0.91	0.53		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.1		21.9	0.5		15.3	0.4		0.8	0.9	
Delay (s)	52.1	3.3		61.5	4.9		51.0	33.6		34.2	34.8	
Level of Service	D	A		E	A		D	C		C	C	
Approach Delay (s)		5.6			6.9			42.3			34.6	
Approach LOS		A			A			D			C	

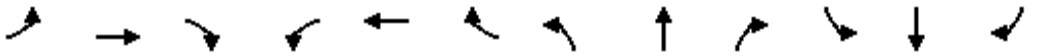
Intersection Summary			
HCM Average Control Delay	11.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	154	864	11	798	25	31	238	93
v/c Ratio	0.66	0.41	0.11	0.52	0.10	0.08	0.79	0.22
Control Delay	52.1	4.4	42.6	18.6	24.5	17.0	50.1	12.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	52.1	4.4	42.6	18.6	24.5	17.0	50.1	12.3
Queue Length 50th (ft)	79	27	6	150	11	8	127	15
Queue Length 95th (ft)	114	118	23	258	28	27	192	48
Internal Link Dist (ft)		1262		3552		693		561
Turn Bay Length (ft)	200		200		200		200	
Base Capacity (vph)	307	2089	103	1528	354	497	407	550
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.50	0.41	0.11	0.52	0.07	0.06	0.58	0.17

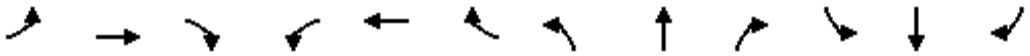
Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	146	752	68	10	577	181	24	18	11	226	33	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3224		1662	3127		1498	1518		1630	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00		0.74	1.00	
Satd. Flow (perm)	1646	3224		1662	3127		1098	1518		1264	1586	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	154	792	72	11	607	191	25	19	12	238	35	58
RTOR Reduction (vph)	0	5	0	0	27	0	0	9	0	0	44	0
Lane Group Flow (vph)	154	859	0	11	771	0	25	22	0	238	49	0
Heavy Vehicles (%)	1%	2%	0%	0%	3%	1%	11%	14%	0%	2%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.8	55.0		1.1	43.3		21.4	21.4		21.4	21.4	
Effective Green, g (s)	12.8	55.0		1.1	43.3		21.4	21.4		21.4	21.4	
Actuated g/C Ratio	0.14	0.61		0.01	0.48		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.5		2.5	4.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	234	1970		20	1504		261	361		301	377	
v/s Ratio Prot	c0.09	0.27		0.01	c0.25			0.01			0.03	
v/s Ratio Perm							0.02			c0.19		
v/c Ratio	0.66	0.44		0.55	0.51		0.10	0.06		0.79	0.13	
Uniform Delay, d1	36.5	9.3		44.2	16.1		26.8	26.5		32.2	27.0	
Progression Factor	1.12	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	0.6		23.6	1.3		0.1	0.1		12.8	0.1	
Delay (s)	46.0	4.5		67.8	17.3		26.9	26.6		45.0	27.1	
Level of Service	D	A		E	B		C	C		D	C	
Approach Delay (s)		10.8			18.0			26.7			40.0	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM Average Control Delay	18.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	63.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	5	35	7	8	50	33	671	24	74	872	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	5	5	37	7	8	53	35	706	25	78	918	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1558	1879	464	1443	1872	366	927			732		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1558	1879	464	1443	1872	366	927			732		
tC, single (s)	7.5	6.9	7.0	7.5	6.8	7.0	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.2	3.3	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	91	89	93	90	84	92	95			91		
cM capacity (veh/h)	56	50	542	73	52	628	721			882		

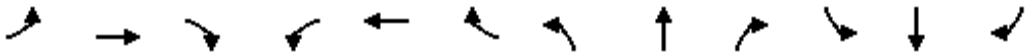
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	47	68	35	471	261	78	612	315
Volume Left	5	7	35	0	0	78	0	0
Volume Right	37	53	0	0	25	0	0	9
cSH	178	198	721	1700	1700	882	1700	1700
Volume to Capacity	0.27	0.35	0.05	0.28	0.15	0.09	0.36	0.19
Queue Length 95th (ft)	26	36	4	0	0	7	0	0
Control Delay (s)	32.5	32.5	10.2	0.0	0.0	9.5	0.0	0.0
Lane LOS	D	D	B			A		
Approach Delay (s)	32.5	32.5	0.5			0.7		
Approach LOS	D	D						

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	45.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	249	10	15	622	131	9	9	28	23	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	262	11	16	655	138	9	9	29	24	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	793			273			972	1108	267	1005	976	655
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	793			273			972	1108	267	1005	976	655
tC, single (s)	4.1			4.4			7.4	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.8	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	95	96	88	100	100
cM capacity (veh/h)	837			1131			200	206	776	202	247	470

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	281	671	138	48	25
Volume Left	8	16	0	9	24
Volume Right	11	0	138	29	1
cSH	837	1131	1700	369	207
Volume to Capacity	0.01	0.01	0.08	0.13	0.12
Queue Length 95th (ft)	1	1	0	11	10
Control Delay (s)	0.4	0.4	0.0	16.2	24.8
Lane LOS	A	A		C	C
Approach Delay (s)	0.4	0.3		16.2	24.8
Approach LOS				C	C

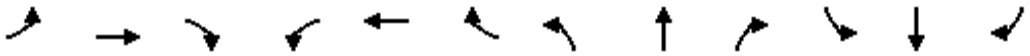
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	54.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	9	3	6	14	54	9	31	9	30	11	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	10	3	7	16	60	10	34	10	33	12	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			13			77	101	12	98	72	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			13			77	101	12	98	72	46
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	96	99	96	99	100
cM capacity (veh/h)	1536			1618			904	790	1075	849	819	1030

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	82	54	46
Volume Left	0	7	10	33
Volume Right	3	60	10	0
cSH	1536	1618	851	841
Volume to Capacity	0.00	0.00	0.06	0.05
Queue Length 95th (ft)	0	0	5	4
Control Delay (s)	0.0	0.6	9.5	9.5
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.6	9.5	9.5
Approach LOS			A	A

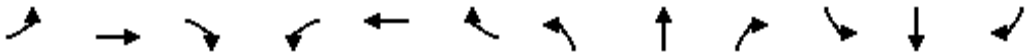
Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	24.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	10	316	0	0	508	7	0	0	0	13	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	11	333	0	0	535	7	0	0	0	14	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	542			333			905	896	333	892	892	538
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	542			333			905	896	333	892	892	538
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	95	100	97
cM capacity (veh/h)	942			1238			249	279	714	263	280	547

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	11	333	0	542	0	31
Volume Left	11	0	0	0	0	14
Volume Right	0	0	0	7	0	17
cSH	942	1700	1700	1700	1700	368
Volume to Capacity	0.01	0.20	0.00	0.32	0.00	0.08
Queue Length 95th (ft)	1	0	0	0	0	7
Control Delay (s)	8.9	0.0	0.0	0.0	0.0	15.7
Lane LOS	A				A	C
Approach Delay (s)	0.3		0.0		0.0	15.7
Approach LOS					A	C

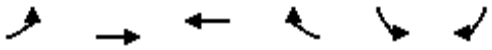
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	39.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	4	326	0	8	502	8	1	0	1	12	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	4	343	0	8	528	8	1	0	1	13	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	537			343			902	905	343	902	901	533
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	537			343			902	905	343	902	901	533
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	95	100	100
cM capacity (veh/h)	1041			1137			258	275	704	258	277	551

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	347	545	2	14
Volume Left	4	8	1	13
Volume Right	0	8	1	1
cSH	1041	1137	378	269
Volume to Capacity	0.00	0.01	0.01	0.05
Queue Length 95th (ft)	0	1	0	4
Control Delay (s)	0.1	0.2	14.6	19.1
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.2	14.6	19.1
Approach LOS			B	C

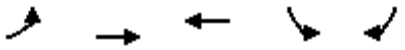
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	333	805	139	64	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	351	847	146	67	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			570			
pX, platoon unblocked	0.68				0.68	0.68
vC, conflicting volume	994				1096	497
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	64				213	0
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	100
cM capacity (veh/h)	1060				513	745

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	175	175	565	429	68
Volume Left	0	0	0	0	67
Volume Right	0	0	0	146	1
cSH	1700	1700	1700	1700	515
Volume to Capacity	0.10	0.10	0.33	0.25	0.13
Queue Length 95th (ft)	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	13.1
Lane LOS					B
Approach Delay (s)	0.0		0.0		13.1
Approach LOS					B

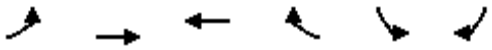
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	39.6%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	11	407	1288	421	11
v/c Ratio	0.11	0.25	0.82	0.79	0.02
Control Delay	45.6	11.5	22.7	36.8	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	45.6	11.5	22.7	36.8	10.6
Queue Length 50th (ft)	6	56	253	188	0
Queue Length 95th (ft)	26	94	#488	#398	12
Internal Link Dist (ft)		490	240	1823	
Turn Bay Length (ft)	150			275	
Base Capacity (vph)	101	2287	1946	710	717
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.11	0.18	0.66	0.59	0.02

Intersection Summary

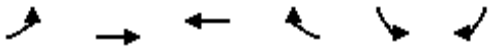
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	10	387	934	290	400	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0	5.0		4.5	4.5
Lane Util. Factor	1.00	0.95	0.95		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1662	3137	3108		1484	1488
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1662	3137	3108		1484	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	11	407	983	305	421	11
RTOR Reduction (vph)	0	0	29	0	0	7
Lane Group Flow (vph)	11	407	1259	0	421	4
Heavy Vehicles (%)	0%	6%	2%	7%	12%	0%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	0.7	44.1	38.9		28.0	28.0
Effective Green, g (s)	0.7	44.1	38.9		28.0	28.0
Actuated g/C Ratio	0.01	0.54	0.48		0.34	0.34
Clearance Time (s)	4.5	5.0	5.0		4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	14	1695	1482		509	511
v/s Ratio Prot	0.01	c0.13	c0.41		c0.28	
v/s Ratio Perm						0.00
v/c Ratio	0.79	0.24	0.85		0.83	0.01
Uniform Delay, d1	40.4	9.9	18.8		24.6	17.6
Progression Factor	1.00	1.00	1.00		1.00	1.00
Incremental Delay, d2	130.6	0.1	4.8		10.6	0.0
Delay (s)	170.9	10.0	23.5		35.2	17.7
Level of Service	F	A	C		D	B
Approach Delay (s)		14.2	23.5		34.7	
Approach LOS		B	C		C	

Intersection Summary			
HCM Average Control Delay	24.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	81.6	Sum of lost time (s)	14.5
Intersection Capacity Utilization	70.1%	ICU Level of Service	C
Analysis Period (min)	15		

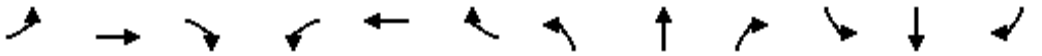
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	787	1220	0	8	4
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	828	1284	0	8	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		320				
pX, platoon unblocked					0.94	
vC, conflicting volume	1284				1698	642
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1284				1620	642
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	99
cM capacity (veh/h)	547				90	422

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	0	414	414	856	428	13
Volume Left	0	0	0	0	0	8
Volume Right	0	0	0	0	0	4
cSH	1700	1700	1700	1700	1700	122
Volume to Capacity	0.00	0.24	0.24	0.50	0.25	0.10
Queue Length 95th (ft)	0	0	0	0	0	8
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	37.8
Lane LOS						E
Approach Delay (s)	0.0			0.0		37.8
Approach LOS						E

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	46.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	769	26	16	792	0	0	0	0	142	0	428
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	809	27	17	834	0	0	0	0	149	0	451
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		760										
pX, platoon unblocked				0.97			0.97	0.97	0.97	0.97	0.97	
vC, conflicting volume	834			809			1274	1691	418	1272	1677	417
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	834			731			1212	1644	326	1210	1630	417
tC, single (s)	4.1			4.8			7.5	6.5	6.9	7.8	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	100			97			100	100	100	0	100	23
cM capacity (veh/h)	808			668			31	95	652	119	97	588

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	SB 1	SB 2
Volume Total	540	297	17	417	417	149	451
Volume Left	0	0	17	0	0	149	0
Volume Right	0	27	0	0	0	0	451
cSH	1700	1700	668	1700	1700	119	588
Volume to Capacity	0.32	0.17	0.03	0.25	0.25	1.26	0.77
Queue Length 95th (ft)	0	0	2	0	0	241	175
Control Delay (s)	0.0	0.0	10.5	0.0	0.0	237.1	28.4
Lane LOS			B			F	D
Approach Delay (s)	0.0		0.2			80.4	
Approach LOS						F	

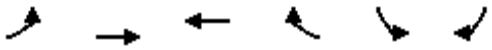
Intersection Summary				
Average Delay	21.2			
Intersection Capacity Utilization	59.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	697	214	98	786	22	57
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	734	225	103	827	23	60
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			734		1354	734
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			734		1354	734
tC, single (s)			4.3		7.1	7.1
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			87		79	83
cM capacity (veh/h)			816		110	347

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	734	225	103	414	414	23	60
Volume Left	0	0	103	0	0	23	0
Volume Right	0	225	0	0	0	0	60
cSH	1700	1700	816	1700	1700	110	347
Volume to Capacity	0.43	0.13	0.13	0.24	0.24	0.21	0.17
Queue Length 95th (ft)	0	0	11	0	0	19	15
Control Delay (s)	0.0	0.0	10.0	0.0	0.0	46.4	17.5
Lane LOS			B			E	C
Approach Delay (s)	0.0		1.1			25.6	
Approach LOS						D	

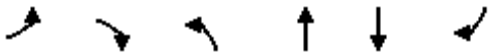
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	59.1%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	37	717	837	82	75	47
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	39	755	881	86	79	49
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	967				1757	484
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	967				1757	484
tC, single (s)	4.2				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	94				0	91
cM capacity (veh/h)	696				71	529

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	39	755	587	380	128
Volume Left	39	0	0	0	79
Volume Right	0	0	0	86	49
cSH	696	1700	1700	1700	107
Volume to Capacity	0.06	0.44	0.35	0.22	1.21
Queue Length 95th (ft)	4	0	0	0	211
Control Delay (s)	10.5	0.0	0.0	0.0	228.1
Lane LOS	B				F
Approach Delay (s)	0.5		0.0		228.1
Approach LOS					F

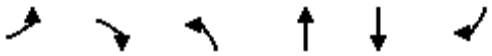
Intersection Summary			
Average Delay	15.7		
Intersection Capacity Utilization	55.3%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	14	1	8	32	82	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	1	9	36	91	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	161	107	123			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	161	107	123			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	99			
cM capacity (veh/h)	830	952	1476			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	44	123
Volume Left	16	9	0
Volume Right	1	0	32
cSH	837	1476	1700
Volume to Capacity	0.02	0.01	0.07
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.4	1.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	3	0	3	4	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	3	0	3	4	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	13	10	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13	10	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	1011	1077	1615			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	3	16
Volume Left	7	0	0
Volume Right	3	0	11
cSH	1032	1615	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: Future

Greensprings Dr / Dover Ave / Riverside Dr
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Greensprings Dr											
3L	L	3	0.0	0.098	6.6	LOS A	0.6	14.7	0.18	0.66	25.8
8L	T	39	4.0	0.099	0.3	LOS A	0.6	14.7	0.18	0.07	28.5
8T	R	108	7.0	0.099	6.2	LOS A	0.6	14.7	0.18	0.52	26.1
Approach		150	6.1	0.099	4.7	LOS A	0.6	14.7	0.18	0.40	26.6
North East: Greensprings Dr											
17T	L	71	11.0	0.046	7.3	LOS A	0.0	0.0	0.00	1.00	24.8
14R	T	1	0.0	0.046	6.2	LOS A	0.0	0.0	0.00	0.69	26.1
14R	R	3	0.0	0.046	6.9	LOS A	0.0	0.0	0.00	0.67	25.8
Approach		76	10.4	0.046	5.1	LOS A	0.0	0.0	0.00	0.98	24.9
North: Riverside Dr											
7L	L	4	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	1.00	23.5
4T	T	46	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.88	23.8
4R	R	1	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.88	23.7
Approach		51	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.89	23.8
West: Dover Ave											
5L	L	1	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.91	23.0
2T	T	1	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.85	23.0
2R	R	3	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.83	22.9
Approach		6	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.85	23.0
All Vehicles		282	6.0	0.099	6.0	NA	0.6	14.7	0.13	0.65	25.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

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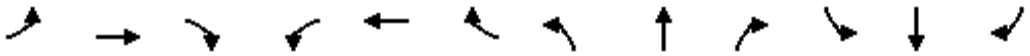
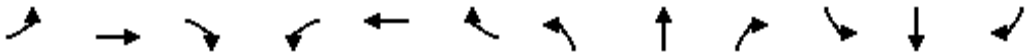


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	542	3	0	618	0	4	0	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	571	3	0	651	0	4	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	651			574			1223	1223	572	1231	1224	651
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	651			574			1223	1223	572	1231	1224	651
tC, single (s)	4.1			4.1			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			100			97	100	98	100	100	100
cM capacity (veh/h)	945			1009			158	181	492	153	181	472

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	574	651	13	0
Volume Left	0	0	4	0
Volume Right	3	0	8	0
cSH	945	1009	288	1700
Volume to Capacity	0.00	0.00	0.04	0.00
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	18.1	0.0
Lane LOS			C	A
Approach Delay (s)	0.0	0.0	18.1	0.0
Approach LOS			C	A

Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	441	12	48	1161	12	19	1	42	9	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	6	459	12	50	1209	12	20	1	44	9	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1222			472			1788	1800	466	1788	1800	1216
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1222			472			1788	1800	466	1788	1800	1216
tC, single (s)	4.6			4.3			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.7			2.3			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			95			64	99	93	82	100	98
cM capacity (veh/h)	432			1021			55	76	595	51	76	223

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	472	50	1222	65	14
Volume Left	6	0	50	0	20	9
Volume Right	0	12	0	12	44	4
cSH	432	1700	1021	1700	144	67
Volume to Capacity	0.01	0.28	0.05	0.72	0.45	0.20
Queue Length 95th (ft)	1	0	4	0	51	17
Control Delay (s)	13.5	0.0	8.7	0.0	48.7	71.6
Lane LOS	B		A		E	F
Approach Delay (s)	0.2		0.3		48.7	71.6
Approach LOS					E	F

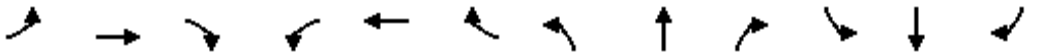
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	77.8%	ICU Level of Service	D
Analysis Period (min)	15		



Lane Group	EBT	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	200	178	152	942	150	722	18
v/c Ratio	0.51	0.50	0.60	0.72	0.59	0.54	0.03
Control Delay	14.0	17.2	36.7	19.5	36.4	15.4	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.0	17.2	36.7	19.5	36.4	15.4	7.4
Queue Length 50th (ft)	26	32	44	113	43	79	0
Queue Length 95th (ft)	69	74	#153	#320	#151	200	13
Internal Link Dist (ft)	1132	2558		6451		1685	
Turn Bay Length (ft)			275		350		100
Base Capacity (vph)	838	798	267	1364	267	1386	649
Starvation Cap Reductn	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.24	0.22	0.57	0.69	0.56	0.52	0.03

Intersection Summary

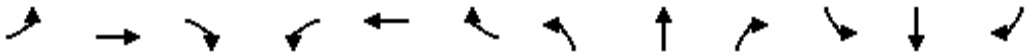
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	54	100	33	58	69	137	804	44	135	650	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt		0.93			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1598			1617		1646	3166		1646	3228	1488
Flt Permitted		0.95			0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1530			1489		1646	3166		1646	3228	1488
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	60	111	37	64	77	152	893	49	150	722	18
RTOR Reduction (vph)	0	83	0	0	51	0	0	5	0	0	0	11
Lane Group Flow (vph)	0	117	0	0	127	0	152	937	0	150	722	7
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%	1%	4%	8%	1%	3%	0%
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)		10.9			10.9		8.3	22.2		8.3	22.2	22.2
Effective Green, g (s)		10.9			10.9		8.3	22.2		8.3	22.2	22.2
Actuated g/C Ratio		0.20			0.20		0.16	0.42		0.16	0.42	0.42
Clearance Time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		2.5			2.5		2.5	4.5		2.5	4.5	4.5
Lane Grp Cap (vph)		312			304		256	1316		256	1342	619
v/s Ratio Prot							c0.09	c0.30		0.09	0.22	
v/s Ratio Perm		0.08			c0.09							0.01
v/c Ratio		0.38			0.42		0.59	0.71		0.59	0.54	0.01
Uniform Delay, d1		18.3			18.5		21.0	12.9		21.0	11.7	9.2
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.6			0.7		3.1	2.1		2.8	0.6	0.0
Delay (s)		18.9			19.2		24.1	15.1		23.8	12.4	9.2
Level of Service		B			B		C	B		C	B	A
Approach Delay (s)		18.9			19.2			16.3			14.2	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	16.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.61		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

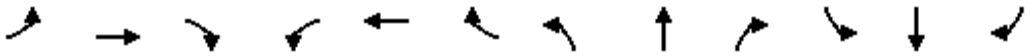
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	141	45	20	77	20	21	151	16	70	292	48
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	36	147	47	21	80	21	22	157	17	73	304	50
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	745	693	329	805	709	166	354			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	745	693	329	805	709	166	354			174		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	57	93	88	76	98	98			95		
cM capacity (veh/h)	250	338	717	178	330	884	1216			1385		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	230	122	196	427
Volume Left	36	21	22	73
Volume Right	47	21	17	50
cSH	357	318	1216	1385
Volume to Capacity	0.65	0.38	0.02	0.05
Queue Length 95th (ft)	107	44	1	4
Control Delay (s)	31.8	23.2	1.0	1.7
Lane LOS	D	C	A	A
Approach Delay (s)	31.8	23.2	1.0	1.7
Approach LOS	D	C		

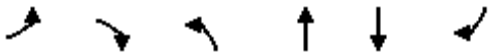
Intersection Summary				
Average Delay	11.4			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	56	27	145	3	14	13	97	309	5	13	441	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	62	30	161	3	16	14	108	343	6	14	490	54
Pedestrians		18			8			1			2	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		2			1			0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1147	1137	536	1266	1161	356	562			357		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1147	1137	536	1266	1161	356	562			357		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	56	83	70	96	91	98	89			99		
cM capacity (veh/h)	143	176	540	80	170	687	1004			1205		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	253	33	108	349	14	544
Volume Left	62	3	108	0	14	0
Volume Right	161	14	0	6	0	54
cSH	280	216	1004	1700	1205	1700
Volume to Capacity	0.91	0.15	0.11	0.21	0.01	0.32
Queue Length 95th (ft)	206	13	9	0	1	0
Control Delay (s)	72.1	24.7	9.0	0.0	8.0	0.0
Lane LOS	F	C	A		A	
Approach Delay (s)	72.1	24.7	2.1		0.2	
Approach LOS	F	C				

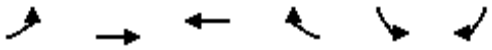
Intersection Summary				
Average Delay	15.5			
Intersection Capacity Utilization	65.8%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	69	40	410	444	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	80	77	44	456	493	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1067	523	552			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1067	523	552			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	86	96			
cM capacity (veh/h)	237	558	1028			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	80	77	44	456	552
Volume Left	80	0	44	0	0
Volume Right	0	77	0	0	59
cSH	237	558	1028	1700	1700
Volume to Capacity	0.34	0.14	0.04	0.27	0.32
Queue Length 95th (ft)	36	12	3	0	0
Control Delay (s)	27.7	12.5	8.7	0.0	0.0
Lane LOS	D	B	A		
Approach Delay (s)	20.3		0.8		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	26	164	109	85	108	45
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	29	182	121	94	120	50
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216				408	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216				408	168
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	98				80	94
cM capacity (veh/h)	1366				588	865

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	211	216	120	50
Volume Left	29	0	120	0
Volume Right	0	94	0	50
cSH	1366	1700	588	865
Volume to Capacity	0.02	0.13	0.20	0.06
Queue Length 95th (ft)	2	0	19	5
Control Delay (s)	1.2	0.0	12.7	9.4
Lane LOS	A		B	A
Approach Delay (s)	1.2	0.0	11.7	
Approach LOS			B	

Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		



Lane Group	WBL	NBT	SBL	SBT
Lane Group Flow (vph)	317	479	569	451
v/c Ratio	0.94	0.93	0.95	0.37
Control Delay	64.5	56.9	58.6	5.6
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	64.5	56.9	58.6	5.6
Queue Length 50th (ft)	142	281	348	86
Queue Length 95th (ft)	#315	#477	#568	128
Internal Link Dist (ft)	1985	1504		1756
Turn Bay Length (ft)				
Base Capacity (vph)	344	550	622	1298
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.92	0.87	0.91	0.35

Intersection Summary

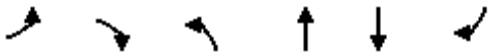
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	91	210	344	111	541	428
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0		4.0	4.0
Lane Util. Factor	1.00		1.00		1.00	1.00
Frt	0.91		0.97		1.00	1.00
Flt Protected	0.99		1.00		0.95	1.00
Satd. Flow (prot)	1395		1567		1614	1683
Flt Permitted	0.99		1.00		0.95	1.00
Satd. Flow (perm)	1395		1567		1614	1683
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	96	221	362	117	569	451
RTOR Reduction (vph)	83	0	12	0	0	0
Lane Group Flow (vph)	234	0	467	0	569	451
Heavy Vehicles (%)	21%	8%	7%	11%	3%	4%
Turn Type					Prot	
Protected Phases	8		2		1	6
Permitted Phases						
Actuated Green, G (s)	17.6		31.1		35.7	70.8
Effective Green, g (s)	17.6		31.1		35.7	70.8
Actuated g/C Ratio	0.18		0.32		0.37	0.73
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	255		506		598	1236
v/s Ratio Prot	c0.17		c0.30		c0.35	0.27
v/s Ratio Perm						
v/c Ratio	0.92		0.92		0.95	0.36
Uniform Delay, d1	38.7		31.5		29.5	4.6
Progression Factor	1.00		1.00		1.00	1.00
Incremental Delay, d2	35.0		22.7		25.2	0.2
Delay (s)	73.7		54.2		54.7	4.8
Level of Service	E		D		D	A
Approach Delay (s)	73.7		54.2			32.7
Approach LOS	E		D			C

Intersection Summary			
HCM Average Control Delay	45.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	96.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	89.0%	ICU Level of Service	E
Analysis Period (min)	15		

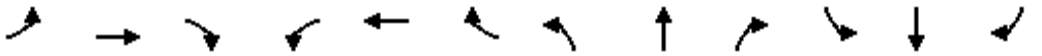
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	5	451	453	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	5	475	477	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	964	479	481			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	964	479	481			
tC, single (s)	6.4	6.2	4.4			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	100	100	99			
cM capacity (veh/h)	284	591	972			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	2	5	475	481
Volume Left	1	5	0	0
Volume Right	1	0	0	4
cSH	384	972	1700	1700
Volume to Capacity	0.01	0.01	0.28	0.28
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	14.4	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.4	0.1		0.0
Approach LOS	B			

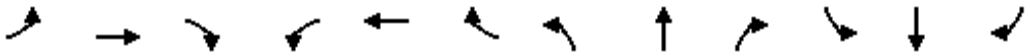
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	56	2	240	36	611	0	0	573	653
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	59	2	253	38	643	0	0	603	687
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1323	1322	603	1322	1322	643	603			643		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1323	1322	603	1322	1322	643	603			643		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	55	99	47	96			100		
cM capacity (veh/h)	60	152	503	131	152	475	965			951		

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	61	253	38	643	603	687
Volume Left	59	0	38	0	0	0
Volume Right	0	253	0	0	0	687
cSH	131	475	965	1700	1700	1700
Volume to Capacity	0.46	0.53	0.04	0.38	0.35	0.40
Queue Length 95th (ft)	53	77	3	0	0	0
Control Delay (s)	54.3	20.9	8.9	0.0	0.0	0.0
Lane LOS	F	C	A			
Approach Delay (s)	27.4		0.5		0.0	
Approach LOS	D					

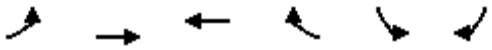
Intersection Summary					
Average Delay	3.9				
Intersection Capacity Utilization	60.9%	ICU Level of Service		B	
Analysis Period (min)	15				



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	352	6	17	0	0	0	0	295	78	208	421	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	371	6	18	0	0	0	0	311	82	219	443	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			16									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1192	1192	443	1204	1192	311	443			311		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1192	1192	443	1204	1192	311	443			311		
tC, single (s)	7.2	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	96	97	100	100	100	100			82		
cM capacity (veh/h)	140	156	619	132	156	734	1128			1244		

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	395	311	82	219	443
Volume Left	371	0	0	219	0
Volume Right	18	0	82	0	0
cSH	146	1700	1700	1244	1700
Volume to Capacity	2.71	0.18	0.05	0.18	0.26
Queue Length 95th (ft)	883	0	0	16	0
Control Delay (s)	837.4	0.0	0.0	8.5	0.0
Lane LOS	F			A	
Approach Delay (s)	837.4	0.0		2.8	
Approach LOS	F				

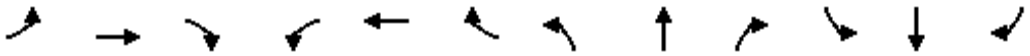
Intersection Summary				
Average Delay	229.3			
Intersection Capacity Utilization	60.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	49	634	550	66	78	56
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	52	667	579	69	82	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	648				1384	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	648				1384	614
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				45	88
cM capacity (veh/h)	947				150	488

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	52	667	648	82	59
Volume Left	52	0	0	82	0
Volume Right	0	0	69	0	59
cSH	947	1700	1700	150	488
Volume to Capacity	0.05	0.39	0.38	0.55	0.12
Queue Length 95th (ft)	4	0	0	68	10
Control Delay (s)	9.0	0.0	0.0	54.6	13.4
Lane LOS	A			F	B
Approach Delay (s)	0.6		0.0	37.4	
Approach LOS				E	

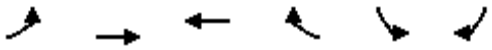
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	53.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	124	549	1	13	458	100	4	28	40	45	11	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	131	578	1	14	482	105	4	29	42	47	12	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	587			579			1418	1454	578	1458	1402	535
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	587			579			1418	1454	578	1458	1402	535
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			99			95	73	92	32	90	89
cM capacity (veh/h)	998			1005			85	110	513	70	121	549

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	131	579	14	587	76	47	75
Volume Left	131	0	14	0	4	47	0
Volume Right	0	1	0	105	42	0	63
cSH	998	1700	1005	1700	190	70	355
Volume to Capacity	0.13	0.34	0.01	0.35	0.40	0.68	0.21
Queue Length 95th (ft)	11	0	1	0	44	76	20
Control Delay (s)	9.2	0.0	8.6	0.0	36.1	129.6	17.8
Lane LOS	A		A		E	F	C
Approach Delay (s)	1.7		0.2		36.1	61.2	
Approach LOS					E	F	

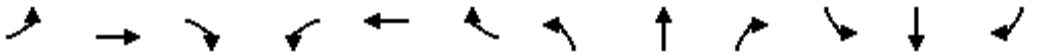
Intersection Summary				
Average Delay	7.6			
Intersection Capacity Utilization	59.6%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	89	470	516	22	14	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	94	495	543	23	15	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	566				1237	555
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	566				1237	555
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				92	86
cM capacity (veh/h)	1011				178	531

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	94	495	566	92
Volume Left	94	0	0	15
Volume Right	0	0	23	77
cSH	1011	1700	1700	403
Volume to Capacity	0.09	0.29	0.33	0.23
Queue Length 95th (ft)	8	0	0	22
Control Delay (s)	8.9	0.0	0.0	16.6
Lane LOS	A			C
Approach Delay (s)	1.4		0.0	16.6
Approach LOS				C

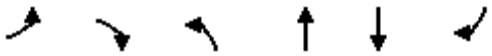
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	194	349	62	0	398	55	26	29	1	23	38	99
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	204	367	65	0	419	58	27	31	1	24	40	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	477			433			1352	1285	400	1240	1289	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	477			433			1352	1285	400	1240	1289	448
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			60	77	100	78	70	83
cM capacity (veh/h)	1091			1138			69	132	654	108	132	615

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	204	433	0	477	59	64	104
Volume Left	204	0	0	0	27	24	0
Volume Right	0	65	0	58	1	0	104
cSH	1091	1700	1700	1700	94	122	615
Volume to Capacity	0.19	0.25	0.00	0.28	0.63	0.53	0.17
Queue Length 95th (ft)	17	0	0	0	75	62	15
Control Delay (s)	9.1	0.0	0.0	0.0	93.8	63.2	12.0
Lane LOS	A				F	F	B
Approach Delay (s)	2.9		0.0		93.8	31.5	
Approach LOS					F	D	

Intersection Summary				
Average Delay	9.5			
Intersection Capacity Utilization	58.0%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	139	211	219	318	415	157
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	145	220	228	331	432	164
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1302	514	596			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1302	514	596			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	61	76			
cM capacity (veh/h)	134	556	966			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	145	220	228	331	596
Volume Left	145	0	228	0	0
Volume Right	0	220	0	0	164
cSH	134	556	966	1700	1700
Volume to Capacity	1.08	0.39	0.24	0.19	0.35
Queue Length 95th (ft)	201	47	23	0	0
Control Delay (s)	164.8	15.6	9.9	0.0	0.0
Lane LOS	F	C	A		
Approach Delay (s)	74.9		4.0		0.0
Approach LOS	F				

Intersection Summary			
Average Delay	19.4		
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

APPENDIX D - TRAFFIC SIGNAL WARRANT ANALYSIS

KITTELSON & ASSOCIATES, INC.
610 SW Alder, Suite 700
Portland, Oregon 97205
(503) 228-5230
Fax: (503) 273-8169

Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[14_Oregon and Biehn Sig
Intersection: Oregon Ave & Biehn St
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	269	349	0	424
2nd	Highest Hour	258	335	0	407
3rd	Highest Hour	253	328	0	399
4th	Highest Hour	215	279	0	339
5th	Highest Hour	204	265	0	322
6th	Highest Hour	183	237	0	288
7th	Highest Hour	169	220	0	267
8th	Highest Hour	161	209	0	254
9th	Highest Hour	129	168	0	204
10th	Highest Hour	121	157	0	191
11th	Highest Hour	121	157	0	191
12th	Highest Hour	116	150	0	182
13th	Highest Hour	105	136	0	165
14th	Highest Hour	97	126	0	153
15th	Highest Hour	97	126	0	153
16th	Highest Hour	94	122	0	148
17th	Highest Hour	54	70	0	85
18th	Highest Hour	30	38	0	47
19th	Highest Hour	27	35	0	42
20th	Highest Hour	11	14	0	17
21st	Highest Hour	8	10	0	13
22nd	Highest Hour	8	10	0	13
23rd	Highest Hour	5	7	0	8
24th	Highest Hour	5	7	0	8

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	269	349	0	424
2nd	Highest Hour	258	335	0	407
3rd	Highest Hour	253	328	0	399
4th	Highest Hour	215	279	0	339
5th	Highest Hour	204	265	0	322
6th	Highest Hour	183	237	0	288
7th	Highest Hour	169	220	0	267
8th	Highest Hour	161	209	0	254
9th	Highest Hour	129	168	0	204
10th	Highest Hour	121	157	0	191
11th	Highest Hour	121	157	0	191
12th	Highest Hour	116	150	0	182
13th	Highest Hour	105	136	0	165
14th	Highest Hour	97	126	0	153
15th	Highest Hour	97	126	0	153
16th	Highest Hour	94	122	0	148
17th	Highest Hour	54	70	0	85
18th	Highest Hour	30	38	0	47
19th	Highest Hour	27	35	0	42
20th	Highest Hour	11	14	0	17
21st	Highest Hour	8	10	0	13
22nd	Highest Hour	8	10	0	13
23rd	Highest Hour	5	7	0	8
24th	Highest Hour	5	7	0	8

KITTELSON & ASSOCIATES, INC.
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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[16_OR 39 and Portland Ave Sig
Intersection: OR 39 & Portland Avenue
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	849	1245	54	35
2nd	Highest Hour	815	1195	52	34
3rd	Highest Hour	798	1170	51	33
4th	Highest Hour	679	996	43	28
5th	Highest Hour	645	946	41	27
6th	Highest Hour	577	847	37	24
7th	Highest Hour	535	784	34	22
8th	Highest Hour	509	747	32	21
9th	Highest Hour	408	598	26	17
10th	Highest Hour	382	560	24	16
11th	Highest Hour	382	560	24	16
12th	Highest Hour	365	535	23	15
13th	Highest Hour	331	486	21	14
14th	Highest Hour	306	448	19	13
15th	Highest Hour	306	448	19	13
16th	Highest Hour	297	436	19	12
17th	Highest Hour	170	249	11	7
18th	Highest Hour	93	137	6	4
19th	Highest Hour	85	125	5	4
20th	Highest Hour	34	50	2	1
21st	Highest Hour	25	37	2	1
22nd	Highest Hour	25	37	2	1
23rd	Highest Hour	17	25	1	1
24th	Highest Hour	17	25	1	1

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	849	1245	54	35
2nd	Highest Hour	815	1195	52	34
3rd	Highest Hour	798	1170	51	33
4th	Highest Hour	679	996	43	28
5th	Highest Hour	645	946	41	27
6th	Highest Hour	577	847	37	24
7th	Highest Hour	535	784	34	22
8th	Highest Hour	509	747	32	21
9th	Highest Hour	408	598	26	17
10th	Highest Hour	382	560	24	16
11th	Highest Hour	382	560	24	16
12th	Highest Hour	365	535	23	15
13th	Highest Hour	331	486	21	14
14th	Highest Hour	306	448	19	13
15th	Highest Hour	306	448	19	13
16th	Highest Hour	297	436	19	12
17th	Highest Hour	170	249	11	7
18th	Highest Hour	93	137	6	4
19th	Highest Hour	85	125	5	4
20th	Highest Hour	34	50	2	1
21st	Highest Hour	25	37	2	1
22nd	Highest Hour	25	37	2	1
23rd	Highest Hour	17	25	1	1
24th	Highest Hour	17	25	1	1

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[30_Eberlein Ave and OR 39 Sig
Intersection: Eberlein Ave & OR 39
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	773	883	156	60
2nd	Highest Hour	742	848	150	58
3rd	Highest Hour	727	830	147	56
4th	Highest Hour	618	706	125	48
5th	Highest Hour	587	671	119	46
6th	Highest Hour	526	600	106	41
7th	Highest Hour	487	556	98	38
8th	Highest Hour	464	530	94	36
9th	Highest Hour	371	424	75	29
10th	Highest Hour	348	397	70	27
11th	Highest Hour	348	397	70	27
12th	Highest Hour	332	380	67	26
13th	Highest Hour	301	344	61	23
14th	Highest Hour	278	318	56	22
15th	Highest Hour	278	318	56	22
16th	Highest Hour	271	309	55	21
17th	Highest Hour	155	177	31	12
18th	Highest Hour	85	97	17	7
19th	Highest Hour	77	88	16	6
20th	Highest Hour	31	35	6	2
21st	Highest Hour	23	26	5	2
22nd	Highest Hour	23	26	5	2
23rd	Highest Hour	15	18	3	1
24th	Highest Hour	15	18	3	1

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	773	883	156	60
2nd	Highest Hour	742	848	150	58
3rd	Highest Hour	727	830	147	56
4th	Highest Hour	618	706	125	48
5th	Highest Hour	587	671	119	46
6th	Highest Hour	526	600	106	41
7th	Highest Hour	487	556	98	38
8th	Highest Hour	464	530	94	36
9th	Highest Hour	371	424	75	29
10th	Highest Hour	348	397	70	27
11th	Highest Hour	348	397	70	27
12th	Highest Hour	332	380	67	26
13th	Highest Hour	301	344	61	23
14th	Highest Hour	278	318	56	22
15th	Highest Hour	278	318	56	22
16th	Highest Hour	271	309	55	21
17th	Highest Hour	155	177	31	12
18th	Highest Hour	85	97	17	7
19th	Highest Hour	77	88	16	6
20th	Highest Hour	31	35	6	2
21st	Highest Hour	23	26	5	2
22nd	Highest Hour	23	26	5	2
23rd	Highest Hour	15	18	3	1
24th	Highest Hour	15	18	3	1

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[35_Homedale and Shasta Way Sig
Intersection: Homedale Rd & Shasta Way
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	654	295	230	94
2nd	Highest Hour	628	283	221	90
3rd	Highest Hour	615	277	216	88
4th	Highest Hour	523	236	184	75
5th	Highest Hour	497	224	175	71
6th	Highest Hour	445	201	156	64
7th	Highest Hour	412	186	145	59
8th	Highest Hour	392	177	138	56
9th	Highest Hour	314	142	110	45
10th	Highest Hour	294	133	104	42
11th	Highest Hour	294	133	104	42
12th	Highest Hour	281	127	99	40
13th	Highest Hour	255	115	90	37
14th	Highest Hour	235	106	83	34
15th	Highest Hour	235	106	83	34
16th	Highest Hour	229	103	81	33
17th	Highest Hour	131	59	46	19
18th	Highest Hour	72	32	25	10
19th	Highest Hour	65	30	23	9
20th	Highest Hour	26	12	9	4
21st	Highest Hour	20	9	7	3
22nd	Highest Hour	20	9	7	3
23rd	Highest Hour	13	6	5	2
24th	Highest Hour	13	6	5	2

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	654	295	230	94
2nd	Highest Hour	628	283	221	90
3rd	Highest Hour	615	277	216	88
4th	Highest Hour	523	236	184	75
5th	Highest Hour	497	224	175	71
6th	Highest Hour	445	201	156	64
7th	Highest Hour	412	186	145	59
8th	Highest Hour	392	177	138	56
9th	Highest Hour	314	142	110	45
10th	Highest Hour	294	133	104	42
11th	Highest Hour	294	133	104	42
12th	Highest Hour	281	127	99	40
13th	Highest Hour	255	115	90	37
14th	Highest Hour	235	106	83	34
15th	Highest Hour	235	106	83	34
16th	Highest Hour	229	103	81	33
17th	Highest Hour	131	59	46	19
18th	Highest Hour	72	32	25	10
19th	Highest Hour	65	30	23	9
20th	Highest Hour	26	12	9	4
21st	Highest Hour	20	9	7	3
22nd	Highest Hour	20	9	7	3
23rd	Highest Hour	13	6	5	2
24th	Highest Hour	13	6	5	2

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[42_OR 39 and Fargo St Sig
Intersection: OR 39 & Fargo St
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	No
#3	Peak Hour	Yes	No
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	1974	1119	68	0
2nd	Highest Hour	1895	1074	65	0
3rd	Highest Hour	1856	1052	64	0
4th	Highest Hour	1579	895	54	0
5th	Highest Hour	1500	850	52	0
6th	Highest Hour	1342	761	46	0
7th	Highest Hour	1244	705	43	0
8th	Highest Hour	1184	671	41	0
9th	Highest Hour	948	537	33	0
10th	Highest Hour	888	504	31	0
11th	Highest Hour	888	504	31	0
12th	Highest Hour	849	481	29	0
13th	Highest Hour	770	436	27	0
14th	Highest Hour	711	403	24	0
15th	Highest Hour	711	403	24	0
16th	Highest Hour	691	392	24	0
17th	Highest Hour	395	224	14	0
18th	Highest Hour	217	123	7	0
19th	Highest Hour	197	112	7	0
20th	Highest Hour	79	45	3	0
21st	Highest Hour	59	34	2	0
22nd	Highest Hour	59	34	2	0
23rd	Highest Hour	39	22	1	0
24th	Highest Hour	39	22	1	0

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	1974	1119	68	0
2nd	Highest Hour	1895	1074	65	0
3rd	Highest Hour	1856	1052	64	0
4th	Highest Hour	1579	895	54	0
5th	Highest Hour	1500	850	52	0
6th	Highest Hour	1342	761	46	0
7th	Highest Hour	1244	705	43	0
8th	Highest Hour	1184	671	41	0
9th	Highest Hour	948	537	33	0
10th	Highest Hour	888	504	31	0
11th	Highest Hour	888	504	31	0
12th	Highest Hour	849	481	29	0
13th	Highest Hour	770	436	27	0
14th	Highest Hour	711	403	24	0
15th	Highest Hour	711	403	24	0
16th	Highest Hour	691	392	24	0
17th	Highest Hour	395	224	14	0
18th	Highest Hour	217	123	7	0
19th	Highest Hour	197	112	7	0
20th	Highest Hour	79	45	3	0
21st	Highest Hour	59	34	2	0
22nd	Highest Hour	59	34	2	0
23rd	Highest Hour	39	22	1	0
24th	Highest Hour	39	22	1	0

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[54_OR 140 and US 97 SB Ramps Sig
Intersection: OR 140 & US 97 SB Ramps
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	795	808	0	570
2nd	Highest Hour	763	776	0	547
3rd	Highest Hour	747	760	0	536
4th	Highest Hour	636	646	0	456
5th	Highest Hour	604	614	0	433
6th	Highest Hour	541	549	0	388
7th	Highest Hour	501	509	0	359
8th	Highest Hour	477	485	0	342
9th	Highest Hour	382	388	0	274
10th	Highest Hour	358	364	0	257
11th	Highest Hour	358	364	0	257
12th	Highest Hour	342	347	0	245
13th	Highest Hour	310	315	0	222
14th	Highest Hour	286	291	0	205
15th	Highest Hour	286	291	0	205
16th	Highest Hour	278	283	0	200
17th	Highest Hour	159	162	0	114
18th	Highest Hour	87	89	0	63
19th	Highest Hour	80	81	0	57
20th	Highest Hour	32	32	0	23
21st	Highest Hour	24	24	0	17
22nd	Highest Hour	24	24	0	17
23rd	Highest Hour	16	16	0	11
24th	Highest Hour	16	16	0	11

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	795	808	0	570
2nd	Highest Hour	763	776	0	547
3rd	Highest Hour	747	760	0	536
4th	Highest Hour	636	646	0	456
5th	Highest Hour	604	614	0	433
6th	Highest Hour	541	549	0	388
7th	Highest Hour	501	509	0	359
8th	Highest Hour	477	485	0	342
9th	Highest Hour	382	388	0	274
10th	Highest Hour	358	364	0	257
11th	Highest Hour	358	364	0	257
12th	Highest Hour	342	347	0	245
13th	Highest Hour	310	315	0	222
14th	Highest Hour	286	291	0	205
15th	Highest Hour	286	291	0	205
16th	Highest Hour	278	283	0	200
17th	Highest Hour	159	162	0	114
18th	Highest Hour	87	89	0	63
19th	Highest Hour	80	81	0	57
20th	Highest Hour	32	32	0	23
21st	Highest Hour	24	24	0	17
22nd	Highest Hour	24	24	0	17
23rd	Highest Hour	16	16	0	11
24th	Highest Hour	16	16	0	11

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[56_OR 140 and Greensprings Sig
Intersection: OR 140 & Greensprings Dr
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	754	919	0	122
2nd	Highest Hour	724	882	0	117
3rd	Highest Hour	709	864	0	115
4th	Highest Hour	603	735	0	98
5th	Highest Hour	573	698	0	93
6th	Highest Hour	513	625	0	83
7th	Highest Hour	475	579	0	77
8th	Highest Hour	452	551	0	73
9th	Highest Hour	362	441	0	59
10th	Highest Hour	339	414	0	55
11th	Highest Hour	339	414	0	55
12th	Highest Hour	324	395	0	52
13th	Highest Hour	294	358	0	48
14th	Highest Hour	271	331	0	44
15th	Highest Hour	271	331	0	44
16th	Highest Hour	264	322	0	43
17th	Highest Hour	151	184	0	24
18th	Highest Hour	83	101	0	13
19th	Highest Hour	75	92	0	12
20th	Highest Hour	30	37	0	5
21st	Highest Hour	23	28	0	4
22nd	Highest Hour	23	28	0	4
23rd	Highest Hour	15	18	0	2
24th	Highest Hour	15	18	0	2

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Minor
East-West Approach =	Major
Major Street Thru Lanes =	2
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	EB	WB	NB	SB
4:00 PM	5:00 PM	754	919	0	122
2nd	Highest Hour	724	882	0	117
3rd	Highest Hour	709	864	0	115
4th	Highest Hour	603	735	0	98
5th	Highest Hour	573	698	0	93
6th	Highest Hour	513	625	0	83
7th	Highest Hour	475	579	0	77
8th	Highest Hour	452	551	0	73
9th	Highest Hour	362	441	0	59
10th	Highest Hour	339	414	0	55
11th	Highest Hour	339	414	0	55
12th	Highest Hour	324	395	0	52
13th	Highest Hour	294	358	0	48
14th	Highest Hour	271	331	0	44
15th	Highest Hour	271	331	0	44
16th	Highest Hour	264	322	0	43
17th	Highest Hour	151	184	0	24
18th	Highest Hour	83	101	0	13
19th	Highest Hour	75	92	0	12
20th	Highest Hour	30	37	0	5
21st	Highest Hour	23	28	0	4
22nd	Highest Hour	23	28	0	4
23rd	Highest Hour	15	18	0	2
24th	Highest Hour	15	18	0	2

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[64_Clinton Ave and Summers Ln Sig
Intersection: Clinton Ave & Summers Ln
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	No
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	411	503	228	30
2nd	Highest Hour	395	483	219	29
3rd	Highest Hour	386	473	214	28
4th	Highest Hour	329	402	182	24
5th	Highest Hour	312	382	173	23
6th	Highest Hour	279	342	155	20
7th	Highest Hour	259	317	144	19
8th	Highest Hour	247	302	137	18
9th	Highest Hour	197	241	109	14
10th	Highest Hour	185	226	103	14
11th	Highest Hour	185	226	103	14
12th	Highest Hour	177	216	98	13
13th	Highest Hour	160	196	89	12
14th	Highest Hour	148	181	82	11
15th	Highest Hour	148	181	82	11
16th	Highest Hour	144	176	80	11
17th	Highest Hour	82	101	46	6
18th	Highest Hour	45	55	25	3
19th	Highest Hour	41	50	23	3
20th	Highest Hour	16	20	9	1
21st	Highest Hour	12	15	7	1
22nd	Highest Hour	12	15	7	1
23rd	Highest Hour	8	10	5	1
24th	Highest Hour	8	10	5	1

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	411	503	228	30
2nd	Highest Hour	395	483	219	29
3rd	Highest Hour	386	473	214	28
4th	Highest Hour	329	402	182	24
5th	Highest Hour	312	382	173	23
6th	Highest Hour	279	342	155	20
7th	Highest Hour	259	317	144	19
8th	Highest Hour	247	302	137	18
9th	Highest Hour	197	241	109	14
10th	Highest Hour	185	226	103	14
11th	Highest Hour	185	226	103	14
12th	Highest Hour	177	216	98	13
13th	Highest Hour	160	196	89	12
14th	Highest Hour	148	181	82	11
15th	Highest Hour	148	181	82	11
16th	Highest Hour	144	176	80	11
17th	Highest Hour	82	101	46	6
18th	Highest Hour	45	55	25	3
19th	Highest Hour	41	50	23	3
20th	Highest Hour	16	20	9	1
21st	Highest Hour	12	15	7	1
22nd	Highest Hour	12	15	7	1
23rd	Highest Hour	8	10	5	1
24th	Highest Hour	8	10	5	1

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[70_OR 140 EB Ramps and Washburn Way Sig
Intersection: OR 140 EB Ramps & Washburn Way
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	373	629	375	0
2nd	Highest Hour	358	604	360	0
3rd	Highest Hour	351	591	353	0
4th	Highest Hour	298	503	300	0
5th	Highest Hour	283	478	285	0
6th	Highest Hour	254	428	255	0
7th	Highest Hour	235	396	236	0
8th	Highest Hour	224	377	225	0
9th	Highest Hour	179	302	180	0
10th	Highest Hour	168	283	169	0
11th	Highest Hour	168	283	169	0
12th	Highest Hour	160	270	161	0
13th	Highest Hour	145	245	146	0
14th	Highest Hour	134	226	135	0
15th	Highest Hour	134	226	135	0
16th	Highest Hour	131	220	131	0
17th	Highest Hour	75	126	75	0
18th	Highest Hour	41	69	41	0
19th	Highest Hour	37	63	38	0
20th	Highest Hour	15	25	15	0
21st	Highest Hour	11	19	11	0
22nd	Highest Hour	11	19	11	0
23rd	Highest Hour	7	13	8	0
24th	Highest Hour	7	13	8	0

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	No
Population < 10,000?	No
Warrant Factor	100%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	373	629	375	0
2nd	Highest Hour	358	604	360	0
3rd	Highest Hour	351	591	353	0
4th	Highest Hour	298	503	300	0
5th	Highest Hour	283	478	285	0
6th	Highest Hour	254	428	255	0
7th	Highest Hour	235	396	236	0
8th	Highest Hour	224	377	225	0
9th	Highest Hour	179	302	180	0
10th	Highest Hour	168	283	169	0
11th	Highest Hour	168	283	169	0
12th	Highest Hour	160	270	161	0
13th	Highest Hour	145	245	146	0
14th	Highest Hour	134	226	135	0
15th	Highest Hour	134	226	135	0
16th	Highest Hour	131	220	131	0
17th	Highest Hour	75	126	75	0
18th	Highest Hour	41	69	41	0
19th	Highest Hour	37	63	38	0
20th	Highest Hour	15	25	15	0
21st	Highest Hour	11	19	11	0
22nd	Highest Hour	11	19	11	0
23rd	Highest Hour	7	13	8	0
24th	Highest Hour	7	13	8	0

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Project #: 11172
Project Name: Klamath Falls Urban Area TSP
Analyst: MJK
Date: 12/29/2010
File: K:\H_Portland\projfile\11172 - Klamath Falls TSP\Analysis\Future Year Signal Warrants\[75_OR 140 and OR 39 Way Sig
Intersection: OR 140 & OR 39
Scenario: Future Year PM Peak Hour

Warrant Summary

Warrant	Name	Analyzed?	Met?
#1	Eight-Hour Vehicular Volume	Yes	Yes
#2	Four-Hour Vehicular volume	Yes	Yes
#3	Peak Hour	Yes	Yes
#4	Pedestrian Volume	No	-
#5	School Crossing	No	-
#6	Coordinated Signal System	No	-
#7	Crash Experience	No	-
#8	Roadway Network	No	-

Raw Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	537	498	350	0
2nd	Highest Hour	516	478	336	0
3rd	Highest Hour	505	468	329	0
4th	Highest Hour	430	398	280	0
5th	Highest Hour	408	378	266	0
6th	Highest Hour	365	339	238	0
7th	Highest Hour	338	314	221	0
8th	Highest Hour	322	299	210	0
9th	Highest Hour	258	239	168	0
10th	Highest Hour	242	224	158	0
11th	Highest Hour	242	224	158	0
12th	Highest Hour	231	214	151	0
13th	Highest Hour	209	194	137	0
14th	Highest Hour	193	179	126	0
15th	Highest Hour	193	179	126	0
16th	Highest Hour	188	174	123	0
17th	Highest Hour	107	100	70	0
18th	Highest Hour	59	55	39	0
19th	Highest Hour	54	50	35	0
20th	Highest Hour	21	20	14	0
21st	Highest Hour	16	15	11	0
22nd	Highest Hour	16	15	11	0
23rd	Highest Hour	11	10	7	0
24th	Highest Hour	11	10	7	0

Input Parameters

Volume Adjustment Factor =	1.0
North-South Approach =	Major
East-West Approach =	Minor
Major Street Thru Lanes =	1
Minor Street Thru Lanes =	1
Speed > 40 mph?	Yes
Population < 10,000?	No
Warrant Factor	70%
Peak Hour or Daily Count?	Peak Hour
Major Street: 4th-Highest Hour / Peak Hour	80%
Major Street: 8th-Highest Hour / Peak Hour	60%
Minor Street: 4th-Highest Hour / Peak Hour	80%
Minor Street: 8th-Highest Hour / Peak Hour	60%

Analysis Traffic Volumes

Hour		Major Street		Minor Street	
Begin	End	NB	SB	EB	WB
4:00 PM	5:00 PM	537	498	350	0
2nd	Highest Hour	516	478	336	0
3rd	Highest Hour	505	468	329	0
4th	Highest Hour	430	398	280	0
5th	Highest Hour	408	378	266	0
6th	Highest Hour	365	339	238	0
7th	Highest Hour	338	314	221	0
8th	Highest Hour	322	299	210	0
9th	Highest Hour	258	239	168	0
10th	Highest Hour	242	224	158	0
11th	Highest Hour	242	224	158	0
12th	Highest Hour	231	214	151	0
13th	Highest Hour	209	194	137	0
14th	Highest Hour	193	179	126	0
15th	Highest Hour	193	179	126	0
16th	Highest Hour	188	174	123	0
17th	Highest Hour	107	100	70	0
18th	Highest Hour	59	55	39	0
19th	Highest Hour	54	50	35	0
20th	Highest Hour	21	20	14	0
21st	Highest Hour	16	15	11	0
22nd	Highest Hour	16	15	11	0
23rd	Highest Hour	11	10	7	0
24th	Highest Hour	11	10	7	0

Appendix 2E
Technical Memorandum #5: Alternatives Analysis

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TECHNICAL MEMORANDUM #5 – ALTERNATIVES ANALYSIS

Date: April 28, 2011 Project #: 11172

To: Mark Willrett, City of Klamath Falls; Stan Strickland, Klamath County

Cc: Klamath Falls Project Management Team

From: Susan Wright, P.E., Erin Ferguson, Matt Kittelson

Project: Klamath Falls Urban Area TSP Update

Subject: Technical Memorandum #5 - Alternatives Analysis

The purpose of this memorandum is to summarize the needs and deficiencies identified within the Klamath Falls Urban Area, outline possible alternatives to address those needs and deficiencies, and describe recommended improvement projects. This memorandum will serve as an initial analysis of alternatives to be considered for the Klamath Falls Urban Area TSP Update. A forthcoming memorandum will detail the preferred cost constrained alternatives.

This document is organized into three sections. The Summary of Needs and Deficiencies section outlines the deficiencies identified in Technical Memorandum #3 (Existing Conditions) and Technical Memorandum #4 (Future Conditions). The Alternatives Analysis section outlines a variety of alternatives evaluated to address future needs of the Klamath Falls Urban Area transportation system. Finally, the Key Development Areas section summarizes the proposed projects of all types within each of the key growth areas identified by the City. It is critical to minimize transportation barriers to development in the areas that are targeted for growth to minimize sprawl into other areas. .

SUMMARY OF NEEDS AND DEFICIENCIES

This section presents needs and deficiencies identified in Technical Memorandum #3 (Existing Conditions) and Technical Memorandum #4 (Future Conditions). These summaries are organized in the following subsections:

- **Safety Focused Intersection and Roadway Segments** – Summaries safety deficiencies identified at study intersections and roadway segments under existing conditions.
- **Forecasted Traffic Operations Issues** – Summaries intersection operational deficiencies identified at study intersections under 2035 future conditions.
- **Non-Auto Modes of Travel** – Summaries deficiencies related to the pedestrian, bicycle, and transit networks identified under existing conditions.

Safety Focus Intersections and Roadway Segments

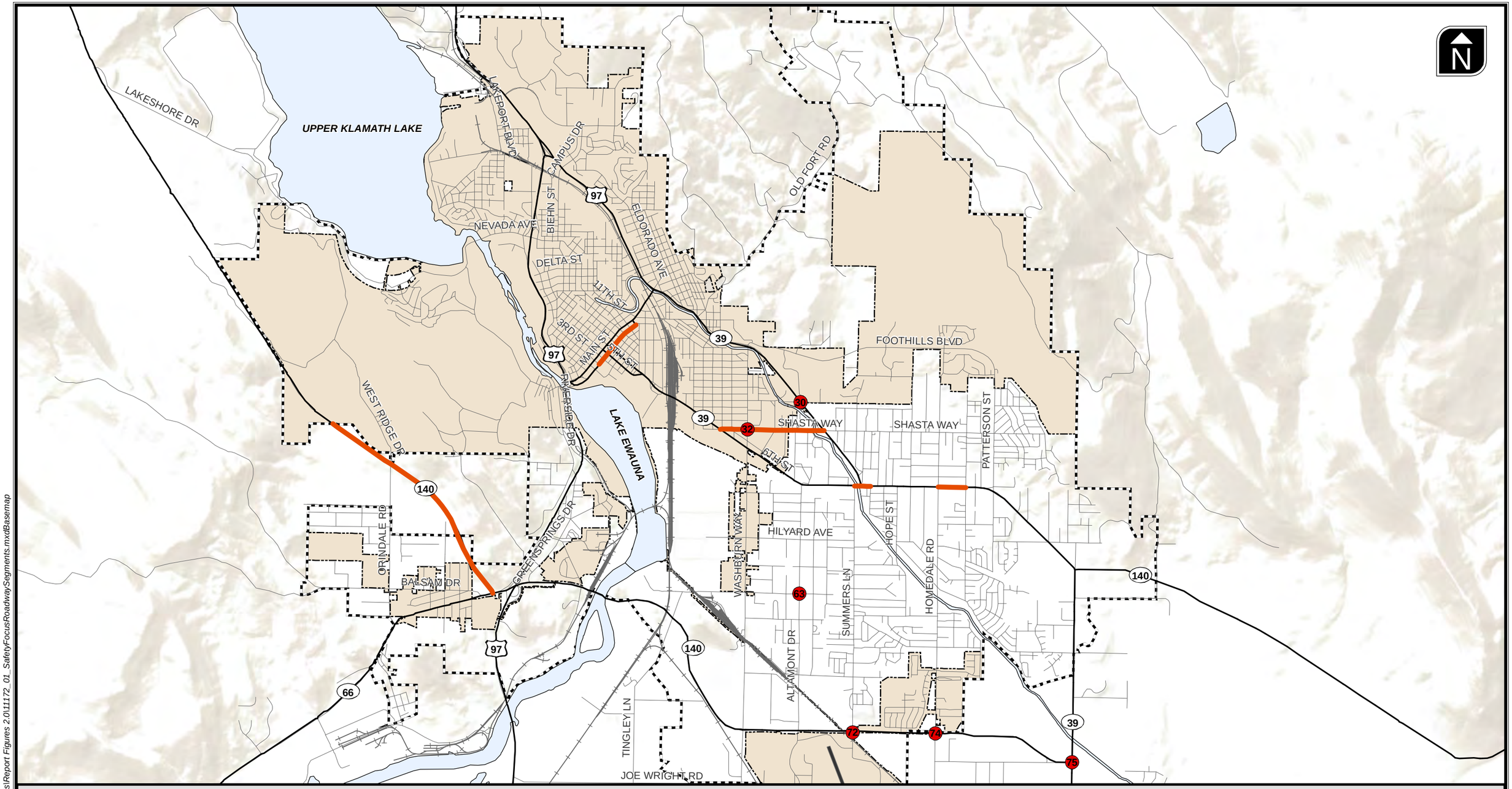
Based on crash rates calculated as part of the existing conditions analysis, the following study intersections were observed to exceed their respective critical crash rate:

- OR 39 & Eberlein Avenue
- Washburn Way & Shasta Way
- Altamont Drive & Laverne Avenue
- OR 140 & Summers Lane
- OR 140 & Homedale Drive
- OR 140 & OR 39 (south of the Big Y)

Similarly, the following roadway segments were observed to exceed critical crash rates:

- OR 140 from Western UGB to OR 66
- S 6th Street from Summers Lane to OR 39
- S 6th Street from OR 39 to Fargo Street
- S 6th Street from Homedale Road to Madison Street
- Shasta Way from S 6th Street to Washburn Way
- Shasta Way from Washburn Way to OR 39
- Klamath Avenue from Main Street to 3rd Street

Figure 1 shows the location of the results of the intersection and roadway segment crash analysis.



Legend

- Safety Focus Segments
- Urban Growth Boundary
- City Limits
- ## Study Intersection Number
- ## Above Critical Crash Rate

Safety Focus Roadway Segments

Figure 1

H:\proj\file\11172 - Klamath Falls TSP\gis\Report Figures 2.0\11172_01_SafetyFocusRoadwaySegments.mxdBasemap

Forecasted Traffic Operations Issues

Based on the travel demand forecasts and operational analysis conducted for the study intersections, the following locations are expected to operate in excess of the applicable performance standards under 2035 No-Build conditions:

- OR 39 / Biehn Street / Campus Drive
- Biehn Street / Oregon Avenue
- Esplanade Drive / OR 39
- OR 39 / Main Street
- Washburn Way / OR 39
- OR 39 / Eberlein Avenue ***(also a safety focus intersection)***
- OR 39 / Shasta Way
- Homedale Road / Shasta Way
- Fargo Street / OR 39
- Homedale Road / OR 39
- OR 140 / OR 66
- US 97 SB Ramps / OR 140
- Greensprings Drive / OR 140
- Midland Highway / OR 140
- Summers Lane / Clinton Avenue
- OR 39 / OR 140 (Big Y)
- Washburn Way / OR 140 EB Ramps
- OR 140 / OR 39 ***(also a safety focus intersection)***

The No-Build year 2035 forecasted turning movements and operations for each of the above study intersections is provided in Technical Memorandum #4.

Non-Auto Modes of Travel

The following sections outline needs and issues identified for the pedestrian, bicycle, and transit networks.

Pedestrian and Bicycle Networks

Based on input received from through the public involvement process, many people in the community would like to see the pedestrian and bicycle networks in Klamath Falls expanded.

In the case of the bicycle network, public comments were focused on constructing new off-road trails for cyclists to use. Also, comments were focused on improving the on-street bicycle network, particularly along main travel corridors.

Comments related to improving the pedestrian network were mostly focused on identifying improvements in the vicinity of schools. Additional comments focused on providing pedestrian facilities on key collectors and arterials or providing off-street alternatives to these types of facilities.

Transit Service

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 (i.e., Klamath Falls Airport) 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 three forms of service: 1) Fixed Route Bus Service; 2) Dial-A-Ride Services and 3) Historical Trolley Tours. Current service hours for fixed routes within Klamath Falls are shown below in Table 1.

Table 1 **Basin Transit Service Fixed Routes Time of Day Service[1]**

Routes	Route Begins	Monday though Friday		Saturday	
		Time First Bus Departs[2]	Time Last Bus Departs[2]	Time First Bus Departs[2]	Time Last Bus Departs[2]
Route 1 North	Keller Rd	6:30 a.m.	6:57 p.m.	9:57 a.m.	3:57 p.m.
Route 1 South	OIT	6:30 a.m.	7:13 p.m.	10:30 a.m.	4:13 p.m.
Route 2 North	Gatewood	6:27 a.m.	7:27 p.m.	10:27 a.m.	4:27 p.m.
Route 2 South	OIT	6:43 a.m.	6:43 p.m.	10:43 a.m.	3:43 p.m.
Route 3	Stewart Lennox	6:00 a.m.	6:00 p.m.	10:12 a.m.	4:00 p.m.[4]
Route 4	Fairgrounds	6:18 a.m.	6:18 p.m.	10:03a.m.[3]	4:18 p.m.
Route 5	Pelican City	6:30 a.m.	6:30 p.m.	10:12 a.m.	4:30 p.m.[5]
Route 6	Fairgrounds	6:48 a.m.	6:48 p.m.	10:18 a.m.	3:48 p.m.

Notes: [1]Source: http://www.basintransit.com/routesrates.shtml
[2]This is the time the first bus departs from the first stop on the route.
[3]First departs from Mia's & Pia's.
[4]Last bus departs from Stewart Lennox.
[5]Last bus departs from Downtown.

Given the hours of operation of the transit system, it mainly serves employees working traditional office hours, students with daytime classes, and non-working residents who are able to run errands or go shopping during the day. This may result in many potential users, many of whom may need to rely on transit for transportation, not being served by the existing system.

ALTERNATIVES ANALYSIS

This section presents alternative treatments, strategies and approaches that can be used to improve existing and forecasted transportation system deficiencies. The treatments, strategies and approaches are organized in the following subsections:

- **Roadway Safety** – Presents measures to reduce crashes and address safety concerns at intersections and along roadway segments based on their crash history.
- **Local Street Connectivity** – Discusses strategies for improving local street connectivity to minimize the need for out-of-direction travel for all travel modes.
- **Corridor Improvements** – Discusses specific corridors within the Urban Area that could require a more detailed evaluation in the future.
- **Access Management** – Presents treatments and policies for managing the frequency and density of driveways along roadways.
- **Transportation System Management (TSM)** – Discusses measures that aimed at optimizing traffic operations of the existing roadway system.
- **Transportation Demand Management (TDM)** – Presents strategies to influence and manage the demand for travel on a system for example exploring measures that encourage non-essential trips (e.g., trips to the grocery store) to occur outside of peak commuting hours.
- **Non-Automobile Modes of Travel** – Discusses facilities, treatments, and strategies to accommodate and facilitate travel by pedestrians, bicyclists, and transit.
- **Capacity Enhancing Roadway Treatments** – Presents treatments and approaches for adding capacity at existing intersections or along roadways.

These sub-sections are intended to outline the options or alternatives for addressing the deficiencies and needs noted in the previous section.

For ease of referencing, proposed projects, policies, programs, and travel demand management strategies have been numbered. The referencing codes are described below:

- PRJ-XX: Proposed Project
- POL-XX: Proposed Policy
- PRO-XX: Proposed Program (area of further evaluation)
- TDM-XX: Proposed Travel Demand Management Strategy

Roadway Safety

An analysis of intersection crash rates that identified study intersections that exceed the critical crash rate for their specific type of facility was included in Technical Memorandum #3: Existing Conditions.

An analysis of segment crash rates that identified study segments that exceed the critical crash rate for their specific type of facility is included in Appendix A. Tables 2 and 3, respectively, provide potential countermeasures for consideration to incorporate into maintenance, capacity, or urban upgrade projects when they occur.

Table 2 **Potential Countermeasures at Study Intersections Exceeding Critical Crash Rate**

Project Number	Intersection	Potential Activities/Countermeasures to Decrease Crashes
PRJ-1	30. OR 39 & Eberlein Avenue	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Realign intersection to correct minor street offset and create a 90-degree angle between OR 39 and Eberlein Avenue. Investigate the feasibility of installing a roundabout at the intersection once intersection is realigned.
PRJ-2	32. Washburn Way & Shasta Way	Conduct field visit to confirm traffic signal head visibility throughout the day on the southbound approach. Consider installing near-side traffic signals for approaching vehicles. Consider installing red-light running cameras.
PRJ-3	63. Altamont Drive & Laverne Avenue	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.
PRJ-4	72. OR 140 & Summers Lane	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.

Project Number	Intersection	Potential Activities/Countermeasures to Decrease Crashes
PRJ-5	74. OR 140 & Homedale Drive	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.
PRJ-6	75. OR 140 & OR 39 (south of the Big Y)	Conduct sight distance and 85th percentile speed studies to confirm sufficient sight distance is available. Consult NCHRP Report 613 *Guidelines for Selection of Speed Reduction Treatments at High-Speed Intersections* to reduce 85th percentile speeds to desired speeds. Conduct roundabout feasibility study for the intersection and depending on study results, install a roundabout at the intersection.

Table 3 **Considerations for Roadway Segments Exceeding Critical Crash Rate**

Project Number	Roadway and Segment Extents	Crash Trends	Considerations
PRJ-7	OR 140 from Western UGB to OR 66	Primarily fixed object collisions with approximately half of all crashes occurring under icy or snowy conditions.	Consider installing shoulder rumble strips to reduce run-off-the-road fixed object crashes under dry conditions. Consider increased road alignment delineation. Consider study to ensure sufficient roadside clearance for motorists' to recover if/when they leave the roadway.
PRJ-8	S 6th Street from Summers Lane to OR 39	All reported crashes were rear-end crashes. Majority resulted in at least one injury.	Consider decreasing (through cross easements and consolidation) the number of access driveways and increasing the spacing between access driveways along S 6th Street.
PRJ-9	S 6th Street from OR 39 to Fargo Street	Majority of crashes were rear-end crashes. Second most common crash type was turning crashes. Majority occurred under dry, daylight conditions.	Consider decreasing (through cross easements and consolidation) the number of access driveways and increasing the spacing between access driveways along S 6th Street.
PRJ-10	S 6th Street from Homedale Road to Madison Street	Majority of crashes turning movement and/or rear end crashes. Majority occurred under dry and daylight conditions.	Consider decreasing (through cross easements and consolidation) the number of access driveways and increasing the spacing between access driveways along S 6th Street. Consider installing a raised median on S 6th Street.
PRJ-11	Shasta Way from S 6th Street to Washburn Way	Majority of crashes turning movement and/or rear end crashes. Majority occurred under daylight and all occurred under dry conditions.	Consider decreasing (through cross easements and consolidation) the number of access driveways and increasing the spacing between access driveways along S 6th Street. Consider installing a raised median on Shasta Way.

PRJ-12	Shasta Way from Washburn Way to OR 39	Majority of crashes were rear-end crashes. Second most common crash type was turning crashes. Majority occurred under dry, daylight conditions.	No obvious issues from an engineering perspective. Suggest a focused crash and safety study/review to determine potential countermeasures.
PRJ-13	Klamath Avenue from Main Street to 3rd Street	No evident crash trends; three crashes in five years.	No evident issues; City may wish to monitor on annual basis.

Local Street Connectivity

The Klamath Falls transportation system currently relies heavily on portions of the state highway system for local trip travel. In particular, east/west travel through the Urban Area is largely required to use OR 140, OR 39, or South 6th Street (which shares and alignment with OR 39). Because of this, local trips add congestion to state highways and must navigate amongst regional trip traffic. The reliance on the state highway system for local travel is not as prevalent for north/south trips as local alternatives are more available. However, travelers traveling north/south west of Lake Ewauna are largely reliant on US 97.

Local Improvement Options

Many local improvements have been identified by Klamath Falls area planning documents that would serve to alleviate local trip reliance on the state highway system. The local improvements identified below include those recommended by the Technical Advisory Committee and Citizens Advisory Committee for inclusion in the updated TSP. These have been modeled in the travel demand model used to determine the future system capacity needs and are shown later in this memorandum in Figure 6 in the Facilities Plan section. The local improvements recommended for inclusion in the updated TSP include:

- **Crescent Avenue Extension (PRJ-14)** – This improvement would extend the existing Crescent Avenue alignment north to Biehn Street. By providing this connection, an alternative route to OR 39 and US 97 would be created for trips to and from the north and downtown Klamath Falls.
- **East Main Street Extension (PRJ-15)** – The East Main Street Extension would extend East Main Street from the intersection of East Main Street / South 6th Street to Washburn Way / Crosby Avenue intersection. This connection would provide an alternative route for travel to/from downtown Klamath Falls and the heavily commercial Washburn Way corridor. South 6th Street is not a state highway in the vicinity of this project, but shares an alignment with OR 39 to the east, making it a route for to/from the east and south.

- **Hilyard Avenue Extension (PRJ-16)** – The extension of Hilyard Avenue would connect east portion of Hilyard Avenue, which connects with OR 39, to Homedale Road. This connection would provide a more complete transportation grid in the vicinity of the project, likely alleviating congestion along OR 39, particularly at the OR 39 / Homedale Road intersection.
- **Construct new collector from Hilyard Avenue to Harlan Drive (PRJ-17)** – This connection would increase local connectivity in vicinity of the project and provide local alternatives to OR 39. This roadway is currently planned to intersect with Hilyard Avenue between Barnes Way and OR 39 and with Harlan Drive near Monrovia Way.
- **Construct new minor collector from Dan O'Brien Way to Dahlia Street (PRJ-18)–** This connection would serve as a frontage road along US 97 and provide parallel capacity to the highway .
- **Extend Daggett Avenue to Dan O'Brien Way (PRJ-19)** – This extension would provide improved connectivity in the vicinity of OIT, possibly reducing trips diverting to US 97.
- **Extend Minor Collector from Dahila Street to Dan O'Brien Way (near Industrial Park Drive) (PRJ-20)** - This extension would provide improved connectivity in the vicinity of OIT, possibly reducing trips diverting to US 97.

Policies

Besides roadway improvement projects, policies can be implemented that would move the Klamath Falls Urban area towards being less reliant on the state highway system. Examples of such policies are outlined below:

- Development review process should include an evaluation of reliance on state highway system. This would not be a condition of approval, but rather would inform decision makers of potential travel patterns and encourage alternative strategies. (POL-1)
- Prioritize improvements that add parallel capacity to state highway facilities. (POL-2)
- Develop alternative mobility standards for key intersections on the state highway system in the Klamath Falls Urban Area. This would limit future expansion of state highways while accepting increased levels of congestion that would deter local travel use of highways. (POL-3)

Corridor Improvements

This section identifies corridors that may need additional evaluation based on existing or forecasted demand. Further evaluation could include corridor studies, access management evaluations, or corridor refinement plans.

Crater Lake Parkway (PRO-1)

Crater Lake Parkway serves as the northern alignment of OR 39 from US 97 to South 6th Street. This facility provides a northern through route for vehicles traveling to/from US 97 in the north and OR 39 or OR 140 in the south or east, respectively.

Crater Lake Parkway is generally a facility with high mobility and limited access from US 97 in the north to South 6th Street in the south. However, in the vicinity of Main Street, more frequent access locations exist because of the local street layout.

Given that this facility serves as a significant connection for travel to and from US 97 to OR 39 and OR 140, standards that maintain a high level of mobility along this corridor should be considered. A corridor improvement plan would help develop strategies to achieve the long term goals of this corridor as growth occurs within Klamath Falls and with through trips traveling through the Urban Area. Specific locations that should be addressed by such a plan include, at a minimum:

- Campus Drive intersection
    - Serves as a major connection to the OIT campus and local medical facilities
- Esplanade Avenue intersection
    - Serves as a major connection to downtown Klamath Falls residential areas, and as a canal crossing
- Main Street intersection
    - Serves as a major connection to downtown Klamath Falls, a local school, residential areas, and as a canal crossing
- Washburn Way intersection
    - Serves as a access point to the heavily commercial Washburn Way corridor and as a canal crossing
- Shasta Way intersection

  - Shasta Way serves as a connection between residential areas and the Washburn Way corridor and is a developing area where congestion is likely to increase

- South 6th Street intersection
  - Constrained environment due to canal alignment

Shasta Way (PRO-2)

Shasta Way is a developing corridor that serves east-west travel from South 6th Street to residential areas in the east. This roadway serves as an alternative route to the South 6th Street corridor.

As Klamath Falls continues to develop, congestion along Shasta Way will likely continue to increase. As such, future mobility standards and corridor goals should be considered for Shasta Way. A corridor evaluation would help establish the appropriate mix of access and mobility to be provided along Shasta Way as well as develop standards to maintain that mix as development continues to occur. Any such plan should consider the following locations, at a minimum:

- South 6th Street intersection
  - Skewed alignment could create operational or safety concerns
- Washburn Way intersection
  - Serves as an access point to the heavily commercial Washburn Way corridor
- Crater Lake Parkway intersection
  - Crater Lake Parkway is a heavily traveled arterial. As such, this intersection could become a bottleneck on the Shasta Way corridor.
- Homedale Road intersection
  - Homedale serves as a local north-south connection
- Patterson Street Intersection
  - Serves as a local north/south connection

Access Management

Access management is the systematic implementation and control of the locations, spacing, design, and operations of driveways, median openings, interchanges, roundabouts, and street connections to a roadway, according to the Access Management Manual (AMM) (*1*). It involves roadway design

applications, such as median treatments and auxiliary lanes, and the appropriate spacing and design of signalized intersections. Access management strives for a balanced transportation network with appropriate proportions and distributions of freeways, arterials, collectors, and local streets that are integrated with local land use activities.

Access management techniques and strategies help to preserve the transportation system investment, and guard against deteriorations in safety and increased congestion. Land use activities and property parcels are served with appropriate access by access management solutions, while safe and efficient movement of traffic is preserved. An effective access management program would include the following elements, according the NCHRP Report 548, "A Guidebook for Including Access Management in Transportation Planning" (*2*):

- Develop and implement an access classification system to apply access standards based on the roadway's functional class;
- Employ the access classification system to plan, design, and maintain the roadway system;
- Define the level of access permitted for each category of the classification;
- Establish spacing criteria for signalized and unsignalized accesses;
- Apply engineering standards of geometric design and traffic engineering to access points or strategies;
- Establish policies, regulations, guidelines, and permitting procedures to implement the access management program; and
- Ensure coordination and support among all agencies that can impact the access and operations of facilities.

The steps to effective access management, according to the AMM (*1*), are:

1. Adopt specific policies, directives, and guidelines;
2. Set access management regulations to dictate the detailed standards to be imposed;
3. Acquire access rights to protect the roadway system;
4. Implement land development regulations at the local level, such as, zoning and subdivision regulations;
5. Undertake development review and impact assessment to determine the consequences of a permitted access or design; and
6. Assure geometric design standards and criteria are compatible with access management objectives.

Well deployed access management strategies can greatly improve travel conditions for pedestrian and bicycles. Eliminating the number of access points on roadways reduces the number of potential interruptions and conflict points between pedestrians, bicyclists, transit vehicles and cars. Access management is typically adopted as a policy in development guidelines. It can be extremely difficult to implement an access management program once properties have been developed along a corridor. Cooperation among and involvement of relevant government agencies, business owners, land developers and the public is necessary to establish an access management plan that benefits all roadway users and businesses.

Access Management Measures

From an operational perspective, access management measures limit new or consolidate the existing number of redundant access points along roadways. This enhances roadway capacity and benefits circulation. Enforcement of the access spacing standards should be complemented with the provision of alternative access points. Purchasing right-of-way and closing driveways without a parallel road system and/or other local access could seriously affect the viability of the impacted properties. Thus, if an access management measure is applied, alternative access should be developed to avoid "land-locking" a given property.

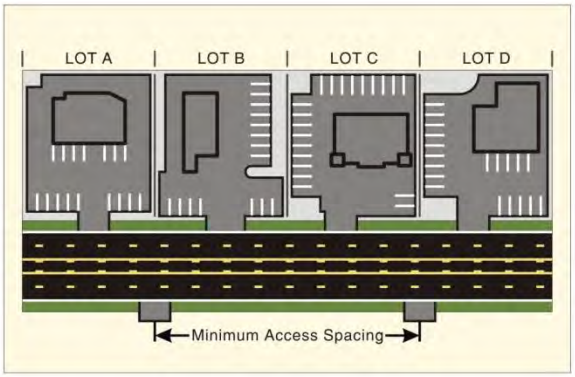
As part of every land use action, the City of Klamath Falls and Klamath County may want to consider evaluating the potential need for conditioning a given development proposal with the following items in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways.

- Crossover easements on compatible parcels (considering topography, access, and land use) may be created to facilitate future access between adjoining parcels;
- Conditional access permits may be issued to developments having proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing driveways.
- Right-of-way dedications may be provided to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) may be provided along site frontages that do not have full build-out improvements in place at the time of development.

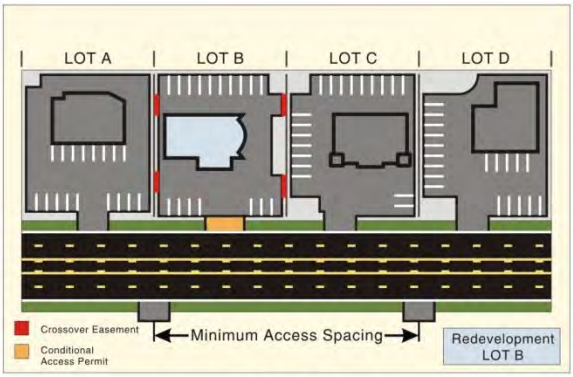
Exhibit 1 on the following page illustrates the application of cross-over easements and conditional access permits over time to achieve the desired access management objectives. The individual steps are described in Table 4, following Exhibit 1. As illustrated in the figure and supporting table, using

these guidelines, all driveways along city, county, and state roadways will eventually move in the overall direction of the access spacing standards as development and redevelopment occur along a given street.

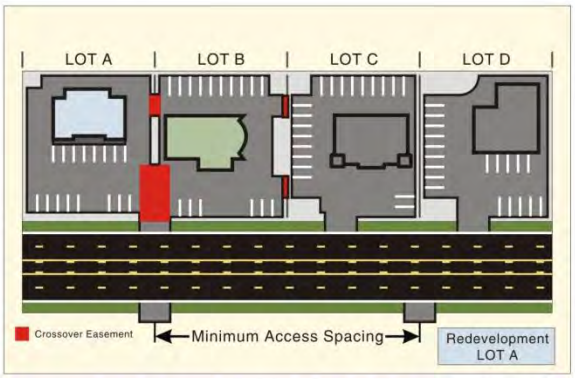
Exhibit 1 Example of Cross-over Easement/Indenture/Consolidation/Conditional Access Process



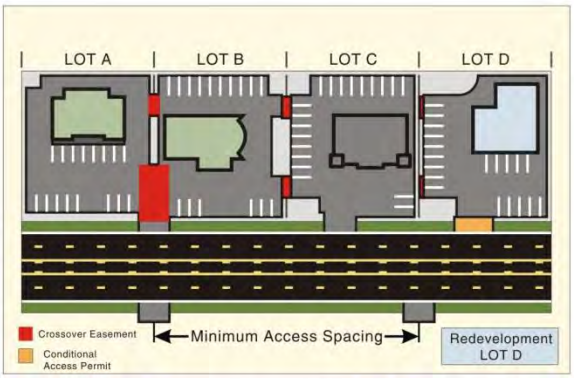
EXISTING CONDITIONS



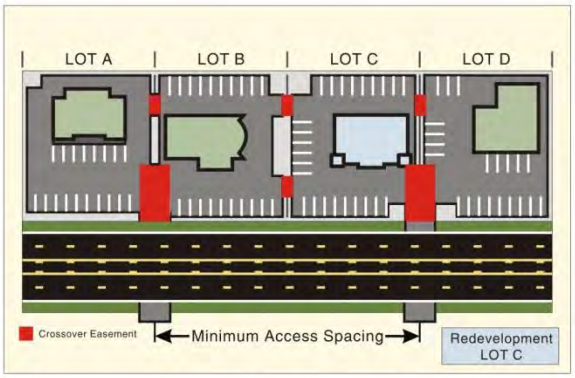
STEP 1
REDEVELOPMENT OF LOT B



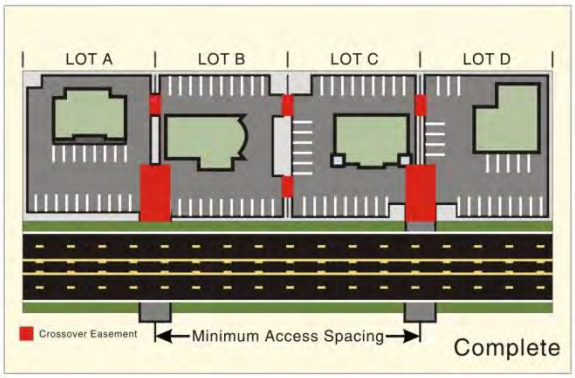
STEP 2



STEP 3



STEP 4



STEP 5

Table 4 **Example of Crossover Easement/Indenture/Consolidation - Conditional Access Process**

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria of 300 feet nor align with driveways or access points on the opposite side of the roadway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the roadway.
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City or County would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City/County/ODOT would issue conditional permits for the development to provide crossover easements with Lots A and C, and City/County/ODOT would grant a conditional access permit to the lot. After evaluating the land use action, the City/County/ODOT would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of roadway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City/County/ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario the City/County/ODOT would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. City/County/ODOT would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the roadway, but will also eliminate the conflicting left-turn movements the roadway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City/County/ODOT be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

Access Management Recommendations

Currently, the City of Klamath Falls and Klamath County have conflicting and inconsistent access management standards (see Roadway Standards White Paper). The Roadway Standards White Paper recommends that a uniform set of standards be developed and applied within the Klamath Falls urban area and makes recommendations on what those standards should be. The following makes recommendations on future access management policies.

Access management plans should be specifically designed for the Washburn Way, South 6th Street and Shasta Way corridors. This will allow the character, context, and vision for the roadway to be considered when standards are developed. As such, the following policy is recommended for future access management plan development.

- Access management refinement plans shall be developed for roadways classified as major collectors or higher in conjunction with the next scheduled overlay project.
- The purpose of an access management plan shall be to evaluate the existing access spacing that exists on the corridor and consolidate, as necessary, to achieve the desired mobility and access levels.

Specific corridors that should be prioritized for access management refinement plans are discussed further below. The observed access spacing that exists today for each of these corridors is shown in Table 5.

Table 5 **Observed Average Access Point Spacing**

Corridor	Segment	Average Spacing
South 6th Street	Shasta Way to Washburn Way	145 feet
	Washburn Way to Altamont Drive	150 feet
	Altamont Drive to Crater Lake Parkway	120 feet
Washburn Way	Shasta Way to South 6th Street	120 feet
	South 6th Street to Hilyard Avenue	290 feet
	Hilyard Avenue to Laverne Avenue	245 feet
Shasta Way	South 6th Street to Washburn Way	130 feet
	Washburn Way to Avalon Street	130 feet
	Avalon Street to Crater Lake Parkway	160 feet

Washburn Way (PRO-3)

Washburn way south of Shasta Way serves as a major commercial area within Klamath Falls. Many existing developments along this corridor have undefined access to and from Washburn Way. This arrangement creates operational and safety concerns that will likely increase as future develop occurs in the area.

The intersection of Washburn Way / Shasta Way has been identified as having a crash rate that exceeds the critical crash rate.

South 6th Street (PRO-4)

South 6th Street serves as a commercial center for Klamath Falls residents as well as a route for regional trips passing through the Urban Area. As such, access and mobility along this corridor should be carefully considered and balanced.

The segments along South 6th Street from Summers Lane to Fargo Street and from Homedale Road to Madison Street have been identified as having a crash rate that exceeds the critical crash rate.

Shasta Way (PRO-5)

Shasta Way is a corridor that runs parallel to South 6th Street and serves as an alternative route. As development occurs within the Urban Area, congestion along Shasta Way will likely rise. As such, specific standards should be outlined that maintain a high level of mobility while allowing for additional develop in the area to occur.

The intersection of Washburn Way / Shasta Way and the segment along Shasta Way from South 6th Street to Crater Lake Parkway have been identified as having a crash rate that exceeds the critical crash rate.

Transportation System Management (TSM)

TSM strategies include a wide variety of measures aimed at improving operations of existing transportation facilities. TSM measures can be focused on improving transportation "supply" through enhancing capacity and efficiency, typically with advanced technologies to improve traffic operations. Or they may be focused on reducing transportation demand, through promoting travel options and ongoing programs intended to reduce demand for drive alone trips, especially during peak travel periods.

The sections below present possible TSM alternatives that could be applied in Klamath Falls to improve the capacity and efficiency of the transportation system.

Signal Retiming/Optimization (PRO-6)

Signal retiming and optimization refers to updating timing plans to better match prevailing traffic conditions and coordinating signals. Timing optimization can be applied to existing systems or may include upgrading signal technology, including signal communication infrastructure or signal controllers or cabinets. Signal retiming can reduce travel times and be especially beneficial to improving travel time reliability. Signal retiming could also be implemented to improve or facilitate

pedestrian movements through intersections by increasing minimum green times to accommodate pedestrian crossing movements during each cycle in high pedestrian or desired pedestrian traffic areas, eliminating the need to push pedestrian crossing buttons. Bicycle movements could be facilitated by installing bicycle detection along existing or proposed bicycle routes. Signal upgrades often come at a higher cost and usually require further coordination between jurisdictions.

Klamath Falls currently has one coordinated signal systems in operation. ODOT maintains a coordinated system along a portion of South 6th Street, but it has not been updated for 5 to 10 years. This system should be updated and other new systems explored. Below is a summary of the current coordinated signal system within Klamath Falls and those that should be explored

- Current Coordinated Signal Systems
    - South 6th Street – Avalon Street to Patterson Street
        - Currently in works to coordinate from Shasta Way to Patterson Street
- Coordinated Signal Systems to Consider
    - Washburn Way –Crosby Street to Laverne Avenue
        - City of Klamath Falls and ODOT currently addressing

Advanced Signal Systems (PRO-7)

Advanced signal systems incorporate various strategies in signal operations to improve the efficiency of a transportation network. Strategies may include coordinated signal operations across jurisdictions as well as centralized control of traffic signals. Advanced signal systems can reduce delay, travel time and the number of stops for vehicles, while potentially increasing average vehicle speed. In addition, these systems may help reduce vehicle emissions and have a high impact on improving travel time reliability.

Advanced signal systems may be applied to several innovative control strategies. The costs of these systems vary as a function of the types of controllers, programming needs and detection needs. Implementing any of these systems would require coordination between the City of Klamath Falls, Klamath County, and ODOT. Alternative signal systems include:

- **Adaptive or active signal control** systems improve the efficiency of signal operations by actively changing the allotment of green time for vehicle movements and reducing the average delay for vehicles. Adaptive or active signal control systems require several vehicle

detectors at intersections in order to detect traffic flows adequately, in addition to hardware and software upgrades.

Potential Klamath Falls Applications: Crater Lake Parkway, South 6th Street, Washburn Way, Shasta Way

- **Traffic responsive control** uses data collected from traffic detectors to change signal timing plans for intersections. The data collected from the detectors is used by the system to automatically select a timing plan best suited to current traffic conditions. This system is able to determine times when peak-hour timing plans begin or end; potentially reducing vehicle delays.

  Potential Klamath Falls Applications: Crater Lake Parkway, South 6th Street, Washburn Way, Shasta Way

- **Transit signal priority** systems use sensors to detect approaching transit vehicles and alter signal timings to improve transit performance. This improves travel times for transit, reliability of transit travel time, and overall attractiveness of transit.

  Potential Klamath Falls Applications: Downtown core, South 6th Street, Washburn Way

- **Truck signal priority** systems use sensors to detect approaching heavy vehicles and alter signal timings to improve truck freight travel. While truck signal priority may improve travel times for trucks, its primary purpose is to improve the overall performance of intersection operations by clearing any trucks that would otherwise be stopped at the intersection and subsequently have to spend a longer time getting back up to speed. Implementing truck signal priority requires additional advanced detector loops, usually placed in pairs back from the approach to the intersection.

  Potential Klamath Falls Applications: US 97, Crater Lake Parkway, Portions of South 6th Street

ODOT is currently in the process of developing a project that would evaluate the effectiveness of an adaptive signal system within Klamath Falls. The extents of this system are uncertain, but ideally the system would include the major corridors within Klamath Falls including Crater Lake Parkway, South 6th Street, and Washburn Way. Recently, ODOT installed a similar system in the downtown core in Redmond.

Transportation Demand Management (TDM)

TDM measures include any method intended to shift travel demand from single occupant vehicles to non-auto modes or carpooling, travel at less congested times of the day, or to locations with more available vehicle capacity. Some common examples of TDM strategies include programs such as carpool matching assistance or flexible work shifts; parking management strategies; direct financial incentives such as transit subsidies; or facility or service improvements, such as bicycle lockers or increased bus service.

Some of the most effective TDM strategies are best implemented by employers and are aimed at encouraging non-single occupancy vehicle (SOV) commuting. Strategies include preferential carpool parking, subsidized transit passes, and flexible work schedules. Cities and other public agencies can play a critical role in support of TDM through provision of facilities and services, as well as development policies that encourage TDM.

While many TDM strategies are most effectively implemented by employers, there are numerous strategies that cities can implement or support with other agencies. These include access management and connectivity strategies that are more often associated with roadway elements of planning. Other strategies include provision of facilities (sidewalks, bicycle lanes, transit amenities) and management of existing resources (parking). Another critical role that cities play is in the policies related to development activities. Through support, incentive, and mandate, cities can ensure that new development supports a balanced transportation system. Several broad TDM strategies are summarized in Table 6. The table also identifies typical implementation roles.

Table 6 **TDM Strategies and Typical Implementing Roles**

TDM Strategy		City/County	Transportation Management Association[1]	Developers	Transit Provider	Employers	State
TDM-1	Public parking management	P		S	S	S	
TDM-2	Flexible parking requirements	P		S		S	
TDM-3	Access management	P					P
TDM-4	Connectivity standards	P		S			P
TDM-5	Pedestrian facilities	P		S		S	S
TDM-6	Bicycle facilities	P		S			S
TDM-7	Transit stop amenities	S		S	P		
TDM-8	Parking management	P		S		S	
TDM-9	Limited parking requirements	P		S			
TDM-10	Carpool match services	S	P			S	
TDM-11	Parking cash out		S		S	P	
TDM-12	Subsidized transit passes				S	P	
TDM-13	Carsharing program support	P	S	S	S	S	

Note: [1]A Transportation Management Association does not currently exist in Klamath Falls
P: Primary role
S: Secondary/Support role
* Primary implementation depends on roadway jurisdiction

While all the strategies listed in Table 6 could be implemented in Klamath Falls, the urban area faces a difficult challenge related to TDM strategies. Given the climate and culture, not all of the options listed would receive strong public support or involvement. As such, care should to taken to implement strategies that are consistent with Klamath Falls lifestyles, while still effectively reducing travel demand. Below is a list of specific strategies that could be effective in Klamath Falls.

- Access Management
- Connectivity Standards
- Pedestrian Facilities
- Bicycle Facilities
- Parking Management
- Developer Incentives

Incentives can also be used to encourage development to incorporate facilities, strategies and programs that promote TDM. For example, a tiered system of SDC credits could be provided to developers that implement two or more TDM strategies such as paid parking, special carpool parking, free transit passes, shower facilities, electric vehicle charging stations, etc.

Many of the above TDM strategies would require coordination between the City/County and future developments that occur within the Klamath Falls Urban Area. This can be accomplished by outlining clear standards related to access management, connectivity, complete street design, and parking requirements, to name a few. When developing these standards, however, it is important for consistency between the City and County to maximize the effectiveness of those standards.

Non-Automobile Modes

The following sections identify alternatives for the pedestrian, bicycle, and transit modes.

Pedestrian Facilities and Treatments

Pedestrian facilities are the elements of the network that enable people to walk safely and efficiently on the transportation system. These facilities include facilities for pedestrian connectivity (sidewalks, mixed-use trails) as well as safe crossing locations (unmarked and marked crosswalks, crossing beacons, pedestrian refuge islands). Each plays a role in developing a comprehensive pedestrian network which can promote both walking trips and multi-modal trips such as using a combination of walking and transit to complete a trip.

The pedestrian system within Klamath Falls includes sidewalks and multi-use paths. Pedestrian facilities within Klamath Falls generally exist along major collectors and arterials, but holes exist in the system which limit its functionality. Pedestrian improvements should be prioritized based on their ability to complete connections between places that generate pedestrian trips. Stakeholders within Klamath Falls have conveyed a desire to focus pedestrian improvements in the vicinity of schools to allow for safe access to and from school for students.

Multi-use path projects are discussed in a subsequent section because of their utility for both pedestrians and bicyclists.

Types of Pedestrian Facilities

The Klamath Falls Urban Area currently has a pedestrian network that consists mainly of sidewalks along arterials, collectors, and local roads and a network of multi-use paths for commuting and

recreational uses. The sidewalk network has breaks in connectivity that limit the usability of the system within certain areas of the Urban Area, most notably along the following roadways:

- Nevada Avenue
- Eldorado Boulevard
- Spring Street
- Washburn Way
- Altamont Drive
- Hope Street
- Patterson Street
- Crosby Avenue
- Hilyard Avenue
- Laverne Avenue
- Clinton Avenue
- Harlan Drive
- Keller Road

Pedestrian Crossings

Pedestrian crossing locations allow for walking trips to connect across facilities to continue along pedestrian facilities. Most notably, the OC&E trail has a signalized pedestrian crossing at Washburn Way just south of South 6th Street. However, other such crossings (besides those at signalized intersections) are limited within the Urban Area. Pedestrian crossing options that can be implemented when need dictates, either for operational or safety purposes are shown in Table 7.

Table 7 Pedestrian Crossing Treatments

Treatment	Potential Klamath Falls Application
Grade Separated Crossings	OR 140, Crater Lake Parkway, US 97
Pedestrian Hybrid Beacon	OC&E trail crossings, high pedestrian volume crossings
Signalized Intersection	Unlikely to meet pedestrian signal warrants in Klamath Falls
Rectangular Rapid Flashing Beacon	Along collectors or arterials
Raised Pedestrian Refuge	Roadways with wide cross-sections
Marked Crosswalks	Installed as needs dictate
Unmarked Crosswalks	Along local roads or minor collectors

Note: A description of each of these types of crossing treatments is provided in Appendix B.

Pedestrian Alternatives

The existing roadways with sidewalks and locations on facilities classified as Minor Collectors or higher where no sidewalks exist within the Klamath Falls Urban area are shown in Figure 2. Also

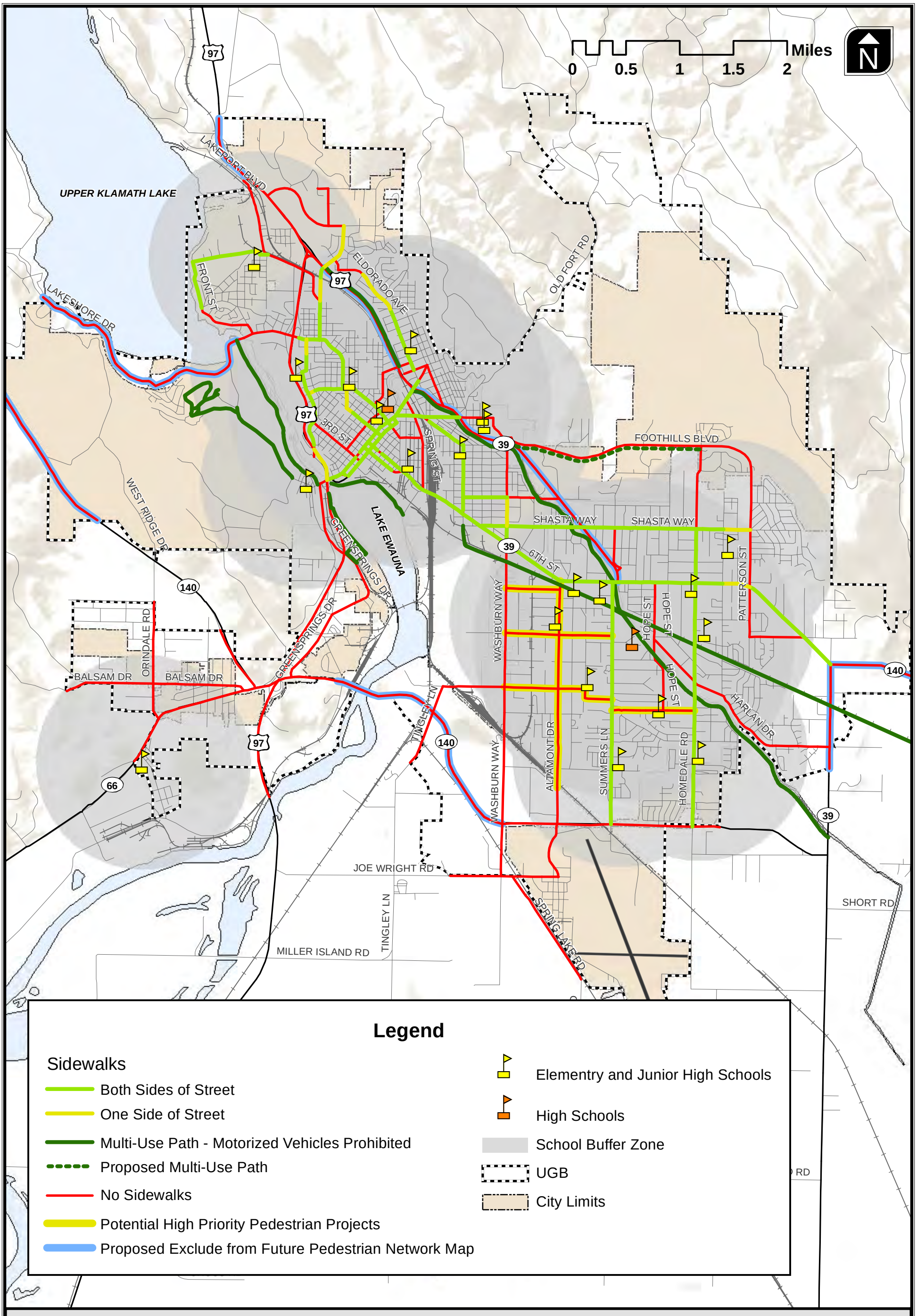
shown are buffers around schools based on school district school bus policies of not providing school bus service to students within one-mile of the school. Areas that are shaded indicate that those locations that fall within an area where students could be expected to walk or bike to school. Locations where students are expected to provide their own transportation to school should be considered higher priority sidewalk locations than those outside of the no-bus areas.

Current design standards require sidewalks on all collector level roadways and above within the urban area. Therefore, the future sidewalk network would include all study roadways shown in red (no sidewalks) and yellow (sidewalks on one side). However, not all sidewalks are likely to be completed within the planning horizon and therefore it is proposed that the future sidewalk map be reviewed and each segment be designated in to one of the three following categories:

- **High Priority Sidewalks** – High priority sidewalks are those that are located near schools, near other pedestrian destinations, or in areas with safety issues. High priority sidewalks could be constructed as a sidewalk project, as development frontage improvements, as part of a vehicle capacity increasing project, or as part of an urban upgrade project. It is recommended that the sidewalk projects with this designation become part of the cost-constrained plan.
- **Remove from Future Pedestrian Network Map** – Several segments are proposed to be removed from the future pedestrian network map. These locations primarily include state facilities where the environment is anticipated to remain high speed, transitioning out of the UGB, or where there is a parallel multi-use path.
- **Future Sidewalks** – All segments currently without sidewalk that are not identified as High Priority or Remove from Future Pedestrian Network Map would be part of the TSP's future pedestrian network. Sidewalks on these facilities could be constructed as a sidewalk project, as development frontage improvements, as part of a vehicle capacity increasing project, or as part of an urban upgrade project. However, *the City and County should consider establishing a fee in lieu program where development frontage improvements would result in an isolated segment of sidewalk that would be anticipated to be isolated for a significant time period. This would allow sidewalk fees collected to be assembled to construct complete segments of sidewalk in another location that are higher priority*.

The roadway segments proposed as High Priority and Remove from Future Pedestrian Network Map are shown in Figure 2. They include:

- High Priority Segments
    - Altamont Drive: South 6th Street to Anderson Avenue (PRJ-21)
    - Hilyard Avenue: Washburn Way to Summers Lane (PRJ-22)
    - Laverne Avenue: Washburn Way to Crest Street (PRJ-23)
    - Crest Street: Laverne Avenue to Clinton Avenue (PRJ-24)
    - Clinton Avenue: Crest Street to Summers Lane (PRJ-25)
    - Bristol Avenue: Summers Lane to Homedale Road (PRJ-26)
- Remove from Future Pedestrian Network Map
    - Lakeshore Drive: Klamath Lake to UGB
    - OR 39: US 97 to Portland Street
    - OR 39: Esplanade Avenue to South 6th Street
    - OR 140: Memorial Drive to Washburn Way
    - OR 140: OR 39 to UGB
    - OR 39/OR 140: Big Y to UGB
    - Lakeport Boulevard: North of Pearl Avenue
    - OR 140: Western edge of UGB



Legend

Sidewalks

- Both Sides of Street
- One Side of Street
- Multi-Use Path - Motorized Vehicles Prohibited
- Proposed Multi-Use Path
- No Sidewalks
- Potential High Priority Pedestrian Projects
- Proposed Exclude from Future Pedestrian Network Map

- Elementry and Junior High Schools
- High Schools
- School Buffer Zone
- UGB
- City Limits

Draft Future Pedestrian Network

Figure 2

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Bicycle Facilities and Treatments

Bicycle facilities are the elements of the network that enable cyclists to safely and efficiently travel on the transportation system. These facilities include public infrastructure (bicycle lanes, mixed-use trails, signage and striping) as well as off-road facilities (secure parking, changing rooms and showers at worksites). Each plays a role in developing a comprehensive bicycle network.

Many different bicycle facility types are needed to create a complete bicycle network that connects people to their destinations and allows cyclists to feel safe riding. Currently, Klamath Falls' bicycle network includes marked bike lanes, shoulder lanes, and multiuse paths. A complete inventory of the existing bicycle system within Klamath Falls is shown in Figure 3.

In some locations where bicycle lanes are provided, specific conditions compromise the quality of the bicycle facility, such as high motor vehicle volumes and travel speeds. In these locations, wider bike lanes or buffers (wider striping, barriers, or medians) separating bicycles from vehicle traffic may be appropriate.

Other roadways with lower vehicle volumes may not require bicycle lanes for cyclists, but may benefit instead from low-traffic bikeway treatments to create what is known as a bike boulevard. Bike boulevards are generally parallel to roadways with high mobility for vehicles and are designed to connect similar destinations to the parallel road. Treatments along the roadway are designed to benefit bicycle mode of travel including through lanes only for bikes, switching two-way stop signs to side-street traffic, and wayfinding signs for riders.

Types of Bicycle Facilities

A brief description of the various bicycle facility types is provided below.

Bicycle lane – Bicycle lanes are striped lanes on the roadway dedicated for the exclusive use of bicycles. Typically, bicycle lanes are placed at the outer edge of pavement (but to the inside of right-turn lanes and/or on-street parking). Bicycle lanes improve bicycle safety, improve cyclist security, and if comprehensive can provide direct connections between origins and destinations. However, inexperienced cyclists often feel uncomfortable riding on busy streets, even when they include bicycle lanes. City of Klamath Falls street standards include bicycle lanes on all arterials and collectors, expect for minor collectors that allow on-street parking. Klamath County street standards are less clear, but do provide a 40 foot wide pavement section on collectors that could be used for bicycle lanes where parking is prohibited and a center turn lane in not necessary.



Example Bicycle Lane

Low-traffic bikeway (bicycle boulevard) – Low-traffic bikeways are also known as bike boulevards and provide high-quality bicycle facilities on continuous street corridors with low vehicular traffic volumes. Typically, low-traffic bikeways are made from existing local streets, which are reconfigured to prioritize bicycle trips and reduce through automobile trips. Local automobile access is retained. Bicycling conditions are improved by reducing stop signs to a minimum along the route and providing wayfinding information specific to bicyclists. Traffic calming is often used to slow automobile speeds and eliminate the cut-through automobile traffic that the removal of stop signs would otherwise attract.



Low-traffic Bikeway Example

Low-traffic bikeways are best used when they parallel major roadways and can provide cyclists with a low-volume alternative route.

Shared-lane Pavement Marking – Shared-lane pavement markings (often called "sharrows") are a tool designed to help accommodate bicyclists on roadways where bicycle lanes are desirable but infeasible to construct. The sharrow marking indicates a shared roadway space, and are typically centered approximately 4 feet from the edge of the travelway to encourage cyclists to ride further away from parked and parking cars and/or the curb. Typically, sharrows are suitable on roadways with fewer than 3,000 ADT. Shared-lane pavement markings have been extensively applied in several cities, including Oregon cities, such as Corvallis. Shared-lane pavement markings have been included in the latest edition of the MUTCD. Guidance in that document indicates that shared lane markings should not be placed on roadways with a posted speed greater than 35 mph.





Examples of Shared-lane Pavement Markings

Shared-roadway – Any roadway without dedicated bicycle facilities is a shared roadway. Where traffic volumes are low, shared roadways are generally safe and comfortable facilities for cyclists. However, the ODOT *Bicycle and Pedestrian Plan*[1] does not recommend shared roadways where automobile volumes or vehicle speeds are high. Thresholds for where shared-lanes are appropriate are based on several factors, including land-use and grade. Generally, bike lanes are preferred on most roadways with greater than 3,000 ADT or with a speed limit greater than 25 mph. For these roadways, dedicated bicycle facilities, typically bicycle lanes, are recommended. Table 8 shows how the bicycle alternatives presented would apply to Klamath Falls.

[1] Oregon Department of Transportation. *Oregon Bicycle and Pedestrian Plan*. Salem, Oregon. June 1995.

Table 8 **Bicycle Alternatives**

Facility	Potential Klamath Falls Application
Bicycle Lane	See Figure 3 for proposed bike lane additions
Low Traffic Bikeway	None proposed. Could be installed on corridors where bicycle trips should be prioritized. El Dorado Avenue is a roadway where such a facility could be explored.
Shared Bicycle Lane	See Figure 2 for proposed shared bicycle lane additions
Shared roadway	Neighborhoods, local roads, and low volume collectors

Bicycle Crossings and Off-Road Facilities

Bicycle crossing treatments are used to connect bike facilities at intersections with high vehicle volumes, trailheads, or other bike routes. Typical treatments include bicycle detectors at traffic signals, bicycle only signals, or preferential movements for bicyclists such as only allowing bikes to make a through movement.

Traffic signals that are actuated, meaning that green indications are only given to a movement when the signal detects the presence of a vehicle, are difficult for a cyclist if no indication is given of the location of detection equipment. Pavement markings should be used, including actuated left-turn lanes, to show cyclists where to stand to actuate a signal. Additionally, the sensitivity of all loop detectors should be set to allow for bicycle activation.

Bicycle Alternatives

The existing roadways with bicycle lanes or shoulder lanes (greater than 4 feet), the location of multi-use pathways, and locations on facilities classified as Minor Collectors or higher where no bicycle lanes exist within the Klamath Falls Urban area are shown in Figure 3. Also shown are buffers around schools based on school district school bus policies. Areas that are shaded indicated that those locations fall within an area where students could be expected to walk or bike to school. Locations where students are expected to provide their own transportation to school should be considered higher priority bicycle lane locations than those outside of the no-bus areas.

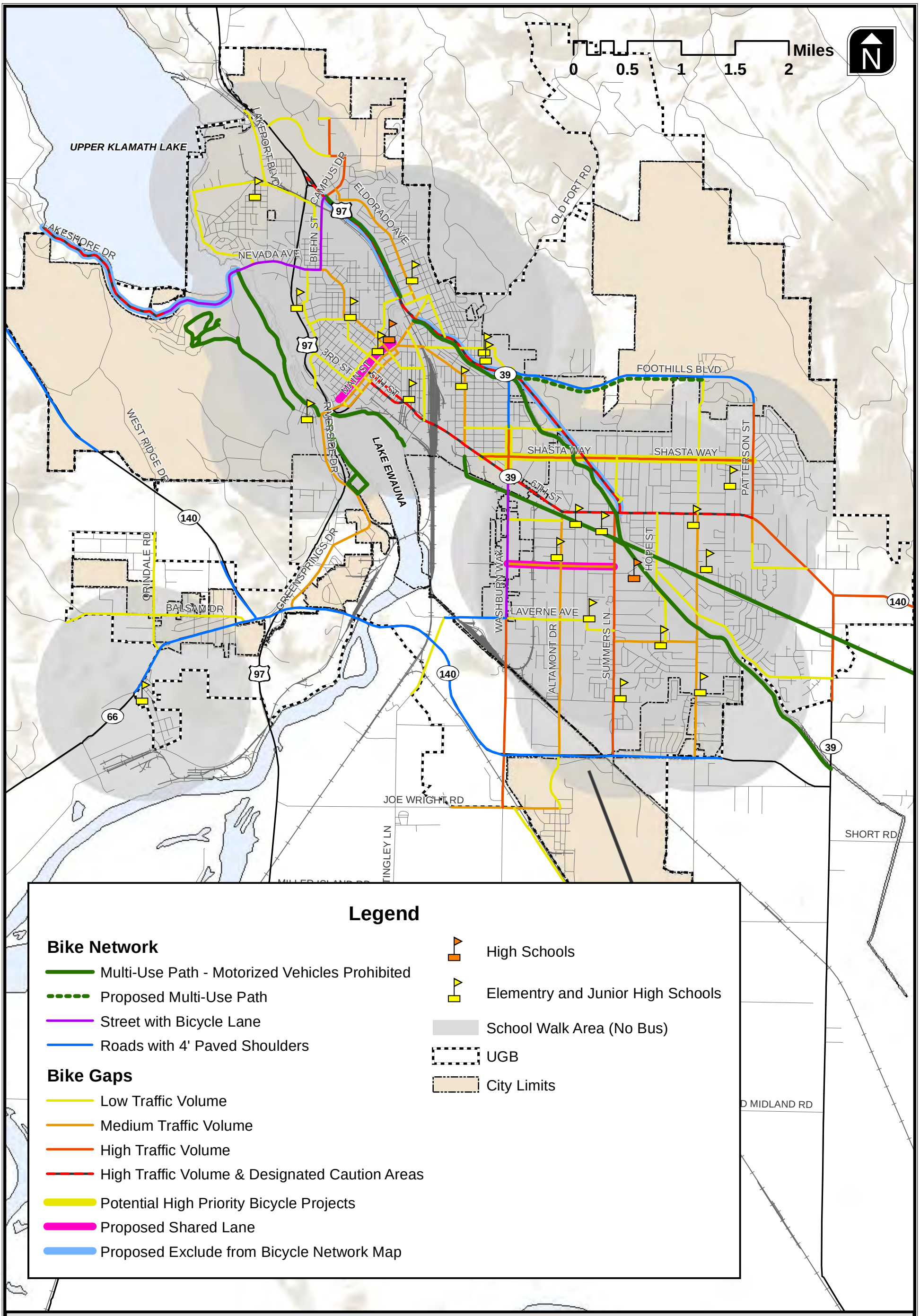
Current design standards require bicycle lanes (or shoulder lanes) on state facilities and city jurisdiction arterials. Bicycle lanes are shown as optional on city collectors (major and minor) and are not specified on county collectors although the pavement width of 40 feet could accommodate bicycle lanes depending on if a center turn lane is provided or not. It is recommended that all collector level

roadways and above within the urban area that are anticipated to serve over 3,000 vehicles per day be planned to include bicycle lanes or shoulder lanes. Roadways with less than 3,000 vehicles per day are generally suitable to have shared lanes for bicycles and vehicles. It is recommended that the TSP Update include a Future Bicycle Network map that eliminates the ambiguity of the current design standards as to whether a bicycle lane is required or optional. As with the pedestrian network, not all bicycle lanes are likely to be completed within the planning horizon and therefore it is proposed that the future bicycle lane map be reviewed and each segment be put in to one of the three following categories:

- **High Priority Bicycle Lanes** – High priority bicycle lanes are those that are located near schools, near other bicycle destinations, or in areas with safety issues. High priority bicycle lanes could be constructed as a bicycle lane project, as development frontage improvements, as part of a vehicle capacity increasing project, or as part of an urban upgrade project. It is recommended that the bicycle lane projects with this designation become part of the cost-constrained plan.
- **Remove from Future Bicycle Network Map** – Several segments are proposed to be removed from the future bicycle lane network map. These locations primarily include state facilities where the environment is anticipated to remain high speed, transitioning out of the UGB, or where there is a parallel multi-use path.
- **Future Bicycle Lanes** – All segments currently without bicycle lanes or shoulder lanes that are not identified as High Priority or Remove from Future Bicycle Network Map would be part of the TSP's future bicycle network. Bicycle lanes on these facilities could be constructed as a bicycle project, as development frontage improvements, as part of a vehicle capacity increasing project, or as part of an urban upgrade project. However, the City and County could consider establishing a fee in lieu program where development frontage improvements would result in an isolated segment of bicycle lane that would be anticipated to be isolated for a significant time period so that the fees collected could be assembled to construct complete segments that are higher priority.
- **Shared Lane Facility** – Shared lane facilities are those collector level facilities that are desirable bicycle routes but where the future traffic is anticipated to be less than 3,000 vehicles per day and the posted speed is 35 mph or less. These facilities could use "sharrows" to indicate that they are a shared facility or could have other treatments to that would enhance their desirability for bicycles as described above under Low Traffic Bikeways.

The roadway segments proposed as High Priority and Remove from Future Bicycle Network Map, and Shared Lane Facilities are shown in Figure 5. They include:

- High Priority
    - Shasta Way: South 6th Street to Patterson Street (PRJ-26)
    - Washburn Way: Eberlein Avenue to South 6th Street (PRJ-27)
- Remove from Future Bicycle Network Map
    - Lakeshore Drive: Klamath Lake to UGB
    - OR 39: US 97 to South 6th Street
- Shared Lane Facilities
    - Hilyard Avenue: Washburn Way to Summers Lane (PRJ-28)
    - Pine Street: Esplanade Avenue to Payne Alley (PRJ-29)



Legend

Bike Network

- Multi-Use Path - Motorized Vehicles Prohibited
- Proposed Multi-Use Path
- Street with Bicycle Lane
- Roads with 4' Paved Shoulders

Bike Gaps

- Low Traffic Volume
- Medium Traffic Volume
- High Traffic Volume
- High Traffic Volume & Designated Caution Areas
- Potential High Priority Bicycle Projects
- Proposed Shared Lane
- Proposed Exclude from Bicycle Network Map

- High Schools
- Elementry and Junior High Schools
- School Walk Area (No Bus)
- UGB
- City Limits

Draft Future Bicycle Network

Figure 3

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During the Virtual Open House, requests from the public for enhanced bicycle facilities and crossings were received for the following locations:

- Provide a bicycle connection across OR 39 from Esplanade Avenue to Melrose Street (existing conditions require bicycles to travel on OR 39 between those two locations) (PRJ-30)
- Improve bicycle crossing options at Biehn St/Campus Drive across Crater Lake Parkway (bicycles traveling northbound on Biehn Street across Crater Lake Parkway end up trapped between two lanes due to the right-turn add lane from Crater Lake Parkway to Campus Drive) (PRJ-31)
- Improve visibility and facilities for bicycles and pedestrians at Summers Lane/South 6th Street (PRJ-32)

Multi-use Pathways

Multi-use pathways are other facilities dedicated to pedestrians and bicyclists. They provide an excellent alternative to on-street pedestrian or bicycle facilities and have an integral role in recreation, commuting, and accessibility for residents. However, the construction of these facilities is often expensive due to the potential need for right-of-way acquisitions.

Klamath Fall's most prominent multi-use path is the OC&E trail that bisects the eastern portion of the Urban Area. This pathway is used for a variety of recreational and commuter purposes. Currently, this pathway has a dedicated signalized crossing of Washburn Way just south of South 6th Street.

Additional multi-use pathways are being considered by both the City and the County. In particular, the County has plans to build a new multi-use pathway in the vicinity of Foothills Boulevard located in the northeast quadrant of the Urban Area. The proposed alignment is shown on Figure 2 and Figure 3.

Additional multi-use pathways recommendations received from the public through the Virtual Open House (but not shown on the draft map currently) include:

- Extend OC&E trail to downtown (PRJ-33)
- Extend OC&E trail to Klamath Community College (PRJ-34)
- Extend multi-use pathway near Foothills Boulevard (PRJ-35)

It is recommended that these extensions be considered for inclusion in the Draft Preferred Plan.

Transit

Transit serves three main types of riders:

- **Captive riders,** those passengers who cannot afford to own or operate a car, are too young or too old to drive, or have a disability that prevents them from driving, and therefore rely on public transportation to meet their mobility needs. Transit service fulfills a basic social need for these passengers.
- **Captive-by-choice riders,** people who could afford to own and operate a car, but choose not to for environmental, lifestyle, or other reasons. These people will seek out locations to live in that provide quality walking and bicycling facilities for shorter trips and quality transit service for longer trips.
- **Choice riders,** people who own a car, but will choose to use transit when it offers an advantage over the automobile (e.g., parking cost savings, travel time savings, ability to use travel time in more productive ways). Improving transit service quality by improving service frequencies, service spans, travel speeds, etc. attracts choice riders to use transit service.

From a community perspective, transit service can be a tool for supporting a diverse community in terms of ages, incomes, and abilities; an environmentally friendly means to address the community's transportation needs; a way to avoid costly and impactful street widening projects; and a catalyst for new development that enhances the community's livability.

In smaller communities, the majority of transit ridership often consists of captive riders. However, cities such as Klamath Falls that have larger institutional land uses (such as universities)—particularly ones that charge for parking (OIT charges $110 per academic year)—may see a significant number of choice riders associated with those institutions. In addition, where land uses (grocery stores and housing located in close proximity) and alternative transportation facilities (e.g., sidewalks, bicycle facilities, bus routes) are provided in a way to make it feasible to travel around the city without an automobile, smaller cities can also generate captive-by-choice ridership.

Transit Service Quality Attributes

Regardless of what type of rider a person is, there are some basic service attributes that make bus service accessible and convenient for the public. Accessibility determines whether or not a particular trip can be made by bus. If the bus doesn't run close to one's origin or destination, or if service isn't provided at the times one needs to travel, transit is not an option for that trip. Assuming that transit

is an option, convenience factors determine whether one will choose transit for a given trip instead of another travel mode.

Accessibility

Accessibility attributes include *where* the bus (or other transit vehicle) goes, *when* during the day and week it runs, and *how often* it runs. "How often" is determined by the *frequency* of service, "when" is determined by the *span* of service, and "where" is determined by the *coverage* of service. Each of these factors has important cost and ridership generation implications.

Impacts of Accessibility Improvements

Higher-frequency service attracts choice riders, but operating costs and capital costs for additional buses increase proportionately to the increase in frequency. Span of service determines what types of customer markets are served by transit—for example, shoppers, commuters, and students attending night classes. Increasing the span of service increases the types of trips that can be made by transit (again attracting ridership), but operating costs increase proportionately to the increase in service hours. Finally, coverage determines the origins and destinations within the community that are served by transit. Increasing coverage increases the number of people who have access to transit, but operating costs and capital costs for additional buses increase proportionately to the increase in service hours required to serve new areas. In addition, to meet Americans with Disabilities Act (ADA) requirements, paratransit (dial-a-ride) service will need to be provided during any new service hours and within ¾ mile of new bus routes, which incurs additional operating costs.

Ways to Improve Transit Accessibility

As an example of how increases in funding can influence transit accessibility, assume a transit agency currently spends $300,000 a year to operate a single bus up and down its city's main street every 30 minutes from 6:30 a.m. to 6:30 p.m., Monday through Friday. If the agency could afford to double the amount of money it spends each year on operating transit service (including the required ADA service, and recognizing that fares typically cover only 10–20% of the total cost of providing service), it would have several options:

- It could choose to add a second bus to the current route, improving the frequency to every 15 minutes. There would also be capital costs associated with purchasing a second bus to provide the added frequency.
- It could create a second route that served a different portion of the city every 30 minutes. The round-trip distance that the bus could travel within 30 minutes, including time for a driver

break, would determine how large an area would benefit from the new service. There would also be capital costs associated with purchasing a second bus to serve the new route.

- It could increase the service hours on the current route to 6:30 a.m. to 12:30 a.m. Monday through Saturday and 6:30 a.m. to 6:30 p.m. on Sunday. Because the same bus could operate the additional service hours, there would be no immediate capital costs involved, but the bus might need to be replaced sooner than otherwise, due to the additional miles it would be travelling each day and week.

A decision on the best option would be dependent upon current ridership and capacity (are the buses full during peak times?), demand for transit service beyond the current hours (are there major employers or schools with evening shifts or classes?), and if there are areas of population without a transit route. Ridership data, transit rider surveys, and surveys of non-riders at major employers, schools, and unserved residential areas could be used to assess the best option for a community.

Access to Transit

Most transit passengers are pedestrians at one or both ends of their transit trip. Therefore, it is particularly important to have a good pedestrian network in the vicinity of transit stops, to maximize the number of locations that can be reached by the transit service that is provided. Most passengers are willing to walk up to ¼ mile to access local bus service and up to ½ mile to access high-frequency and/or high-speed service such as bus rapid transit and rail modes, trading off added walking time for reduced waiting time at stops and/or shorter travel times while on a transit vehicle. A "good pedestrian network" includes such things as a continuous sidewalk network to and from transit stops; safe ways to cross streets, particularly at bus stops; and ADA compliance (e.g., curb cuts) to minimize barriers that might keep persons with disabilities from using the service. Providing such a network should be a consideration when prioritizing pedestrian network improvements.

Some passengers may wish to use their bicycle to access transit. An average person can travel four times as fast on a bicycle than on foot, which greatly expands the area a bicyclist can reach from a bus stop in the same amount of time as walking. Providing bicycle racks on buses allows bicyclists to be able to use their bicycle at both ends of their transit trip. In smaller communities where travel distances are short and buses run infrequently, a given trip can be made by bicycle in about the same time as by bus. However, even in these cases, bicycle racks can be useful in serving, for example, bicyclists who experience flat tires as well as origins and destinations in hilly areas. Basin Transit

provide bicycle racks on its buses. If in some cases (e.g., service to universities), the demand for bicycle rack space on some trips is greater than the number of spaces available (typically 2 or 3). Attention should focus at that point to providing (1) secure bicycle parking at transit stops and (2) service close to bicyclists' destinations, to minimize the need to bring a bicycle along on a bus.

Access vs. Efficiency

A fundamental trade-off faced by transit service providers is whether service hours should be spread over the agency's entire service area (prioritizing access), or whether service hours should be concentrated in the highest-ridership corridors (prioritizing efficiency). For example, Rogue Valley Transportation District (RVTD) emphasizes efficiency, with service focused along main streets, while Corvallis Transit operates under a city policy to provide transit service within ¼ mile of 95% of the city's residents. Prioritizing access means that more locations have access to service, but that most locations will receive service relatively infrequently. Prioritizing efficiency focuses service on the areas with the highest population and job densities and most transit-supportive demographics, giving those areas more frequent service than would be possible if service covered the entire area (given a fixed budget). Basin Transit, the transit service provider for Klamath Falls, provides hourly service to many locations within Klamath Falls, thus providing coverage, but also provides essentially half-hourly service in the corridor where the "mainline" Routes 1 and 2 overlap, thus also providing a degree of efficiency.

Convenience

Convenience attributes include the *reliability* of service (will I get to the doctor on time, will I have to stand out in the cold longer than planned), the *speed* of the trip, the *comfort* of the trip, and the *cost* of the trip.

Service Reliability

As illustrated in the previous paragraph, reliability is a customer service issue, but it also has potential impacts to a transit agency's operations and bottom line. From an operations perspective, the less reliable a route, the more slack time that needs to be built into the schedule to allow a late-arriving bus to begin its next trip on time. This extra time is time that could otherwise be spent providing service—for example, by extending the route. From a financial perspective, unreliable service is unattractive to riders (thus reducing potential farebox revenue) and—in a worst case—it requires an extra bus to be added to a route to maintain the schedule, thus increasing an agency's costs.

There are many potential sources of reliability issues. From a city's perspective, things that it can do to address bus reliability include:

- Addressing congestion issues that slow down buses—either by addressing the issue for all roadway users (for example, by increasing roadway capacity), by providing measures directed specifically at buses (for example, by allowing buses to jump to the front of the queue using right-turn lanes at traffic signals), or by providing new street connections that buses can use to avoid congested locations.
- Adjusting traffic signal timing—for example, by reducing traffic signal cycle lengths when possible (so that when a bus does have to stop, it doesn't stop for so long), or by providing signal priority for buses at key locations, where traffic signal stays green a little longer than normal to allow a bus to make it through an intersection.
- Managing roadway access—for example, by requiring that new driveways be located farther away from signalized intersections, so that transit agencies have greater flexibility in locating bus stops.

Speed

Many of the issues and potential solutions listed above for reliability also apply when it comes to bus speeds. The faster a bus can operate, the more distance it can cover in a given amount of time (i.e., the longer the route), or the fewer the buses needed to operate a given length of route at a specified headway.

From a customer perspective, the total amount of time required to make a trip is also important. Therefore, having direct walking routes to and from bus stops, quick and safe ways of crossing streets, and quick connections between buses when a transfer is required are also important. To minimize transfer times, Basin Transit operates two timed-transfer connection points (one downtown and one near the fairgrounds), where the "feeder" routes meet the "mainline" routes and allow for quick connections.

Comfort

Comfort issues include comfort waiting for the bus to come and comfort on-board the bus (e.g., related to crowding). From the city's perspective, it can support passenger comfort waiting for the bus by ensuring that its street standards provide sufficient space for Basin Transit to install bus shelters where demand warrants, while maintaining sufficient sidewalk space to meet ADA requirements and other pedestrian needs.

Cost

Once the decision has been made to purchase a car, most of its costs (e.g., possible interest on a car loan, registration, insurance, fuel, servicing) are not associated with any one trip or type of trip. In contrast, people think of the cost of riding the bus every time they board and pay a cash fare or show a transit pass. To make transit more competitive with the automobile, some cities support programs designed either to (1) reduce the perceived cost of riding transit (e.g., employer-sponsored transit subsidies) or (2) increase the perceived cost of using a car (e.g., by charging for parking or making it more difficult to find). Some cities, such as Ashland, Oregon and Boulder, Colorado subsidize local transit service through programs that allow passengers to pay a reduced fare (with the city paying the difference), by sponsoring free downtown shuttles, by developing neighborhood group bus pass programs, or by paying the local transit operate to provide more frequent bus service than they would otherwise receive.

Transit Alternatives

Existing Conditions Summary

Technical Memorandum #3 presented the existing condition of Klamath Falls' transportation system. With respect to transit service, the following information from that memo is relevant:

- Many developed portions of Klamath Falls are located within ¼ mile of a bus route.
- Service is provided 12 hours a day on weekdays (6:30 a.m. to 6:30 p.m. from downtown on the mainline routes, up to one-half hour earlier or later elsewhere) and for 6 hours on Saturdays.
- Most areas receive service once an hour; areas served by both Routes 1 and 2 (OIT, downtown, portions of South 6th Street) receive service twice an hour.
- Timed transfers between feeder and mainline routes can be made downtown and at the transfer center located near the fairgrounds.
- Most—but not all—of the streets used by mainline Routes 1 and 2 have sidewalks; most of the streets used by the feeder routes do not.
- The City has relatively few on-street bicycle facilities.

Figures 4 and 5 compares the locations where bus service is considered to be provided (i.e., is located within ¼ mile of a bus route) and the locations of the highest-density areas within Klamath Falls under existing and future conditions, respectively. The *Transit Capacity and Quality of Service Manual*

defines "transit-supportive" areas as locations that can support at least hourly transit service; these have a minimum of 3 households per gross acre or 4 jobs per gross acre. Although residential and job density are by no means the only indicators of potential areas of transit ridership (income, car ownership, and locations of major institutions also play a role), they are good tools for indicating where—all other things being equal—concentrations of potential customers are located. Figure 4 shows that nearly all of the developed portions of the City's transit-supportive traffic analysis zones are served, with the exception of the southern portion of downtown.

Future Conditions

As summarized in Technical Memorandum #1, Basin Transit's 1995 Transit Development Plan identified frequency improvements as being a higher priority in the future than expanded geographic coverage, as they tended to generate greater ridership. The plan also identifies the need for street connections between large developments, to allow the efficient through-routing of transit service.

Figure 5 shows the locations of transit-supportive areas anticipated to develop by the year 2035. Future transit-supportive areas not currently served by transit consist of portions of South 6th Street between downtown and Washburn Way, and an area north of Dan O'Brien Way.

UPPER KLAMATH LAKE
WOCUS RD
97
HARBOR ISLES BLVD
CAMPUS DR
BIEHN ST
NEVADA AVE
DELTA ST
ELDORADO AVE
OLD FORT RD
11TH ST
MAIN ST
3RD ST
5TH ST
39
FOOTHILLS BLVD
WEST RIDGE DR
RIVERSIDE DR
LAKE EWAUNA
SHASTA WAY
PATTERSON ST
6TH ST
140
ORINDALE RD
WASHBURN WAY
HILYARD AVE
HOPE ST
BALSAM DR
LAVERNE AVE
SUMMERS LN
BRISTOL AVE
ALTAMONT DR
66
JOE WRIGHT RD
SHORT RD
SPRING LAKE RD
HOMEDALE RD
OLD MIDLAND RD

Legend

Transit Center

Basin Transit

- Line 1
- Line 2
- Line 3
- Line 4
- Line 5
- Line 6

TransitBuffer
Minimum of 4 Employees Per Acre
Minimum of 3 Households Per Acre
Urban Growth Boundary

Klamath Falls Transit Analysis
Base Year 2010 Land Use

Figure 4

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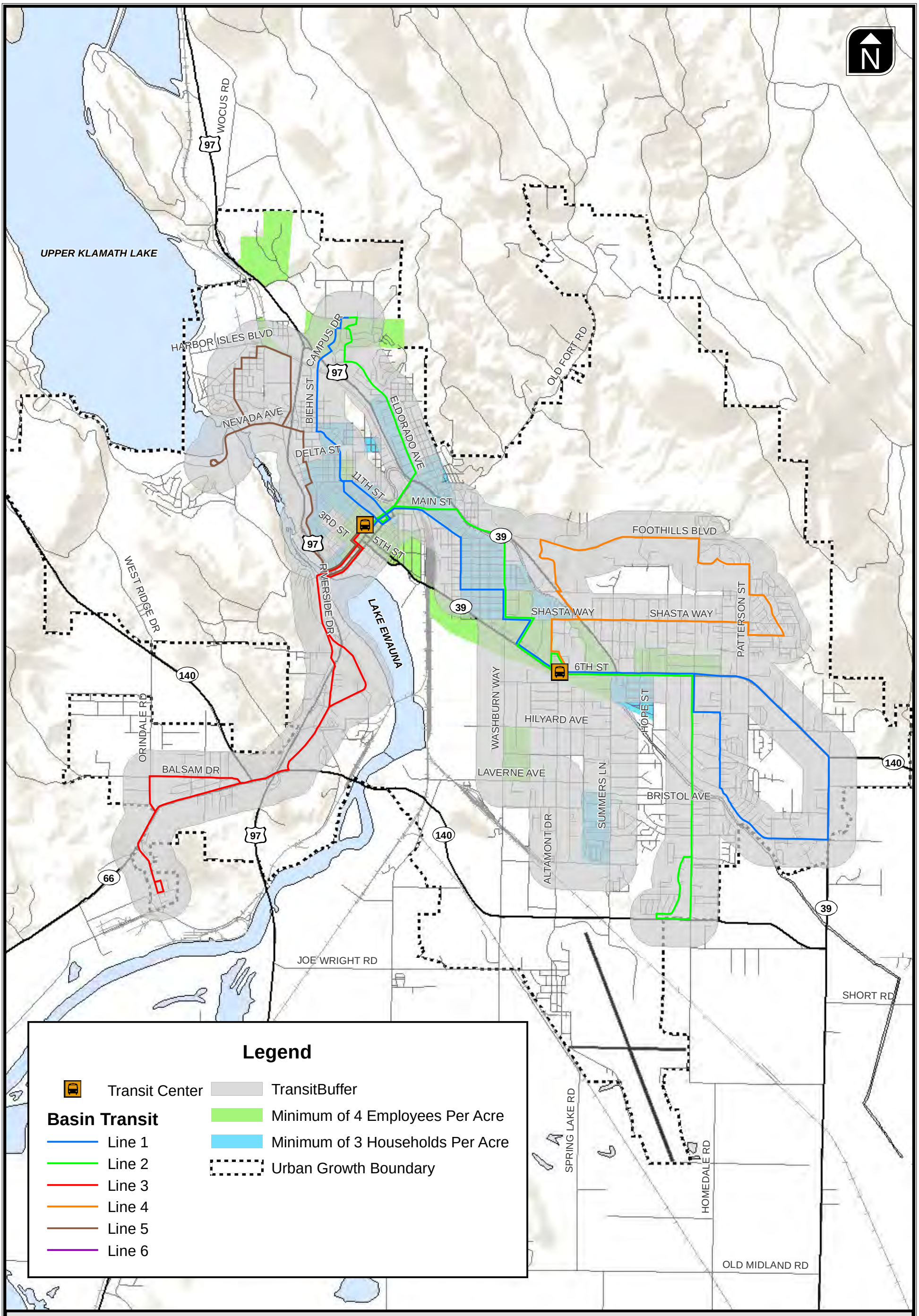

Klamath Falls Transit Analysis Future Year 2035 Land Use

Figure 5

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Alternatives

Transit Service Alternatives

- **Frequency Improvements.** In the future, Route 1 would be the highest priority for improved frequency, as it serves the greatest number of transit trip generators. The feeder routes would be timed to connect with Route 1, allowing Route 2's schedule to be adjusted to allow service three times an hour between OIT, downtown, and the fairgrounds.
- **Span Improvements.** Route 1 would also be a candidate for a longer service span, to provide service for students attending night classes at OIT, for retail and other employees who work in the evening, and other potential riders who need to travel during the evening. Secondarily, additional service could be considered on Saturdays (to serve people needing to work on Saturday).
- **Coverage Changes.** If Route 1's frequency was improved, Route 2 could be adjusted to serve the South 6th Street and south downtown areas not currently served by transit, while maintaining existing service levels within the neighborhood north of South 6th Street and east of Washburn Way. With road improvements, Route 5 could be converted to a two-way route connecting OIT, new development along Dan O'Brien Way, Pelican City, and downtown. The key improvement needed would be widening the Quarry Road railroad underpass to accommodate two lanes of traffic (or providing a new grade-separated crossing in that portion of Klamath Falls—for example, by continuing Dan O'Brien Way across both US 97 and the railroad). This routing would address both the future transit-supportive area service need north of OIT, as well as improving the bus connection from Pelican City to the medical and educational services on the opposite side of US 97.

Table 9 below shows transit alternatives available and how each could apply to Klamath Falls.

Table 9 **Transit Alternatives**

Project Number	Alternative	Potential Klamath Falls Application
PRJ-36	Frequency Improvement	Increase frequency on Route 1
PRJ-37	Span Improvements	Extend frequency of Route 1
PRJ-38 PRJ-39	Coverage Changes	Modify Route 2 to serve downtown and South 6th Street Modify Route 5 to serve OIT, Dan O'Brien Way, Pelican City, and Downtown

Infrastructure Alternatives

- Prioritize sidewalk construction along streets with transit service and portions of streets leading to streets with transit service.
- Roadway/intersection improvements to minimize impact of future congestion on buses. The intersection analysis indicates capacity improvements are necessary at the following intersections located along existing transit routes:
    - 7. OR 39 / Biehn Street / Campus Drive
    - 14. Biehn Street / Oregon Avenue
    - 23. Esplanade Drive / OR 39
    - 27. OR 39 / Main Street
    - 28. Washburn Way / OR 39
    - 33. OR 39 / Shasta Way
    - 35. Homedale Road / Shasta Way
    - 42. Fargo Street / OR 39
    - 43. Homedale Road / OR 39
    - 52. OR 140 / OR 66
    - 54. US 97 SB Ramps / OR 140
    - 56. Greensprings Drive / OR 140
    - 64. Summers Lane / Clinton Avenue
    - 67. OR 39 / OR 140 (Big Y)
- Complete street connections between subdivisions; if potential cut-through auto traffic is perceived as an issue, consider bus gates (used in Europe) that allow bus, pedestrian, bicycle, and emergency vehicle traffic through, while preventing auto traffic.

Transit System Alternatives

Future expansions of the Klamath Falls transit system expansion can focus on increased frequency of service, expanded operation hours, or expanded route coverage. Currently, the transit system covers the majority of the transit supportive areas in the Urban Area, as shown previously in Figure 1. However, the hours of operation of the transit system are from roughly 6:30 a.m. to 7:00 p.m. on weekdays and 10:00 a.m. to 4:00 p.m. on Saturdays. No service is provided on Sundays. This makes the transit service useful mainly to employees working traditional office hours, students with

daytime classes, and non-working residents who are able to run errands or go shopping during the day. Customer markets not currently being served include:

- Employees working non-traditional hours (e.g., weekends and evenings). These tend to be the type of jobs that are attractive to students, and the jobs tend to be lower-paying, which makes transit service an attractive alternative to driving to work for these employees.

- OIT or Klamath Community College students who take evening classes, need to study or go to activities on campus in the evening, or want to patronize area restaurants and bars without having to drive.

The City, County, and Basin Transit should consider what customer markets should be served by the transit system and weigh the benefits of increased frequency of service, expanded operation hours, expanded route coverage, or some combination of these.

In addition to transit service enhancement, other actions could be taken by the City, County, or Basin Transit to enhance the transit system within Klamath Falls. These include:

- Making sure ADA-compliant sidewalk facilities are provided along and leading to streets with transit service.

- Providing adequate street lighting at bus stops and along streets leading to bus stops.

- Providing secure bicycle storage facilities at key stops, and evaluating major streets for opportunities to improve pedestrian crossing opportunities.

- Supporting other alternative modes—such as improving bicycle facilities, developing a bike-sharing program, or supporting car-sharing programs—can make it easier for area residents to forego owning a car; those residents will then likely use transit service for a portion of their trips.

- Encouraging higher-density and mixed-use development along transit routes through its land use planning efforts.

Capacity Enhancing Roadway Projects

The following subsections present the draft roadway capacity project recommendations for the auto mode. These are based on existing and future no build conditions analyses as well as input from project stakeholders. The treatments, strategies and approaches are organized in the following subsections:

- **Roadway Segment Projects** – Presents roadway segment projects including new roads, roadway extensions and roadway widening projects that are in addition to the local street connectivity projects from the previous section.
- **Intersection Projects** – Presents specific intersection projects to address forecasted operational deficiencies.

Roadway Segment Projects

The Klamath Falls Area Travel Demand Model was used to evaluate the potential impact of the recommended draft projects. Figure 6 below shows the location and extent of the roadway segment projects considered for this analysis. They include the local street connectivity projects described previously plus the following additional roadway projects:

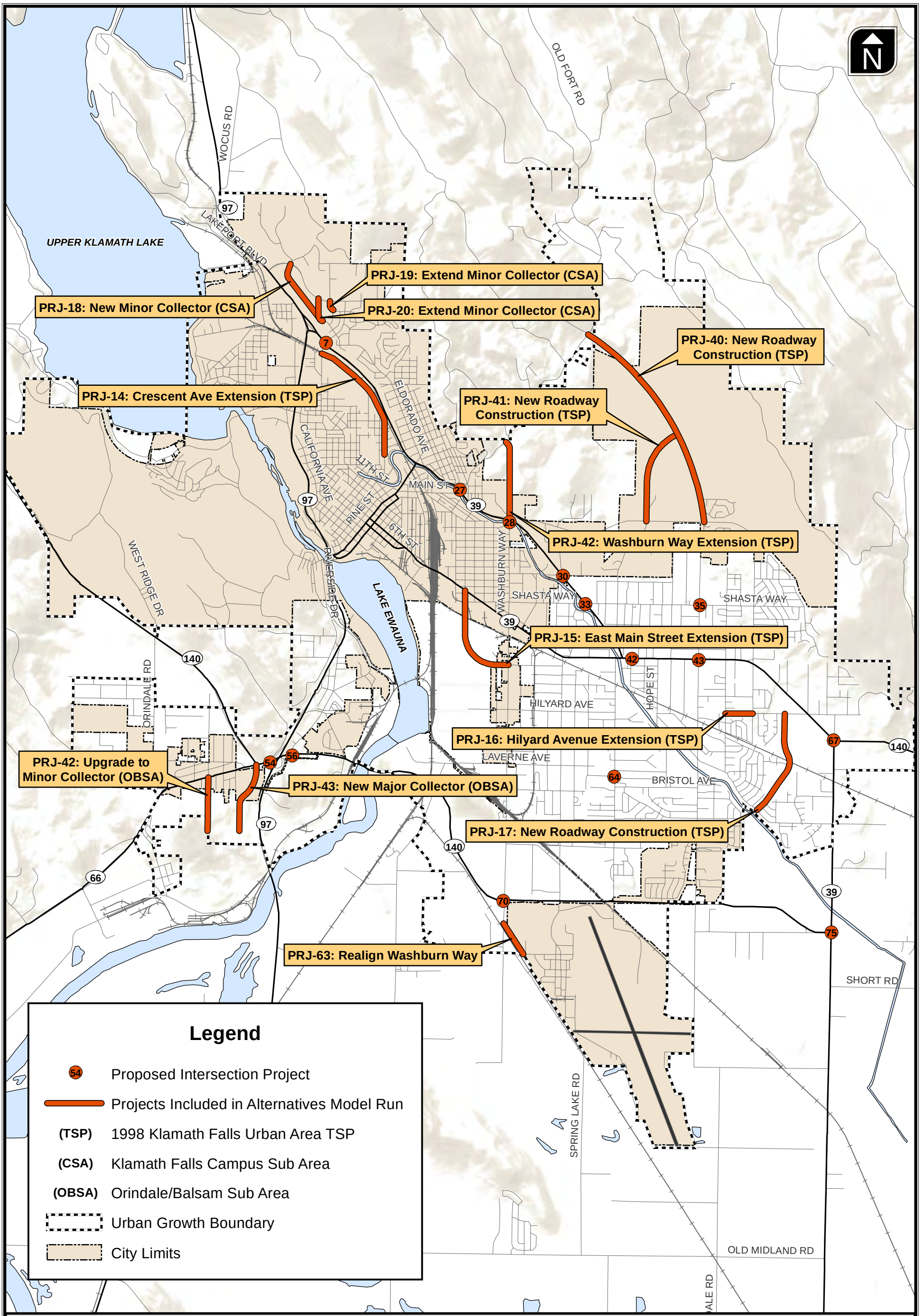
- Construct new roadway north to Old Fort Road from Homedale Road/Foothills Boulevard (PRJ-40)
- Construct new roadway north from Foothills Boulevard near Beverly Drive (PRJ-41)
- Extend Washburn Way north (PRJ-42)
- Upgrade Emerald Street south of OR 66 (PRJ-43)
- Construct new roadway south of OR 66 near OR 140 intersection (PRJ-44)

Figure 6 also notes the intersections that will still require a capacity increasing project despite the enhanced network connectivity (deficiencies at the Biehn Street/Oregon Avenue and Midland Highway/OR 140 intersections were mitigated by the enhanced network connectivity).

Although many of the local connectivity projects do not appear to provide significant system benefits, many of these projects are intended to serve future growth and development, not reduce existing congestion. As such, all of the projects shown in Figure 6 are recommended to remain in the TSP and be constructed when development or demand dictate.

Intersection Projects

The lane configurations and traffic control devices required to mitigate the deficient intersections are shown on Figures 7A and 7B. As noted above, enhanced network connectivity mitigated deficiencies at the Biehn Street/Oregon Avenue and Midland Highway/OR 140 intersections. Table 10 lists the proposed intersection improvement projects and their resulting traffic operations. These projects address the capacity deficiencies identified in the existing and future conditions analyses. Technical analysis worksheet are included in Appendix C.



Projects Included in Alternatives Model Run

Figure 6

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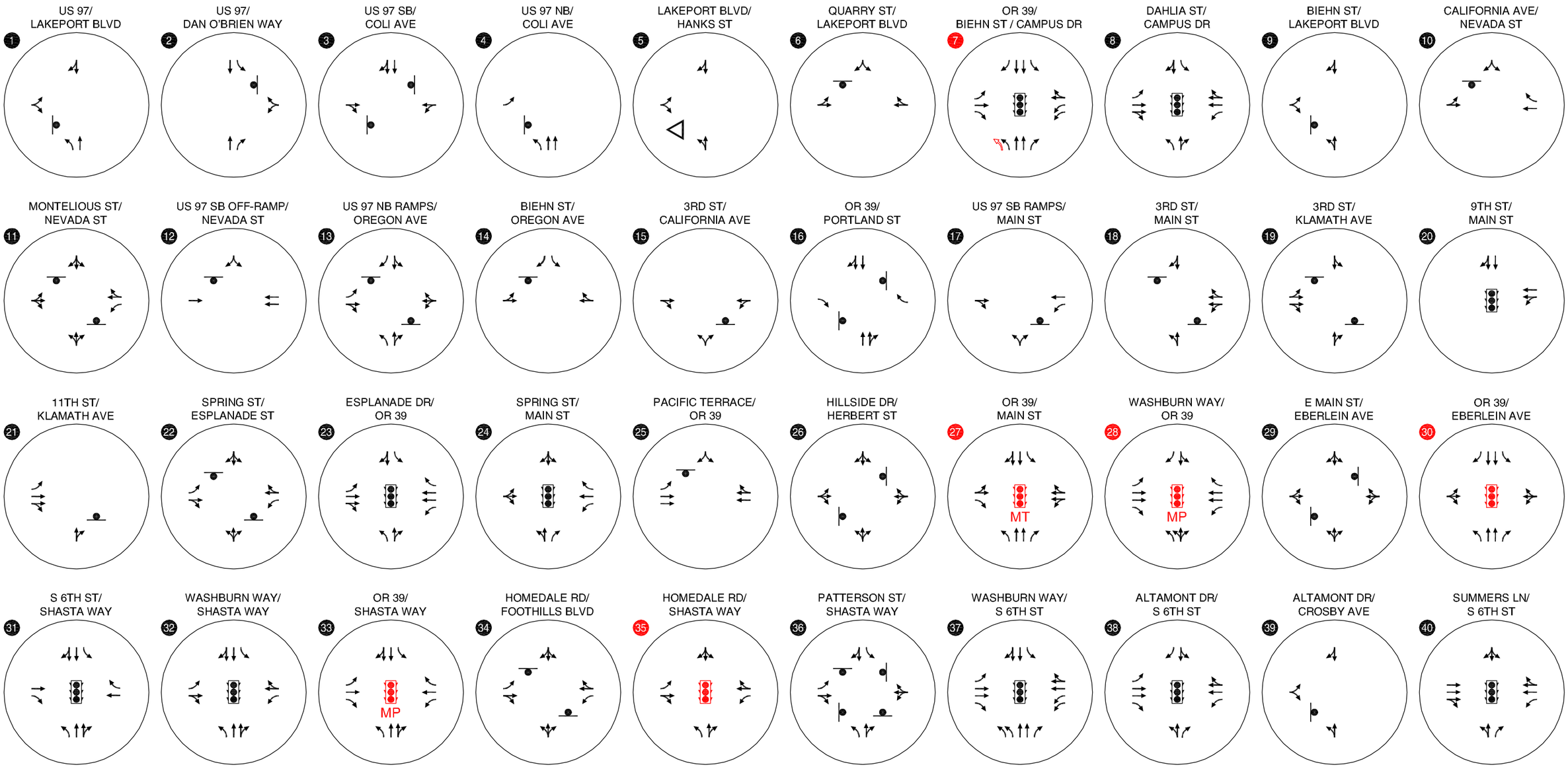


- STOP SIGN
- TRAFFIC SIGNAL
- YIELD SIGN

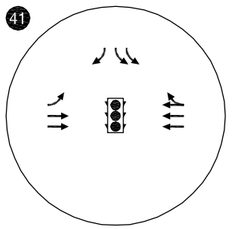
MT - MODIFY SIGNAL TIMING
MP - MODIFY SIGNAL PHASING
- PROPOSED IMPROVEMENTS

PROPOSED INTERSECTION IMPROVEMENTS

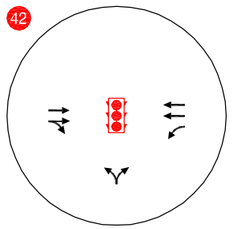
CITY OF KLAMATH FALLS
KLAMATH COUNTY

Figure 7a

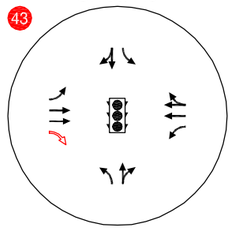
41 S 6TH ST/ OR 39



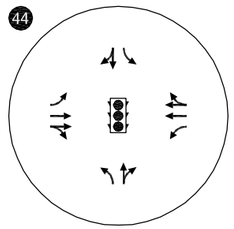
42 FARGO ST/ OR 39



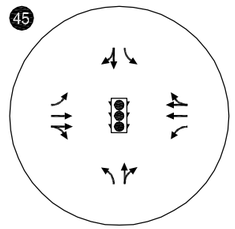
43 HOMEDALE RD/ OR 39/140



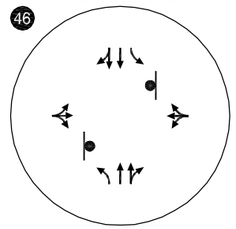
44 MADISON ST/ OR 39



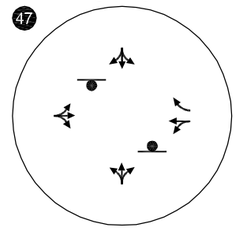
45 PATTERSON DR/ OR 39



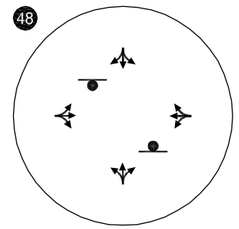
46 OR 39/ HILYARD AVE



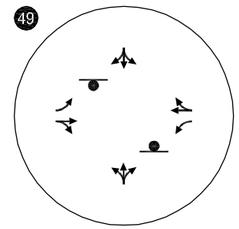
47 ORINDALE RD/ OR 140



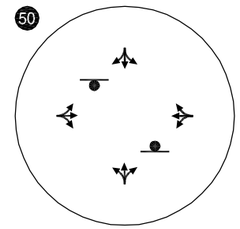
48 ORINDALE RD/ BALSAM DR



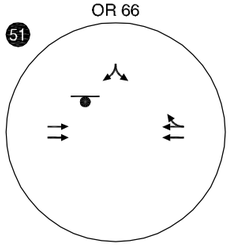
49 ORINDALE DR/ OR 66



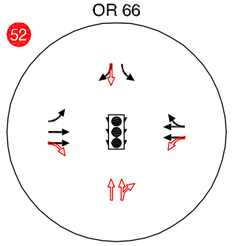
50 EMERALD ST/ OR 66



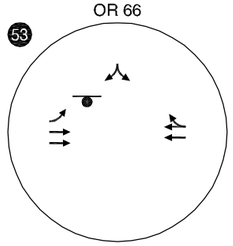
51 BALSAM DR/ OR 66



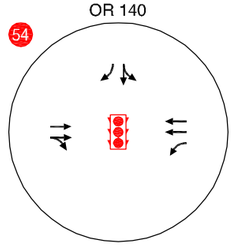
52 OR 140/ OR 66



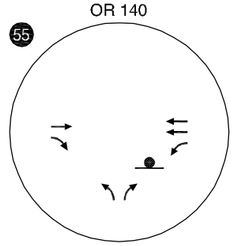
53 DELAP RD/ OR 66



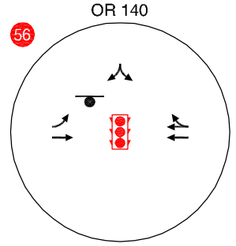
54 US 97 SB RAMPS/ OR 140



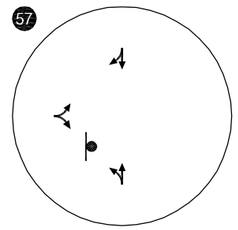
55 US 97 NB RAMPS/ OR 140



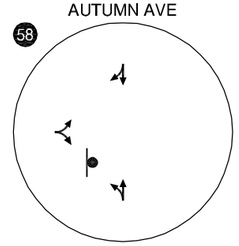
56 GREENSPRINGS DR/ OR 140



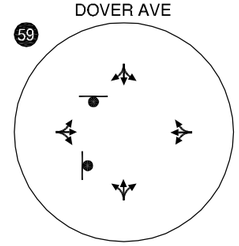
57 RIVERSIDE DR/ LINDLEY WAY



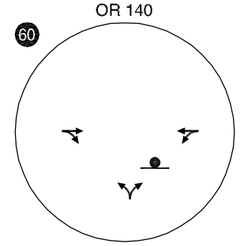
58 RIVERSIDE DR/ AUTUMN AVE



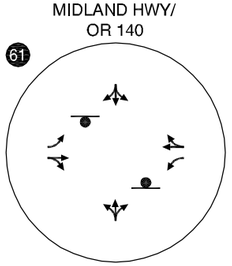
59 GREENSPRINGS DR/ DOVER AVE



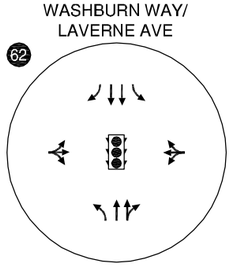
60 MEMORIAL DR/ OR 140



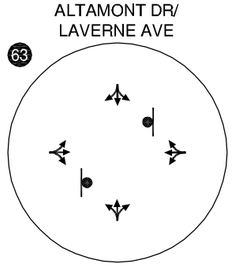
61 MIDLAND HWY/ OR 140



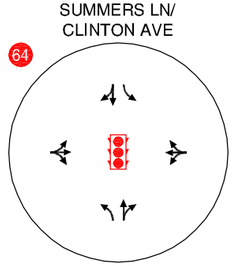
62 WASHBURN WAY/ LAVERNE AVE



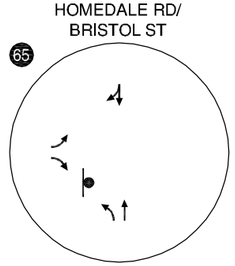
63 ALTAMONT DR/ LAVERNE AVE



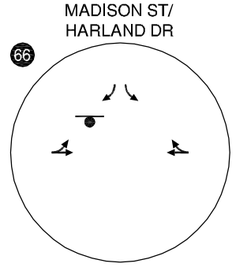
64 SUMMERS LN/ CLINTON AVE



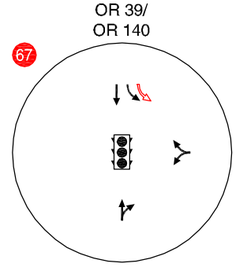
65 HOMEDALE RD/ BRISTOL ST



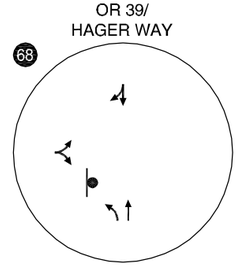
66 MADISON ST/ HARLAND DR



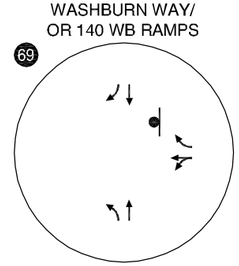
67 OR 39/ OR 140



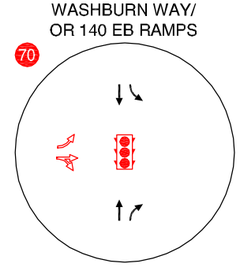
68 OR 39/ HAGER WAY



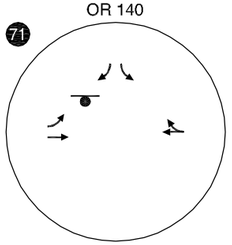
69 WASHBURN WAY/ OR 140 WB RAMPS



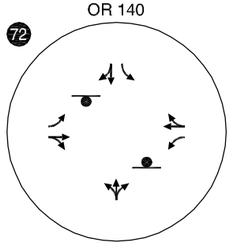
70 WASHBURN WAY/ OR 140 EB RAMPS



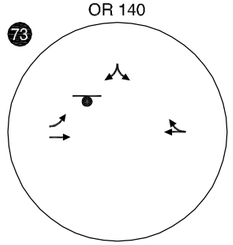
71 ALTAMONT DR/ OR 140



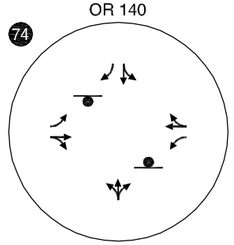
72 SUMMERS LN/ OR 140



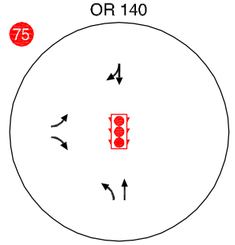
73 GLENWOOD DR/ OR 140



74 HOMEDALE RD/ OR 140



75 OR 39/ OR 140



- STOP SIGN
- TRAFFIC SIGNAL
- YIELD SIGN

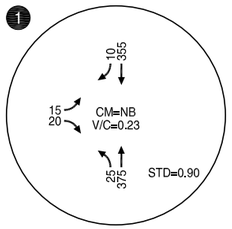
MT - MODIFY SIGNAL TIMING
MP - MODIFY SIGNAL PHASING
- PROPOSED IMPROVEMENTS

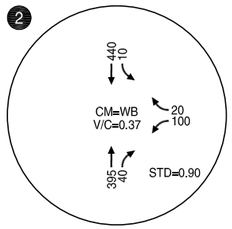
PROPOSED INTERSECTION IMPROVEMENTS

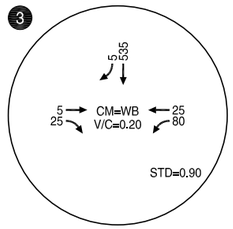
CITY OF KLAMATH FALLS
KLAMATH COUNTY

Figure 7b

H:\profile\111172 - Klamath Falls TSP\dwgs\figs\111172_Fig07.dwg Mar 23, 2011 - 9:12am - jsommerville Layout Tab: 7b

1 US 97/ LAKEPORT BLVD


2 US 97/ DAN O'BRIEN WAY


3 US 97 SB/ COLI AVE


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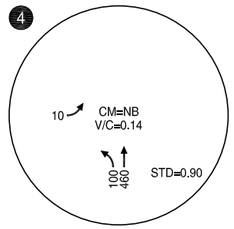
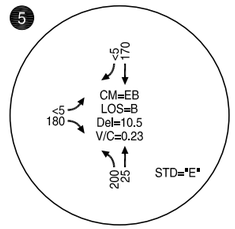


5 LAKEPORT BLVD/ HANKS ST


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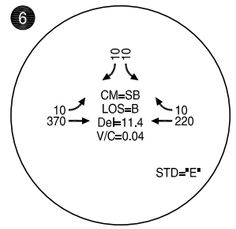
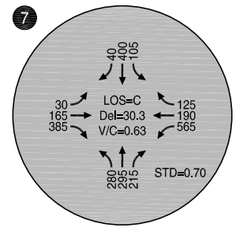
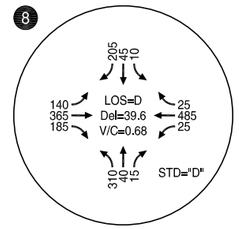


7 OR 39/ BIEHN ST / CAMPUS DR


8 DAHLIA ST/ CAMPUS DR


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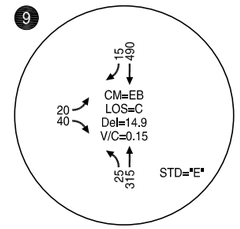
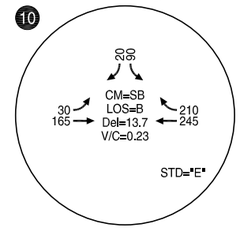
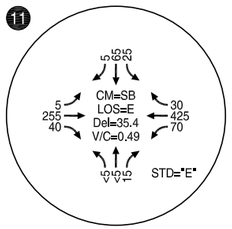
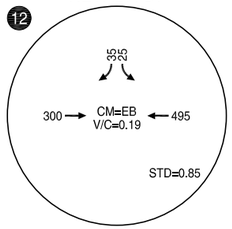
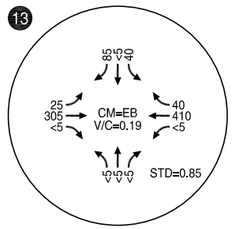


10 CALIFORNIA AVE/ NEVADA ST


11 MONTELIOUS ST/ NEVADA ST


12 US 97 SB OFF-RAMP/ NEVADA ST


13 US 97 NB RAMPS/ OREGON AVE


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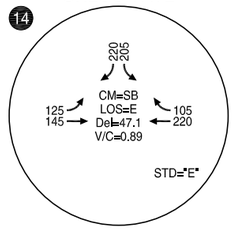
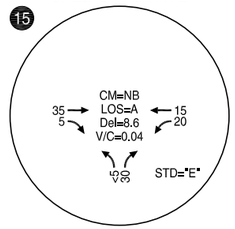
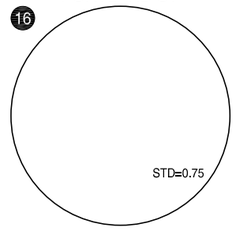
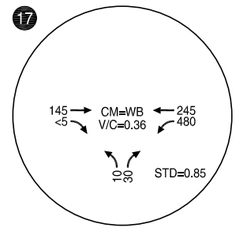


15 3RD ST/ CALIFORNIA AVE


16 OR 39/ PORTLAND ST


17 US 97 SB RAMPS/ MAIN ST


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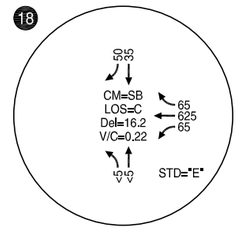
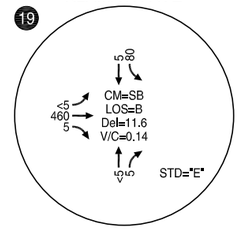
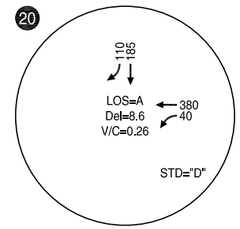
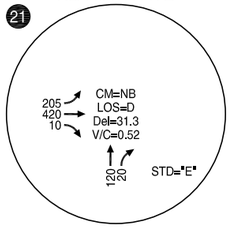
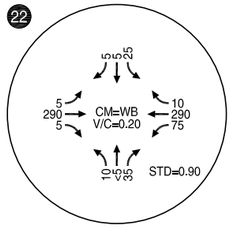
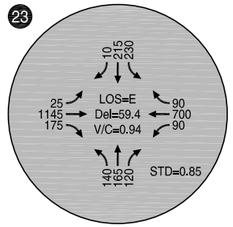


19 3RD ST/ KLAMATH AVE


20 9TH ST/ MAIN ST


21 11TH ST/ KLAMATH AVE


22 SPRING ST/ ESPLANADE ST


23 ESPLANADE DR/ OR 39


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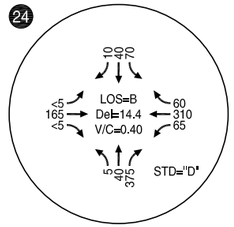
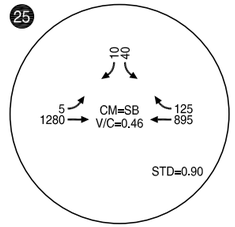
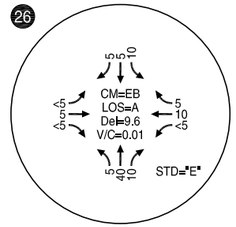
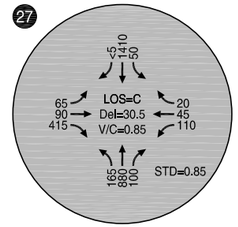
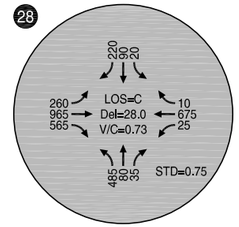
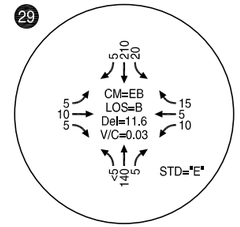


25 PACIFIC TERRACE/ OR 39


26 HILLSIDE DR/ HERBERT ST


27 OR 39/ MAIN ST


28 WASHBURN WAY/ OR 39


29 E MAIN ST/ EBERLEIN AVE


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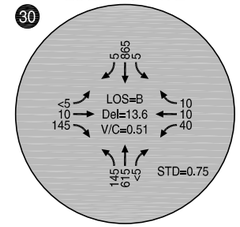
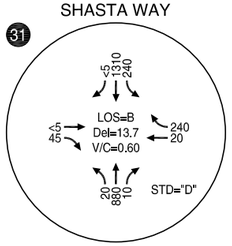
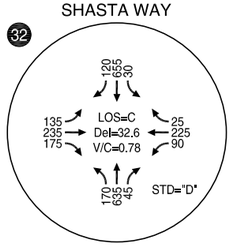


31 S 6TH ST/ SHASTA WAY


32 WASHBURN WAY/ SHASTA WAY


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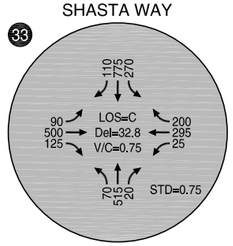
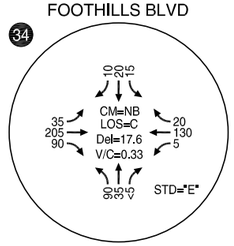
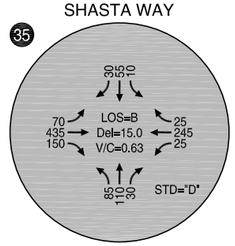
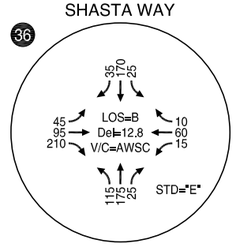
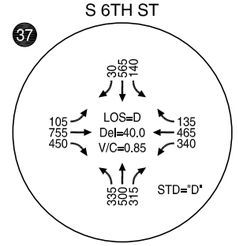
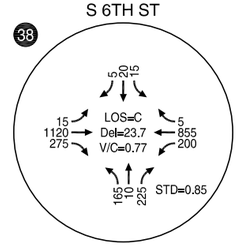


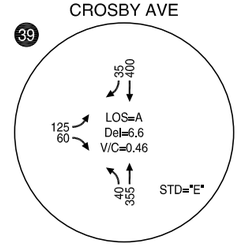
34 HOMEDALE RD/ FOOTHILLS BLVD


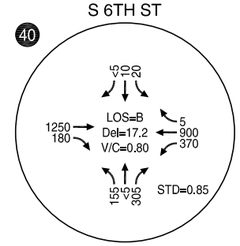
35 HOMEDALE RD/ SHASTA WAY


36 PATTERSON ST/ SHASTA WAY


37 WASHBURN WAY/ S 6TH ST


38 ALTAMONT DR/ S 6TH ST


39 ALTAMONT DR/ CROSBY AVE


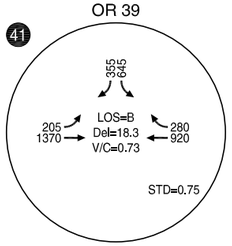
40 SUMMERS LN/ S 6TH ST


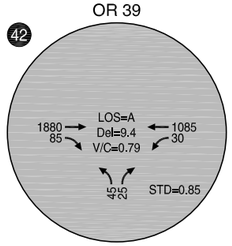
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

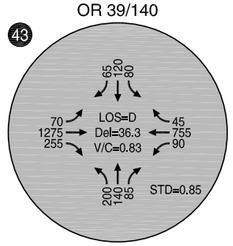
Future Year 2035 Intersection Improvements Traffic Conditions Weekday PM Peak Hour

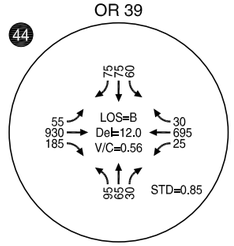
Figure 8a

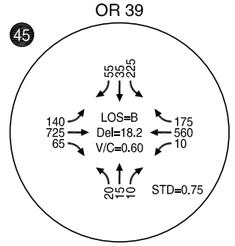
H:\profile\11172 - Klamath Falls TSP\11172_Fig01_dwg Alt Analysis - Mitigations.dwg Mar 23, 2011 - 2:47pm - openbnd Layout Tab: 1a

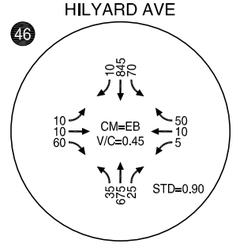
41 S 6TH ST/ OR 39


42 FARGO ST/ OR 39


43 HOMEDALE RD/ OR 39/140


44 MADISON ST/ OR 39


45 PATTERSON DR/ OR 39


46 OR 39/ HILYARD AVE


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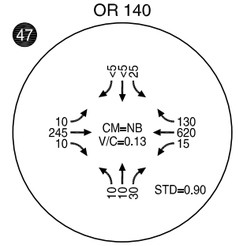
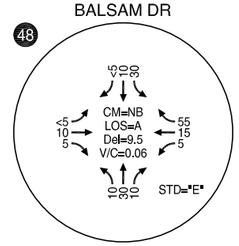
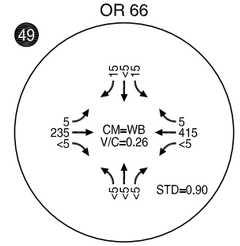


48 ORINDALE RD/ BALSAM DR


49 ORINDALE DR/ OR 66


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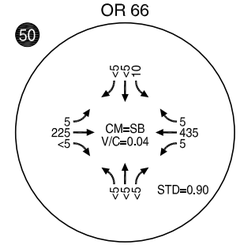

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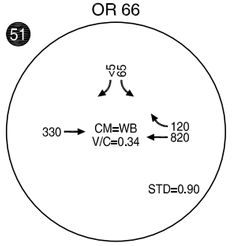

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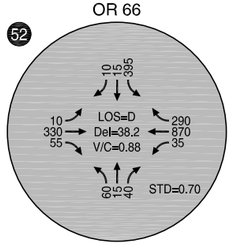

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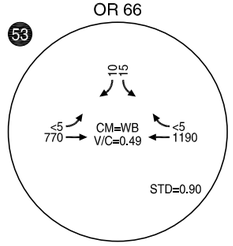

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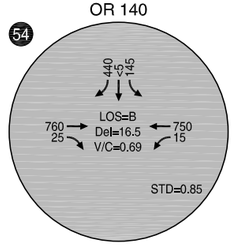

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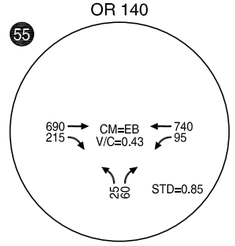

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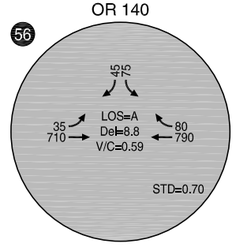

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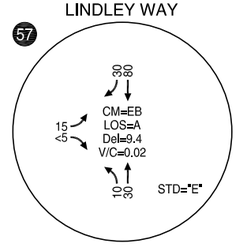

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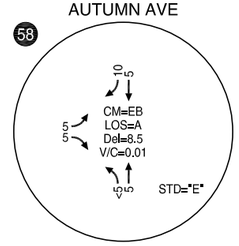

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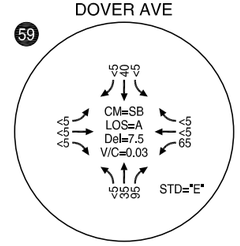

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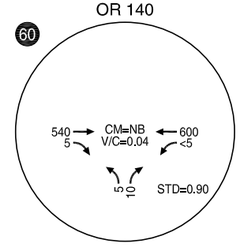

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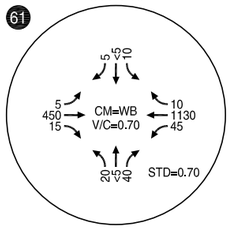

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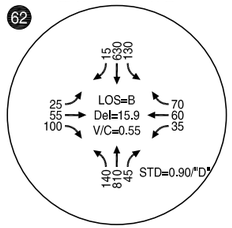

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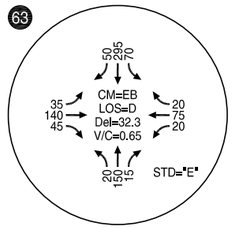

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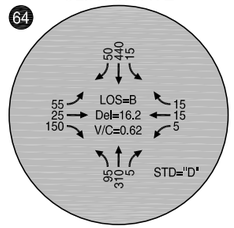

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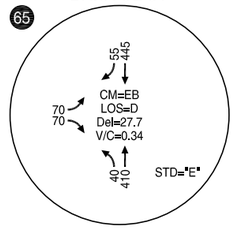

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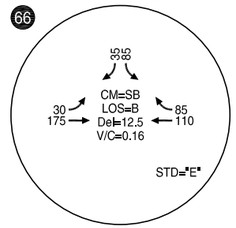

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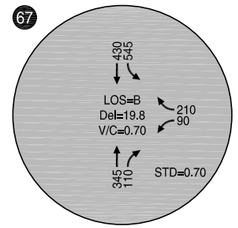

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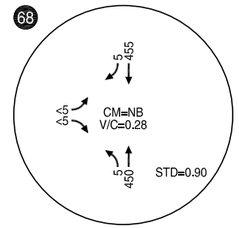
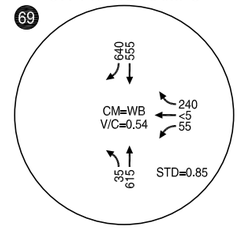


69 WASHBURN WAY/ OR 140 WB RAMPS


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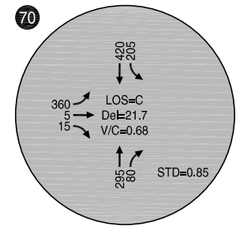

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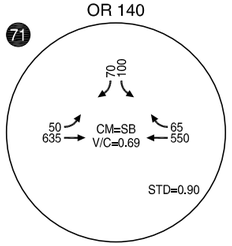

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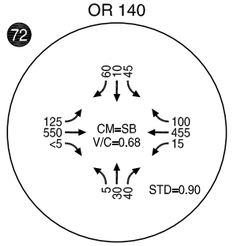

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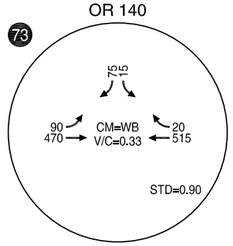

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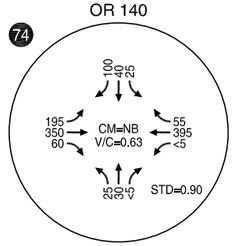
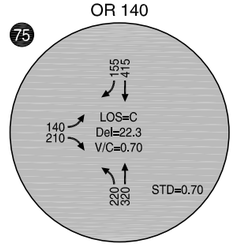


75 OR 39/ OR 140


CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO
STD = OPERATIONAL STANDARD

Future Year 2035 Intersection Improvements Traffic Conditions Weekday PM Peak Hour

Figure 8b

H:\proj\file\11172 - Klamath Falls TSP\111172_Fig01_dwg Alt Analysis - Mitigations.dwg Mar 23, 2011 - 2:45pm - openbnd Layout Tab: 1b

Table 10 **Proposed Intersection Improvements**

Project	Intersection	Mobility Standard	2035 Performance Level	Proposed Mitigation Measure	Resultant Performance Level	Considerations
PRJ-45	#7 – OR 39/Biehn Street/Campus Drive	0.70 v/c	0.73 v/c	Construct NBL	0.63 v/c	-Would require constructing second receiving lane -Potential impacts to adjacent gas station **-Consider alternative mobility standard**
PRJ-46	#14 – Biehn Street/Oregon Avenue	LOS "E"	LOS "F"	Construct SBL	LOS "D"	-Eight-hour signal warrant not met in 2035 -Peak and Four-Hour warrant is met in 2035
PRJ-47	#23 – OR 39/Espanade Street	0.85 v/c	0.95 v/c	None Proposed	-	-Severe constraints limit improvements options -Improvements should be focused on alternative routes
PRJ-48	#27 – Main Street/OR 39	0.85 v/c	0.87 v/c	Modify signal timing	0.85 v/c	-Constrained environment near intersection **-Consider alternative mobility standard**
PRJ-49	#28 – OR 39/Washburn Way	0.75 v/c	0.78 v/c	Modify signal phasing	0.73 v/c	-Install projected/permitted phasing northbound -Install permitted phasing southbound -Install overlap phasing for eastbound right-turn -Install overlap phasing for southbound right-turn **-Consider alternative mobility standard**
PRJ-50	#30 – Eberlein Avenue/OR 39	0.90 v/c	>1.0 v/c	Traffic signal	0.51 v/c	-Signal warrant met in 2035 due to high right-turn
PRJ-51	#33 – OR 39/Shasta Way	0.75 v/c	0.78 v/c	Modify signal phasing	0.75 v/c	-Install protect/permitted phasing on Shasta Way **-Consider alternative mobility standard**
PRJ-52	#35 – Shasta Way/Homedale Road	LOS "E"	LOS "F"	Traffic signal	LOS "C"	-Eight-hour signal warrant not met in 2035 -Peak and Four-Hour warrant is met in 2035
PRJ-53	#42 – Fargo Street/OR 39	0.90 v/c	>1.0 v/c	Traffic signal	0.79 v/c	-No signal warrants met in 2035 -Consider as part of coordinated signal system
PRJ-54	#43 – Homedale Road/OR 39	0.85 v/c	0.94 v/c	Construct EBR	0.83 v/c	-Impacts to adjacent church parking lot are likely

PRJ-55	#52 – OR 140/OR66	0.70 v/c	0.85 v/c	None proposed	-	-Area will be considered as part of Greensprings IAMP
PRJ-56	#54 – US 97 SB Ramps/OR 140	0.85 v/c	>1.0 v/c	Traffic signal	0.70 v/c	-Area will be considered as part of Greensprings IAMP
PRJ-57	#56 – Greensprings Drive/OR140	0.90 v/c	>1.0 v/c	Traffic signal	0.60 v/c	-Area will be considered as part of Greensprings IAMP
PRJ-58	#61 – Midland Highway/OR 140	0.70 v/c	0.72 v/c	Construct WBT auxiliary through lane	0.47 v/c	-Significant expense for minor issue -System improvements would likely mitigate impact **-Consider alternative mobility standard**
PRJ-59	#64 – Summers Lane/Clinton Avenue	LOS "E"	LOS "F"	Traffic signal	LOS "B"	-Eight-hour signal warrant not met in 2035 -Peak and Four-Hour warrant is met in 2035
PRJ-60	#67 – OR 39/OR 140 (Big Y)	0.70 v/c	0.94 v/c	Construct SBL	0.70 v/c	-Would require second receiving lane -Potential right-of-way impacts to adjacent parcels
PRJ-61	#70 – Washburn Way/OR 140 EB Ramps	0.85 v/c	>1.0 v/c	Traffic signal	0.68	-Part of identified STIP project -Off-ramp lanes should be reconfigured
PRJ-62	#75 – OR 39/OR 140	0.70 v/c	0.96 v/c	Traffic signal	0.70 v/c	-Intersection outside of UGB

KEY DEVELOPMENT AREAS

Due to operational performance standards and roadway connectivity issues, the transportation system can at times be a barrier for development. Below is a summary of the proposed improvements (identified in the previous sections) for several key areas targeted for growth and where it is critical that barriers to development be minimized.

Pelican City

Pelican City is an area of Klamath Falls located to the northwest of downtown Klamath Falls and on the southeast side of the Klamath Lake. The area is somewhat isolated from the rest of the community by the alignment of US 97 to the east. As such, trips to and from this area rely heavily on the Lakeport Boulevard and the US 97 / Nevada Street / Oregon Avenue interchange as well as an unsignalized access to US 97 at Coli Avenue. Each of these access points to Pelican City are projected to operate acceptably with the planning horizon based on the growth assumptions for this area within the Transportation Analysis Zones. The proposed Crescent Avenue Extension project helps provide additional access routes for Pelican City and reduces reliance on US 97 and its interchanges. Proposed projects anticipated to minimize development barriers for this area include:

- Crescent Avenue Extension (PRJ-14)
- Modify transit Route 5 to serve more areas (PRJ-39)

Basin View

Basin View is an area located north of Foothills Boulevard on the northeast side of Klamath Falls. This area is projected to have new development occur in the future. Along with that development, several new collector roadways have been identified that will serve this area and provide two access points to Foothills Boulevard and one to Old Fort Road. Old Fort Road will provide a more direct route to downtown and to US 97 for development in the northern portion of the development area. Although not projected to carry a significant amount of traffic, the connection to Old Fort Road will eliminate the need for the entire area to funnel down Foothills Boulevard. With these planned connections, all study intersections serving this area are projected to operate acceptably with the planning horizon based on the growth assumptions for this area within the Transportation Analysis Zones. The

connection to Old Fort Road will increase in value if an extension of Campus Drive to Old Fort Road via Collman Dairy Road were to be planned.

Proposed projects anticipated to minimize development barriers for this area include:

- Extend muli-use path near Foothills Boulevard (PRJ-35)
- Construct new roadway north to Old Fort Road from Homedale Road/Foothills Boulevard (PRJ-40)
- Construct new roadway north from Foothills Boulevard near Beverly Drive (PRJ-41)

Airport Industrial Park

The Airport Industrial Park area is located to the west of the Klamath Falls Airport, east of Washburn Way, and south of OR 140. Due to limited access and crossings of OR 140, Washburn Way is the only access to the Airport Industrial Park from OR 140 and includes two at-grade railroad crossings (one on Washburn Way and one on Joe Wright Road). The Airport Industrial Park can also be accessed from US 97 via Joe Wright Road. This route has only one at-grade railroad crossing (on Joe Wright Road). With the proposed signal to mitigate operations at the intersection of Washburn Way/OR 140 Eastbound Ramp Terminal, all of the study intersections serving this area are projected to operate acceptably with the planning horizon based on the growth assumptions for this area within the Transportation Analysis Zones. If the at-grade railroad crossings result in undesirable levels of congestion due to train traffic, a more cost effective manner to address this than constructing a grade crossing would be to construct a new collector facility that avoids both rail crossings by connecting Washburn Way to Joe Wright Road east of the railroad tracks and intersecting Joe Wright Road at Airport Way (PRJ-63).

Proposed projects anticipated to minimize development barriers for this area include:

- Improve safety at OR 140 / Summers Lane (PRJ-4)
- Install traffic signal at OR 140 EB Ramps / Washburn Way (PRJ-61)
- Construct an extension/realignment of Washburn Way to the intersection of Joe Wright Road/Airport Way (PRJ-63)

South 6th Street

The South 6th Street corridor serves as a major east-west route through the Klamath Falls Urban Area. In addition, this corridor serves as a major commercial center for the area and as a key connection between downtown Klamath Falls and housing areas and additional commercial corridors, such as Washburn Way.

Given the significance of South 6th Street within the Klamath Falls transportation system, any facilities along it that exceed performance thresholds could be become a barrier to development (namely the intersections of Fargo Street and Homedale Road). Additional barriers include the existing safety issues (several segments of S. 6th Street are identified as safety focus segments) and access management.

One of the intersections that require mitigation in the future is the Fargo Street intersection. A signal would mitigate the operational issues at this location. It is closely spaced intersection with of Summers Lane and Crater Lake Parkway (OR 39) and signalization would likely require a coordinated signal system including these three intersections. The canal between Summers Lane and Crater Lake Parkway also make physical improvements to this location challenging and expensive.

Proposed projects anticipated to minimize development barriers for this area include:

- Improve safety from Summers Lane to OR 39 (PRJ-8)
- Improve safety from OR 39 to Fargo Street (PRJ-9)
- Improve safety from Homedale Road to Madison Street (PRJ-10)
- East Main Street Extension (PRJ-15)
- Install traffic signal at Fargo Street / OR 39 (PRJ-53)
- Construct eastbound right-turn lane at Homedale Road / OR 39 (PRJ-54)

Washburn Way

The Washburn Way corridor serves as a major commercial center for the Klamath Falls Urban Area, particularly south of the South 6th Street intersection. This roadway also serves as a major north-south connection through Klamath Falls, connecting with Crater Lake Parkway in the north, OR 140 in the south, and providing access to the airport.

Like South 6th Street, any facilities along Washburn Way it that exceed performance thresholds could be become a barrier to development; however, all of the intersections along Washburn Way are

projected to operate acceptably within the planning horizon based on the growth assumptions for this area with the proposed traffic signal at the OR 140 Eastbound Ramp Terminal on Washburn Way. However, safety issues at the Shasta Way intersection and access management along the corridor are additional barriers to development along the corridor.

Proposed projects anticipated to minimize development barriers for this area include:

- Improve safety at Washburn Way / Shasta Way (PRJ-2)
- East Main Street Extension (PRJ-15)
- Extend Washburn Way north (PRJ-42)
- Modify signal phasing at OR 39 / Washburn Way (PRJ-49)
- Install traffic signal at OR 140 EB Ramps / Washburn Way (PRJ-61)

Summary of Projects

As a result of analysis conducted and input gathered as part of the TSP update effort, the following issues have been identified for the transportation system within the Klamath Falls Urban Area:

- 18 intersections are forecasted to exceed applicable mobility standards under future conditions. Mitigation measures that address these deficiencies are proposed for 16 of these locations.
- 6 intersections and 7 roadway segment were observed to exceed critical crash rates.
- Gaps in the connectivity and coverage of the pedestrian and bicycle networks were identified. An emphasis was put on proposing improvements that would improve these networks in the vicinity of schools.
- Transit service within Klamath Falls was found to cover nearly all the existing and expected transit supportive areas within the Urban Area. Future expansion of the transit system could be focused on expanding frequency, coverage, or operating hours of the service.
- Certain areas within Klamath Falls are particularly susceptible to transportation related development barriers, meaning that transportation deficiencies could make future development expensive and/or unfeasible, due to a reliance on limited access locations or proximity to critical system junctions.

- Travel within Klamath Falls currently relies heavily on the state highway system for local connections. Future projects have been identified that would provide parallel or alternative routes for these trips.

Based on the issues identified above, the following recommendations have been proposed:

- Table 2 and Table 3 identify intersection and segment safety projects that should be incorporated into maintenance, capacity, or urban upgrade projects when they occur at these locations. These projects could also be considered as stand-alone safety projects.
- Alternatives and policies have been proposed for Access Management, Transportation system Management, and Transportation Demand Management.
- Figure 6 shows the roadway projects included in the alternative analysis. These are recommended for inclusion in the updated TSP.
- Figure 7 shows the recommended intersection improvement projects. These are recommended for inclusion in the updated TSP.
- Figure 2 shows the existing pedestrian facilities, gaps, and proposed priority areas.
- Figure 3 shows the existing bicycle facilities, gaps, proposed priority areas, and recommended sharrow corridors.
- Expansion of the transit system is recommended to be focused on increased frequency or extended service hours.

NEXT STEPS

This memorandum serves as a summary of alternatives available to address the challenges that the Klamath Falls Urban Area transportation system is expected to face in the future. Final recommendations will be based on PMT, TAC, and CAC feedback, project cost estimates, and anticipated future funding levels. The preferred alternative will be documented and summarized in the forthcoming Technical Memorandum #6.

APPENDIX A – SEGMENT SAFETY ANALYSIS

Roadway	Extents	Length(miles)	AADT	Fatal	Injury	PDO	Total	Crash Rate	ODOT By Facility Type
US97	Lakeport Boulevard to Dan O'Brien Way	0.77	6900	0	2	6	8	0.83	2.02
US97	Dan O'Brien Way to Coil Avenue	0.35	7750	0	4	4	8	1.62	2.02
US97	The split to Nevada Street	0.69	6500	0	2	3	5	0.61	2.02
US97	Nevada Street to Main Street	1.42	6300	1	5	8	14	0.86	2.02
US97	Main Street to OR 140	2.07	8600	0	7	12	19	0.58	2.02
US97	OR 140 To Southern UGB	1.08	5500	1	3	8	12	1.11	2.02
				0			0		
OR 66	Orindale Road to Emerald Street	0.61	5350	0	1	3	4	0.67	2.02
OR 66	Emerald Street OR 140	0.46	7750	1	2	2	5	0.77	2.02
				0			0		
OR 140	Werstern UGB to OR 66	1.08	5300	1	8	13	22	2.11	2.02
OR 140	OR 66 US 97	0.19	10350	0	1	2	3	0.84	2.02
OR 140	US 97 to Memorial Drive	0.58	8900	0	2	3	5	0.53	2.02
OR 140	Memorial Drive to Midland Highway	0.92	8800	0	4	8	12	0.81	2.02
OR 140	Midland Highway to Washburn Way	1.24	9800	0	4	3	7	0.32	2.02
OR 140	Washburn Way to Altamont Drive	0.51	9400	0	2	0	2	0.23	2.02
OR 140	Altamont Drive to Summers Lane	0.5	9600	0	6	2	8	0.91	2.02
OR 140	Summers Lane to Glenwood Drive	0.44	9300	0	2	1	3	0.40	2.02
OR 140	Glenwood Drive to Homedale Road	0.31	8100	0	0	0	0	0.00	2.02
OR 140	Homedale Road to OR 39 (Klamath Falls-Malin H	1.33	5500	0	4	1	5	0.37	2.02
				0			0		
OR 39	Biehn Street to Portland Street	1.19	15750	0	5	1	6	0.18	2.02
OR 39	Portland Street to Esplanade Street	0.25	18950	0	2	5	7	0.81	2.02
OR 39	Esplanade Street to Pacific Terrace	0.32	19000	1	4	1	6	0.54	2.02
OR 39	Pacific Terrace to Main Street	0.19	20200	0	2	2	4	0.57	2.02
OR 39	Main Street to Washburn Way	0.52	26540	0	5	4	9	0.36	2.02
OR 39	Washburn Way to Eberlein Avenue	0.71	12300	0	6	3	9	0.56	2.02
OR 39	Eberlein Avenue to Shasta Way	0.34	15600	0	4	2	6	0.62	2.02
OR 39	Shasta Way to 6th Street	0.63	11050	0	3	7	10	0.79	2.02
OR 39	OR 140 (Big Y) to Hager Way	0.3	6850	0	3	2	5	1.33	2.02
OR 39	Hager Way to OR 140 (Southside Expressway)	1.47	6850	0	12	13	25	1.36	2.02
				0			0		
S 6th Street	Klamath Avenue to Shasta Way	1.24	22150	0	10	8	18	0.36	2.02
S 6th Street	Shasta Way to Washburn Way	0.3	18900	0	3	4	7	0.68	2.02
S 6th Street	Washburn Way to Altamont Drive	0.61	19100	0	8	9	17	0.80	2.02
S 6th Street	Altamont Drive to Summers Lane	0.49	18950	0	11	11	22	1.30	2.02
S 6th Street	Summers Lane to OR 39	0.05	22250	0	5	3	8	3.94	2.02
S 6th Street	OR 39 to Fargo Street	0.09	25250	0	8	9	17	4.10	2.02
S 6th Street	Fargo Street to Homedale Road	0.63	22400	0	16	23	39	1.51	2.02
S 6th Street	Homedale Road to Madison Street	0.25	19900	0	10	13	23	2.53	2.02
S 6th Street	Madison Street to Patterson Street	0.25	13000	0	4	4	8	1.35	2.02
S 6th Street	Patterson Street to Hilyard Avenue	0.69	14250	0	5	10	15	0.84	2.02
S 6th Street	Hilyard Avenue to OR 140 (Klamath Falls-Lakevi	0.35	13000	0	2	8	10	1.20	2.02
				0			0		
Washburn Way	OR 140 to Laverne Avenue	1.19	12550	0	1	3	4	0.15	2.02
Washburn Way	Laverne Avenue to S 6th Street	1.33	12450	0	7	5	12	0.40	2.02
Washburn Way	S 6th Street to Shasta Way	0.17	13800	0	1	3	4	0.93	2.02
Washburn Way	Shasta Way to OR 39	0.77	12500	0	5	5	10	0.57	2.02
				0			0		
Shasta Way	S 6th Street to Washburn Way	0.25	8400	0	4	4	8	2.09	2.02
Shasta Way	Washburn Way to OR 39	0.7	5500	1	7	11	19	2.70	2.02
Shasta Way	OR 39 to Homedale Road	1.06	8250	0	7	10	17	1.07	2.02
Shasta Way	Homedale Road to Patterson Street	0.5	6450	0	2	3	5	0.85	2.02
				0			0		
5th Street	Main Street to 6th Street	0.44	#VALUE!	1	2	2	5	#VALUE!	1.56
				0			0		
Klamath Avenu	Main Street to 3rd Street	0.18	3600	0	1	2	3	2.54	2.27
Klamath Avenu	3rd Street to 11th Street	0.44	6300	0	0	4	4	0.79	2.27
				0			0		
Main Street	US 97 to 3rd Street	0.34	4450	0	1	3	4	1.45	2.27
Main Street	3rd Street to 9th Street	0.37	5000	0	0	1	1	0.30	2.27
Main Street	9th Street to Esplanade Street	0.08	3550	0	0	1	1	1.93	2.27
				0			0		
Esplanade Stre	Main Street to OR 39	0.4	5300	0	2	1	3	0.78	2.27

APPENDIX B – PEDESTRIAN CROSSING TREATMENTS

Grade-Separated Crossing – Grade-separated crossings are either underpasses or overpasses that allow pedestrians to entirely avoid conflicts with automobiles when crossing a busy roadway. When used as part of a multi-use path, grade-separated crossings also accommodate bicycles. Grade-separated crossings are necessary limited circumstances, such as railroad crossings. However, they are often perceived as unsafe (especially under-crossings), and may result in significant out-of-direction travel for pedestrians, grade-separated crossings should be used sparingly. Grade-separated crossings can be relatively expensive to build.

Pedestrian Hybrid Beacon – The pedestrian hybrid beacon is a pedestrian-actuated hybrid beacon that would interrupt traffic on the mainline to provide a protected crossing for pedestrians at an unsignalized location. Pedestrian hybrid beacons were included in the most recent edition of the Manual on Uniform Traffic Control Devices (MUTCD) (Reference 2). Warrants for the installation of pedestrian-actuated hybrid signals are based on the number of pedestrians per hour (PPH), vehicles per hour on the roadway for the crossing, and the length of the crosswalk. Thresholds are available for two types of roadways: locations where prevailing speeds are above 35 mph and locations where prevailing speeds are below 35 mph.



Signalized Intersection – This option would require review of signal warrants according to the MUTCD to determine if a signal is warranted at an intersection based on the number of pedestrian crossings. The MUTCD requires pedestrian crossing volumes of 190 pedestrians during one peak

hour, or 100 or more during each of four hours. These conditions are relatively rare, but may exist near public schools.

Rectangular Rapid Flashing Beacon – RRFBs consist of user-actuated amber LEDs, which have an irregular flash pattern similar to emergency flashers on police vehicles. These supplement warning signs at unsignalized intersections or mid-block crosswalks.

Raised Pedestrian Refuge – This option provides a pedestrian refuge in the roadway median, allowing a two-stage crossing to occur if needed. The *ODOT Traffic Manual* (Reference 1) states that for state highways a raised median, in combination with a marked crosswalk is desired when average daily traffic (ADT) volumes are greater than 10,000.

Marked Crosswalks – Marked crosswalks are painted roadway markings that indicate the location of a crosswalk to motorists. Marked crosswalks can be accompanied by signs, curb extensions and/or median refuge islands, and may occur at intersections or at mid-block locations. By increasing the visibility of crosswalks, marked crosswalks can improve driver yield rates to pedestrians on many facilities. In general, median refuge islands should be included with marked crosswalks to improve pedestrian safety wherever crossing distances are significant, pedestrian volumes are above average, vehicle speeds are above a residential standard, vehicle volumes make full crossings difficult, physical space is available, and/or pedestrians in the area are incapable of full crossings at standard pedestrian rates of speed.



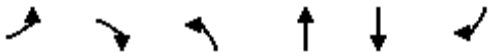
Research has shown that marked crosswalks in certain situations do not improve pedestrian safety and can even make it worse. Recent research indicates that on multi-lane roadways (more than two lanes), marked crosswalks should not be installed without accompanying treatments (e.g., signalization) when traffic volumes exceed 12,000 ADT (no median refuge island) or 15,000 ADT (with median island).[2]

Unmarked Crosswalks – Under Oregon law, pedestrians have the right-of-way at any unsignalized intersection. On narrow, low-speed streets unmarked crosswalks are generally sufficient for pedestrians to cross the street safely, as the low-speed environment makes drivers more responsive to the presence of pedestrians. However, drivers are less likely to yield to pedestrians at unmarked crosswalks on high-speed and/or high-volume roadways, even when the pedestrian has stepped onto the roadway. In these situations, pedestrian crossing facilities are needed to delineate the pedestrian right-of-way and remind drivers that they must yield when pedestrians are present.

[2] Zegeer, C., et. al. *Safety Effects of Marked versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines,* Report No. HRT-04-100. Federal Highway Administration. Washington, DC. September 2005.



APPENDIX C – TECHNICAL ANALYSIS WORKSHEETS



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	15	20	25	374	357	8
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	16	21	26	394	376	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	826	380	384			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	826	380	384			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	95	97	98			
cM capacity (veh/h)	337	671	1185			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	37	26	394	384
Volume Left	16	26	0	0
Volume Right	21	0	0	8
cSH	471	1185	1700	1700
Volume to Capacity	0.08	0.02	0.23	0.23
Queue Length 95th (ft)	6	2	0	0
Control Delay (s)	13.3	8.1	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	13.3	0.5		0.0
Approach LOS	B			

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	32.6%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	100	21	396	41	10	442
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	104	22	412	43	10	460
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	894	412			455	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	894	412			455	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	66	97			99	
cM capacity (veh/h)	310	644			1116	

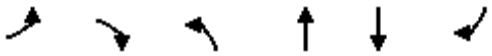
Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	126	412	43	10	460
Volume Left	104	0	0	10	0
Volume Right	22	0	43	0	0
cSH	341	1700	1700	1116	1700
Volume to Capacity	0.37	0.24	0.03	0.01	0.27
Queue Length 95th (ft)	41	0	0	1	0
Control Delay (s)	21.6	0.0	0.0	8.3	0.0
Lane LOS	C			A	
Approach Delay (s)	21.6	0.0		0.2	
Approach LOS	C				

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	7	27	78	23	0	0	0	0	1	535	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	7	28	82	24	0	0	0	0	1	563	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	579	567	283	316	568	0	566			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	579	567	283	316	568	0	566			0		
tC, single (s)	7.5	6.5	7.0	7.5	6.6	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.1	3.3	2.2			2.2		
p0 queue free %	100	98	96	86	94	100	100			100		
cM capacity (veh/h)	385	436	705	586	422	1091	1016			1636		

Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	36	106	283	285
Volume Left	0	82	1	0
Volume Right	28	0	0	3
cSH	625	538	1636	1700
Volume to Capacity	0.06	0.20	0.00	0.17
Queue Length 95th (ft)	5	18	0	0
Control Delay (s)	11.1	13.3	0.0	0.0
Lane LOS	B	B	A	
Approach Delay (s)	11.1	13.3	0.0	
Approach LOS	B	B		

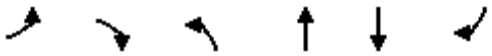
Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	35.5%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	8	0	101	462	0	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	0	106	486	0	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	456	0	0			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	456	0	0			
tC, single (s)	6.8	6.9	4.2			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	93			
cM capacity (veh/h)	503	1091	1614			

Direction, Lane #	EB 1	NB 1	NB 2	NB 3
Volume Total	8	106	243	243
Volume Left	8	106	0	0
Volume Right	0	0	0	0
cSH	503	1614	1700	1700
Volume to Capacity	0.02	0.07	0.14	0.14
Queue Length 95th (ft)	1	5	0	0
Control Delay (s)	12.3	7.4	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	12.3	1.3		
Approach LOS	B			

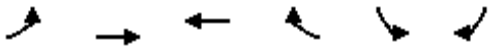
Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	23.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	0	180	199	23	171	0
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	200	221	26	190	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	658	190	190			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	658	190	190			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	77	84			
cM capacity (veh/h)	363	854	1384			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	200	247	190
Volume Left	0	221	0
Volume Right	200	0	0
cSH	854	1384	1700
Volume to Capacity	0.23	0.16	0.11
Queue Length 95th (ft)	23	14	0
Control Delay (s)	10.5	7.4	0.0
Lane LOS	B	A	
Approach Delay (s)	10.5	7.4	0.0
Approach LOS	B		

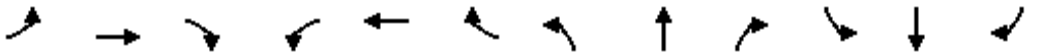
Intersection Summary			
Average Delay	6.2		
Intersection Capacity Utilization	45.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	8	368	218	9	8	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	9	409	242	10	9	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	252				674	247
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	252				674	247
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				98	98
cM capacity (veh/h)	1325				420	796

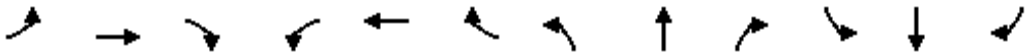
Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	418	252	22
Volume Left	9	0	9
Volume Right	0	10	13
cSH	1325	1700	586
Volume to Capacity	0.01	0.15	0.04
Queue Length 95th (ft)	1	0	3
Control Delay (s)	0.2	0.0	11.4
Lane LOS	A		B
Approach Delay (s)	0.2	0.0	11.4
Approach LOS			B

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	38.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	31	164	383	566	192	126	278	295	216	87	331	35
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	0.97	1.00		0.97	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.94		1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1662	1716	1488	3225	1636		3193	3197	1445	1525	3023	1409
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1662	1716	1488	3225	1636		3193	3197	1445	1525	3023	1409
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	33	173	403	596	202	133	293	311	227	92	348	37
RTOR Reduction (vph)	0	0	311	0	22	0	0	0	169	0	0	30
Lane Group Flow (vph)	33	173	92	596	313	0	293	311	58	92	348	7
Confl. Peds. (#/hr)							2		5	5		2
Heavy Vehicles (%)	0%	2%	0%	0%	1%	0%	1%	4%	1%	9%	10%	3%
Turn Type	Split		Perm	Split			Prot		Perm	Prot		Perm
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4						2			6
Actuated Green, G (s)	14.0	14.0	14.0	20.2	20.2		12.8	20.3	20.3	8.4	15.9	15.9
Effective Green, g (s)	14.0	14.0	14.0	20.2	20.2		12.8	20.3	20.3	8.4	15.9	15.9
Actuated g/C Ratio	0.18	0.18	0.18	0.25	0.25		0.16	0.25	0.25	0.11	0.20	0.20
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0		4.0	5.0	5.0	4.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	291	301	261	815	414		512	812	367	160	602	280
v/s Ratio Prot	0.02	c0.10		0.18	c0.19		c0.09	0.10		0.06	c0.12	
v/s Ratio Perm			0.06						0.04			0.01
v/c Ratio	0.11	0.57	0.35	0.73	0.76		0.57	0.38	0.16	0.57	0.58	0.03
Uniform Delay, d1	27.7	30.2	29.0	27.4	27.6		31.0	24.6	23.2	34.0	29.0	25.8
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.2	2.6	0.8	3.4	7.6		1.5	0.3	0.2	4.9	1.4	0.0
Delay (s)	27.9	32.9	29.8	30.8	35.2		32.6	24.9	23.4	39.0	30.3	25.8
Level of Service	C	C	C	C	D		C	C	C	D	C	C
Approach Delay (s)		30.6			32.4			27.2			31.6	
Approach LOS		C			C			C			C	

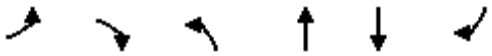
Intersection Summary			
HCM Average Control Delay	30.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	79.9	Sum of lost time (s)	17.0
Intersection Capacity Utilization	64.4%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	142	365	187	23	486	26	312	40	13	8	44	205
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.95		1.00	0.99		1.00	0.96		1.00	0.88	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3156		1662	3300		1662	1687		1662	1534	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3156		1662	3300		1662	1687		1662	1534	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	158	406	208	26	540	29	347	44	14	9	49	228
RTOR Reduction (vph)	0	81	0	0	5	0	0	8	0	0	171	0
Lane Group Flow (vph)	158	533	0	26	564	0	347	50	0	9	106	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases												
Actuated Green, G (s)	8.0	24.6		2.2	18.8		16.8	35.4		1.1	19.7	
Effective Green, g (s)	8.0	24.6		2.2	18.8		16.8	35.4		1.1	19.7	
Actuated g/C Ratio	0.10	0.31		0.03	0.24		0.21	0.45		0.01	0.25	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	168	979		46	782		352	753		23	381	
v/s Ratio Prot	c0.10	0.17		0.02	c0.17		c0.21	0.03		0.01	c0.07	
v/s Ratio Perm												
v/c Ratio	0.94	0.54		0.57	0.72		0.99	0.07		0.39	0.28	
Uniform Delay, d1	35.4	22.7		38.1	27.8		31.1	12.5		38.8	24.1	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	52.0	0.6		14.9	3.3		43.8	0.2		10.7	1.8	
Delay (s)	87.4	23.3		53.0	31.1		74.9	12.7		49.4	25.9	
Level of Service	F	C		D	C		E	B		D	C	
Approach Delay (s)		36.4			32.1			66.0			26.6	
Approach LOS		D			C			E			C	

Intersection Summary			
HCM Average Control Delay	39.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	79.3	Sum of lost time (s)	16.0
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		

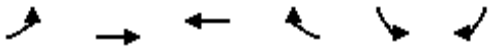
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	18	40	24	314	488	17
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	19	43	26	338	525	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	923	534	543			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	923	534	543			
tC, single (s)	6.5	6.2	4.2			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.3			
p0 queue free %	93	92	97			
cM capacity (veh/h)	286	544	1006			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	62	363	543
Volume Left	19	26	0
Volume Right	43	0	18
cSH	425	1006	1700
Volume to Capacity	0.15	0.03	0.32
Queue Length 95th (ft)	13	2	0
Control Delay (s)	14.9	0.9	0.0
Lane LOS	B	A	
Approach Delay (s)	14.9	0.9	0.0
Approach LOS	B		

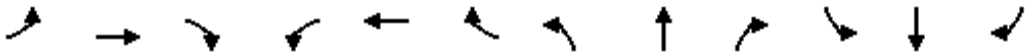
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	49.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	29	165	244	208	91	20
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	32	183	271	231	101	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	271				519	271
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	271				519	271
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				80	97
cM capacity (veh/h)	1304				504	772

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	216	271	231	123
Volume Left	32	0	0	101
Volume Right	0	0	231	22
cSH	1304	1700	1700	538
Volume to Capacity	0.02	0.16	0.14	0.23
Queue Length 95th (ft)	2	0	0	22
Control Delay (s)	1.4	0.0	0.0	13.7
Lane LOS	A			B
Approach Delay (s)	1.4	0.0		13.7
Approach LOS				B

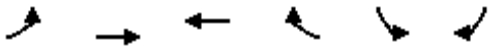
Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	41.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	257	40	72	424	32	1	0	15	27	67	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	3	286	44	80	471	36	1	0	17	30	74	4
Pedestrians		2										
Lane Width (ft)		12.0										
Walking Speed (ft/s)		4.0										
Percent Blockage		0										
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	507			330			989	981	308	980	986	491
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	507			330			989	981	308	980	986	491
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.6	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.3
p0 queue free %	100			94			99	100	98	86	67	99
cM capacity (veh/h)	1069			1241			159	234	737	209	222	581

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	333	80	507	18	109
Volume Left	3	80	0	1	30
Volume Right	44	0	36	17	4
cSH	1069	1241	1700	600	224
Volume to Capacity	0.00	0.06	0.30	0.03	0.49
Queue Length 95th (ft)	0	5	0	2	61
Control Delay (s)	0.1	8.1	0.0	11.2	35.4
Lane LOS	A	A		B	E
Approach Delay (s)	0.1	1.1		11.2	35.4
Approach LOS				B	E

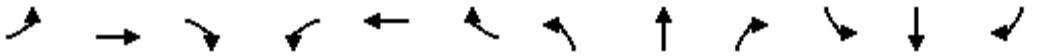
Intersection Summary				
Average Delay	4.5			
Intersection Capacity Utilization	66.3%	ICU Level of Service	C	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	299	494	0	27	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	315	520	0	28	36
Pedestrians		2				
Lane Width (ft)		12.0				
Walking Speed (ft/s)		4.0				
Percent Blockage		0				
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	520				835	262
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	520				835	262
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				91	95
cM capacity (veh/h)	1056				310	741

Direction, Lane #	EB 1	WB 1	WB 2	SB 1
Volume Total	315	260	260	64
Volume Left	0	0	0	28
Volume Right	0	0	0	36
cSH	1700	1700	1700	459
Volume to Capacity	0.19	0.15	0.15	0.14
Queue Length 95th (ft)	0	0	0	12
Control Delay (s)	0.0	0.0	0.0	14.1
Lane LOS				B
Approach Delay (s)	0.0	0.0		14.1
Approach LOS				B

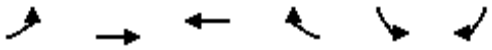
Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	28.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	23	303	0	0	409	39	0	0	0	40	0	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	24	316	0	0	426	41	0	0	0	42	0	89
Pedestrians		1			3						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		0			0						0	
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	427			316			899	791	319	814	811	448
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	427			316			899	791	319	814	811	448
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.0	3.3
p0 queue free %	98			100			100	100	100	85	100	85
cM capacity (veh/h)	1142			1256			220	317	725	285	309	607

Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	24	316	467	0	0	42	89
Volume Left	24	0	0	0	0	42	0
Volume Right	0	0	41	0	0	0	89
cSH	1142	1700	1256	1700	1700	285	607
Volume to Capacity	0.02	0.19	0.00	0.00	0.00	0.15	0.15
Queue Length 95th (ft)	2	0	0	0	0	13	13
Control Delay (s)	8.2	0.0	0.0	0.0	0.0	19.8	11.9
Lane LOS	A			A	A	C	B
Approach Delay (s)	0.6		0.0	0.0		14.4	
Approach LOS				A		B	

Intersection Summary				
Average Delay	2.2			
Intersection Capacity Utilization	41.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	126	145	218	107	207	219
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	131	151	227	111	216	228
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	339				696	283
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	339				696	283
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	89				41	70
cM capacity (veh/h)	1221				365	756

Direction, Lane #	EB 1	WB 1	SB 1
Volume Total	282	339	444
Volume Left	131	0	216
Volume Right	0	111	228
cSH	1221	1700	497
Volume to Capacity	0.11	0.20	0.89
Queue Length 95th (ft)	9	0	250
Control Delay (s)	4.4	0.0	47.1
Lane LOS	A		E
Approach Delay (s)	4.4	0.0	47.1
Approach LOS			E

Intersection Summary			
Average Delay	20.8		
Intersection Capacity Utilization	72.4%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	34	4	19	16	1	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	38	4	21	18	1	36
Pedestrians					2	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					4.0	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			44		102	42
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			44		102	42
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		100	97
cM capacity (veh/h)			1574		888	1033

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	42	39	37
Volume Left	0	21	1
Volume Right	4	0	36
cSH	1700	1574	1028
Volume to Capacity	0.02	0.01	0.04
Queue Length 95th (ft)	0	1	3
Control Delay (s)	0.0	4.0	8.6
Lane LOS		A	A
Approach Delay (s)	0.0	4.0	8.6
Approach LOS			A

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	18.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	16	21	88	9	9	17	60	759	29	37	1135	21
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	17	22	93	9	9	18	63	799	31	39	1195	22
Pedestrians					2			2				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								1311				
pX, platoon unblocked	0.90	0.90		0.90	0.90	0.90				0.90		
vC, conflicting volume	1832	2241	610	1723	2237	417	1217			831		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1707	2160	610	1587	2156	140	1217			600		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	56	40	79	62	75	98	89			96		
cM capacity (veh/h)	38	37	441	25	37	801	580			890		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	132	37	63	533	297	39	796	420
Volume Left	17	9	63	0	0	39	0	0
Volume Right	93	18	0	0	31	0	0	22
cSH	105	56	580	1700	1700	890	1700	1700
Volume to Capacity	1.25	0.66	0.11	0.31	0.17	0.04	0.47	0.25
Queue Length 95th (ft)	222	68	9	0	0	3	0	0
Control Delay (s)	245.8	151.0	12.0	0.0	0.0	9.2	0.0	0.0
Lane LOS	F	F	B			A		
Approach Delay (s)	245.8	151.0	0.8			0.3		
Approach LOS	F	F						

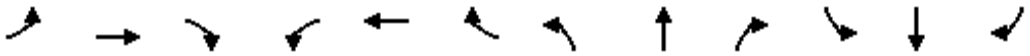
Intersection Summary				
Average Delay	16.8			
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	147	2	481	243	10	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	155	2	506	256	11	32
Pedestrians	6					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	4.0					
Percent Blockage	0					
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			157		1430	156
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			157		1430	156
tC, single (s)			4.1		6.4	6.3
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.4
p0 queue free %			64		89	96
cM capacity (veh/h)			1411		96	877

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	157	506	256	42
Volume Left	0	506	0	11
Volume Right	2	0	0	32
cSH	1700	1411	1700	288
Volume to Capacity	0.09	0.36	0.15	0.15
Queue Length 95th (ft)	0	41	0	13
Control Delay (s)	0.0	9.0	0.0	19.6
Lane LOS		A		C
Approach Delay (s)	0.0	6.0		19.6
Approach LOS				C

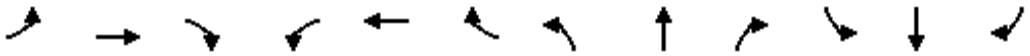
Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	50.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	67	625	67	0	0	0	0	37	51
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	71	658	71	0	0	0	0	39	54
Pedestrians					3			21				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					4.0			4.0				
Percent Blockage					0			2				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	728			21			564	890	24	837	855	364
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	728			21			564	890	24	837	855	364
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			100	100	100	100	86	92
cM capacity (veh/h)	884			1580			316	267	1032	250	279	638

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	399	399	0	93
Volume Left	71	0	0	0
Volume Right	0	71	0	54
cSH	1580	1700	1700	415
Volume to Capacity	0.04	0.23	0.00	0.22
Queue Length 95th (ft)	4	0	0	21
Control Delay (s)	1.6	0.0	0.0	16.2
Lane LOS	A		A	C
Approach Delay (s)	0.8		0.0	16.2
Approach LOS			A	C

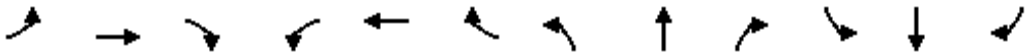
Intersection Summary				
Average Delay	2.4			
Intersection Capacity Utilization	38.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	460	3	0	0	0	0	0	6	80	5	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	484	3	0	0	0	0	0	6	84	5	0
Pedestrians		9			22			15				
Lane Width (ft)		12.0			0.0			12.0				
Walking Speed (ft/s)		4.0			4.0			4.0				
Percent Blockage		1			0			1				
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			502			512	501	281	270	502	9
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			502			512	501	281	270	502	9
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	87	99	100
cM capacity (veh/h)	1636			1059			432	469	713	654	468	1069

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	242	245	6	89
Volume Left	0	0	0	84
Volume Right	0	3	6	0
cSH	1636	1700	713	639
Volume to Capacity	0.00	0.14	0.01	0.14
Queue Length 95th (ft)	0	0	1	12
Control Delay (s)	0.0	0.0	10.1	11.6
Lane LOS			B	B
Approach Delay (s)	0.0		10.1	11.6
Approach LOS			B	B

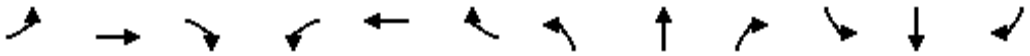
Intersection Summary				
Average Delay	1.9			
Intersection Capacity Utilization	32.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	0	41	378	0	0	0	0	0	185	112
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)					4.0						4.0	
Lane Util. Factor					0.95						0.95	
Frpb, ped/bikes					1.00						1.00	
Flpb, ped/bikes					1.00						1.00	
Frt					1.00						0.94	
Flt Protected					1.00						1.00	
Satd. Flow (prot)					3305						3118	
Flt Permitted					1.00						1.00	
Satd. Flow (perm)					3305						3118	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	0	0	43	398	0	0	0	0	0	195	118
RTOR Reduction (vph)	0	0	0	0	20	0	0	0	0	0	71	0
Lane Group Flow (vph)	0	0	0	0	421	0	0	0	0	0	242	0
Confl. Peds. (#/hr)			15	15					22	22		
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%
Turn Type				Perm								
Protected Phases					8						6	
Permitted Phases				8								
Actuated Green, G (s)					16.0						16.0	
Effective Green, g (s)					16.0						16.0	
Actuated g/C Ratio					0.40						0.40	
Clearance Time (s)					4.0						4.0	
Lane Grp Cap (vph)					1322						1247	
v/s Ratio Prot											c0.08	
v/s Ratio Perm					0.13							
v/c Ratio					0.32						0.19	
Uniform Delay, d1					8.2						7.8	
Progression Factor					1.00						1.00	
Incremental Delay, d2					0.6						0.3	
Delay (s)					8.9						8.2	
Level of Service					A						A	
Approach Delay (s)		0.0			8.9			0.0			8.2	
Approach LOS		A			A			A			A	

Intersection Summary			
HCM Average Control Delay	8.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.26		
Actuated Cycle Length (s)	40.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	32.1%	ICU Level of Service	A
Analysis Period (min)	15		

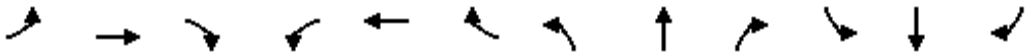
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	203	421	9	0	0	0	0	118	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	214	443	9	0	0	0	0	124	19	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	0			453			875	875	226	730	880	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			453			875	875	226	730	880	0
tC, single (s)	4.1			4.1			7.5	6.5	7.1	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.4	3.5	4.0	3.3
p0 queue free %	87			100			100	51	98	100	100	100
cM capacity (veh/h)	1622			1119			222	252	759	170	250	1091

Direction, Lane #	EB 1	EB 2	EB 3	NB 1
Volume Total	214	295	157	143
Volume Left	214	0	0	0
Volume Right	0	0	9	19
cSH	1622	1700	1700	276
Volume to Capacity	0.13	0.17	0.09	0.52
Queue Length 95th (ft)	11	0	0	69
Control Delay (s)	7.6	0.0	0.0	31.3
Lane LOS	A			D
Approach Delay (s)	2.4			31.3
Approach LOS				D

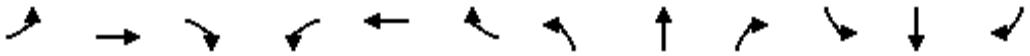
Intersection Summary			
Average Delay	7.5		
Intersection Capacity Utilization	27.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	5	287	6	76	292	9	12	0	35	27	3	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	6	319	7	84	324	10	13	0	39	30	3	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)					694							
pX, platoon unblocked	1.00						1.00	1.00		1.00	1.00	1.00
vC, conflicting volume	334			326			833	837	322	867	835	329
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	333			326			832	836	322	866	834	328
tC, single (s)	4.1			4.2			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.3			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			95	100	95	88	99	99
cM capacity (veh/h)	1236			1206			270	282	723	246	283	717

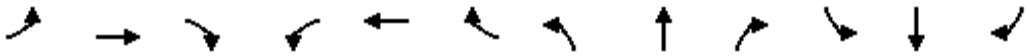
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	326	84	334	52	38
Volume Left	6	0	84	0	13	30
Volume Right	0	7	0	10	39	4
cSH	1236	1700	1206	1700	506	270
Volume to Capacity	0.00	0.19	0.07	0.20	0.10	0.14
Queue Length 95th (ft)	0	0	6	0	9	12
Control Delay (s)	7.9	0.0	8.2	0.0	12.9	20.5
Lane LOS	A		A		B	C
Approach Delay (s)	0.1		1.7		12.9	20.5
Approach LOS					B	C

Intersection Summary				
Average Delay	2.6			
Intersection Capacity Utilization	36.7%	ICU Level of Service	A	
Analysis Period (min)	15			



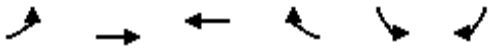
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	27	1143	174	90	700	88	139	166	122	228	213	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3207		1630	3260	1416	1630	1629		1662	1739	
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3207		1630	3260	1416	1630	1629		1662	1739	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	29	1216	185	96	745	94	148	177	130	243	227	9
RTOR Reduction (vph)	0	10	0	0	0	52	0	22	0	0	2	0
Lane Group Flow (vph)	29	1391	0	96	745	42	148	285	0	243	234	0
Confl. Peds. (#/hr)	4		6	6		4	2		2	2		2
Heavy Vehicles (%)	0%	1%	2%	2%	2%	2%	2%	0%	0%	0%	0%	0%
Turn Type	Prot			Prot		Perm	Split			Split		
Protected Phases	1	6		5	2		4	4		8	8	
Permitted Phases						2						
Actuated Green, G (s)	3.8	47.0		8.0	51.2	51.2	23.1	23.1		21.8	21.8	
Effective Green, g (s)	3.8	47.0		8.0	51.2	51.2	23.1	23.1		21.8	21.8	
Actuated g/C Ratio	0.03	0.41		0.07	0.44	0.44	0.20	0.20		0.19	0.19	
Clearance Time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	4.0		3.0	4.0	4.0	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	54	1301		113	1440	626	325	325		313	327	
v/s Ratio Prot	0.02	c0.43		c0.06	0.23		0.09	c0.17		c0.15	0.13	
v/s Ratio Perm						0.03						
v/c Ratio	0.54	1.07		0.85	0.52	0.07	0.46	0.88		0.78	0.72	
Uniform Delay, d1	55.2	34.4		53.4	23.4	18.6	40.9	45.0		44.7	44.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	9.9	45.8		41.5	0.4	0.1	1.4	22.7		12.1	7.8	
Delay (s)	65.1	80.3		94.8	23.8	18.7	42.2	67.7		56.8	51.9	
Level of Service	E	F		F	C	B	D	E		E	D	
Approach Delay (s)		80.0			30.6			59.4			54.4	
Approach LOS		E			C			E			D	

Intersection Summary			
HCM Average Control Delay	59.4	HCM Level of Service	E
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	115.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.7%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	2	165	0	64	311	61	4	39	374	72	41	8
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Lane Util. Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00	0.98		1.00	1.00		1.00	
Flpb, ped/bikes		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Frt		1.00		1.00	1.00	0.85		1.00	0.85		0.99	
Flt Protected		1.00		0.95	1.00	1.00		1.00	1.00		0.97	
Satd. Flow (prot)		1699		1458	1750	1453		1681	1473		1607	
Flt Permitted		1.00		0.95	1.00	1.00		0.97	1.00		0.79	
Satd. Flow (perm)		1691		1458	1750	1453		1642	1473		1309	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	2	183	0	71	346	68	4	43	416	80	46	9
RTOR Reduction (vph)	0	0	0	0	0	35	0	0	307	0	4	0
Lane Group Flow (vph)	0	185	0	71	346	33	0	47	109	0	131	0
Confl. Peds. (#/hr)	3		23	23		3						
Heavy Vehicles (%)	0%	3%	0%	14%	0%	0%	0%	4%	1%	2%	8%	14%
Turn Type	Perm			Prot		Perm	Perm		Perm	Perm		
Protected Phases		2		1	6			8			4	
Permitted Phases	2					6	8		8	4		
Actuated Green, G (s)		11.5		1.9	17.9	17.9		9.6	9.6		9.6	
Effective Green, g (s)		11.5		1.9	17.9	17.9		9.6	9.6		9.6	
Actuated g/C Ratio		0.32		0.05	0.49	0.49		0.26	0.26		0.26	
Clearance Time (s)		4.5		4.5	4.5	4.5		4.5	4.5		4.5	
Vehicle Extension (s)		3.0		3.0	3.0	3.0		3.0	3.0		3.0	
Lane Grp Cap (vph)		533		76	858	713		432	387		344	
v/s Ratio Prot				c0.05	c0.20							
v/s Ratio Perm		0.11				0.02		0.03	0.07		c0.10	
v/c Ratio		0.35		0.93	0.40	0.05		0.11	0.28		0.38	
Uniform Delay, d1		9.6		17.2	5.9	4.9		10.2	10.7		11.0	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.4		80.4	0.3	0.0		0.1	0.4		0.7	
Delay (s)		10.0		97.6	6.2	4.9		10.3	11.1		11.7	
Level of Service		B		F	A	A		B	B		B	
Approach Delay (s)		10.0			19.4			11.0			11.7	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	14.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.40		
Actuated Cycle Length (s)	36.5	Sum of lost time (s)	9.0
Intersection Capacity Utilization	55.2%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	7	1280	897	124	42	12
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	1347	944	131	44	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			1013			
pX, platoon unblocked	0.87				0.87	0.87
vC, conflicting volume	1075				1698	537
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	781				1500	162
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				55	98
cM capacity (veh/h)	733				99	747

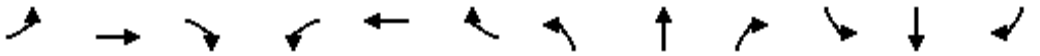
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	7	674	674	629	445	57
Volume Left	7	0	0	0	0	44
Volume Right	0	0	0	0	131	13
cSH	733	1700	1700	1700	1700	122
Volume to Capacity	0.01	0.40	0.40	0.37	0.26	0.46
Queue Length 95th (ft)	1	0	0	0	0	52
Control Delay (s)	10.0	0.0	0.0	0.0	0.0	57.6
Lane LOS	A					F
Approach Delay (s)	0.1			0.0		57.6
Approach LOS						F

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	48.4%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	4	0	0	10	4	4	38	8	12	3	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	4	0	0	11	4	4	42	9	13	3	4
Pedestrians					1							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					0							
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	98	93	6	91	91	48	8			52		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	98	93	6	91	91	48	8			52		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	99	100	100	99	100	100			99		
cM capacity (veh/h)	868	791	1083	885	793	1026	1626			1565		

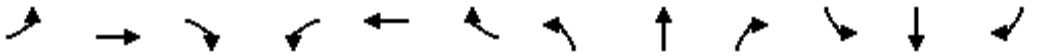
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	4	16	56	21
Volume Left	0	0	4	13
Volume Right	0	4	9	4
cSH	791	848	1626	1565
Volume to Capacity	0.01	0.02	0.00	0.01
Queue Length 95th (ft)	0	1	0	1
Control Delay (s)	9.6	9.3	0.6	4.6
Lane LOS	A	A	A	A
Approach Delay (s)	9.6	9.3	0.6	4.6
Approach LOS	A	A		

Intersection Summary			
Average Delay	3.3		
Intersection Capacity Utilization	15.2%	ICU Level of Service	A
Analysis Period (min)	15		



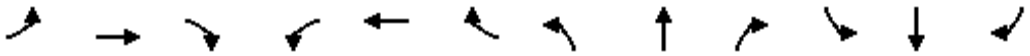
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	67	91	415	109	45	18	164	878	100	51	1409	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Lane Util. Factor		1.00	1.00		0.95		1.00	0.95	1.00	1.00	0.95	
Frpb, ped/bikes		1.00	0.98		1.00		1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Frt		1.00	0.85		0.98		1.00	1.00	0.85	1.00	1.00	
Flt Protected		0.98	1.00		0.97		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)		1674	1442		3057		1662	3197	1473	1539	3292	
Flt Permitted		0.79	1.00		0.65		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)		1358	1442		2063		1662	3197	1473	1539	3292	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	71	96	437	115	47	19	173	924	105	54	1483	0
RTOR Reduction (vph)	0	0	152	0	8	0	0	0	42	0	0	0
Lane Group Flow (vph)	0	167	285	0	173	0	173	924	63	54	1483	0
Confl. Peds. (#/hr)	2		8	8		2						
Heavy Vehicles (%)	0%	4%	1%	5%	0%	0%	0%	4%	1%	8%	1%	0%
Turn Type	Perm		Perm	Perm			Prot		Perm	Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8					2			
Actuated Green, G (s)		25.0	25.0		25.0		14.5	67.1	67.1	6.8	59.4	
Effective Green, g (s)		25.0	25.0		25.0		14.5	67.1	67.1	6.8	59.4	
Actuated g/C Ratio		0.22	0.22		0.22		0.13	0.60	0.60	0.06	0.53	
Clearance Time (s)		4.0	4.0		4.0		3.0	4.5	4.5	4.0	5.5	
Vehicle Extension (s)		2.5	2.5		3.0		2.5	4.3	4.3	2.5	4.3	
Lane Grp Cap (vph)		305	324		463		216	1926	887	94	1755	
v/s Ratio Prot							c0.10	0.29		0.04	c0.45	
v/s Ratio Perm		0.12	c0.20		0.08				0.04			
v/c Ratio		0.55	0.88		0.37		0.80	0.48	0.07	0.57	0.85	
Uniform Delay, d1		38.2	41.7		36.6		47.0	12.4	9.2	50.9	22.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2		1.6	22.5		0.5		18.4	0.3	0.1	6.8	4.2	
Delay (s)		39.8	64.3		37.1		65.4	12.7	9.3	57.7	26.3	
Level of Service		D	E		D		E	B	A	E	C	
Approach Delay (s)		57.5			37.1			20.0			27.4	
Approach LOS		E			D			B			C	

Intersection Summary			
HCM Average Control Delay	30.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	111.4	Sum of lost time (s)	12.5
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	259	966	565	24	675	12	484	80	35	20	89	218
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	0.96	1.00	1.00			1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98			1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	0.97			0.99	1.00
Satd. Flow (prot)	1662	3260	1473	1662	3292	1430	1579	1556			1734	1488
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.46	0.50			0.88	1.00
Satd. Flow (perm)	1662	3260	1473	1662	3292	1430	771	810			1547	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	273	1017	595	25	711	13	509	84	37	21	94	229
RTOR Reduction (vph)	0	0	201	0	0	5	0	5	0	0	0	65
Lane Group Flow (vph)	273	1017	394	25	711	8	310	315	0	0	115	164
Confl. Peds. (#/hr)	6					6						
Heavy Vehicles (%)	0%	2%	1%	0%	1%	0%	0%	7%	0%	0%	0%	0%
Turn Type	Prot		pm+ov	Prot		Perm	pm+pt			Perm		pm+ov
Protected Phases	5	2	3	1	6		3	8			4	5
Permitted Phases			2			6	8			4		4
Actuated Green, G (s)	20.0	46.1	66.9	2.2	28.3	28.3	39.3	39.3			14.0	34.0
Effective Green, g (s)	20.0	46.1	66.9	2.2	28.3	28.3	39.3	39.3			14.0	34.0
Actuated g/C Ratio	0.20	0.46	0.66	0.02	0.28	0.28	0.39	0.39			0.14	0.34
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5			4.5	4.5
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0			3.0	3.0
Lane Grp Cap (vph)	329	1487	1040	36	921	400	466	468			214	567
v/s Ratio Prot	c0.16	0.31	0.08	0.02	c0.22		0.14	c0.14				0.06
v/s Ratio Perm			0.19			0.01	0.12	c0.12			0.07	0.05
v/c Ratio	0.83	0.68	0.38	0.69	0.77	0.02	0.67	0.67			0.54	0.29
Uniform Delay, d1	38.9	21.7	7.7	49.1	33.4	26.4	23.7	25.6			40.5	24.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2	15.8	1.3	0.2	44.9	4.1	0.0	3.6	3.8			2.6	0.3
Delay (s)	54.7	23.1	7.9	94.0	37.5	26.4	27.3	29.4			43.1	24.9
Level of Service	D	C	A	F	D	C	C	C			D	C
Approach Delay (s)		22.9			39.2			28.4			31.0	
Approach LOS		C			D			C			C	

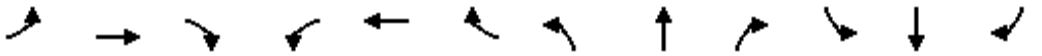
Intersection Summary			
HCM Average Control Delay	28.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	101.1	Sum of lost time (s)	13.5
Intersection Capacity Utilization	71.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	8	4	12	5	15	1	138	5	21	212	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	3	9	4	13	5	16	1	152	5	23	233	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	458	442	236	448	442	154	240			157		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	458	442	236	448	442	154	240			157		
tC, single (s)	7.1	6.5	6.2	7.2	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.6	4.0	3.3	2.2			2.2		
p0 queue free %	99	98	99	97	99	98	100			98		
cM capacity (veh/h)	496	504	808	490	504	897	1339			1435		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	16	35	158	263
Volume Left	3	13	1	23
Volume Right	4	16	5	7
cSH	558	626	1339	1435
Volume to Capacity	0.03	0.06	0.00	0.02
Queue Length 95th (ft)	2	4	0	1
Control Delay (s)	11.6	11.1	0.1	0.8
Lane LOS	B	B	A	A
Approach Delay (s)	11.6	11.1	0.1	0.8
Approach LOS	B	B		

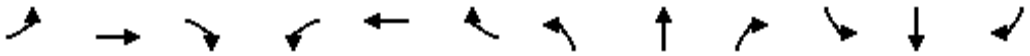
Intersection Summary				
Average Delay	1.7			
Intersection Capacity Utilization	35.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	1	9	146	42	8	10	145	617	0	6	865	7
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt		0.87			0.98		1.00	1.00		1.00	1.00	0.85
Flt Protected		1.00			0.97		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1528			1651		1630	3260		1662	3260	1488
Flt Permitted		1.00			0.66		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1526			1133		1630	3260		1662	3260	1488
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1	9	154	44	8	11	153	649	0	6	911	7
RTOR Reduction (vph)	0	129	0	0	9	0	0	0	0	0	0	3
Lane Group Flow (vph)	0	35	0	0	54	0	153	649	0	6	911	4
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	2%	0%
Turn Type	Perm			Perm			Prot		Perm	Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8					2			6
Actuated Green, G (s)		11.0			11.0		11.8	43.6		0.6	32.4	32.4
Effective Green, g (s)		11.0			11.0		11.8	43.6		0.6	32.4	32.4
Actuated g/C Ratio		0.16			0.16		0.18	0.65		0.01	0.48	0.48
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	4.0
Vehicle Extension (s)		4.0			4.0		4.0	4.0		3.0	4.0	4.0
Lane Grp Cap (vph)		250			185		286	2115		15	1572	717
v/s Ratio Prot							c0.09	0.20		0.00	c0.28	
v/s Ratio Perm		0.02			c0.05							0.00
v/c Ratio		0.14			0.29		0.53	0.31		0.40	0.58	0.01
Uniform Delay, d1		24.1			24.7		25.2	5.2		33.1	12.5	9.0
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.4			1.2		2.4	0.4		16.6	1.6	0.0
Delay (s)		24.4			25.9		27.7	5.6		49.7	14.1	9.0
Level of Service		C			C		C	A		D	B	A
Approach Delay (s)		24.4			25.9			9.8			14.3	
Approach LOS		C			C			A			B	

Intersection Summary			
HCM Average Control Delay	13.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	67.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.0%	ICU Level of Service	B
Analysis Period (min)	15		

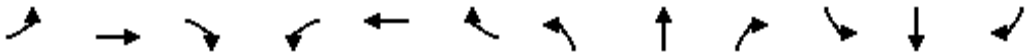
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	0	44	0	21	238	21	880	9	240	1309	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Lane Util. Factor			1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frt			0.85		1.00	0.85	1.00	1.00		1.00	1.00	
Flt Protected			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)			1488		1750	1473	1662	3224		1662	3260	
Flt Permitted			1.00		1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)			1488		1750	1473	1662	3224		1662	3260	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	0	0	46	0	22	248	22	917	9	250	1364	0
RTOR Reduction (vph)	0	0	41	0	0	219	0	1	0	0	0	0
Lane Group Flow (vph)	0	0	5	0	22	29	22	925	0	250	1364	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	2%	0%
Turn Type			Perm			Perm	Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)			6.0		6.0	6.0	0.8	23.8		9.5	32.5	
Effective Green, g (s)			6.0		6.0	6.0	0.8	23.8		9.5	32.5	
Actuated g/C Ratio			0.12		0.12	0.12	0.02	0.46		0.18	0.63	
Clearance Time (s)			4.0		4.0	4.0	4.0	4.5		4.0	4.5	
Vehicle Extension (s)			2.5		2.5	2.5	2.5	5.0		2.5	5.0	
Lane Grp Cap (vph)			172		203	171	26	1481		305	2045	
v/s Ratio Prot					0.01		0.01	0.29		c0.15	c0.42	
v/s Ratio Perm			0.00			c0.02						
v/c Ratio			0.03		0.11	0.17	0.85	0.62		0.82	0.67	
Uniform Delay, d1			20.3		20.5	20.6	25.4	10.6		20.3	6.2	
Progression Factor			1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2			0.1		0.2	0.3	108.5	1.2		15.3	1.1	
Delay (s)			20.4		20.7	21.0	134.0	11.8		35.6	7.3	
Level of Service			C		C	C	F	B		D	A	
Approach Delay (s)		20.4			21.0			14.6			11.7	
Approach LOS		C			C			B			B	

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	51.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.0%	ICU Level of Service	B
Analysis Period (min)	15		

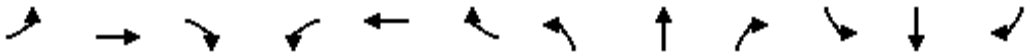
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	135	234	173	90	224	27	169	634	47	31	655	119
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.94		1.00	0.98		1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1614	1595		1599	1654		1646	3260		1662	3216	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1614	1595		1599	1654		1646	3260		1662	3216	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	142	246	182	95	236	28	178	667	49	33	689	125
RTOR Reduction (vph)	0	36	0	0	6	0	0	7	0	0	19	0
Lane Group Flow (vph)	142	392	0	95	258	0	178	709	0	33	795	0
Heavy Vehicles (%)	3%	4%	1%	4%	4%	5%	1%	1%	0%	0%	1%	1%
Turn Type	Prot			Prot			Prot			Prot		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	7.1	21.8		5.4	20.1		9.1	29.4		1.7	22.0	
Effective Green, g (s)	7.1	21.8		5.4	20.1		9.1	29.4		1.7	22.0	
Actuated g/C Ratio	0.10	0.30		0.07	0.28		0.13	0.41		0.02	0.30	
Clearance Time (s)	3.0	4.0		3.0	4.0		3.0	4.0		3.0	4.0	
Vehicle Extension (s)	2.5	2.5		2.5	2.5		2.5	4.5		2.5	4.5	
Lane Grp Cap (vph)	158	481		119	460		207	1326		39	979	
v/s Ratio Prot	c0.09	c0.25		0.06	0.16		c0.11	0.22		0.02	c0.25	
v/s Ratio Perm												
v/c Ratio	0.90	0.81		0.80	0.56		0.86	0.54		0.85	0.81	
Uniform Delay, d1	32.2	23.4		32.9	22.3		31.0	16.3		35.2	23.2	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	42.8	9.9		29.2	1.3		27.8	0.6		84.0	5.7	
Delay (s)	75.1	33.3		62.1	23.6		58.8	16.9		119.1	29.0	
Level of Service	E	C		E	C		E	B		F	C	
Approach Delay (s)		43.7			33.8			25.2			32.5	
Approach LOS		D			C			C			C	

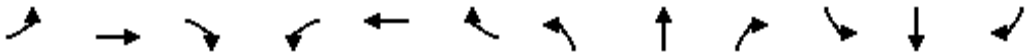
Intersection Summary			
HCM Average Control Delay	32.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	72.3	Sum of lost time (s)	10.0
Intersection Capacity Utilization	77.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	89	500	127	26	296	201	69	516	21	271	774	111
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.99		1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	1699	1473	1662	1636	1473	1662	3171		1662	3197	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.24	1.00		0.28	1.00	
Satd. Flow (perm)	1662	1699	1473	1662	1636	1473	419	3171		498	3197	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	94	526	134	27	312	212	73	543	22	285	815	117
RTOR Reduction (vph)	0	0	53	0	0	143	0	3	0	0	11	0
Lane Group Flow (vph)	94	526	81	27	312	69	73	562	0	285	921	0
Confl. Peds. (#/hr)							2		1	1		2
Heavy Vehicles (%)	0%	3%	1%	0%	7%	1%	0%	4%	8%	0%	2%	0%
Turn Type	Prot		Perm	Prot		Perm	pm+pt			pm+pt		
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases			4			8	2			6		
Actuated Green, G (s)	6.6	32.0	32.0	1.6	27.0	27.0	33.6	28.5		46.9	37.8	
Effective Green, g (s)	6.6	32.0	32.0	1.6	27.0	27.0	33.6	28.5		46.9	37.8	
Actuated g/C Ratio	0.07	0.34	0.34	0.02	0.29	0.29	0.36	0.30		0.50	0.40	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	5.5		4.0	5.5	
Vehicle Extension (s)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	4.6		2.5	4.6	
Lane Grp Cap (vph)	117	578	501	28	470	423	217	961		427	1286	
v/s Ratio Prot	c0.06	c0.31		0.02	0.19		0.02	0.18		c0.10	c0.29	
v/s Ratio Perm			0.05			0.05	0.10			0.23		
v/c Ratio	0.80	0.91	0.16	0.96	0.66	0.16	0.34	0.59		0.67	0.72	
Uniform Delay, d1	43.1	29.6	21.6	46.2	29.5	25.1	20.5	27.7		15.4	23.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	30.8	18.5	0.1	153.8	3.2	0.1	0.7	1.3		3.5	2.2	
Delay (s)	73.8	48.1	21.7	199.9	32.7	25.2	21.2	29.0		18.9	25.8	
Level of Service	E	D	C	F	C	C	C	C		B	C	
Approach Delay (s)		46.6			38.0			28.1			24.2	
Approach LOS		D			D			C			C	

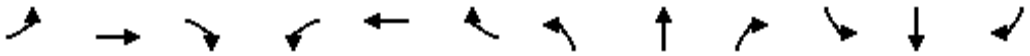
Intersection Summary			
HCM Average Control Delay	32.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	94.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	36	205	89	6	129	19	92	34	1	13	22	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	40	228	99	7	143	21	102	38	1	14	24	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	164			327			539	535	277	495	574	154
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			327			539	535	277	495	574	154
tC, single (s)	4.1			4.1			7.1	6.5	7.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	4.2	3.5	4.0	3.3
p0 queue free %	97			99			76	91	100	97	94	99
cM capacity (veh/h)	1426			1244			418	439	576	444	418	897

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	40	327	7	164	141	52
Volume Left	40	0	7	0	102	14
Volume Right	0	99	0	21	1	13
cSH	1426	1700	1244	1700	425	493
Volume to Capacity	0.03	0.19	0.01	0.10	0.33	0.11
Queue Length 95th (ft)	2	0	0	0	36	9
Control Delay (s)	7.6	0.0	7.9	0.0	17.6	13.2
Lane LOS	A		A		C	B
Approach Delay (s)	0.8		0.3		17.6	13.2
Approach LOS					C	B

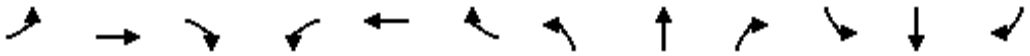
Intersection Summary				
Average Delay	4.8			
Intersection Capacity Utilization	45.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	436	149	26	244	24	87	111	32	10	55	31
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Frt	1.00	0.96		1.00	0.99		1.00	0.97			0.96	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1662	1683		1662	1726		1662	1691			1644	
Flt Permitted	0.95	1.00		0.95	1.00		0.77	1.00			0.96	
Satd. Flow (perm)	1662	1683		1662	1726		1347	1691			1594	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	77	484	166	29	271	27	97	123	36	11	61	34
RTOR Reduction (vph)	0	15	0	0	4	0	0	16	0	0	25	0
Lane Group Flow (vph)	77	635	0	29	294	0	97	143	0	0	81	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	7	4		3	8			2			6	
Permitted Phases							2			6		
Actuated Green, G (s)	4.9	29.2		1.5	25.8		11.8	11.8			11.8	
Effective Green, g (s)	4.9	29.2		1.5	25.8		11.8	11.8			11.8	
Actuated g/C Ratio	0.09	0.54		0.03	0.47		0.22	0.22			0.22	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Vehicle Extension (s)	4.0	4.0		4.0	4.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	149	902		46	817		292	366			345	
v/s Ratio Prot	c0.05	c0.38		0.02	0.17			c0.08				
v/s Ratio Perm							0.07				0.05	
v/c Ratio	0.52	0.70		0.63	0.36		0.33	0.39			0.23	
Uniform Delay, d1	23.7	9.4		26.2	9.1		18.0	18.3			17.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	4.0	2.7		27.6	0.4		0.9	0.9			0.5	
Delay (s)	27.7	12.1		53.8	9.5		18.9	19.2			18.1	
Level of Service	C	B		D	A		B	B			B	
Approach Delay (s)		13.8			13.4			19.1			18.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	54.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	62.8%	ICU Level of Service	B
Analysis Period (min)	15		

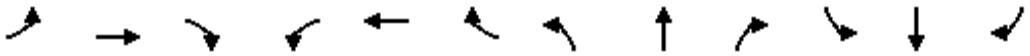
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Volume (vph)	44	96	212	14	59	10	114	173	26	23	172	36
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	49	107	236	16	66	11	127	192	29	26	191	40

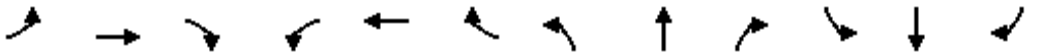
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	49	342	92	127	221	26	231
Volume Left (vph)	49	0	16	127	0	26	0
Volume Right (vph)	0	236	11	0	29	0	40
Hadj (s)	0.50	-0.45	0.04	0.50	-0.09	0.50	-0.12
Departure Headway (s)	6.9	6.0	6.9	6.9	6.3	7.1	6.4
Degree Utilization, x	0.09	0.57	0.18	0.24	0.39	0.05	0.41
Capacity (veh/h)	490	568	468	492	538	474	527
Control Delay (s)	9.4	15.2	11.4	10.9	12.1	9.2	12.7
Approach Delay (s)	14.5		11.4	11.7		12.4	
Approach LOS	B		B	B		B	

Intersection Summary				
Delay	12.8			
HCM Level of Service	B			
Intersection Capacity Utilization	48.9%	ICU Level of Service	A	
Analysis Period (min)	15			



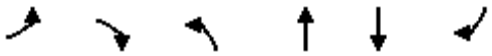
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	106	754	451	339	467	135	337	498	313	140	564	29
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Lane Util. Factor	1.00	0.95	1.00	0.97	0.95		0.97	0.95	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.99	1.00	1.00		1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.97		1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1599	3260	1439	3162	3115		3131	3228	1435	1630	3176	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1599	3260	1439	3162	3115		3131	3228	1435	1630	3176	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	112	794	475	357	492	142	355	524	329	147	594	31
RTOR Reduction (vph)	0	0	218	0	27	0	0	0	215	0	4	0
Lane Group Flow (vph)	112	794	257	357	607	0	355	524	114	147	621	0
Confl. Peds. (#/hr)	4		1	1		4	7		4	4		7
Heavy Vehicles (%)	4%	2%	2%	2%	3%	2%	3%	3%	2%	2%	4%	0%
Turn Type	Prot		Perm	Prot			Prot		Perm	Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2						8			
Actuated Green, G (s)	9.0	24.1	24.1	11.5	26.6		11.5	23.2	23.2	10.9	22.6	
Effective Green, g (s)	9.0	24.1	24.1	11.5	26.6		11.5	23.2	23.2	10.9	22.6	
Actuated g/C Ratio	0.10	0.27	0.27	0.13	0.30		0.13	0.26	0.26	0.12	0.25	
Clearance Time (s)	4.5	6.0	6.0	4.5	6.0		4.5	5.0	5.0	4.5	5.0	
Vehicle Extension (s)	3.5	5.0	5.0	3.5	5.0		3.5	3.5	3.5	3.5	2.5	
Lane Grp Cap (vph)	160	876	387	405	924		401	835	371	198	800	
v/s Ratio Prot	0.07	c0.24		c0.11	0.19		c0.11	0.16		0.09	c0.20	
v/s Ratio Perm			0.18						0.08			
v/c Ratio	0.70	0.91	0.66	0.88	0.66		0.89	0.63	0.31	0.74	0.78	
Uniform Delay, d1	39.0	31.7	29.2	38.4	27.6		38.5	29.4	26.8	38.0	31.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	13.4	13.5	5.6	19.9	2.3		20.5	1.6	0.6	14.4	4.6	
Delay (s)	52.4	45.3	34.8	58.4	29.8		59.0	31.0	27.3	52.4	35.7	
Level of Service	D	D	C	E	C		E	C	C	D	D	
Approach Delay (s)		42.2			40.1			38.2			38.9	
Approach LOS		D			D			D			D	

Intersection Summary			
HCM Average Control Delay	40.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	89.7	Sum of lost time (s)	20.0
Intersection Capacity Utilization	79.3%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	15	1120	276	201	855	3	167	12	228	14	19	5
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95			1.00	1.00		1.00	1.00
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Flpb, ped/bikes	0.99	1.00	1.00	1.00	1.00			1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00			0.96	1.00		0.98	1.00
Satd. Flow (prot)	1408	3292	1458	1554	3258			1627	1417		1534	992
Flt Permitted	0.95	1.00	1.00	0.95	1.00			0.72	1.00		0.87	1.00
Satd. Flow (perm)	1408	3292	1458	1554	3258			1218	1417		1365	992
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	16	1179	291	212	900	3	176	13	240	15	20	5
RTOR Reduction (vph)	0	0	115	0	0	0	0	0	187	0	0	4
Lane Group Flow (vph)	16	1179	176	212	903	0	0	189	53	0	35	1
Confl. Peds. (#/hr)	18					18						
Heavy Vehicles (%)	17%	1%	2%	7%	2%	0%	3%	0%	5%	18%	7%	50%
Turn Type	Prot		Perm	Prot			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases			2				8		8	4		4
Actuated Green, G (s)	0.8	40.8	40.8	17.2	57.2			20.0	20.0		20.0	20.0
Effective Green, g (s)	0.8	40.8	40.8	17.2	57.2			20.0	20.0		20.0	20.0
Actuated g/C Ratio	0.01	0.45	0.45	0.19	0.64			0.22	0.22		0.22	0.22
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0			4.0	4.0		4.0	4.0
Vehicle Extension (s)	2.5	4.5	4.5	2.5	4.5			3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	13	1492	661	297	2071			271	315		303	220
v/s Ratio Prot	0.01	c0.36		c0.14	0.28							
v/s Ratio Perm			0.12					c0.16	0.04		0.03	0.00
v/c Ratio	1.23	0.79	0.27	0.71	0.44			0.70	0.17		0.12	0.01
Uniform Delay, d1	44.6	21.0	15.3	34.1	8.3			32.2	28.3		27.9	27.3
Progression Factor	1.00	1.00	1.00	0.69	0.72			1.00	1.00		1.00	1.00
Incremental Delay, d2	333.7	4.3	1.0	6.9	0.6			7.6	0.3		0.2	0.0
Delay (s)	378.3	25.3	16.3	30.5	6.6			39.8	28.5		28.1	27.3
Level of Service	F	C	B	C	A			D	C		C	C
Approach Delay (s)		27.3			11.1			33.5			28.0	
Approach LOS		C			B			C			C	

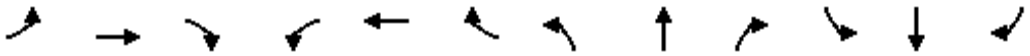
Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	73.1%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	124	60	41	355	398	36
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0			4.0	4.0	
Lane Util. Factor	1.00			1.00	1.00	
Frt	0.96			1.00	0.99	
Flt Protected	0.97			0.99	1.00	
Satd. Flow (prot)	1597			1717	1699	
Flt Permitted	0.97			0.93	1.00	
Satd. Flow (perm)	1597			1607	1699	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	136	66	45	390	437	40
RTOR Reduction (vph)	34	0	0	0	4	0
Lane Group Flow (vph)	168	0	0	435	473	0
Heavy Vehicles (%)	2%	0%	5%	1%	2%	0%
Turn Type			pm+pt			
Protected Phases	4		5	2	6	
Permitted Phases			2			
Actuated Green, G (s)	8.7			22.5	22.5	
Effective Green, g (s)	8.7			22.5	22.5	
Actuated g/C Ratio	0.22			0.57	0.57	
Clearance Time (s)	4.0			4.0	4.0	
Vehicle Extension (s)	3.0			3.0	3.0	
Lane Grp Cap (vph)	354			922	975	
v/s Ratio Prot	c0.11				c0.28	
v/s Ratio Perm				0.27		
v/c Ratio	0.47			0.47	0.49	
Uniform Delay, d1	13.3			4.9	4.9	
Progression Factor	1.00			1.00	1.00	
Incremental Delay, d2	1.0			0.4	0.4	
Delay (s)	14.3			5.3	5.3	
Level of Service	B			A	A	
Approach Delay (s)	14.3			5.3	5.3	
Approach LOS	B			A	A	

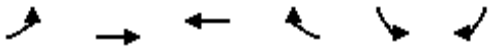
Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	39.2	Sum of lost time (s)	8.0
Intersection Capacity Utilization	69.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1248	181	372	898	6	155	0	305	21	9	1
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Lane Util. Factor		0.91		1.00	0.95			1.00	1.00		1.00	
Frpb, ped/bikes		1.00		1.00	1.00			1.00	0.98		1.00	
Flpb, ped/bikes		1.00		1.00	1.00			1.00	1.00		1.00	
Frt		0.98		1.00	1.00			1.00	0.85		1.00	
Flt Protected		1.00		0.95	1.00			0.95	1.00		0.97	
Satd. Flow (prot)		4584		1646	3225			1646	1465		1605	
Flt Permitted		1.00		0.95	1.00			0.74	1.00		0.79	
Satd. Flow (perm)		4584		1646	3225			1276	1465		1315	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	1314	191	392	945	6	163	0	321	22	9	1
RTOR Reduction (vph)	0	19	0	0	0	0	0	0	261	0	1	0
Lane Group Flow (vph)	0	1486	0	392	951	0	0	163	60	0	31	0
Confl. Peds. (#/hr)	2		8	8		2			3	3		
Heavy Vehicles (%)	0%	2%	0%	1%	3%	0%	1%	0%	0%	7%	0%	0%
Turn Type				Prot			Perm		Perm	Perm		
Protected Phases		2		1	6			8			8	
Permitted Phases							8		8	8		
Actuated Green, G (s)		37.7		23.0	64.7			16.8	16.8		16.8	
Effective Green, g (s)		37.7		23.0	64.7			16.8	16.8		16.8	
Actuated g/C Ratio		0.42		0.26	0.72			0.19	0.19		0.19	
Clearance Time (s)		4.5		4.0	4.5			4.0	4.0		4.0	
Vehicle Extension (s)		4.5		2.5	5.6			2.5	2.5		2.5	
Lane Grp Cap (vph)		1920		421	2318			238	273		245	
v/s Ratio Prot		c0.32		c0.24	0.29							
v/s Ratio Perm								c0.13	0.04		0.02	
v/c Ratio		0.77		0.93	0.41			0.68	0.22		0.13	
Uniform Delay, d1		22.5		32.7	5.0			34.1	31.0		30.5	
Progression Factor		0.37		1.00	0.41			1.00	1.00		1.00	
Incremental Delay, d2		2.4		22.5	0.4			7.3	0.3		0.2	
Delay (s)		10.7		55.2	2.5			41.4	31.3		30.7	
Level of Service		B		E	A			D	C		C	
Approach Delay (s)		10.7			17.9			34.7			30.7	
Approach LOS		B			B			C			C	

Intersection Summary			
HCM Average Control Delay	17.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	76.8%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	205	1369	920	282	646	356
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5	4.5		4.0	4.0
Lane Util. Factor	1.00	0.95	0.91		0.97	1.00
Frpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.96		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1646	3260	4417		3162	1444
Flt Permitted	0.95	1.00	1.00		0.95	1.00
Satd. Flow (perm)	1646	3260	4417		3162	1444
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	216	1441	968	297	680	375
RTOR Reduction (vph)	0	0	60	0	0	279
Lane Group Flow (vph)	216	1441	1205	0	680	96
Confl. Peds. (#/hr)	5			5		
Heavy Vehicles (%)	1%	2%	3%	7%	2%	3%
Turn Type	Prot					Perm
Protected Phases	5	2	6		4	
Permitted Phases						4
Actuated Green, G (s)	18.0	58.4	36.4		23.1	23.1
Effective Green, g (s)	18.0	58.4	36.4		23.1	23.1
Actuated g/C Ratio	0.20	0.65	0.40		0.26	0.26
Clearance Time (s)	4.0	4.5	4.5		4.0	4.0
Vehicle Extension (s)	2.5	6.3	4.5		2.5	2.5
Lane Grp Cap (vph)	329	2115	1786		812	371
v/s Ratio Prot	0.13	c0.44	0.27		c0.22	
v/s Ratio Perm						0.07
v/c Ratio	0.66	0.68	0.67		0.84	0.26
Uniform Delay, d1	33.2	9.9	22.0		31.7	26.6
Progression Factor	0.74	0.35	1.00		1.00	1.00
Incremental Delay, d2	2.9	1.2	2.1		7.4	0.3
Delay (s)	27.4	4.7	24.0		39.1	26.9
Level of Service	C	A	C		D	C
Approach Delay (s)		7.6	24.0		34.8	
Approach LOS		A	C		C	

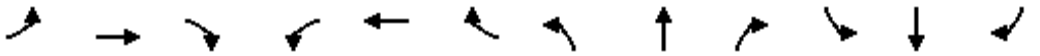
Intersection Summary			
HCM Average Control Delay	20.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (vph)	1881	85	28	1085	44	24
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0	4.0	4.0	
Lane Util. Factor	0.95		1.00	0.95	1.00	
Frt	0.99		1.00	1.00	0.95	
Flt Protected	1.00		0.95	1.00	0.97	
Satd. Flow (prot)	3242		1599	3228	1581	
Flt Permitted	1.00		0.95	1.00	0.97	
Satd. Flow (perm)	3242		1599	3228	1581	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	1980	89	29	1142	46	25
RTOR Reduction (vph)	2	0	0	0	23	0
Lane Group Flow (vph)	2067	0	29	1142	48	0
Heavy Vehicles (%)	2%	0%	4%	3%	0%	6%
Turn Type			Prot			
Protected Phases	4		3	8	2	
Permitted Phases						
Actuated Green, G (s)	72.2		2.8	79.0	9.1	
Effective Green, g (s)	72.2		2.8	79.0	9.1	
Actuated g/C Ratio	0.75		0.03	0.82	0.09	
Clearance Time (s)	4.0		4.0	4.0	4.0	
Vehicle Extension (s)	4.0		4.0	4.0	4.0	
Lane Grp Cap (vph)	2436		47	2654	150	
v/s Ratio Prot	c0.64		0.02	c0.35	c0.03	
v/s Ratio Perm						
v/c Ratio	0.85		0.62	0.43	0.32	
Uniform Delay, d1	8.2		46.1	2.4	40.6	
Progression Factor	1.00		1.00	1.00	1.00	
Incremental Delay, d2	3.1		24.5	0.2	1.7	
Delay (s)	11.3		70.6	2.5	42.3	
Level of Service	B		E	A	D	
Approach Delay (s)	11.3			4.2	42.3	
Approach LOS	B			A	D	

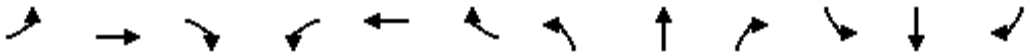
Intersection Summary			
HCM Average Control Delay	9.4	HCM Level of Service	A
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	96.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	69	1274	253	92	754	45	200	140	83	82	118	65
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.94		1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3228	1418	1614	3139		1614	1595		1662	1594	
Flt Permitted	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3228	1418	1614	3139		1614	1595		1662	1594	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	73	1341	266	97	794	47	211	147	87	86	124	68
RTOR Reduction (vph)	0	0	146	0	4	0	0	24	0	0	24	0
Lane Group Flow (vph)	73	1341	120	97	837	0	211	210	0	86	168	0
Confl. Peds. (#/hr)	2		3	3		2						
Heavy Vehicles (%)	0%	3%	2%	3%	5%	3%	3%	4%	3%	0%	5%	2%
Turn Type	Prot		Perm	Prot			Prot			Prot		
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases			2									
Actuated Green, G (s)	7.1	40.7	40.7	7.9	41.5		11.5	17.9		7.0	13.4	
Effective Green, g (s)	7.1	40.7	40.7	7.9	41.5		11.5	17.9		7.0	13.4	
Actuated g/C Ratio	0.08	0.45	0.45	0.09	0.46		0.13	0.20		0.08	0.15	
Clearance Time (s)	4.0	4.5	4.5	4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6	4.6	2.5	4.6		2.5	2.5		0.2	0.2	
Lane Grp Cap (vph)	131	1460	641	142	1447		206	317		129	237	
v/s Ratio Prot	0.04	c0.42		c0.06	0.27		c0.13	c0.13		0.05	c0.11	
v/s Ratio Perm			0.08									
v/c Ratio	0.56	0.92	0.19	0.68	0.58		1.02	0.66		0.67	0.71	
Uniform Delay, d1	39.9	23.1	14.8	39.8	17.8		39.2	33.3		40.4	36.4	
Progression Factor	1.00	1.00	1.00	0.75	1.24		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.1	10.7	0.6	11.2	1.6		69.2	4.6		9.6	7.7	
Delay (s)	44.0	33.8	15.4	41.2	23.8		108.4	37.9		50.0	44.2	
Level of Service	D	C	B	D	C		F	D		D	D	
Approach Delay (s)		31.4			25.6			71.3			46.0	
Approach LOS		C			C			E			D	

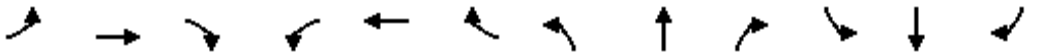
Intersection Summary			
HCM Average Control Delay	36.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	80.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	56	927	182	26	668	31	95	65	31	60	74	77
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.99		1.00	0.95		1.00	0.92	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1599	3159		1662	3205		1599	1664		1630	1576	
Flt Permitted	0.95	1.00		0.95	1.00		0.51	1.00		0.67	1.00	
Satd. Flow (perm)	1599	3159		1662	3205		854	1664		1148	1576	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	59	976	192	27	703	33	100	68	33	63	78	81
RTOR Reduction (vph)	0	12	0	0	3	0	0	23	0	0	49	0
Lane Group Flow (vph)	59	1156	0	27	733	0	100	78	0	63	110	0
Heavy Vehicles (%)	4%	3%	1%	0%	3%	4%	4%	0%	0%	2%	0%	5%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	6.5	60.5		2.4	56.4		14.6	14.6		14.6	14.6	
Effective Green, g (s)	6.5	60.5		2.4	56.4		14.6	14.6		14.6	14.6	
Actuated g/C Ratio	0.07	0.67		0.03	0.63		0.16	0.16		0.16	0.16	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.6		2.5	4.6		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	115	2124		44	2008		139	270		186	256	
v/s Ratio Prot	0.04	c0.37		0.02	c0.23			0.05			0.07	
v/s Ratio Perm							c0.12			0.05		
v/c Ratio	0.51	0.54		0.61	0.37		0.72	0.29		0.34	0.43	
Uniform Delay, d1	40.2	7.6		43.3	8.1		35.8	33.1		33.4	34.0	
Progression Factor	1.30	0.42		0.92	0.54		1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.5	0.5		18.5	0.5		15.3	0.4		0.8	0.9	
Delay (s)	53.9	3.7		58.4	4.9		51.0	33.6		34.2	34.8	
Level of Service	D	A		E	A		D	C		C	C	
Approach Delay (s)		6.1			6.8			42.3			34.6	
Approach LOS		A			A			D			C	

Intersection Summary			
HCM Average Control Delay	12.0	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.5
Intersection Capacity Utilization	66.3%	ICU Level of Service	C
Analysis Period (min)	15		

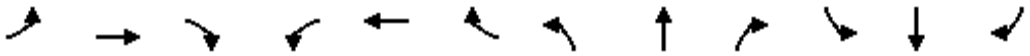
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	141	727	66	10	560	176	22	17	10	226	33	55
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.99		1.00	0.96		1.00	0.94		1.00	0.91	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1646	3225		1662	3127		1498	1518		1630	1586	
Flt Permitted	0.95	1.00		0.95	1.00		0.70	1.00		0.74	1.00	
Satd. Flow (perm)	1646	3225		1662	3127		1098	1518		1267	1586	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	148	765	69	11	589	185	23	18	11	238	35	58
RTOR Reduction (vph)	0	5	0	0	26	0	0	8	0	0	44	0
Lane Group Flow (vph)	148	829	0	11	748	0	23	21	0	238	49	0
Heavy Vehicles (%)	1%	2%	0%	0%	3%	1%	11%	14%	0%	2%	0%	0%
Turn Type	Prot			Prot			Perm			Perm		
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		
Actuated Green, G (s)	12.6	55.0		1.1	43.5		21.4	21.4		21.4	21.4	
Effective Green, g (s)	12.6	55.0		1.1	43.5		21.4	21.4		21.4	21.4	
Actuated g/C Ratio	0.14	0.61		0.01	0.48		0.24	0.24		0.24	0.24	
Clearance Time (s)	4.0	4.5		4.0	4.5		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	2.5	4.5		2.5	4.5		2.5	2.5		2.5	2.5	
Lane Grp Cap (vph)	230	1971		20	1511		261	361		301	377	
v/s Ratio Prot	c0.09	0.26		0.01	c0.24			0.01			0.03	
v/s Ratio Perm							0.02			c0.19		
v/c Ratio	0.64	0.42		0.55	0.49		0.09	0.06		0.79	0.13	
Uniform Delay, d1	36.6	9.2		44.2	15.8		26.7	26.5		32.2	27.0	
Progression Factor	1.12	0.42		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	4.7	0.6		23.6	1.2		0.1	0.0		12.8	0.1	
Delay (s)	45.7	4.4		67.8	16.9		26.8	26.6		45.0	27.1	
Level of Service	D	A		E	B		C	C		D	C	
Approach Delay (s)		10.6			17.7			26.7			40.0	
Approach LOS		B			B			C			D	

Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	62.1%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	9	9	60	7	8	50	34	675	25	72	844	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	9	9	63	7	8	53	36	711	26	76	888	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1528	1853	449	1459	1845	368	898			737		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1528	1853	449	1459	1845	368	898			737		
tC, single (s)	7.5	6.9	7.0	7.5	6.8	7.0	4.2			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.2	3.3	3.5	4.2	3.3	2.2			2.2		
p0 queue free %	84	82	89	88	85	92	95			91		
cM capacity (veh/h)	60	52	555	63	55	626	740			878		

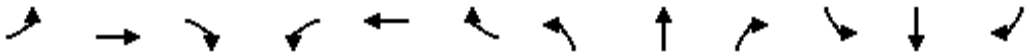
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	82	68	36	474	263	76	592	306
Volume Left	9	7	36	0	0	76	0	0
Volume Right	63	53	0	0	26	0	0	9
cSH	181	193	740	1700	1700	878	1700	1700
Volume to Capacity	0.45	0.35	0.05	0.28	0.15	0.09	0.35	0.18
Queue Length 95th (ft)	53	38	4	0	0	7	0	0
Control Delay (s)	40.5	33.5	10.1	0.0	0.0	9.5	0.0	0.0
Lane LOS	E	D	B			A		
Approach Delay (s)	40.5	33.5	0.5			0.7		
Approach LOS	E	D						

Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	45.8%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	8	247	10	15	619	131	9	9	28	23	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	8	260	11	16	652	138	9	9	29	24	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	789			271			966	1103	265	999	971	652
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	789			271			966	1103	265	999	971	652
tC, single (s)	4.1			4.4			7.4	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.5			3.8	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	95	96	88	100	100
cM capacity (veh/h)	839			1133			202	208	778	204	249	472

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1
Volume Total	279	667	138	48	25
Volume Left	8	16	0	9	24
Volume Right	11	0	138	29	1
cSH	839	1133	1700	371	209
Volume to Capacity	0.01	0.01	0.08	0.13	0.12
Queue Length 95th (ft)	1	1	0	11	10
Control Delay (s)	0.4	0.4	0.0	16.1	24.6
Lane LOS	A	A		C	C
Approach Delay (s)	0.4	0.3		16.1	24.6
Approach LOS				C	C

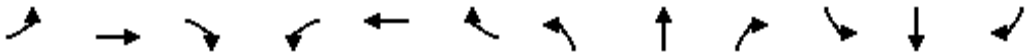
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	54.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	9	3	6	14	54	9	31	9	30	11	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	0	10	3	7	16	60	10	34	10	33	12	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	76			13			77	101	12	98	72	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			13			77	101	12	98	72	46
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	96	99	96	99	100
cM capacity (veh/h)	1536			1618			904	790	1075	849	819	1030

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	13	82	54	46
Volume Left	0	7	10	33
Volume Right	3	60	10	0
cSH	1536	1618	851	841
Volume to Capacity	0.00	0.00	0.06	0.05
Queue Length 95th (ft)	0	0	5	4
Control Delay (s)	0.0	0.6	9.5	9.5
Lane LOS		A	A	A
Approach Delay (s)	0.0	0.6	9.5	9.5
Approach LOS			A	A

Intersection Summary				
Average Delay	5.1			
Intersection Capacity Utilization	24.6%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	7	236	0	0	416	6	0	0	0	13	0	16
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	7	248	0	0	438	6	0	0	0	14	0	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	444			248			718	707	248	704	704	441
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	444			248			718	707	248	704	704	441
tC, single (s)	4.3			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.4			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	97
cM capacity (veh/h)	1027			1329			336	360	795	352	361	620

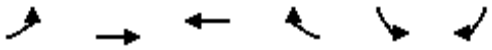
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	7	248	0	444	0	31
Volume Left	7	0	0	0	0	14
Volume Right	0	0	0	6	0	17
cSH	1027	1700	1700	1700	1700	463
Volume to Capacity	0.01	0.15	0.00	0.26	0.00	0.07
Queue Length 95th (ft)	1	0	0	0	0	5
Control Delay (s)	8.5	0.0	0.0	0.0	0.0	13.3
Lane LOS	A				A	B
Approach Delay (s)	0.2		0.0		0.0	13.3
Approach LOS					A	B

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	34.2%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	3	223	0	7	437	7	1	0	1	12	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	3	235	0	7	460	7	1	0	1	13	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	467			235			721	723	235	721	719	464
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	467			235			721	723	235	721	719	464
tC, single (s)	4.1			4.3			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.4			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	100	96	100	100
cM capacity (veh/h)	1105			1249			343	352	809	343	353	603

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	238	475	2	14
Volume Left	3	7	1	13
Volume Right	0	7	1	1
cSH	1105	1249	481	354
Volume to Capacity	0.00	0.01	0.00	0.04
Queue Length 95th (ft)	0	0	0	3
Control Delay (s)	0.1	0.2	12.5	15.6
Lane LOS	A	A	B	C
Approach Delay (s)	0.1	0.2	12.5	15.6
Approach LOS			B	C

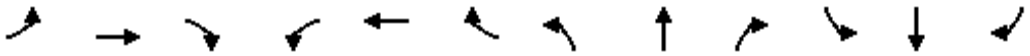
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	39.8%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	331	819	120	64	1
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	348	862	126	67	1
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)			570			
pX, platoon unblocked	0.67				0.67	0.67
vC, conflicting volume	988				1099	494
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	17				181	0
tC, single (s)	4.1				6.9	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				87	100
cM capacity (veh/h)	1088				529	736

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	174	174	575	414	68
Volume Left	0	0	0	0	67
Volume Right	0	0	0	126	1
cSH	1700	1700	1700	1700	532
Volume to Capacity	0.10	0.10	0.34	0.24	0.13
Queue Length 95th (ft)	0	0	0	0	11
Control Delay (s)	0.0	0.0	0.0	0.0	12.8
Lane LOS					B
Approach Delay (s)	0.0		0.0		12.8
Approach LOS					B

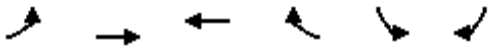
Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	39.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	10	332	53	36	870	290	59	15	40	397	14	10
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	5.0		5.0	5.0		4.0	4.0		4.5	4.5	
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	0.98		1.00	0.96		1.00	0.89		1.00	0.94	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3086		1630	3100		1630	1528		1484	1620	
Flt Permitted	0.95	1.00		0.51	1.00		0.74	1.00		0.95	1.00	
Satd. Flow (perm)	1662	3086		880	3100		1270	1528		1484	1620	
Peak-hour factor, PHF	0.95	0.95	0.92	0.92	0.95	0.95	0.92	0.92	0.92	0.95	0.92	0.95
Adj. Flow (vph)	11	349	58	39	916	305	64	16	43	418	15	11
RTOR Reduction (vph)	0	11	0	0	25	0	0	39	0	0	8	0
Lane Group Flow (vph)	11	396	0	39	1196	0	64	20	0	418	18	0
Heavy Vehicles (%)	0%	6%	2%	2%	2%	7%	2%	2%	2%	12%	2%	0%
Turn Type	Prot			Perm			Perm			Split		
Protected Phases	5	2			6			8		4	4	
Permitted Phases				6			8					
Actuated Green, G (s)	0.8	51.2		45.9	45.9		8.9	8.9		33.6	33.6	
Effective Green, g (s)	0.8	51.2		45.9	45.9		8.9	8.9		33.6	33.6	
Actuated g/C Ratio	0.01	0.48		0.43	0.43		0.08	0.08		0.31	0.31	
Clearance Time (s)	4.5	5.0		5.0	5.0		4.0	4.0		4.5	4.5	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	12	1474		377	1327		105	127		465	508	
v/s Ratio Prot	0.01	c0.13			c0.39			0.01		c0.28	0.01	
v/s Ratio Perm				0.04			c0.05					
v/c Ratio	0.92	0.27		0.10	0.90		0.61	0.15		0.90	0.04	
Uniform Delay, d1	53.2	16.8		18.3	28.5		47.5	45.7		35.2	25.6	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	212.2	0.1		0.1	8.7		9.6	0.6		19.8	0.0	
Delay (s)	265.3	16.9		18.5	37.2		57.1	46.2		54.9	25.6	
Level of Service	F	B		B	D		E	D		D	C	
Approach Delay (s)		23.4			36.6			51.9			53.2	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	107.2	Sum of lost time (s)	18.5
Intersection Capacity Utilization	74.6%	ICU Level of Service	D
Analysis Period (min)	15		

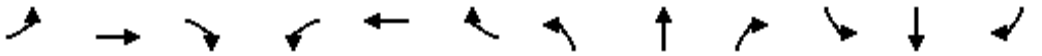
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	0	769	1188	0	16	8
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	809	1251	0	17	8
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		320	440			
pX, platoon unblocked	0.85				0.88	0.85
vC, conflicting volume	1251				1655	625
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	935				1155	197
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				90	99
cM capacity (veh/h)	628				170	693

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	0	405	405	834	417	25
Volume Left	0	0	0	0	0	17
Volume Right	0	0	0	0	0	8
cSH	1700	1700	1700	1700	1700	227
Volume to Capacity	0.00	0.24	0.24	0.49	0.25	0.11
Queue Length 95th (ft)	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	22.9
Lane LOS						C
Approach Delay (s)	0.0			0.0		22.9
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	758	27	15	749	0	0	0	0	146	0	439
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0		4.0	4.0						4.0	4.0
Lane Util. Factor		0.95		1.00	0.95						1.00	1.00
Frt		0.99		1.00	1.00						1.00	0.85
Flt Protected		1.00		0.95	1.00						0.95	1.00
Satd. Flow (prot)		3053		1250	3260						1458	1473
Flt Permitted		1.00		0.95	1.00						0.95	1.00
Satd. Flow (perm)		3053		1250	3260						1458	1473
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	0	798	28	16	788	0	0	0	0	154	0	462
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	86
Lane Group Flow (vph)	0	823	0	16	788	0	0	0	0	0	154	376
Heavy Vehicles (%)	0%	8%	18%	33%	2%	0%	0%	0%	0%	14%	0%	1%
Turn Type				Prot						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases										4		4
Actuated Green, G (s)		22.6		0.6	27.2						20.7	20.7
Effective Green, g (s)		22.6		0.6	27.2						20.7	20.7
Actuated g/C Ratio		0.40		0.01	0.49						0.37	0.37
Clearance Time (s)		4.0		4.0	4.0						4.0	4.0
Vehicle Extension (s)		4.0		4.0	4.0						4.0	4.0
Lane Grp Cap (vph)		1234		13	1586						540	545
v/s Ratio Prot		c0.27		0.01	c0.24							
v/s Ratio Perm											0.11	c0.26
v/c Ratio		0.67		1.23	0.50						0.29	0.69
Uniform Delay, d1		13.6		27.6	9.7						12.4	14.9
Progression Factor		1.00		1.00	1.00						1.00	1.00
Incremental Delay, d2		1.5		333.7	0.3						0.4	3.9
Delay (s)		15.1		361.3	10.1						12.8	18.8
Level of Service		B		F	B						B	B
Approach Delay (s)		15.1			17.0			0.0			17.3	
Approach LOS		B			B			A			B	

Intersection Summary			
HCM Average Control Delay	16.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.69		
Actuated Cycle Length (s)	55.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

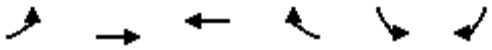
c Critical Lane Group



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	690	214	95	741	23	59
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	726	225	100	780	24	62
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)	562			529		
pX, platoon unblocked			0.72		0.77	0.72
vC, conflicting volume			726		1316	726
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			420		730	420
tC, single (s)			4.3		7.1	7.1
tC, 2 stage (s)						
tF (s)			2.3		3.6	3.4
p0 queue free %			87		89	85
cM capacity (veh/h)			774		222	403

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	WB 3	NB 1	NB 2
Volume Total	726	225	100	390	390	24	62
Volume Left	0	0	100	0	0	24	0
Volume Right	0	225	0	0	0	0	62
cSH	1700	1700	774	1700	1700	222	403
Volume to Capacity	0.43	0.13	0.13	0.23	0.23	0.11	0.15
Queue Length 95th (ft)	0	0	11	0	0	9	13
Control Delay (s)	0.0	0.0	10.3	0.0	0.0	23.2	15.5
Lane LOS			B			C	C
Approach Delay (s)	0.0		1.2			17.7	
Approach LOS						C	

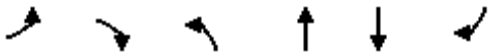
Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	58.5%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (vph)	37	712	789	80	76	47
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0		4.0	
Lane Util. Factor	1.00	1.00	0.95		1.00	
Frt	1.00	1.00	0.99		0.95	
Flt Protected	0.95	1.00	1.00		0.97	
Satd. Flow (prot)	1599	1683	3123		1569	
Flt Permitted	0.95	1.00	1.00		0.97	
Satd. Flow (perm)	1599	1683	3123		1569	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	39	749	831	84	80	49
RTOR Reduction (vph)	0	0	7	0	33	0
Lane Group Flow (vph)	39	749	908	0	96	0
Heavy Vehicles (%)	4%	4%	5%	5%	3%	2%
Turn Type	Prot					
Protected Phases	5	2	6		4	
Permitted Phases						
Actuated Green, G (s)	2.1	40.3	34.2		9.4	
Effective Green, g (s)	2.1	40.3	34.2		9.4	
Actuated g/C Ratio	0.04	0.70	0.59		0.16	
Clearance Time (s)	4.0	4.0	4.0		4.0	
Vehicle Extension (s)	4.0	4.0	4.0		4.0	
Lane Grp Cap (vph)	58	1175	1851		256	
v/s Ratio Prot	0.02	c0.45	0.29		c0.06	
v/s Ratio Perm						
v/c Ratio	0.67	0.64	0.49		0.37	
Uniform Delay, d1	27.5	4.7	6.7		21.5	
Progression Factor	1.00	1.00	1.00		1.00	
Incremental Delay, d2	28.7	1.3	0.3		1.2	
Delay (s)	56.1	6.0	7.0		22.8	
Level of Service	E	A	A		C	
Approach Delay (s)		8.5	7.0		22.8	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	8.8	HCM Level of Service	A
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	57.7	Sum of lost time (s)	8.0
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		

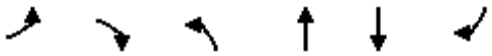
c Critical Lane Group



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	14	1	8	32	82	29
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	16	1	9	36	91	32
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	161	107	123			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	161	107	123			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	98	100	99			
cM capacity (veh/h)	830	952	1476			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	17	44	123
Volume Left	16	9	0
Volume Right	1	0	32
cSH	837	1476	1700
Volume to Capacity	0.02	0.01	0.07
Queue Length 95th (ft)	2	0	0
Control Delay (s)	9.4	1.5	0.0
Lane LOS	A	A	
Approach Delay (s)	9.4	1.5	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.2		
Intersection Capacity Utilization	19.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	6	3	0	3	4	10
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	7	3	0	3	4	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	13	10	16			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	13	10	16			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	99	100	100			
cM capacity (veh/h)	1011	1077	1615			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	10	3	16
Volume Left	7	0	0
Volume Right	3	0	11
cSH	1032	1615	1700
Volume to Capacity	0.01	0.00	0.01
Queue Length 95th (ft)	1	0	0
Control Delay (s)	8.5	0.0	0.0
Lane LOS	A		
Approach Delay (s)	8.5	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	13.3%	ICU Level of Service	A
Analysis Period (min)	15		

MOVEMENT SUMMARY

Site: Future

Greensprings Dr / Dover Ave / Riverside Dr
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance ft	Prop. Queued	Effective Stop Rate per veh	Average Speed mph
South: Greensprings Dr											
3L	L	3	0.0	0.098	6.6	LOS A	0.6	14.7	0.18	0.66	25.8
8L	T	39	4.0	0.099	0.3	LOS A	0.6	14.7	0.18	0.07	28.5
8T	R	108	7.0	0.099	6.2	LOS A	0.6	14.7	0.18	0.52	26.1
Approach		150	6.1	0.099	4.7	LOS A	0.6	14.7	0.18	0.40	26.6
North East: Greensprings Dr											
17T	L	71	11.0	0.046	7.3	LOS A	0.0	0.0	0.00	1.00	24.8
14R	T	1	0.0	0.046	6.2	LOS A	0.0	0.0	0.00	0.69	26.1
14R	R	3	0.0	0.046	6.9	LOS A	0.0	0.0	0.00	0.67	25.8
Approach		76	10.4	0.046	5.1	LOS A	0.0	0.0	0.00	0.98	24.9
North: Riverside Dr											
7L	L	4	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	1.00	23.5
4T	T	46	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.88	23.8
4R	R	1	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.88	23.7
Approach		51	0.0	0.034	7.5	LOS A	0.2	4.4	0.17	0.89	23.8
West: Dover Ave											
5L	L	1	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.91	23.0
2T	T	1	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.85	23.0
2R	R	3	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.83	22.9
Approach		6	0.0	0.007	9.4	LOS A	0.0	0.9	0.26	0.85	23.0
All Vehicles		282	6.0	0.099	6.0	NA	0.6	14.7	0.13	0.65	25.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (HCM).
Approach LOS values are based on the worst delay for any vehicle movement.

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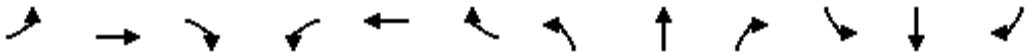
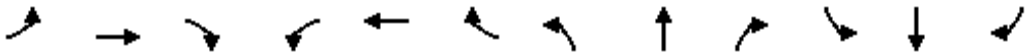


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	542	3	0	599	0	4	0	8	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	571	3	0	631	0	4	0	8	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	631			574			1203	1203	572	1211	1204	631
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	631			574			1203	1203	572	1211	1204	631
tC, single (s)	4.1			4.1			7.1	6.5	6.4	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.5	3.5	4.0	3.3
p0 queue free %	100			100			97	100	98	100	100	100
cM capacity (veh/h)	962			1009			163	186	492	158	186	485

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	574	631	13	0
Volume Left	0	0	4	0
Volume Right	3	0	8	0
cSH	962	1009	294	1700
Volume to Capacity	0.00	0.00	0.04	0.00
Queue Length 95th (ft)	0	0	3	0
Control Delay (s)	0.0	0.0	17.8	0.0
Lane LOS			C	A
Approach Delay (s)	0.0	0.0	17.8	0.0
Approach LOS			C	A

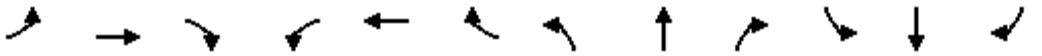
Intersection Summary			
Average Delay	0.2		
Intersection Capacity Utilization	44.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	6	451	13	47	1132	12	19	1	42	9	0	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	6	470	14	49	1179	12	20	1	44	9	0	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1192			483			1766	1779	477	1766	1779	1185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1192			483			1766	1779	477	1766	1779	1185
tC, single (s)	4.6			4.3			7.2	6.5	6.2	7.2	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.7			2.3			3.6	4.0	3.3	3.6	4.0	3.3
p0 queue free %	99			95			65	99	93	82	100	98
cM capacity (veh/h)	445			1010			57	78	586	53	78	232

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	6	483	49	1192	65	14
Volume Left	6	0	49	0	20	9
Volume Right	0	14	0	12	44	4
cSH	445	1700	1010	1700	148	70
Volume to Capacity	0.01	0.28	0.05	0.70	0.44	0.19
Queue Length 95th (ft)	1	0	4	0	49	17
Control Delay (s)	13.2	0.0	8.7	0.0	46.7	68.7
Lane LOS	B		A		E	F
Approach Delay (s)	0.2		0.3		46.7	68.7
Approach LOS					E	F

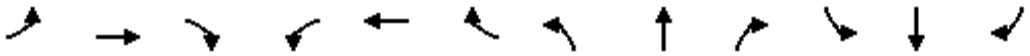
Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	76.1%	ICU Level of Service	D
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	26	54	100	33	58	69	138	810	45	131	630	16
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	1.00
Frt		0.93			0.94		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.99			0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1598			1617		1646	3165		1646	3228	1488
Flt Permitted		0.95			0.91		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1530			1489		1646	3165		1646	3228	1488
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	29	60	111	37	64	77	153	900	50	146	700	18
RTOR Reduction (vph)	0	83	0	0	51	0	0	5	0	0	0	11
Lane Group Flow (vph)	0	117	0	0	127	0	153	945	0	146	700	7
Heavy Vehicles (%)	0%	0%	1%	0%	0%	2%	1%	4%	8%	1%	3%	0%
Turn Type	Perm			Perm			Prot			Prot		Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								6
Actuated Green, G (s)		10.9			10.9		8.3	22.3		8.2	22.2	22.2
Effective Green, g (s)		10.9			10.9		8.3	22.3		8.2	22.2	22.2
Actuated g/C Ratio		0.20			0.20		0.16	0.42		0.15	0.42	0.42
Clearance Time (s)		4.0			4.0		3.5	4.5		3.5	4.5	4.5
Vehicle Extension (s)		2.5			2.5		2.5	4.5		2.5	4.5	4.5
Lane Grp Cap (vph)		312			304		256	1322		253	1342	619
v/s Ratio Prot							c0.09	c0.30		0.09	0.22	
v/s Ratio Perm		0.08			c0.09							0.01
v/c Ratio		0.38			0.42		0.60	0.72		0.58	0.52	0.01
Uniform Delay, d1		18.3			18.5		21.0	12.9		21.0	11.6	9.2
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		0.6			0.7		3.1	2.1		2.6	0.6	0.0
Delay (s)		18.9			19.2		24.1	15.0		23.6	12.2	9.2
Level of Service		B			B		C	B		C	B	A
Approach Delay (s)		18.9			19.2			16.3			14.1	
Approach LOS		B			B			B			B	

Intersection Summary			
HCM Average Control Delay	15.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	53.4	Sum of lost time (s)	7.5
Intersection Capacity Utilization	59.2%	ICU Level of Service	B
Analysis Period (min)	15		

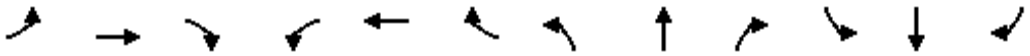
c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	35	141	45	20	77	20	21	151	16	71	295	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	36	147	47	21	80	21	22	157	17	74	307	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	751	698	333	810	716	166	358			174		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	751	698	333	810	716	166	358			174		
tC, single (s)	7.1	6.6	6.2	7.1	6.6	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	85	56	93	88	76	98	98			95		
cM capacity (veh/h)	248	335	714	175	327	884	1212			1385		

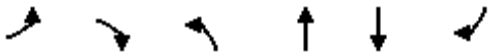
Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	230	122	196	432
Volume Left	36	21	22	74
Volume Right	47	21	17	51
cSH	353	315	1212	1385
Volume to Capacity	0.65	0.39	0.02	0.05
Queue Length 95th (ft)	109	44	1	4
Control Delay (s)	32.3	23.5	1.0	1.8
Lane LOS	D	C	A	A
Approach Delay (s)	32.3	23.5	1.0	1.8
Approach LOS	D	C		

Intersection Summary			
Average Delay	11.5		
Intersection Capacity Utilization	61.4%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	57	27	148	3	14	13	97	309	5	13	441	49
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			0.99		1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00		1.00	1.00		0.99	1.00	
Frt		0.91			0.94		1.00	1.00		1.00	0.99	
Flt Protected		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1557			1626		1662	1745		1651	1716	
Flt Permitted		0.91			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1441			1595		1662	1745		1651	1716	
Peak-hour factor, PHF	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Adj. Flow (vph)	63	30	164	3	16	14	108	343	6	14	490	54
RTOR Reduction (vph)	0	100	0	0	11	0	0	1	0	0	5	0
Lane Group Flow (vph)	0	157	0	0	22	0	108	348	0	14	539	0
Confl. Peds. (#/hr)	2		1	1		2	18		8	8		18
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Turn Type	Perm			Perm			Prot			Prot		
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		12.1			12.1		6.0	32.8		0.7	27.5	
Effective Green, g (s)		12.1			12.1		6.0	32.8		0.7	27.5	
Actuated g/C Ratio		0.21			0.21		0.10	0.57		0.01	0.48	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)		303			335		173	994		20	819	
v/s Ratio Prot							c0.06	0.20		0.01	c0.31	
v/s Ratio Perm		c0.11			0.01							
v/c Ratio		0.52			0.07		0.62	0.35		0.70	0.66	
Uniform Delay, d1		20.2			18.2		24.7	6.7		28.3	11.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.0			0.1		7.7	0.3		77.4	2.1	
Delay (s)		22.1			18.3		32.5	7.0		105.8	13.6	
Level of Service		C			B		C	A		F	B	
Approach Delay (s)		22.1			18.3			13.0			15.9	
Approach LOS		C			B			B			B	

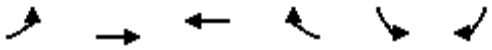
Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	57.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	72	69	40	410	444	53
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	80	77	44	456	493	59
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1067	523	552			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1067	523	552			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	86	96			
cM capacity (veh/h)	237	558	1028			

Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1
Volume Total	80	77	44	456	552
Volume Left	80	0	44	0	0
Volume Right	0	77	0	0	59
cSH	237	558	1028	1700	1700
Volume to Capacity	0.34	0.14	0.04	0.27	0.32
Queue Length 95th (ft)	36	12	3	0	0
Control Delay (s)	27.7	12.5	8.7	0.0	0.0
Lane LOS	D	B	A		
Approach Delay (s)	20.3		0.8		0.0
Approach LOS	C				

Intersection Summary			
Average Delay	2.9		
Intersection Capacity Utilization	46.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	28	173	109	85	85	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Hourly flow rate (vph)	31	192	121	94	94	39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	216				423	168
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	216				423	168
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	98				84	96
cM capacity (veh/h)	1366				576	865

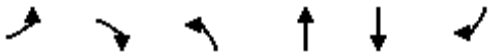
Direction, Lane #	EB 1	WB 1	SB 1	SB 2
Volume Total	223	216	94	39
Volume Left	31	0	94	0
Volume Right	0	94	0	39
cSH	1366	1700	576	865
Volume to Capacity	0.02	0.13	0.16	0.04
Queue Length 95th (ft)	2	0	15	4
Control Delay (s)	1.2	0.0	12.5	9.4
Lane LOS	A		B	A
Approach Delay (s)	1.2	0.0	11.6	
Approach LOS			B	

Intersection Summary			
Average Delay	3.2		
Intersection Capacity Utilization	38.5%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (vph)	91	210	344	111	543	429
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0		4.0	4.0	4.0	4.0
Lane Util. Factor	1.00		1.00	1.00	0.97	1.00
Frpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Flpb, ped/bikes	1.00		1.00	1.00	1.00	1.00
Frt	0.91		1.00	0.85	1.00	1.00
Flt Protected	0.99		1.00	1.00	0.95	1.00
Satd. Flow (prot)	1395		1636	1340	3131	1683
Flt Permitted	0.99		1.00	1.00	0.95	1.00
Satd. Flow (perm)	1395		1636	1340	3131	1683
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	96	221	362	117	572	452
RTOR Reduction (vph)	75	0	0	0	0	0
Lane Group Flow (vph)	242	0	362	117	572	452
Confl. Bikes (#/hr)			1		1	
Heavy Vehicles (%)	21%	8%	7%	11%	3%	4%
Turn Type				Free	Prot	
Protected Phases	8		2		1	6
Permitted Phases				Free		
Actuated Green, G (s)	17.6		21.0	69.3	18.7	43.7
Effective Green, g (s)	17.6		21.0	69.3	18.7	43.7
Actuated g/C Ratio	0.25		0.30	1.00	0.27	0.63
Clearance Time (s)	4.0		4.0		4.0	4.0
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	354		496	1340	845	1061
v/s Ratio Prot	c0.17		c0.22		c0.18	0.27
v/s Ratio Perm				0.09		
v/c Ratio	0.68		0.73	0.09	0.68	0.43
Uniform Delay, d1	23.3		21.6	0.0	22.6	6.5
Progression Factor	1.00		1.00	1.00	1.00	1.00
Incremental Delay, d2	5.4		5.3	0.1	2.2	0.3
Delay (s)	28.7		26.9	0.1	24.8	6.7
Level of Service	C		C	A	C	A
Approach Delay (s)	28.7		20.4			16.8
Approach LOS	C		C			B

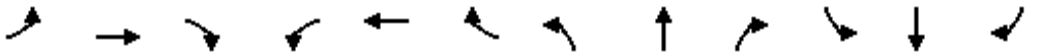
Intersection Summary			
HCM Average Control Delay	19.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	69.3	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (veh/h)	1	1	5	451	453	4
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	1	1	5	475	477	4
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	964	479	481			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	964	479	481			
tC, single (s)	6.4	6.2	4.4			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.4			
p0 queue free %	100	100	99			
cM capacity (veh/h)	284	591	972			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	2	5	475	481
Volume Left	1	5	0	0
Volume Right	1	0	0	4
cSH	384	972	1700	1700
Volume to Capacity	0.01	0.01	0.28	0.28
Queue Length 95th (ft)	0	0	0	0
Control Delay (s)	14.4	8.7	0.0	0.0
Lane LOS	B	A		
Approach Delay (s)	14.4	0.1		0.0
Approach LOS	B			

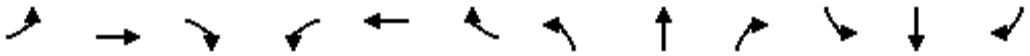
Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	36.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	0	0	56	2	241	37	616	0	0	557	639
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	0	0	59	2	254	39	648	0	0	586	673
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)								880				
pX, platoon unblocked	0.80	0.80		0.80	0.80	0.80				0.80		
vC, conflicting volume	1314	1313	586	1313	1313	648	586			648		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1268	1267	586	1267	1267	439	586			439		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	49	98	49	96			100		
cM capacity (veh/h)	55	131	514	114	131	498	979			908		

Direction, Lane #	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	61	254	39	648	586	673
Volume Left	59	0	39	0	0	0
Volume Right	0	254	0	0	0	673
cSH	115	498	979	1700	1700	1700
Volume to Capacity	0.53	0.51	0.04	0.38	0.34	0.40
Queue Length 95th (ft)	62	71	3	0	0	0
Control Delay (s)	67.2	19.5	8.8	0.0	0.0	0.0
Lane LOS	F	C	A			
Approach Delay (s)	28.8		0.5		0.0	
Approach LOS	D					

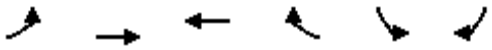
Intersection Summary				
Average Delay	4.2			
Intersection Capacity Utilization	60.8%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	358	6	17	0	0	0	0	295	78	207	419	0
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Frt	1.00	0.89						1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1583	1553						1716	1417	1614	1716	
Flt Permitted	0.95	1.00						1.00	1.00	0.95	1.00	
Satd. Flow (perm)	1583	1553						1716	1417	1614	1716	
Peak-hour factor, PHF	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	377	6	18	0	0	0	0	311	82	218	441	0
RTOR Reduction (vph)	0	13	0	0	0	0	0	0	55	0	0	0
Lane Group Flow (vph)	377	11	0	0	0	0	0	311	27	218	441	0
Heavy Vehicles (%)	5%	0%	0%	0%	0%	0%	0%	2%	5%	3%	2%	0%
Turn Type	Perm								Perm	Prot		
Protected Phases		4						2		1	6	
Permitted Phases	4								2			
Actuated Green, G (s)	19.5	19.5						22.3	22.3	12.8	39.1	
Effective Green, g (s)	19.5	19.5						22.3	22.3	12.8	39.1	
Actuated g/C Ratio	0.29	0.29						0.33	0.33	0.19	0.59	
Clearance Time (s)	4.0	4.0						4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0						3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	463	455						575	474	310	1007	
v/s Ratio Prot		0.01						c0.18		c0.14	0.26	
v/s Ratio Perm	c0.24								0.02			
v/c Ratio	0.81	0.02						0.54	0.06	0.70	0.44	
Uniform Delay, d1	21.9	16.8						18.0	15.0	25.1	7.6	
Progression Factor	1.00	1.00						1.00	1.00	1.00	1.00	
Incremental Delay, d2	10.5	0.0						3.6	0.2	7.1	1.4	
Delay (s)	32.4	16.8						21.6	15.3	32.2	9.0	
Level of Service	C	B						C	B	C	A	
Approach Delay (s)		31.5			0.0			20.3			16.7	
Approach LOS		C			A			C			B	

Intersection Summary			
HCM Average Control Delay	21.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	66.6	Sum of lost time (s)	12.0
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		

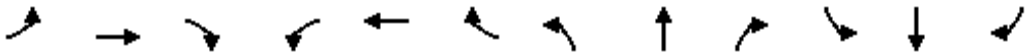
c Critical Lane Group



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	49	634	549	66	99	72
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	52	667	578	69	104	76
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	647				1383	613
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	647				1383	613
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	95				31	85
cM capacity (veh/h)	948				151	489

Direction, Lane #	EB 1	EB 2	WB 1	SB 1	SB 2
Volume Total	52	667	647	104	76
Volume Left	52	0	0	104	0
Volume Right	0	0	69	0	76
cSH	948	1700	1700	151	489
Volume to Capacity	0.05	0.39	0.38	0.69	0.15
Queue Length 95th (ft)	4	0	0	100	14
Control Delay (s)	9.0	0.0	0.0	70.3	13.7
Lane LOS	A			F	B
Approach Delay (s)	0.6		0.0	46.5	
Approach LOS				E	

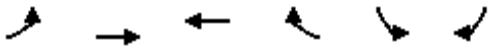
Intersection Summary			
Average Delay	5.7		
Intersection Capacity Utilization	55.0%	ICU Level of Service	B
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	124	549	1	13	457	100	4	28	40	44	11	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	131	578	1	14	481	105	4	29	42	46	12	63
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	586			579			1417	1453	578	1457	1401	534
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	586			579			1417	1453	578	1457	1401	534
tC, single (s)	4.1			4.1			7.1	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	87			99			95	73	92	34	90	89
cM capacity (veh/h)	999			1005			85	110	513	70	121	550

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	131	579	14	586	76	46	75
Volume Left	131	0	14	0	4	46	0
Volume Right	0	1	0	105	42	0	63
cSH	999	1700	1005	1700	190	70	355
Volume to Capacity	0.13	0.34	0.01	0.34	0.40	0.66	0.21
Queue Length 95th (ft)	11	0	1	0	44	74	20
Control Delay (s)	9.1	0.0	8.6	0.0	36.0	126.2	17.8
Lane LOS	A		A		E	F	C
Approach Delay (s)	1.7		0.2		36.0	59.3	
Approach LOS					E	F	

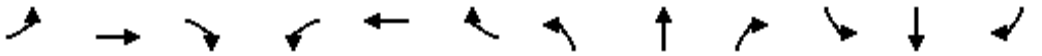
Intersection Summary				
Average Delay	7.4			
Intersection Capacity Utilization	59.5%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	89	472	515	22	14	73
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	94	497	542	23	15	77
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	565				1238	554
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	565				1238	554
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	91				92	86
cM capacity (veh/h)	1012				178	532

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	94	497	565	92
Volume Left	94	0	0	15
Volume Right	0	0	23	77
cSH	1012	1700	1700	403
Volume to Capacity	0.09	0.29	0.33	0.23
Queue Length 95th (ft)	8	0	0	22
Control Delay (s)	8.9	0.0	0.0	16.5
Lane LOS	A			C
Approach Delay (s)	1.4		0.0	16.5
Approach LOS				C

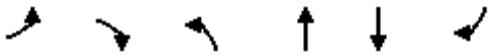
Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	194	349	62	0	397	55	26	29	1	23	38	99
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	204	367	65	0	418	58	27	31	1	24	40	104
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	476			433			1351	1284	400	1239	1288	447
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	476			433			1351	1284	400	1239	1288	447
tC, single (s)	4.1			4.1			7.2	6.6	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			60	77	100	78	70	83
cM capacity (veh/h)	1092			1138			69	132	654	109	133	616

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1	SB 2
Volume Total	204	433	0	476	59	64	104
Volume Left	204	0	0	0	27	24	0
Volume Right	0	65	0	58	1	0	104
cSH	1092	1700	1700	1700	94	122	616
Volume to Capacity	0.19	0.25	0.00	0.28	0.63	0.52	0.17
Queue Length 95th (ft)	17	0	0	0	75	62	15
Control Delay (s)	9.1	0.0	0.0	0.0	93.5	63.0	12.0
Lane LOS	A				F	F	B
Approach Delay (s)	2.9		0.0		93.5	31.5	
Approach LOS					F	D	

Intersection Summary				
Average Delay	9.4			
Intersection Capacity Utilization	57.9%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Volume (vph)	138	210	219	318	415	157
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1599	1430	1583	1667	1614	
Flt Permitted	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (perm)	1599	1430	1583	1667	1614	
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	144	219	228	331	432	164
RTOR Reduction (vph)	0	183	0	0	12	0
Lane Group Flow (vph)	144	36	228	331	584	0
Heavy Vehicles (%)	4%	4%	5%	5%	3%	8%
Turn Type		Perm	Prot			
Protected Phases	4		5	2	6	
Permitted Phases		4				
Actuated Green, G (s)	13.3	13.3	18.0	59.1	37.1	
Effective Green, g (s)	13.3	13.3	18.0	59.1	37.1	
Actuated g/C Ratio	0.17	0.17	0.22	0.74	0.46	
Clearance Time (s)	4.0	4.0	4.0	4.0	4.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	265	237	354	1225	745	
v/s Ratio Prot	c0.09		c0.14	0.20	c0.36	
v/s Ratio Perm		0.03				
v/c Ratio	0.54	0.15	0.64	0.27	0.78	
Uniform Delay, d1	30.8	28.7	28.3	3.5	18.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	2.3	0.3	4.0	0.1	5.4	
Delay (s)	33.0	29.0	32.3	3.6	23.7	
Level of Service	C	C	C	A	C	
Approach Delay (s)	30.6			15.3	23.7	
Approach LOS	C			B	C	

Intersection Summary			
HCM Average Control Delay	22.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	80.4	Sum of lost time (s)	12.0
Intersection Capacity Utilization	65.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Appendix 2F
Technical Memorandum #6: Preferred and Cost Constrained Alternatives

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TECHNICAL MEMORANDUM #6 – PREFERRED AND COST CONSTRAINED ALTERNATIVES

Date:	July 21, 2011	Project #: 11172.06
To:	Mark Willrett, City of Klamath Falls and Stan Strickland, Klamath County	
Cc:	Project Management Team, Technical Advisory Committee, and Citizen Advisory Committee	
From:	Susan Wright, P.E., Matt Kittelson, and Erin Ferguson	
Project:	Klamath Falls Urban Area Transportation System Plan Update	
Subject:	Technical Memorandum #6: Preferred and Cost Constrained Alternatives	

The purpose of this memorandum is to present the preferred and cost constrained alternatives for the Klamath Falls Urban Area Transportation System Plan (TSP) update. Previous technical memorandums documented existing and future conditions helping to identify existing and anticipated future system deficiencies. Alternatives for addressing those system deficiencies were presented in Technical Memorandum #5 Alternatives Analysis. The consultant team developed a preferred alternative using the input gathered from the Project Management Team (PMT), Technical Advisory Committee (TAC), and Citizen Advisory Committee (CAC) on the alternatives analysis as well as the goals and objectives documented in Technical Memorandum #2 Goals, Objectives and Evaluation Criteria. The cost constrained alternative was developed by identifying forecasted transportation funding and selecting the higher priority projects from the preferred plan that can be funded with forecasted funds. Project priorities were developed based on input from PMT, TAC, and CAC members as well identifying when a particular improvement would be needed. For example, intersection deficiencies that were identified under existing conditions were given a high priority and those that were identified is minor deficiencies under future conditions were given a low priority.

The draft preferred alternative identifies recommended policies as well as the high, medium, and low priority projects and refinement plans required to address the City of Klamath Falls' and Klamath County's goals for the urban area. The goals were documented in more detail in Technical Memorandum #2; they are listed below for reference.

- Goal 1 – Ensure a safe and efficient transportation system for all users.
- Goal 2 – Provide access to the transportation system for all users, including low income and minority populations.
- Goal 3 – Integrate adequate bicycle and pedestrian pathways, sidewalks, and bicycle lanes through the community, particularly to connect residential areas with schools and activity centers.
- Goal 4 – Improve the local circulation system to reduce the community's reliance on State Highways to travel to local destinations.
- Goal 5 – Build and maintain the transportation system to facilitate economic development in the region.
- 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.

Planning level cost estimates were generated for each project within the preferred alternative. These cost estimates were used to construct the cost constrained alternative to provide a more realistic plan based on the City's and County's financial constraints. The cost constrained alternative was developed to meet as many of the transportation goals as possible, while not exceeding the forecasted transportation funding.

PREFERRED ALTERNATIVE

This section outlines the policies, programs, studies and projects included in the draft preferred plan. These were identified based on a technical analysis of the Klamath Falls Urban Area transportation system and comments from the Project Management Team (PMT), Technical Advisory Committee (TAC), and Citizen Advisory Committee (CAC) members.

This section is divided into three subsections outlined below:

- **Policies** – This subsection details proposed policy modifications that should be considered for implementation within the Klamath Falls Urban Area.
- **Programs** – This subsection outlines proposed safety program recommended to address the safety focus intersections in the Klamath Falls Urban Area.
- **Studies** - This subsection outlines proposed studies or refinement plans for intersections and/or corridors throughout the Klamath Falls Urban Area.
- **Projects** – This subsection describers proposed capital improvement projects developed based on an analysis of existing and forecasted deficiencies of the transportation system within the Klamath Falls Urban Area.

Policies

The following subsection outline proposed policies that the City and County should consider adopting as part of the TSP update.

DEVELOPMENT REVIEW STANDARDS

The TSP should contain guidance language that would create a policy that requires an evaluation of the reliance on the state highway system as part of the development review process. This would not be a condition of approval, but would rather inform decision makers of potential travel patterns.

ALTERNATIVE MOBILITY STANDARDS ON STATE HIGHWAY

The TSP should contain language that would recommend the development of alternative mobility standards for key intersections on the state highway system in the Klamath Falls Urban Area in cases where those intersections are at or near identified mobility thresholds and capacity improvement projects are determined to be not economically feasible. Table 17 of this memorandum identifies intersections within the Klamath Falls Urban Area that are potential candidates for alternative mobility standards under the cost constrained plan.

Since facilities that exceed mobility standards can limit economic development in the vicinity of that facility, alternative mobility standards can to allow some development to occur in exchange for higher levels of congestion.

BICYCLE FACILITIES

The TSP should contain language that states bicycle facilities will be included on all new collectors and arterials built within the Urban Areas. However, many collectors and arterials currently exist that do not include area dedicated to bicyclists. Based on conversations together, the City and County have agreed upon the following approach to address these facilities:

- Evaluate the feasibility and cost of installing bicycle facilities on arterials and collectors, starting with the highest traveled arterials.
- If retrofitting is feasible, explore the advantages and disadvantages of striping actual lanes versus using bicycle symbols.

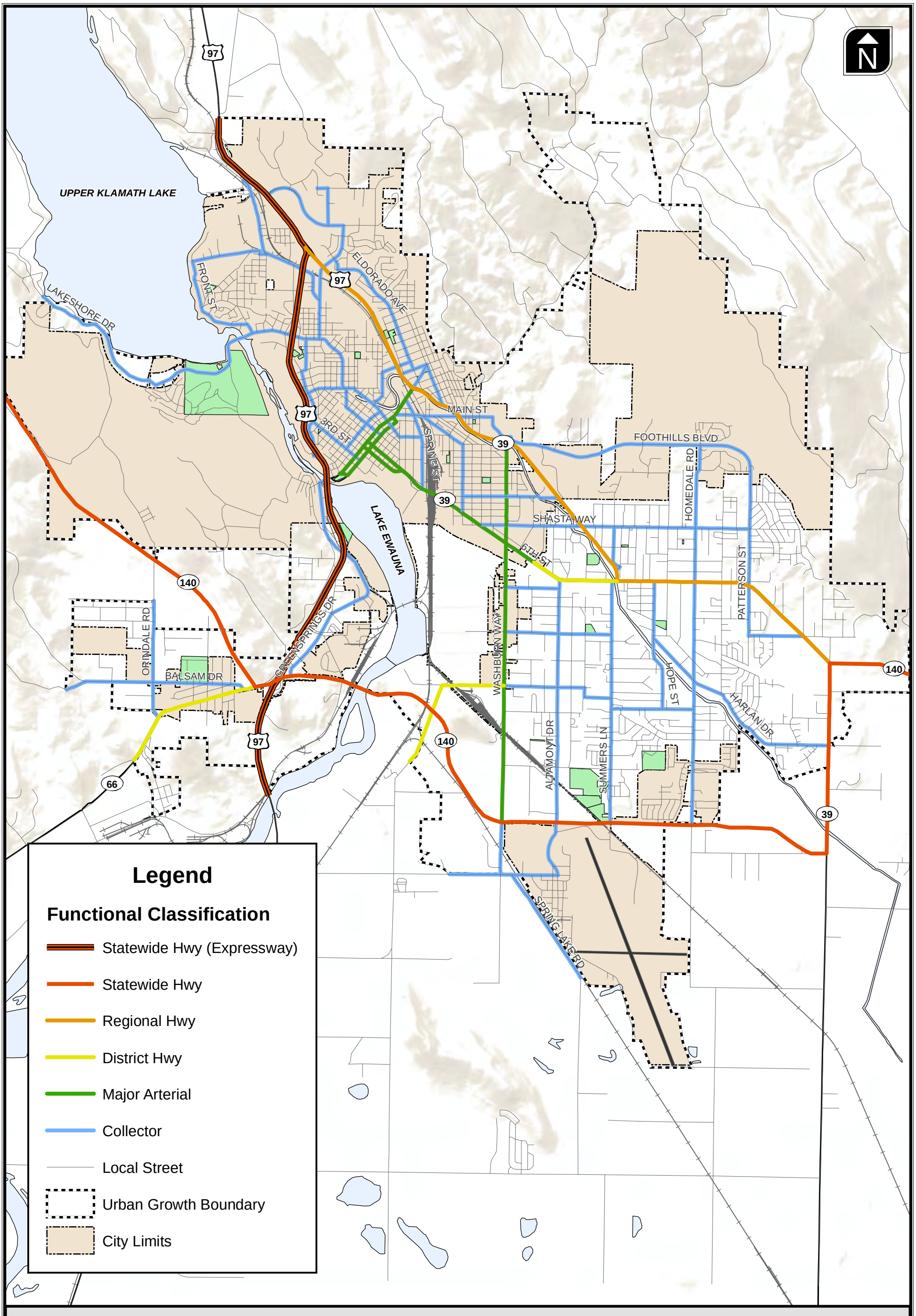
This approach will systematically evaluate the existing transportation system and install bicycle facilities where appropriate throughout the Urban Area.

ROADWAY CROSS-SECTIONS

Based on conversations between the City and County, both intend on maintaining their respective roadway cross-section standards. In addition, cross-section standards will be documented and maintained in separate City and County documents which the TSP will reference. As such, specific cross-section standards or guidance will not be included in the updated version of the Klamath Falls Urban Area TSP.

However, the City intends to modify their current functional classification system to only included "collectors," rather than differentiating between "major collectors" and "minor collectors." In addition, local streets will not be required to have dedicated bikes lanes on City or County Streets. Bike lanes will be built on all new collectors and arterials within the Urban Area and opportunities to provide bike lanes on arterials and then collectors through restriping will be evaluated. It is recommended that this type of evaluation be performed whenever arterials and collectors are being repaved.

Figure 1 shows a roadway functional classification map that eliminates the "major" and "minor" designation for collectors.



Proposed Functional Classifications

Figure 1

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ACCESS SPACING STANDARDS

Access management is the systematic implementation and control of the locations, spacing, design, and operations of driveways, median openings, interchanges, roundabouts, and street connections to a roadway, according to the Access Management Manual (AMM) (*1*). It involves roadway design applications, such as median treatments and auxiliary lanes, and the appropriate spacing and design of signalized intersections. Access management strives for a balanced transportation network with appropriate proportions and distributions of freeways, arterials, collectors, and local streets that are integrated with local land use activities.

Access management techniques and strategies help to preserve the transportation system investment, and guard against deteriorations in safety and increased congestion. Land use activities and property parcels are served with appropriate access by access management solutions, while safe and efficient movement of traffic is preserved.

The City of Klamath Falls, Klamath County and ODOT currently each have slightly different access spacing standards. The access spacing standards that apply to a specific roadway depends on the roadways functional classification and the jurisdictional responsibility (i.e., City, County, State).

To develop more standardized access spacing standards in the future, it is recommended that the spacing standards outline in Table 1 below be adopted as part of the updated TSP by the City, County, and ODOT. It should be noted that the driveway access spacing is measured from center-to-center of each driveway to the upstream or downstream driveway or intersection on one side of the roadway.

Table 1 **Recommended Access Spacing Standards**

Street Functional Classification	Intersection Spacing	Minimum Driveway Access Spacing	Residential Uses	Commercial Uses	Industrial Uses
Major Arterial	¼ mile	300 feet	No Direct Access	Shared Access Encouraged Left-Turn Lanes Determined through Review	
Collector	¼ mile	100 feet	Shared Access Encouraged	Shared Access Encouraged Left-Turn Lanes Determined through Review	
Local Street	Min. 400 feet Max. 600 feet	None	Curb Cut Minimum 45 feet to Curb Return	Curb Cut Minimum 50 feet to Curb Return	

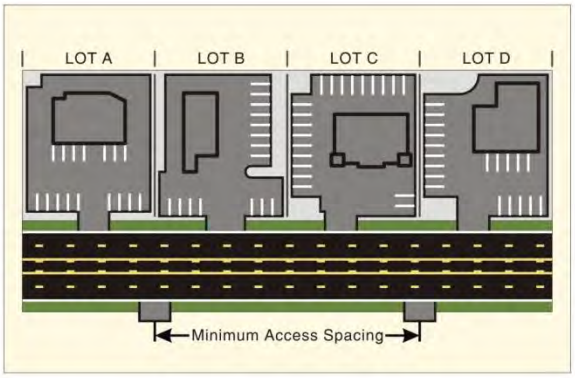
Adopting a common set of standards will ensure that new access locations meet uniform standards throughout the Urban Area. However, many existing access locations exist that may not meet the standards ultimately adopted. As such, an effort should be made to consolidate access locations where spacing is too dense, over time, as redevelopment occurs.

The City of Klamath Falls and Klamath County should consider implementing the following policies, as part of every land use action, in order to maintain and/or improve traffic operations and safety along the arterial and collector roadways. Access decisions should be based upon the review of an approved traffic study prepared according to proposed Traffic Impact Analysis guidelines (see Appendix C).

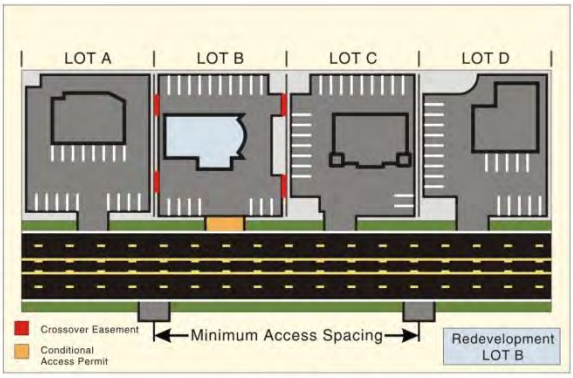
- Developments with frontage on two roadways should take locate their driveways on the lower functional classified roadway.
- Access driveways should be located to align with opposing driveways.
- Multiple driveways may be permitted so long as they meet the driveway access spacing standards.
- If spacing standards cannot be met, effort should be made to consolidate access points with neighboring properties.
- Where standards cannot be met and joint access is not feasible, temporary conditional access can be granted with the provision of crossover easements on compatible parcels (considering topography, access, and land use) to facilitate future access between adjoining parcels.
- Right-of-way dedications may be provided to facilitate the future planned roadway system in the vicinity of proposed developments.
- Half-street improvements (sidewalks, curb and gutter, bike lanes/paths, and/or travel lanes) may be provided along site frontages that do not have full build-out improvements in place at the time of development.

Exhibit 1 on the following page illustrates the application of cross-over easements and conditional access permits over time to achieve the desired access management objectives. The individual steps are described in Table 2, following Exhibit 1. As illustrated in the figure and supporting table, using these guidelines, all driveways along city, county, and state roadways will eventually move in the overall direction of the access spacing standards as development and redevelopment occur along a given street.

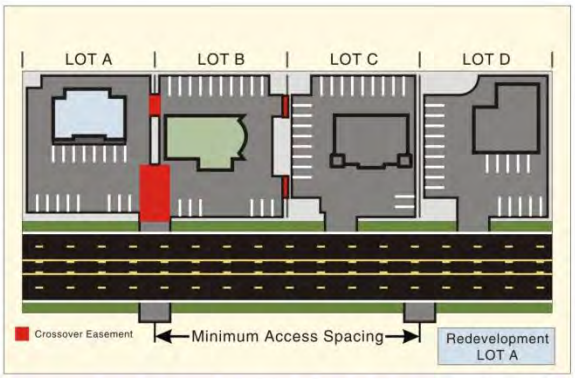
Exhibit 1 Example of Cross-over Easement/Indenture/Consolidation/Conditional Access Process



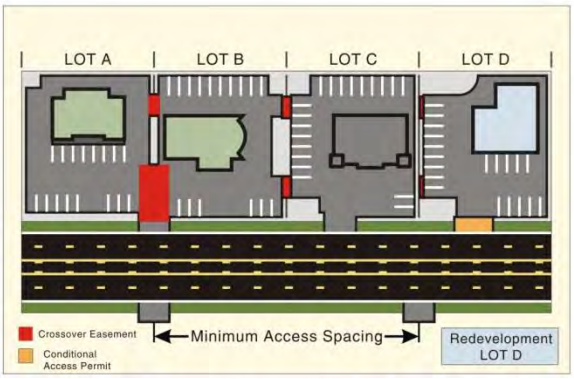
EXISTING CONDITIONS



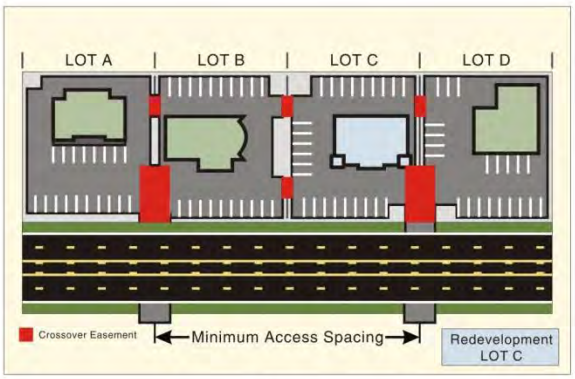
STEP 1
REDEVELOPMENT OF LOT B



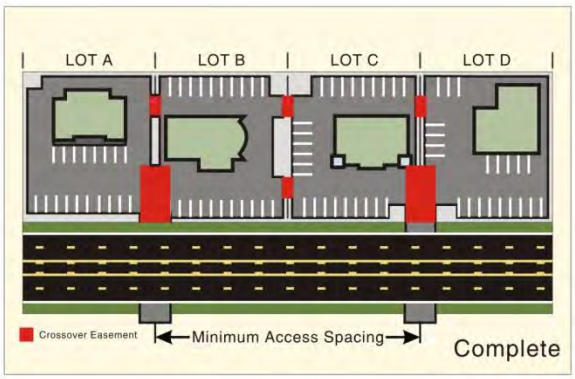
STEP 2



STEP 3



STEP 4



STEP 5

Table 2 **Example of Crossover Easement/Indenture/Consolidation - Conditional Access Process**

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria of 300 feet nor align with driveways or access points on the opposite side of the roadway. Under these conditions motorists are into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the roadway.
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the City or County would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the City/County/ODOT would issue conditional permits for the development to provide crossover easements with Lots A and C, and City/County/ODOT would grant a conditional access permit to the lot. After evaluating the land use action, the City/County/ODOT would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria set forth for segment of roadway.
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the City/County/ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario the City/County/ODOT would use the previously obtained cross-over easement at Lot B consolidate the access points of Lots A and B. City/County/ODOT would then relocate the conditional access of Lot B to align with the opposing access point and provide and efficient access to both Lots A and B. The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the roadway, but will also eliminate the conflicting left-turn movements the roadway by the alignment with the opposing access point.
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access the shared site-access driveway of Lots A and B. By using the crossover agreement and conditional access permit process, the City/County/ODOT be able to eliminate another access point and provide the alignment with the opposing access points.
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will meet the access spacing standard.

ADDITIONAL ACCESS MANAGEMENT TREATMENTS

Several corridors warrant more attention to access management than the above proposed programmatic improvement of access spacing over time as part of land use actions. Sound access management principals should be emphasized at these locations to improve access management more rapidly as development and redevelopment occur. In addition, more proactive improvements to control permitted turning movements should be considered.

This could include treatments such as center raised medians that restrict access to right-in/right-out only, or right-in/right-out/left-in in some cases. Medians with openings for left-turn lanes off of a facility resulting in right-in/right-out/left-in access points provide significant improvement in safety

while still providing a high level of property access. Consolidating driveways from multiple parcels to mid-block locations is critical to being able to provide effective right-in/right-out/left-in access in locations where medians are warranted due to safety concerns.

According to Action 3B.3 of the Oregon Highway Plan, non-traversable medians should be considered on state highways when any of the following criteria are met, although similar consideration should be given on City and County roads under similar circumstances:

- Forecasted average daily traffic is anticipated to be 28,000 vehicles per day during the 20-year planning period;
- The annual accident rate is greater than the statewide annual average accident rate for similar roadways;
- Pedestrians are unable to safely cross the highway, as demonstrated by an accident rate that is greater than the statewide annual average accident rate for similar roadways; and/or
- Topography and horizontal or vertical roadway alignment result in inadequate left-turn intersection sight distance and it is impractical to relocate or reconstruct the connecting approach road or impractical to reconstruct the highway in order to provide adequate sight distance.

The following corridors have been identified for this level of effort:

- Shasta Way
- Washburn Way
- South 6th Street

The specific corridors recommended for more focused access management refinement efforts are discussed further below. The observed access spacing that exists today for each of these corridors is shown in Table 3.

Table 3 **Observed Average Access Point Spacing**

Corridor	Segment	Jurisdiction	Average Spacing	Existing Minimum Spacing Standard
South 6th Street	Shasta Way to Washburn Way	City	145 feet	22 feet
	Washburn Way to Altamont Drive	City	150 feet	22 feet
	Altamont Drive to Crater Lake Parkway	County	120 feet	300 feet
Washburn Way	Shasta Way to South 6th Street	City	120 feet	22 feet
	South 6th Street to Hilyard Avenue	City	290 feet	22 feet
	Hilyard Avenue to Laverne Avenue	City	245 feet	22 feet
Shasta Way	South 6th Street to Washburn Way	City	130 feet	22 feet
	Washburn Way to Avalon Street	City	130 feet	22 feet
	Avalon Street to Crater Lake Parkway	County	160 feet	100 feet

Aerial photo maps of each corridor are contained in Appendix A.

Washburn Way

Washburn way south of Shasta Way serves as a major commercial area within Klamath Falls. Many existing developments along this corridor have undefined access to and from Washburn Way. This arrangement creates operational and safety concerns that will likely increase as future develop occurs in the area.

The intersection of Washburn Way / Shasta Way has been identified as having a crash rate that exceeds the critical crash rate.

South 6th Street

South 6th Street serves as a commercial center for Klamath Falls residents as well as a route for regional trips passing through the Urban Area. As such, access and mobility along this corridor should be carefully considered and balanced.

The segments along South 6th Street from Summers Lane to Fargo Street and from Homedale Road to Madison Street have been identified as having a crash rate that exceeds the critical crash rate.

Shasta Way

Shasta Way is a corridor that runs parallel to South 6th Street and serves as an alternative route. As development occurs within the Urban Area, congestion along Shasta Way will likely rise. As such, specific standards should be outlined that maintain a high level of mobility while allowing for additional development in the area to occur.

The intersection of Washburn Way / Shasta Way and the segment along Shasta Way from South 6th Street to Crater Lake Parkway have been identified as having a crash rate that exceeds the critical crash rate.

Programs

A number of safety focus intersections have been identified through this planning process that each warrant a more in-depth evaluation to determine the countermeasures that have the potential to provide the most benefit. In addition, the critical crash areas are likely to change over the course of the plan horizon. As such, a programmatic approach to safety (i.e., dedicating a specified sum of capital improvement dollars to studying and improving identified safety deficiencies each year) is recommended. Specifically, the following is recommended:

- $30,000 - $50,000/year – Study of safety deficiencies
- $100,000 - $120,000/year – Safety related capital improvements

Table 4 outlines twelve safety focus intersections that should programmed for evaluation and potential improvements over the next twelve years. The need for these studies were identified through a safety analysis of the transportation system within the Urban Area and comments received from the program management team, project stakeholders, and the general public.

Table 4 **Safety Program Facilities**

Project Number	Name	Description	Cost	Priority
SA1	Improve bicycle facilities at the intersection of Biehn Street/Campus Drive	Would improve bicycle facilities at the intersection of Biehn Street/Campus Drive by providing clearer routes through the intersection for bicycle users.	$30,000	High
SA2	Bicycle crossing of OR 39	Would provide a bicycle connection across OR 39 from Esplanade Avenue to Melrose Street	$30,000	High
SA3	Safety Improvements on Klamath Avenue from Main Street to 3rd Street	City monitor on an annual basis.	$50,000	Low
SA4	Safety Improvements on Shasta Way from South 6th Street to Washburn Way	Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street. Investigate feasibility of installing a raised median.	$50,000	Low
SA5	Safety Improvements at Washburn Way & Shasta Way	Conduct site visit to confirm traffic signal head visibility on southbound approach. Depending on visibility, investigate ways to improve signal head visibility such as installing near-side traffic signals for approaching vehicles.	$30,000	Low
SA6	Safety Improvements on Shasta Way from Washburn Way to OR 39	Conduct a focused safety study of the segment in conjunction with PRJ-2. Focus of study to identify contributing factors to crashes and determine potential countermeasures to reduce crashes.	$50,000	Medium
SA7	Safety Improvements at OR 39 & Eberlein Avenue	Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.	$30,000	Low
SA8	Improve bicycle facilities at the intersection of Summers Lane/South 6th Street	Would improve bicycle and pedestrian facilities at the intersection of Summers Lane/South 6th Street	$30,000	High
SA9	Safety Improvements on South 6th Street from Summers Lane to Fargo Street	Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street.	$50,000	High
SA10	Safety Improvements on South 6th Street from Homedale Road to Madison Street	Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street. Investigate feasibility of installing a raised median.	$50,000	Medium
SA11	Safety Improvements at Altamont Drive & Laverne Avenue	Conduct intersection study to determine existing available sight distance, prevailing speeds on major street, and feasibility of a roundabout. Develop and compare alternative improvement measures to reduce crashes.	$30,000	High

Project Number	Name	Description	Cost	Priority
SA12	Safety Improvements at OR 140 & Summers Lane	Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.	$30,000	Medium
SA13	Safety Improvements at OR 140 & Homedale Drive	Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.	$30,000	Low
SA14	Safety Improvements at OR 140 & OR 39 (South of Big Y)	Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.	$30,000	Medium
SA15	Safety Improvements on OR 140 from Western UGB to OR 66	Conduct study to determine feasibility of shoulder rumble strips, increased roadside delineation and other similar measures to mitigate crashes. Based on study, implement mitigation measures.	$50,000	Low

Note: SA = safety study

Studies

Table 5 shows a variety of studies and refinement plans that are included in the preferred alternative plan. These projects reflect studies that are needed to generate refinement plans for given corridors or explore different improvements to the transportation system, such as the implementation of advanced signal systems.

Table 5 **Preferred Alternative Future Refinement Studies**

Project Number	Name	Description	Cost	Priority
ST1	Crater Lake Parkway Corridor Improvement Study	Would conduct a study that would identify evaluate key intersections along the corridor and identify improvements needed to serve users.	$100,000	High
ST2	Shasta Way Corridor Improvement Study	Would conduct a study that would identify evaluate key intersections along the corridor and identify improvements needed to serve users.	$100,000	Low

Project Number	Name	Description	Cost	Priority
ST6	Traffic Signal Retiming Study	Would conduct a study that would evaluate existing signalized intersections and optimize timing plans to better serve traffic conditions.	$150,000	High
ST7	Advanced Signal Systems Study	Would conduct a study that would evaluate adaptive signal systems in Klamath Falls focused on key travel corridors.	$150,000	High

Note: ST = proposed study

Projects

As shown in Table 6, a variety of roadway and intersection improvement projects are identified for inclusion in the preferred plan. However, many of the new roadway construction projects are categorized as "development driven," meaning that those projects would be constructed based on needs related to future development patterns and are likely to be constructed by development as frontage improvements or subdivision requirements. As such, no timeline is designated for construction of these projects. Similarly, funds for construction of these projects will likely be generated from the developments each would serve, not come out of City or County capital improvement funds.

Table 6 **Preferred Alternative Roadway Projects and Future Refinement Studies**

Project Number	Name	Description	Cost	Priority
R1	New Minor Collector from Dan O'Brien Way to Dahlia Street	Would create a new connection from Dan O'Brien Way to Dahlia Street.	$8,216,418	Development Driven
R2	Daggett Avenue Extension	Would extend existing Daggett Avenue alignment north to Dan O'Brien Way.	$1,737,524	Development Driven
R3	Dahila Street Extension	Would extend existing Dahila Street alignment north to Dan O'Brien Way (near Industrial Park Drive)	$881,859	Development Driven
R4	Crescent Avenue Extension	Would extend the existing Crescent Avenue alignment north to Biehn Street.	$6,752,660	Development Driven
R5	Washburn Way Extension	Would extend current alignment of Washburn Way north to Old Fort Road.	$5,801,933	Development Driven
R6	Roadway from Foothill Blvd to Homedale Road Extension	Roadway would extend north from Foothills Boulevard near Beverly Drive.	$8,654,149	Development Driven
R7	Extend Homedale Road to Old Fort Road	Roadway would extend north from the Homedale Road/Foothills Boulevard intersection to Old Fort Road.	$17,454,548	Development Driven

Project Number	Name	Description	Cost	Priority
R8	East Main Street Extension	Would extend East main Street from the intersection of East main Street/South 6th Street to the intersection of Washburn Way/Crosby Avenue.	$11,820,000	Development Driven
R9	Upgrade Emerald Street	Would upgrade Emerald Street south of OR 66 to serve future development in the area.	$1,666,219	Development Driven
R10	New Roadway South of OR 66/OR140	Would construct a new roadway that would extend south from the OR66/OR140 intersection.	$2,574,273	Development Driven
R11	Hilyard Avenue Extension	Would connect the eastern portion of Hilyard Avenue to Homedale Road.	$2,168,395	Medium
R12	New Collector from Hilayrd Avenue to Harlan Drive	Would create a new connection from Hilyard Avenue to Harland Drive.	$6,651,487	Development Driven
R13	Washburn Way Realignment	Would realign Washburn Way to connect with Joe Wright Road east of the railroad track alignment	$2,389,023	High
I1	OR 39/Biehn Street/Campus Drive Intersection	Construct a northbound left-turn lane. Would require the construction of an additional receiving lane.	$839,312	Low
I2	Biehn Street/Oregon Avenue Intersection	Construct a southbound left-turn lane.	$164,016	Medium
I3	Main Street/OR 39 Intersection	Modify signal timings to better serve existing and future demand.	$195,000	Low
I4	OR 39/Washburn Way Intersection	Modify signal phasing to provide protected/permitted phasing northbound, permitted phasing southbound, overlap phasing for eastbound right-turn, and overlap phasing for southbound right-turn.	$195,000	High
I5	Eberlein Avenue/OR 39 Intersection	Install traffic signal.	$507,000	Medium
I6	OR 39/Shasta Way Intersection	Modify signal phasing to provide protected/permitted phasing on Shasta Way.	$195,000	Low
I7	Shasta Way/Homedale Road Intersection	Install traffic signal.	$507,000	Medium
I8	Fargo Street/OR 39 Intersection	Install traffic signal.	$526,500	Medium
I9	Homedale Road/OR 39 Intersection	Construct eastbound right-turn lane. Would likely impact adjacent parking lot.	$743,066	High
I10	Midland Highway/OR 140 Intersection	Construct westbound auxiliary through lane.	$1,727,505	Low
I11	Summers Lane/Clinton Avenue Intersection	Install traffic signal.	$507,000	Medium
I12	OR 39/OR 140 (Big Y) Intersection	Construct southbound left-turn lane. Would require second receiving lane and would likely impact adjacent parcels.	$825,453	High
I13	Washburn Way/OR 140 Eastbound Ramps Intersection	Install traffic signal	$507,000	High

Project Number	Name	Description	Cost	Priority
I14	OR 39/OR 140 (South of Big Y) Intersection	Install traffic signal	$507,000	Medium

Note: I = intersection project, R = roadway project

As shown in Table 7, six pedestrian projects have been identified for inclusion in the preferred plan, all of which have been labeled as high priority projects because they fill existing holes in the pedestrian system in high priority locations, such as along major roadways that experience pedestrian traffic or in the vicinity of schools.

Table 7 **Preferred Alternative Pedestrian Projects**

Project Number	Name	Description	Cost	Priority
P1	Daggett Avenue Sidewalks: El Dorado Avenue to Clairmont Drive	Would add sidewalks to both sides of the street	$355,484	High
P2	El Dorado Avenue Sidewalks: Van Ness to Daggett Avenue	Would add sidewalks to one side of the street	$820,093	High
P3	Washburn Way Sidewalks: Crater Lake Parkway to Shasta Way	Would add sidewalks to both sides of the street	$1,523,167	High
P4	Eberlein Avenue Sidewalks: Washburn Way to Canal	Would add sidewalks to both sides of the street	$619,868	High
P5	Crosby Avenue Sidewalks: Washburn Way to Altamont Drive	Would add sidewalks to both sides of the street	$1,117,713	High
P6	Laverne Avenue to Clinton Street Sidewalks	Would add sidewalks to both sides of the street	$2,357,450	High

Note: P = pedestrian project

As shown in Table 8, several bicycle and multi-use pathway projects were identified for inclusion in the draft preferred plan. In addition, several studies were identified that are needed to outline system connectivity options or safety improvements related to bicycle facilities.

Table 8 **Preferred Alternative Bicycle Projects**

Project Number	Name	Description	Cost	Priority
B1	Washburn Way Bicycle Lanes: Eberlein Avenue to South 6th Street	Would add bike lanes to both sides of the street	$2,570,497	High
B2	Shasta Way Bicycle Lanes: South 6th Street to Patterson Street	Would add bike lanes to both sides of the street	$10,569,865	Low
M1	Extend OC&E trail to downtown	Would extend the existing alignment of the OC&E trail to serve downtown Klamath Falls	$5,485,000	High
M2	Extend OC&E trail to Klamath Community College	Would extend the existing alignment of the OC&E trail to serve the area in the vicinity of Klamath Community College	$218,960	High
M3	New Multi-Use Path Along Foothillls Boulevard	Would construct a multi-use path along Foothills Boulevard to serve users in the area.	$1,409,801	High
M4	Multi-use Path Along Lakeshore Drive	Would construct a new multi-use path from the Link River Trail to the Western UGB	$2,114,702	Low

Note: B = bicycle project, M = multi-use path project

Table 9 shows the transit projects that have been included in the draft preferred alternative plan. In general, improvements to the transit system are directed at increasing the frequency and operating hours of Route 1. However, based on the current Basin Transit route configuration, the operations of Route 1 and Route 2 are linked based on driver route patterns. As such, modifications to Route 1 should also consider subsequent improvements to Route 2. The cost estimates shown in Table 5 reflect this reality. In addition, it should be noted that modifications to the transit system would result in additional yearly expenses, not just one time improvement costs. Because of this, outside funding sources aside from traditional capital improvement funds would likely be necessary to fund these projects.

Table 9 **Preferred Alternative Transit Projects**

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

Note: T = transit project

Figure 2 shows each project of the preferred plan and its location.

UPPER KLAMATH LAKE
WOCUS RD
HARBOR ISLES BLVD
WEST RIDGE DR
RIVERSIDE DR
LAKE EWAUNA
ORINDALE RD
BALSAM DR
DELTA ST
UPHAM ST
5TH ST
ELDORADO AVE
OLD FORT RD
FOOTHILLS BLVD
SHASTA WAY
6TH ST
HOPE ST
LAVERNE AVE
BRISTOL AVE
WASHBURN WAY
ALTAMONT DR
SUMMERS LN
JOE WRIGHT RD
SLAND RD
TINGLEY LN
SPRING LAKE RD
OLD MIDLAND RD
SHORT RD
97
140
66
39

R1 R2 R3 R4 R5 R6 R7 R8 R9 R10 R11 R12 R13
P1 P2 P3 P4 P5 P6
SA1 SA2 SA3 SA4 SA5 SA6 SA7 SA8 SA9 SA10 SA11 SA12 SA13 SA14 SA15
M1 M2 M3 M4
B1 B2
I1 I2 I3 I4 I5 I6 I7 I8 I9 I10 I11 I12 I13 I14

Legend

- # Intersection Projects
- New Roadways
- Safety Program Intersections
- Safety Program Segments
- New Multi-Use Path
- Pedestrian Projects
- Bicycle Projects
- Urban Growth Boundary

Draft Preferred Plan Projects

Figure 2

H:\profile\11172 - Klamath Falls TSP\gis\Memo\Fig02 - Draft Preferred Plan Projects.mxd

Preferred Plan Summary

As shown in Table 10, the vast majority of costs associated with transportation improvement projects within the Klamath Falls Urban Area have been identified as "Development Driven" projects. This is because many of the expensive new roadway construction projects identified in the preferred plan would serve future development areas. As such, local capital improvement funds are not expected to fund these projects.

Table 10 **Total Planning Level Preferred Alternative Improvement Costs**

Project Type	0-5 Year High Priority	5-15 Year Medium Priority	15-25 Year Low Priority	Total	*Development Driven*
Capital Improvement Projects					
Roadway	$4,659,542	$4,886,916	$2,956,812	$12,503,270	*$72,211,070*
Pedestrian	$6,793,775	$0	$0	$6,793,775	*$0*
Bicycle	$9,684,258	$0	$12,684,567	$22,368,825	*$0*
Refinement Studies	$400,000	$0	$100,000	$500,000	*$0*
Safety Program	$750,000	$1,500,000	$1,500,000	$3,750,000	*$0*
Total	**$22,287,575**	**$6,386,916**	**$17,241,379**	**$45,915,870**	**-**
Operations Costs					
Transit	$0	$0	$1,600,000/yr	$1,600,000/yr	$0

Note: Development driven projects and transit projects are excluded from totals because these projects are not expected to use capital improvement dollars.

Available Funding

Table 11 shows the expected funds to be available for capital improvement projects. These projects are based on the assumption that current funding levels for the City and County are constant through the horizon year of this study. However, the funds available to the City and the County are both strongly tied to the continuation of the Federal Forest Receipts. The longevity of the receipts passed 2012 is currently in doubt due to funding scenarios being explored by the federal government. Without these Forest Receipts, the future transportation funds available for capital improvements is essentially $0.

Table 11 **Forecast Future Transportation Funding**

Funding Source	0-5 Year Forecast High Priority Projects	5-15 Year Forecast Medium Priority Projects	15-25 Year Forecast Low Priority Projects	Total
City	$2,750,000	$5,500,000	$5,500,000	$13,750,000
County	$3,750,000	$7,500,000	$7,500,000	$18,750,000
Total	**$6,500,000**	**$13,000,000**	**$13,000,000**	**$32,500,000**

Assumptions: City has an estimated $550,000/yr for capital improvement projects.
County has an estimated $750,000/yr for capital improvement projects
Federal forest receipts continue to be funded

COST CONSTRAINED ALTERNATIVE

The cost constrained alternative described below outlines a draft cost constrained alternative plan based on the estimated cost of the projects identified in the preferred plan compared to the funds expected to be available for capital improvement projects.

This section is divided into three subsections outlined below:

- **Programs** – This subsection outlines proposed safety program recommended to address the safety focus intersections in the Klamath Falls Urban Area.
- **Studies** - This subsection outlines proposed studies or refinement plans for intersections and/or corridors throughout the Klamath Falls Urban Area.
- **Projects** – This subsection describers proposed capital improvement projects developed based on an analysis of existing and forecasted deficiencies of the transportation system within the Klamath Falls Urban Area.

The policy section is not included in the cost constrained alternative because money associated with the implementation of those policies will likely not come from capital improvement dollars.

Cost Constrained Programs

The programmatic safety improvement approach is assumed to be part of the cost constrained plan with an estimated cost of $150,000/year. See the Preferred Plan for the list of twelve priority locations.

Cost Constrained Studies

Table 12 shows the cost constrained project list of proposed studies and refinement plans.

Table 12 **Cost Constrained Future Refinement Plans and Studies**

Project Number	Name	Description	Cost	Priority
ST1	Crater Lake Parkway Corridor Improvement Study	Would conduct a study that would identify evaluate key intersections along the corridor and identify improvements needed to serve users.	$100,000	High
ST2	Shasta Way Corridor Improvement Study	Would conduct a study that would identify evaluate key intersections along the corridor and identify improvements needed to serve users.	$100,000	Low
ST6	Traffic Signal Retiming Study	Would conduct a study that would evaluate existing signalized intersections and optimize timing plans to better serve traffic conditions.	$150,000	High
ST7	Advanced Signal Systems Study	Would conduct a study that would evaluate adaptive signal systems in Klamath Falls focused on key travel corridors.	$150,000	High

Note: I = intersection project, P = pedestrian project, B = bicycle project, T = transit project, ST = proposed study, SA = safety study

Cost Constrained Projects

This section details the cost constrained project list based on the preferred plan and funds expected to be available.

Table 13 shows the cost constrained roadway and intersection projects. This project list has been modified from the preferred plan to reflect anticipated funds that will be available. As such, projects have been removed or priorities have been changed to match funds available during each time period. Most notably, this list excludes projects from the preferred plan that are expected to be constructed as future development occurs.

Table 13 **Cost Constrained Roadway and Intersection Projects**

Project Number	Name	Description	Cost	Priority
R11	Hilyard Avenue Extension	Would connect the eastern portion of Hilyard Avenue to Homedale Road.	$2,168,395	Medium
R13	Washburn Way Realignment	Would realign Washburn Way to connect with Joe Wright Road east of the railroad track alignment	$2,389,023	Medium
I2	Biehn Street/Oregon Avenue Intersection	Construct a southbound left-turn lane.	$164,016	Medium

Project Number	Name	Description	Cost	Priority
I4	OR 39/Washburn Way Intersection	Modify signal phasing to provide protected/permitted phasing northbound, permitted phasing southbound, overlap phasing for eastbound right-turn, and overlap phasing for southbound right-turn.	$195,000	High
I5	Eberlein Avenue/OR 39 Intersection	Install traffic signal.	$507,000	Low
I7	Shasta Way/Homedale Road Intersection	Install traffic signal.	$507,000	Low
I8	Fargo Street/OR 39 Intersection	Install traffic signal.	$526,500	Medium
I9	Homedale Road/OR 39 Intersection	Construct eastbound right-turn lane. Would likely impact adjacent parking lot.	$743,066	High
I11	Summers Lane/Clinton Avenue Intersection	Install traffic signal.	$507,000	Medium
I12	OR 39/OR 140 (Big Y) Intersection	Construct southbound left-turn lane. Would require second receiving lane and would likely impact adjacent parcels.	$825,453	High
I13	Washburn Way/OR 140 Eastbound Ramps Intersection	Install traffic signal	$0[1]	N/A[1]
I14	OR 39/OR 140 (South of Big Y) Intersection	Install traffic signal	$507,000	Medium

Note: [1]Project I13 has been identified for STIP funding, therefore its cost is not included in the cost constrained plan.
R = roadway project, I = intersection project
Red text indicates a change in priority from the preferred plan.

Table 14 displays the cost constrained pedestrian project list. These projects are the same as those in the preferred plan, though the priorities of some have been changed to match funds that are anticipated to be available.

Table 14 **Cost Constrained Pedestrian Projects**

Project Number	Name	Description	Cost	Priority
P1	Daggett Avenue Sidewalks: El Dorado Avenue to Clairmont Drive	Would add sidewalks to both sides of the street	$355,484	High
P2	El Dorado Avenue Sidewalks: Van Ness to Daggett Avenue	Would add sidewalks to one side of the street	$820,093	High
P3	Washburn Way Sidewalks: Crater Lake Parkway to Shasta Way	Would add sidewalks to both sides of the street	$1,523,167	Medium
P4	Eberlein Avenue Sidewalks: Washburn Way to Canal	Would add sidewalks to both sides of the street	$619,868	High
P5	Crosby Avenue Sidewalks: Washburn Way to Altamont Drive	Would add sidewalks to both sides of the street	$1,117,713	Medium
P6	Laverne Avenue to Clinton Street Sidewalks	Would add sidewalks to both sides of the street	$2,357,450	Medium

Note: P = pedestrian project
Red text indicates a change in priority from the preferred plan.

Table 15 shows the cost constrained bicycle projects. Most notably, the project to install bicycle lanes on Shasta Way has been removed due to the significant cost associated with this effort. As such, this project was removed from the cost constrained plan to make way for multiple other beneficial capital improvement projects.

Table 15 **Cost Constrained Bicycle Projects and Refinement Studies**

Project Number	Name	Description	Cost	Priority
B1	Washburn Way Bicycle Lanes: Eberlein Avenue to South 6th Street	Would add bike lanes to both sides of the street	$2,570,497	Low
M1	Extend OC&E trail to downtown	Would extend the existing alignment of the OC&E trail to serve downtown Klamath Falls	$5,485,000	Low

Project Number	Name	Description	Cost	Priority
M2	Extend OC&E trail to Klamath Community College	Would extend the existing alignment of the OC&E trail to serve the area in the vicinity of Klamath Community College	$218,960	High
M3	New Multi-Use Path Along Foothillls Boulevard	Would construct a multi-use path along Foothills Boulevard to serve users in the area.	$1,409,801	High
M4	Multi-use Path Along Lakeshore Drive	Would construct a new multi-use path from the Link River Trail to the Western UGB	$2,114,702	Low

Note: B = bicycle project, M = multi-use path project
Red text indicates a change in priority from the preferred plan.

Cost Constrained Summary

The projects in the cost constrained plan address many of the identified needs within the Klamath Falls Urban Area and can be funded by the horizon year of the update TSP if current funding levels stay constant. The notable exceptions to this are transit improvement projects, given that these projects would require yearly funds, not just one time capital improvement funds, and most of the new roadway projects which are expected to be built as needed for development to occur with funding tied to the development process.

However, this analysis is largely based on the continuation of the Federal Forest Receipts. This funding source accounts for the vast majority of the capital improvement dollars that both the City and County expect to have in the future. If this funding source is stopped as it is currently planned to by 2012, the future funding for capital improvement projects within the Urban Area is essentially $0 and an alternative funding source will be necessary to make maintain and provide improvements to the transportation system.

Table 16 below shows a summary of the cost constrained plan and the funding expected to be available through the horizon year periods.

Table 16 **Cost Constrained Funding Summary**

Project Type	0-5 Year High Priority	5-15 Year Medium Priority	15-25 Year Low Priority	Total
Cost Constrained Projects, Studies, and Programs				
Roadway	$1,763,519	$6,261,934	$1,014,000	$9,039,453
Pedestrian	$1,795,445	$4,998,350	$0	$6,793,795
Bicycle	$1,628,701	$0	$10,170,199	$11,798,900
Refinement Studies	$400,000	$0	$100,000	$500,000
Safety Program	$750,000	$1,500,000	$1,500,000	$3,750,000
Total	**$6,337,665**	**$12,760,284**	**$12,784,199**	**$31,882,148**
Available Funding				
City	$2,750,000	$5,500,000	$5,500,000	$13,750,000
County	$3,750,000	$7,500,000	$7,500,000	$18,750,000
Total	**$6,500,000**	**$13,000,000**	**$13,000,000**	**$32,500,000**

Table 17 shows the projects included in the preferred plan that were not included in the cost constrained plan due to lack of sufficient funding.

Table 17 **Preferred Plan Projects Not Included in Cost Constrained Plan**

Project Number	Name	Description	Cost	Priority	Mobility Standard	2030 V/C
B2	Shasta Way Bicycle Lanes: South 6th Street to Patterson Street	Would add bike lanes to both sides of the street	$10,569,865	Low	N/A	N/A
I1	OR 39/Biehn Street/Campus Drive Intersection	Construct a northbound left-turn lane. Would require the construction of an additional receiving lane.	$839,312	Low	0.70	0.73
I3	Main Street/OR 39 Intersection	Modify signal timings to better serve existing and future demand.	$195,000	Low	0.85	0.87
I6	OR 39/Shasta Way Intersection	Modify signal phasing to provide protected/permitted phasing on Shasta Way.	$195,000	Low	0.75	0.78
I10	Midland Highway/OR 140 Intersection	Construct westbound auxiliary through lane.	$1,727,505	Low	0.70	0.72

Project B2 was excluded because of its low priority and extremely high cost. The four intersection projects shown were excluded because each represent a location that exceeds mobility standards by a small margin under future year conditions. As such, alternative mobility standards should be considered at these locations when the congestion increases in the future in lieu of dedicating capital improvement dollars towards mitigation measures.

Appendix 2G
Klamath Falls Westside Refinement Plan

KLAMATH FALLS
WEST SIDE REFINEMENT PLAN

Transportation System Plan

Submitted: May 24, 2006

Table of Contents

Introduction and Background ---------- 1
Existing Traffic Conditions (2005) ---------- 5
Future Traffic Conditions (2025) ---------- 6
Transportation System Plan Improvements ---------- 7
Conclusions ---------- 17

Tables

Table 1. Proposed Developments for Klamath Falls West Side ---------- 3
Table 2. Existing (2005) Traffic Operations – 30th Highest Hour ---------- 5
Table 3. Future 2025 Traffic Operations without New Improvements ---------- 6
Table 4. West Side Refinement Plan Survey Response Summary ---------- 8
Table 5. State Highway Focused Plan versus Collector Street Focused Plan ---------- 10
Table 6. Transportation System Improvements ---------- 15
Table 7. Transportation System Improvements – Future 2025 Traffic Operations ---------- 16

Figures

Figure 1. Study Area ---------- 2
Figure 2. Transportation System Plan Improvements ---------- 13
Figure 3. Oregon 140/Oregon 66 ---------- 14
Figure 4. Oregon 140/Oregon 66 ---------- 14

Introduction and Background

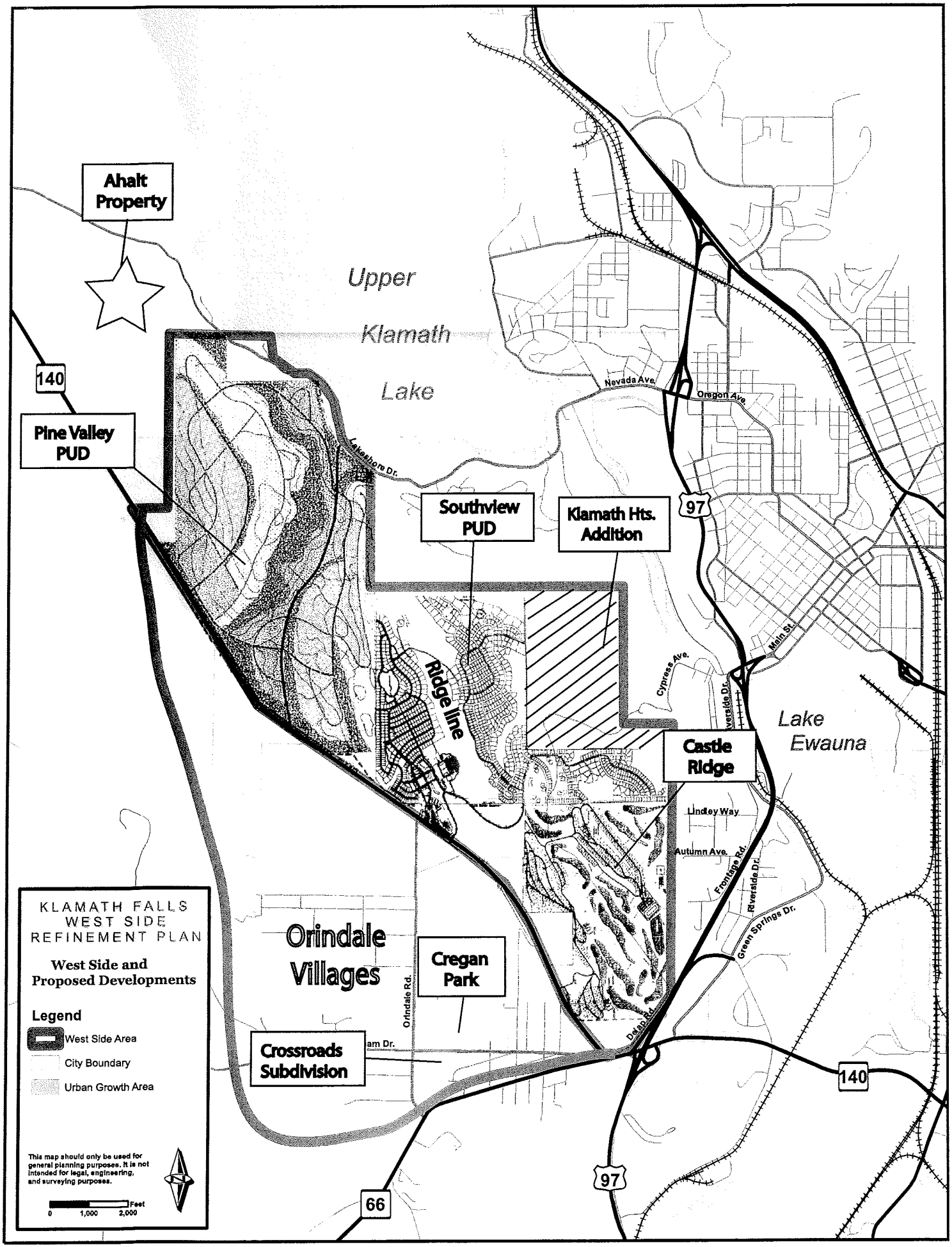
The Klamath Falls West Side Refinement Plan amends the 1998 Klamath Falls Urban Area Transportation System Plan (TSP), and addresses an area commonly known as the West Side, a developing area in the Urban Growth Boundary of Klamath Falls. When the original TSP process was initiated (pre-1998), population forecasts were made for potential areas of growth for a 20-year planning horizon; the West Side was not expected to grow in the near term, and thus, transportation issues were not anticipated nor addressed. The West Side area falls under both the City of Klamath Falls and Klamath County, and the West Side Refinement Plan is a joint effort by the City of Klamath Falls, Klamath County, and Oregon Department of Transportation (ODOT). The jurisdictions, state, and developers will benefit from the West Side Refinement Plan as it identifies, locates, and sets priorities for future transportation improvements.

The West Side land area consists of approximately 2,000 acres located west of Highway 97, south of Lakeshore Drive and north of Oregon 140 West/Oregon 66. Of these 2,000 acres, 500 are outside the Urban Growth Boundary (UGB). Subsequent to the 1998 adoption of the TSP, plans have been approved or pending for approximately 3,827 single-family homes, including two Planned Unit Developments (PUDs) totaling about 1,500 acres and a proposed Destination Resort of approximately 300 acres. Although development started in the West Side as early as the 1920's and 1930's, growth has increased significantly in recent years with the approval of the Southview PUD in 2000 and the Castle Ridge Destination Resort in 2004. Neither of these developments was addressed in the 1998 Klamath Falls Urban Area TSP. Additional development proposals have been submitted and are in the review process.

The increased development activity, both now and in the future, will impact the transportation system. As a result, the TSP must be amended to account for the additional development and subsequent traffic in the West Side. This amendment must also identify transportation facilities and services required to support the planned land uses on the West Side as identified by the City and County in a manner consistent with Oregon's Transportation Planning Rule (TPR).

There are eight approved and proposed developments that will have cumulative traffic impacts in the West Side study area, which are shown in Figure 1 and listed in Table 1. Within the study area, major highways (US 97, OR 66, and OR 140) and their associated interchanges were included in the analysis, as well as the City and County local arterial, collector, and local street system.

This document lays out a transportation plan for safe, affordable, and accessible transportation facilities for all users within the West Side study area. As such, the Plan includes an assessment of the existing transportation system; an evaluation of the impacts of growth on the transportation system; an identification of possible alternative improvements; an identification of improvement projects that are included in the preferred alternative; and transportation financing.


Ahalt Property
Upper Klamath Lake
140
Pine Valley PUD
Lakeshore Dr.
Nevada Ave.
Oregon Ave.
Southview PUD
Klamath Hts. Addition
97
Ridge line
Cypress Ave.
Main St.
Riverside Dr.
Lake Ewauna
Castle Ridge
Lindley Way
Autumn Ave.
Frontage Rd.
Riverside Dr.
Green Springs Dr.
Orindale Villages
Orindale Rd.
Cregan Park
Crossroads Subdivision
Dolan Rd.
140
97
66
KLAMATH FALLS
WEST SIDE
REFINEMENT PLAN
West Side and Proposed Developments
Legend
West Side Area
City Boundary
Urban Growth Area
This map should only be used for general planning purposes. It is not intended for legal, engineering, and surveying purposes.
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1,000
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Table 1. Proposed Developments for Klamath Falls West Side

Name	Approved	Status	Single-Family Homes	Other Planned Land Uses
Pine Valley PUD	1979 Approved	Revised preliminary plan approved in 1986 Plans approved April 2006	Up to 2,200 Up to 778	Incidental Private restaurant/club
Southview PUD	2000	Preliminary plan approved in 2002	1,330	Light industry, Commercial core, retail core
Klamath Heights Addition	1930's	Platted	446	Incidental
Castle Ridge DRO	2004	Preliminary plan approved in 2004	244	Resort hotel, golf course, multi-family
Ahalt Property/ Buckridge	Not approved	Unknown	25 homes	None
Cregan Park and adjacent lands		Platted and unplatted	Up to 591	None
Crossroads	Not approved	Preliminary proposed plans under development	143	None
Orindale Villages	Not approved	Preliminary proposed plans under development	270	None
			Total: 3,827	

The following goals and objectives were developed by the project Citizen Advisory Committee (made up of property owners and neighborhood watch members), the Technical Advisory Committee (made up of representatives from the City, County, State, and Basin Transit Service), and public input gathered over the last year.

Goals (*as identified in the 1998 Klamath Falls Urban Area Transportation System Plan*):

1. Ensure a safe and efficient transportation system, allowing access into and through the community for all users.
2. Improve personal mobility and access to transportation services throughout the region using a variety of travel modes.
3. Improve the movement of goods and delivery services throughout the region using a variety of travel modes.
4. Improve area-wide quality of life by: 1) increasing the compatibility of regional transportation system development with existing and future land use patterns; and 2) minimizing the impacts of transportation system development on the natural and built environment.
5. Improve the local circulation system to reduce the community's reliance on Highways 97, 140, and 66.
6. Ensure adequate capacity for future travel demand on collector and arterial streets and on the local highways to enable economic development in the community.
7. Ensure the integration of adequate bike and pedestrian facilities throughout the community, especially to connect residential areas with schools and activity centers.

8. Develop recommendations for improving the overall safety and efficiency of the transportation system by: 1) managing access to and development along state highway facilities; 2) promoting transportation demand management strategies (i.e., carpooling, telecommuting, etc.) and 3) drafting ordinances to ensure safe and convenient connections between land use and transportation.
9. Ensure sustained funding for needed transportation improvement projects.

Objectives:

1. The main focus of the project is the current and future land use and traffic impacts west of Highway 97.
2. Traffic impacts from future development on Klamath Falls' West Side should be identified and mitigated.
3. Any transportation alternatives to mitigate future traffic impacts should be realistic, affordable, and fully constructed when land uses reach 100% build-out (approximately the year 2025).
4. Future transportation improvements should be phased to correspond with traffic growth in Klamath Falls' West Side.
5. The functional classification of Lakeshore Drive should not be changed.
6. New access points on OR 140 should meet ODOT requirements for traveling public's safety and mobility standards, and should be consistent with the Oregon Highway Plan, and the ODOT Highway Design Manual.
7. These project objectives should be consistent and reinforce existing TSP goals, and once the project is complete, be incorporated and amended in their entirety into the existing 1998 Klamath Falls Urban Area TSP.

Existing Traffic Conditions (2005)

To determine the transportation impacts of future development, the project team evaluated traffic conditions in 2005 and 2025; the latter is when all developments in the West Side are expected to be built out. Two primary measures of effectiveness were used to assess the operation of at-grade traffic intersections and highway interchanges: level of service (LOS) and volume-to-capacity (v/c) ratios. Note that the State uses v/c ratios for State facilities while the City and County use LOS.

Level of service and volume-to-capacity analyses were conducted at each of the study intersections and summarized in Table 2. As shown, all study area intersections for the West Side Study area currently operate at an acceptable level of service with acceptable volume-to-capacity ratios during the peak hour.

Table 2. Existing (2005) Traffic Operations – 30th Highest Hour

Signalized Intersections	Volume-to- Capacity	Level of Service	Average Delay (seconds per vehicle)
OR 140 at OR 66	0.30	A	6.5
Unsignalized Intersections	**Volume-to- Capacity (critical movement)**	**Level of Service**	**Delay (seconds per vehicle)**
OR 66 at Balsam Drive	0.19	C	17.2
OR 140 at Delap Pit Road	0.05	C	19.1
OR 140 at US 97 SB Ramps	0.34	C	15.0
OR 140 at US 97 NB Ramps	0.10	C	15.2
OR 140 at Green Springs Drive	0.46	D	25.2
OR 66 at Orindale Road	0.02	B	12.6
Orindale Road at Balsam Drive	0.05	A	9.7
OR 140 at Orindale Road	0.01	B	10.7
Green Springs at Riverside at Dover	0.07	B	10.9
Riverside Drive at Frontage Road	0.01	A	9.8
Riverside Drive at Lindley Way	0.04	B	10.4
Riverside Drive at Green Springs	0.01	A	9.2
Riverside Drive at Main Street	0.17	A	9.3
Main Street at US 97 SB ramps	0.17	C	21.3
Main Street at US 97 NB ramps	0.06	C	18.3
Main Street at US 97 NB off-ramp	0.21	B	13.4
Nevada Avenue at Montelius Street	0.11	C	20.9
Nevada Avenue at US 97 SB ramps	0.04	B	13.5
Nevada Avenue at US 97 NB ramps	0.10	B	14.7

Future Traffic Conditions (2025)

To gauge the transportation impacts of current and future growth, the project team evaluated future traffic conditions in 2025 assuming no new highway, arterial, collector, or local street improvements beyond those already funded. These 2025 traffic conditions are summarized below.

Table 3. Future 2025 Traffic Operations without New Improvements

Signalized Intersections	Volume-to- Capacity	Level of Service	Average Delay (seconds per vehicle)
OR 140 at OR 66	0.49	A	8.8
Unsignalized Intersections	**Volume-to- Capacity (critical movement)**	**Level of Service**	**Delay (seconds per vehicle)**
OR 66 at Balsam Drive	0.47	E	35.2
OR 140 at Delap Pit Road	0.24	F	53.9
OR 140 at US 97 SB Ramps	1.20	F	79.9
OR 140 at US 97 NB Ramps	0.48	E	39.0
OR 140 at Green Springs Drive	2.68	F	452.2
OR 66 at Orindale Road	0.04	C	16.4
Orindale Road at Balsam Drive	0.08	B	10.4
OR 140 at Orindale Road	0.02	C	15.7
Green Springs at Riverside at Dover	0.12	B	12.3
Riverside Drive at Frontage Road	0.02	B	10.5
Riverside Drive at Lindley Way	0.05	B	11.4
Riverside Drive at Green Springs	0.02	A	9.5
Riverside Drive at Main Street	0.28	B	10.1
Main Street at US 97 SB ramps	0.70	F	95.8
Main Street at US 97 NB ramps	0.22	E	40.1
Main Street at US 97 NB off-ramp	0.37	C	21.4
Nevada Avenue at Montelius Street	0.27	F	60.9
Nevada Avenue at US 97 SB ramps	0.11	C	19.5
Nevada Avenue at US 97 NB ramps	0.24	D	26.5

As shown in the table above, the following intersections and highway interchanges will degrade to a level of service E or F (or unacceptable v/c ratios) by 2025 if no new intersections or highway interchanges are constructed or improved:

- OR 66 at Balsam Drive
- OR 140 at Delap Pit Road
- OR 140 at US 97 SB Ramps
- OR 140 at US 97 NB Ramps
- OR 140 at Green Springs Drive
- Main Street at US 97 SB ramps
- Main Street at US 97 NB ramps
- Nevada Avenue at Montelius Street

Unfortunately, the interchange areas of Highway 140 and US 97 and Main Street and US 97 are projected to degrade to unacceptable levels by 2025. The analysis indicates that an interchange access management plan and improvements to these interchanges will be needed by 2025 or sooner, if the majority of the proposed developments reach build out.

In addition, improvements are needed for the intersection of Nevada Avenue-Oregon Avenue at Montelius Street by 2025.

Transportation System Plan Improvements

Seventeen packages of transportation system alternatives to mitigate future traffic impacts were developed and analyzed for the Klamath Falls West Side Refinement Plan. Meetings and workshops were held with ODOT, City staff, County staff, stakeholders, City Council members, County Commissioners, and neighborhood associations to discuss the West Side development and potential transportation solutions. These meetings and workshops included the following:

- December 22, 2004 – Technical Advisory Committee Meeting
- January 26, 2005 – Agency Coordination Meeting
- January 27, 2005 – Technical Advisory Committee Meeting
- March 2, 2005 – Citizen Advisory Committee Meeting
- March 3, 2005 – Technical Advisory Committee Meeting
- May 16, 2005 – City Council and Planning Commission work sessions
- May 17, 2005 – Stewart-Lennox and Lindley/Autumn Neighborhood meeting
- June 20, 2005 – Project Workshop with ODOT, City staff, County staff, and stakeholders
- September 2, 2005 – Project Workshop with ODOT, City staff, County staff, stakeholders, City Council members, County Commissioners
- October 14, 2005 – Project Workshop with ODOT, City staff, County staff, stakeholders, City Council members, County Commissioners
- January 30, 2006 – Public Comment Meeting
- April 3, 2006 – City Council Work Session

Surveys identifying potential solutions were given to workshop and public open house attendees with a scoring range of 1-5; 1 was strongly disagree and 5 was strongly agree. The summary of responses is provided in Table 4.

As shown in Table 4, the score represents the weighted average of scoring responses ranging from Strongly Disagree (1 point), Somewhat Disagree (2 points), Neutral (3 points), Somewhat Agree (4 points) and Strongly Agree (5 points).

The project "statements" receiving an overall agree from the scoring results follow:

- OR 140 should remain as it is today: an Expressway with limited or no stops.
- Protecting the Hwy 97, OR 140, and OR 66 interchange from traffic "overload" should be a top priority for the project.
- The developments proposed for the West Side should have a more interconnected street network.
- Any alternatives to mitigate traffic impacts should be affordable and cost-effective.
- OR 140 should be five lanes from Pine Valley to OR 66 to accommodate future traffic from West Side.

The project "statements" receiving an overall somewhat agree from the scoring results follow:

- An east-west collector or arterial street should be connected to Cypress Avenue to relieve future traffic congestion in the West Side.
- Green Springs Drive at OR 140 should be closed, and improvements to Memorial Drive at OR 140 should be a priority.
- Roadway improvements/mitigation should be concentrated on the state highway system and re-build interchanges.

The project "statements" receiving an overall somewhat disagree from the scoring results follow:

- OR 140 should be turned into an urban arterial with traffic signals spaced every mile.
- An east-west collector or arterial street should be connected to either Lindley Way or Autumn Avenue to relieve future traffic congestion in the West Side.
- An east-west collector or arterial street should be connected to Moore Parkway/Lakeshore to relieve future traffic congestion in the West Side.
- A bridge connection from the West Side to the northeast into the Klamath Falls central business district should be a priority.
- OR 66 Re-route/relocation should be a top priority.

The transportation system alternatives were refined based on input at these meetings and workshops as well as the technical analysis conducted by the project team. The Transportation System Plan improvements developed for the West Side represent the best consensus solution to accommodate the current and future projected traffic on the roadway network that also meets the project goals and objectives listed previously. This transportation solution includes multi-modal improvements with multi-use paths for pedestrians and bicyclists in the area.

Multiple transportation options were studied to connect the West Side area with the City of Klamath Falls. The options included a range of transportation improvements in multiple corridors, such as extensions of existing roads, new collector streets, long-span bridges, interchanges, and signalized intersections. These options were analyzed using transportation model runs from the Oregon Department of Transportation (ODOT) Transportation Planning and Analysis Unit (TPAU). The purpose of modeling was to find a combination of transportation improvements to balance the transportation system, so roadway improvements could be incrementally phased as the pace of development warrants.

The future horizon year for the modeling was year 2025, and the model sensitivity tests assumed approximately 3,827 single-family homes would be constructed in the West Side. The 2025 land use consisted of the projected growth for each of the developments in the West Side study area and a reduced amount of growth for Pine Valley PUD with up to 778 residential units as proposed in their development proposal and traffic study submitted in August 2005 for approval. This land use scenario represents growth most likely to occur in the West Side Area and was used in further model runs evaluated for 2025. In addition, the 2025 ODOT TPAU travel demand model includes projected growth over the next 20 years in areas outside of the West Side area.

Table 5 depicts selected results from the alternative testing process. The testing indicated that focusing all growth-related traffic into one corridor (either a state highway or a single local collector street connection) would quickly absorb the remaining traffic capacity in the corridor and hasten the need for major capital improvements. For example, concentrating all improvements on OR 140 (shown as alternative #4 below), results in approximately 68% of all future traffic moving through the US 97/OR 140/OR 66 interchange. This results in a significant decrease in the useful life of the existing interchange and increases the cost and complexity of the required interchange replacement.

Likewise, concentrating future traffic growth on the local street connections will result in significant capital expenditures in multiple corridors. Alternative #5, also listed in Table 1, shows that approximately 75% of future traffic could be directed toward local collector streets. However, the local collector scenario is only viable if at least three collector street connections are constructed. Unfortunately, terrain and elevation make any collector street connection problematic. Each of the six options has unique benefits and challenges which include topography, functional classification, cultural and archeological concerns, impacts to existing infrastructure, the built environment, and cost.

Table 5. State Highway Focused Plan versus Collector Street Focused Plan

Alternative Number	Alternative Focus	Definition	Improvements	Percentage of Traffic on City & County Roadways	Percentage of Traffic on State Highways
4	State Highway Focus	Concentrate traffic onto the state system	OR 140	32%	68%
5	Collector Street Focus	Concentrate traffic on the local system	Pine Valley Drive Bridge over US 97 Moore Parkway	75%	25%

The analysis showed a need to make both highway and collector street improvements to balance traffic growth and disperse traffic throughout the transportation network. The purpose of a collector street connection is to provide an alternative travel route for future residents of Klamath Falls' West Side. The future collector street should provide a direct connection between the main population centers in the West Side and the transportation network to Klamath Falls destinations. The collector street should provide a longer period before capacity improvements are needed for OR 140 and help moderate the cost and complexity of the future US 97/OR 140/US 66 interchange replacement project. Lastly, the collector street should further community goals and objectives and support the balanced transportation goals of the Klamath Falls' Transportation System Plan.

The project team has studied six potential collector street connections, which are listed below:

- A north-south collector street through Pine Valley from OR 140 to Lakeshore Drive
- Moore Parkway
- Cypress Avenue
- Lindley Way
- A new bridge over US 97 and the Link River
- Causeway between Lindley and Cypress

Overall, the Technical Advisory Committee developed seventeen alternatives to evaluate the above collector street connections in various combinations. Model sensitivity tests were conducted for the alternatives, and the results of each alternative were compared.

Below is a short description of the collector street connections tested:

- **A north-south collector street through Pine Valley from OR 140 to Lakeshore Drive.** Approved first in the late 1970's, the first Pine Valley master plan depicted a north-south collector street connection between OR 140 and Lakeshore. It is one of the only locations where a north-south connection can be made in the geographically rugged West Side.

- **Moore Parkway.** A collector road extended north from Southview connecting to Lakeshore east of Moore Park. Potentially constructed along a power line easement, the parkway could potentially impact cultural or archeological sites above the Link River.

- **Cypress Avenue.** An extension of Cypress Avenue west past Riverside Elementary into the West Side and connecting with Southview. The Cypress connection is currently narrow with substandard curves. It connects a historic neighborhood with downtown Klamath Falls.

- **Lindley Way.** Currently a local neighborhood street, Lindley Way is a dead-end road with multiple single-family homes on either side. There is an easement across the Castle Ridge development that would allow a local street connection between Lindley Way and Southview.

- **A new bridge over US 97 and the Link River.** Directly connecting the West Side with the residential northern end of downtown Klamath Falls, a new bridge connection was proposed to span across US 97 and the Link River to provide an alternate way to downtown instead of Cypress Avenue.

- **Causeway between Lindley and Cypress.** The causeway between Lindley and Cypress would also provide an alternative route to the east. It was proposed to connect from the West Side to Greensprings Drive and further east to the Southside Bypass.

An evaluation comparing the traffic volumes between the six different collector streets was completed using ODOT TPAU model sensitivity tests. From that analysis, the Cypress Avenue connection attracts the most trips to and from the West Side when comparing the collector street connections.

From the alternatives evaluation, the Cypress Avenue connection would be a key component of the West Side transportation network:

- Cypress Avenue connection provides a direct access to downtown Klamath Falls
- Cypress Avenue connection provides an indirect access to the state highway (US 97) via Main Street
- Vehicle miles traveled are reduced (out of direction travel reduced) which is consistent with the Oregon Transportation Planning Rule
- Cypress Avenue connection provides shortest travel time to the majority of trip destinations
- Transportation improvements are already needed to Cypress Avenue

When comparing the Moore Parkway connection at Lakeshore Drive to the Cypress Avenue connection, the Cypress Avenue connection attracts and carries significantly more trips than the Moore Parkway connection. In regards to geometry, significant curve and sight distance issues exist at the connection of Moore Parkway and Lakeshore Drive. Due to a combination of a strong community sentiment to preserve Moore Park and its adjacent environmentally sensitive areas, the Moore Parkway connection was removed at the direction of the Klamath Falls City Council.

The technical analysis indicates that Cypress Avenue is the top-ranked corridor for connecting the West Side to the greater City of Klamath Falls. This finding from the alternatives evaluation has been generally supported by the public comments we received from participants in the open houses, workshops, and letters. The comments support the technical recommendation.

Because of technical engineering issues and a desire of the Technical Advisory Committee to keep the plan flexible, we have also recommended that more than one collector street connection be kept in the plan in order to preserve as many future options as possible. As a result, the technical team proposes the following:

- Option 1 – Cypress Avenue is the preferred collector street connection for connecting the West Side to the Klamath Falls' regional transportation network.

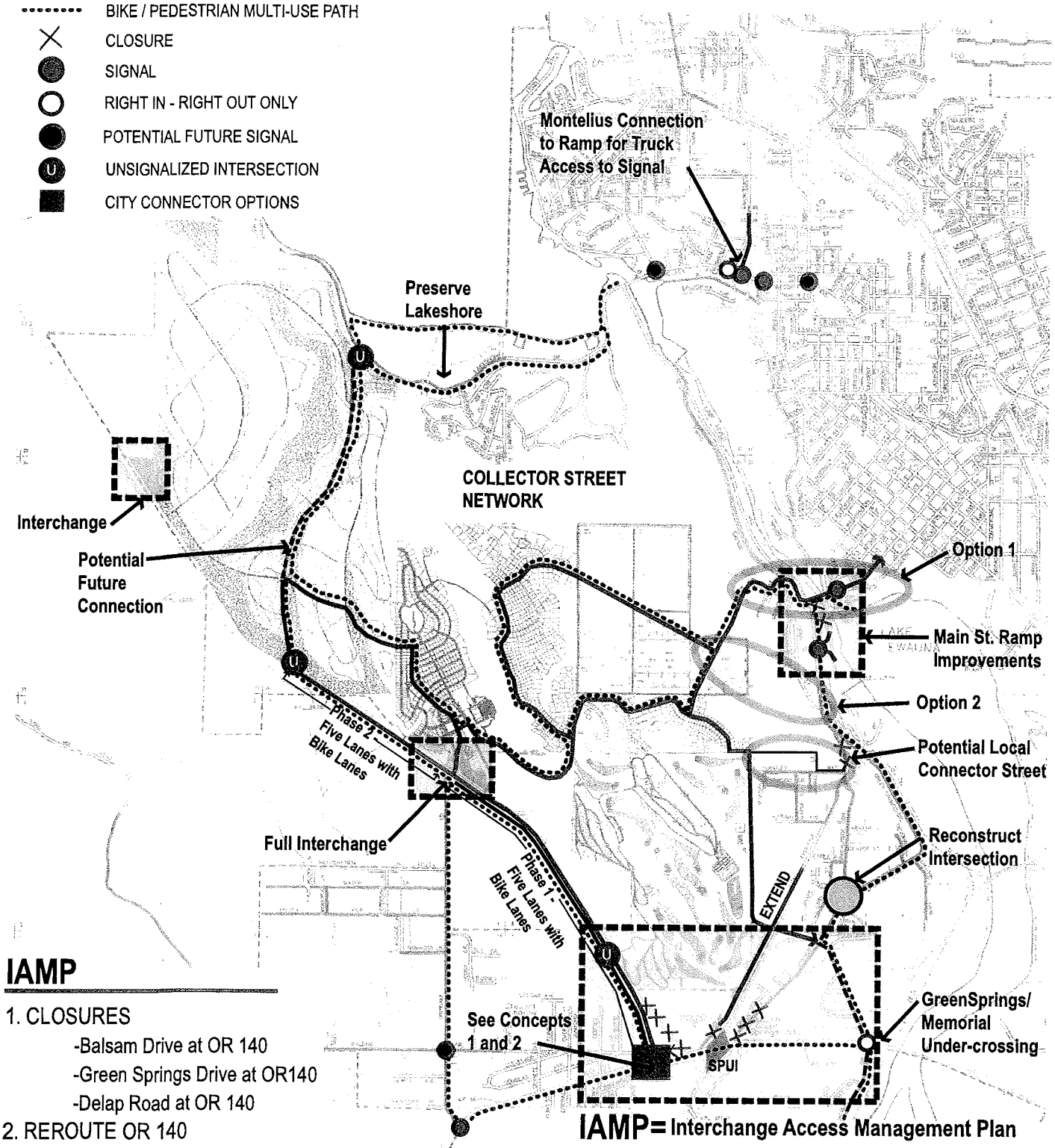
- Option 2 – A collector street north of Lindley Way is an alternate connection for connecting the West Side to the Klamath Falls' regional transportation network.

The technical team does not recommend further consideration of Lindley Way as a collector street connection although a local street connection is a possible option.

The Transportation System Plan improvements are shown in the following figure. The project list, brief description of each project, and estimated costs are provided in Table 6. The total estimated cost of the projects shown in Table 6 is $95 million dollars. The project priority for short term and long term is defined in the table for each project as short term from 1 to 5 years and long term from 6 to 20 years.

KLAMATH FALLS WEST SIDE

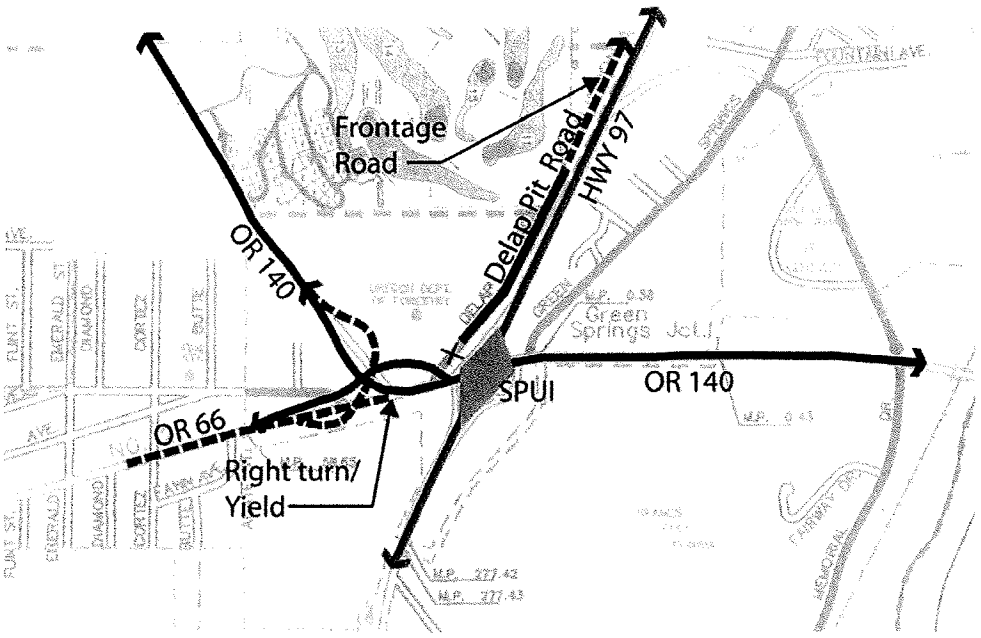
TRANSPORTATION SYSTEM PLAN IMPROVEMENTS
Figure 2



IAMP

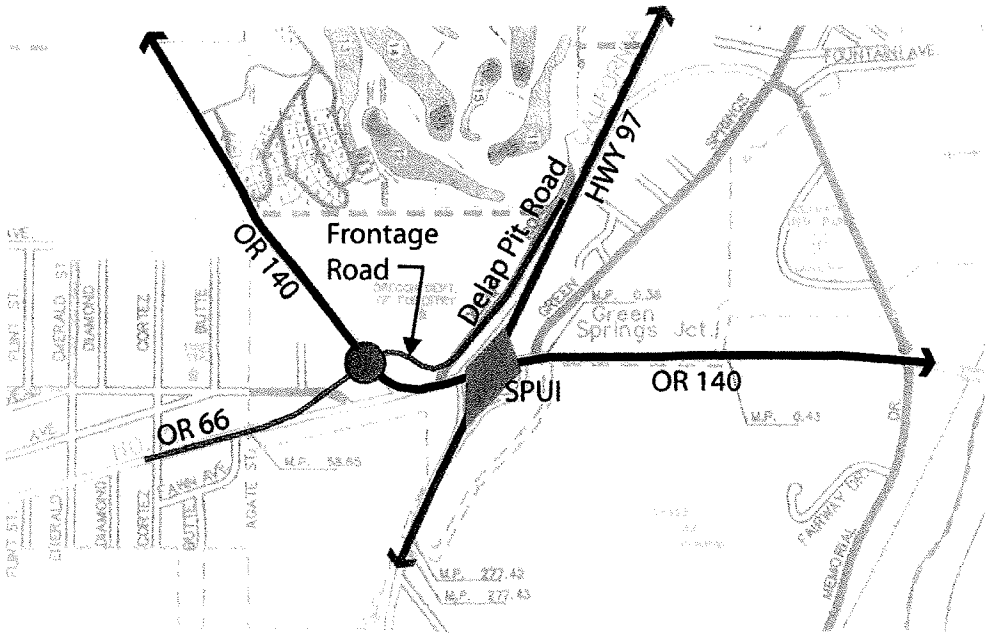
1. CLOSURES
   - -Balsam Drive at OR 140
   - -Green Springs Drive at OR140
   - -Delap Road at OR 140
2. REROUTE OR 140
3. SINGLE POINT URBAN INTERCHANGE (SPUI)
4. EXTEND FRONTAGE RD.
5. RELOCATE GREEN SPRINGS DRIVE AT 0R140

Figure 3. Oregon 140/Oregon 66



Concept #1

Figure 4. Oregon 140/Oregon 66



Concept #2

Note: OR 140 at OR 66/Delap Pit Road is shown with a traffic signal in Concept #2.

Table 6. Transportation System Improvements

Roadway Improvement Projects	Cost Estimate	Priority
IAMP and interchange reconstruction project – single-point urban interchange (SPUI) at US 97 and Oregon 140, traffic signalization of SPUI ramps at OR 140. Closure of Balsam Drive at OR 66. Closure of Delap Pit Road at OR 140. Improve a local street connection between Balsam Drive and OR 66. Close Green Springs at existing OR 140 location. Modified access for Delap Pit Road, Balsam Drive, and Green Springs.	$ 30 million	Short term for IAMP / Long term for project construction
OR 140 widen – 5 lanes with bike lanes from Pine Valley to OR 66	$ 10 million	Short term
OR 140 realignment to the west at OR 66	$ 5 million	Long term
Green Springs Drive/Memorial Drive Under-Crossing (right-in/right-out only access to Oregon 140)	$ 6 million	Long term
Main Street Interchange Improvements including traffic signalization at ramps and relocation of US 97 southbound ramps to Riverside Drive, and left turn channelization on Riverside Drive.	$ 12 million	Long term
Green Springs Drive/Riverside Drive at Dover – intersection reconstruction including channelization and left turn lanes. Closure of Riverside at Green Springs north of Lindley Way (Green Springs to function as main street).	$ 2 million	Long term
Pine Valley PUD – local street (not gated) connection from OR 140 to Lakeshore Drive – *potential future connection*		
Local street connection between Pine Valley PUD and Southview		
OR 140 at Orindale Road – full interchange	$ 8 million	Long term
OR 140 at Pine Valley – interchange or left turn fly-over ramps	$ 5 million	Long term
Option #1 - Cypress Connection with sidewalks and multi-use path	$ 6 million	Long term
Option #2 – Collector Street north of Lindley with bike lanes and sidewalks	$ 8 million	Long term
Multi-Use Path connections	$ 10 million	Long term
Intersection Improvement Projects	**Cost Estimate**	**Priority**
OR 140 at Orindale Road – traffic signalization (interim only)	$ 150,000	Short term
OR 66 at Orindale Road – traffic signalization	$ 150,000	Short term
Orindale Road at Balsam Drive – construct NB and SB left turn lanes – review traffic control (potential signalization)	$ 250,000	Long term
Nevada – Oregon Avenue at US 97 ramps – traffic signalization	$ 300,000	Short term
Nevada Avenue at Montelius – intersection reconstruction to a right-in/right-out only for Montelius access to Nevada Avenue	$ 100,000	Short term
Total *	**$ 95 million**	

* Total assumes Option #1 connection as part of the improvements package
Note: Short term defined as 1 to 5 years and long term as 6 to 20 years

Intersections	Volume-to-Capacity	Level of Service	Delay (seconds per vehicle)
OR 140 at Pine Valley Drive	0.53	C	24.3
OR 140 at Castle Ridge Drive	0.14	C	16.6

* Traffic signalization included

The traffic analysis for the plan assumes that the connection from Pine Valley to Lakeshore Drive is eliminated. As a result, the intersection of OR 140 at Pine Valley Drive operates at level of service C during the future 2025 PM peak hour; however, this intersection meets Signal Warrant 3, Peak Hour (*Manual on Uniform Traffic Control Devices, 2003 edition*) for 2025 AM conditions. From the goals and objectives of this project and input from project meetings and workshops, traffic signals are not recommended along Oregon 140. Therefore, this intersection is recommended to be replaced with an interchange that meets ODOT's spacing standards, or to have turn restrictions when signal warrants are met.

Conclusions

The West Side Refinement Plan balances State, City, County, and a private developer interest to ensure this area of Klamath Falls has a well-functioning transportation system to accommodate additional development growth. The phased improvements will allow travelers to select from several options to travel between the West Side and Klamath Falls historic downtown core. The improvements accommodate motorists, bicyclists, and pedestrians.

Appendix 2H
Orindale/Balsam Sub-Area Master Plan

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
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TECHNICAL MEMORANDUM

Klamath Falls, OR
Orindale/Balsam Sub-Area Master Plan
& Transportation SDC Methodology

Date: May 14, 2007 **Project** #: 7718.0

To: Mark Willrett, Director of Public Works
City of Klamath Falls
500 Klamath Avenue
Klamath Falls, Oregon 97601

From: Del Huntington, P.L.S.
Marc Butorac, P.E., P.T.O.E
Kate Sylvester

Subject: System Development Charge Analysis and Methodology

Introduction

The City of Klamath Falls, Oregon commissioned a sub-area transportation master plan for the Orindale-Balsam area to provide a better understanding of the potential impacts to the transportation system, future deficiencies, and estimated costs to plan and construct necessary roadway improvements to ensure that property owners and developers are provided a level of certainty regarding necessary transportation improvements and contributions to mitigate potential impacts in a fair and equitable manner.

The remainder of this memorandum documents the transportation master plan for the study area, as well as the transportation System Development Charge methodology recommended to fund the anticipated transportation improvements for the Orindale-Balsam study area. The proposed System Development Charge is intended to fund anticipated transportation improvements by applying a "per trip" fee to future development in the study area. All existing development in the study area is exempt from the System Development Charge.

The System Development Charge was developed by considering the existing land uses and traffic conditions in the study area, identifying the potential for future development in the study area, and determining necessary transportation mitigations and associated costs for the build out scenario. This memorandum summarizes the methodology used to develop the System Development Charge, including 1) the existing land uses and traffic conditions; 2) the necessary transportation improvements to accommodate forecast regional growth through year 2025; 3) the assumptions used to estimate development potential in the study area; 4) the necessary transportation improvements and associated costs to accommodate the local development under year 2025 conditions; 5) a preliminary funding strategy to address the transportation mitigation

costs; and 6) the next steps necessary to complete the study and implement a development review and funding process for the study area.

Study Area

The study area comprises approximately 1,115 acres southwest of OR-140 at the far west of Klamath County, Oregon. Approximately 200 acres are within the City of Klamath Falls city limits, while the remainder is within the Urban Growth Boundary (UGB) in Klamath County. Downtown Klamath Falls, northeast of the study area, is a primary destination for employment, retail, and recreational traffic from the study area. Figure 1 shows the site vicinity and the study area.

This study considered the development potential of City and County property beyond what was assumed for this area in the *Klamath Falls West Side Refinement Plan, Transportation System Plan* prepared by Parsons Brinkerhoff (PB) in May 2006. The PB study included much of the study area for this analysis; however it concentrated on the potential development that could occur to the north of OR-140 and assumed little development south of OR-140. The City is anticipating higher development north and south of OR-66, which is the focus of this study. The PB study identified intersection improvements for three intersections within the Orindale/Balsam study area, including two concepts for the OR-66/OR-140 intersection. As identified in the PB study, it is likely that additional traffic in the Orindale/Balsam study area will trigger mitigation needs east of the OR-66/OR-140 intersection. The *Klamath Falls West Side Refinement Plan, Transportation System Plan* is included as Appendix "A".

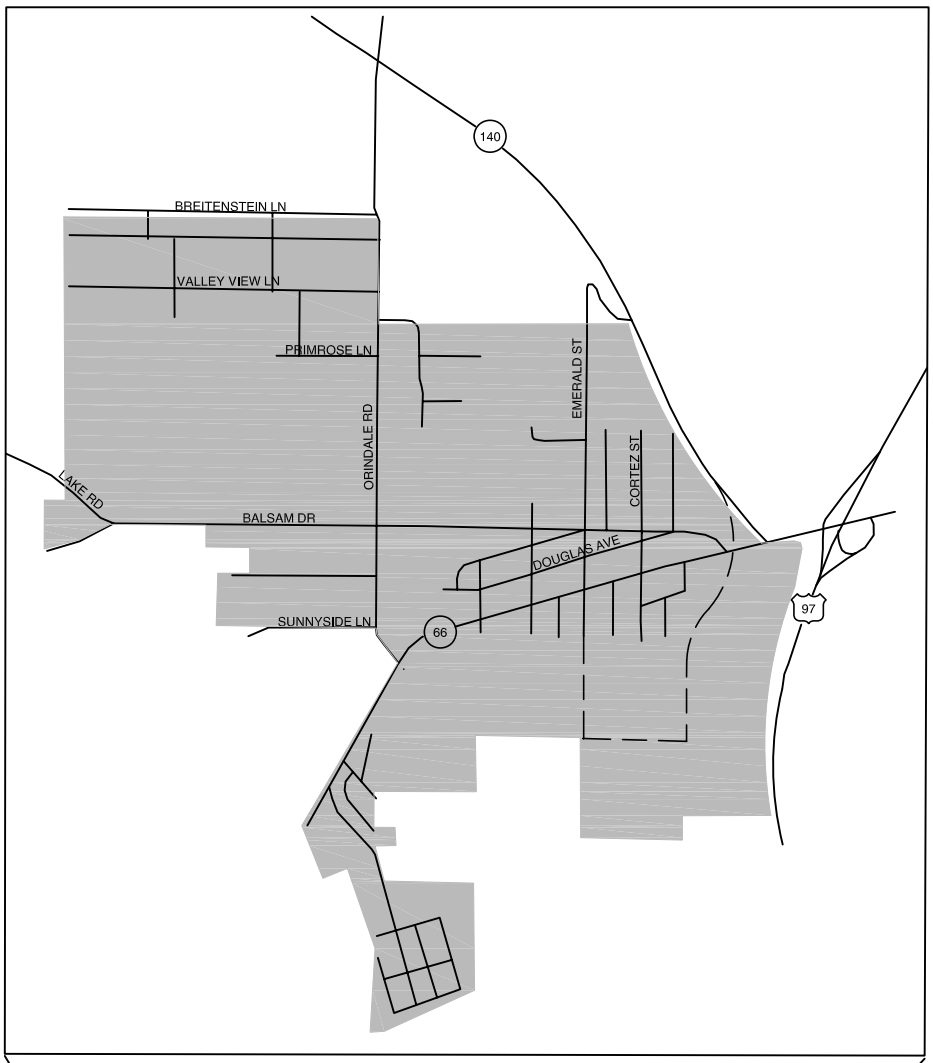
For analysis purposes the study area was divided into sub-sections north and south of OR-66. Figure 2 shows the two sub-sections of the study area.

Existing Conditions

Zoning and Land Use

Approximately 20 percent of the study area is within the city limits of Klamath Falls, while the rest is outside the city but within Klamath County and the UGB. More than 80 percent of the study area is zoned for residential development. Within the city limits, most of the residential land is zoned Medium Density, which has a minimum lot size of 5,000 square-feet. The remainder of the residential land within the city limits and nearly all of the residential land in the study area outside the city limits is zoned Suburban Residential, which has a minimum lot size of 10,000 square-feet. There are also approximately 75 acres of commercial land and 65 acres of industrial land in the study area, most of which is adjacent to Highway 97 south of OR-66. Figure 3 shows the City Limits and the zoning in the study area.

Most of the study area is currently undeveloped. Existing development is primarily residential; there are a few neighborhood developments with residential lots sizes ranging from 6,500 square-feet to 1-acre, and a minimal number of small agricultural land uses in the study area.



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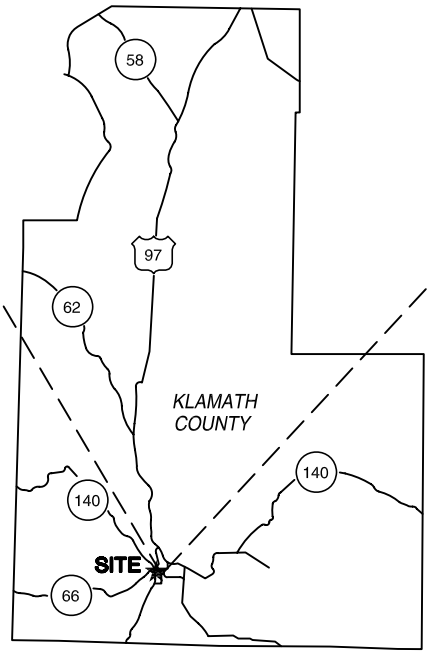

LEGEND

STUDY AREA

SITE VICINITY MAP
KLAMATH FALLS, OREGON

FIGURE 1

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LEGEND

- NORTH SUB-SECTION
- SOUTH SUB-SECTION

STUDY AREA SUB-SECTIONS
KLAMATH FALLS, OREGON

FIGURE 2

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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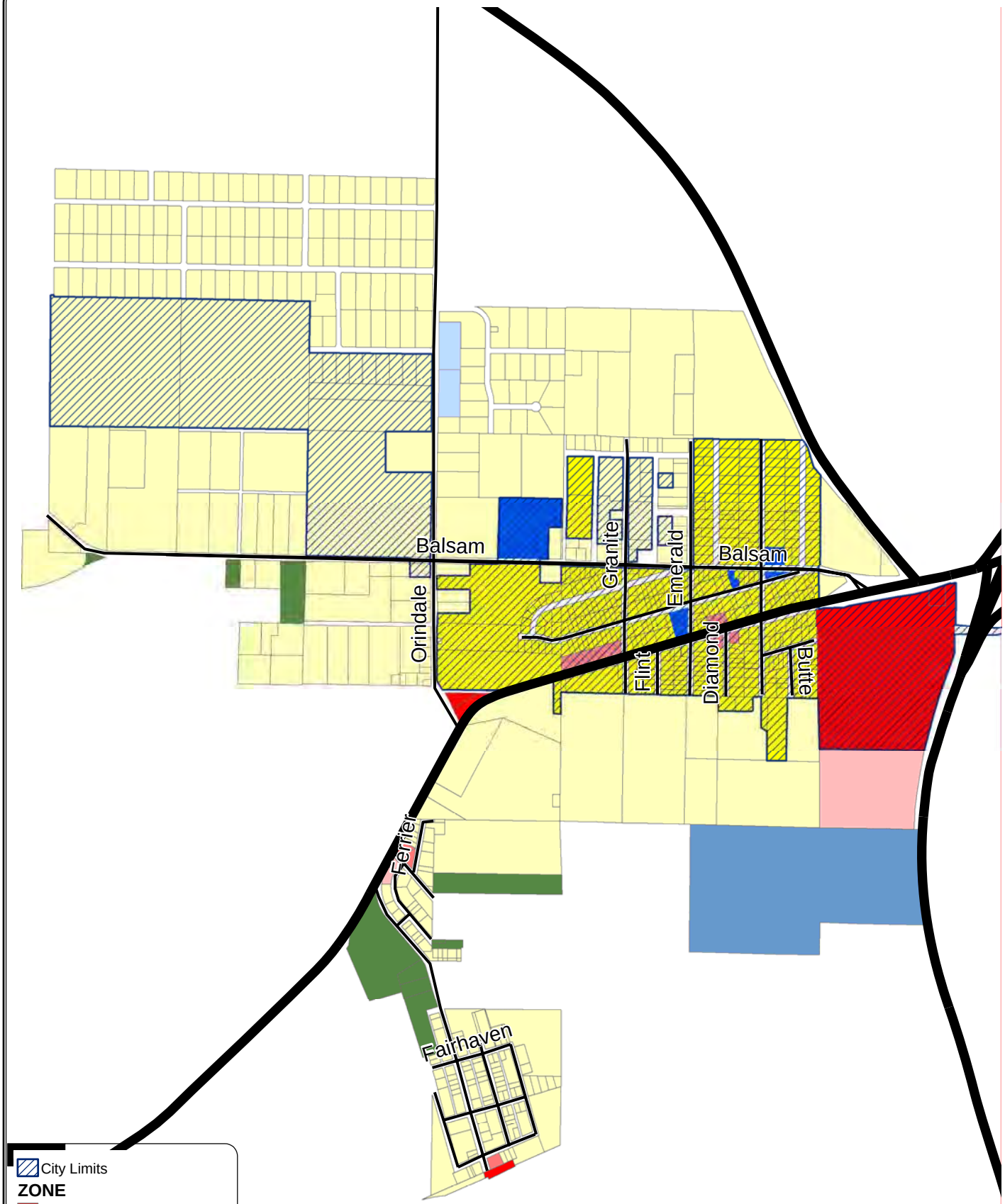


ZONING AND CITY LIMITS
KLAMATH FALLS, OR

FIGURE **3**

March 2007

Transportation Facilities

Highway 97, OR-140, and OR-66 are the primary highways in the project vicinity. Orindale Road, running north-south, and Balsam Road, running east-west, are the primary arterial roads in the study area. Table 1 summarizes the characteristics of the key roadways in the study area.

Table 1 Existing Transportation Facilities and Roadway Designations

Roadway	Classification by roadway ownership	Cross Section	Speed Limit	Sidewalks?	Bicycle Lanes?	On-Street Parking?
OR-140	Statewide (Expressway) – ODOT	2-4 lane	55	No	No	No
OR-66	District – ODOT	2-4 lane	35, 45	No	No	No
Highway 97	Statewide (Expressway) – ODOT	2-4 lane	50	No	No	No
Orindale Road	Collector – Klamath County	2-lane	45	No	No	No
Balsam Road	Collector – Klamath County	2-lane	35, 55	No	No	No
Emerald Street	Collector – Klamath County	2-lane	NP	No	No	No

NP = Not Posted

Study Intersections

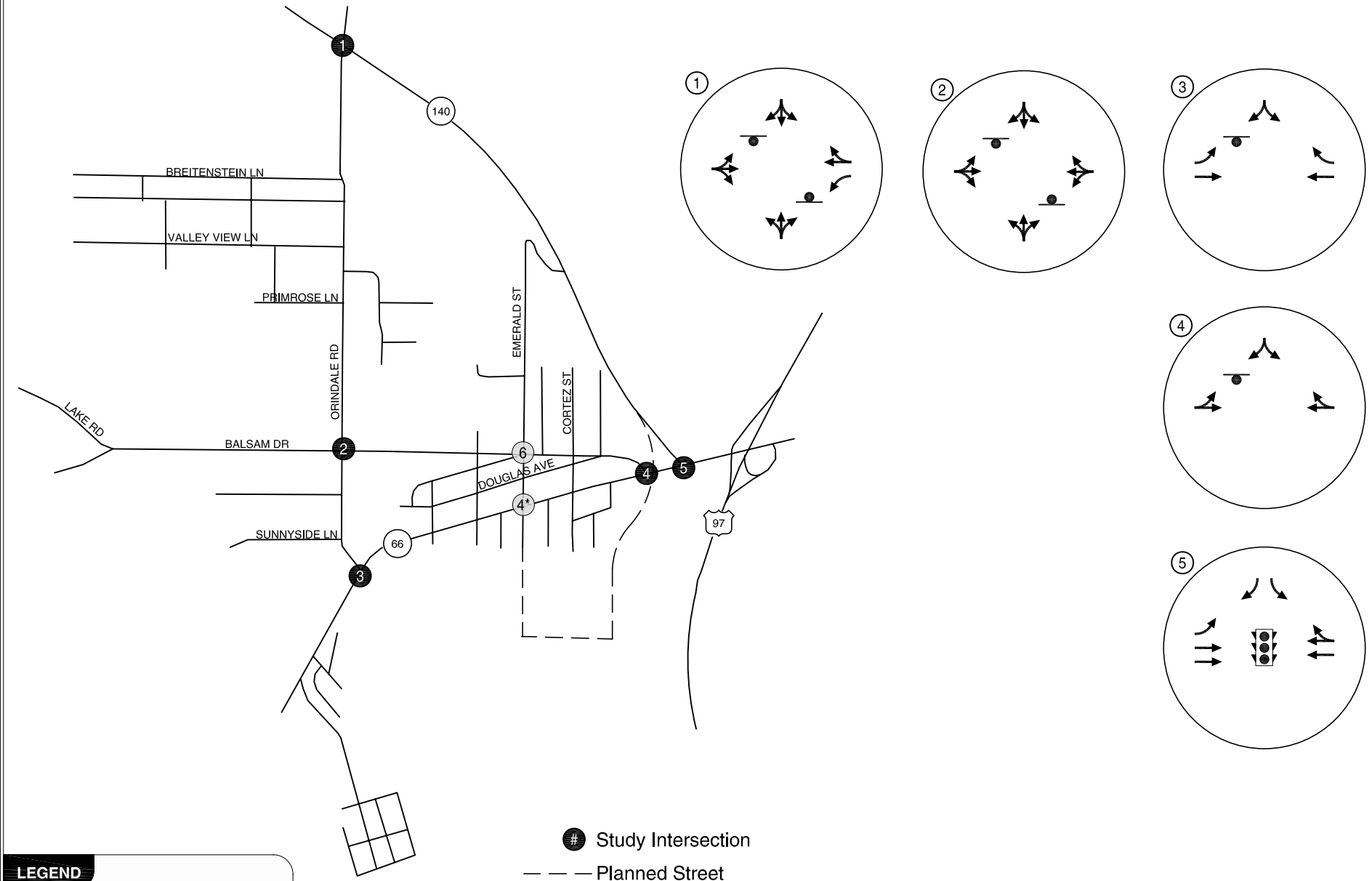
The following intersections were considered in the traffic analyses:

- Orindale Road/OR-140
- Orindale Road/Balsam Road
- Emerald Street/Balsam Road
- Orindale Road/OR-66
- OR-66/Balsam Road[1]
- OR-66/Emerald Street[2]
- OR-66/OR-140

Figure 4 illustrates the location of the study intersections, the existing lane configurations, and the associated traffic control devices.

[1] For the future analysis scenarios it was assumed that Balsam Road would no longer connect to OR-66. The Emerald Street / OR-66 intersection was assumed to replace this intersection as the primary arterial connection to OR-66 east of Orindale Road in the study area. This expected change in circulation pattern is discussed in more detail in the future analysis section of this report.

[2] The Emerald Street intersections were only considered in the future analysis scenarios when it was assumed that Emerald Street would become a key roadway in the study area.



EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES KLAMATH FALLS, OREGON

FIGURE 4

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Existing Operations

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (Reference 1). A description of level of service and the criteria by which they are determined is presented in Appendix "B" of this memorandum. Appendix "B" also indicates how level of service is measured and what is generally considered the acceptable range of level of service. As ODOT evaluates intersections based on a volume to capacity (v/c) analysis, the resultant v/c ratios are provided for each location that intersects with a state highway.

The peak 15-minute flow rate during the weekday a.m. and p.m. peak hours were used in the evaluation of all intersection levels of service. Thus, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average peak hour.

The existing conditions analysis was conducted using turning movement counts included in the *Klamath Falls West Side Refinement Plan.* These manual turning movement counts were collected during the weekday a.m. and p.m. peak hours in April 2005. *These existing conditions turning movement counts are included as Appendix "C".*

The existing conditions analysis indicates that all of the study intersections currently operate under capacity and at level of service (LOS) C or better. The ODOT managed intersections operate at a 0.32 v/c ratio or better. Figure 5 shows the weekday a.m. and p.m. peak hour traffic operations. These results are consistent with the existing conditions operations analysis provided in the *Klamath Falls West Side Refinement Plan. Appendix "D" contains the existing conditions operational analysis worksheets.*

Year 2025 Regional Growth Conditions

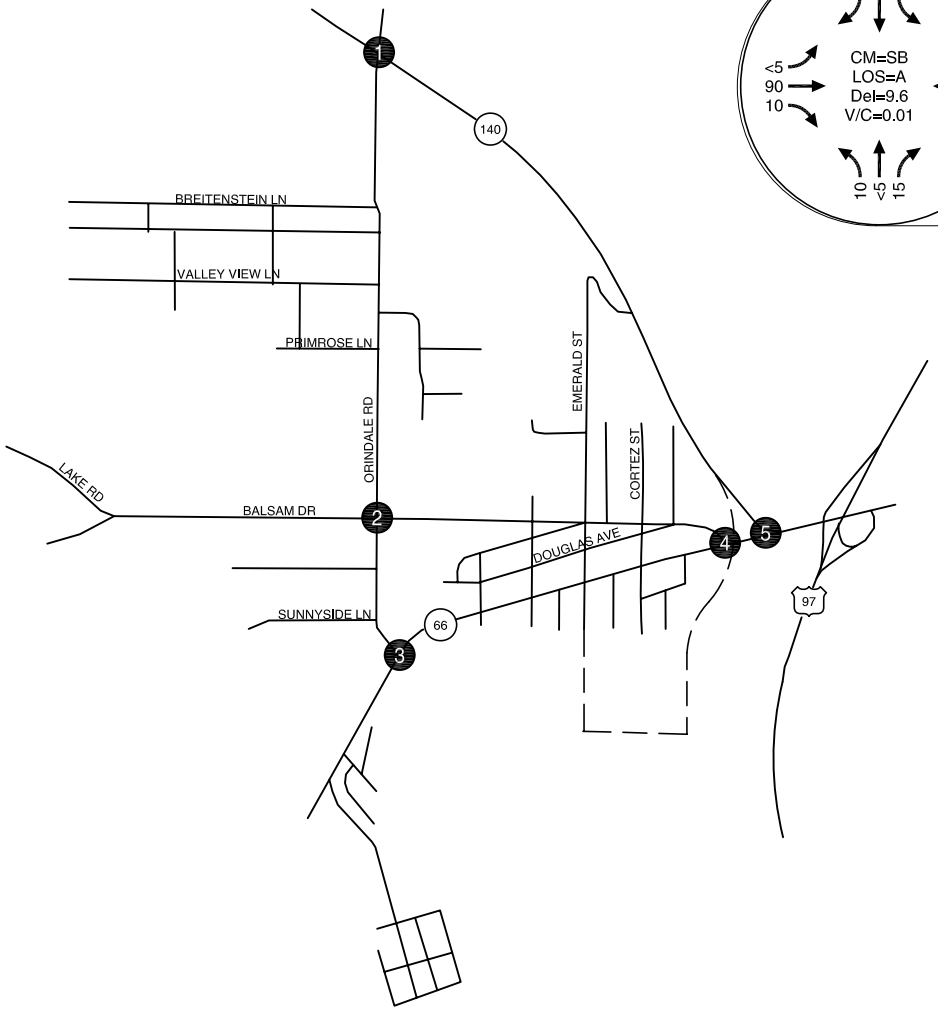
Forecast Traffic Volumes

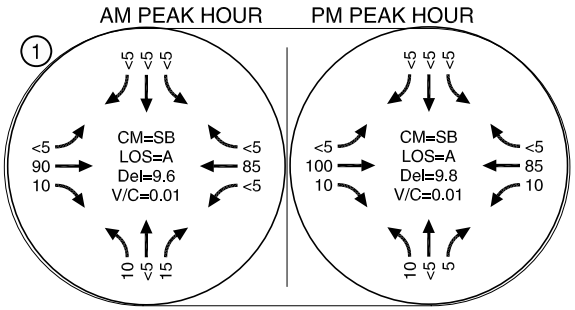
The year 2025 No Development Scenario assumes continued regional growth, but no new development within the study area. Year 2025 was selected as the future analysis year in order to be consistent with the future analysis in the *Klamath Falls West Side Refinement Plan*.

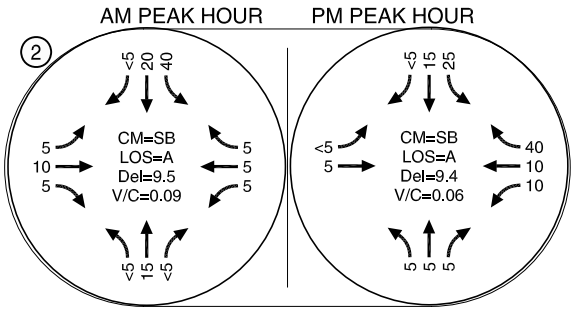
A 3% annual growth rate was applied to existing traffic volumes on OR-66 and OR-140 to account for regional growth. This rate is consistent with the growth projected by the ODOT Transportation Planning and Analysis Unit (TPAU). Growth rates in the TPAU model used for the *Klamath Falls West Side Refinement Plan* range from 1.5% to 6% annually.

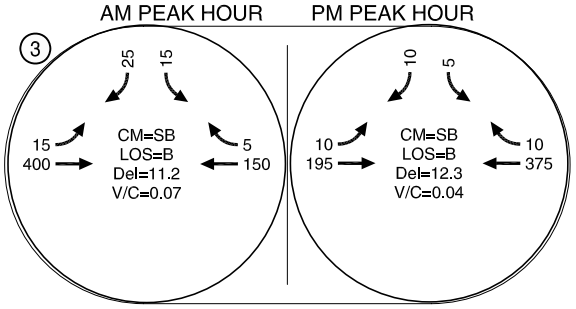
Additional traffic was added to account for a planned residential development north of the study area on Orindale Road. Approximately 25% of the traffic generated by this development was assumed to use OR-140 and the remaining traffic was assumed to travel north into Klamath Falls. No traffic from this development was assumed to cut through the study area.

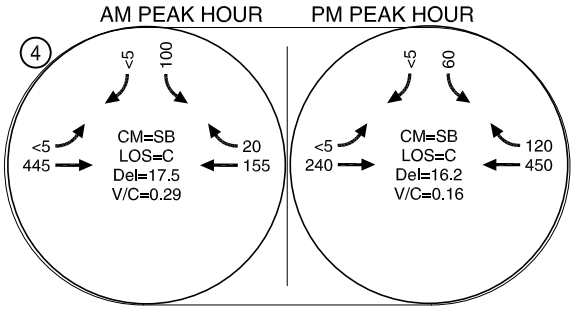
Figure 6 shows the forecast weekday a.m. and p.m. peak hour traffic volumes for the 2025 Regional Growth Conditions.

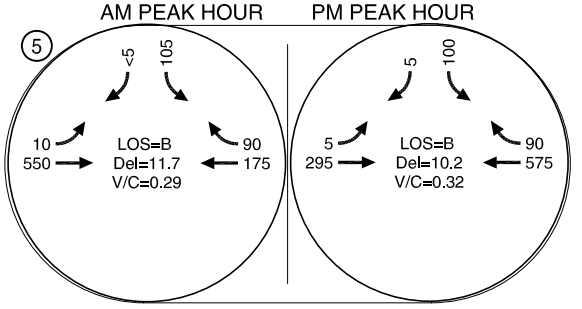












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CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2005 EXISTING TRAFFIC CONDITIONS
KLAMATH FALLS, OREGON

FIGURE 5

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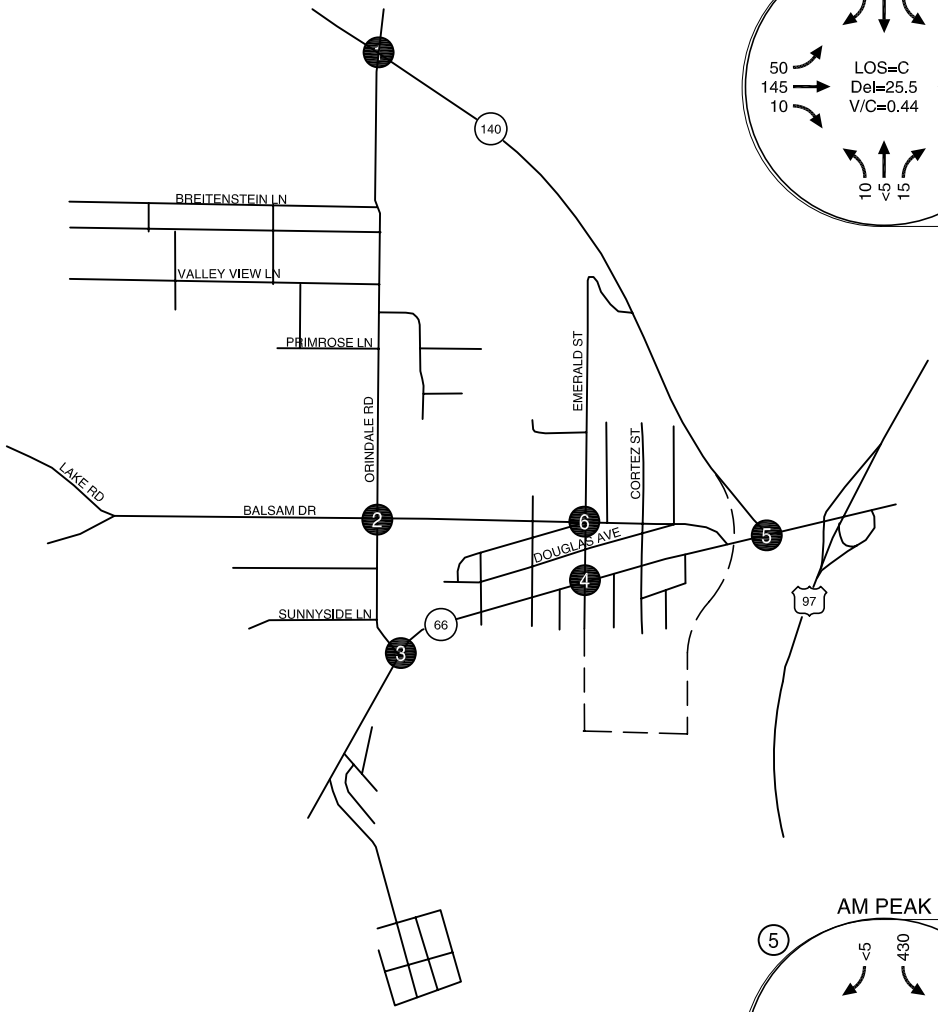
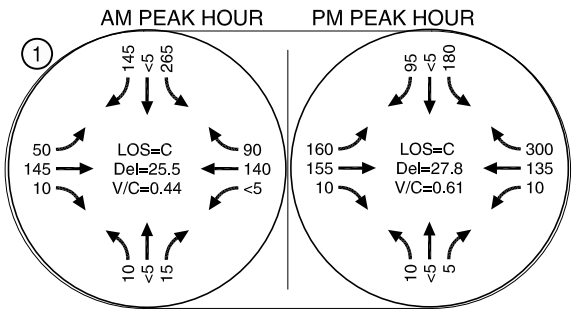
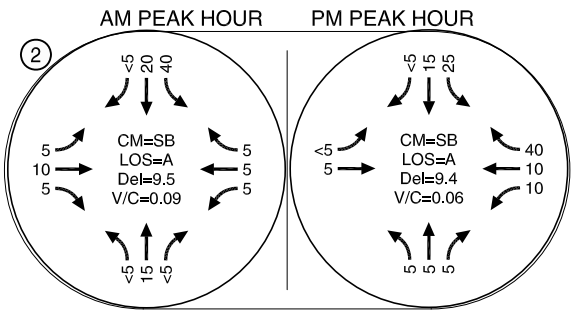
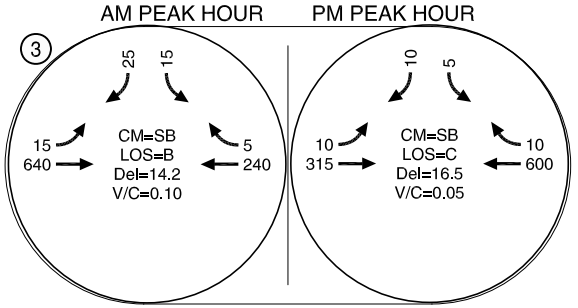
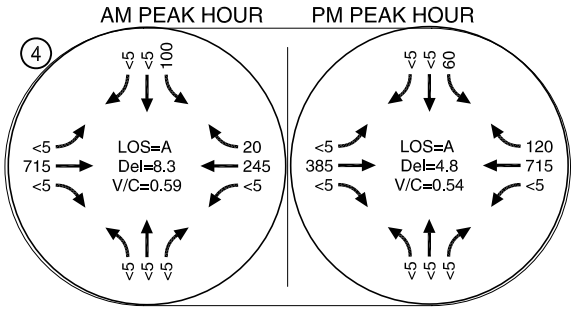
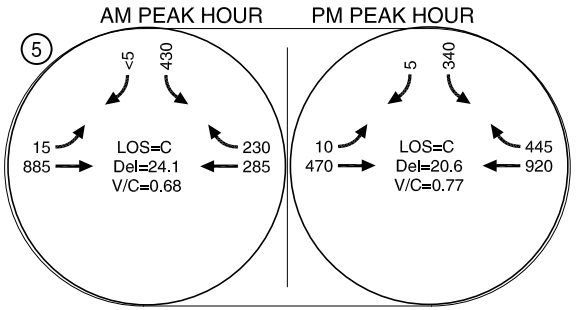


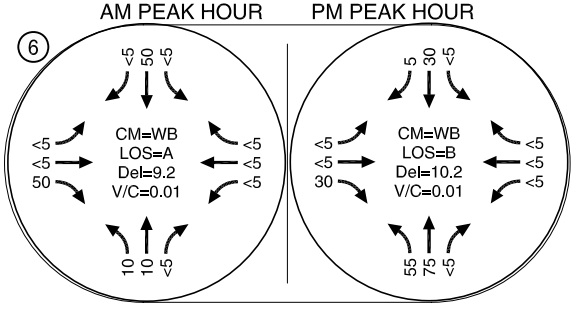












LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2025 REGIONAL GROWTH TRAFFIC CONDITIONS
WEEKDAY OPERATIONS
KLAMATH FALLS, OREGON

FIGURE 6

H:\projfile\7718pdx\DWGS\Figs\7718Figs Full Area.dwg May 14, 2007 - 1:48pm - ksylvester Layout Tab: FIG 06

Transportation Improvements

It was assumed that the forecast transportation improvements identified for OR-140 in the *Klamath Falls West Side Refinement Plan* will occur regardless of the build out within the Orindale/Balsam study area. The *Klamath Falls West Side Refinement Plan* is included as Appendix "A".

Orindale Road/OR-140

Traffic from the planned residential development north of OR-140 will cause the intersection of Orindale Road/OR-140 to meet traffic signal warrants at about 75% of build out of this in-process development. The PB study identifies construction of a full interchange as a long-term improvement at this location. For the purposes of this study, it was assumed that the intersection will be signalized in the near-term in conjunction with the proposed development to the north of the study area, without any financial contribution from development within the study area. Construction of an eastbound left-turn lane was assumed to provide access to the north development site. Traffic operations are expected to improve if an interchange is constructed rather than a signal.

OR-66/Balsam Drive and OR-66/Emerald Street

Based on the distance and estimated travel time, the majority of the anticipated traffic from the Orindale/Balsam study area will travel south to OR-66, then east along OR-66 into various locations within Klamath Falls. Preliminary traffic signal warrants will be met at the OR-66/Balsam intersection with the estimated traffic from the study area. However, it is unlikely that ODOT will allow signalization of the existing intersection, as it is located less than 500 feet from the OR-140/OR-66 intersection and does not meet ODOT's standard traffic signal spacing for a District-level highway. Furthermore, ODOT is considering relocating the OR-66/OR-140 intersection to the west, which places it even closer to the existing OR-66/Balsam intersection.

It was assumed that Balsam Road will no longer connect to OR-66 and the traffic will be redirected to an improved OR-66/Emerald Street intersection. Emerald Street was selected as the logical connection because it extends farther into the study area than the other north-south collector roads in the vicinity and it is spaced roughly half-way between the Orindale Road/OR-66 and OR-140/OR-66 intersections.

Emerald Street/Balsam Drive/Cleveland Avenue

The existing Emerald Street/Balsam Drive intersection, to the north of OR-66, currently has five legs, as Cleveland Avenue connects to the intersection from the southwest. For purposes of this study, it was assumed that Cleveland Avenue, will no longer access this intersection. The traffic generated from this local street (ten to twenty homes) will access major travel corridors via Granite Road.

Forecast Traffic Operations

Operational analyses were conducted for the study intersections, using the weekday a.m. and p.m. peak hour turning movement volumes shown in Figure 6, to determine the 2025 Regional Growth traffic conditions. *The Regional Growth traffic operations analysis worksheets are included in Appendix "D".*

OR-66/Emerald Street

Without any improvements, the critical southbound approach is forecast to operate at LOS F with a volume-to-capacity ratio of 0.65 during the weekday a.m. peak hour. Because MUTCD Signal Warrants #1, #2, and #3 are met, signalization of this intersection is appropriate to provide safe and efficient access to OR-66 from the study area.

Signalization of OR-66/Emerald Street intersection is assumed in all future analysis scenarios. It is also assumed that when signalization occurs, Emerald Street will be upgraded to a 3-lane minor collector and the stop-control at the Emerald/Balsam intersection will be changed so that the north- and southbound approaches are uncontrolled.

With this improvement in place, all of the study intersections are forecast to operate under capacity at LOS D or better during the weekday a.m. and p.m. peak hours, as shown in Figure 6.

Year 2025 Local Build-Out Conditions

Development Potential

Development potential within the study area was estimated using tax assessment property information provided by Klamath County, a review of aerial photography and topographic information, and discussions with City staff and the City Council. It was assumed that undeveloped land would build-out at the maximum density permitted under the current zoning, with a few exceptions due to topographic or other constraints. The specific build-out assumptions are discussed below.

Northern Sub-Section

Approximately 95% of the 730 acres in the northern sub-section is zoned for residential uses. The remaining 5% consists of commercial, industrial, public facilities, and non-resource lands. It was assumed that no development would occur on land zoned Public Facilities or Non-Resource.

Residential

Approximately 30% of the northern sub-section is currently developed in neighborhood patterns with lots ranging in size from 6,500 square-feet to 1-acre. For the purposes of this study, it was assumed that these homes would not redevelop within the 20-year study period.

It was estimated that there are approximately 85 existing homes on lots of at least 1-acre or greater in size which are not organized into neighborhood patterns. It was assumed that these parcels could be redeveloped, subdivided, and/or partitioned into smaller lots within the 20 year study period.

It was assumed that development proposals that have been submitted to the City but not yet built will be approved and built as planned. The four planned developments that have been submitted for approval but not yet built include:

- Crossroads Subdivision (140 homes on 29 acres)
- Cregan Park (196 homes on 40 acres)
- Orindale Village I (266 homes on 80 acres)

- Orindale Village II (155 homes on 50 acres)

It was assumed that the remaining underdeveloped land (approximately 285 acres) will build-out residentially with 5,000 square-foot lots in the City and 10,000 square-foot lots in the County.

Based on these assumptions, the northern sub-section could build-out with approximately 1,625 new homes.

Commercial

A floor-area-ratio (FAR) of 0.20 was assumed for the 5 acres of commercially zoned land in the northern sub-section. All of these properties front OR-66. It was assumed that one-half acre of this land would develop with a high-intensity commercial use (convenience store) and that the remaining 4.5 acres would develop with a more general commercial use (shopping center).

Industrial

It was assumed that the 10 acres of industrially zoned land in the northern sub-section would develop with a light industrial use. The trip generation potential was estimated using the trip rate per gross acre in the ITE Trip Generation Manual, 7th Edition.

Southern Sub-Section

The southern sub-section consists of approximately 385 acres. The majority of the area is zoned residential; however, there are significant commercially and industrially zoned lands. There are 23 acres zoned Non-Resource where it was assumed no development would occur.

Residential

Roughly 230 acres are zoned residential in the south sub-section. There are about 155 existing homes covering 55 acres that are on lots smaller than 1-acre. For the purposes of this study, it was assumed that these homes would not redevelop within the 20-year study period.

There are about 45 residential parcels smaller than one acre (comprising roughly 20 acres) that are currently not developed. It was assumed that these parcels will develop without being further subdivided.

Due to the steep terrain on about 55 acres of undeveloped land opposite the OR-66/Orindale Road intersection, it was assumed that no more than 5 homes would develop in this area.

It was assumed that the remaining underdeveloped residential land (approximately 100 acres) will build out at the maximum density permitted by the current zoning (5,000 square-foot lots for Medium Density Residential, and 10,000 square-foot lots for Suburban Residential). This includes approximately 10 existing homes on lots larger than one-acre that are not organized into neighborhood developments for which it was assumed that redevelopment, subdivision, and/or partitioning into smaller lots could occur within the 20 year study period.

Based on these assumptions, about 380 new homes could develop in the south sub-section of the study area.

Commercial

A floor/area ratio of 0.20 was assumed for the 69 acres of commercial land in the southern sub-section, resulting in approximately 605,000 square feet of commercial development potential within the southern area. It was assumed that 0.5 acre of this land would develop with a high-intensity commercial use (convenience store) and that the remaining 68.5 acres would develop with a more general commercial use (shopping center).

Industrial

It was assumed that the 65 acres of industrially zoned land in the southern sub-section would develop with a light industrial use. The trip generation potential was estimated using the trip rate per gross acre in the ITE Trip Generation Manual, 7th Edition.

Figure 7 shows the location and size of the land uses expected to occur under Local Build-Out Conditions.

Trip Generation

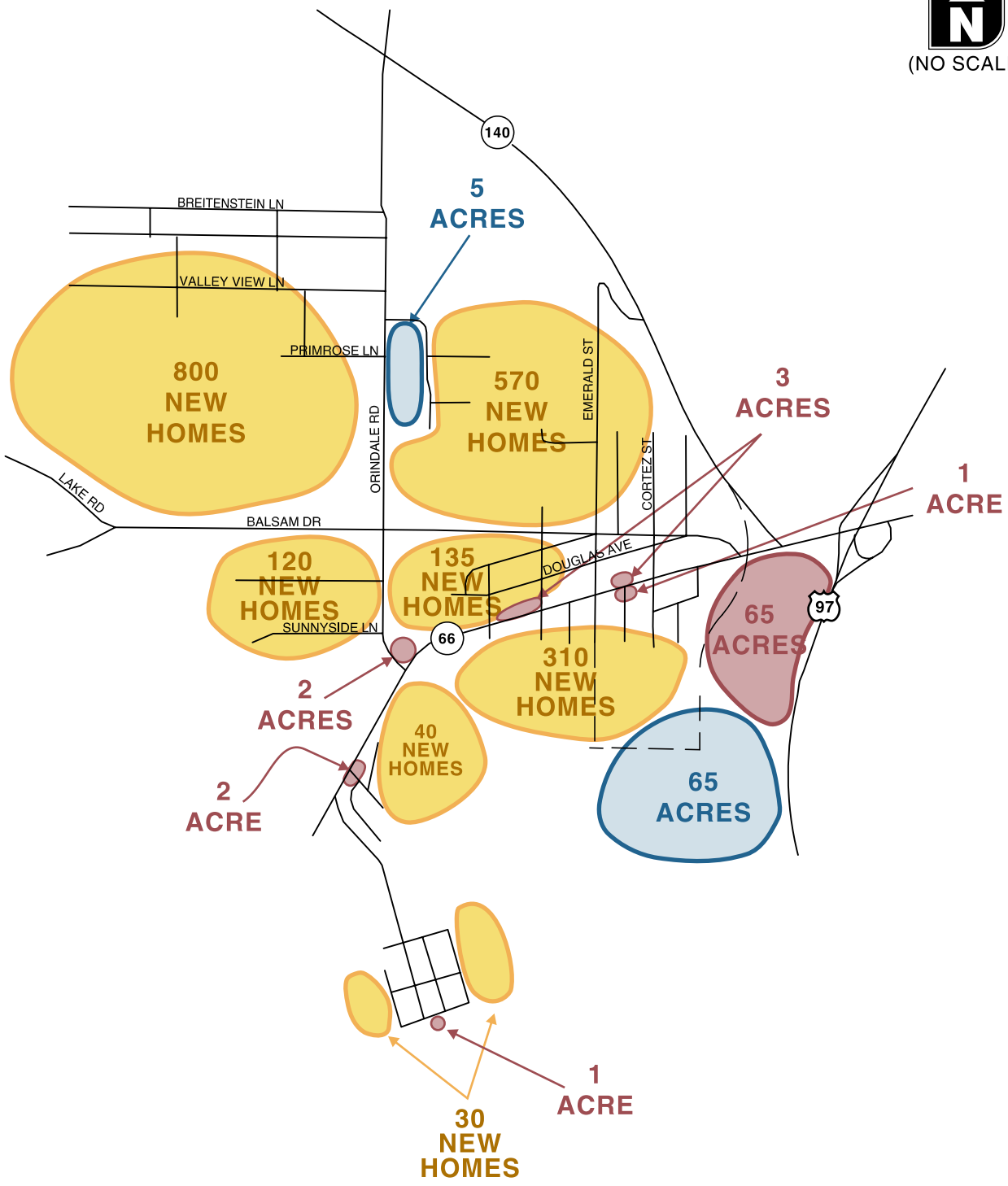
Trip generation estimates for each development scenario were developed based on ITE Trip Generation Manual, 7th Edition.

Trip generation estimates for existing and expected residential development were developed using Land Use Code 210: Single-Family Detached Housing. Land Use Code 820: Shopping Center was used to estimate the trip generation potential of land zoned General Commercial or Transportation Commercial, while Land Use Code 851: Convenience Store was used to estimate the trip generation potential of land zoned Neighborhood Commercial.

Fifty percent of the commercial trips were assumed to be new trips on the network (primary trips), 34 percent of the trips were assumed to be trips already on OR-66 or OR-140 that are diverted to or from the commercial site (pass-by trips), and the remaining 16 percent of trips were assumed to be trips already on Highway 97 that are diverted to and from the commercial site (diverted link trips). These ratios are consistent with the ITE Trip Generation Handbook, 7th Edition.

Because it was assumed that existing homes on parcels larger than 1 acre could either redeveloped or subdivided a trip discount was included to provide a reduction for the existing use (85 in the northern sub-section, 10 in the southern sub-section). A trip discount allows a property owner to receive a credit for the existing trips in the event that a site is redeveloped. For example, if a property owner replaces an existing single-family home (10 daily trips) with five new single-family homes (50 daily trips) a 10 trip credit is applied and the development is charged for 40 new trips.

Table 2 shows the estimated trip generation for the northern and southern sub-sections and for the entire study area.



LEGEND	Northern Sub-Section	Southern Sub-Section
Residential	1625 New Homes	380 New Homes
Commercial	5 Acres (39,000 sf leasable space)	69 Acres (605,000 sf leasable space)
Industrial	5 Acres	65 Acres

Approximate Development Potential
Klamath Falls, Oregon

FIGURE 7

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Table 2 Revised Estimated Trip Generation

Land Use	ITE Code	Size (units)	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
				In	Out	Total	In	Out	Total
Northern Sub-Section									
Residential	210	1,710	16,365	320	960	1,285	1,090	640	1,730
Industrial	110	5	260	35	5	40	5	25	30
Commercial	820/ 851	39,000	4,710	170	160	330	180	180	360
Discount for Existing Homes	210	(85)	(815)	(15)	(50)	(65)	(55)	(30)	(85)
Discount for Commercial Pass-by (34%)	820/ 851		(1,600)	(55)	(55)	(110)	(60)	(60)	(120)
Discount for Commercial Diverted (16%)	820/ 851		(755)	(25)	(25)	(50)	(30)	(30)	(60)
Net New Trips			***18,165***	***430***	***995***	***1,430***	***1,130***	***725***	***1,855***
Southern Sub-Section									
Residential	210	390	3,715	70	220	290	245	145	390
Industrial	120	65	435	65	65	130	70	70	140
Commercial	820/ 851	605,000	28,470	500	360	860	1,180	1,265	2,445
Discount for Existing Homes	210	(10)	(95)	(5)	(5)	(10)	(5)	(5)	(10)
Discount for Commercial Pass-by (34%)	820/ 851		(9,680)	(145)	(145)	(290)	(415)	(415)	(830)
Discount for Commercial Diverted (16%)	820/ 851		(4,555)	(70)	(70)	(140)	(195)	(195)	(390)
Net New Trips			***18,290***	***415***	***425***	***840***	***880***	***865***	***1,745***
Total Study Area									
Total New Trips			***36,455***	***845***	***1,420***	***2,270***	***2,010***	***1,590***	***3,600***
Total New Trips Excluding Commercial			***19,865***	***470***	***1,195***	***1,670***	***1,350***	***845***	***2,195***

If development occurs as assumed, a total of 2,005 (1,625 in the north and 380 in the south) new homes could be built in the study area. Additionally, 644,000 square feet of commercial property could be built and 70 acres of industrial land could be developed. In total, build-out of the study area could generate approximately 36,455 new trips daily with 2,270 occurring during the weekday a.m. peak hour and 3,600 occurring during the weekday p.m. peak hour.

If the commercial trips are excluded from the SDC program, development included in the SDC program could generate an estimated 19,865 daily trips.

Trip Distribution

The distribution of new trips onto the study area roadway system was estimated based on local and regional destinations, an examination of the transportation facilities and the relative travel times to reach the major roadways. It was assumed that the vast majority of weekday a.m. and p.m. peak hour trips to and from homes within the study area will be destined to and from

downtown Klamath Falls via Highway 97. The same trip distribution pattern was assumed for the industrial development because it is expected that most of the trips with be destined to or arriving via Highway 97. Based on discussions with City staff and an evaluation of local and regional commercial centers, it was estimated that the primary market areas for the commercial properties in the study area will be within the study area and development northwest of the study area. Only a small percentage of the new trips are expected to travel to or from downtown Klamath Falls and areas to the east. The residential and industrial trip distribution pattern is illustrated in Figure 8. The commercial trip distribution pattern shown in Figure 9 applies only to primary trips to and from the commercial properties. As described above, half of the commercial trips are assumed to be pass-by or diverted trips traveling on OR-66, OR-140, or Highway 97. These trips are not included in the distribution pattern shown in Figure 9.

Figure 10 shows the assignment of new trips onto the network. *Appendix "E" shows the assignment of trips onto the network by land use and location within the study area.*

Forecast Traffic Operations

The Year 2025 Regional Background Growth traffic volumes shown in Figure 6 were added to the traffic volumes expected to be generated by build-out of the study area shown in Figure 10 to reach the year 2025 Local Build-Out traffic volumes shown in Figure 11. Figure 11 shows the forecast total traffic operations associated with build-out of the study area in year 2025.

Mitigated Traffic Conditions

The following roadway segment adjustments are recommended to accommodate the projected traffic volumes:

1. OR-66: 5-lane Major Arterial between Orindale and Highway 97
2. Orindale Road: 3-lane Major Collector between OR-140 and OR-66
3. Emerald Street: 3-lane Minor Collector south of Balsam
4. Balsam Drive: 3-lane Minor Collector between Orindale and Emerald
5. Emerald Street Extension: 3-lane Minor Collector between OR-66 and industrial property boundary
6. OR-140/Commercial Extension: 3-lane Major Collector between OR-66 and industrial property boundary
7. New Collector: 3-lane Minor Collector between Emerald Extension and Commercial Extension

In addition, the following intersection improvements are needed to achieve the operational conditions shown in Figure 11:

1. Orindale Road/OR-140: provide eastbound right-turn lane and northbound left-turn lane (in addition to signalization and eastbound left-turn lane assumed under regional growth conditions)

2. Orindale Road/Balsam Drive: Signalize or install a single-lane roundabout [3]
3. Emerald Street/Balsam Drive: Convert stop-control from north-south movements to east-west movements
4. Orindale Road/OR-66: Signalize, add westbound right-turn lane
5. OR-66/Emerald Street: Signalize, add westbound right-turn lane
6. OR-66/OR-140: Provide northbound, eastbound, and westbound right-turn lanes; provide second eastbound and westbound left-turn lanes; provide second southbound receiving lane

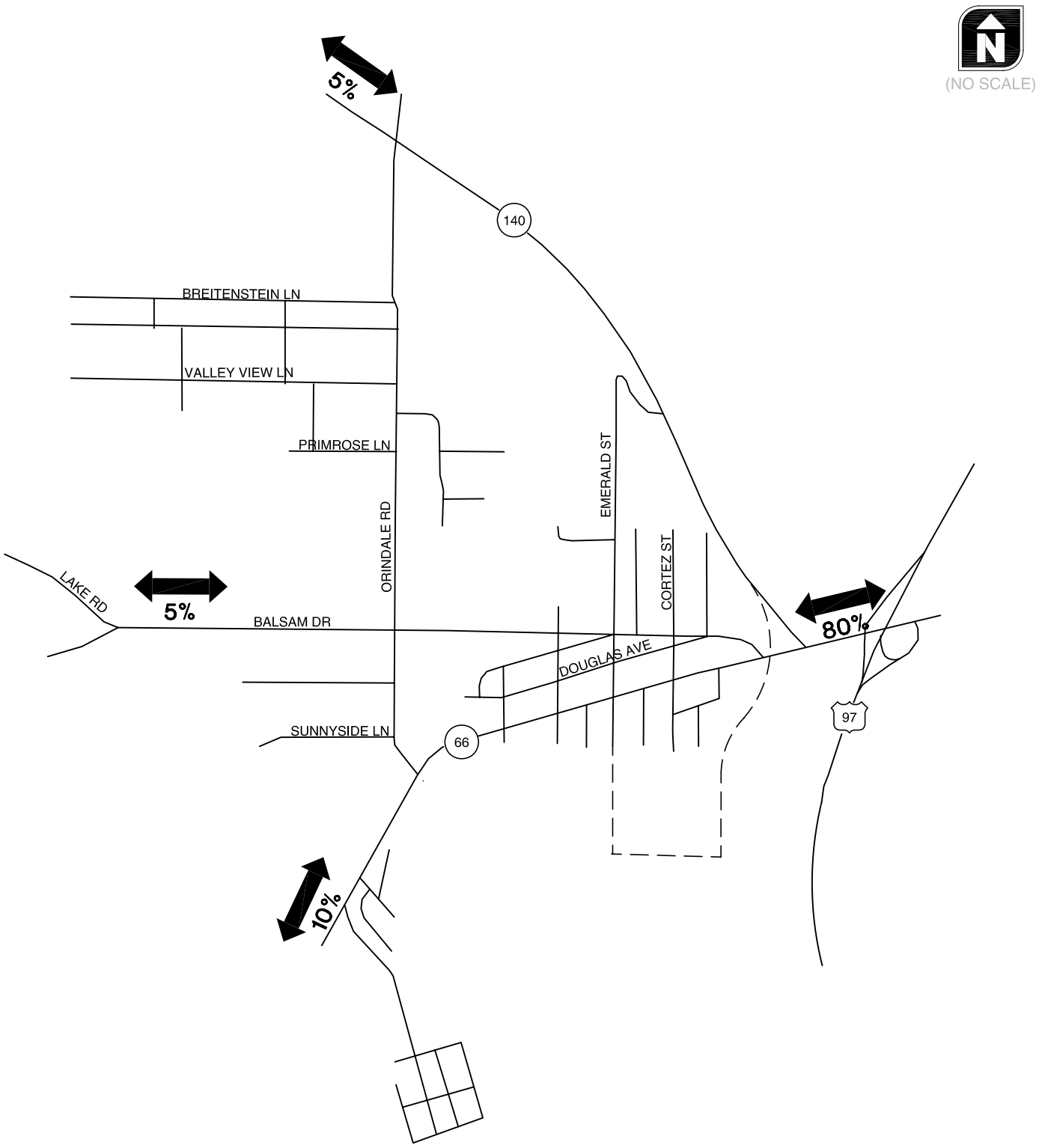
With these improvements in place, all signalized study intersections are forecast to operate under capacity at LOS D or better during the weekday a.m. and p.m. peak hours. The unsignalized Emerald Street/Balsam Drive intersection is forecast to operate at LOS E during the p.m. peak hour. The poor LOS at this intersection reflects delay experienced for the critical movement only. The OR-66/OR-140 intersection is forecast to operate with a volume-to-capacity ratio of 0.80 during the weekday a.m. peak hour and 0.88 during the weekday p.m. peak hour. The OR-66/Emerald Street intersection is forecast to operate with a volume to capacity ratio of 0.73 during the p.m. peak hour. All other study intersections on the state highways are forecast to operate at a v/c ratio of 0.67 or better during both peak hours.

The OR-66/OR-140 intersection is forecast to fail to meet the ODOT standard for District highways. To achieve acceptable operations at this intersection without constructing a new facility to share the demand to and from Highway 97, OR-66 would need to be widened to 3-through lanes in each direction in the vicinity of the intersection. ODOT is not likely to build a facility of this size and the right-of-way costs would be extensive, thus it was assumed that the higher level of congestion would be tolerated and that the additional through-lanes would not be constructed. Further analysis of the OR-66/Highway 97 interchange and adjacent segments should be conducted to refine the expected operations at this intersection.

Appendix "D" contains the Local Build-Out operational analysis worksheets.

Figures 12 illustrates the necessary mitigation improvements noted in Table 3 and required for build-out of the study area. Figure 13 shows the proposed traffic control and lane configurations associated with the recommended improvements.

[3] A single-lane roundabout was assumed for the cost estimate for the SDC. Either a single-lane roundabout or a signalized intersection may be acceptable alternatives. The cost estimate for the roundabout is slightly higher than for a signal.



TRIP DISTRIBUTION PATTERN
RESIDENTIAL AND INDUSTRIAL DEVELOPMENT
KLAMATH FALLS, OREGON

FIGURE **8**

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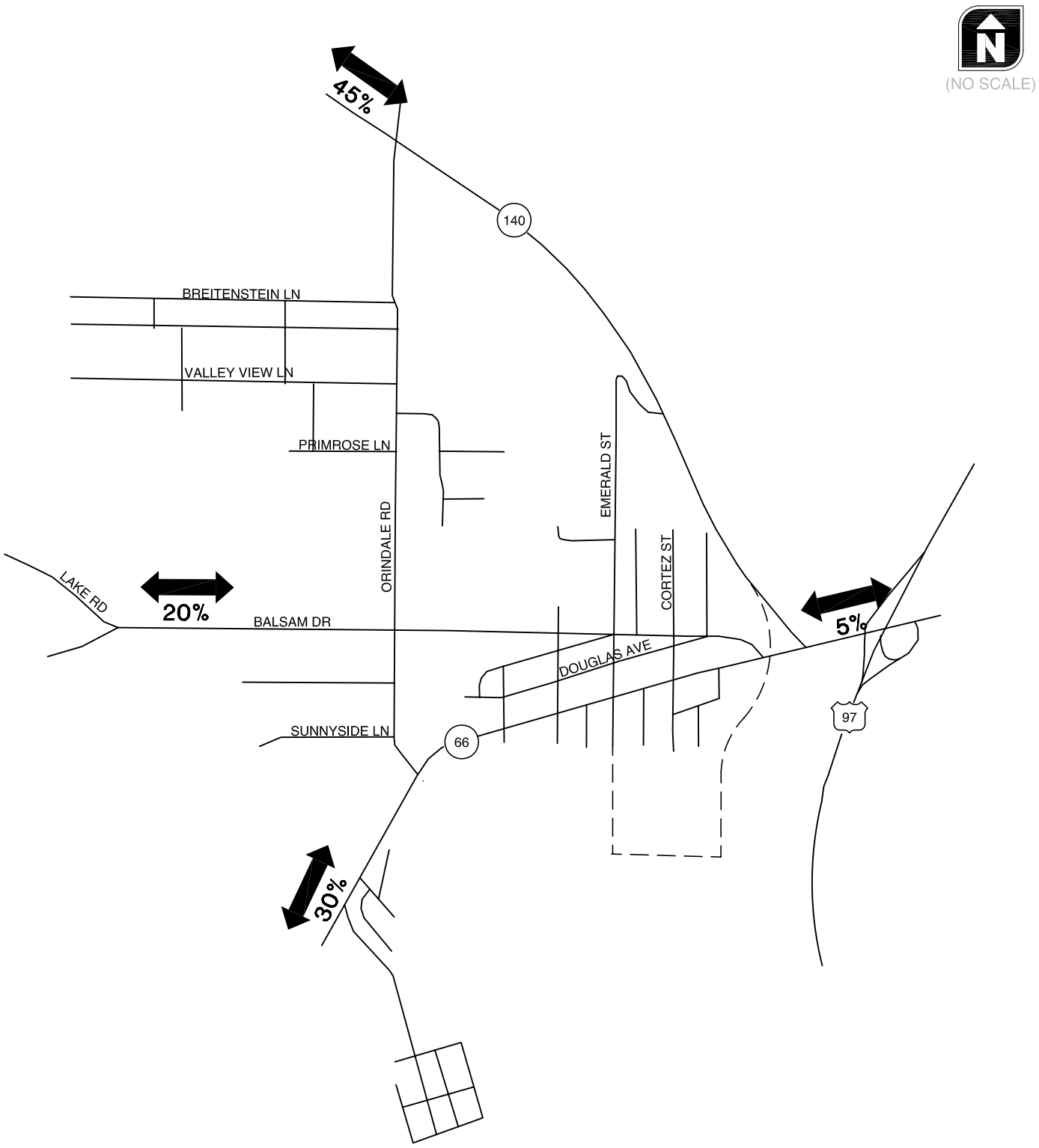

TRIP DISTRIBUTION PATTERN
COMMERCIAL DEVELOPMENT
KLAMATH FALLS, OREGON

FIGURE 9

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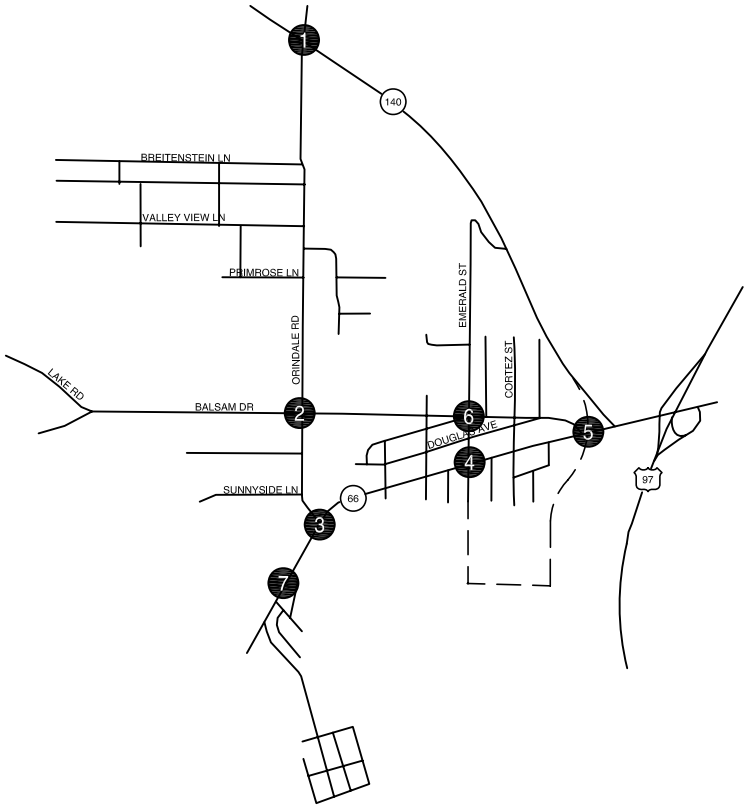
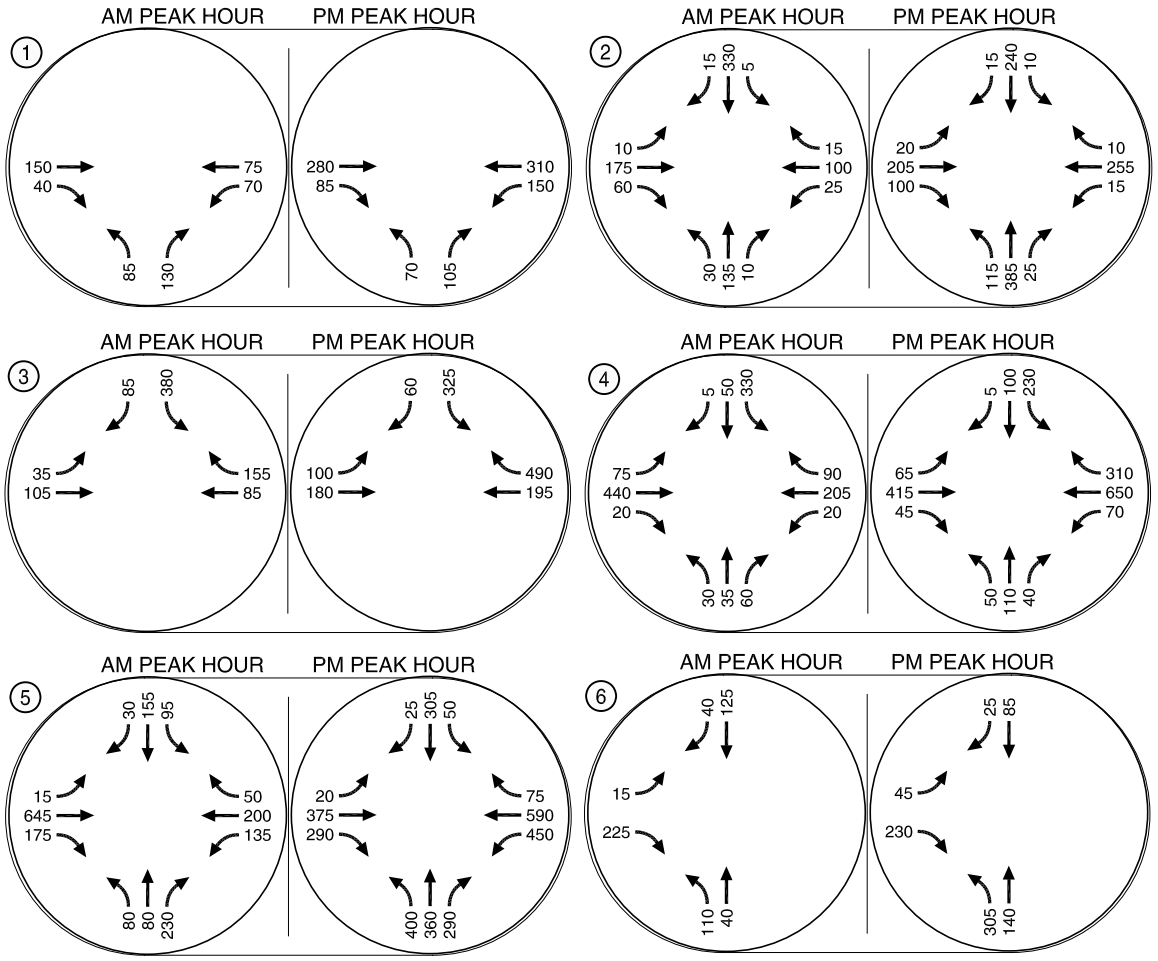
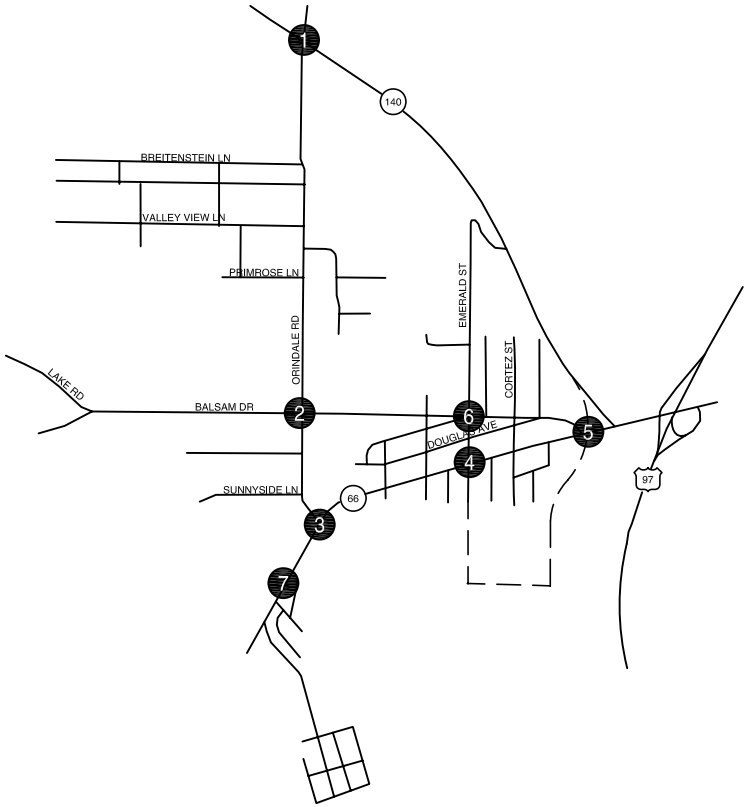
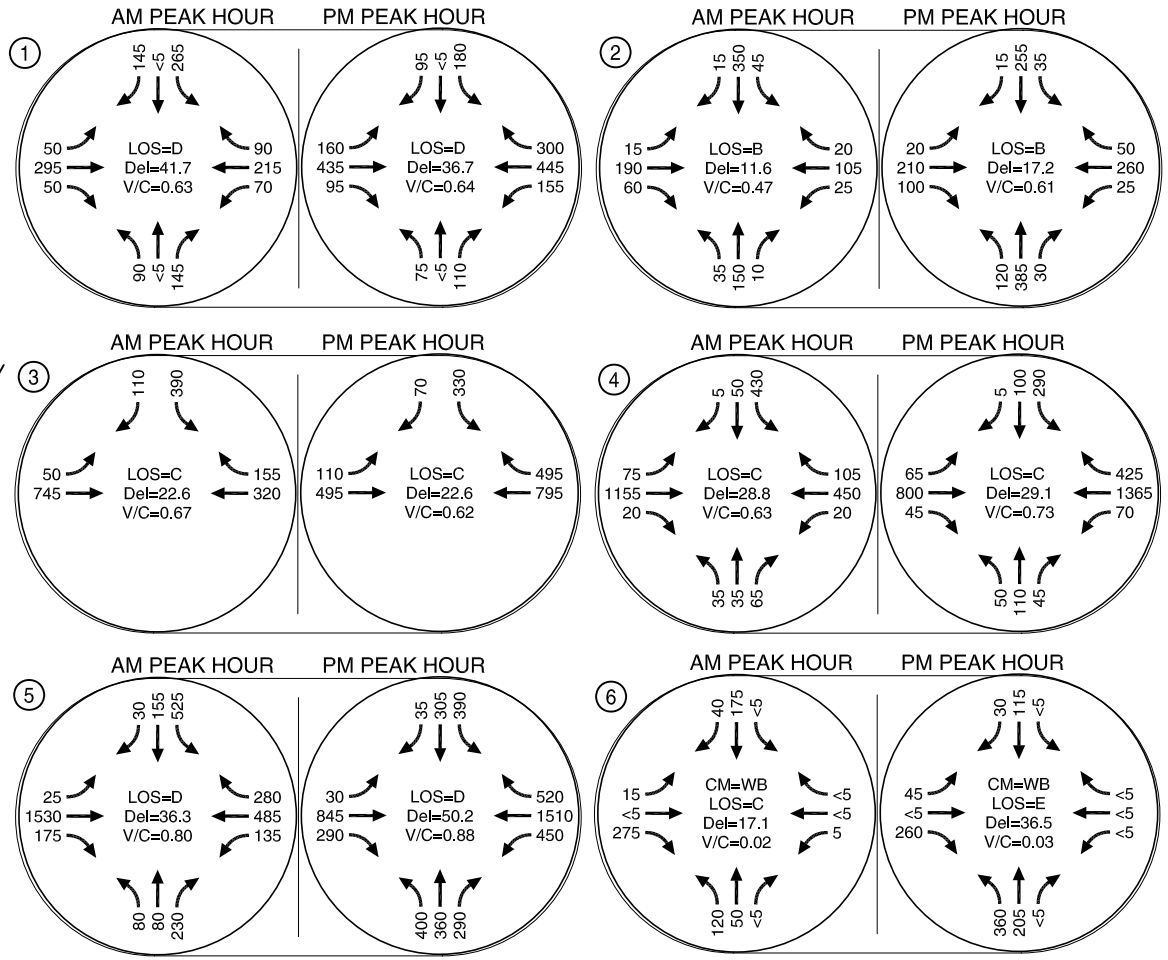




TRIP ASSIGNMENT
LOCAL BUILD OUT
KLAMATH FALLS, OREGON

FIGURE **10**





LEGEND

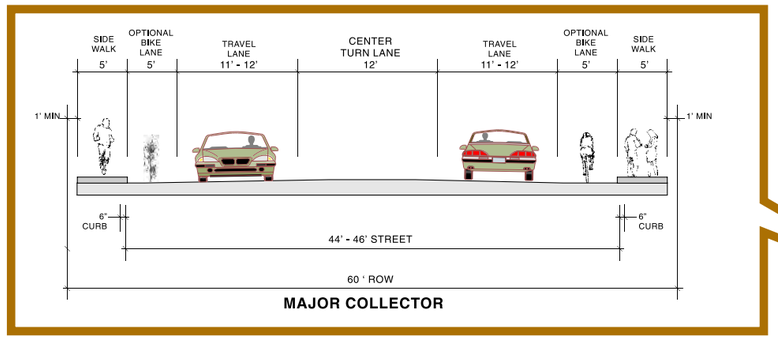
CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

MITIGATED TRAFFIC OPERATIONS
2025 LOCAL BUILD OUT TRAFFIC CONDITIONS
KLAMATH FALLS, OREGON

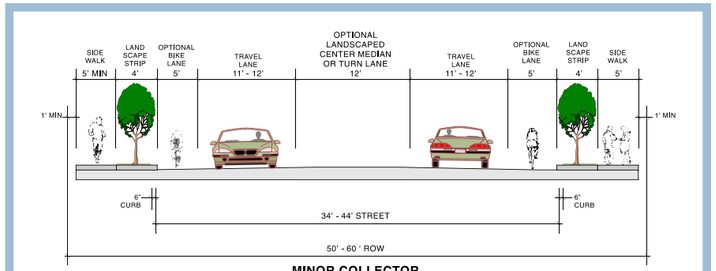
FIGURE **11**

H:\projfile\7718pdx\DWGS\Figs\7718Figs Full Area.dwg May 14, 2007 - 1:50pm - ksylvester Layout Tab: FIG 11

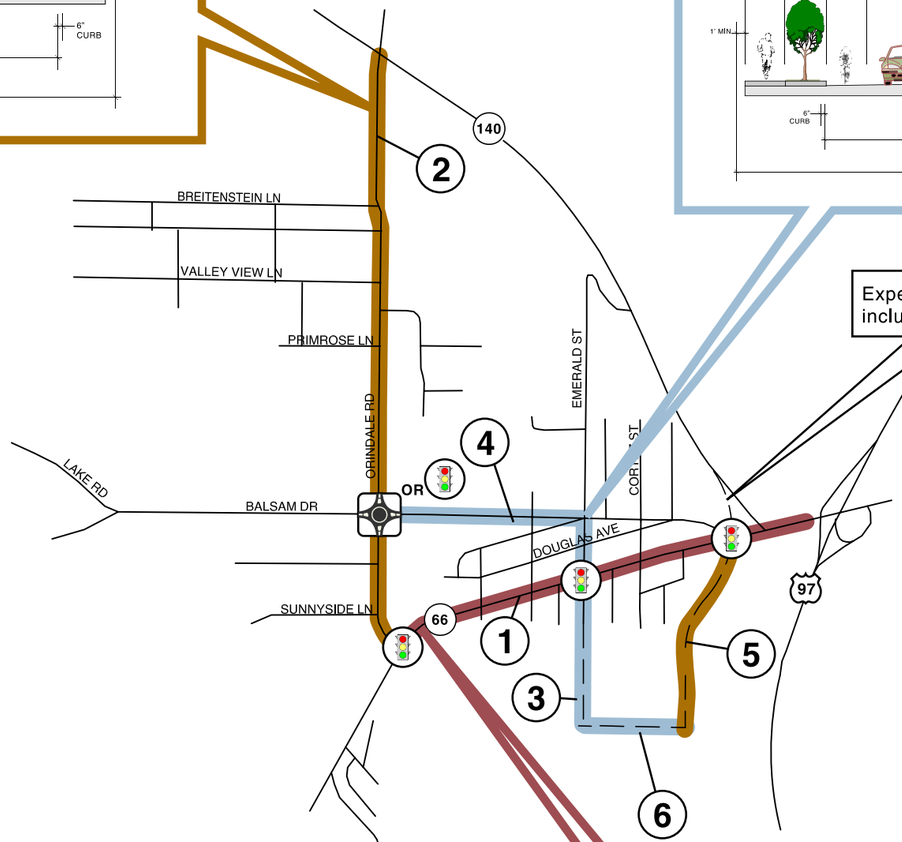
(NO SCALE)



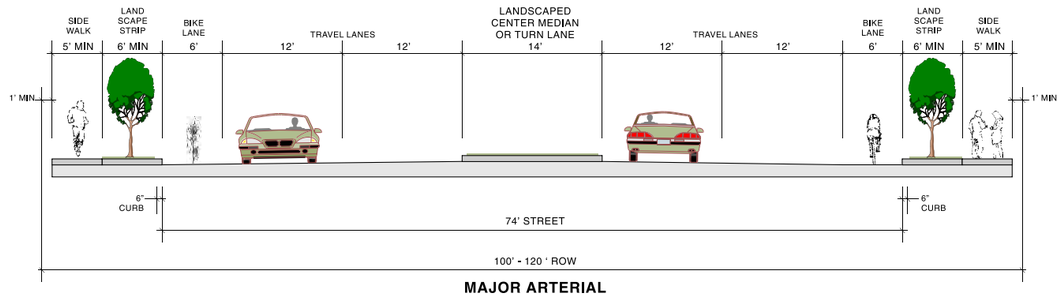
MAJOR COLLECTOR



MINOR COLLECTOR



Expected realignment of OR-140 not included in SDC prgram mitigations.



MAJOR ARTERIAL

Improvements

1. Upgrade to 5-Lane Major Arterial
2. Upgrade to Major Collector
3. Upgrade to Minor Collector
4. Upgrade to Minor Collector
5. New Major Collector
6. New Minor Collector

Transportation Improvements Orndale/Balsam Study Area
2025 Full Build Out
Klamath Falls, Oregon

FIGURE 12

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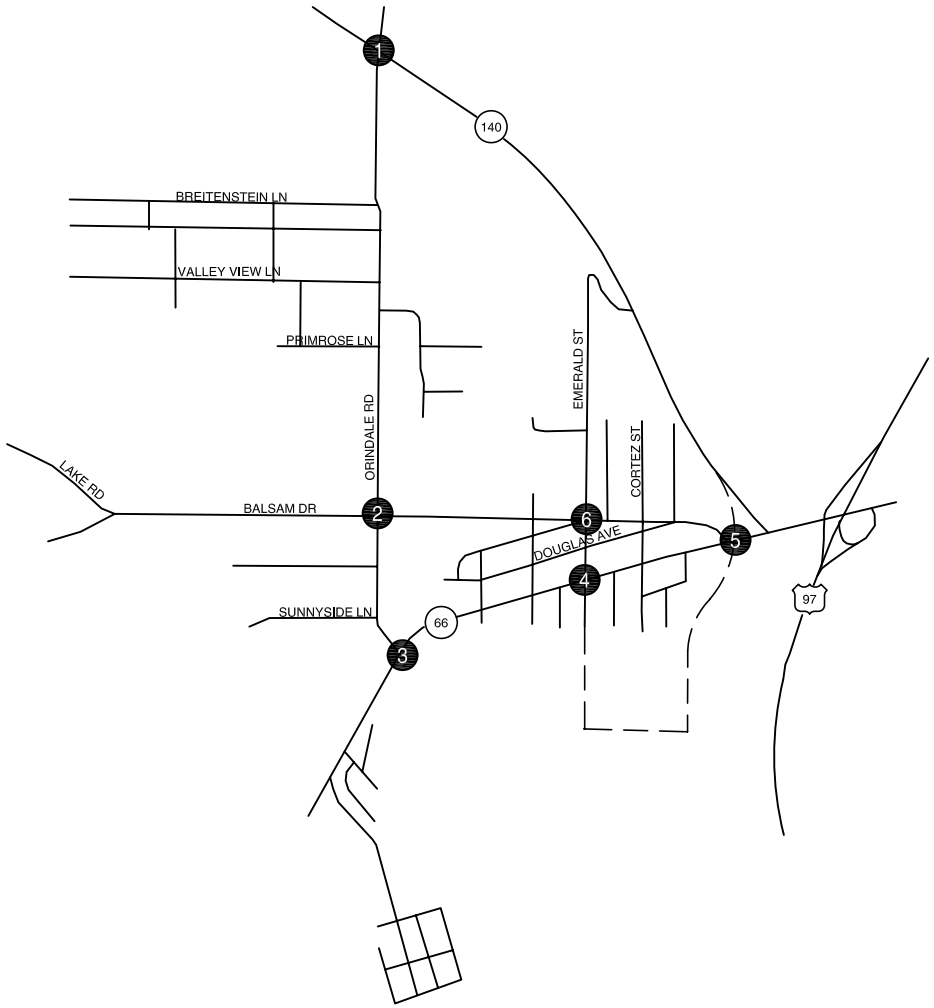

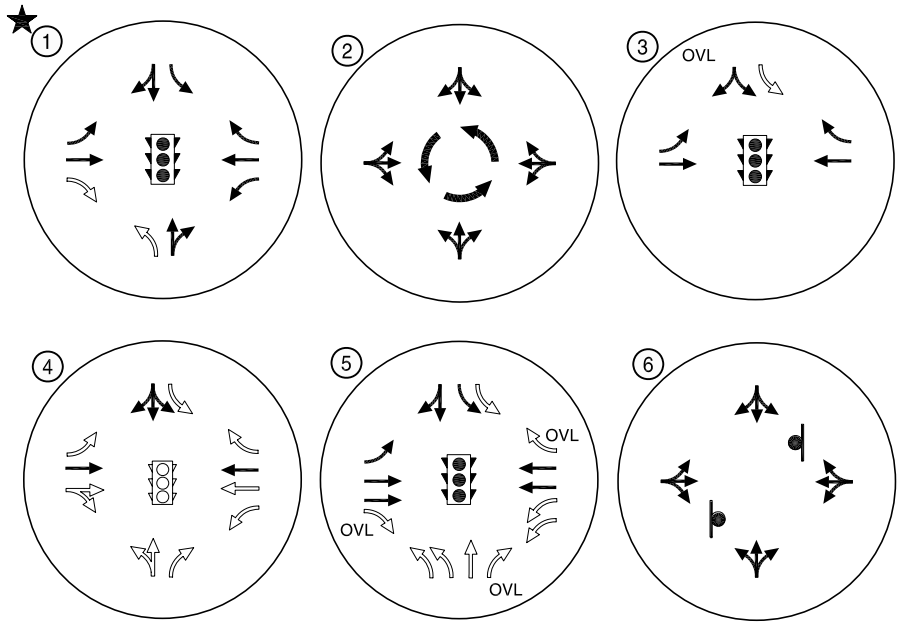

LEGEND

OVL - OVERLAP

- STOP SIGN

- TRAFFIC SIGNAL

★ - Signalization and turn lanes to and from north assumed to be conditioned with development north of the study area

INTERSECTION IMPROVEMENTS
2025 BUILD OUT TRAFFIC CONDITIONS
KLAMATH FALLS, OREGON

FIGURE **13**

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System Development Charge Alternatives

In order to develop a proportional based system development charge overlay zone for the Orindale/Balsam study area, the costs of the transportation improvement needs were estimated at a planning level. The estimated cost of each improvement was then divided by the total number of estimated new trips generation within the study area to determine the cost per daily trip. *The cost estimation worksheets are shown in Appendix "F".*

Four alternatives were developed, including:

- Alternative A: Including commercial developments and OR-66 improvements
- Alternative B: Including commercial developments, excluding OR-66 improvements
- Alternative C: Excluding commercial developments, including OR-66 improvements
- Alternative D: Excluding commercial developments and OR-66 improvements

Table 3 summarizes the improvement costs for each of the alternatives.

Table 3 Improvement Summary

#	Improvement	Estimated Cost	Cost Per Trip			
			Alt. A	Alt. B	Alt. C	Alt. D
Link Improvements: State Roads						
1	*OR-66*: 5-lane Major Arterial between Hwy 97 and Orindale	$6,681,000	$183		$336	
	*OR-66 right-of-way acquisition**	$2,139,000	$59		$108	
	SUBTOTAL	$8,820,000	$242		$444	
Link Improvements: Local Roads						
2	*Orindale Road:* 3-lane Major Collector between OR-140 and Balsam	$4,487,000	$123	$123	$226	$226
	Orindale Road: 3-lane Major Collector between Balsam and OR-66	$1,342,000	$37	$37	$68	$68
3	*Emerald Street:* 3-lane Minor Collector between Balsam and south end	$530,000	$15	$15	$27	$27
	Emerald Street Extension: 3-lane Minor Collector between OR-66 and Industrial property	$1,555,000	$43	$43	$78	$78
4	*Balsam Drive:* 3-lane Minor Collector between Orindale and Balsam	$1,882,000	$52	$52	$95	$95
5	*OR-140/Commercial Extension:* 3-Lane Major Collector between OR-66 and new collector	$1,968,000	$53	$53	$99	$99
6	*New East-West Collector:* 3-lane Minor Collector between Emerald and Commercial Collector	$1,101,000	$30	$30	$55	$55
	SUBTOTAL	$12,865,000	$353	$353	$648	$648
Intersection Improvements						
	Orindale / OR-140: Provide EB RT lane and NB LT lane	$89,000	$2	$2	$4	$4
	Orindale / Balsam: Single-lane Roundabout	$500,000	$14	$14	$25	$25
	OR-66 / Orindale Road:: Signalize	$336,000	$9	$9	$17	$17
	OR-66 / Orindale Road: Signal modifications, provide WB RT lane, second SB LT lane	$248,000	$7	$7	$13	$13
	OR-66 / Emerald Street: Signalize, provide WB RT lane	$399,000	$11	$11	$20	$20
	OR-66 / OR-140: Provide NB, EB, and WB RT; SB, EB, and WB second LT lanes; second SB receiving lane and taper; signal modification (70% of $618,000)	$433,000	$12	$12	$22	$22
	SUBTOTAL	$2,005,000	$55	$55	$101	$101
Orindale/Balsam System Development Charge Transportation Study						
		$81,500	$2	$2	$4	$4
Total						
Total Cost		$23,771,500	$652		$1,197	
Total Cost (no OR-66 Link Improvements)		$14,951,500		$410		$753

*Based on discussions with the City of Klamath Falls and ODOT, the cost of acquiring right-of-way was estimated using an estimate of $15 per square foot. The cost is considered to be volatile; however, this was agreed to be a conservative order-of-magnitude estimate.

As shown in Table 3, the total cost for all improvements is approximately $23.75 million. The system development charges for the four alternatives range from $410 per trip when commercial developments are included and OR-66 improvements are excluded to $1,197 per trip when commercial developments are excluded and OR-66 improvements are included.

System Development Charge Administration

It is recommended that the City of Klamath Falls develop a System Development Charge program for the Orindale/Balsam study area. The general characteristics of the proposed program are outline below.

Development Process

- The City, in negotiations with the developer, may elect to collect system development charges and develop roadway improvements as necessary, or elect to have the developer construct the roadway improvements as part of the development.

Transportation System Development Charges (TSDC)

- TSDCs are to be collected at the point in time when the water hook-up is processed for each new development.
- The TSDC is to be phased in, with an initial fee of half of the total SDC in 2007. This amount will increase by 10 percent of the total SDC each year for the five successive years. This results in the total SDC charged in 2012 and beyond.
- An annual increase in the TSDC will also be applied to account for inflation and will be tied to the City's adopted price index for construction related projects.

Credits

- All right of way and construction costs within the approved list of roadway improvements paid for and/or constructed by a developer shall result in a credit for the developer.
- Credits accrued by the developer shall be transferable within the study area to other developers.

Exceptions

- Any development in the study area that requires a zone change or comprehensive plan amendment will be required to prepare a traffic impact study. The study will be used to determine the number of primary trips that the site will generate and the resultant system development charge. In addition, land use actions that result in a significant impact per OAR 660-12-0060 will potentially be responsible for additional improvements not identified within the Orindale/Balsam transportation master plan.

Benefits

- Developers are able to proceed with development without preparing a Traffic Impact Analysis as a means to identify appropriate mitigation measures.

- All new development to the area contributes an equal and proportionate share to the necessary future roadway improvements.
- Provides predictability and immediate response from the City when the development is consistent with the sub-area transportation master plan assumptions.

Action Items

- Gain City Council approval of the proposed System Development Charge Program
- City adoption of ordinance to provide for the System Development Charge Program

In order for the System Development Charge Program to be equally applied to all future developments in the Orindale/Balsam Sub-Area, an Intergovernmental Agreement (IGA) is required between the City, Klamath County, and ODOT. This IGA will ensure that all future development in the Klamath Falls Orindale/Balsam Sub-Area follow the same criteria for development, regardless of the responsible agency.

Appendix 2I
Klamath Falls Campus Sub-Area Master Plan

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING
610 SW Alder Street, Suite 700, Portland, OR 97205 P 503.228.5230 F 503.273.8169

TECHNICAL MEMORANDUM

Klamath Falls Campus Sub-Area Master Plan

System Development Charge Analysis and Methodology

Date: September 8, 2008 Project #: 8338.0

To: Mark Willrett, P.E., Director of Public Works

From: Del Huntington, P.L.S.
Marc Butorac, P.E.., P.T.O.E.
Joey Bansen, E.I.
Kirsty Bilton

CC: Sandra Zaida, Community Development Director

INTRODUCTION

The City of Klamath Falls, Oregon commissioned a campus sub-area transportation master plan in the vicinity of the Oregon Institute of Technology (OIT) to provide a better understanding of the potential impacts to the transportation system, future deficiencies, and estimated costs to plan and construct necessary roadway improvements to ensure that property owners and developers are provided a level of certainty regarding necessary transportation improvements and contributions to mitigate potential impacts in a fair and equitable manner.

The remainder of this memorandum documents the transportation master plan for the study area, as well as the transportation System Development Charge (SDC) methodology recommended to fund the anticipated transportation improvements for the OIT study area. The proposed SDC is intended to fund anticipated transportation improvements by applying a "per trip" fee to future development in the study area. All existing development in the study area is exempt from the SDC.

The SDC was developed by considering the existing land uses and traffic conditions in the study area, identifying the potential for future development in the study area, and determining necessary transportation mitigations and associated costs for the build out scenario. This memorandum summarizes the methodology used to develop the proposed SDC, including:

- The existing land uses and traffic conditions;
- The assumptions used to estimate development potential in the study area;

- The transportation improvements and associated costs to accommodate the local build-out of study area land-uses, in conjunction with continued local and regional growth through year 2030;
- A preliminary funding strategy to address the transportation mitigation costs; and
- The next steps necessary to complete the study and implement a development review and funding process for the study area.

STUDY AREA

The study area comprises approximately 1,085 acres northeast of US-97 in the northeast corner of the City of Klamath Falls, Oregon. Approximately 880 acres (which represents 80 percent of the study area) are within the city limits, while the remainder is within the Urban Growth Boundary (UGB) in Klamath County. Downtown Klamath Falls, southeast of the study area, is a primary destination for employment and retail traffic from the study area. Figure 1 shows the site vicinity and the study area.

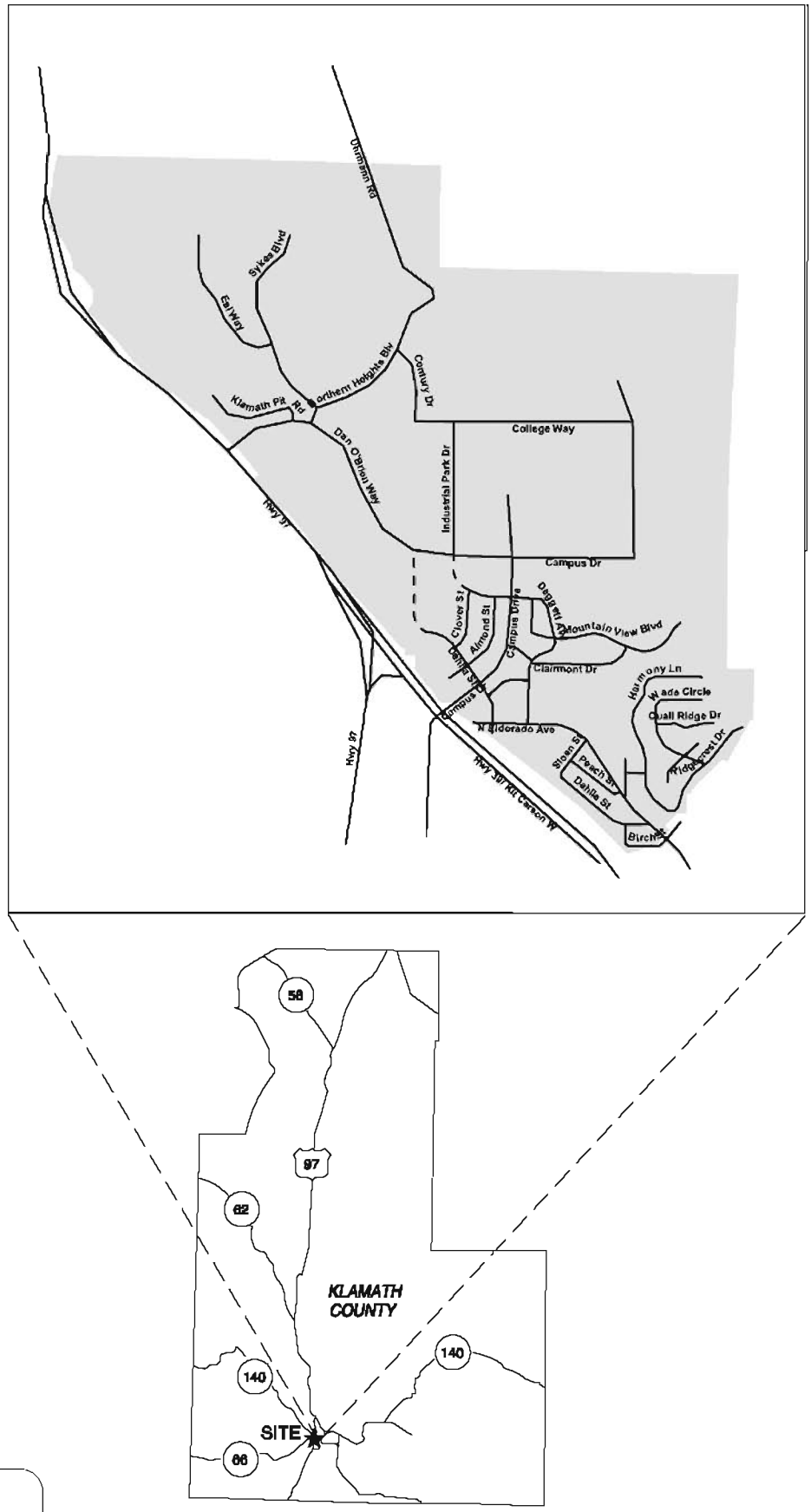
For analysis purposes, the study area was divided into four sub-sections. Figure 2 shows the four sub-sections of the study area.

EXISTING CONDITIONS

Zoning and Land Use

The 20 percent of the study area that is outside city limits is shown as undesignated zoning on the City of Klamath Falls zoning map and is zoned Residential by Klamath County. Much of this undesignated land is on steep topography and may not be developable. The remaining study area is within the City limits and includes the following approximations;

- Approximately 25 percent of the study area is zoned for residential development, most of which is for Single-Family development, with a minimum lot size of 7,000 square-feet.
- Approximately 125 acres of commercial land located mostly along Highway 97 and Campus Drive, which includes a mix of general commercial and neighborhood commercial.
- Approximately 160 acres of heavy industrial and 125 acres of light industrial uses are located on the north side of Dan O'Brien Way.
- Approximately 50 acres is zoned for medical professional uses south of the OIT campus, and 175 acres are zoned Public, most of which is the OIT campus.



LEGEND

STUDY AREA

SITE VICINITY MAP
KLAMATH FALLS, OREGON

FIGURE 1

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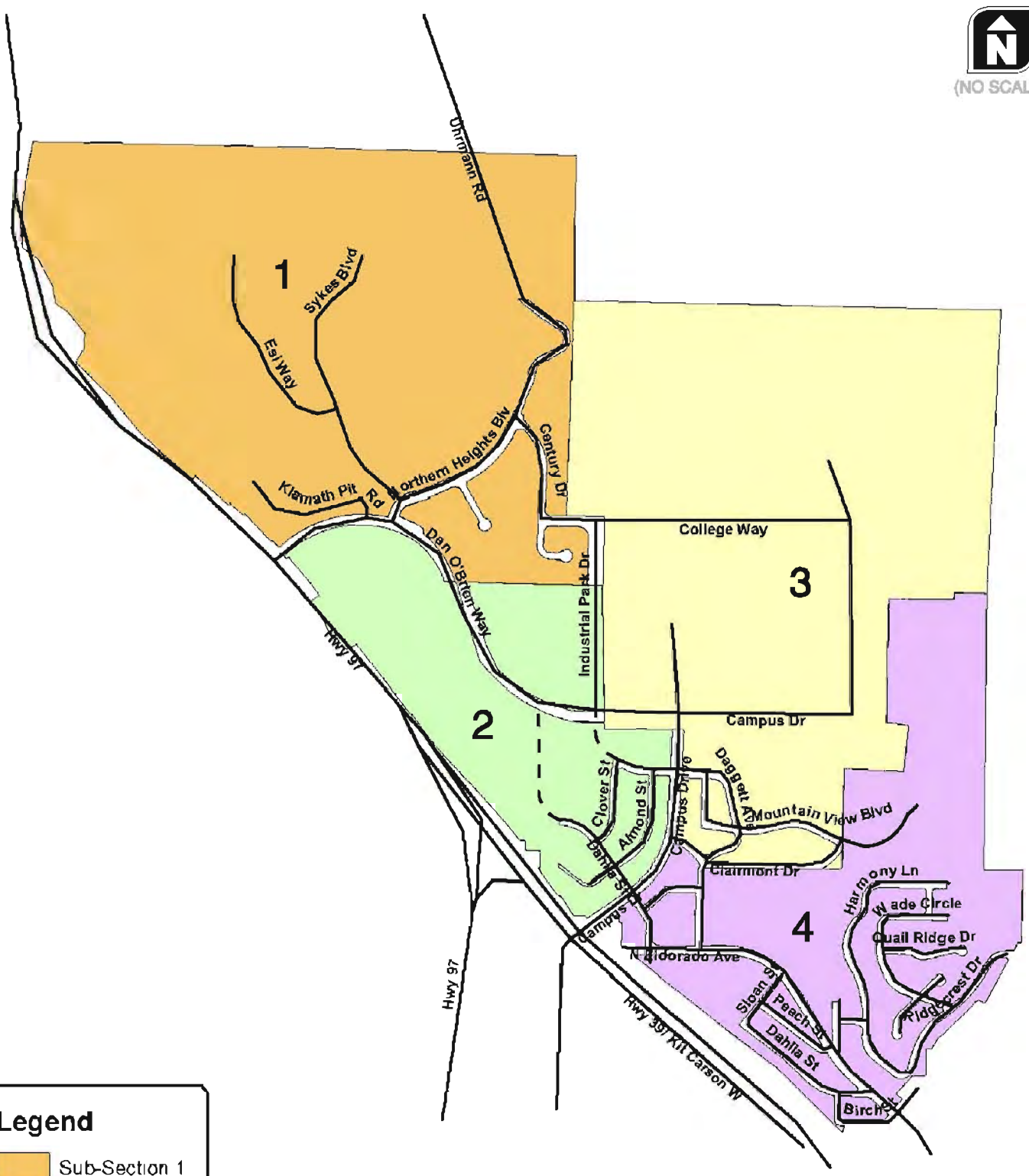

STUDY AREA SUB-SECTIONS
KLAMATH FALLS, OREGON

FIGURE 2

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Almost sixty percent of the study area is currently undeveloped. Existing development is made up primarily of residential developments, the OIT campus, and medical and commercial uses. Figure 3 shows the city limits and the zoning in the study area.

Transportation Facilities

Highway 97 and Highway 39 (Highway 97 Business Route/Crater Lake Parkway) are the primary state highways in the project vicinity. Campus Drive, running north to the OIT campus from Highway 97, is the primary arterial carrying traffic to and from the campus and is the main access to serve the entire study area. The other major outlets to the study area are Dan O'Brien Way to the north and North El Dorado Avenue to the south. Table 1 summarizes the characteristics of the key roadways in the study area.

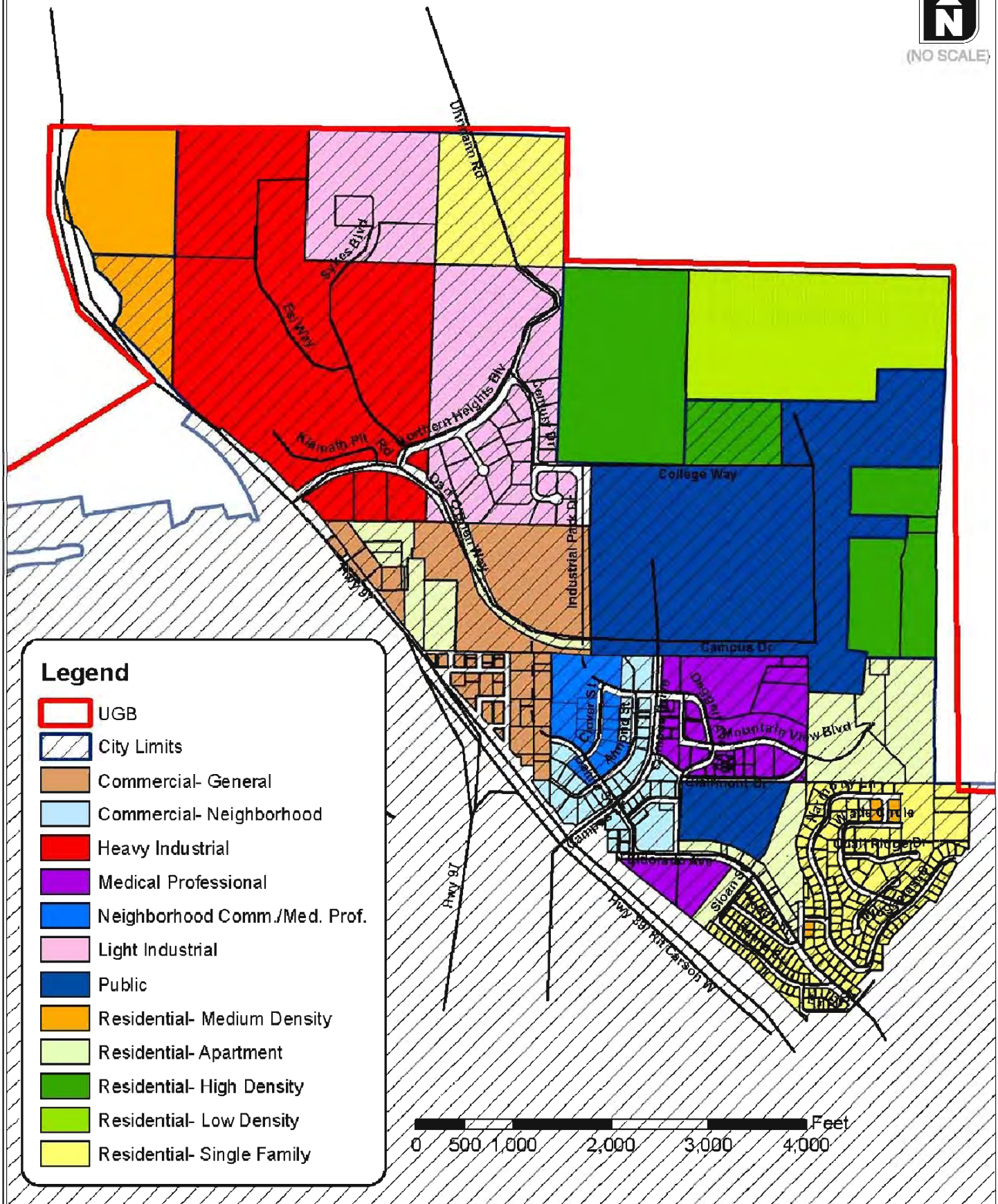
Table 1 Existing Transportation Facilities and Roadway Designations

Roadway	Classification by Roadway Ownership	Cross Section	Posted Speed (mph)	Sidewalks?	Bicycle Lanes?	On-Street Parking?
Highway 97	Statewide Highway, Freight Route & Expressway – ODOT	2-4 lane	50	No	Yes	No
Crater Lake Parkway/ OR 39/ Highway 97 Business Route	Statewide Highway– ODOT	4-lane	50	No	Yes	No
Campus Drive – East of Dan O'Brien Way	Private (OIT)	2-lane	20	Yes – South Side	No	No
Campus Drive – South of Dan O'Brien Way	Major Arterial	4-lane	35	Yes	No	No
Dan O'Brien Way	Major Collector	2-lane	35	No	Yes	No
Industrial Park Drive	Collector	2-lane	30	No	No	No
Daggett Avenue	Local	2-lane	Not Posted	Yes	No	Yes
Dahlia Street	Minor Collector	2-lane	25	Yes	No	No

Study Intersections

The following intersections were considered in the traffic analyses:

- Crater Lake Parkway(Highway 39)/ Campus Drive
- Campus Drive/Dahlia Street
- Campus Drive/Daggett Avenue
- Campus Drive/Dan O'Brien Way
- Dan O'Brien Way/Industrial Park Drive



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STUDY AREA LAND USES
KLAMATH FALLS, OREGON

FIGURE 3

- Dan O'Brien Way/Northern Heights Boulevard
- Highway 97/Dan O'Brien Way
- Daggett Avenue/El Dorado Avenue

Figure 4 illustrates the location of the study intersections, the existing lane configurations, and the associated traffic control devices.

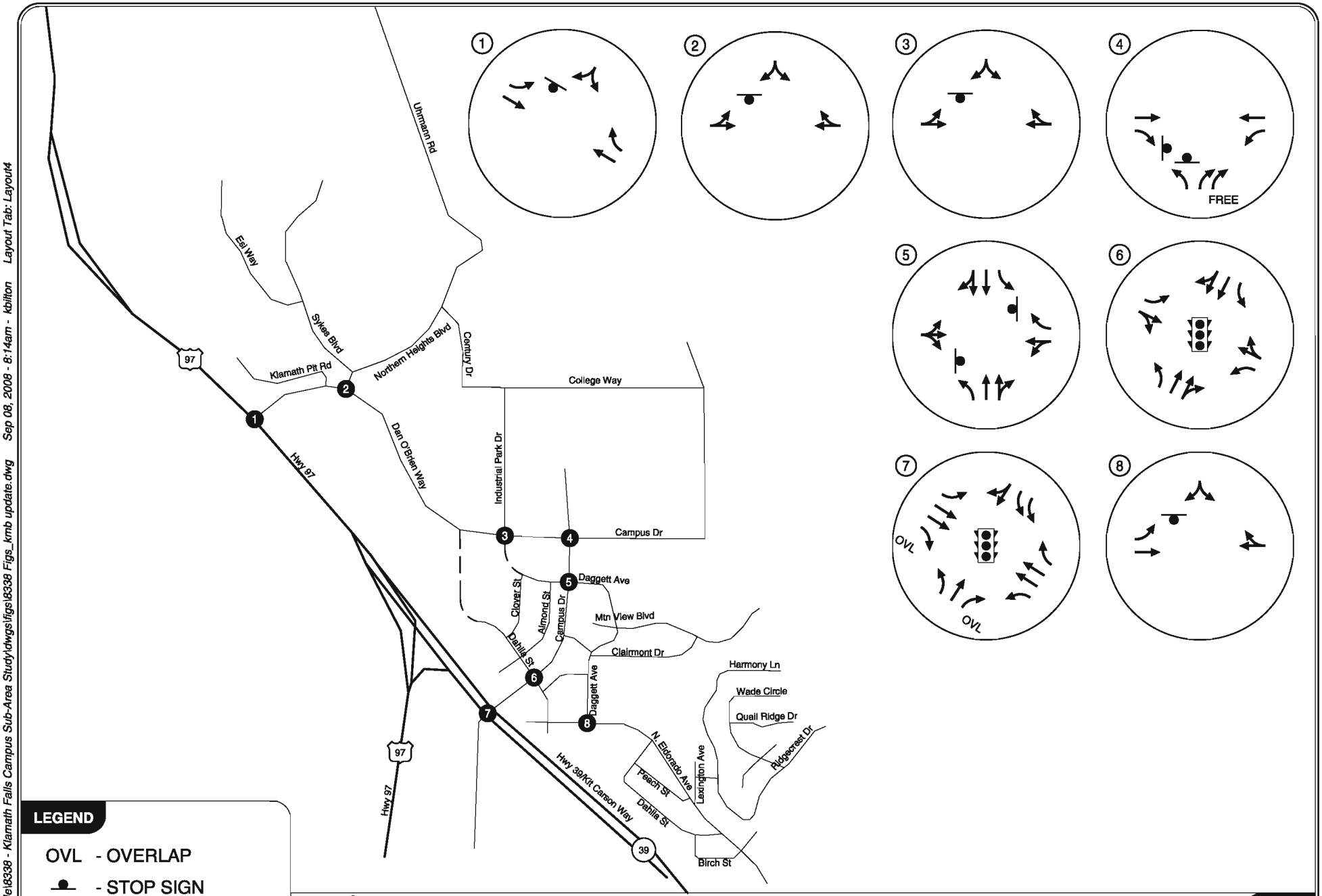
Existing Operations

All level-of-service analyses described in this report were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual* (Reference 1). A description of level of service and the criteria by which they are determined is presented in Appendix "A" of this memorandum. Appendix "A" also discusses how level of service (LOS) and volume to capacity (v/c) ratio is measured. Appendix "A" also describes what is generally considered the acceptable range of LOS and the maximum v/c ratio for intersections within ODOT jurisdictions. The City of Klamath Falls has adopted a LOS D standard for signalized and unsignalized intersections on City maintained streets. ODOT evaluates intersections based on a v/c analysis for intersections on State Highways, with a 0.70 v/c ratio standard on Highway 97 in the study area.

The peak 15-minute flow rate during the weekday a.m. and p.m. peak hours were used in the evaluation of all intersection levels of service. Thus, the analyses reflect conditions that are only likely to occur for 15 minutes out of each average weekday peak hour.

The existing conditions analysis was conducted using turning movement counts collected for this study. These manual turning movement counts were collected during the weekday a.m. and p.m. peak hours in November 2007 while classes were in session at OIT. The weekday peak hours for the study area were identified as 7:30 to 8:30 during the a.m. and 4:15 to 5:15 during the p.m. periods. *The traffic count data are included as Appendix "B".*

The existing conditions analysis indicates that all of the study intersections currently operate under capacity and at LOS D or better, except for the intersection of Campus Drive and Daggett Avenue in the AM peak hour. This two-way stop-controlled intersection operates at LOS F on the westbound approach. This is consistent with analysis results from the *OIT Center for Health Professionals Traffic Impact Analysis*, performed by KAI in February 2006 (Reference 2). The ODOT managed signalized intersection at Crater Lake Parkway/Highway 39 and Campus Drive operates at a v/c ratio of 0.60 and 0.63 under existing traffic conditions during the weekday a.m. and p.m. peak hours, respectively. Figure 5 shows the weekday a.m. and p.m. peak hour traffic operations. *The 2007 Existing Conditions Analysis worksheets are included as Appendix "C".*



LEGEND

OVL - OVERLAP

- STOP SIGN

- TRAFFIC SIGNAL

Study Intersection

— — — Planned Street

EXISTING LANE CONFIGURATIONS AND TRAFFIC CONTROL DEVICES KLAMATH FALLS, OREGON

FIGURE 4

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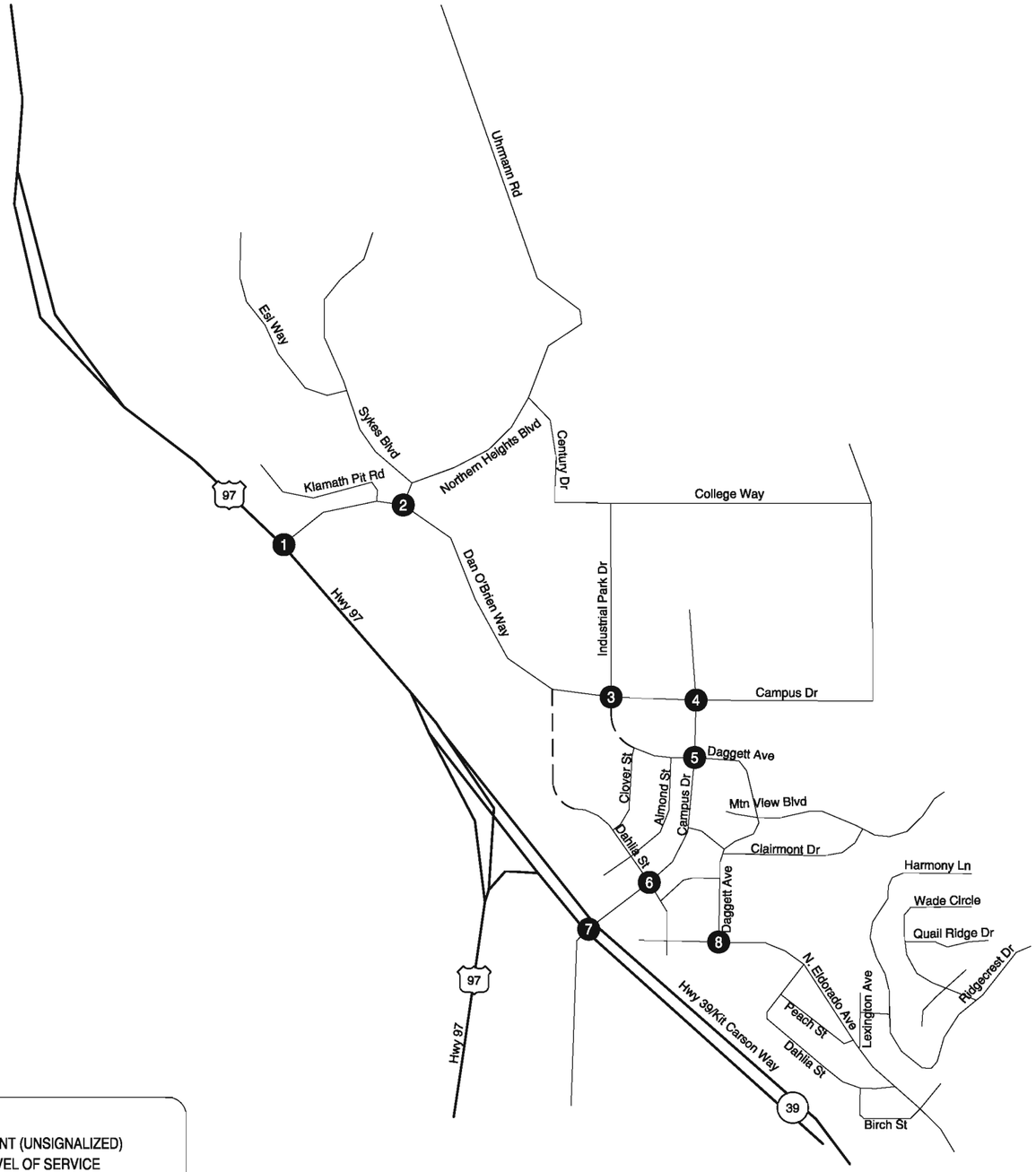

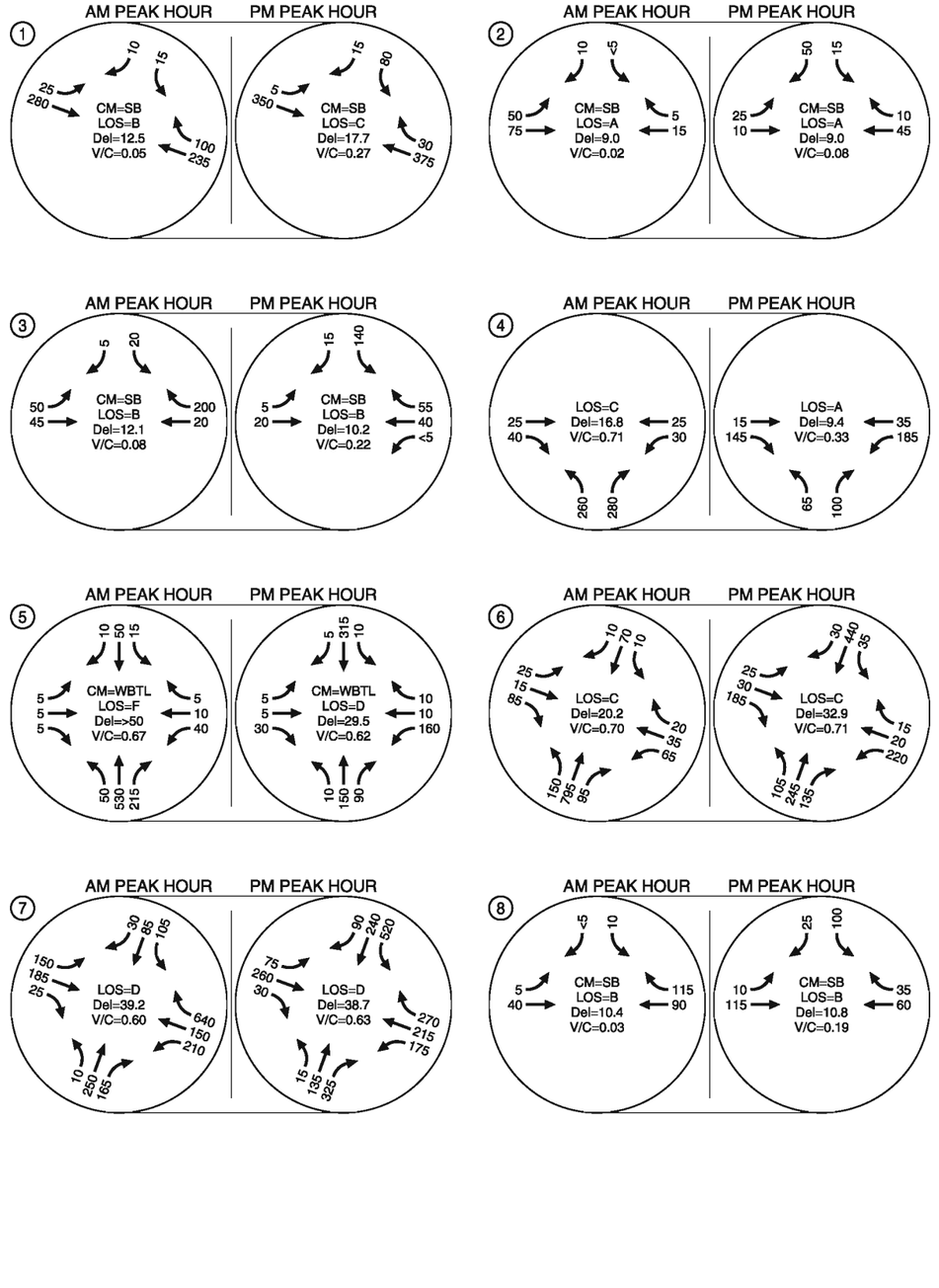

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2007 EXISTING TRAFFIC CONDITIONS
WEEKDAY OPERATIONS
KLAMATH FALLS, OREGON

FIGURE **5**

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YEAR 2030 REGIONAL GROWTH CONDITIONS

Forecast Traffic Volumes

The "Year 2030 Regional Growth Scenario" assumes continued regional traffic growth along Highway 97 traveling through the study area, but no new development within the study area except for developments which have been approved at the time of this study ("in-process developments"). Year 2030 was selected as the future analysis year to provide a 20-year horizon for growth, and to adequately determine the future needs of the study area traffic system.

Base year (2000) and future year (2025) model outputs were obtained from the ODOT Transportation Planning and Analysis Unit (TPAU) for the Klamath Falls Travel Demand Model area. To check the model outputs for reasonableness, the 2000 and 2025 models were interpolated to year 2007 and compared with the traffic counts collected in November 2007. As shown in the worksheets included in Appendix "D", the model outputs were found to vary significantly from actual conditions, and the future year 2025 model forecast traffic volumes on Highway 97 near Dan O'Brien Way are actually lower than existing 2007 traffic counts.

The TPAU model was used to develop a growth rate to be applied to existing traffic counts. A straight-line growth rate of approximately one percent per year was found between the 2000 and 2025 model volumes on Highway 97. This study assumes that regional growth will occur only on Highway 97 while traffic growth on the local roads in the study area will occur based on localized future development; thus, only Highway 97 traffic volumes were increased by one percent per year for regional growth.

In-Process Development Traffic

Additional traffic was added to study area roadways to account for developments which are currently approved but yet to be built. Traffic studies for these developments were obtained to determine the assignment of trips to study area roadways, and are included in Appendix "E". The "in-process" developments are as follows:

- Valley Vista Residential: This development is located in the northern portion of the study area (Sub-Section 1) and consists of 156 single-family residential units on approximately 42 acres. The site is expected to generate approximately 1,500 daily trips with 117 trips in the weekday a.m. peak hour and 158 trips in the weekday p.m. peak hour.

- Harbor View Subdivision: This development is located in the northwest corner of the study area (Sub-Section 1) and will include 46 single-family homes on approximately 15 acres. This development is expected to generate approximately 510 daily trips with 41 trips in the weekday a.m. peak hour and 54 trips in the weekday p.m. peak hour.

- Somerlande PUD: Somerlande is a 6-phase development with residential and commercial uses located just north of the OIT campus (Sub-Section 3). Phases 1-3 have been approved to be built and include 89 single-family units and 16 town-home units. This portion of the

development is expected to generate approximately 950 daily trips with 74 trips in the weekday a.m. peak hour and 98 trips in the weekday p.m. peak hour.

- OIT Expansion: A Traffic Impact Study was prepared in 2006 for the addition of the new Center for Health Professionals medical classroom building near the main entrance to the OIT campus (Sub-Section 3). The construction is planned to occur in two stages, with the first phase of 42,300 square-feet already completed and in use. The second phase of 37,700 square-feet is currently under construction and is expected to be in use by April 2009, according to OIT staff. The second phase is estimated to add approximately 425 daily trips with 40 weekday a.m. peak hour trips and 36 weekday p.m. peak hour trips.

Traffic volumes for the 2030 regional growth conditions were developed by growing existing 2007 traffic volumes on Highway 97 by one percent per year to 2030 and then adding the traffic associated with the addition of the four approved "in-process" developments to the study area roadways. Figure 6 shows the forecast weekday a.m. and p.m. peak hour volumes for this scenario.

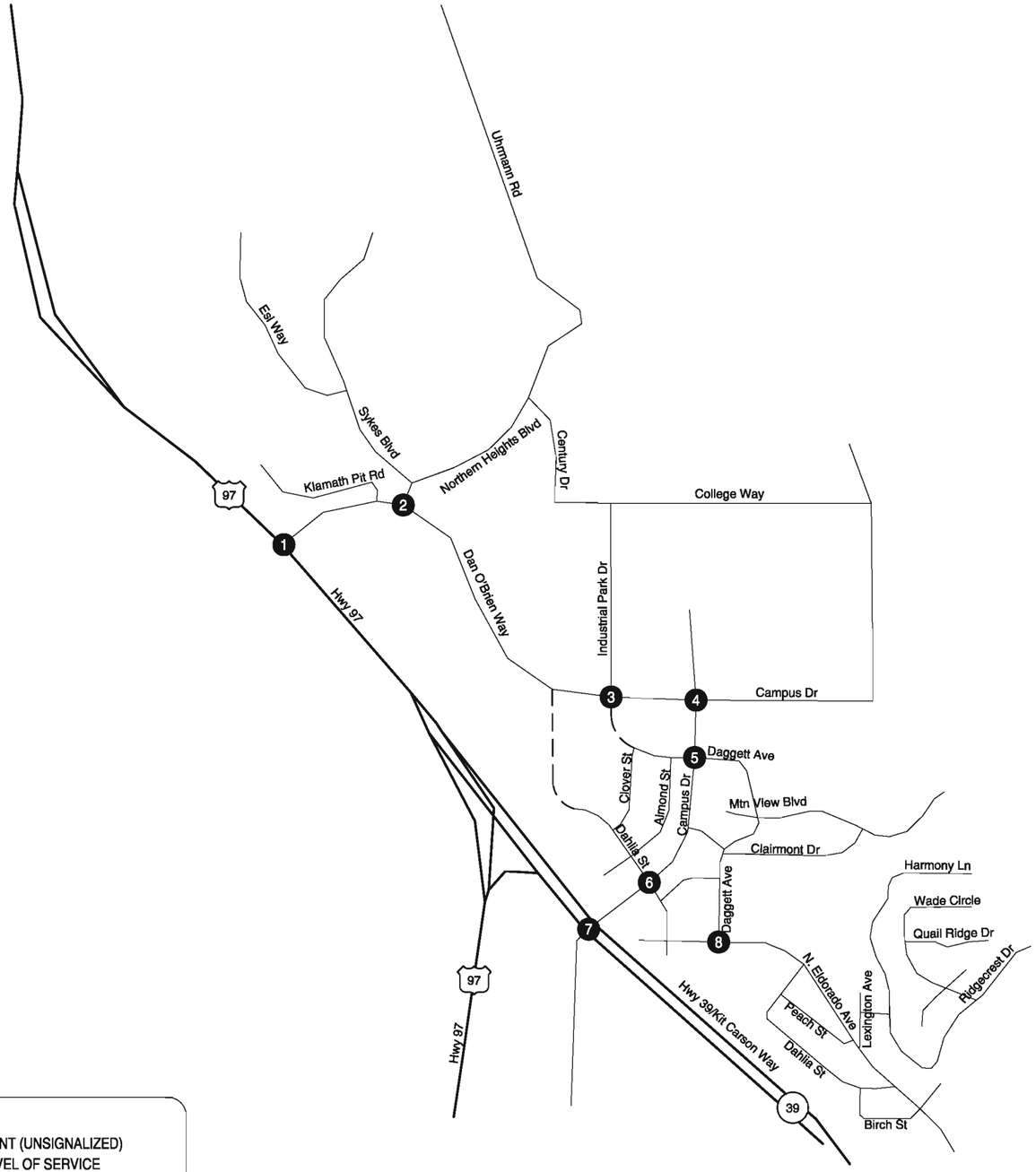
Transportation Improvements

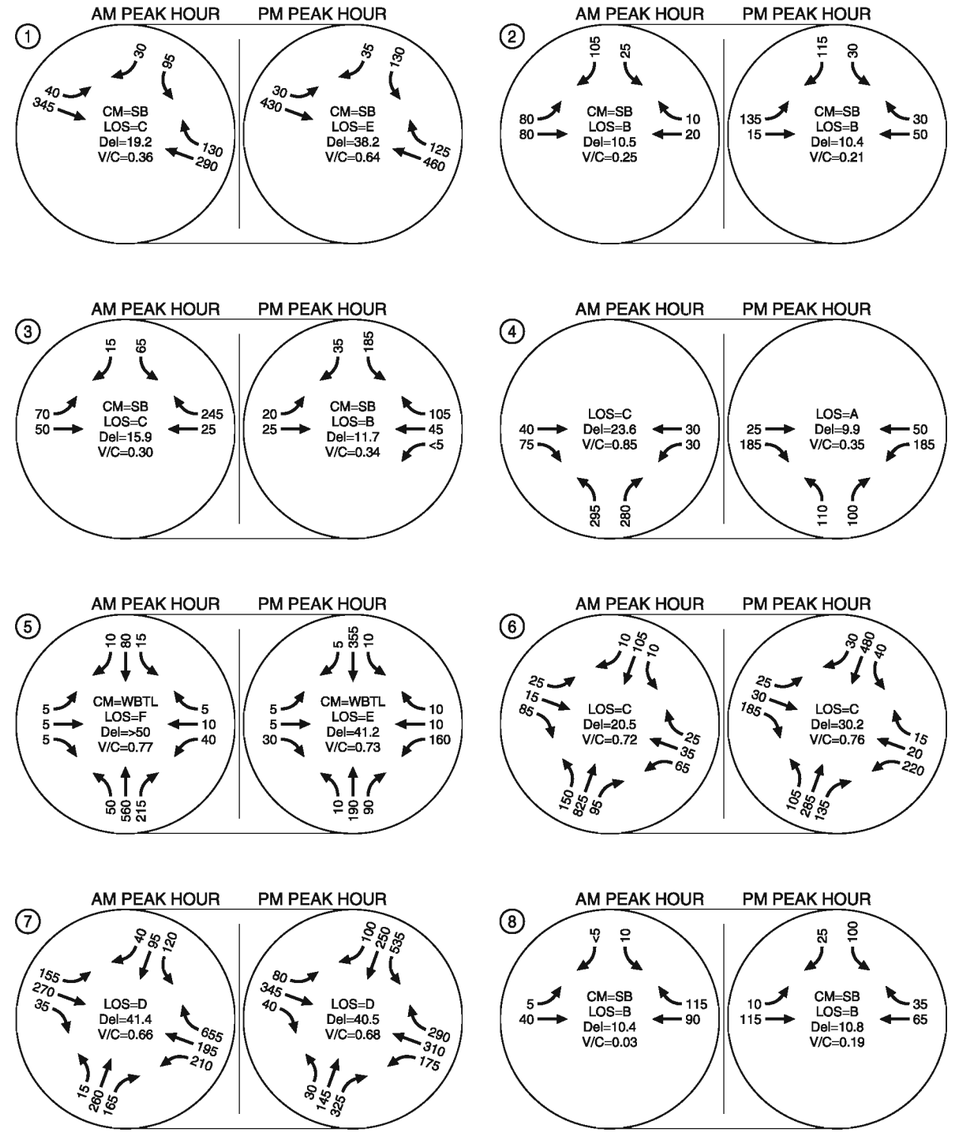
Two local street extensions are included in the 1997 Klamath Falls Urban Area Transportation System Plan (TSP). The two new streets will be two-lane minor collectors, and are shown in Figure 4 as dashed lines. The two roadway extensions will connect Daggett Avenue and Dahlia Street to Dan O'Brien Way. The extension of Daggett Avenue is expected to connect to Dan O'Brien Way at Industrial Park Drive, adding a fourth leg to the stop-controlled intersection. It was assumed that these forecast transportation improvements identified in the TSP will occur regardless of the build out within the study area.

Forecast Traffic Operations

Operational analyses were conducted for the study intersections, using the weekday a.m. and p.m. peak hour turning movement volumes shown in Figure 6, to determine the 2030 Regional Growth traffic conditions.

As shown in Figure 6, the Campus Drive/Daggett Avenue intersection is anticipated to operate below City of Klamath Falls standards. All other intersections are expected to operate within accepted limits. *The 2030 Regional Growth traffic operations analysis worksheets are included in Appendix "F".*





LEGEND

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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2030 REGIONAL GROWTH TRAFFIC CONDITIONS
WEEKDAY OPERATIONS
KLAMATH FALLS, OREGON

FIGURE **6**

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YEAR 2025 LOCAL BUILD-OUT CONDITIONS

Development Potential

Development potential within the study area was estimated using tax assessment property information provided by Klamath County, a review of aerial photography and topographic information, and discussions with City staff. Because it was recognized that portions of the study area are located on steep topography which may not be developable, a slope analysis was run in GIS by City staff to determine the potential for development on currently vacant land. It was assumed that residential uses may be built on slopes flatter than 15% and commercial and industrial uses may be built on slopes flatter than 12%. *Results of the slope analysis are shown in Appendix "G".*

A significant portion of the study area is not presently served by roadways and utilities, therefore a 25-percent reduction was applied to several of the land area to accommodate future city street right of ways and utilities. Where a reduction has been made for the future provision of right of way and utilities, it is noted in the discussion below. *These reductions are also included in the detailed worksheets included in Appendix "H".*

For purposes of determining the gross square-footage that may actually be built on undeveloped land in the study area, floor-area-ratios (FAR) were applied to the overall area of the vacant parcels. The FAR's are national averages of the portion of the total site area that is taken up by the building for specific land uses. An FAR of 0.20 was assumed for commercial and office uses, and an FAR of 0.40 was assumed for industrial uses.

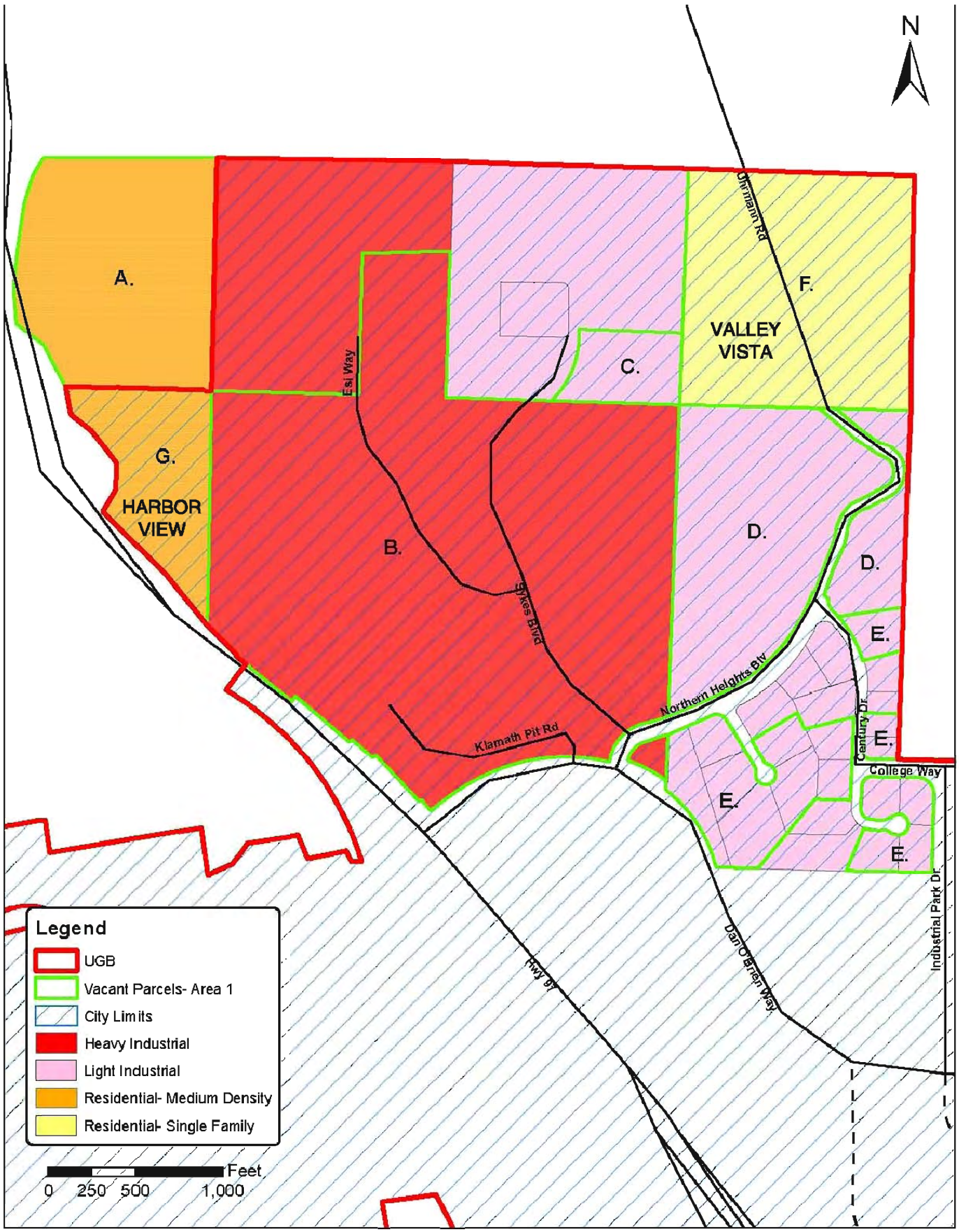
It was assumed that vacant land zoned for residential uses will build out at the maximum density permitted by the current zoning (7,000 square-foot lots for Single-Family Residential, and 5,000 square-foot lots for Medium-Density Residential) unless current development in the close vicinity suggests a different density.

Sub-Section 1

Approximately 75 percent of the 375 acres in Sub-Section 1 is zoned for industrial uses. The remaining 25 percent consists of residential uses. Figure 7 shows the current zoning and areas of potential future development for Sub-Section 1.

Residential

No residential dwelling units currently exist in Sub-Section 1, though two developments (Valley Vista and Harbor View) have been approved to build 202 new single-family homes on approximately 57 acres of vacant land, as discussed previously in "In-Process Development Traffic." Valley Vista and Harbor View developments are shown in Figure 7 as Areas "F" and "G", respectively.



POTENTIAL FUTURE DEVELOPMENT
SUB-SECTION 1
KLAMATH FALLS, OREGON

FIGURE 7

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A vacant 32-acre parcel of Medium-Density Residential zoned land is located in the northwest corner of Sub-Section 1 (Area "A" in Figure 7). It was assumed that this land will become a part of the city limits and develop residentially at 3 parcels per acre (approximately 15,000 square foot lots), similar to the development intensity of the currently approved Harbor View Subdivision directly to the south (Area "G" in Figure 7). It has also been assumed that provisions for rights of way and utilities is considered in these rates and thus no further reductions were applied. Based on these assumptions, the build-out of this land will result in 97 new homes.

Industrial

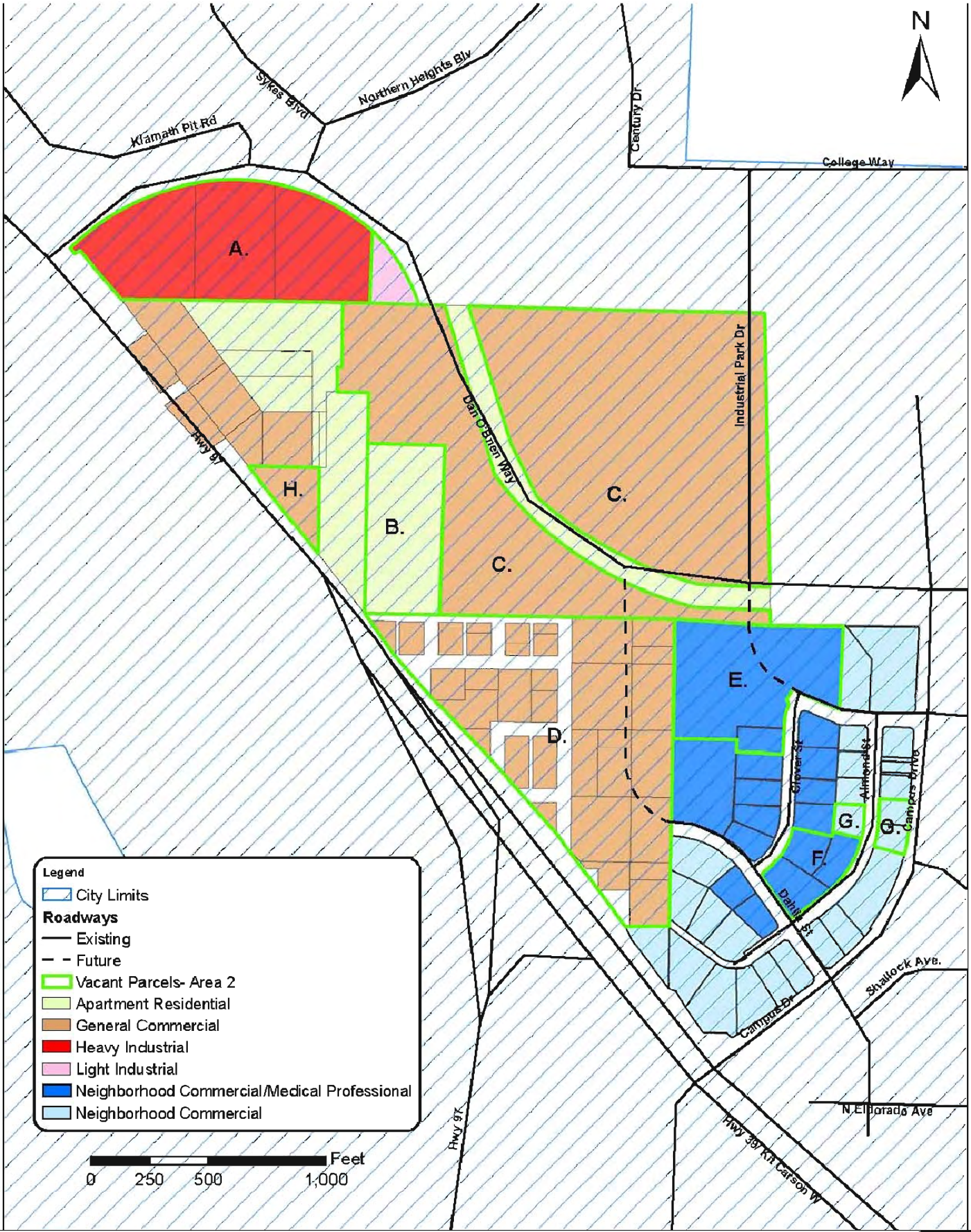
Of the 280 acres zoned for industrial uses, some 129 acres of Heavy Industrial-zoned land and approximately 67 acres of Light Industrial-zoned land is currently vacant. Based on the topography of the area, approximately 52 acres of Heavy Industrial land (Area "B" in Figure 7), and some 39 acres of Light Industrial land can be developed (Areas "C", "D" and "E" in Figure 7). This includes the expected provision for internal roads and utilities. Using an FAR of 0.40 for industrial use, it is assumed that Sub-Section 1 can support approximately 899,100 gross square feet of Heavy Industrial and 686,500 gross square feet of Light Industrial development.

Sub-Section 2

Sub-Section 2 consists of approximately 140 acres. The majority of the area is zoned for a mix of General Commercial, Neighborhood Commercial, and Neighborhood Commercial/Medical Professional uses, which is in the proximity of the OIT campus and Campus Drive. Approximately ten percent of Sub-Section 2 is zoned Apartment Residential, and ten percent is zoned for industrial use. Figure 8 shows the current zoning and areas of potential development for Sub-Section 2.

Residential

Approximately ten percent of Sub-Section 2 is zoned Apartment Residential, with some 2.7 acres of it being a vacant parcel (Area "B" in Figure 8). Similar to the adjacent parcel to the west, it was assumed that this vacant land will build out as a mobile home park at a rate of 15 dwelling units per acre, resulting in 41 new homes in Sub-Section 2.



POTENTIAL FUTURE DEVELOPMENT
SUB-SECTION 2
KLAMATH FALLS, OREGON

FIGURE 8

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Commercial

Of the approximately 75 acres of vacant land in Sub-Section 2 zoned for commercial uses (Areas "C" through "H" in Figure 8), approximately 45 acres are assumed to be developable based on the topography of the vacant land. Reductions to allow for the construction of future roadways and utilities have been applied to all commercial areas except for Areas "F" and "G", as these two areas have these facilities constructed already. A floor/area ratio of 0.20 was assumed for the 45 acres of commercial land in Sub-Section 2, resulting in approximately 298,200 gross square feet of commercial development potential. It was assumed that land zoned as "commercial" would be developed with a General Commercial use (shopping center).

Industrial

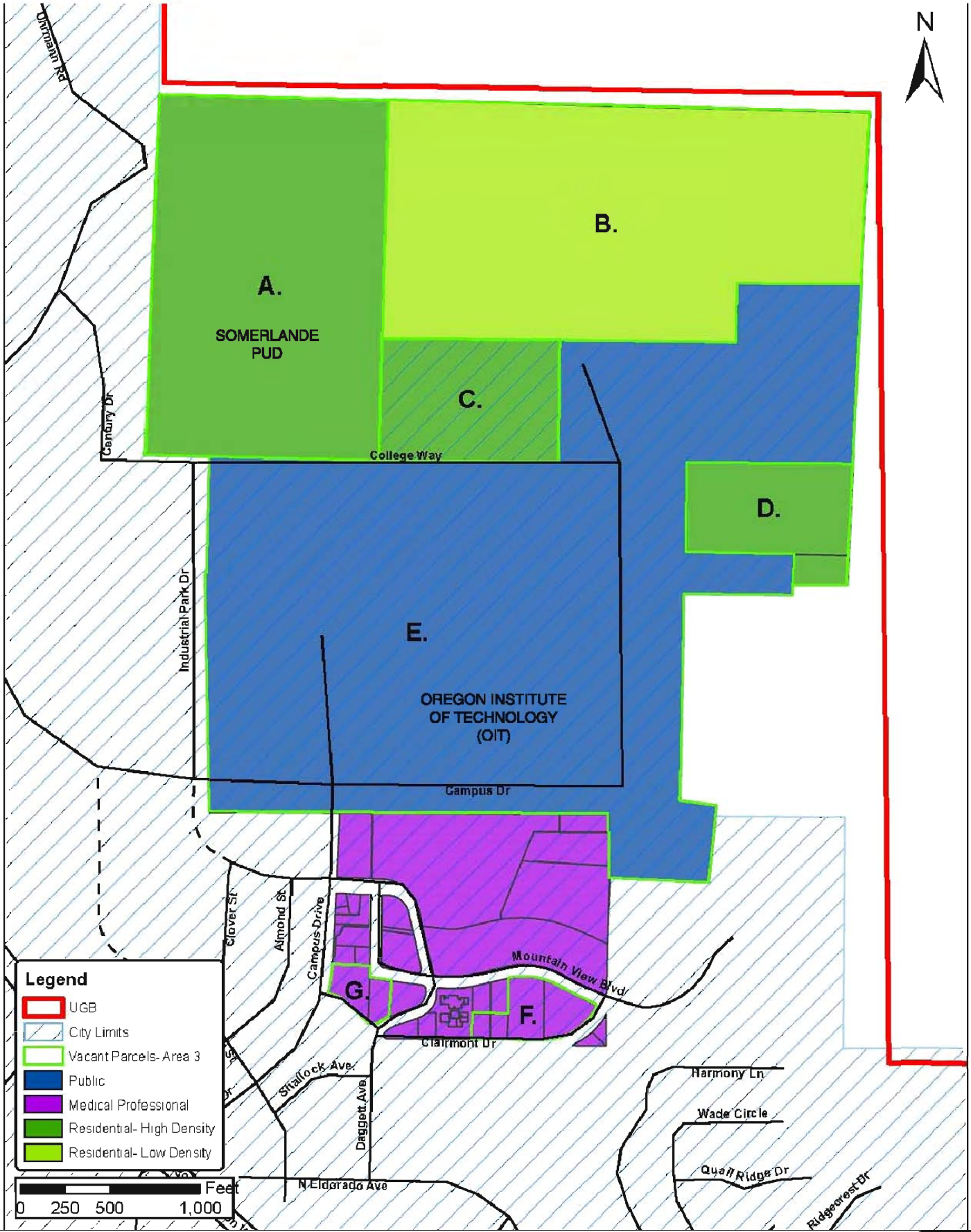
Reductions of 25% have been made to the developable area of Heavy Industrial-zoned land in Sub-Section 2 (Area "A" in Figure 8) to allow for future internal road and utility requirements for this area of land. It was assumed that the 12 acres will develop with an FAR of 0.40, resulting in approximately 209,000 gross square feet of new Heavy Industrial development. With all of these reductions accounted for, the total developable area for industrial uses is approximately 156,800 square feet.

Sub-Section 3

Almost half of the 360 acres in Sub-Section 3 consists of the OIT campus. The remaining area consists of Medical Professional uses, and residential-zoned land that is currently outside the city limits but inside the urban growth boundary. Figure 9 shows the current zoning and areas of potential development for Sub-Section 3.

Residential

Approximately 60 acres of Sub-Section 3 is currently zoned for Residential use as part of the Somerlande PUD (Area "A" in Figure 9) described as an "In-Process Development." Phases 1 through 3 are currently approved and were included in the 2030 Regional Growth conditions analysis. The later phases 4 through 6 of the Somerlande PUD, which have not yet been approved, will include an additional 71 condominium units, along with office and commercial uses.



POTENTIAL FUTURE DEVELOPMENT
SUB-SECTION 3
KLAMATH FALLS, OREGON

FIGURE 9

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Approximately 100 acres of Residential-zoned land in Sub-Section 3 is located outside the current city limits, but inside the UGB, as shown as Areas "B", "C' and "D" in Figure 9. It was assumed that this land will likely develop as low-density Single-Family Residential uses in the future. Based on the assumptions of the topographic analysis of the area included in Appendix "G", it was determined that only approximately 8 acres of the 100 acres can support development. Based upon reductions for internal roads and utilities and a minimum lot size of 7,000 square feet for Single-Family Residential, the build-out of the vacant Residential land in Sub-Section 3 will result in 35 new homes.

Commercial

Phases 4 through 6 of Somerlande PUD (Area "A" in Figure 9), which are not currently approved, include approximately 23,500 square-feet of commercial uses. It is assumed that these uses will build out in the 20-year study period.

Office

Phases 4 through 6 of Somerlande PUD (Area "A" in Figure 9), which are not currently approved, include approximately 7,500 square-feet of office use. It is assumed that this will build out in the 20-year study period.

Medical Professional

Approximately 40 acres of Sub-Section 3 are zoned Medical Professional, with the majority currently built-out. Some 5.5 acres of Medical Professional land is currently vacant (Areas "F" and "G" in Figure 9). Based on the assumptions used in the topographic analysis performed for Sub-Section 3, approximately 3 acres of land is assumed to be developable. Assuming that this land will build-out in the 20-year analysis period as general medical uses (medical-dental office building), a FAR of 0.20 was applied, resulting in approximately 23,700 square-feet of new Medical Professional uses.

OIT Campus

The addition of a 300-bed student dormitory is being planned for the OIT Campus, and is discussed in the OIT Center for Health Professionals Traffic Impact Study prepared by KAI in 2006. The study discusses that the addition of a student dormitory is likely to actually decrease traffic to the campus, and thus the impacts were not studied. In follow up conversations with City staff, it was determined that the OIT campus is mostly built-out. However, the Campus Planned Unit Development (PUD) has potential for additional development. Some expansion near the campus would not likely have a significant impact on the transportation network as the majority of trips would be internalized between OIT and the Campus PUD.

Sub-Section 4

The majority of the 195 acres in Sub-Section 4 consist of Residential uses. The remaining area of Sub-Section 4 consists of Public/School, Medical Professional, and Commercial uses. Figure 10 shows the current zoning and areas of potential development for Sub-Section 4.

Residential

Of the land in Sub-Section 4 zoned for Single-Family Residential, most is currently built-out or platted. A review of aerials and tax lot information, with input from the City of Klamath Falls, revealed that 56 single-family lots are currently platted but vacant (shown as Area "H" in Figure 10).

An additional 10-acre area of Single-Family Residential shown as Area "G" in Figure 10 is currently vacant, and is assumed to be built-out in the 2030 analysis year. A topographical analysis revealed that approximately 8 acres of this land is available for development. With reductions applied to this area for internal roads and utilities, a total of 35 new homes with a minimum lot size of 7,000 square feet is expected to be accommodated in this area.

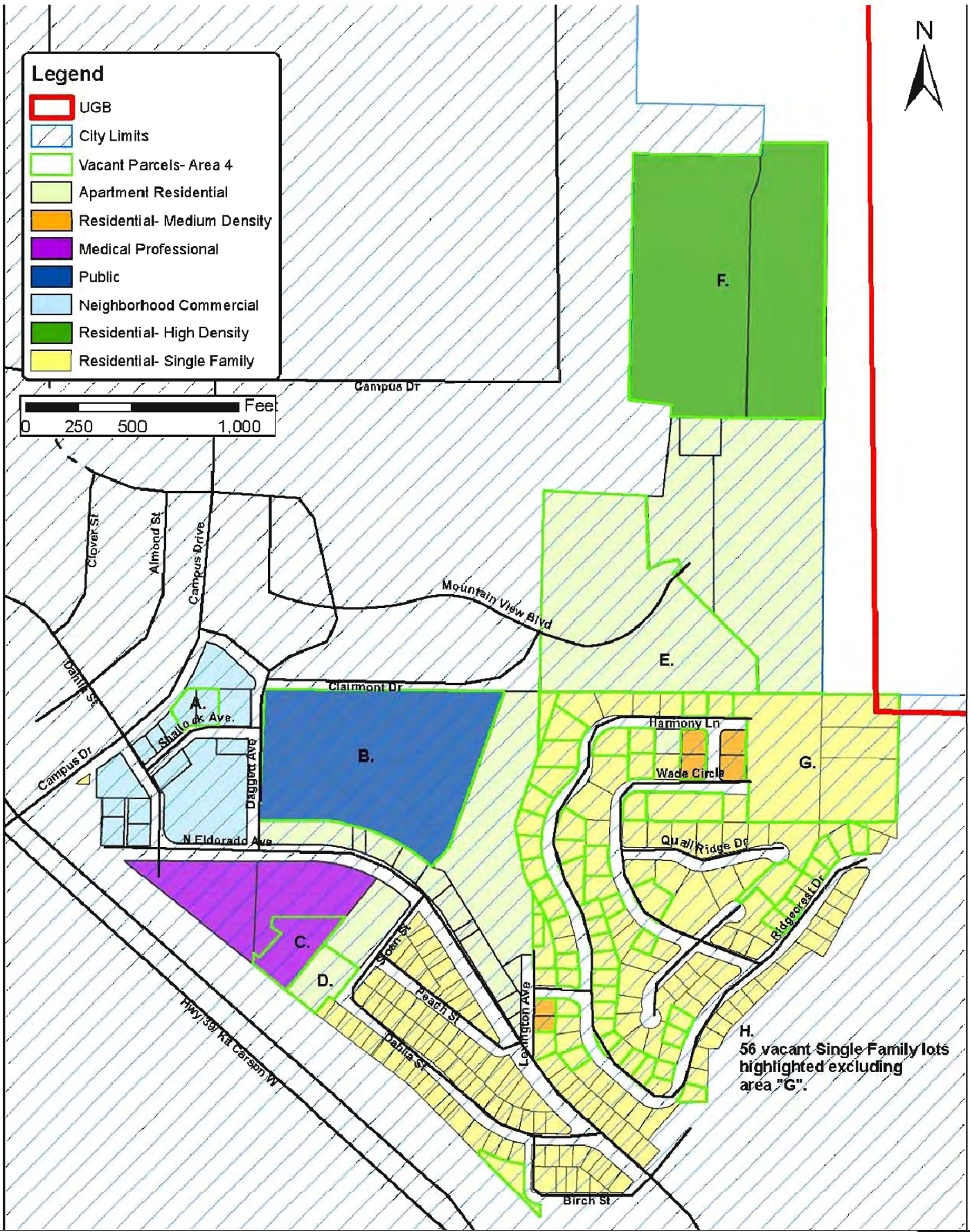
Area "D" in Figure 10 is zoned Apartment Residential, and is a vacant portion of Eldorado Heights Assisted Living. It was assumed that this 1.25-acre portion will build-out at the maximum intensity for medium-density residential with 14 units per acre. Assuming an apartment land use, the build-out of this area will result in 18 new residential units.

Area "E" in Figure 10 is zoned Apartment Residential, and currently includes low- and medium-density retirement community uses in the Crystal Terrace Retirement Community. It was assumed that an additional 7 acres of this land will develop with duplex or four-plex units at the maximum density (5,000 square-foot lots) for the zoning, and similar to the existing portions of Crystal Terrace Retirement Community. The build-out of this land will result in 42 new residential units with allowances made for the internal road network.

While a topographical analysis shows that the majority of Area "F" is too steep for development, approximately 5 acres of this area would be suitable for low-density residential housing. Based upon the possibility of constructing 8 dwelling units per acre, a total of 38 houses can be accommodated at this location.

Commercial

Approximately one acre of land zoned Neighborhood Commercial is currently vacant in Sub-Section 4 (Area "A" in Figure 10), and is assumed to build out in the 20-year study period. Assuming this land will develop with a general commercial use (shopping center) with an FAR of 0.20, approximately 6,800 square-feet of commercial use is expected for Sub-Section 4.



POTENTIAL FUTURE DEVELOPMENT
SUB-SECTION 4
KLAMATH FALLS, OREGON

FIGURE **10**

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Medical Professional

Approximately two acres of vacant land zoned Medical Professional (Area "C" in Figure 10) are expected to develop in Sub-Section 4. Assuming build-out as a general medical use (medical-dental office building), this area will result in approximately 15,000 square-feet of new Medical Professional uses.

The area shown as "B" in Figure 10 is currently zoned Public, and is owned by the Klamath Falls School District. Discussions with City staff led to the assumption that this 16-acre lot is likely to rezone to Medical Professional, resulting in 136,000 square feet of new general medical uses.

Trip Generation

Trip generation estimates for each area of potential development were calculated based on *ITE Trip Generation Manual, 7th Edition* (Reference 3).

Trip generation estimates for the build-out of residential development were developed using primarily:

- Land Use Code (LUC) 210: Single-Family Detached Housing, except when more specific land uses were assumed to be more appropriate.
- LUC 240: Mobile Home Park was assumed for the vacant residential land in Sub-Section 2, consistent with adjacent uses.
- LUC 220: Apartment was used in Sub-Section 4 for the build-out of vacant land zoned Apartment Residential.

Trip generation estimates for the build-out of commercial uses were developed using LUC 820: Shopping Center. LUC 720: Medical-Dental Office Building was assumed for determining the trip generation potential of land zoned Medical Professional.

It is expected that a portion of trips to commercial uses will be by vehicles already on the roadway network (e.g. Highway 97) in the vicinity of the campus will be diverted to or from the commercial sites in the form of pass-by trips. Therefore the expected trip generation for commercial uses has been reduced by 34% to account for these trips.

Recognizing that the study area has, or will have, a mix of residential, commercial, medical, industrial, and office uses, it is reasonable to assume that not all new trips will have an origin or destination outside the study area. To account for new trips that will remain internal to the study area a twenty percent reduction of the total trip generation estimate was taken, as shown in Table 2.

Table 2 shows the estimated trip generation for each Sub-Section and for the entire study area though it does not include the trips associated with the approved developments listed on pages 10 and 11 as the approved development related volumes are included in the background analysis. If additional development occurs as assumed, a total of 432 new homes or dwelling units could

be built in the study area. Additionally, approximately 1,795,000 square-feet of industrial uses, approximately 420,000 square-feet of commercial uses, and 182,000 square-feet of office/medical professional could be built. In total, build-out of the study area could generate approximately 26,900 new trips daily with 1,800 occurring during the weekday a.m. peak hour and 3,100 occurring during the weekday p.m. peak hour.

Detailed worksheets showing the trip generation calculations for each sub-area are included at Appendix "H".

Table 2 Estimated Trip Generation for Study Area Build-Out – Future Development[1]

Land Use	Developable Acreage	Net Development (Sq. Ft., D.U.'s)	ITE Code	Daily Trips	AM Peak Hour Trips			PM Peak Hour Trips		
					Total	In	Out	Total	In	Out
Sub-Section 1										
Industrial	91	1,585,600	110, 120	6,220	1,000	880	120	1,220	145	1,075
Residential	32	97	210	1,005	80	20	60	105	65	40
Sub-Section 2										
Industrial	12	156,800	120	235	80	70	10	110	15	95
Residential	3	41	240	420	20	5	15	25	15	10
Commercial	45	298,200	820	14,995	355	235	120	1,375	645	730
Sub-Section 3										
Residential	68	106	210, 230	810	65	15	50	80	50	30
Commercial	60	23,500	820	665	15	10	5	60	30	30
Office	60	7,500	710	85	15	10	5	15	5	10
Medical Professional	3	23,700	720	540	60	50	10	90	25	65
Sub-Section 4										
Residential	47	189	210, 220	2,160	170	40	130	230	145	85
Commercial	1	6,800	820	780	20	15	5	70	35	35
Medical Professional	17	150,700	720	5,735	375	295	80	475	130	340
Total Study Area										
Gross Trips				33,655	2,245	1,645	600	3,835	1,295	2,540
Reduction for Study Area Internalization (20%)				6,730	450	330	120	765	260	505
Total Net New Trips				**26,925**	**1,800**	**1,315**	**485**	**3,070**	**1,035**	**2,035**

[1] Table does not include traffic generated by developments already approved, as discussed on Pages 10 and 11.

Trip Distribution

The distribution of new trips onto the study area roadway system was estimated based on local and regional destinations, an examination of the transportation facilities and the relative travel times to reach the major roadways. It was assumed that the vast majority (90%) of weekday a.m. and p.m. peak hour trips to and from new development within the study area will be destined to and from downtown Klamath Falls via Highway 97 and Crater Lake Parkway (Highway 39). The same trip distribution pattern was assumed for the industrial, office and commercial development. The trip distribution pattern used to assign trips to the study area roadways is illustrated in Figure 11. Figure 12 shows the assignment of new trips onto the network.

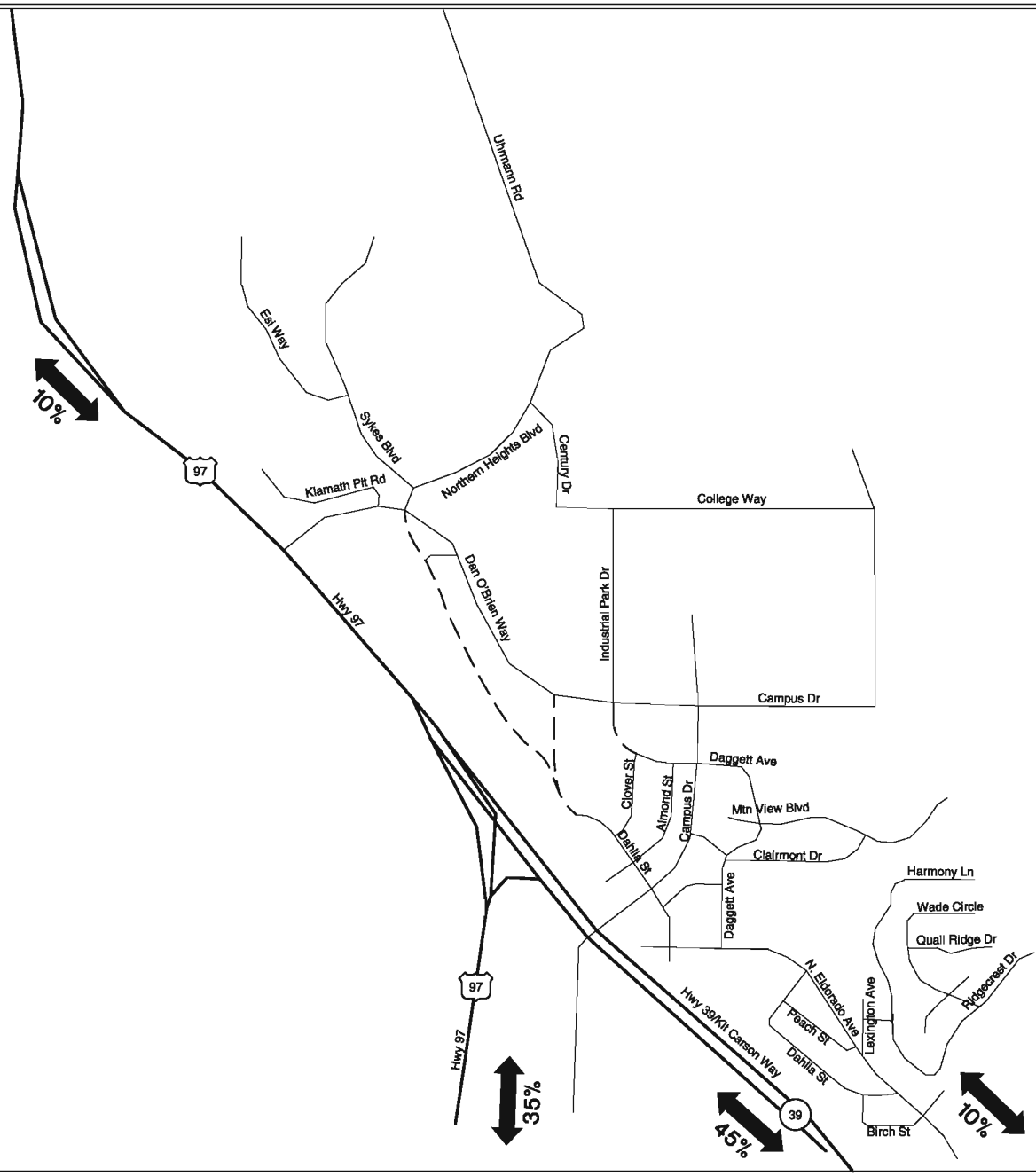
Forecast Traffic Operations

The year 2030 regional background growth traffic volumes shown in Figure 6 were added to the traffic volumes expected to be generated by build-out of the study area shown in Figure 12 to reach the year 2030 local build-out traffic volumes shown in Figure 13. Figure 13 shows the forecast traffic operations associated with build-out of the study area in year 2030. Under 2030 local build-out conditions, all study area roadways are projected to exceed City and ODOT standards during the weekday a.m. and/or p.m. peak hour study periods, except for the intersection of Daggett Avenue and El Dorado Avenue.

For purposes of comparison, Figure 14 is provided to show the estimated average daily traffic (ADT) in the existing year 2007 and future year 2030 under local build-out conditions. (For the purposes of the study, it is assumed that the traffic volumes during weekday p.m. peak hour represent 10-percent of the weekday ADT). As shown, a substantial increase in traffic along all of the study area roadways is expected, and roadway improvements are needed to mitigate the added traffic. *Appendix "I" contains the Year 2030 Local Build-Out Conditions Worksheets.*

Coordination with Campus Area Refinement Plan

In 1999, Kittelson & Associates, Inc. and W&H Pacific Inc. prepared the *Highway 97 Klamath Falls Campus Area Access and Circulation Refinement Plan* for ODOT (Reference 4). The refinement plan took into account the safety issues and the future traffic demand for the 20-year build-out of the Campus study area. *Attachment 1 contains relevant figures from the Highway 97 Klamath Falls Campus Area Access and Circulation Refinement Plan including figures showing the improvements discussed below.*



ASSUMED TRIP DISTRIBUTION PATTERN FOR LOCAL BUILD-OUT TRAFFIC KLAMATH FALLS, OREGON

FIGURE 11

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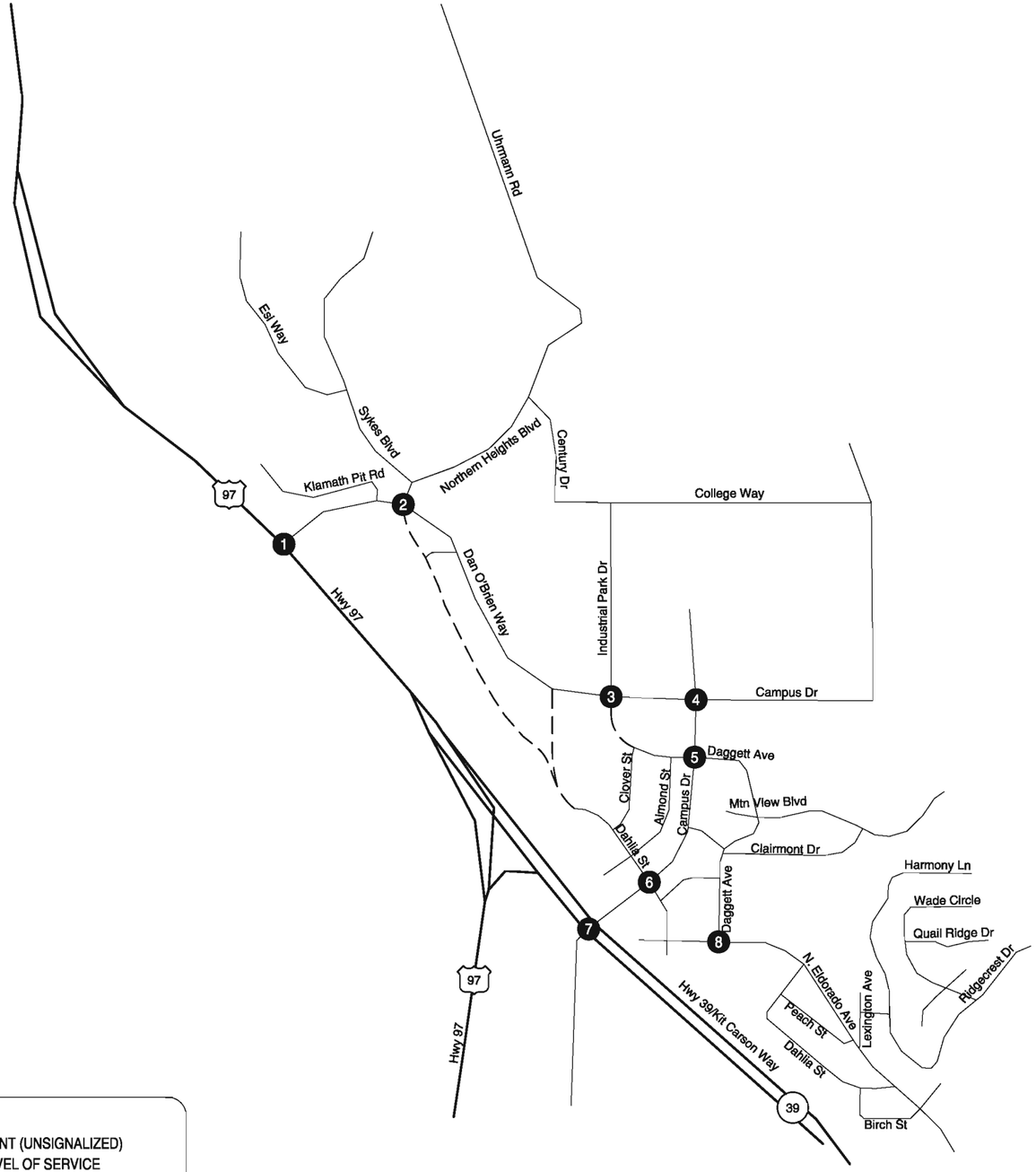

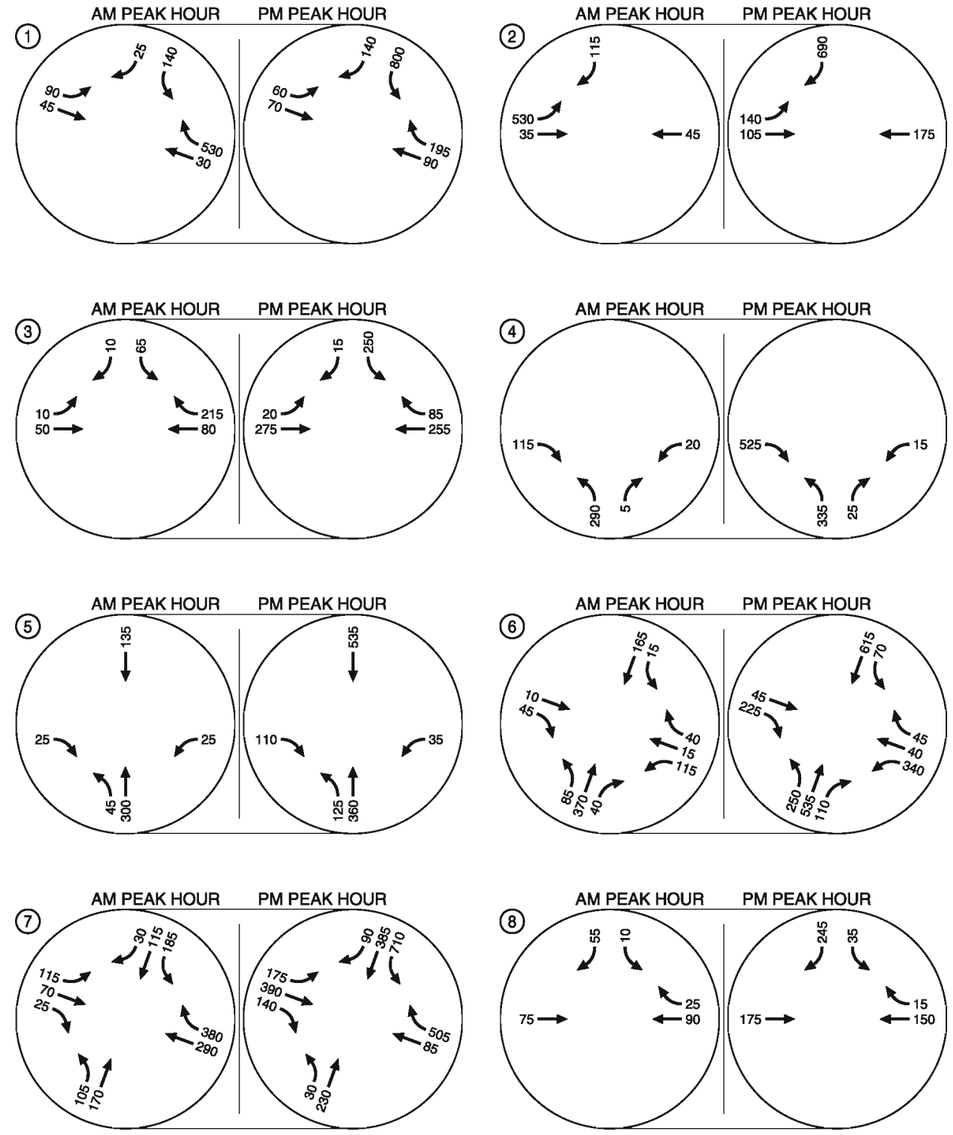

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

TRIP ASSIGNMENT
2030 LOCAL BUILD-OUT CONDITIONS
KLAMATH FALLS, OREGON

FIGURE **12**

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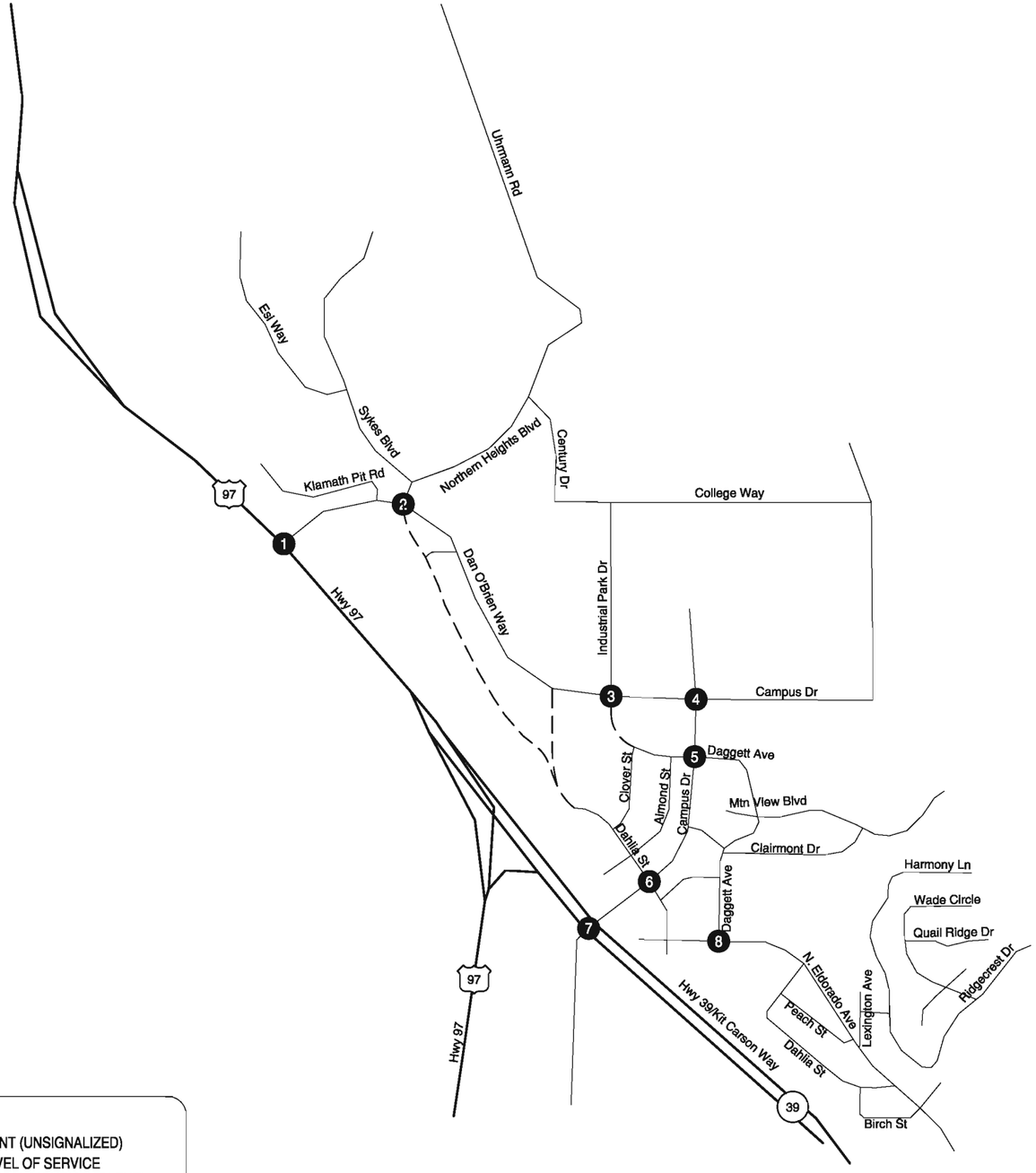

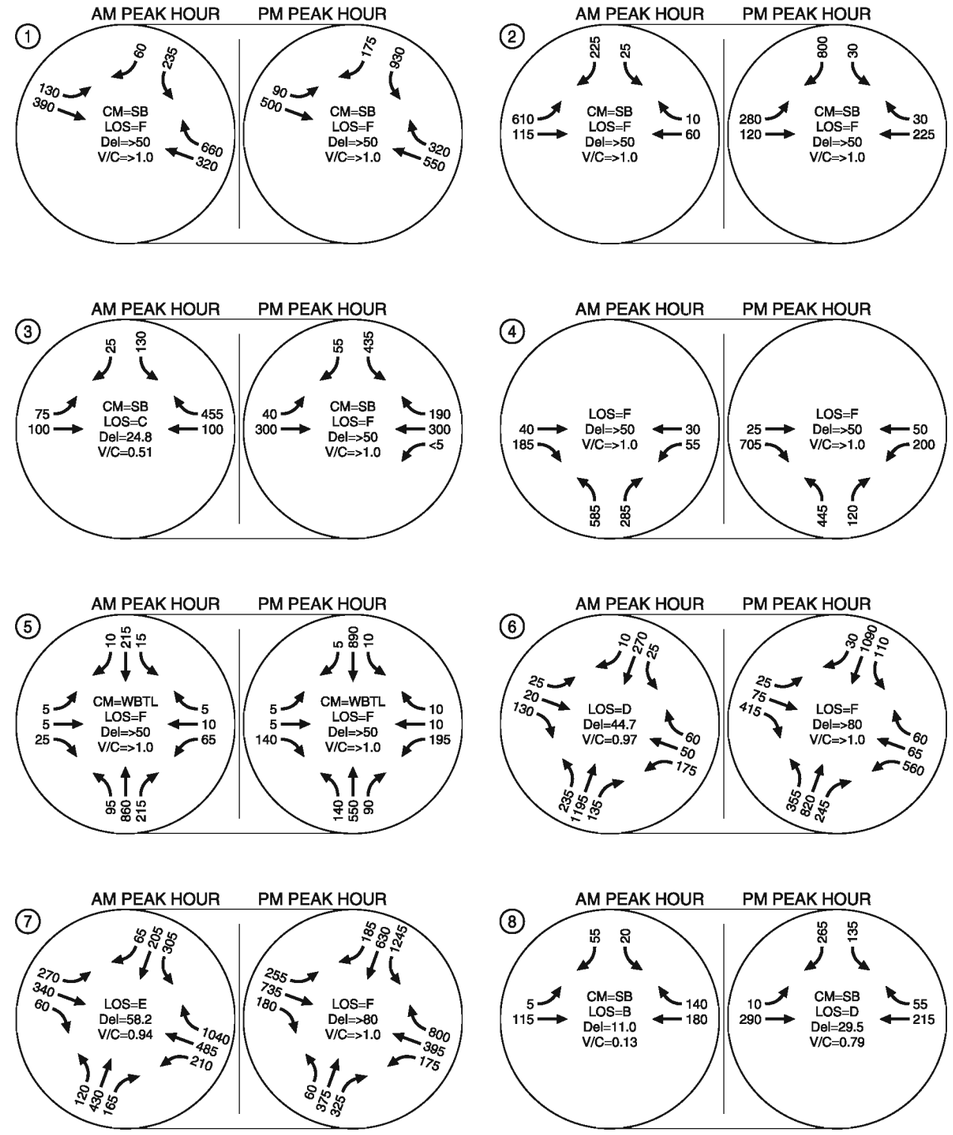

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CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2030 LOCAL BUILD-OUT TRAFFIC CONDITIONS
WEEKDAY OPERATIONS
KLAMATH FALLS, OREGON

FIGURE **13**

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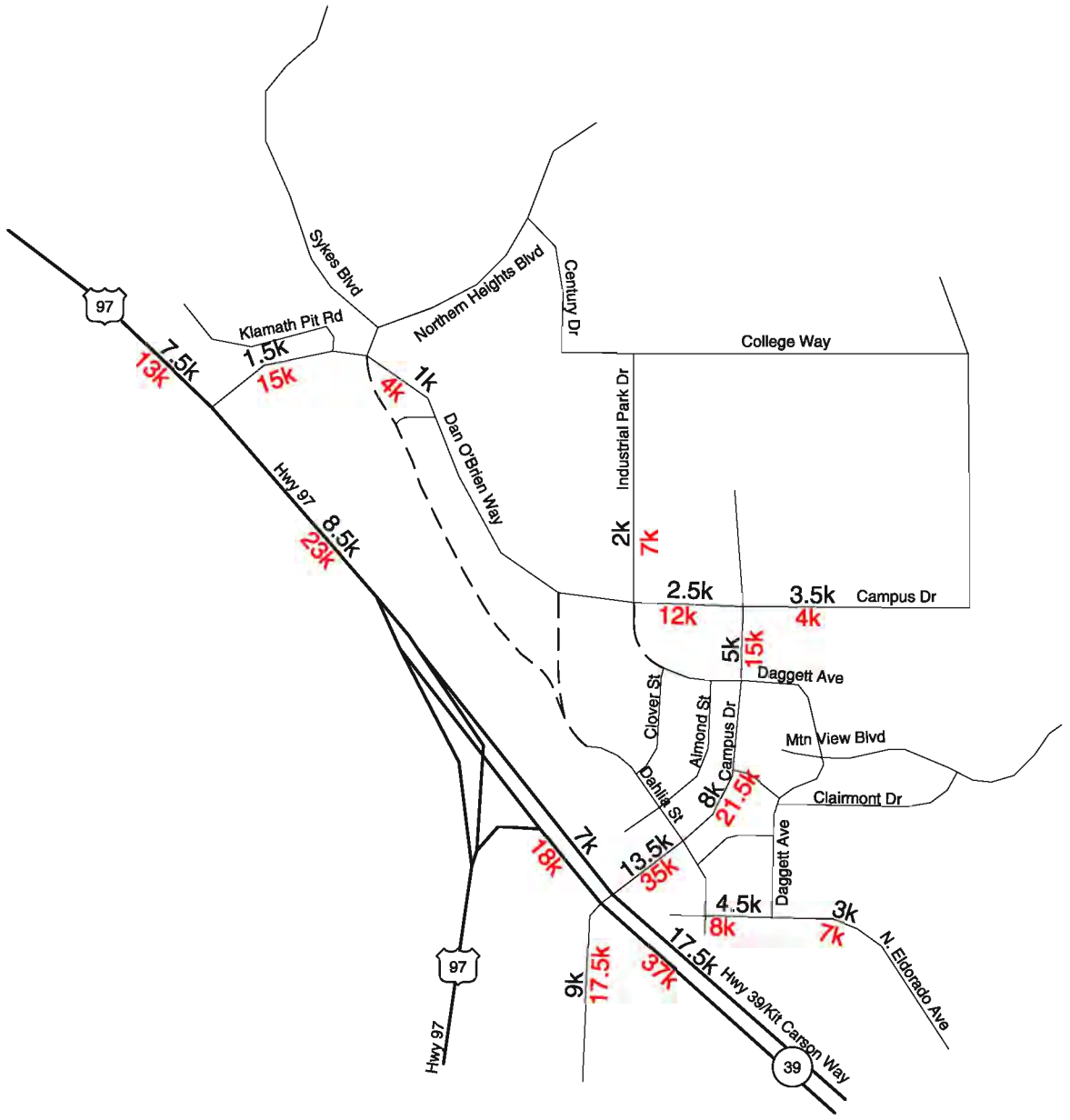

XX = Existing ADT (x1000)

XX = Future 2030 Build-Out ADT (x1000)

ADT COMPARISON
EXISTING 2007 VS. 2030 LOCAL BUILD-OUT
KLAMATH FALLS, OREGON

FIGURE 14

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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The refinement plan presented and evaluated multiple design alternatives in three tiers:

- Tier 1 Improvements: Safety
  - Recommended option: Alternative 1 *(see Figure 12 in Attachment 1)*
    - As shown in Figure 12 of the Refinement Plan, Alternative 1 shifts the lane drop on northbound Crater Lake Parkway/Highway 39 approximately 1,000 feet east of the existing location in order to separate it from the merge with northbound Highway 97. Additionally, the median crossing area would be widened in the northbound direction to improve the alignment with the western driveway to the mobile home park at Quarry Street, and the existing two driveways are to be closed.
- The shift of the lane drop has already been constructed at this time, but the multiple driveways along Highway 97 are maintained.
- Tier 2 Improvements: Access Management and Circulation
  - Recommended option: Alternative 3E – Option 5 *(see Figure 25 in Attachment 1)*
    - Under this option, a jug-handle left-turn would be constructed for the U-turns and left-turns from northbound Highway 97, as shown in Figure 25 of the Refinement Plan. This option will close the existing Quarry Street intersection, and provide a new connection to and from Pelican City. All direct access to and from Highway 97 would be closed under this alternative. A southwest-bound left-turn lane would be added and the northbound right-turn lane would be extended at the Dan O'Brien Way intersection. The option was chosen because it is most consistent with Category 1 access requirements.
  - Recommended option: Alternative 4 – Option 1 *(see Figures 35A and 35B in Attachment 1)*
    - This alternative, shown in Figure 35A and 35B of the Refinement Plan, creates a grade-separation of Dan O'Brien Way over Highway 97 with ramp connections to and from Highway 97. Consistent with Alternative 3E – Option 5, this alternative includes closing all direct access to Highway 97. The configuration shown may require design exceptions for ramp spacing and design; however, the operations are expected to be acceptable, and the design could be incorporated into future Tier 3 system interchange improvements.
    - This alternative requires acquisition of right-of-way (existing storage facility) for constructing the Highway 97 over-crossing.
- Tier 3 Improvements: System Improvements *(see Figures 29 -33 in Attachment 1)*
  - Alternative 5 – A through E (Figures 29 – 33 in Refinement Plan) are presented for providing additional access to the Campus area through interchange concepts at Highway 97 and Crater lake Parkway/Highway 39.
  - The plan recognizes that an Alternative 5 concept would be desirable, but does not make a recommendation. Alternatives 5B and 5D were considered to likely not be

feasible because of project costs. The at-grade improvements at Campus Drive in Alternative 5A may not serve the heavy southbound left-turn forecast traffic.

Implementation and Funding of Refinement Plan

Under Tier 1 and 2 improvement strategies, the Refinement Plan recommends Alternative 3E-Option 5 in conjunction with Alternative 1 concepts to address operational and safety issues in the corridor. The Refinement Plan recommends that these improvements are followed by Alternative 4-Option 1. As Alternative 4-Option 1 is constructed, the jug-handle from Alternative 3E-Option 5 would be eliminated and access management on Highway 97 would be completed. The costs of each improvement alternative (estimated in 1999) are provided in Table 3 below.

Table 3 Refinement Plan Costs and Funding Allocations (1999 Dollars)

Improvement	Planning Level Cost	Estimated Jurisdictional Financial Responsibility	
		State	Local
Alternative 1: Safety Enhancements	$10,000 - $15,000	20%	80%
Alternative 3E – Option 5	$1,500,000 - $2,000,000	67%	33%
Alternative 4 – Option 1	$5,500,000 - $6,500,000	50%	50%

The improvements recommended in the Refinement Plan were to be incorporated into the next City of Klamath Falls Transportation System Plan (TSP), but since no such TSP has been produced since the Refinement Plan in 1999, they are yet to be incorporated.

Alternative 3E-Option 5

The capacity improvements that include a southwest-bound left-turn lane and a northbound right-turn lane at the Highway 97 and Dan O'Brien Way intersection shown in Alternative 3E-Option 5 were analyzed with the 2030 Local Build-Out traffic volumes, and found to operate at LOS F during both the weekday a.m. and p.m. peak hours. A sensitivity test was run, and it was found that approximately 26 weekday a.m. development trips and 41 weekday p.m. development trips (3% of total local build-out) may be added to the intersection before it falls below the ODOT standard of 0.7 V/C ratio, and requires additional improvements beyond the additional turn lanes shown in Alternative 3E – Option 5.

Alternative 4-Option 1

With the grade-separation of Dan O-Brien Way at Highway 97 shown in Alternative 4-Option 1, all local build-out traffic assigned to the interchange can be accommodated in 2030.

Alternative 5 "System" Improvements

An Alternative 5 system improvement would serve as an ultimate improvement to make the north side of Highway 97 accessible, and would relieve traffic demand on Campus Drive. However, no specific recommendation for an Alternative 5 option has been made in the Refinement Plan. Without a future "system" improvement, the north side of Highway 97 will not be able to fully develop, due to the capacity constraints on Campus Drive.

Future Parking Considerations

While not a formal part of the OIT sub-area study, KAI was asked to comment on future parking demands in the study area. As the traffic volumes increase in the future, there will be a greater need to reserve the roadway cross-section for travel lanes rather than on-street parking. This will be especially true on the minor and major collectors and the arterials. Parking will also need to be restricted and/or eliminated near the study intersections to accommodate the additional turning lanes that will be required.

It is recommended that the City and development community consider opportunities to develop off-street parking facilities (generally estimated at $3,000 to $5,000 per parking space), and/or a parking structure (generally estimated at $15,000 to $20,000 per parking space) to meet the anticipated demand.

Additional potential solutions can include employee benefits for car-pools, entice riders to use a transit provider (especially to uses such as the medical facilities), coordinate parking at the OIT campus when school is not in session and provide van pool service to the major destinations.

Recommended Transportation Improvements

As shown in Figure 13, all study area intersections are expected to fail during the weekday a.m. and/or p.m. peak hour study periods with the full local build-out in the study area. Because of the significant increase in traffic along Highway 97, Campus Drive, and Dan O'Brien Way, additional improvements are needed beyond those described in the 1999 Campus Area Refinement Plan.

The critical intersection carrying most of the projected new development traffic from local build-out is the Campus Drive/Crater Lake Parkway (Highway 39) intersection. Feasible improvements to accommodate full build-out were explored; however, without grade separation or an additional major connection to the campus area, the intersection cannot accommodate the level of development expected. A sensitivity analysis was run to determine the amount of development the intersection, with feasible improvements, could accommodate before failing (reaching v/c of 1.0). Based on this analysis, approximately 965 weekday a.m. peak hour development trips and 1,780 weekday p.m. peak hour development trips (approximately 65% of full build-out) could be added to the at-grade intersection of Campus Drive and Crater Lake Parkway/Highway 39 before causing it to fail.

Based on this sensitivity analysis, other necessary roadway improvements throughout the study area to accommodate the 65 percent of total local build-out were identified and are shown in Figure 15:

A. Dan O'Brien Way at Highway 97: Construct the grade separation of Dan O'Brien Way, as recommended in Alternative 4-Option 1 of the Campus Area Refinement Plan. This includes the construction of the intersection where Highway 97 meets Dan O'Brien Way.

B. Dan O'Brien Way: Upgrade to a Major Collector cross-section from Highway 97 to Campus Drive.

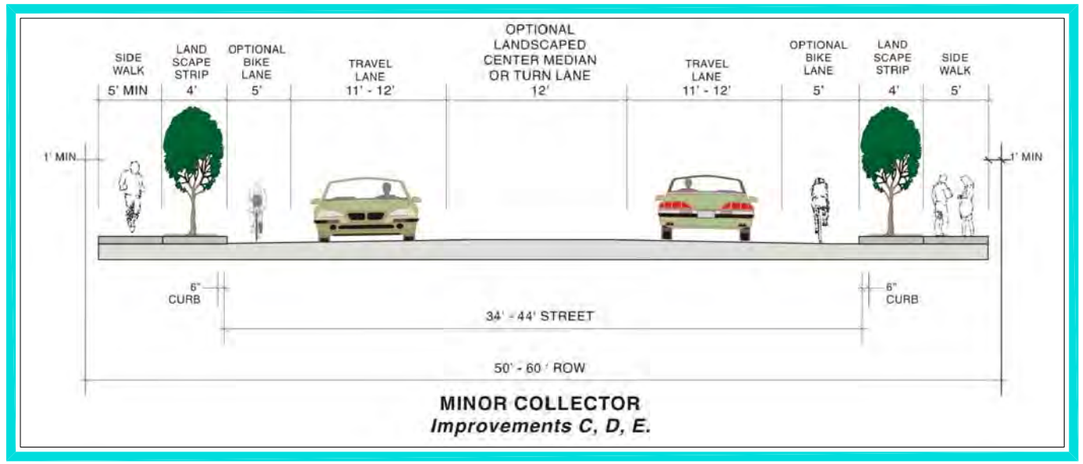
C. Daggett Avenue Extension: Extend Daggett Avenue to Dan O'Brien Way at Industrial Park Drive as a 2-lane Minor Collector, as specified in the City of Klamath Falls TSP.

D. Dahlia Street Extension: Extend Dahlia Street to Dan O'Brien Way as a 2-lane Minor Collector, as specified in the City of Klamath Falls TSP.

E. New Collectors: 3-lane Minor Collector "frontage roads" along the north side of Highway 97, between Dan O'Brien Way and the extension of Dahlia Street.

F. Industrial Park Drive: Construction of curbs and sidewalks adjacent to the existing roadway. Bike lanes will be provided within the existing road area through the addition of striping.

All access to Highway 97 between Dan O'Brien Way and Campus Drive will be removed as part of Alternative 4-Option 1 of the *Highway 97 Klamath Falls Campus Area Access and Circulation Refinement Plan* and a local roadway network will be needed to distribute traffic to Dan O'Brien Way and Campus Drive. Consistent with the Alternative 4-Option 1 concept of the Refinement Plan, the "frontage roads" shown as dashed lines in Figure 15 will serve as access points for development north of Highway 97. The locations shown are only conceptual and exact locations and alignment will be determined in the future.



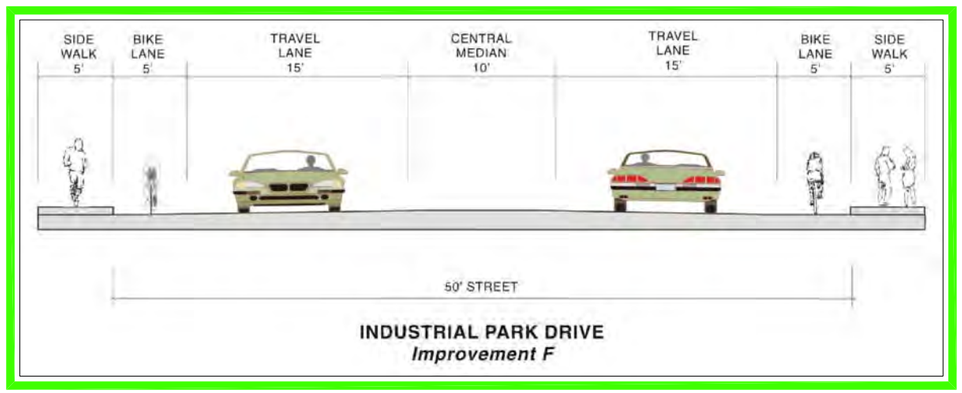
MINOR COLLECTOR
Improvements C, D, E.



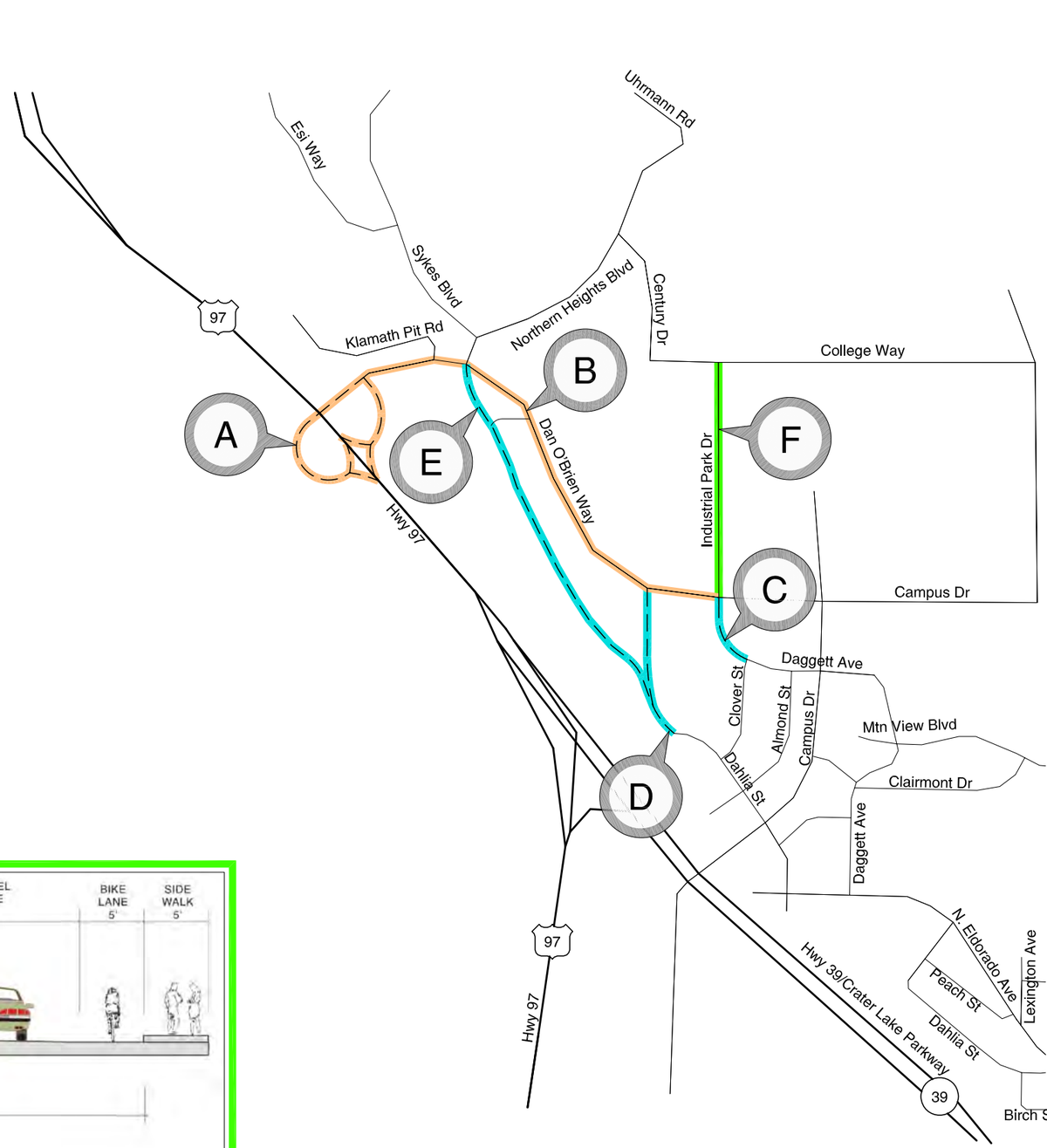
MAJOR COLLECTOR
Improvement B

IMPROVEMENTS

- (A) Overcrossing of Highway 97 (per Alternative 4-Option 1 of Refinement Plan)
- (B) Upgrade to Major Collector
- (C) Extend Minor Collector
- (D) Extend Minor Collector
- (E) New Minor Collector (Alignment Conceptual Only)
- (F) Upgrade Curb, Sidewalk and Bike Lanes



INDUSTRIAL PARK DRIVE
Improvement F



ROADWAY IMPROVEMENTS 2030 LOCAL BUILD-OUT (65% OF TOTAL)
KLAMATH FALLS, OREGON

FIGURE **15**

H:\projfile\8338 - Klamath Falls Campus Sub-Area Study\dwgs\figs\8338 Figs_kmb update.dwg Sep 08, 2008 - 9:16am - rmcfadden Layout Tab: Layout 15

In addition to the roadway improvements shown in Figure 15, the following intersection improvements shown in Figure 16 are needed to achieve the acceptable operational conditions shown in Figure 17.

1. Highway 97/Dan O'Brien Way: Install a two-way stop-controlled intersection at the Highway 97/Dan O'Brien Way ramp terminal. Provide southbound left-turn pocket (accommodated by 3-lane cross-section).

2. Dan O'Brien Way/Northern Heights Boulevard: Add eastbound left-turn (provided in 3-lane section) and westbound right-turn pocket

3. Dan O'Brien Way/Industrial Park Drive: Signalize and add left-turn pockets on all approaches

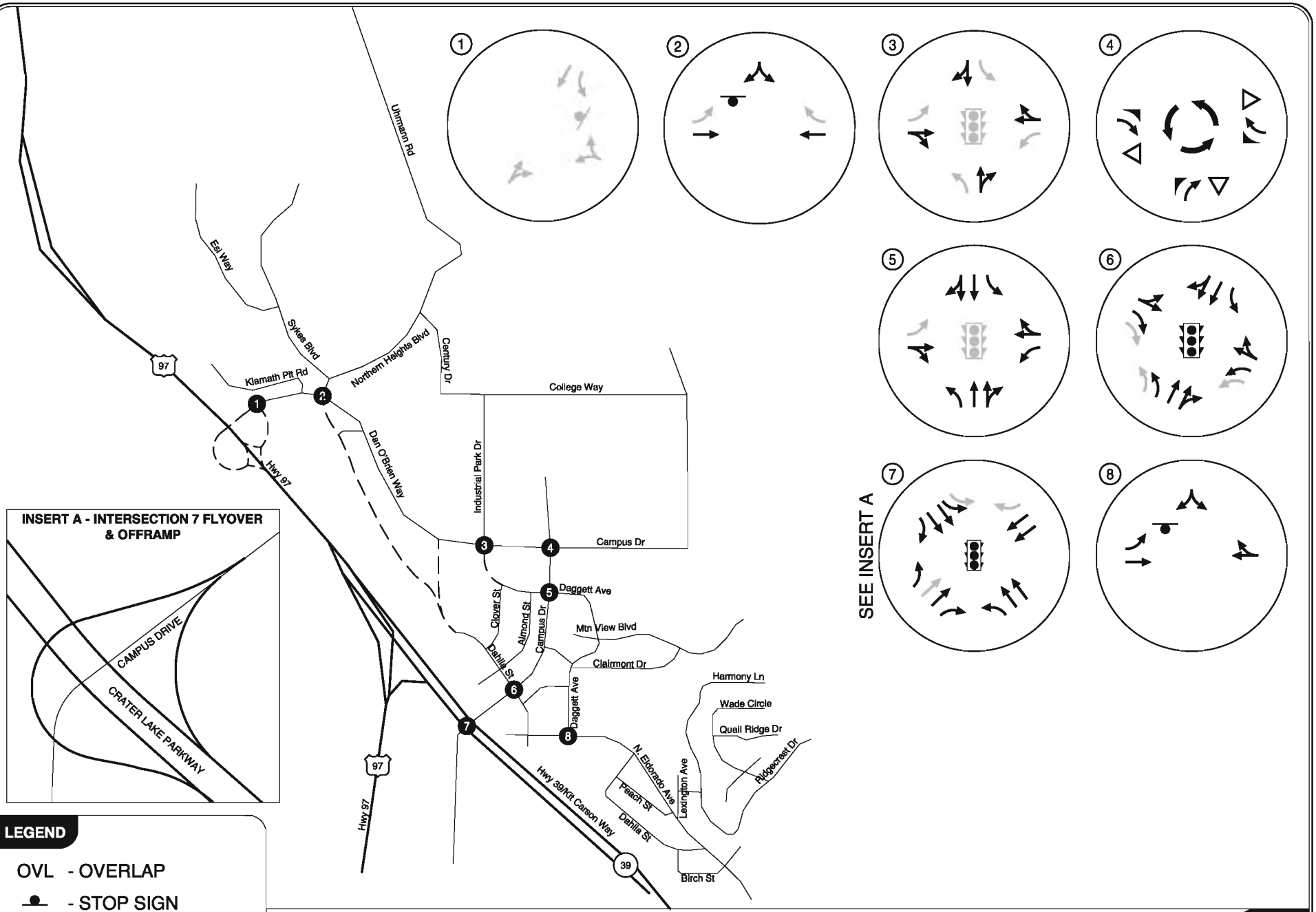
4. Campus Drive/Dan O'Brien Way: Replace existing intersection with a three-leg roundabout and a single circulating lane.

5. Campus Drive/Daggett Avenue: Signalize and add a separate eastbound left-turn lane

6. Campus Drive/Dahlia Street: Add northbound and westbound left-turn lanes and an eastbound right-turn lane

7. Crater Lake Parkway (OR 39)/ Campus Drive: Construct a southbound-to-eastbound flyover from Campus Drive to the Crater Lake Parkway and a westbound-to-northbound off-ramp from the Crater Lake Parkway to Campus Drive. These improvements will require further evaluation and refinement as part of the future Campus Drive/Crater Lake Parkway and Crater Lake Parkway/US 97 interchange area management plans (IAMPs).

With the above improvements and 65 percent of local build-out, all intersections operate within the City of Klamath Falls and ODOT standards except for the intersection of Highway 97 and the Dan O'Brien Way ramp terminal, which is forecast to operate with a v/c > 1.0 and a LOS F during the weekday a.m. peak hour. The intersection is forecast to operate acceptably during the weekday p.m. peak hour. *Appendix "J" contains the Year 2030 Mitigated Traffic Conditions Worksheets.*



NECESSARY LANE CONFIGURATIONS
2030 LOCAL BUILD-OUT CONDITIONS (65% OF TOTAL)
KLAMATH FALLS, OREGON

FIGURE **16**

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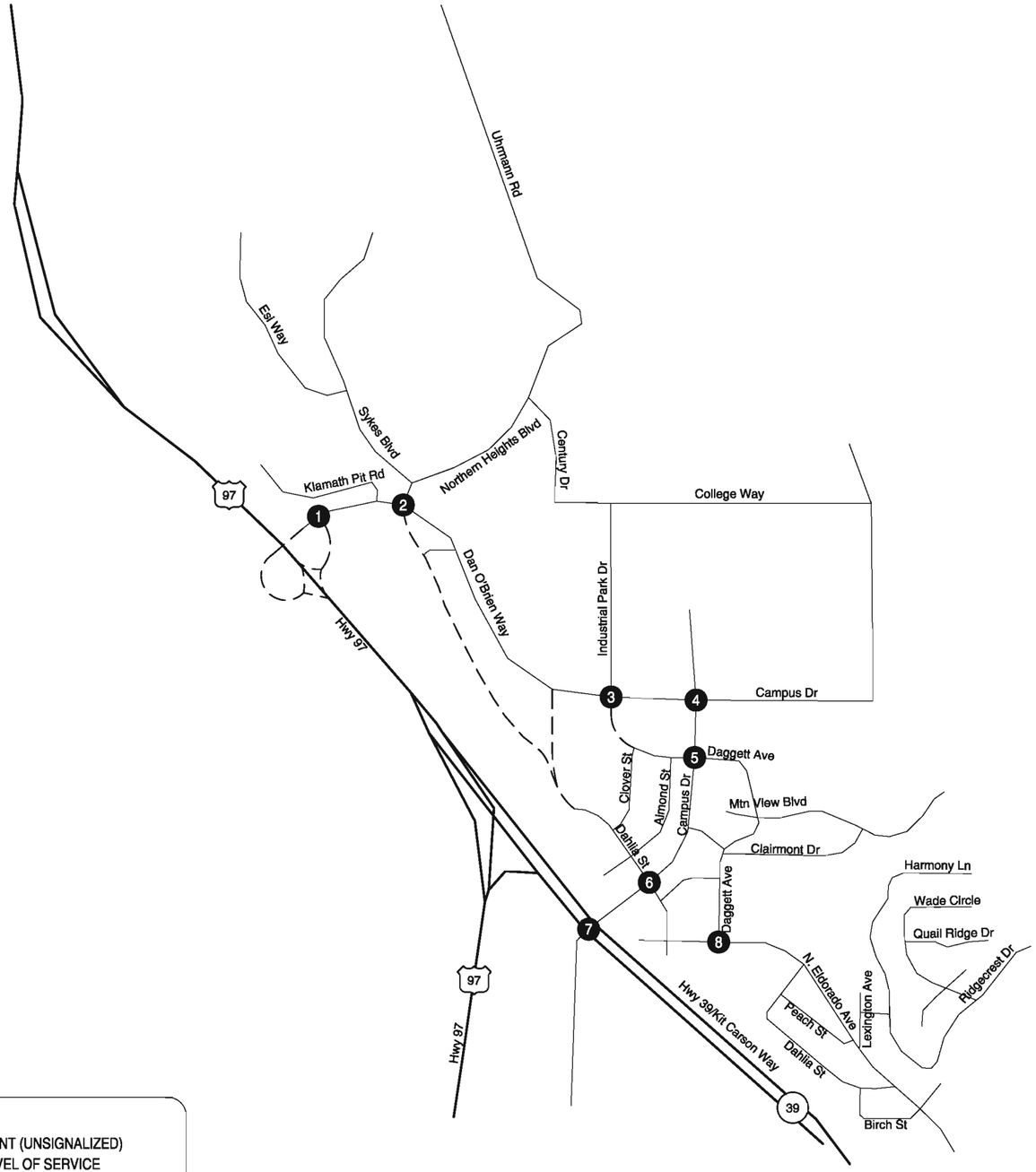

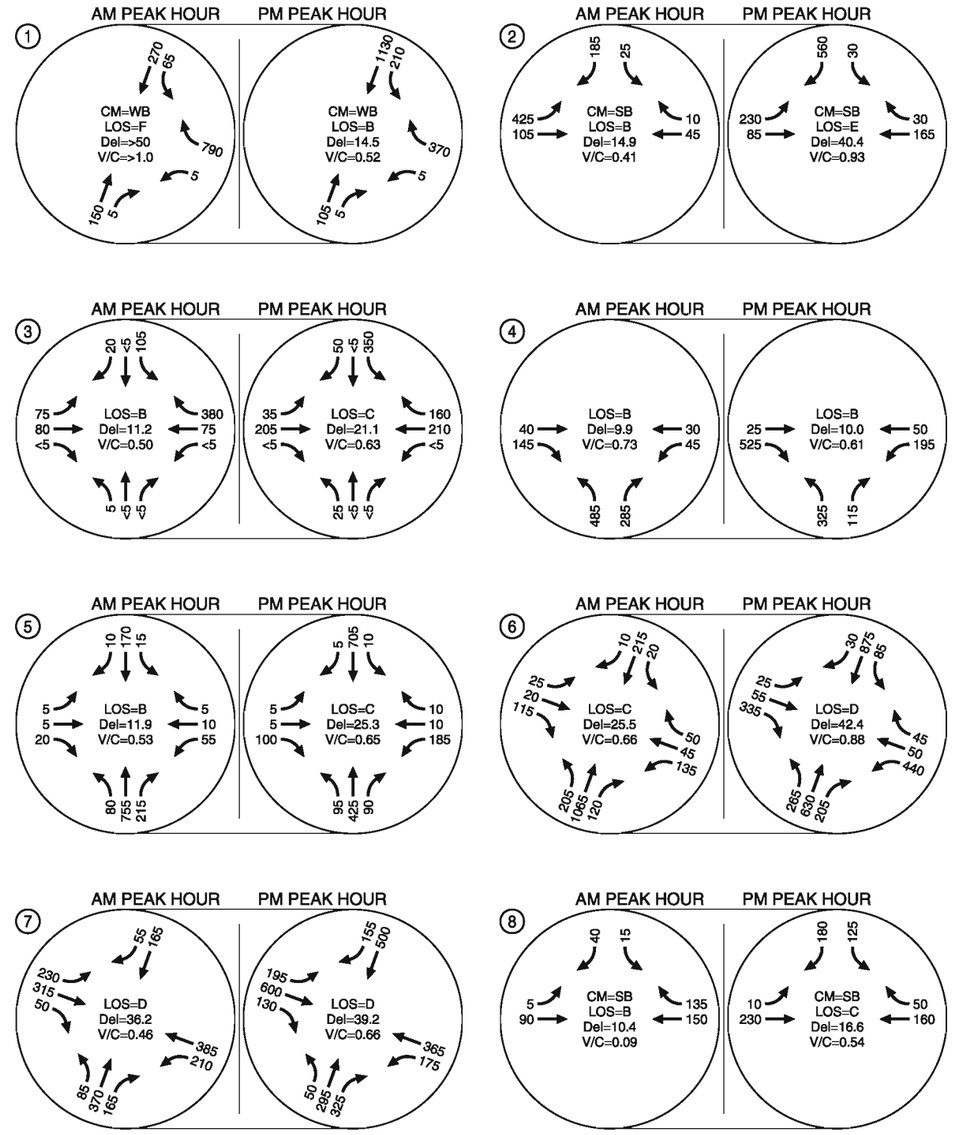

LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

2030 MITIGATED TRAFFIC CONDITIONS (65% LOCAL BUILD-OUT)
WEEKDAY OPERATIONS
KLAMATH FALLS, OREGON

FIGURE 17

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Signal Warrant Analysis

An analysis of the traffic signal warrants were undertaken to determine whether signals would be required at the intersections of Dan O'Brien Way/Industrial Park Drive, Campus Drive/Dan O'Brien Way, and Campus Drive/Daggett Avenue. This analysis is based upon estimated volumes for the expected weekday p.m. peak hour volumes for the 2030 design year. The analysis of traffic signal warrants was based on procedures outlined in the *Manual on Uniform Traffic Control Devices* (MUTCD, Reference 5) for Minimum Vehicular Volumes (Warrant 1, Condition A), Interruption of Continuous Traffic (Warrant 1, Condition B), Four-Hour Volume (Warrant 2), and Peak Hour Volume (Warrant 3).

Conditions A and B of Warrant 1 require the evaluation of traffic volumes during the eighth highest peak hour of the day and Warrant 2 requires the evaluation of traffic volumes during the fourth highest peak hour of the day. For this analysis, the eighth highest and fourth highest hour volumes were estimated at 60 percent and 80 percent of the total weekday p.m. peak hour volumes, respectively. *Detailed signal warrant analysis worksheets are provided in Appendix "K".*

The results of the signal warrant analysis show that signals will be required at the Dan O'Brien Way/Industrial Park Drive and Campus Drive/Daggett Avenue intersections. At the Campus Drive/Dan O'Brien Way intersection, however, signals are not warranted and a single lane roundabout is expected to be sufficient in the year 2030 with 65 percent build-out.

SYSTEM DEVELOPMENT CHARGES

In order to develop a proportional based system development charge overlay zone for the Campus study area, the costs of the transportation improvement needs were estimated at a planning level. The estimated cost of each improvement was then divided by the total number of estimated new trips generated within the study area to determine the cost per daily trip. *The cost estimation worksheets are provided in Appendix "L".*

Table 4 summarizes the improvement costs for the recommended study area improvements. It should be noted that the trips generated by developments that have been approved within the study area have also been considered when determining these charges, and therefore these charges will need to be applied to these developments to ensure that sufficient funds are available to complete the required upgrading projects.

Table 4 Improvement Summary and Costs in 2008 Dollars

#	Improvement	Estimated. Cost	Cost / Trip
Link Improvements: State Roads			
A	Hwy 97 Over-crossing at Dan O-Brien Way, includes intersection treatment at Hwy 97/Dan O'Brien Way (50%/50% – State/City match)	$10,309,000 ($5,155K/$5,155K)	$ 174
SUBTOTAL - CITY COST		*$5,155,000*	*$ 174*
Link Improvements: Local Roads			
B	Dan O'Brien Way: Upgrade to a Major Collector cross-section from Highway 97 to Campus Drive.	$1,130,000	$38
C	Daggett Avenue Extension: Extend Daggett Avenue to Dan O'Brien Way at Industrial Park Drive as a 2-lane Minor Collector	$707,000	$24
D	Dahlia Street Extension: Extend Dahlia Street to Dan O'Brien Way as a 2-lane Minor Collector	$1,837,000	$62
E	New Collectors: 3-lane Minor Collector "frontage roads" along the north side of Highway 97, between Dan O'Brien Way and the extension of Dahlia Street	$3,596,000	$121
F	Industrial Park Drive: Construction of curbs, sidewalks, and bike lanes adjacent to existing roadway	$505,900	$17
SUBTOTAL		*$7,775,900*	*$263*
Intersection Improvements			
1	Highway 97/Dan O'Brien Way: Install a two-way stop-controlled intersection at ramp terminal. Provide southbound left-turn pocket.	N/A	N/A
2	Dan O'Brien Way/Northern Heights Boulevard: Add turn lanes.	$27,000	$1
3	Dan O'Brien Way/Industrial Park Drive: Signalize and add turn lanes.	$548,000	$19
4	Campus Drive/Dan O'Brien Way: Upgrade intersection form through installation of a roundabout.	$500,000	$17
5	Campus Drive/Daggett Avenue: Signalize and add turn lanes	$490,000	$17
6	Campus Drive/Dahlia Street: Add turn lanes	$905,000	$31
7	Crater Lake Parkway (Highway 39)/Campus Drive: Add flyover and off-ramp.	$5,153,000	$174
SUBTOTAL		*$7,623,000*	*$257*
Total Cost		**$20,553,900**	**$694**

As shown in Table 4, the total cost for all improvements varies is expected to be approximately $20.6 million, with the realignment of the Campus Drive/Dan O'Brien Way intersection and the construction of a flyover at the Crater Lake Parkway/Campus Drive intersection. The corresponding system development charges for the required study area improvements will be $694 per trip. As noted above this charge includes trips from approved developments and should be applied to these developments as well as future sites.

System Development Charge Administration

It is recommended that the City of Klamath Falls develop a System Development Charge (SDC) program for the Campus study area. The general characteristics of the proposed program are outline below.

Development Process

- The City, in negotiations with the developer, may elect to collect system development charges and develop roadway improvements as necessary, or elect to have the developer construct the roadway improvements as part of the development.

Transportation System Development Charges (TSDC)

- TSDCs are to be collected at the point in time when the water hook-up is processed for each new development.
- The TSDC is to be phased in, with an initial fee of half of the total SDC in 2008. This amount will increase by 10 percent of the total SDC each year for the five successive years. Thus the total SDC will be charged in 2013 and beyond.
- An annual increase in the TSDC will also be applied to account for inflation and will be tied to the City's adopted price index for construction related projects.

Credits

- All right of way and construction costs within the approved list of roadway improvements paid for and/or constructed by a developer shall result in a credit for the developer.
- Credits accrued by the developer shall be transferable within the study area to other developers.

Exceptions

- Any development in the study area that requires a zone change or comprehensive plan amendment will be required to prepare a traffic impact study. The study will be used to determine the number of primary trips that the site will generate and the resultant system development charge. In addition, land use actions that result in a significant impact per OAR 660-12-0060 will potentially be responsible for additional improvements not identified within the Campus transportation refinement plan.

Benefits

- Where the proposed development is consistent with the existing land use, developers are able to proceed with development without preparing a Traffic Impact Analysis as a means to identify appropriate mitigation measures.
- All new development to the area contributes an equal and proportionate share to the necessary future roadway improvements.
- Provides predictability and immediate response from the City when the development is consistent with the sub-area transportation master plan assumptions.

Action Items

- Gain City Council approval of the proposed System Development Charge Program
- City adoption of ordinance to provide for the System Development Charge Program
- Coordination with ODOT for funding of Highway 97 over-crossing at Dan O'Brien Way

In order for the System Development Charge Program to be equally applied to all future developments in the OIT Campus Sub-Area, an Intergovernmental Agreement (IGA) is required between the City, Klamath County, and ODOT. This IGA will ensure that all future development in the Klamath Falls OIT Campus Sub-Area follow the same criteria for development, regardless of the responsible agency.

Next Steps

There are a number of steps required in the coming years to progress the transportation improvements outlined in this Master Plan such that they are implemented in an appropriate timeframe. It is recommended that Interchange Area Management Plans (IAMPs) are prepared to document the requirements for the future interchanges on Highway 97 at Dan O'Brien Way and the likely combined Campus Drive/Crater Lake Parkway and Crater Lake Parkway/US 97 interchanges. Further, the Klamath Falls Transportation System Plan (TSP) will also require upgrading such that it incorporates the upgrades outlined in this report as well as any upgrades required as a result of the two future IAMPs.

Measures should also be taken to secure funding for the proposed interchange at Highway 97 and Dan O'Brien Drive and the combined Campus Drive/Crater Lake Parkway and Crater Lake Parkway/US 97 interchanges. It is important that these proposed interchange programs are added to the STIP lists such that funding is put aside for these projects in the coming years.

REFERENCES

1. Transportation Research Board. *Highway Capacity Manual*. 2000.

2. Kittelson & Associates, Inc. *OIT Center for Health Professionals Traffic Impact Analysis.* February 2006.

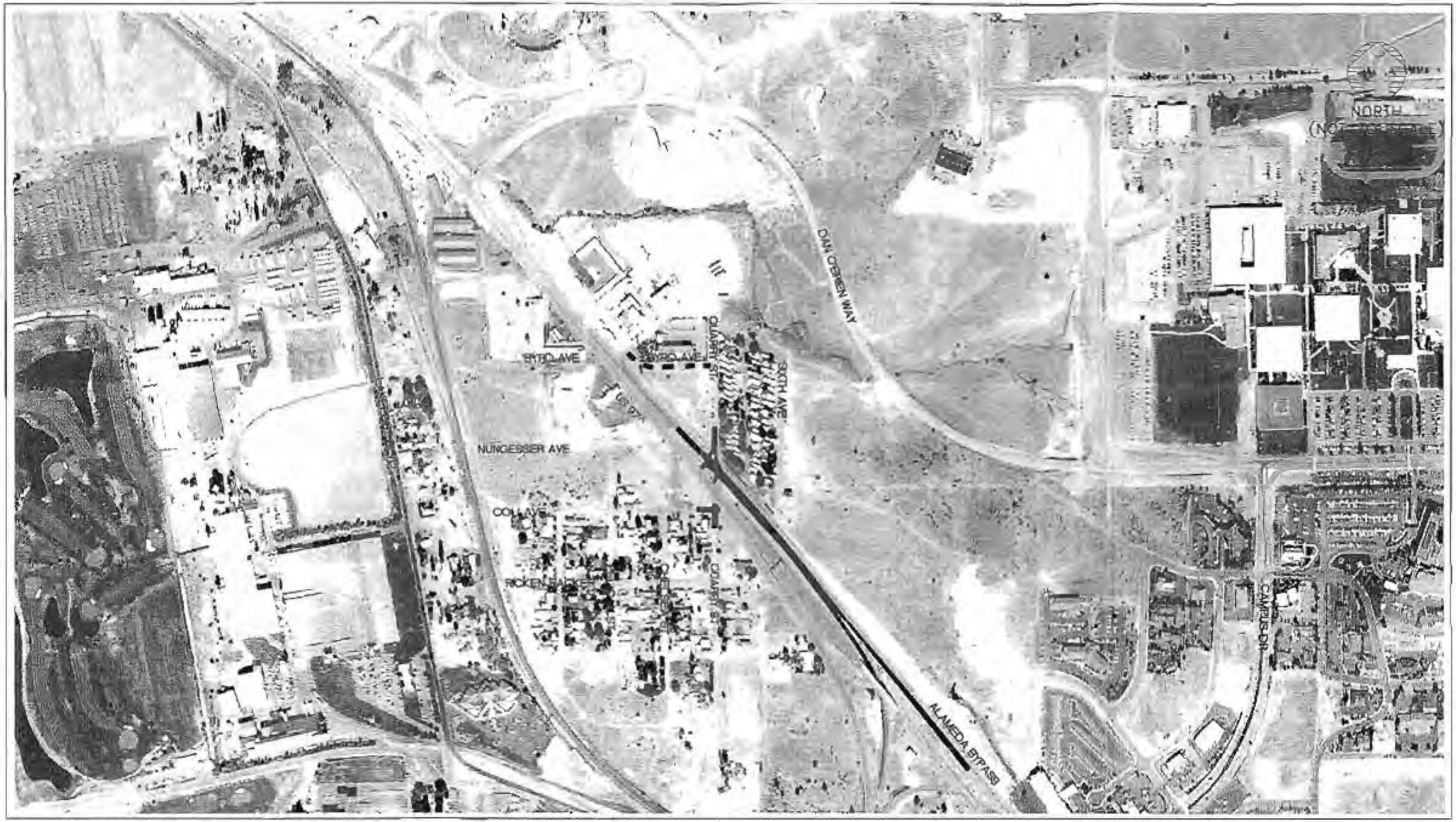
3. Institute of Transportation Engineers. *ITE Trip Generation Manual, Sixth Edition*. 1997.

4. Kittelson & Associates, Inc. *Highway 97 Klamath Falls Campus Area Access and Circulation Refinement Plan.* July 1999.

5. U.S. Department of Transportation. *Manual on Uniform Traffic Control Devices, Millennium Edition* 2000.

ATTACHMENT 1

HIGHWAY 97 KLAMATH FALLS CAMPUS AREA REFINEMENT PLAN REPORT FIGURES

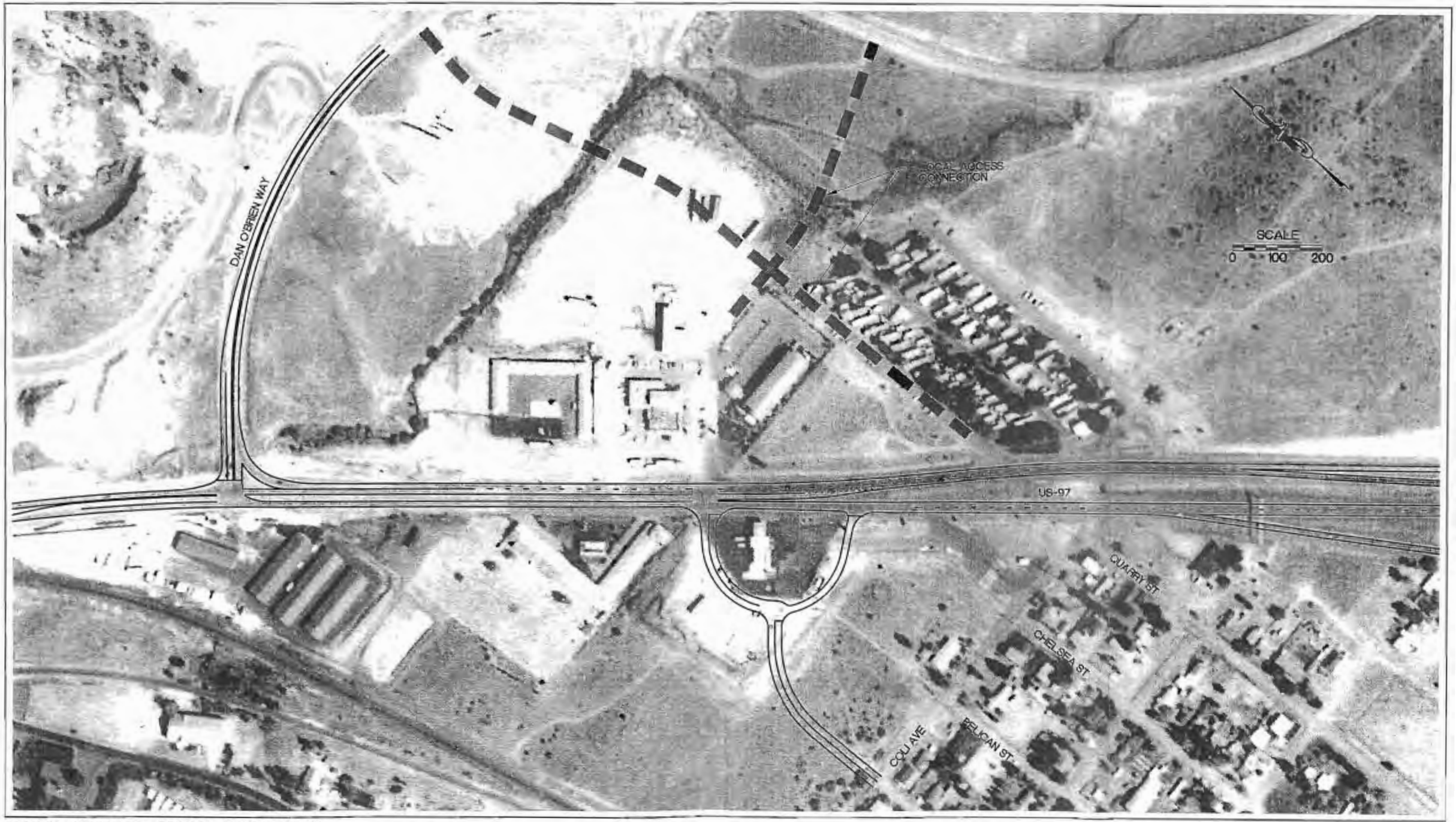


ALL INTERSECTIONS AND ACCESS POINTS ARE UNSIGNALIZED

ALTERNATIVE 1
ACCESS MANAGEMENT AND
CIRCULATION CONCEPTS

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT	FIGURE 12
JULY 1999	

209.7F1.DWG



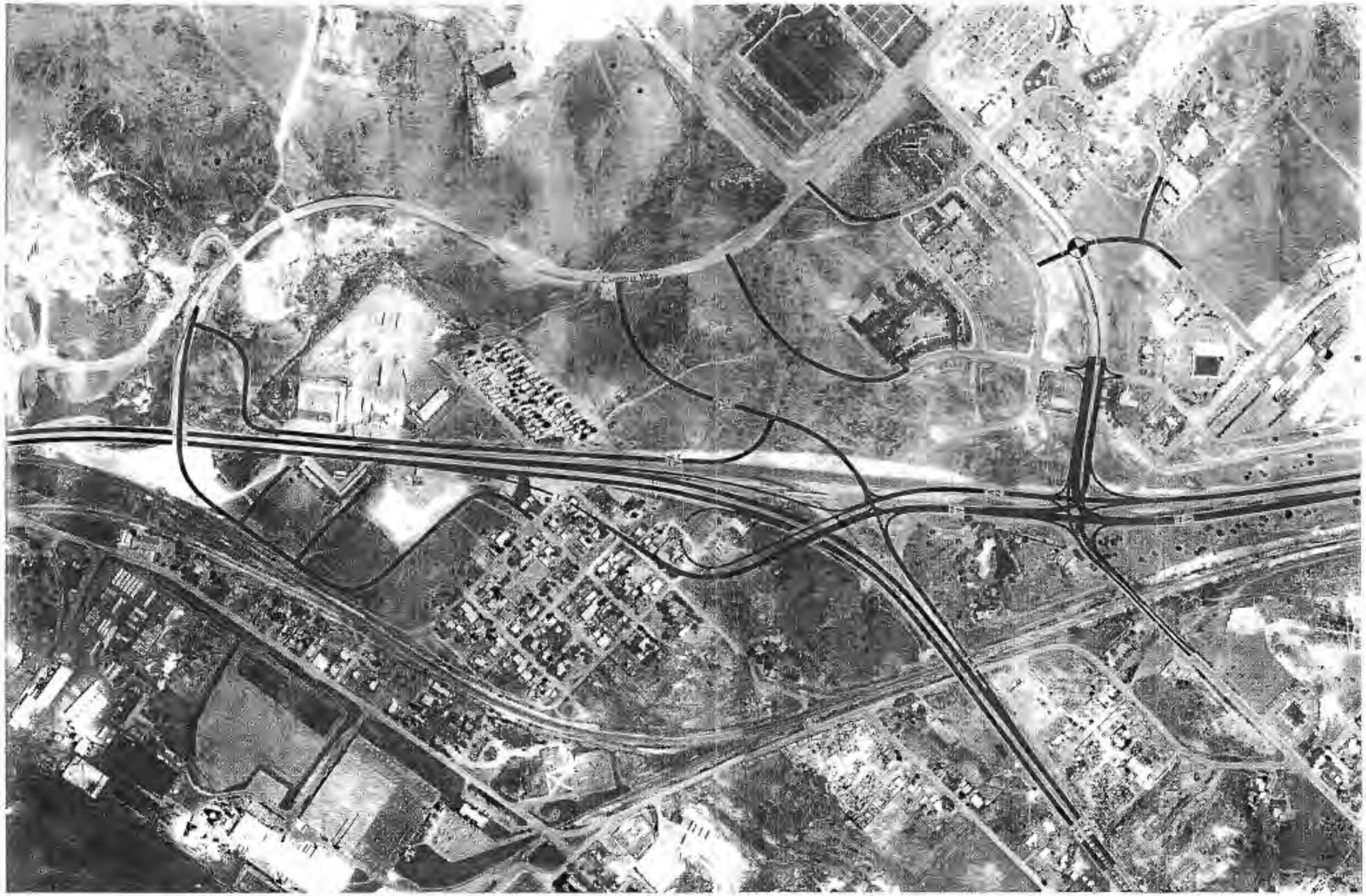
SPECIFIC ACCESS TO PRIVATE DRIVEWAYS TO BE DETERMINED DURING FINAL DESIGN

ALL INTERSECTIONS AND PRIVATE ACCESS POINTS WOULD BE UNSIGNALIZED

ALTERNATIVE 3E OPTION 5

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT JULY 1999	FIGURE 25	K

ALT35.DWG



NORTH
(NOT TO SCALE)

ALTERNATIVE 5A
SYSTEM IMPROVEMENT CONCEPTS
SEMI-DIRECTIONAL INTERCHANGE

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT	FIGURE 29
JULY 1999	

2097-SA.DWG

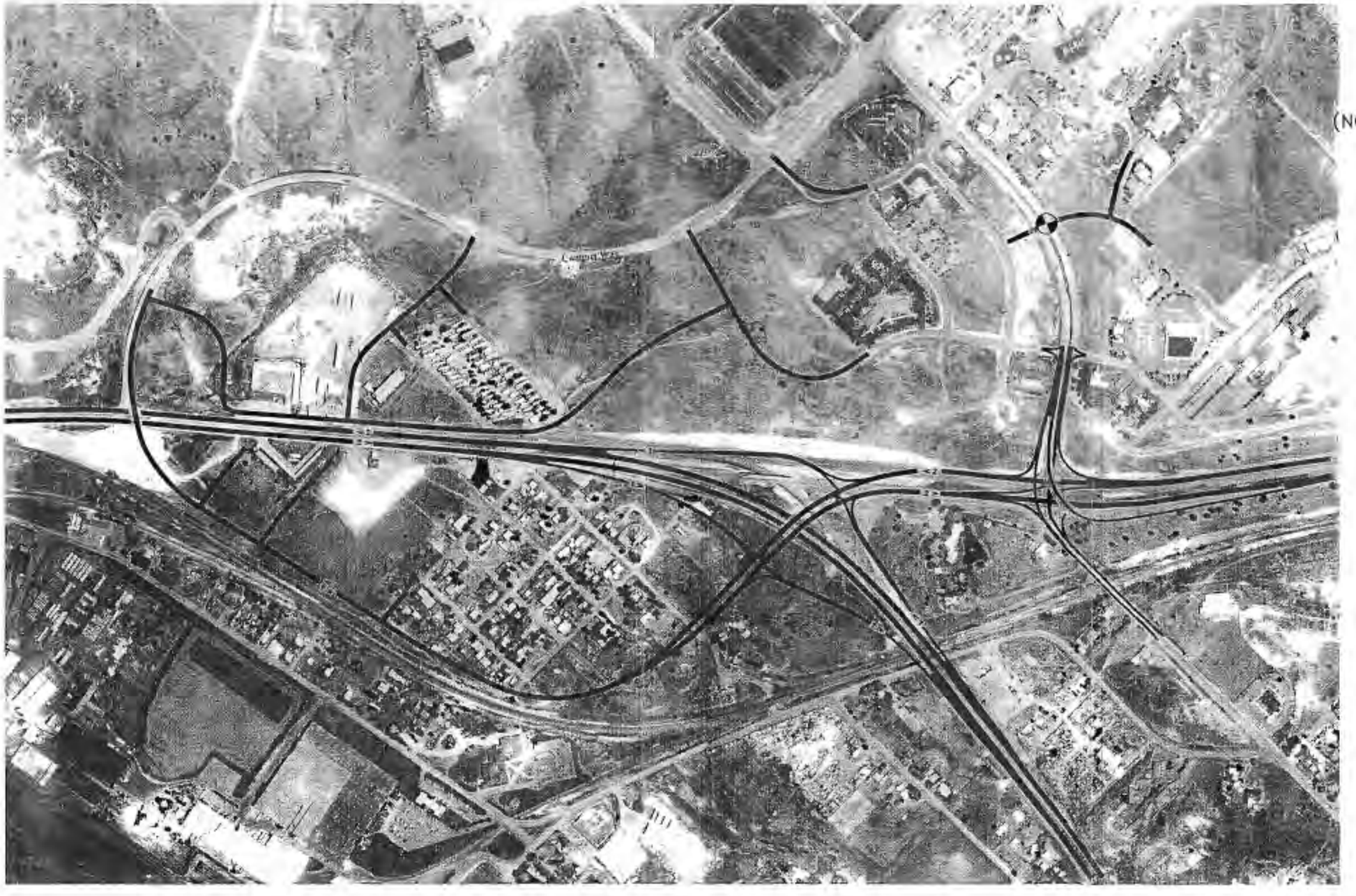


NORTH
(NOT TO SCALE)

ALTERNATIVE 5B
SYSTEM IMPROVEMENT CONCEPTS
SEMI-DIRECTIONAL INTERCHANGE

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT JULY 1999	FIGURE 30

2097-5B.DWG

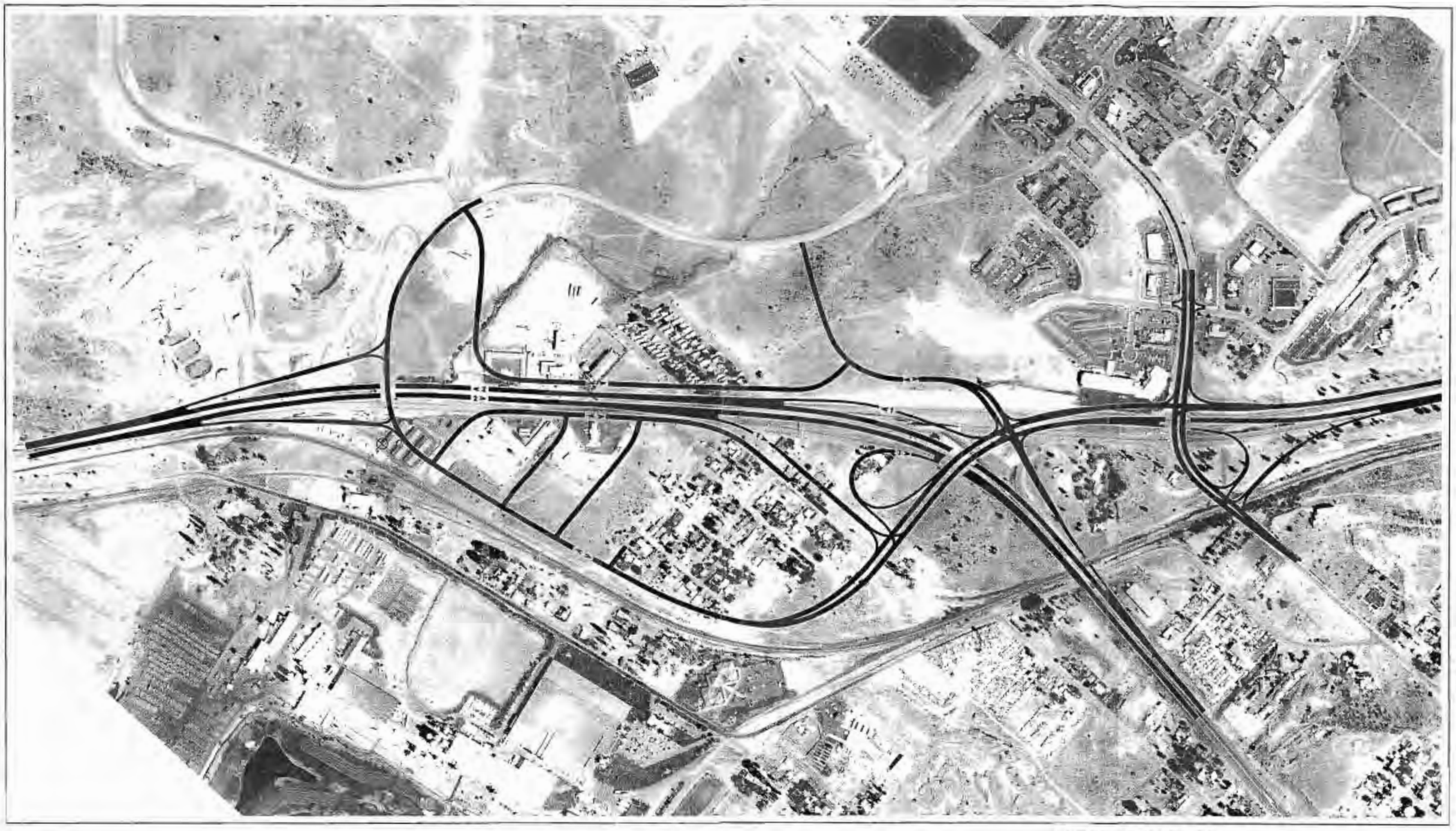


NORTH
(NOT TO SCALE)

ALTERNATIVE 5C
SYSTEM IMPROVEMENT CONCEPTS
DIAMOND INTERCHANGE

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT	FIGURE 31
JULY 1999	

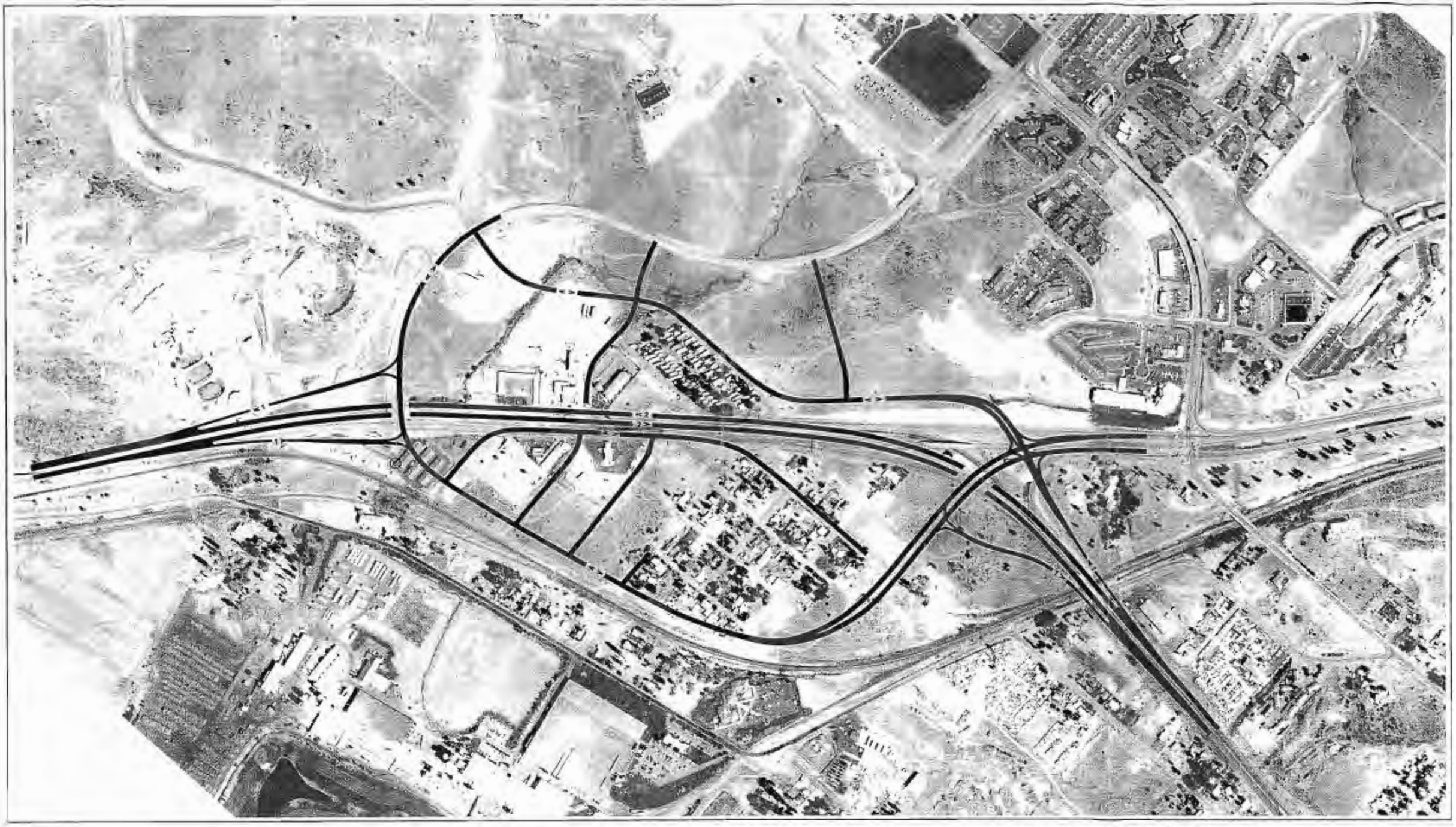
2057-5C.DWG



ALTERNATIVE 5D
SYSTEM IMPROVEMENT CONCEPTS
MODIFIED TRUMPET INTERCHANGE

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT	FIGURE 32	K
JULY 1999		

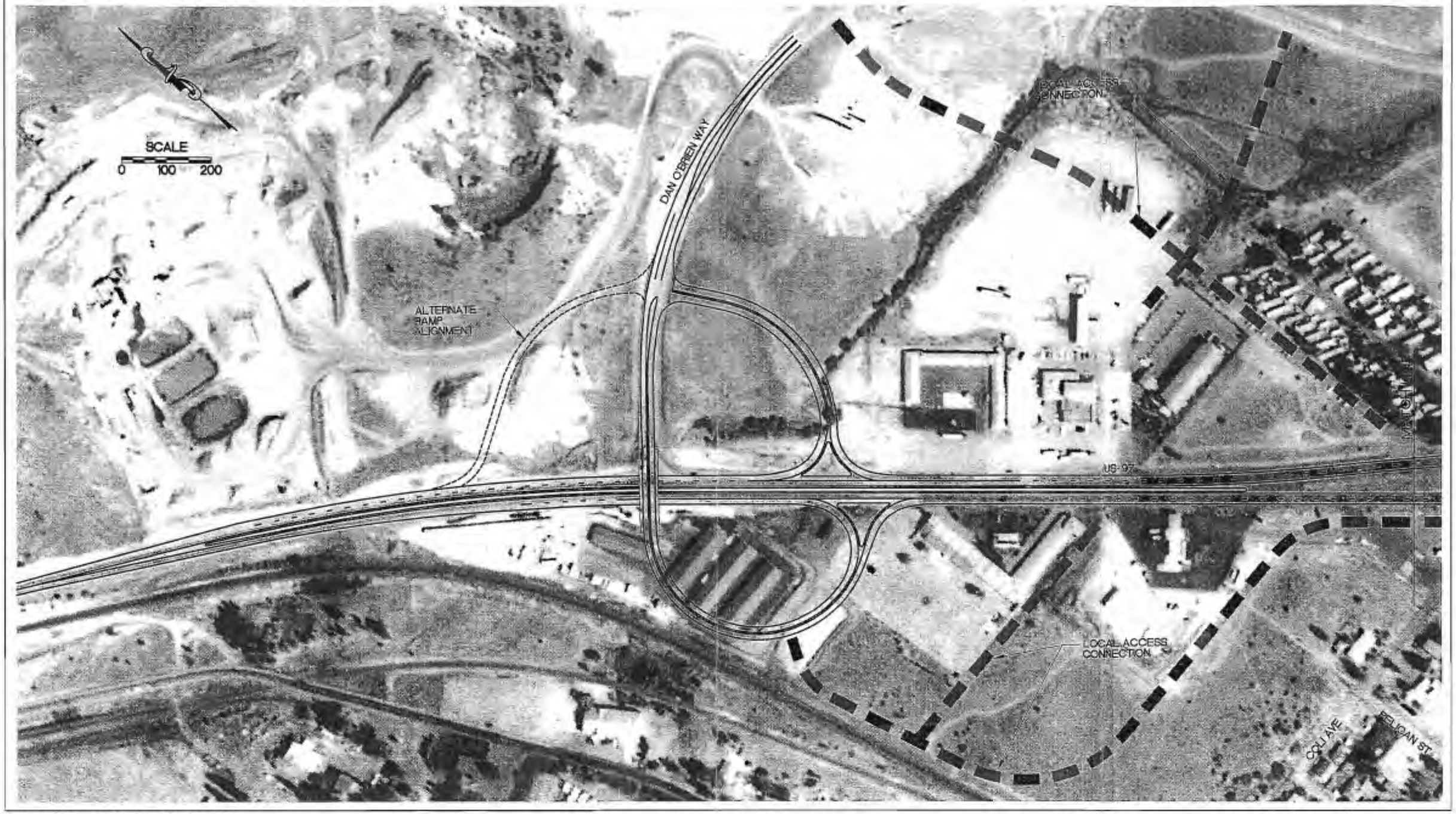
2097-5D.DWG



ALTERNATIVE 5E
SYSTEM IMPROVEMENT CONCEPTS
DOUBLE HALF DIAMOND INTERCHANGE

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT	FIGURE 33	K
JULY 1999		

2097-5E.DWG

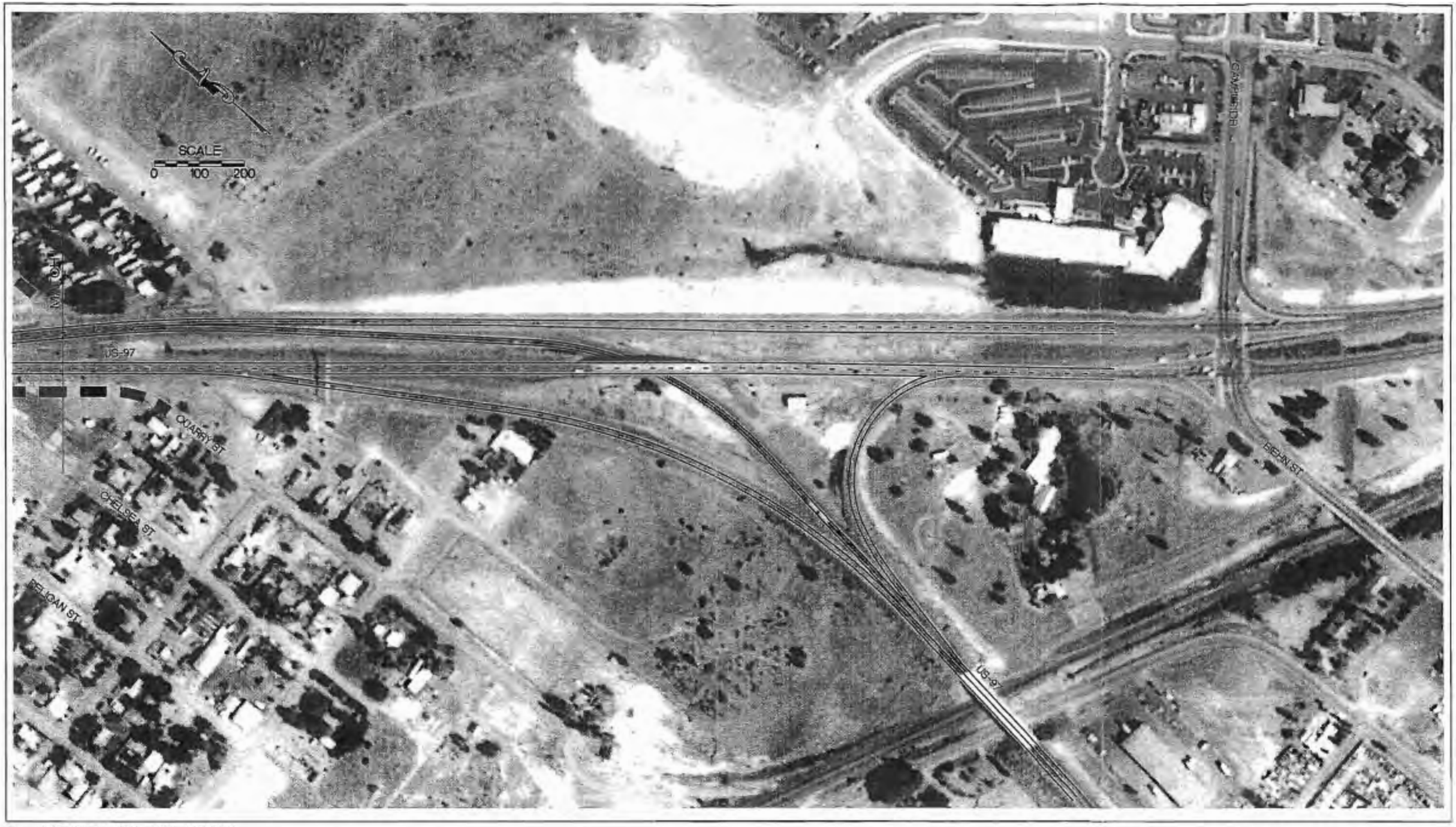


ALL INTERSECTIONS AND ACCESS POINTS ARE UNSIGNALIZED.

ALTERNATIVE 4 OPTION 1 RECOMMENDED

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT JULY 1999	FIGURE 35A	K

ALT4A.DWG



ALL INTERSECTIONS AND ACCESS POINTS ARE UNSIGNALIZED.

ALTERNATIVE 4 OPTION 1 RECOMMENDED

HWY-97 KLAMATH FALLS CAMPUS AREA ACCESS AND CIRCULATION REFINEMENT JULY 1999	FIGURE 35B	K

ALT4A.DWG



April 2012

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN UPDATE

TECHNICAL APPENDIX VOLUME 1

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

APPENDICES

Technical Appendices, Volume 1

Appendix 1A ..... Public Involvement Plan
Appendix 1B ..... Recommended Ordinance Amendments
Appendix 1C ..... Transportation Impact Analysis Guidelines
Appendix 1D ..... Prospectus Sheets
Appendix 1E ..... Cost Estimates

Technical Appendices, Volume 2 (Separate Document)

Appendix 2A ..... Technical Memorandum #1: Plans and Policy Review
Appendix 2B ..... Technical Memorandum #2: Goals, Objectives, and Evaluation Criteria
Appendix 2C ..... Technical Memorandum #3: Existing Conditions
Appendix 2D ..... Technical Memorandum #4: Future Conditions
Appendix 2E ..... Technical Memorandum #5: Alternatives Analysis
Appendix 2F ..... Technical Memorandum #6: Preferred and Cost Constrained Alternatives
Appendix 2G ..... Klamath Falls Westside Refinement Plan
Appendix 2H ..... Orindale/Balsam Sub-Area Master Plan
Appendix 2I ..... Klamath Falls Campus Sub-Area Master Plan

Appendix 1A Public Involvement Plan

INTERAGENCY AND PUBLIC INVOLVEMENT PROGRAM

As part of the Klamath Falls Urban Area TSP update, interagency and public involvement occurred through: a Technical Advisory Committee (TAC) and Citizen Advisory Committee (CAC) that had regular meetings; two public Open Houses and virtual open houses involving local citizens, property owners, and business owners; public comments posted on the project website; and, a joint work session of the City of Klamath Falls and Klamath County Planning Commissions, Klamath Falls City Council, and Klamath County Commissioners that was open to the public. An overview of the TAC and CAC meetings and open houses is summarized below.

Technical and Community Advisory Committees

The TAC and CAC guided the planning work and were responsible for reviewing all work products, providing input on all planning recommendations such as the project study area, goals and objectives, level of public involvement, technical analysis, and the proposed alternatives. Ultimately the TAC and CAC helped select the projects and policies included in the TSP. A Project Management Team (PMT) performed a coordination function, planning and executing project management tasks related to project schedule, meeting logistics, and final project recommendations. The PMT included representation from ODOT, the City of Klamath Falls, Klamath County, and the consultant team and were all members of the TAC.

Membership on the TAC and CAC was established through input from City, County, and ODOT representatives. A list of TAC and CAC members is included in Table 1A-1.

TABLE 1A-1: PROJECT PARTICIPANTS

Project Management Team (PMT)	
Mark Willrett, PE *City of Klamath Falls*	Stan Strickland *Klamath County`*
Sandra Fox *City of Klamath Falls*	Dennis Nelson, PE *Klamath County*
Devin Hearing *Oregon Department of Transportation*	Bill Adams *Klamath County*
Susan Wright, PE *Kittelson & Associates, Inc.*	Darci Rudzinski *Angelo Planning Group*
Technical Advisory Committee (TAC)	
Mark Willrett, PE *City of Klamath Falls*	Stan Strickland *Klamath County*
Sandra Fox *City of Klamath Falls*	Dennis Nelson, PE *Klamath County*
Devin Hearing *Oregon Department of Transportation*	Bill Adams *Klamath County*
Mike Stinson *Oregon Department of Transportation*	Peter Schuytema *Oregon Department of Transportation*
C. David Lanning *ODOT Rail*	Ernie Palmer *Basin Area Transit Service*
John Longley *City of Klamath Falls*	
Citizen Advisory Committee	
Cole Chase *City Planning Commission*	Bud Hart *City Council*
Greg Taylor *City Council*	Tim Thompson *County Planning Commission*
Al Switzer *Board of County Commissioners*	Roger Lindgren *County Road Advisory Committee/OIT*
Mike Moore *Parking Board*	Shawn Snoozy *Klamath County School District*
Sam McGuire *Klamath Falls City Schools*	Randy Bednar *County Bike and Pedestrian Committee*
Clidia Gibson *SPOKES*	Jeff Monson *Commute Options of Central Oregon*
Chip Massie *Chamber of Commerce*	

Consultant Team	
Kittelson & Associates, Inc.	*Angelo Planning Group*
Marc Butorac, PE, Project Principal	Darci Rudzinski, AICP
Susan Wright, PE, Project Manager	
Erin Ferguson, PE	
Matt Kittelson	

Public Involvement Plan

To ensure that adequate project coordination and public participation occurred throughout the development of the Klamath Falls Urban Area TSP, a series of joint TAC and CAC meetings, public workshops and virtual open houses, and public joint work sessions were held over the course of the project. A summary of all of the meetings associated with the project, as well as the meeting objectives, are summarized in 0.

TABLE 1A-2: MEETING SUMMARY

Meeting Event	Date/Location	Meeting Purpose/Objectives
TAC/CAC Meeting #1	Monday, November 15, 2010 City of Klamath Falls	Provided an opportunity for project stakeholders to become familiar with the project scope, schedule and key deliverables. Discussed draft Technical Memorandum #1 and #2
TAC/CAC Meeting #2	Wednesday, January 19, 2011 City of Klamath Falls	Discussed Technical Memorandum #3 and #4, which evaluated existing and future conditions and presented the results.
Public Workshop #1	Wednesday, January 19, 2011 Community Meeting Room 133 North 4th Street Klamath Falls, OR	Provided an opportunity for community members to share their ideas, thoughts, concerns and desires related to Klamath Falls in its present state and the future of Klamath Falls. Also presented the results of the existing and future conditions analyses. A Virtual Open House was also available for those unable to attend to have information discussed available online and to submit their comments electronically.
TAC/CAC Meeting #3	Tuesday, March 29, 2011 City of Klamath Falls	Discussed Technical Memorandum #5, which summarized the alternatives analysis conducted.
Adopting Bodies Joint Work Session #1	Tuesday, March 29, 2011 Klamath County Commissioners Chambers	Discussed project findings to date and outlined project tasks yet to be completed.
Access Spacing Discussion	Monday, June 6, 2011 City of Klamath Falls	Discussed existing and potential access spacing standards with City, County, and ODOT staff.

TAC/CAC Meeting #4	Monday, June 6th, 2011 City of Klamath Falls	Discussed Technical Memorandum #6, which summarizes the preferred plan and the cost constrained plan.
Public Workshop #2	Wednesday, June 29, 2011 Klamath Falls City Council Chambers 500 Klamath Avenue Klamath Falls, Oregon	Provided an opportunity for community members to hear review the projects included in the draft preferred plan and provide input. A general project update was also provided. A Virtual Open House was also available for those unable to attend to have information discussed available online and to submit their comments electronically.
TAC/CAC Meeting #5	Tuesday, September 6th, 2011 City of Klamath Falls	Discussed the Draft TSP.
Adopting Bodies Joint Work Session #2	Monday, September 19, 2011 Klamath County Commissioners Chambers	Provided an overview of the Draft TSP.
Board of County Commissioners Public Hearing	Tuesday, January 24th, 2012 Klamath County Commissioners Chambers	Adopted Klamath Falls Urban Area TSP. This was a joint hearing with the Klamath County Planning Commission.
County Planning Commission Public Hearing	Tuesday, January 24th, 2012 Klamath County Commissioners Chambers	Adopted Klamath Falls Urban Area TSP. This was a joint hearing with the Klamath County Board of Commissioners.
City Council Public Hearing	Monday, April 9th, 2012 City of Klamath Falls Council Chambers	Adopted Klamath Falls Urban Area TSP. This was a joint hearing with the Klamath Falls Planning Commission.
City Planning Commission Public Hearing	Monday, April 9th, 2012 City of Klamath Falls Council Chambers	Adopted Klamath Falls Urban Area TSP. This was a joint hearing with the Klamath Falls City Council.

Appendix 1B Recommended Ordinance Amendments

Angelo planning group LAND USE PLANNING • TRANSPORTATION PLANNING • PROJECT MANAGEMENT

Memorandum

Date: September 12, 2011

To: Mark Willrett, City of Klamath Falls
Stan Strickland, Klamath County

cc: Project Management Team, Technical Advisory Committee,
Citizens Advisory Committee

From: Darci Rudzinski and Shayna Rehberg

Re: Klamath Falls Urban Area Transportation System Plan Update
Recommended Ordinance Amendments WORK SESSION REVIEW DRAFT

I. Introduction

This memorandum presents draft amendment language for the City of Klamath Falls Community Development Ordinance (CDO) and the Klamath County Land Development Code (LDC). The proposed language reflects issues that have been raised during the update of the Urban AreaTransportation System Plan (TSP) and identified during the initial regulatory review conducted for Task 2 of this project's scope of work (see Technical Memorandum #1). The intent of the proposed amendments is to ensure consistency between local code requirements, policy language, and the TSP as well as bring local ordinances into greater compliance with the Oregon Transportation Planning Rule (TPR). These objectives correspond to those established in Task 6.

A summary list of proposed changes and corresponding TPR requirements follows;[1] proposed amendments to the City's CDO begins on page 5 and proposed County LDC language begins on page 16. Code amendment language is presented such that language recommended for addition to the code is underlined and language recommended for removal from the code is ~~struck through~~.

Proposed amendments will not be adopted until which time the City and County initiate a legislative action, either concurrent with the adoption of the Urban Area TSP or through a subsequent hearing process, to amend the respective local ordinances.

[1] For reference seethe TPR http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_012.html; a summary of relevant Transportation Planning Rule requirements can also be found in Technical Memorandum #1, Table 1.

Ordinance Section	Description of Amendment	Corresponding TPR Citation
City of Klamath Falls Community Development Ordinance		
Chapter 10 General Provisions		
10.610 Notice of Hearing.	Notice to and coordination with ODOT and other affected agencies.	660-12-0045(1)(c) 660-12-0045(2)(f)
10.815 Agency Involvement.	Notice to and coordination with ODOT and other affected agencies.	660-12-0045(2)(d)
Chapter 11 Land Development Review		
11.415 Required Findings. [Change of Zone – Major Parcels]	Compliance with TPR -0060. Note: Similar language should be included for legislative and quasi-judicial amendments to code and map amendments procedures/ requirements, a section that the CDO does not currently have. The Amendment procedures are listed in the Comprehensive Plan. Should TPR -0060 related policy language reside in the TSP instead, thereby revising the Comprehensive Plan's amendment procedures, or should the CDC be revised to include all amendment procedures?	660-12-0045(2)(g) Through the Urban Area TSP update, the 20-year transportation improvement needs have been determined and corresponding funding sources identified for "reasonably likely" determination [TSP Citation]
11.805 Design Standards.	Cross-reference to TIS requirements and new language requiring connectivity for all modes.	660-12-0045(4)(b)
11.810 Tentative Plan Content.	Cross-reference to TIS requirements.	
11.815 Review Criteria.	Cross-reference to TIS requirements.	
11.820 Approval of Tentative Subdivision Plan.	Conditions of approval added to address needed transportation improvements.	660-12-0045(2)(e)
Chapter 12 Land Use		
12.005 Uses Permitted by Zone.	Permitted transportation improvements.	660-12-0045(1)(b)
Chapter 14 Private Site and Public Facility Standards		
14.010 Off-Street Parking Requirements.	Carpool and vanpool requirements.	660-12-0045(4)(d)
14.048 Vehicle Parking Variance Criteria.	Transit-related and carpool/vanpool parking	660-12-0045(4)(e)

Ordinance Section	Description of Amendment	Corresponding TPR Citation
	reduction.	
14.050 Access and Driveways.	Replace access spacing requirements with a citation to Table 4-3 in the Urban Area TSP. Model code language pertaining to access consolidation, shared access. Also includes pedestrian circulation/access requirements within commercial, industrial, multifamily development and required connections to transit. Originally proposed for subdivision design standards (11.805) in Tech Memo #1. Similar recommendations in 1998 TSP, Appendix G. (Did not include the recommendation from this plan "Walkways shall be provided to the street for every 330 feet of frontage.")	660-12-0045(2)(a) 660-12-0045(3)(b) 660-12-0045(3)(e) 660-12-0045(4)(b) 660-12-0045(4)(f)
14.051 Traffic Impact Study Requirements.	New TIS requirements (from Guidelines developed by Kittelson).	660-12-0045(2)(b) 660-12-0045(2)(e) 660-12-0045(3)(c)
14.445 Location. [NEW SECTION]	Bike lanes shall be located on collectors and arterials; cross-reference to Urban Area TSP standards.	660-12-0045(3)(b)
Klamath County Land Development Code		
Chapter 10 General Provisions		
Article 11 Definitions	Added "certain transportation improvements" to the list of Extensive Impact Services and Utilities.	660-12-0045(1)(b)
Chapter 20 Review Procedures		
21.040 – Notice, Hearing and Appeal	Notice to ODOT.	660-12-0045(1)(c)
Chapter 30 Public Hearings, Notice and Appeal		
32.030 – Types of Notice	Notice to and coordination with ODOT and other affected agencies.	660-12-0045(1)(c) 660-12-0045(2)(d) 660-12-0045(2)(f)
Chapter 40 Application Procedures		

Ordinance Section	**Description of Amendment**	**Corresponding TPR Citation**
41.060 – Site Plan Requirements	Site plan requirement to include non-vehicular access and circulation [new section] and Cross-reference to TIS requirements.	
44.030 Review Criteria	CUP review criteria; compliance with the TSP. Cross-reference to conditions of approval related to transportation impacts.	
46.030 Review Criteria	Land subdivision; transportation improvements. Cross-reference to TIS requirements.	
46.050 Preliminary Subdivision Plan Requirements	Show non-vehicular access and circulation.	*Cross-reference to walkways and pedestrian connections required by Article 71.*
47.030 - Review Criteria	Quasi-Judicial Zone Change; Compliance with TPR -0060.	660-12-0060
48.030 - Review Criteria	Quasi-Judicial Comprehensive Plan Designation Change; Compliance with TPR -0060.	660-12-0060
49.030 - Review Criteria	Legislative Amendment to Code/Plan; Compliance with TPR -0060.	660-12-0060
Chapter 50 Land Use Zones		
50.040 – Transportation-Related Uses [New Section]	Permitted transportation improvements.	660-12-0045(1)(b)
Chapter 60 Planning Department Development Standards		
68.030 – Off-Street Parking Requirements	Bicycle parking standards for Urban Area consistent with the City CDO. Carpool and vanpool requirements. Transit-related and carpool/vanpool parking reduction.	660-12-045(3)(a) 660-12-0045(4)(d) 660-12-0045(4)(e)
Chapter 70 Public Works Department Development Standards		
71.020 – Vehicular Access and Circulation	"Non-vehicular" added to section title and included in the text of the purpose statement.	660-12-0045(3)(b)
71.020 - Access Standards	Citation to Table 4-3 in the Urban Area TSP.	660-12-0045(2)(a)

Ordinance Section	**Description of Amendment**	**Corresponding TPR Citation**
71.050 - Improvements in the Klamath Falls Urban Area	Sidewalks and bike lanes required on arterials and collectors.	660-12-0045(3)(b)
71.100 - Cul-de-sacs	Pedestrian connectivity and pedestrian way standards consistent with City CDO.	660-12-0045(3)(b)
71.150 - Blocks	Block standards for Urban Area consistent with City CDO.	Model Development Code
71.190 - Non-Vehicular Access and Circulation [New Section]	Pedestrian circulation/access requirements within commercial, industrial, multifamily development and required connections to transit. (Language consistent to proposed City CDO amendments.)	660-12-0045(3)(b) 660-12-0045(3)(e) 660-12-0045(4)(b) 660-12-0045(4)(f)
71.200 - Traffic Impact Study [New Section]	New TIS requirements (from Guidelines developed by Kittelson).	660-12-0045(2)(b) 660-12-0045(2)(e) 660-12-0045(3)(c)

City of Klamath Falls Community Development Ordinance

CHAPTER 10
GENERAL PROVISIONS

NOTIFICATION REQUIREMENTS

10.605 Public Hearings. Unless otherwise required by this Ordinance, any hearing before the Commission or Council required by any provision of Chapters 10 to 14 shall be a public hearing held in accordance with the notification and procedure requirements hereinafter provided.

10.610 Notice of Hearing.
(2) Notice of any hearing shall be given not less than twenty (20) days prior to the evidentiary hearing, or ten (10) days if two or more evidentiary hearings are allowed as follows:

a. By publication once in a local newspaper of general circulation;
b. By providing notice to all local electronic media;
c. By first class mail to applicant and all property owners as shown on the ownership list filed with the application. However, failure to receive such notice shall not invalidate any of the proceedings involved if the City can demonstrate by affidavit that such notice was given, by mail.
d. Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the City or is otherwise potentially affected by the proposal. For proposals located adjacent to a state roadway or where proposals are expected to have an impact on a state transportation facility, notice of the hearing shall be sent to ODOT; and
e. Where applicable, by posting in accordance with Section 10.615.

ADMINISTRATIVE REVIEW

10.815 Agency Involvement. To assure affected agencies involvement in the planning process, every application may be referred to appropriate local, state and federal agencies for their review and comment. For application sites located adjacent to a state roadway or where proposals may have an impact on a state transportation facility, notice of a complete application shall be sent to ODOT. The Planning Department shall utilize procedures as outlined in the Klamath Falls Urban Growth Boundary Management Agreement in notifying appropriate Klamath County Departments for review and comment and/or recommendation.

CHAPTER 11
LAND DEVELOPMENT REVIEW

CHANGE OF ZONE - MAJOR PARCELS

11.415 Required Findings. Prior to making a recommendation on the proposed change of zone, the Commission shall analyze the following criteria and incorporate such analysis in their decision:
(1) The change of zone is in conformance with the Comprehensive Plan and all other provisions of Chapters 10 to 14 and any applicable street plans.
(2) The property affected by the change of zone is adequate in size and shape to facilitate those uses that are normally allowed in conjunction with such zoning.
(3) The property affected by the proposed change of zone is properly related to streets to adequately serve the type of traffic generated by such uses that may be permitted therein.

a) Transportation Planning Rule Compliance. A proposed comprehensive plan amendment, zone change or land use regulation change, whether initiated by the city or by a private interest, shall be reviewed to determine whether it significantly affects a transportation facility, in accordance with Oregon Administrative Rule (OAR) 660-012- 0060 (the Transportation Planning Rule – "TPR"). "Significant" means the proposal would:

i. Change the functional classification of an existing or planned transportation facility (exclusive of correction of map errors in an adopted plan);
ii. Change standards implementing a functional classification system; or
iii. As measured at the end of the planning period identified in the adopted transportation system plan:

1. Allow land uses or levels of development that would result in types or levels of travel or access that are inconsistent with the functional classification of an existing or planned transportation facility;
2. Reduce the performance of an existing or planned transportation facility below the minimum acceptable performance standard identified in the TSP; or
3. Worsen the performance of an existing or planned transportation facility that is otherwise projected to perform below the minimum acceptable performance standard identified in the TSP or comprehensive plan.

b) Amendments to the comprehensive plan and land use regulations that significantly affect a transportation facility shall ensure that allowed land uses are consistent with the function, capacity, and level of service of the facility identified in the TSP. This shall be accomplished by one or a combination of the following:

i. Adopting measures that demonstrate allowed land uses are consistent with the planned function, capacity, and performance standards of the transportation facility.
ii. Amending the TSP or comprehensive plan to provide transportation facilities, improvements or services adequate to support the proposed land uses consistent with the requirements of Section -0060 of the TPR.

iii.Altering land use designations, densities, or design requirements to reduce demand for vehicle travel and meet travel needs through other modes of transportation.
iv. Amending the TSP to modify the planned function, capacity or performance standards of the transportation facility.

c) Traffic impact study: A Traffic Impact Study shall be submitted with a zone change application pursuant to Section 14.051, Traffic Impact Study Requirements.

(4) The proposed change of zone will have no adverse effect on abutting property of the permitted uses thereof.

TENTATIVE SUBDIVISION PLAN

11.805 Design Standards.

[…]
(10) Access to Subdivision. All major means of access to a subdivision or major partition shall be from existing streets fully improved to City standards and which in judgment of the Public Works Director, have the capacity to carry all anticipated traffic from the development. Capacity of the surrounding transportation system shall be assessed pursuant to the requirements of Section 14.051, Traffic Impact Study Requirements. Streets, sidewalks, and walkways/pathways in the subdivision shall be planned to provide connections to surrounding commercial areas, activity centers, and transit stops, pursuant to Section 14.050.

[…]
(12) Cul De Sacs. A cul de sac shall be as short as possible and shall have a maximum length of five hundred feet (500') and a minimum length of two hundred and fifty feet (250'). All cul de sacs shall terminate with a circular turnaround. The City may require the applicant to provide a sidewalk or bikeway between the cul de sac and adjacent streets in order to enhance accessibility and connectivity.

11.810 Tentative Plan Content.
[…]
(8) A traffic impact study as required by Section 14.051, Traffic Impact Study Requirements.

11.815 Review Criteria. Prior to making a decision on the proposed tentative plan, the Commission shall analyze the following criteria and incorporated such analysis in their decision:
[…]
(7) The tentative plan complies with the Comprehensive Plan and Chapters 10 to 14 and other applicable local and state regulations. The tentative subdivision plan must be found to be in compliance with the Urban Area Transportation System Plan; transportation system impacts

associated with the subdivision shall be assessed pursuant to the requirements of Section 14.051, Traffic Impact Study Requirements.

11.820 Approval of Tentative Subdivision Plan.

1. Tentative Plan. The Commission shall review the plan and the report of the staff. The Commission may approve the tentative plan as submitted or as modified or reject it. The Commission's decision shall be based upon, but shall not be limited to, the Comprehensive Plan and all other adopted plans supplementary to it.

a) Within forty five (45) days of its decision, the Commission shall forward to the Council a copy of such decision and any supporting information. The Council shall review the tentative plan, the report of the staff and the decision of the Commission and may approve, modify or reject the decision. The Planning Director shall provide the developer with written notice of the Council's action within five (5) days of such action. Such written notice shall include findings relative to the above mentioned factors. Approval of the tentative plan shall not constitute final acceptance of the plat of the proposed subdivision; however, approval of a tentative plan shall be binding upon the City for the purposes of the preparation of the final plat. The City may require only such changes in the final plat as are necessary for compliance with the terms of its approval of the tentative plan.

b) Conditions of approval: The Council may deny, approve, or approve a development proposal with appropriate conditions needed to meet transportation operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system. Conditions of approval that may apply include:

1) Crossover and/or reciprocal easement agreements for all adjoining parcels to facilitate future access between parcels.

2) Access for new developments that have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.

3) Right-of-way dedications for future planned roadway improvements.

4) Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

CHAPTER 12
LAND USE

12.005 Uses Permitted by Zone

1. The following transportation-related improvements and activities are permitted outright in all City zones, unless otherwise specified in individual zones.

a. Normal operation, maintenance, repair, and preservation projects of existing transportation facilities.

b. Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.

c. Projects specifically identified in the Urban Area Transportation System Plan.
d. Landscaping as part of a transportation facility.
e. Emergency measures necessary for the safety and protection of property.
f. Acquisition of right-of-way for public roads, highways, and other transportation improvements designated in the Urban Area Transportation System Plan, except for those that are located in exclusive farm use or forest zones.
g. Construction of a street or road as part of an approved subdivision or land partition approved that is consistent with the applicable land division regulations.

2. The following transportation-related improvements and activities are permitted conditionally/subject to Minor Design Review (Section 11.000) in all City zones, unless otherwise specified in individual zones.
a. Construction, reconstruction, or widening of highways, roads, bridges or other transportation projects that are:
(1) Not improvements designated in the Transportation System Plan; or
(2) Not designed and constructed as part of a subdivision or planned development subject to site plan and/or conditional use review.
(3) An application is subject to review under a Minor Design Review process; however the decision criteria in that section do not apply to transportation improvements. In order to be approved, the site plan permit shall comply with the Urban Area Transportation System Plan and applicable standards of this title, and shall address the criteria below. For State projects that require an Environmental Impact Statement (EIS) or EA (Environmental Assessment), the draft EIS or EA shall be reviewed and used as the basis for findings to comply with the following criteria:
(a) The project is designed to be compatible with existing land use and social patterns, including noise generation, safety, and zoning.
(b) The project is designed to minimize avoidable environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities.
(c) The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.
(d) The project includes provision for bicycle and pedestrian circulation as consistent with the Comprehensive Plan and other requirements of this ordinance.

CHAPTER 14
PRIVATE SITE AND PUBLIC FACILITY STANDARDS

OFF STREET PARKING AND LOADING

14.010 Off-Street Parking Requirements.

(5) Carpool and Vanpool Parking. Large employers (those with 50 employees or more working the same hours or shift) shall dedicate 10% of the required parking spaces for carpools and vanpools.

a) These designated spaces shall be the closest parking spaces to the building entrance normally used by employees, with the exception of disabled/handicap accessible parking spaces.
b) Carpool and vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only" along with specific hours of use.
c) Any other use establishing carpool and vanpool spaces may reduce the minimum parking requirement by 3 spaces for each carpool/vanpool space created.

14.048 Vehicle Parking Variance Criteria.

Upon submission of documentation by the applicant of how the project meets the following criteria, the Director may approve a variation to the parking requirements of Section 14.010 , if the Director finds that:

1. The parking needs of the use will be adequately served; and either
2. Shared Parking is provided consistent with the requirements of Section 14.025(4); or
3. The applicant provides an acceptable proposal for an alternate mode~~s~~ of transportation program, including a description of existing and proposed facilities and assurances that the use of alternate modes of transportation will continue to reduce the need for on-site parking on an on-going basis.

a) Transit-related parking reduction. The number of minimum required parking spaces may be reduced by up to 10% if:
   1) The proposal is located within a ¼ mile of an existing or planned transit route, and;
   2) Transit-related amenities such as transit stops, pull-outs, shelters, park-and-ride lots, transit-oriented development, and transit service on an adjacent street are present or will be provided by the applicant.
b) Carpool and Vanpool Parking. The number of minimum required parking spaces may be reduced by 3 spaces for each carpool/vanpool space created, pursuant to Subsection 14.010(5).

SITE ACCESS AND ~~BOUNDARIES~~ CIRCULATION

14.050 Access and Driveways.

1. All new development and redevelopment shall meet the ~~following~~ access ~~design~~ spacing standards~~:~~ in Table 4-3 of the Urban Area Transportation System Plan.

~~(a) On Category 4 highways and 5-lane arterial streets, maintain 500-foot spacing (centerline-to-centerline) between either public or private access on both sides of the roadway and both sides of the proposed access point.~~

~~(b) On Category 5 highways and 3-lane arterials, 300-foot spacing (centerline-to-centerline) between either public or private access on both sides of the roadway and both sides of the proposed access point.~~

~~(c) On Category 6 highways, 150-foot spacing (centerline-to-centerline) between either public or private access on both sides of the roadway and both sides of the roadway and both sides of the proposed access point.~~

2. For each single family dwelling, a private access driveway shall be provided which shall be at least 10 feet in width. For two or more dwelling units, a private access driveway shall be provided; the improved portion of which shall be at least 20 feet in width. When parking is to be permitted on either or both sides of such driveway, there shall be provided a parking lane on that side of the driveway of at least eight feet in width. For two or more dwelling units, if the driveway dead ends, a turnaround area of not less than 20 feet in diameter shall be provided, which is other than the private driveway service to the dwelling.

3. The surface of driveways shall be of material meeting the standards of Subsection 14.040 (1). All driveways shall be well drained so as to prevent ponding greater than one half inch in depth or two feet in diameter and the provisions for drainage shall be approved by the City Engineer.

4. Access points to an industrial or commercial site from a street shall be located to minimize traffic congestion and hazard. No access point shall be allowed which would direct industrial or commercial traffic into a residential zone. Wherever possible, access points shall be so located so as to serve more than one industrial or commercial site or use.

~~5. All Proposed zone changes, subdivisions, partitions, new development and or/redevelopment shall provide a traffic impact study to the City of Klamath Falls and Oregon Department of Transportation if the proposed use:~~

~~a) Directly accesses a state highway; or~~

~~b) Requires a comprehensive plan amendment; or~~

~~a. Under the TSP, there is a recognized traffic safety or operations deficiency in streets impacted by the proposed land use action;~~

~~and the proposed use exceeds the thresholds defined as:~~

~~b. trip generation threshold- 50 newly generated trips (inbound and outbound) during the adjacent street peak hour; or ,~~

~~c. mitigation threshold- installation of any traffic control device and/or construction of geometric improvements that will affect the progression or operation of traffic travelling on, entering, or exiting the highway; or,~~

~~d. Heavy vehicle trip generation threshold- 20 newly generated heavy vehicle trips (inbound and outbound) during the day.~~

5. When the site of development or redevelopment has frontage on roads with different functional classifications, the site shall take access on the road with the lower functional classification.

6. The City or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. Access to and from off-street parking areas shall not permit backing onto a public street.

a) Shared driveways and frontage streets may be required to consolidate access onto a collector or arterial street. When shared driveways or frontage streets are required, they shall be stubbed to adjacent developable parcels to indicate future extension. "Stub" means that a driveway or street temporarily ends at the property line, but may be extended in the future as the adjacent parcel develops. "Developable" means that a parcel is either vacant or it is likely to receive additional development (i.e., due to infill or redevelopment potential).

b) Reciprocal access and crossover easement agreements shall be recorded for all shared driveways, including pathways, on all affected properties at the time of final plat approval or as a condition of site development approval.

c) Exception. Shared driveways are not required when existing development patterns or physical constraints (e.g., topography, parcel configuration, and similar conditions) prevent extending the street/driveway in the future.

7. For new commercial, light industrial, and multi-family residential development, internal pedestrian circulation shall be provided through sidewalks and walkways/pathways, pursuant to the following standards:

a) Walkways shall be provided connecting building entrances and streets adjoining the site.

b) Connections shall be direct and driveway crossings minimized.

c) Walkways shall be at least five-feet-wide, raised, include curbing, or have different paving material when crossing driveways.

d) Pedestrian connections to adjoining properties shall be provided except where such a connection cannot be accommodated due to topographical constraints or where existing development on adjacent sites preclude connections. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property.

8. Transit Access. New commercial and light industrial buildings within 600 feet of an exsiting or planned transit facility, as identified in the Urban Area TSP, shall provide for pedestrian access to transit through the following measures:

a) Either locate buildings within 20 feet of the transit facility, a transit street, or an intersecting street or provide a pedestrian plaza at the transit facility or a street intersection;

b) Provide a reasonably direct pedestrian connection between the transit facility and building entrances on the site;

c) Provide a transit passenger landing pad accessible to disabled persons;

d) Provide an easement or dedication for a passenger shelter if requested by the transit provider; and

e) Provide lighting at the transit facility.

14.051 Traffic Impact Study Requirements.

1. A traffic impact study shall be developed by a Professional Engineer under the following conditions.

a) The proposed development generates 50 or more peak-hour trips or 500 or more daily trips.

b) An access spacing exception is required for the site access driveway(s) and the development generates 25 or more peak-hour trips or 250 or more daily trips.

c) The proposed development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour.

d) The proposed development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high crash locations or areas that contain a high concentration of pedestrians or bicyclists such as school zones.

2. Submittal requirements: The study shall~~and~~ include the following minimum requirements:

a)~~1.~~ The analysis shall include alternates other than what the developer originally submits as a proposal for access.

b)~~2.~~ The analysis of alternate access proposals shall include:

1)~~a.~~ Existing daily and appropriate design peak hour counts, by traffic movements, at intersections that would be affected by traffic generated by the development.

2)~~b.~~ Projected daily and appropriate design peak hour volumes for these same intersections and at the proposed access points after completion of the development. If the development is to be constructed in phases, projected traffic volumes at the completion of each phase shall be determined.

3)~~c.~~ Trip Generation shall be calculated using the Institute of Transportation Engineers' manual "Trip Generation – 5th Edition" or other, more current, and/or applicable information.

4)~~d.~~ A determination of the need for a traffic signal based on warrants in the "Manual on Uniform Traffic Control Devices".

~~3. The recommendations made in the report shall be specific and based on a minimum level of service when the development has been completed. As an example, if a traffic signal is recommended, the recommendations should include the type of traffic signal control and what movements should be signalized. If a storage lane for right turns or left turns is needed, the recommendations should include the amount of storage needed. If several intersections are involved for signalization, and an interconnected system is considered, specific analysis should be made concerning progression of traffic between intersections.~~

c)~~4~~. The internal circulation of parking lots must be analyzed to the extent that it can be determined whether the points of access will operate properly.

d)~~5~~. An analysis of the impacts to neighboring driveway access points and adjacent streets affected by the proposed new development driveways.

e)~~6~~. A discussion of bike and pedestrian use and the availability of transit to serve the development.

f) The recommendations made in the report shall be specific and based on a minimum level of service when the development has been completed. As an example, if a traffic signal is recommended, the recommendations should include the type of traffic signal control and what movements should be signalized. If a storage lane for right turns or left turns is needed, the recommendations should include the amount of storage needed. If several intersections are involved for signalization, and an interconnected system is considered, specific analysis should be made concerning progression of traffic between intersections.

3. Review criteria and procedure. The following criteria should be used in reviewing a transportation impact analysis:

a) The road system is designed to meet the projected traffic demand at full build-out.

b) Proposed driveways do not adversely affect the functional characteristics of the surrounding roadways.

c) Adequate intersection and stopping sight distance is available at all driveways.

d) Proposed driveways meet the City and County's access spacing standard or sufficient justification is provided to allow a deviation from the spacing standard.

e) Opportunities for providing joint or crossover access have been pursued.

f) The site does not rely upon the surrounding roadway network for internal circulation.

g) The road system provides adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.

h) A pedestrian path system is provided that links buildings with parking areas, entrances to the development, open space, recreational facilities, and other community facilities in accordance with the state Transportation Planning Rule.

4. Conditions of Approval. As part of every land use action, the City of Klamath Falls and/or Klamath County, and ODOT (if access to a state roadway is proposed) will be required to identify conditions of approval needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system. Conditions of approval that may apply include:

a) Crossover easement agreements for all adjoining parcels to facilitate future access between parcels.

b) Conditional access permits for new developments which have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.

c) Right-of-way dedications for future planned roadway improvements.

d) Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

BIKEWAYS

14.445 Location. Bike lanes shall be located on collectors and arterials in the city and Urban Area. This includes the construction of new collectors and arterials and the reconstruction and re-surfacing of existing collectors and arterials. Refer to the cross-sections in the Urban Area Transportation System Plan and engineering standards for design and dimensions.

Klamath County Land Development Code

CHAPTER 10
GENERAL PROVISIONS

Article 11 Definitions

ESSENTIAL SERVICES:
Facilities and services which are necessary and accessory to the principle land use or development, and involve infrastructure such as pipelines, power lines and poles, distribution feeders, meter boxes and pump-houses. Essential services may include, but are not limited to water, sewer, natural gas, cable and electric power service, and certain transportation improvements, as specified in Section 50.040.A.

EXTENSIVE IMPACT SERVICES AND UTILITIES:
Any public or private facilities, services and utilities which may have a substantial impact on surrounding land uses. Typical uses include, but are not limited to: airports, detention and correction institutions, fairgrounds, disposal sites, incinerators, commercial power generating facilities, sports arenas and stadiums, outdoor theaters and amphitheaters, vehicular raceways, electrical transmission towers over 200 feet in height, commercial communication towers, recycle centers, natural gas or petroleum transmission pipelines, and certain transportation improvements, as specified in Section 50.040.B.

CHAPTER 20
REVIEW PROCEDURES

ARTICLE 20 BASIC PROVISIONS
20.040 - CONDITIONS OF APPROVAL
A. General Authorization to Impose Conditions of Approval
In approving any type of development application, the Review Body is authorized to impose such conditions as may be necessary to assure compliance with the applicable provisions of this code, the Comprehensive Plan, the Urban Area Transportation System Plan, the state Transportation Planning Rule, or other requirements of law. Any conditions attached to approvals will be directly related to the impacts of the proposed use or development and will be roughly proportional in both extent and amount to the anticipated impacts of the proposed use or development.

1. In the case of transportation impacts, conditions needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system may be imposed. Conditions of approval that may apply include but are not limited to:

a. Crossover and/or reciprocal easement agreements for all adjoining parcels to facilitate future access between parcels.
b. Access for new developments that have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.
c. Right-of-way dedications for future planned roadway improvements.
d. Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

ARTICLE 21 PRE-APPLICATION CONFERENCE PROCEDURE

21.040 - NOTICE, HEARING AND APPEAL Because a pre-application conference is not a land use decision, no notice, hearing or appeals shall be provided. The discussions of a pre-application conference shall not be binding on any party. For application sites located adjacent to a state roadway or where proposals are expected to have an impact on a state transportation facility, ODOT shall be invited to participate in the conference.

CHAPTER 30
PUBLIC HEARINGS, NOTICE AND APPEAL

ARTICLE 32 PUBLIC NOTICE
32.030 - TYPES OF NOTICE

C. Mailed Public Hearing Notice - Notice of a quasi-judicial land use hearing shall be mailed by first class mail in the following manner: *(ORS 197.763(3))*

1. No later than 20 days prior to the date of the scheduled review or hearing:
   a. To all owners of real property within 500 feet, including rights-of-way and water bodies, of the subject property for actions involving land planned and zoned for farm or forestry use;
   b. To all owners of real property within 250 feet, including rights-of-way and water bodies, of the subject property for actions involving property outside an urban growth boundary that is not zoned for farm or forest use;
   c. To all owners of real property within 100 feet, including rights-of-way and water bodies, of the subject property for actions wholly or partially within an Urban Growth Boundary;
   d. To a public use airport owner if: (ORS 215.416(7) […]
   e. To each mailing address for tenants of a mobile home park for a zone change involving property encompassing all or part of a mobile home park as identified in ORS 446.003. Such notice may not be mailed more than 40 days before the date of the first hearing on a zone change. *(ORS 215.223(7))*
   f. To all property owners affected by a legislative zone change involving a substantial area and number of property owners in accordance with ORS 215.503, if applicable.

g. Notice shall also be provided to any neighborhood or community organization formally recognized by the Board of Commissioners and whose boundaries include the site. *(ORS 197.763(2)(b))*

h. Any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the County or is otherwise potentially affected by the proposal. For application sites located adjacent to a state roadway or where proposals may have an impact on a state transportation facility, notice of the decision shall be sent to ODOT.

D. Mailed Tentative Decision Notice - Notice of a quasi-judicial land use decision made without a hearing shall be mailed by first class mail in the following manner: *(ORS 215.416(11)(a))*

1. No later than 5 days following a written decision rendered pursuant to a Type II Administrative Review Procedure, provided the notice states the 12-day period for appeal of the tentative decision starts on the date the tentative decision is mailed:

a. To all owners of real property within 750 feet, including rights-of-way and water bodies, of the subject property for actions involving land planned and zoned for farm or forestry use;

b. To all owners of real property within 250 feet, including rights-of-way and water bodies, of the subject property for actions involving property outside an urban growth boundary that is not zoned for farm or forest use;

c. To all owners of real property within 100 feet, including rights-of-way and water bodies, of the subject property for actions wholly or partially within an Urban Growth Boundary;

d. To any governmental agency that is entitled to notice under an intergovernmental agreement entered into with the County or is otherwise potentially affected by the proposal. For application sites located adjacent to a state roadway or where proposals are expected to have an impact on a state transportation facility, notice shall be sent to ODOT

CHAPTER 40
APPLICATION PROCEDURES

ARTICLE 41
SITE PLAN REVIEW

41.060 - SITE PLAN REQUIREMENTS
Site plans shall include the following information:
A. Tax lot number and street address;
B. Dimensions of property, scale, and north arrow;
C. Location, name, width and surface type of adjacent streets;
D. Location, dimensions and surface type of existing or proposed driveways or parking areas;

E. Location, dimensions (including height), and use or occupancy of all existing and proposed structures on the property, including accessory structures, decks, balconies, and other structural elements;
F. Distance from property lines to existing and proposed structures, septic tanks, drain lines, and wells;
G. Location of water and drainage features and the flow direction of any ponds, channels, creeks, swales or other drainage facilities effecting the proposed use;
H. Location, type, and dimensions of proposed on-site sewage disposal and water supply, if any;
I. Location and descriptions of any topographic or developed features on the site, such as rock outcrops, excavations, etc.;
J. Location and dimensions of all easements;
K. Landscaping as required by Article 65;
L. Signs as required by Article 66;
M. Parking as required in Article 68;
N. Vehicular access and circulation as required by Article 71;
O. Non-vehicular access and circulation as required by Article 71;
~~O~~P. Other appropriate information that otherwise may be required by this code, including a Traffic Impact Study pursuant to Section 71.200;
~~P~~Q. Signature of applicant.

ARTICLE 44
CONDITIONAL USE PERMIT

44.030 - REVIEW CRITERIA
A. The use complies with policies of the Comprehensive Plan;
B. The use is in conformance with all other required standards and criteria of this code; and
C. The location, size, design, and operating characteristics of the proposed use will not have a significant adverse impact on the livability, value or appropriate development of abutting properties and the surrounding area. This includes impacts on the transportation system to be determined pursuant to Section 71.200.
D. Conditions - The review body may grant a Conditional Use Permit subject to such reasonable conditions, pursuant to Section 20.040, based on findings of fact that it deems necessary to ensure compliance with the Klamath County Comprehensive Plan, Land Development code, Urban Area Transportation System Plan, and sound land use planning principles.

ARTICLE 46
LAND SUBDIVISION

46.030 - REVIEW CRITERIA
[…]
B. A subdivision plat shall be reviewed against the following criteria:

1. The subdivision development complies with policies of the Comprehensive Plan, including the policies and standards of the Urban Area Transportation System Plan;
2. The subdivision plat is in conformance with all standards and criteria of this code and applicable state statutes;
3. The site of the proposed subdivision is physically suitable for the type and density of the proposed development;
4. The street plan for the proposed subdivision will permit its development in a safe and efficient manner in accordance with the Comprehensive Plan and this code and transportation improvements, consistent with the findings from a Traffic Impact Study pursuant to Section 71.200;
5. The street plan for the proposed subdivision will permit the development of adjoining land in a safe and efficient manner in accordance with the Comprehensive Plan and this code; and
6. The existing and proposed infrastructure and public facilities and services required by this code are adequate to serve the proposed development.

46.050 - PRELIMINARY SUBDIVISION PLAT REQUIREMENTS
[…]
D. Required Information - All preliminary subdivision plats shall show the following information:

1. Existing Conditions:
   a. The location, width, and names of all existing or platted streets, ways or other public ways within or adjacent to the proposed subdivision, easements, railroad rights-of-way, and other important features, including but not limited to section lines and corners, city and school district boundaries;
   b. For subdivision within urban growth boundaries, contour lines shall […]
2. Proposed Development:
   a. All streets showing the location, widths, names, approximate grades, and approximate radii of curves and the relationship of all streets to any projected streets. This shall include any walkways and pedestrian connections as required by Article 71, Vehicular and Non-Vehicular Access and Circulation;
   […]

E. Accompanying Statement. A separate statement containing the following information shall accompany the preliminary subdivision plat if the following information cannot be shown practically on the preliminary subdivision plat:

1. Proposed uses of the property and present zoning;
2. Existing and/or proposed deed restrictions, if any;
3. A statement of the improvements proposed to be made or installed, the time such improvements are proposed to be made or completed, and the procedures the subdivider proposes to use;
4. A statement of what provisions are proposed for water supply, sewage disposal and drainage; and

5. Identification of the irrigation district involved and provisions for delivering irrigation water to the lots in the subdivision.

F. Drainage Plan. A drainage plan, prepared in accordance with Article 73 shall accompany all preliminary subdivision plats in the Klamath Falls Urban Area.

G. Evidence that the applicant has contacted the Environmental Health Department regarding the provision of on-site sewage disposal and other requirements, as applicable.

H. A Traffic Impact Study as may be required by Section 71.200.

ARTICLE 47
CHANGE OF ZONE DESIGNATION (QUASI-JUDICIAL)

47.030 - REVIEW CRITERIA

A. A request for a change of zone designation may only be approved if it meets all applicable review criteria.

B. A request for a change of zone designation shall be reviewed against the following criteria:

1. The proposed change of zone designation is in conformance with the Comprehensive Plan and does not afford special privileges to an individual property owner not available to the general public or outside the overall public interest for the change;

2. The property affected by the change of zone designation is adequate in size and shape to facilitate any uses allowed in conjunction with such zoning;

3. The property affected by the proposed change of zone designation is properly related to streets and roads and to other public facilities and infrastructure to adequately serve the types of uses allowed in conjunction with such zoning and the proposed change is in compliance with the Transportation Planning Rule (TPR) OAR 660-012-0060;

4. Traffic impact study: A Traffic Impact Study shall be submitted with a zone change application pursuant to Section 71.091, Traffic Impact Study.

~~4.~~ 5. The proposed change of zone designation will have no significant adverse effect on the appropriate use and development of adjacent properties; and

~~5.~~ 6. The proposed change is supported by specific studies or other factual information, which documents the need for the change.

ARTICLE 48
CHANGE OF COMPREHENSIVE PLAN DESIGNATION
(QUASI-JUDICIAL)

48.030 - REVIEW CRITERIA

A. A request for a change of Comprehensive Plan designation may only be approved if it meets all applicable review criteria;

B. A request for a change of Comprehensive Plan designation shall be reviewed against the following criteria:

1. The proposed change is supported by specific studies or other factual information, which documents the public need for the change;
2. The proposed change complies with policies of the Comprehensive Plan and policies and standards of the Urban Area Transportation System Plan; and
3. The proposed change complies with the Oregon State wide Planning Goals and Administrative Rules, including compliance with the TPR (OAR 660-012-0060). Exceptions to the Statewide Planning Goals, shall be based upon Statewide Planning Goal 2, Part II (Exceptions) as interpreted by Oregon Administrative Rules (OAR Chapter 660, Division 4).
4. Traffic impact study: A Traffic Impact Study shall be submitted with a zone change application pursuant to Section 71.091, Traffic Impact Study.

ARTICLE 49
LEGISLATIVE AMENDMENT TO THE KLAMATH COUNTY
COMPREHENSIVE PLAN, LAND DEVELOPMENT CODE, OR ZONING MAP

49.030 - REVIEW CRITERIA
A. An amendment to the Comprehensive Plan or Land Development Code may only be approved if it meets all applicable review criteria.
B. An amendment to the Comprehensive Plan or Land Development Code shall be reviewed against the following criteria:
1. The proposed amendment is supported by specific studies or other factual information, which documents the public need for the change;
2. The proposed amendment complies with policies of the Comprehensive Plan and policies and standards of the Urban Area Transportation System Plan; and
3. The proposed amendment complies with the Oregon Statewide Planning Goals, ~~and~~ state statutes, and administrative rules, including compliance with the TPR (OAR 660-012-0060).
4. Traffic impact study: A Traffic Impact Study shall be submitted with a zone change application pursuant to Section 71.091, Traffic Impact Study.

CHAPTER 50
LAND USE ZONES

ARTICLE 50
BASIC PROVISIONS
50.010 – PURPOSE
50.020 – LIST OF BASIC ZONES
50.030 – LIST OF SPECIAL PURPOSE ZONES
50.040 – TRANSPORTATION-RELATED USES

A. The following transportation-related improvements and activities are considered "Essential Services" uses and are permitted outright in all County zones, unless otherwise specified in individual zones.

1. Normal operation, maintenance, repair, and preservation activities of existing transportation facilities.
2. Installation of culverts, pathways, medians, fencing, guardrails, lighting, and similar types of improvements within the existing right-of-way.
3. Projects specifically identified in the Urban Area Transportation System Plan.
4. Landscaping as part of a transportation facility.
5. Emergency measures necessary for the safety and protection of property.
6. Acquisition of right-of-way for public roads, highways, and other transportation improvements designated in the Urban Area Transportation System Plan, except for those that are located in exclusive farm use or forest zones.
7. Construction of a street or road as part of an approved subdivision or land partition approved that is consistent with the applicable land division regulations.

B. The following transportation-related improvements and activities are considered "Extensive Impact Services and Utilities" uses and are permitted conditionally in all County zones, unless otherwise specified in individual zones.

1. Construction, reconstruction, or widening of highways, roads, bridges or other transportation projects that are:
    a. Not improvements designated in the Urban Area Transportation System Plan; or
    b. Not designed and constructed as part of a subdivision or planned development subject to site plan and/or conditional use review.
    c. An application for site plan review is subject to review under Article 41. In addition, the site plan permit shall comply with the Urban Area Transportation System Plan and applicable standards of this title, and shall address the criteria below. For State projects that require an Environmental Impact Statement (EIS) or EA (Environmental Assessment), the draft EIS or EA shall be reviewed and used as the basis for findings to comply with the following criteria:
        (1) The project is designed to be compatible with existing land use and social patterns, including noise generation, safety, and zoning.

(2) The project is designed to minimize avoidable environmental impacts to identified wetlands, wildlife habitat, air and water quality, cultural resources, and scenic qualities.
(3) The project preserves or improves the safety and function of the facility through access management, traffic calming, or other design features.
(4) The project includes provision for bicycle and pedestrian circulation as consistent with the Comprehensive Plan and other requirements of this ordinance.

CHAPTER 60
PLANNING DEPARTMENT DEVELOPMENT STANDARDS

ARTICLE 68
OFF-STREET PARKING AND LOADING

68.030 – OFF-STREET PARKING REQUIREMENTS
A. The following off-street parking requirements shall apply to all buildings, structures, developments and land uses unless otherwise specified in this code.
[***Parking standards table remains unchanged.]***
B. Carpool and Vanpool Parking. Large employers (those with 50 employees or more working the same hours or shift) shall dedicate 10% of the required parking spaces for carpools and vanpools.

1. These designated spaces shall be the closest parking spaces to the building entrance normally used by employees, with the exception of disabled/handicap accessible parking spaces.
2. Carpool and vanpool spaces shall be clearly marked "Reserved - Carpool/Vanpool Only" along with specific hours of use.
3. Any other use establishing carpool and vanpool spaces may reduce the minimum parking requirement by 3 spaces for each carpool/vanpool space created.

C. Transit-related parking reduction. The number of minimum required parking spaces may be reduced by up to 10% if:

1. The proposal is located within a ¼ mile of an existing or planned transit route, and;
2. Transit-related amenities such as transit stops, pull-outs, shelters, park-and-ride lots, transit-oriented development, and transit service on an adjacent street are present or will be provided by the applicant.

D. Bicycle Parking Standards
1. The following bicycle parking standards are applicable only inside an Urban Unincorporated Community or within an Urban Growth Boundary for which Klamath County has jurisdiction. The Klamath Falls Urban Area is exempt from this Bicycle Parking Standards section due to an adopted Urban Area Transportation System Plan (KC ORD. 44.68 Acknowledged November 12, 1998).
[***Subsection 2. and the County standards remain unchanged.***]

3. In the Klamath Falls Urban Area, bicycle parking facilities shall be provided for all new or expanded multi dwelling residential, institutional, commercial and industrial uses. Bicycle parking shall be provided as follows:

1. One bicycle parking space shall be provided for every twelve (12) required off street parking spaces, with a minimum of one bicycle parking space.
2. Required bicycle parking facilities shall be located no further than fifty feet (50') from a public entrance.
3. Bicycle parking facilities may be provided in a dedicated area within a building that is accessible to bicycle storage.

4. Bicycle Parking Design Guidelines. The following guidelines are applicable to bicycle parking facilities in the Klamath Falls Urban Area:

1. Bicycle parking facilities shall either be stationary racks, which accommodate bicyclist's locks securing the frame and both wheels or lockable rooms or enclosures in which the bicycle is stored.
2. Bicycle parking spaces shall be at least six feet (6') long and two feet (2') wide. Upright bicycle storage structures are exempted from the parking space length standard.
3. A five-foot (5') aisle for bicycle maneuvering shall be provided and maintained beside or between each row of bicycle parking.
4. Bicycle racks or lockers shall be anchored to the ground surface or to a structure.

CHAPTER 70
PUBLIC WORKS DEPARTMENT DEVELOPMENT STANDARDS

ARTICLE 71
VEHICULAR AND NON-VEHICULAR ACCESS AND CIRCULATION

71.010 - PURPOSE
The purpose of these standards is to ensure safe ingress and egress to and from properties; to minimize street congestion and traffic hazards; to provide safe and convenient access to businesses, public services, and places of public assembly; and to make vehicular and non-vehicular circulation more compatible with surrounding land uses.

71.020 - ACCESS STANDARDS
A. Vehicular Access - Vehicular access shall be provided to all lots or parcels from a dedicated street. Developments fronting on an arterial street or road may be required to provide a frontage or service road.
B. Director of Public Works Approval - Access to property fronting upon a county or public road shall be subject to the approval of the Director of Public Works.
C. Oregon Department of Transportation (ODOT) Approval - Access to property fronting upon a state highway shall be subject to the permits issued by ODOT.
D. Rural County Road Access Management – Minimum Centerline Spacing Standards

[***Rural County spacing standards remain unchanged.***]

E. Klamath Falls Urban Growth Area Access Spacing Standards - All new development and redevelopment shall meet the access spacing standards in Table 4-3 of the Urban Area Transportation System Plan.
F. When the site of development or redevelopment in the Urban Area has frontage on roads with different functional classifications, the site shall take access on the road with the lower functional classification.
G. The County or other agency with access permit jurisdiction may require the closing or consolidation of existing curb cuts or other vehicle access points, recording of reciprocal access easements (i.e., for shared driveways), development of a frontage street, installation of traffic control devices, and/or other mitigation as a condition of granting an access permit, to ensure the safe and efficient operation of the street and highway system. In the Klamath Falls Urban Growth Area, access to and from off-street parking areas shall not permit backing onto a public street.

71.050 - IMPROVEMENTS IN THE KLAMATH FALLS URBAN AREA
The following roadway improvements shall be required for all subdivisions within the Klamath Falls Urban Growth Area unless otherwise specified, and shall be provided at the expense of the developer:
A. ~~Concrete curbs, gutters, sidewalks and paved roadways a minimum width of 36 feet shall be provided where the average lot size of the development is not greater than 20,000 square feet;~~
~~B. Concrete curbs, gutters and paved roadways a minimum width of 36 feet shall be provided where the average lot size of the development is greater than 20,000 square feet and not greater than 43,560 square feet (1 acre);~~
~~C. Roadways paved to a minimum width of 24 feet with gravel shoulders improved to a minimum width of 4 feet and drainage facilities as required by the Director of Public Works shall be provided where the average lot size of the development is greater than 43,560 square feet (1 acre);~~
All roads that are functionally classified as arterials or collectors shall provide sidewalks and bikeways (e.g. bicycle lanes) on both sides of the roadway, except as determined otherwise by the Director of Public Works.
~~D~~B. As required by the Director of Public Works, all rights-of-way shall be cleared between the catch points of cuts or fills of the approved cross section. The entire right-or-way shall be cleared of all flammable brush, limbs, logs and stumps outside of slope limits to the full width of the right-of-way;
~~E~~C. When necessary for public convenience and safety, the review body may require pedestrian ways to permit access to cul-de-sacs, to pass through oddly shaped or unusually long blocks, or to provide access to schools, parks or other public or private areas. Pedestrian ways shall be no less than 10 feet in width with an improved surface no less than 8 feet in width, and shall be dedicated to the public.

~~F~~D. All development shall be designed and constructed in accordance with the Department of Public Works Standard Drawings, as may be revised.

71.100 - CUL-DE-SACS
A. The length of a cul-de-sac shall be measured along the centerline of the roadway from the right-of-way line to the farthest point of the cul-de-sac.
B. All cul-de-sacs shall terminate with a circular turn around having a right-of-way not less than 50 feet radius and an improved turnaround of not less than 40 feet radius, unless otherwise specified in this code.
C. In urban areas a cul-de-sac shall not exceed 500 feet in length or serve more than 18 dwelling units. The review body may require a pedestrian way or bikeway between the cul-de-sac and adjacent streets in order to enhance accessibility and connectivity. Pedestrian ways shall be no less than 10 feet in width with an improved surface no less than 8 feet in width, and shall be dedicated to the public;
D. In rural areas, a cul-de-sac shall not exceed 700 feet in length, unless otherwise specified in this code.
E. The maximum grade of a cul-de-sac turnaround shall not exceed 3%.

71.150 - BLOCKS
A. The length, width and shape of blocks shall be designed with regard to providing a safe and efficient layout of building sites when considering topography, access, circulation and safety.
B. Blocks shall not exceed 1,320 feet when measured from road centerline to road centerline. In the Klamath Falls Urban Growth Area, block length shall not exceed 600 feet to improve connectivity for vehicular and non-vehicular traffic.

71.190 – NON-VEHICULAR ACCESS AND CIRCULATION
1. For new commercial, light industrial, and multi-family residential development, internal pedestrian circulation shall be provided through sidewalks and walkways/pathways, pursuant to the following standards:

a) Walkways shall be provided connecting building entrances and streets adjoining the site.
b) Connections shall be direct and driveway crossings minimized.
c) Walkways shall be at least five-feet-wide, raised, include curbing, or have different paving material when crossing driveways.
d) Pedestrian connections to adjoining properties shall be provided except where such a connection cannot be accommodated due to topographical constraints or where existing development on adjacent sites preclude connections. Pedestrian connections shall connect the on site circulation system to existing or proposed streets, walkways, and driveways that abut the property. Where adjacent properties are undeveloped or have potential for redevelopment, streets, accessways and walkways on site shall be laid out or stubbed to allow for extension to the adjoining property.

2. Transit Access. New commercial and light industrial buildings within 600 feet of an existing or planned transit facility, as identified in the Urban Area TSP, shall provide for pedestrian access to transit through the following measures:

a) Either locate buildings within 20 feet of the transit facility, a transit street, or an intersecting street or provide a pedestrian plaza at the transit facility or a street intersection;
b) Provide a reasonably direct pedestrian connection between the transit facility and building entrances on the site;
c) Provide a transit passenger landing pad accessible to disabled persons;
d) Provide an easement or dedication for a passenger shelter if requested by the transit provider; and
e) Provide lighting at the transit facility.

71.200 – Traffic Impact Study

A. A traffic impact study shall be developed by a Professional Engineer under the following conditions.

1. The proposed development generates 50 or more peak-hour trips or 500 or more daily trips.
2. An access spacing exception is required for the site access driveway(s) and the development generates 25 or more peak-hour trips or 250 or more daily trips.
3. The proposed development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour.
4. The proposed development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high crash locations or areas that contain a high concentration of pedestrians or bicyclists such as school zones.

B. Submittal requirements: The study shall include the following minimum requirements:

1. The analysis shall include alternates other than what the developer originally submits as a proposal for access.
2. The analysis of alternate access proposals shall include:
    a. Existing daily and appropriate design peak hour counts, by traffic movements, at intersections that would be affected by traffic generated by the development.
    b. Projected daily and appropriate design peak hour volumes for these same intersections and at the proposed access points after completion of the development. If the development is to be constructed in phases, projected traffic volumes at the completion of each phase shall be determined.
    c. Trip Generation shall be calculated using the Institute of Transportation Engineers' manual "Trip Generation – 5th Edition" or other, more current, and/or applicable information.
    d. A determination of the need for a traffic signal based on warrants in the "Manual on Uniform Traffic Control Devices".
3. The internal circulation of parking lots must be analyzed to the extent that it can be determined whether the points of access will operate properly.

4. An analysis of the impacts to neighboring driveway access points and adjacent streets affected by the proposed new development driveways.
5. A discussion of bike and pedestrian use and the availability of transit to serve the development.
6. The recommendations made in the report shall be specific and based on a minimum level of service when the development has been completed. As an example, if a traffic signal is recommended, the recommendations should include the type of traffic signal control and what movements should be signalized. If a storage lane for right turns or left turns is needed, the recommendations should include the amount of storage needed. If several intersections are involved for signalization, and an interconnected system is considered, specific analysis should be made concerning progression of traffic between intersections.

C. Review criteria and procedure. The following criteria should be used in reviewing a transportation impact analysis:

1. The road system is designed to meet the projected traffic demand at full buildout.
2. Proposed driveways do not adversely affect the functional characteristics of the surrounding roadways.
3. Adequate intersection and stopping sight distance is available at all driveways.
4. Proposed driveways meet the County's access spacing standard or sufficient justification is provided to allow a deviation from the spacing standard.
5. Opportunities for providing joint or crossover access have been pursued.
6. The site does not rely upon the surrounding roadway network for internal circulation.
7. The road system provides adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.
8. A pedestrian path system is provided that links buildings with parking areas, entrances to the development, open space, recreational facilities, and other community facilities in accordance with the state Transportation Planning Rule.

D. Conditions of Approval. As part of every land use action, Klamath County and the City of Klamath Falls, and ODOT (if access to a state roadway is proposed) will be required to identify conditions of approval needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system. Conditions of approval that may apply include:

1. Crossover easement agreements for all adjoining parcels to facilitate future access between parcels.
2. Conditional access permits for new developments which have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.
3. Right-of-way dedications for future planned roadway improvements.
4. Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

Appendix 1C Transportation Impact Analysis Guidelines

TRANSPORTATION IMPACT ANALYSIS REQUIREMENTS

INTENT AND PURPOSE

A transportation impact analysis (TIA) provides an objective assessment of the anticipated modal transportation impacts associated with a specific land use action. A TIA is useful for answering important transportation-related questions such as:

- Can the existing transportation system accommodate the proposed development from a capacity and safety standpoint?
- What transportation system improvements are necessary to accommodate the proposed development?
- How will access to the proposed development affect the traffic operations on the existing transportation system?
- What transportation impacts will the proposed development have on the adjacent land uses, including commercial, institutional, and residential uses?
- Will the proposed development meet current standards for roadway design?
- Does the proposed development comply with the TSP?

Throughout the development of the TIA (and beginning as early as possible), cooperation/coordination between City of Klamath Falls, Klamath County, and ODOT staff (as applicable), the applicant, and the applicant's traffic engineer is encouraged to provide an efficient and effective process.

If a TIA is not required, a Transportation Assessment Letter shall be submitted indicating that the proposed land use is exempt. The letter should also detail site trip generation requirements confirming the exempt status and verify site-access driveways meeting applicable sight distance requirements.

City of Klamath Falls and Klamath County staff may, at their discretion, and depending on the specific situation, require additional study components in a TIA beyond what is outlined in this section or waive requirements deemed inappropriate.

These requirements are for development applications that are expected to affect City and/or County operated facilities. For development applications that require an ODOT access permit, land use zoning changes, or comprehensive plan modifications, applicable ODOT requirements should be referenced and ODOT should be consulted during the project scoping process.

The City of Klamath Falls and Klamath County assume no liability for any costs or time delays (either direct or consequential) associated with the preparation and review of a transportation impact analysis.

1. **When a Transportation Impact Analysis is Required.** A TIA shall be required when:
    a. The development generates 50 or more peak-hour trips or 500 or more daily trips;
    b. An access spacing exception is required for the site access driveway(s) and the development generates 25 or more peak-hour trips or 250 or more daily trips;
    c. The development is expected to impact intersections that are currently operating at the upper limits of the acceptable range of level of service during the peak operating hour; or
    d. The development is expected to significantly impact adjacent roadways and intersections that have previously been identified as high crash locations or areas that contain a high concentration of pedestrians or bicyclists such as school zones.
    e. A major construction project is anticipated to significantly impede normal traffic flow or roadway capacity, as determined by the Public Works Director.
    f. A construction project is anticipated to cause significant deterioration of the roadway infrastructure, as determined by the Public Works Director.
2. **When a Transportation Assessment Letter is Required.** If a TIA is not required, the applicant's traffic engineer shall submit a transportation assessment letter to the City and/or County indicating the proposed land use action is exempt. This letter shall outline the trip-generating characteristics of the proposed land use and verify that the site-access driveways or roadways meet the City of Klamath Falls or Klamath County sight-distance and access spacing requirements and roadway design standards.
3. **Scoping Memorandum.** For either a TIA or Transportation Assessment Letter, a scoping memorandum shall be prepared and submitted to the City, County, and/or ODOT. This memorandum should detail the proposed analysis approach, relevant assumptions, project background information, assumed trip generation and trip distribution for the site, and proposed study facilities, at a minimum.
4. **Contents of a Transportation Impact Analysis**. As a guide in the preparation of a transportation impact analysis, the City of Klamath Falls and Klamath County recommend the following format be used to document the analysis.
    a. **Table of Contents.** Listing of all sections, figures, and tables included in the report.
    b. **Executive Summary.** Summary of the findings and recommendations contained within the report.

c. **Introduction.** Proposed land use action, including site location, building square footage, and project scope. Map showing the proposed site, building footprint, access driveways, and parking facilities. Map of the study area, which shows site location and surrounding roadway facilities.

d. **Existing Conditions.** Existing site conditions and adjacent land uses. Roadway characteristics (all transportation facilities and modal opportunities located within the study area, including roadway functional classifications, street cross section descriptions, posted speeds, bicycle and pedestrian facilities, on-street parking, and transit facilities). Existing lane configurations and traffic control devices at the study area intersections. Existing traffic volumes and operational analysis of the study area roadways and intersections. Roadway and intersection crash history analysis.

e. **Background Conditions** (without the proposed land use action). Approved developments and funded transportation improvements in the study area. Traffic growth assumptions. Addition of traffic from other planned developments. Background traffic volumes and operational analysis.

f. **Full Buildout Traffic Conditions** (with the proposed land use action). Description of the proposed development plans. Trip-generation characteristics of the proposed development (including trip reduction documentation). Trip distribution assumptions. Full buildout traffic volumes and intersection operational analysis. Intersection and site-access driveway queuing analysis. Expected safety impacts. Recommended roadway and intersection mitigations (if necessary).

g. **Site Circulation Review.** Evaluate internal site access and circulation. Review pedestrian paths between parking lots and buildings. Ensure adequate throat depth is available at the driveways and that vehicles entering the site do not block the public facilities. Review truck paths for the design vehicle.

h. **Turn Lane Warrant Evaluation.** Evaluate the need to provide turn lanes at the site driveways.

i. **Conclusions and Recommendations.** Bullet summary of key conclusions and recommendations from the transportation impact analysis.

j. **Appendix.** Traffic counts summary sheets, crash analysis summary sheets, and existing/background/full buildout traffic operational analysis worksheets. Other analysis summary sheets such as queuing and signal warrant analyses.

K. **Figures.** The following list of figures should be included in the Transportation Impact Analysis: Site Vicinity Map; Existing Lane Configurations and Traffic Control Devices; Existing Traffic Volumes and Levels of Service (all peak hours evaluated); Future Year

Background Traffic Volumes and Levels of Service (all peak hours evaluated); Proposed Site Plan; Future Year Assumed Lane Configurations and Traffic Control Devices; Estimated Trip Distribution Pattern; Site-Generated Traffic Volumes (all peak hours evaluated); Full Buildout Traffic Volumes and Levels of Service (all peak hours evaluated).

L. **Preparer Qualifications**. An Oregon-registered professional engineer (Civil or Traffic) shall prepare the Transportation Impact Analyses. In addition, the preparer should have extensive experience in the methods and concepts associated with transportation impact studies.

5. **Study Area**. The study area shall include, at a minimum, all site-access points and intersections (signalized and unsignalized) adjacent to the proposed site. If the proposed site fronts an arterial or collector street; the study shall include all intersections along the site frontage and within the access spacing distances extending out from the boundary of the site frontage. Beyond the minimum study area, the transportation impact analysis shall evaluate all intersections that receive site-generated trips that comprise at least 10% or more of the total intersection approach volume. In addition to these requirements, the City or County Public Works Director (or his/her designee) shall determine any additional intersections or roadway links that might be adversely affected as a result of the proposed development. The applicant and the Public Works Director (or his/her designee) will agree on these intersections prior to the start of the transportation impact analysis, preferably with input from ODOT. The required study area may need to be expanded to comply with ODOT requirements.
6. **Study Years to be Analyzed in the Transportation Impact Analysis**. A level-of-service analysis shall be performed for all study roadways and intersections for the following horizon years:
    a. **Existing Year.** Evaluate all existing study roadways and intersections under existing conditions.
    b. **Background Year.** Evaluate the study roadways and intersections in the year the proposed land use is expected to be fully built out, without traffic from the proposed land use. This analysis should include traffic from all approved developments that impact the study intersections, or planned developments that are expected to be fully built out in the horizon year.
    c. **Full Buildout Year**. Evaluate the expected roadway, intersection, and land use conditions resulting from the background growth and the proposed land use action assuming full build-out and occupancy. For phased developments, an analysis shall be performed during each year a phase is expected to be completed.

d. **Twenty-Year Analysis.** For all land use actions requesting a Comprehensive Plan Amendment and/or a Zone Change, a long-term level-of-service analysis shall be performed for all study intersections assuming buildout of the proposed site with and without the comprehensive plan designation and/or zoning designation in place. The analysis should be performed using the future year traffic volumes identified in the Transportation System Plan (TSP). If the applicant's traffic engineer proposes to use different future year traffic volumes, justification for not using the TSP volumes must be provided along with documentation of the forecasting methodology. The required study area may need to be expanded to comply with ODOT requirements.

7. **Study Time Periods to be Analyzed in the Transportation Impact Analysis.** Within each horizon year, a level-of-service analysis shall be performed for the time period(s) that experience the highest degree of network travel. These periods typically occur during the mid-week (Tuesday through Thursday) morning (7:00 a.m. to 9:00 a.m.), mid-week evening (4:00 p.m. to 6:00 p.m.), and Saturday afternoon (12:00 p.m. to 3:00 p.m.) periods. The transportation impact analysis should always address the weekday a.m. and p.m. peak hours when the proposed lane use action is expected to generate 25 trips or more during the peak time periods. If the applicant can demonstrate that the peak-hour trip generation of the proposed land use action is negligible during one of the two peak study periods and the peak trip generation of the land use action corresponds to the roadway system peak, then only the worst-case study period need be analyzed.

   Depending on the proposed land use action and the expected trip-generating characteristics of that development, consideration of non-peak travel periods may be appropriate. Examples of land uses that have non-typical trip generating characteristics include schools, movie theaters, and churches. The Public Works Director (or his/her designee) and applicant should discuss the potential for additional study periods prior to the start of the transportation impact analysis.

8. **Traffic Count Requirements**. Once the study periods have been determined, turning movement counts should be collected at all study area intersections to determine the base traffic conditions. These turning movement counts should typically be conducted during the weekday (Tuesday through Thursday) between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m., depending on the proposed land use. Historical turning movement counts may be used if the data are less than 2 years old, but must be factored to meet the existing traffic conditions.

9. **Trip Generation for the Proposed Development**. To determine the impacts of a proposed development on the surrounding transportation network, the trip-generating characteristics of

that development must be estimated. Trip-generating characteristics should be obtained from one of the following acceptable sources:

a. Institute of Transportation Engineers (ITE) *Trip Generation Manual* (latest edition).

b. Specific trip generation studies that have been conducted for the particular land use action for the purposes of estimating peak-hour trip-generating characteristics. The Public Works Director (or his/her designee) should approve the use of these studies prior to their inclusion in the transportation impact analysis.

c. In addition to new site-generated trips, several land uses typically generate additional trips that are not added to the adjacent traffic network. These trips include pass-by trips and internal trips and are considered to be separate from the total number of new trips generated by the proposed development. The procedures listed in the most recent version of the *Trip Generation Handbook* (ITE) should be used to account for pass-by, diverted link, and internal trips.

10. **Trip Distribution**. Estimated site-generated traffic from the proposed development should be distributed and assigned on the existing or proposed arterial/collector street network. Trip distribution methods should be based on a reasonable assumption of local travel patterns and the locations of off-site origin/destination points within the site vicinity. Acceptable trip distribution methods should be based on one of the following procedures:

a. An analysis of local traffic patterns and intersection turning movement counts gathered within the previous 12 months.

b. A detailed market study specific to the proposed development and surrounding land uses.

c. Using the Klamath Falls travel demand model with a select-zone analysis.

11. **Intersection Operation Standards**. The City of Klamath Falls and Klamath County evaluate intersection operational performance based on level of service.

a. **Intersection Levels of Service**. The City of Klamath Falls and Klamath County require all intersections within the study area to maintain an acceptable level of service (LOS) upon full buildout of the proposed land use action. LOS calculations for signalized intersections are based on the average control delay per vehicle, while LOS calculations for unsignalized intersections are based on the average control delay for the worst or critical movement. All LOS calculations should be made using the methods identified in the most recent version of the *Highway Capacity Manual*, published by the Transportation Research Board. The minimum acceptable level of service for signalized intersections is LOS "D" while the minimum acceptable level of service for unsignalized

intersections is LOS "E". Any intersections not operating at these standards will be considered to be unacceptable.

12. **Review Policy and Procedure**. The following criteria should be used in reviewing a transportation impact analysis as part of a subdivision or site plan review.
    a. The road system is designed to adequately meet the projected traffic demand at full build-out.
    b. Proposed driveways do not adversely affect the functional characteristics of the surrounding roadways.
    c. Adequate intersection and stopping sight distance is available at all driveways.
    d. Proposed driveways meet the City and County's access spacing standard or sufficient justification is provided to allow a deviation from the spacing standard.
    e. Opportunities for providing joint or crossover access have been pursued.
    f. The site does not rely upon the surrounding roadway network for internal circulation.
    g. The road system provides adequate access to buildings for residents, visitors, deliveries, emergency vehicles, and garbage collection.
    h. A pedestrian path system is provided that links buildings with parking areas, entrances to the development, open space, recreational facilities, and other community facilities per the Transportation Planning Rule.
13. **Conditions of Approval.** As part of every land use action, the City of Klamath Falls and/or Klamath County, and ODOT (if access to a state roadway is proposed) will be required to identify conditions of approval needed to meet operations and safety standards and provide the necessary right-of-way and improvements to develop the future planned transportation system. Conditions of Approval that should be evaluated as part of subdivision and site plan reviews include:
    a. Crossover easement agreements for all adjoining parcels to facilitate future access between parcels.
    b. Conditional access permits for new developments which have proposed access points that do not meet the designated access spacing policy and/or have the ability to align with opposing access driveways.
    c. Right-of-way dedications for future planned roadway improvements.
    d. Half-street improvements along site frontages that do not have full-buildout improvements in place at the time of development.

Appendix 1D Prospectus Sheets

Project #: B1	**Washburn Way Bicycle Lanes:Eberlein Avenue to South 6th Street**

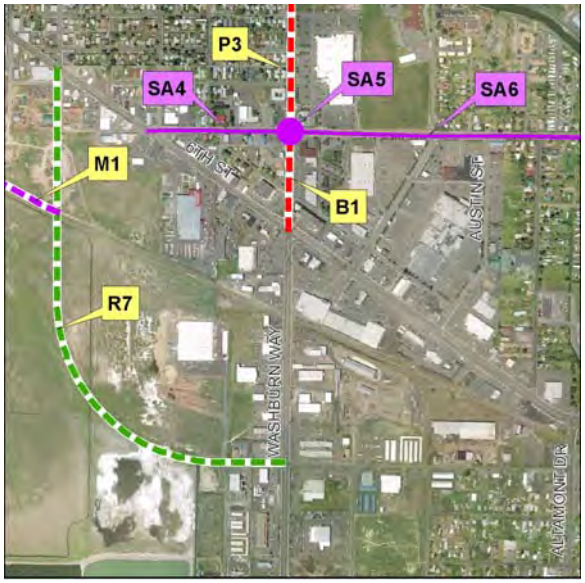
Description: Would add bike lanes to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Bicycle	Major Arterial	0-5 Years	$2,570,000

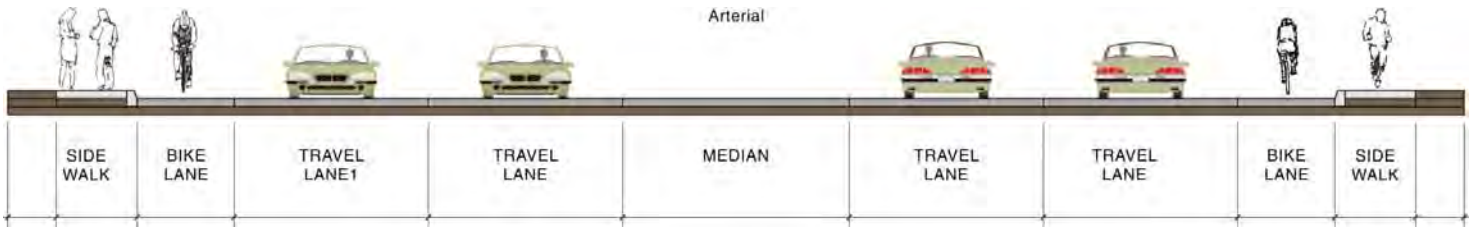
Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: M1	**Extend OC&E trail to downtown**

Description: Would extend the existing alignment of the OC&E trail to serve downtown Klamath Falls

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Multi-use Path	N/A	0-5 Years	$5,485,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: M2	**New Multi-Use Path Along Foothillls Boulevard**

Description: Would construct a new multi-use path from Washburn Way to Homedale Road

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Muli-use Pathw	N/A	0-5 Years	$1,410,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: P1	**Daggett Avenue Sidewalks: El Dorado Avenue to Clairmont Drive**

Description: Would add sidewalks to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Local Road	0-5 Years	$355,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: P2	**El Dorado Avenue Sidewalks: Van Ness to Daggett Avenue**

Description: Would add sidewalks to one side of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Collector	0-5 Years	$820,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: P3	**Washburn Way Sidewalks: Crater Lake Parkway to Shasta Way**

Description: Would add sidewalks to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Major Arterial	0-5 Years	$1,523,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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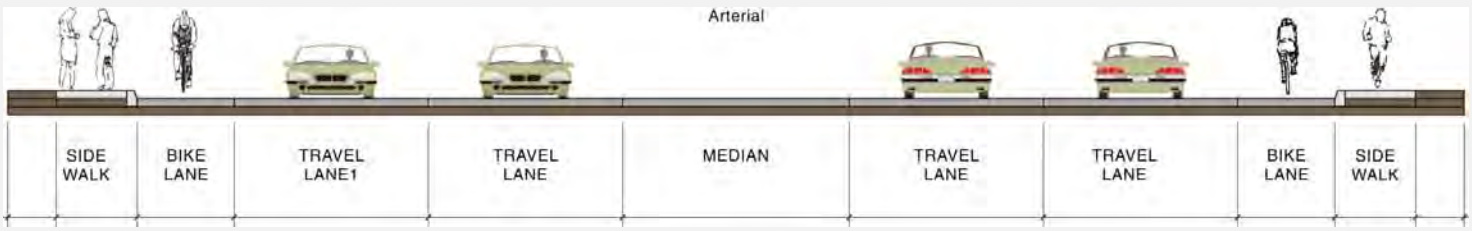
Project Location:



Project Image:



Project #: P4	**Eberlein Avenue Sidewalks: Washburn Way to Canal**

Description: Would add sidewalks to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Collector	0-5 Years	$620,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: P5	**Crest Street and Clinton Street Sidewalks: Hilyard Avenue to Summers Lane**

Description: Would add sidewalks to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Collector	0-5 Years	$2,900,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: P6	**Crest Avenue Street andto Clinton Street Sidewalks: Hilyard Avenue to Summer Lane**

Description: Would add sidewalks to both sides of the street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Pedestrian	Collector	0-5 Years	$1,665,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:



Project #: I1	**OR 39/Biehn Street/Campus Drive Intersection**

Description: Construct a northbound left-turn lane. Would require the construction of an additional receiving lane.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	15-25 Years	$839,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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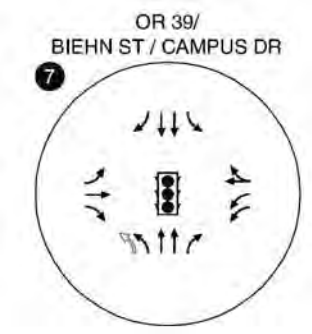
Project Location:



Project Image:



Project #: I2	**Biehn Street/Oregon Avenue Intersection**

Description: Construct a southbound left-turn lane.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	Collector	5-15 Years	$164,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I3	**Main Street/OR 39 Intersection**

Description: Modify signal timings to better serve existing and future demand.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	15-25 Years	$195,000

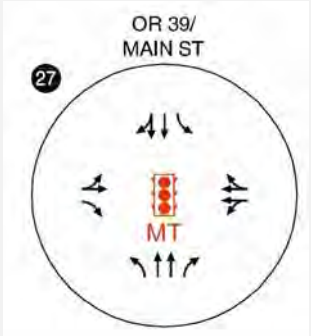
Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I4	**OR 39/Washburn Way Intersection**

Description: Modify signal phasing to provide protected/permitted phasing northbound, permitted phasing southbound, overlap phasing for eastbound right-turn, and overlap phasing for southbound right-turn.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	0-5 Years	$195,000

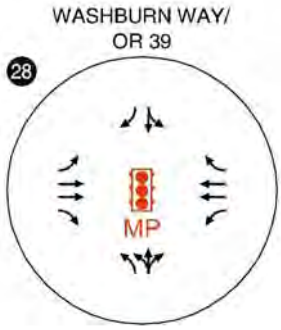
Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I5	**Eberlein Avenue/OR 39 Intersection**

Description: Install traffic signal.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	5-15 Years	$507,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I6	**OR 39/Shasta Way Intersection**

Description: Modify signal phasing to provide protected/permitted phasing on Shasta Way.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	15-25 Years	$195,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I7	**Shasta Way/Homedale Road Intersection**

Description: Install traffic signal.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	Collector	5-15 Years	$507,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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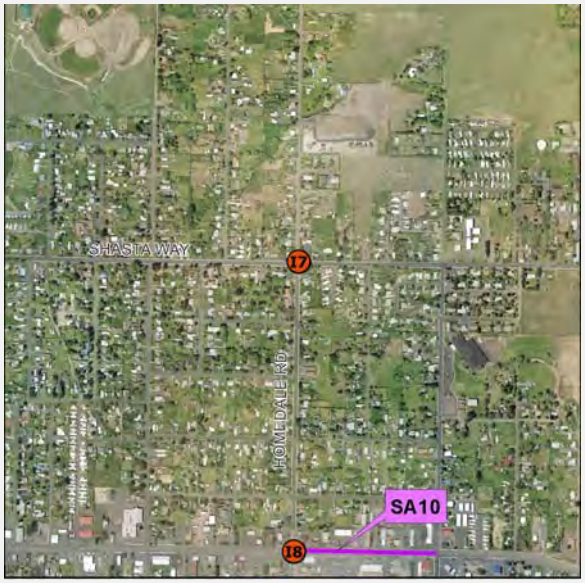
Project Location:



Project Image:



Project #: I8	**Homedale Road/OR 39 Intersection**

Description: Construct eastbound right-turn lane. Would likely impact adjacent parking lot.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	0-5 Years	$743,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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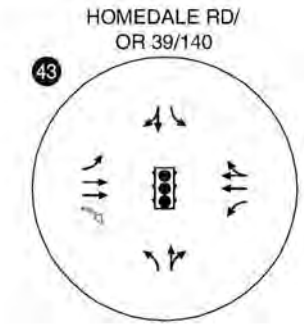
Project Location:



Project Image:



Project #: I9	**Summers Lane/Clinton Avenue Intersection**

Description: Install traffic signal.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	Collector	5-15 Years	$507,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I10	**OR 39/OR 140 (Big Y) Intersection**

Description: Construct southbound left-turn lane. Would require second receiving lane and would likely impact adjacent parcels.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway	0-5 Years	$825,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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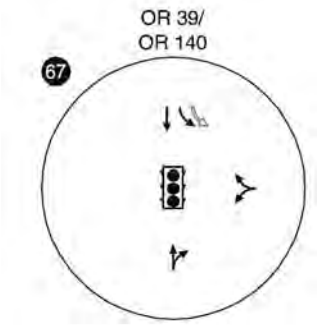
Project Location:



Project Image:



Project #: I11	**Washburn Way/OR 140 Eastbound Ramps Intersection**

Description: Install traffic signal

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway/Collector	0-5 Years	$507,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☐	☐	☐	☑	☑	☐

Project Location:



Project Image:



Project #: I12	**OR 39/OR 140 (South of Big Y) Intersection**

Description: Install traffic signal

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Intersection	State Highway	5-15 Years	$507,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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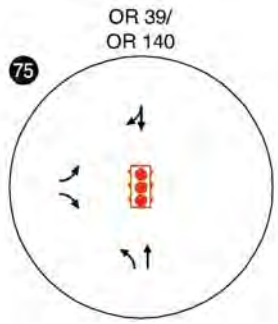
Project Location:



Project Image:



Project #: R1	**New Minor Collector from Dan O'Brien Way to Dahlia Street**

Description: Would create a new connection from Dan O'Brien Way to Dahlia Street.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$8,216,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R2	**Daggett Avenue Extension**

Description: Would extend existing Daggett Avenue alignment north to Dan O'Brien Way.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Local Road	N/A	$1,738,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R3	**Dahila Street Extension**

Description: Would extend existing Dahila Street alignment north to Dan O'Brien Way (near Industrial Park Drive)

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$882,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☑	☐	☑

Project Location:



Project Image:



Project #: R4	**Crescent Avenue Extension**

Description: Would extend the existing Crescent Avenue alignment north to Biehn Street.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$6,753,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R5	**Basin View Roadway**

Description: Roadway would serve Basin View development area.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$8,654,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R6	**Roadway from Foothill Blvd to Old Fort Road**

Description: Roadway would extend north from Foothills Boulevard to Old Fort Road.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$17,455,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R7	**East Main Street Extension**

Description: Would extend East main Street from the intersection of East main Street/South 6th Street to the intersection of Washburn Way/Crosby Avenue.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$11,820,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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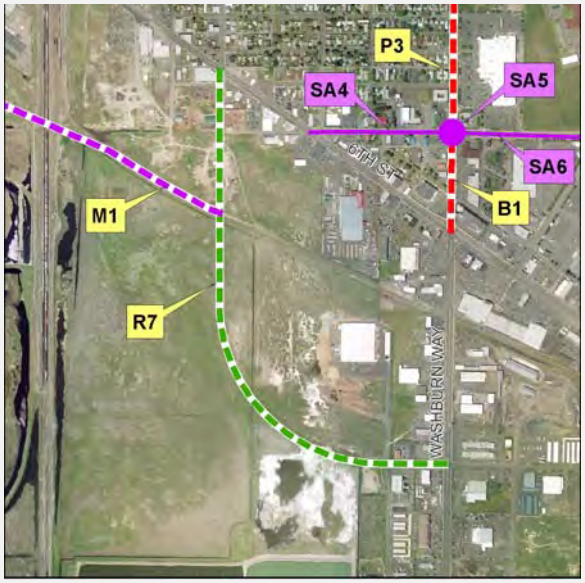
Project Location:



Project Image:



Project #: R8	**Upgrade Emerald Street**

Description: Would upgrade Emerald Street south of OR 66 to serve future development in the area.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$1,666,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
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Project Location:



Project Image:



Project #: R9	**New Roadway South of OR 66/OR140**

Description: Would construct a new roadway that would extend south from the OR66/OR140 intersection.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$2,574,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☑	☐	☑

Project Location:



Project Image:



Project #: R10	**Hilyard Avenue Extension**

Description: Would connect the eastern portion of Hilyard Avenue to Homedale Road.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Local Road	5-15 Years	$2,168,000

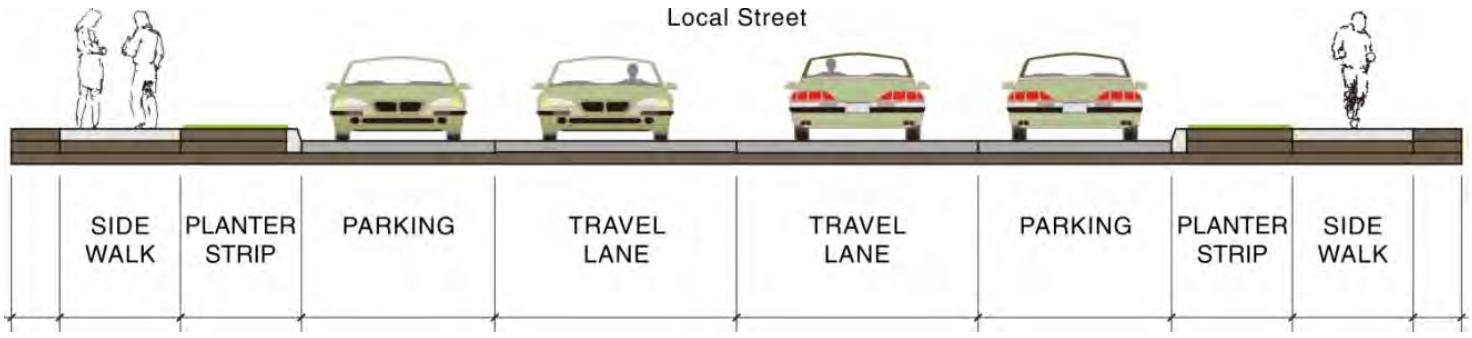
Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☑	☐	☑

Project Location:



Project Image:



Project #: R11	**New Collector from Hilayrd Avenue to Harlan Drive**

Description: Would create a new connection from Hilyard Avenue to Harland Drive.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$6,651,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☑	☐	☑

Project Location:



Project Image:



Project #: R12	**Washburn Way Realignment**

Description: Would realign Washburn Way to connect with Joe Wright Road east of the railroad track alignment

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	N/A	0-5 Years	$2,389,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☐	☐	☐

Project Location:



Project Image:



Project #: R13	**Brett Way Extension**

Description: Would extend Brett Way from Summer Lane to Homedale Road

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Roadway	Collector	N/A	$9,824,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☐	☐	☐	☑	☑	☐	☑

Project Location:



Project Image:



Project #: SA1	**Improve bicycle facilities at the intersection of Biehn Street/Campus Drive**

Description: Would improve bicycle facilities at the intersection of Biehn Street/Campus Drive by providing clearer routes through the intersection for bicycle users.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Bicycle	State Highway/Collector	0-5 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:

Project #: SA2	**Bicycle crossing of OR 39**

Description: Would provide a bicycle connection across OR 39 from Esplanade Avenue to Melrose Street

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Bicycle	N/A	0-5 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:

Project #: SA3	**Safety Improvements on Klamath Avenue from Main Street to 3rd Street**

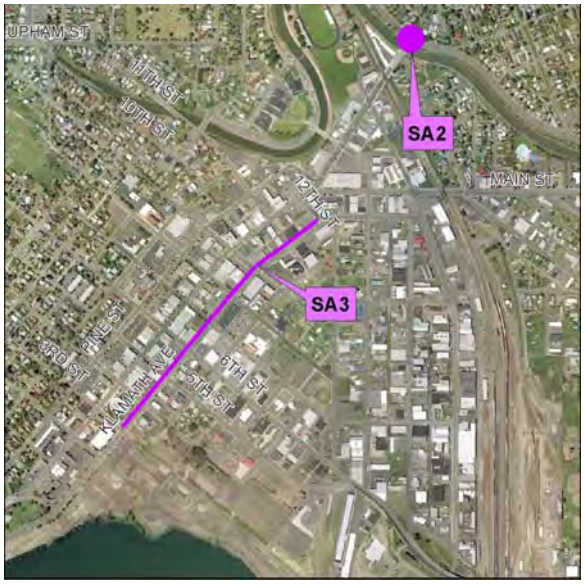
Description: City monitor on an annual basis.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Major Arterial	15-25 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA4	**Safety Improvements on Shasta Way from South 6th Street to Washburn Way**

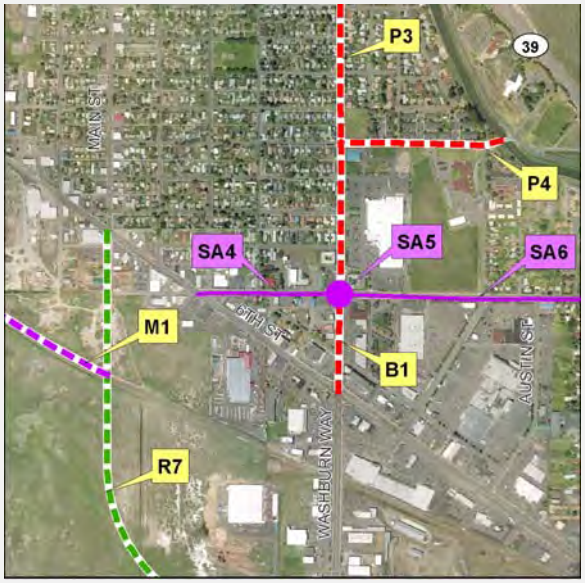
Description: Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street. Investigate feasibility of installing a raised median.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Collector	15-25 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA5	**Safety Improvements at Washburn Way & Shasta Way**

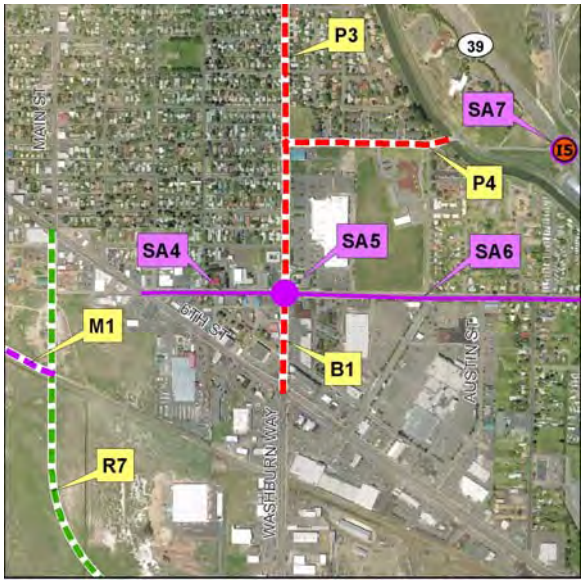
Description: Conduct site visit to confirm traffic signal head visibility on southbound approach. Depending on visibility, investigate ways to improve signal head visibility such as installing near-side traffic signals for approaching vehicles.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Major Arterial/Collector	15-25 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA6	**Safety Improvements on Shasta Way from Washburn Way to OR 39**

Description: Conduct a focused safety study of the segment in conjunction with PRJ-2. Focus of study to identify contributing factors to crashes and determine potential countermeasures to reduce crashes.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Collector	5-15 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA7	**Safety Improvements at OR 39 & Eberlein Avenue**

Description: Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate. Evaluate possible realignment options.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway/Collector	15-25 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA8	**Improve bicycle facilities at the intersection of Summers Lane/South 6th Street**

Description: Would improve bicycle and pedestrian facilities at the intersection of Summers Lane/South 6th Street. Should be considered in conjunction with project I18.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Bicycle/Pedestr	Major Arterial/Collector	0-5 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☑	☑	☐	☑	☑

Project Location:



Project Image:

Project #: SA9	**Safety Improvements on South 6th Street from Summers Lane to Fargo Street**

Description: Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway	0-5 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA10	**Safety Improvements on South 6th Street from Homedale Road to Madison Street**

Description: Conduct access management project to decrease the number of access driveways and increase access spacing between driveways along South 6th Street. Investigate feasibility of installing a raised median.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway	5-15 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA11	**Safety Improvements at Altamont Drive & Laverne Avenue**

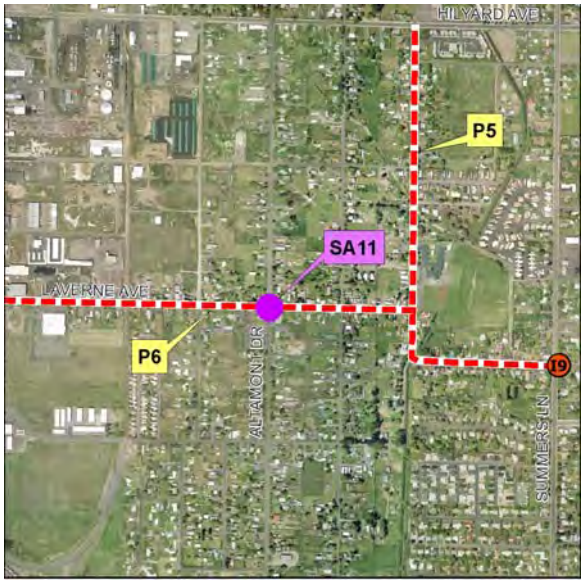
Description: Conduct intersection study to determine existing available sight distance, prevailing speeds on major street, and feasibility of a roundabout. Develop and compare alternative improvement measures to reduce crashes.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Major Arterial/Collector	0-5 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA12	**Safety Improvements at OR 140 & Summers Lane**

Description: Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate. Consider railroad crossing treatments.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	Major Arterial/Collector	5-15 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA13	**Safety Improvements at OR 140 & Homedale Drive**

Description: Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway/Collector	15-25 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA14	**Safety Improvements at OR 140 & OR 39 (South of Big Y)**

Description: Conduct sight distance and speed studies to determine adequate sight distance for prevailing speeds. Consult and apply treatments from the Highway Safety Manual, NCHRP 613 Guidelines for Selection of Speed Reduction Treatments at High Speed Intersections and other similar resources as appropriate.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway	5-15 Years	$30,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Project #: SA15	**Safety Improvements on OR 140 from Western UGB to OR 66**

Description: Conduct study to determine feasibility of shoulder rumble strips, increased roadside delineation and other similar measures to mitigate crashes. Based on study, implement mitigation measures.

Category:	**Functional Classification:**	**Time Frame:**	**Total Cost:**
Safety	State Highway	15-25 Years	$50,000

Project Goals Met:

Safe and Efficient	Access for All	Bike and Ped	Local Circulation	Economic Development	Mobility and Access	Limit Transportation Impacts
☑	☑	☐	☐	☐	☐	☐

Project Location:



Project Image:

Appendix 1E Cost Estimates

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R1: New Minor Collector from Dan O'Brien Way to Dahlia Street

Project Sheet: R1

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	17,360	$15.00	$260,406
Embankment (Fill)	cu. yd.	6,542	$20.00	$130,832
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	136,000	$8.00	$1,088,000
New Curb	lin. ft.	6,800	$15.00	$102,000
New Sidewalk & Concrete Median	sq. ft.	40,800	$5.00	$204,000
Pavement markings	lin. ft.	13,600	$1.00	$13,600
Signage	each	17	$500.00	$8,500
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$1,807,338*
Storm Drainage System		% of Subtotal A	20%	$361,468
Landscape Improvement		% of Subtotal A	5%	$90,367
Street Lighting	each	34	$7,000.00	$238,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	11,180	$150.00	$1,677,000
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$2,416,835*
Subtotal 1 (Subtotals A + B)				$4,224,173
Mobilization		% of Subtotal 1	10%	$422,417
Erosion Control		% of Subtotal 1	5%	$211,209
Traffic Control		% of Subtotal 1	5%	$211,209
Subtotal 2 (Mobilization & Traffic Control)				$844,835
Total (Subtotals 1 + 2)				$5,069,007
Plus Contingencies		% of Total	30%	$1,520,702
Estimated Construction Cost				**$6,589,709**
Architectural/Engineering		% of Est. Cost	15%	$988,456
Construction Management		% of Est. Cost	10%	$658,971
Estimated Professional Fees				**$1,647,427**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$8,237,136**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R2: Daggett Avenue Extension

Project Sheet: R2

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	5,872	$15.00	$88,079
Embankment (Fill)	cu. yd.	2,213	$20.00	$44,252
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	46,000	$8.00	$368,000
New Curb	lin. ft.	2,300	$15.00	$34,500
New Sidewalk & Concrete Median	sq. ft.	13,800	$5.00	$69,000
Pavement markings	lin. ft.	4,600	$1.00	$4,600
Signage	each	6	$500.00	$3,000
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$611,431*
Storm Drainage System		% of Subtotal A	20%	$122,286
Landscape Improvement		% of Subtotal A	5%	$30,572
Street Lighting	each	12	$7,000.00	$80,500
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$283,358*
Subtotal 1 (Subtotals A + B)				$894,788
Mobilization		% of Subtotal 1	10%	$89,479
Erosion Control		% of Subtotal 1	5%	$44,739
Traffic Control		% of Subtotal 1	5%	$44,739
Subtotal 2 (Mobilization & Traffic Control)				$178,958
Total (Subtotals 1 + 2)				$1,073,746
Plus Contingencies		% of Total	30%	$322,124
Estimated Construction Cost				**$1,395,869**
Architectural/Engineering		% of Est. Cost	15%	$209,380
Construction Management		% of Est. Cost	10%	$139,587
Estimated Professional Fees				**$348,967**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$1,744,837**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R3: Dahila Street Extension

Project Sheet: R3

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	2,808	$15.00	$42,125
Embankment (Fill)	cu. yd.	1,058	$20.00	$21,164
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	22,000	$8.00	$176,000
New Curb	lin. ft.	1,100	$15.00	$16,500
New Sidewalk & Concrete Median	sq. ft.	6,600	$5.00	$33,000
Pavement markings	lin. ft.	2,200	$1.00	$2,200
Signage	each	3	$500.00	$1,500
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$292,489*
Storm Drainage System		% of Subtotal A	20%	$58,498
Landscape Improvement		% of Subtotal A	5%	$14,624
Street Lighting	each	6	$7,000.00	$38,500
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$161,622*
Subtotal 1 (Subtotals A + B)				$454,111
Mobilization		% of Subtotal 1	10%	$45,411
Erosion Control		% of Subtotal 1	5%	$22,706
Traffic Control		% of Subtotal 1	5%	$22,706
Subtotal 2 (Mobilization & Traffic Control)				$90,822
Total (Subtotals 1 + 2)				$544,933
Plus Contingencies		% of Total	30%	$163,480
Estimated Construction Cost				**$708,413**
Architectural/Engineering		% of Est. Cost	15%	$106,262
Construction Management		% of Est. Cost	10%	$70,841
Estimated Professional Fees				**$177,103**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$885,516**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R4: Crescent Avenue Extension

Project Sheet: R4

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	23,488	$15.00	$352,314
Embankment (Fill)	cu. yd.	8,850	$20.00	$177,008
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	184,000	$8.00	$1,472,000
New Curb	lin. ft.	9,200	$15.00	$138,000
New Sidewalk & Concrete Median	sq. ft.	55,200	$5.00	$276,000
Pavement markings	lin. ft.	18,400	$1.00	$18,400
Signage	each	23	$500.00	$11,500
Pavement Removal	sq. ft.	19,500	$2.00	$39,000
			Subtotal A (Roadworks)	*$2,484,222*
Storm Drainage System		% of Subtotal A	20%	$496,844
Landscape Improvement		% of Subtotal A	5%	$124,211
Street Lighting	each	46	$7,000.00	$322,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$993,056*
Subtotal 1 (Subtotals A + B)				$3,477,278
Mobilization		% of Subtotal 1	10%	$347,728
Erosion Control		% of Subtotal 1	5%	$173,864
Traffic Control		% of Subtotal 1	5%	$173,864
Subtotal 2 (Mobilization & Traffic Control)				$695,456
Total (Subtotals 1 + 2)				$4,172,733
Plus Contingencies		% of Total	30%	$1,251,820
Estimated Construction Cost				**$5,424,553**
Architectural/Engineering		% of Est. Cost	15%	$813,683
Construction Management		% of Est. Cost	10%	$542,455
Estimated Professional Fees				**$1,356,138**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$6,780,691**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R5: Roadway from Foothill Blvd to Homedale Road Extension

Project Sheet: R5

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	30,636	$15.00	$459,540
Embankment (Fill)	cu. yd.	11,544	$20.00	$230,880
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	240,000	$8.00	$1,920,000
New Curb	lin. ft.	12,000	$15.00	$180,000
New Sidewalk & Concrete Median	sq. ft.	72,000	$5.00	$360,000
Pavement markings	lin. ft.	24,000	$1.00	$24,000
Signage	each	30	$500.00	$15,000
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$3,189,420*
Storm Drainage System		% of Subtotal A	20%	$637,884
Landscape Improvement		% of Subtotal A	5%	$159,471
Street Lighting	each	60	$7,000.00	$420,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$1,267,355*
Subtotal 1 (Subtotals A + B)				$4,456,775
Mobilization		% of Subtotal 1	10%	$445,678
Erosion Control		% of Subtotal 1	5%	$222,839
Traffic Control		% of Subtotal 1	5%	$222,839
Subtotal 2 (Mobilization & Traffic Control)				$891,355
Total (Subtotals 1 + 2)				$5,348,130
Plus Contingencies		% of Total	30%	$1,604,439
Estimated Construction Cost				**$6,952,569**
Architectural/Engineering		% of Est. Cost	15%	$1,042,885
Construction Management		% of Est. Cost	10%	$695,257
Estimated Professional Fees				**$1,738,142**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$8,690,711**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R6: Extend Homedale Road to Old Fort Road

Project Sheet: R6

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	61,272	$15.00	$919,080
Embankment (Fill)	cu. yd.	23,088	$20.00	$461,760
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	480,000	$8.00	$3,840,000
New Curb	lin. ft.	24,000	$15.00	$360,000
New Sidewalk & Concrete Median	sq. ft.	144,000	$5.00	$720,000
Pavement markings	lin. ft.	48,000	$1.00	$48,000
Signage	each	60	$500.00	$30,000
Pavement Removal	sq. ft.	50,000	$2.00	$100,000
			Subtotal A (Roadworks)	*$6,478,840*
Storm Drainage System		% of Subtotal A	20%	$1,295,768
Landscape Improvement		% of Subtotal A	5%	$323,942
Street Lighting	each	120	$7,000.00	$840,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$2,509,710*
Subtotal 1 (Subtotals A + B)				$8,988,550
Mobilization		% of Subtotal 1	10%	$898,855
Erosion Control		% of Subtotal 1	5%	$449,428
Traffic Control		% of Subtotal 1	5%	$449,428
Subtotal 2 (Mobilization & Traffic Control)				$1,797,710
Total (Subtotals 1 + 2)				$10,786,260
Plus Contingencies		% of Total	30%	$3,235,878
Estimated Construction Cost				**$14,022,138**
Architectural/Engineering		% of Est. Cost	15%	$2,103,321
Construction Management		% of Est. Cost	10%	$1,402,214
Estimated Professional Fees				**$3,505,535**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$17,527,673**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R8: Upgrade Emerald Street

Project Sheet: R8

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	5,617	$15.00	$84,249
Embankment (Fill)	cu. yd.	2,116	$20.00	$42,328
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	44,000	$8.00	$352,000
New Curb	lin. ft.	2,200	$15.00	$33,000
New Sidewalk & Concrete Median	sq. ft.	13,200	$5.00	$66,000
Pavement markings	lin. ft.	4,400	$1.00	$4,400
Signage	each	6	$500.00	$3,000
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$584,977*
Storm Drainage System		% of Subtotal A	20%	$116,995
Landscape Improvement		% of Subtotal A	5%	$29,249
Street Lighting	each	11	$7,000.00	$77,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$273,244*
Subtotal 1 (Subtotals A + B)				$858,221
Mobilization		% of Subtotal 1	10%	$85,822
Erosion Control		% of Subtotal 1	5%	$42,911
Traffic Control		% of Subtotal 1	5%	$42,911
Subtotal 2 (Mobilization & Traffic Control)				$171,644
Total (Subtotals 1 + 2)				$1,029,866
Plus Contingencies		% of Total	30%	$308,960
Estimated Construction Cost				**$1,338,825**
Architectural/Engineering		% of Est. Cost	15%	$200,824
Construction Management		% of Est. Cost	10%	$133,883
Estimated Professional Fees				**$334,706**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$1,673,531**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R9: New Roadway South of OR 66/OR140

Project Sheet: R9

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	8,170	$15.00	$122,544
Embankment (Fill)	cu. yd.	3,078	$20.00	$61,568
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	64,000	$8.00	$512,000
New Curb	lin. ft.	3,200	$15.00	$48,000
New Sidewalk & Concrete Median	sq. ft.	19,200	$5.00	$96,000
Pavement markings	lin. ft.	6,400	$1.00	$6,400
Signage	each	8	$500.00	$4,000
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$850,512*
Storm Drainage System		% of Subtotal A	20%	$170,102
Landscape Improvement		% of Subtotal A	5%	$42,526
Street Lighting	each	16	$7,000.00	$112,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	1	$100,000.00	$100,000
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$474,628*
Subtotal 1 (Subtotals A + B)				$1,325,140
Mobilization		% of Subtotal 1	10%	$132,514
Erosion Control		% of Subtotal 1	5%	$66,257
Traffic Control		% of Subtotal 1	5%	$66,257
Subtotal 2 (Mobilization & Traffic Control)				$265,028
Total (Subtotals 1 + 2)				$1,590,168
Plus Contingencies		% of Total	30%	$477,050
Estimated Construction Cost				**$2,067,218**
Architectural/Engineering		% of Est. Cost	15%	$310,083
Construction Management		% of Est. Cost	10%	$206,722
Estimated Professional Fees				**$516,805**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$2,584,023**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R10: Hilyard Avenue Extension

Project Sheet: R10

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	7,148	$15.00	$107,226
Embankment (Fill)	cu. yd.	2,694	$20.00	$53,872
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	56,000	$8.00	$448,000
New Curb	lin. ft.	2,800	$15.00	$42,000
New Sidewalk & Concrete Median	sq. ft.	16,800	$5.00	$84,000
Pavement markings	lin. ft.	5,600	$1.00	$5,600
Signage	each	7	$500.00	$3,500
Pavement Removal	sq. ft.	13,500	$2.00	$27,000
			Subtotal A (Roadworks)	*$771,198*
Storm Drainage System		% of Subtotal A	20%	$154,240
Landscape Improvement		% of Subtotal A	5%	$38,560
Street Lighting	each	14	$7,000.00	$98,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$340,800*
Subtotal 1 (Subtotals A + B)				$1,111,998
Mobilization		% of Subtotal 1	10%	$111,200
Erosion Control		% of Subtotal 1	5%	$55,600
Traffic Control		% of Subtotal 1	5%	$55,600
Subtotal 2 (Mobilization & Traffic Control)				$222,400
Total (Subtotals 1 + 2)				$1,334,397
Plus Contingencies		% of Total	30%	$400,319
Estimated Construction Cost				**$1,734,716**
Architectural/Engineering		% of Est. Cost	15%	$260,207
Construction Management		% of Est. Cost	10%	$173,472
Estimated Professional Fees				**$433,679**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$2,168,395**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R11: New Collector from Hilyard Avenue to Harlan Drive

Project Sheet: R11

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	22,977	$15.00	$344,655
Embankment (Fill)	cu. yd.	8,658	$20.00	$173,160
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	180,000	$8.00	$1,440,000
New Curb	lin. ft.	9,000	$15.00	$135,000
New Sidewalk & Concrete Median	sq. ft.	54,000	$5.00	$270,000
Pavement markings	lin. ft.	18,000	$1.00	$18,000
Signage	each	23	$500.00	$11,500
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$2,392,315*
Storm Drainage System		% of Subtotal A	20%	$478,463
Landscape Improvement		% of Subtotal A	5%	$119,616
Street Lighting	each	45	$7,000.00	$315,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
HAWK at OC&E Trail	each	1	$70,000.00	$70,000
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$1,033,079*
Subtotal 1 (Subtotals A + B)				$3,425,394
Mobilization		% of Subtotal 1	10%	$342,539
Erosion Control		% of Subtotal 1	5%	$171,270
Traffic Control		% of Subtotal 1	5%	$171,270
Subtotal 2 (Mobilization & Traffic Control)				$685,079
Total (Subtotals 1 + 2)				$4,110,473
Plus Contingencies		% of Total	30%	$1,233,142
Estimated Construction Cost				**$5,343,614**
Architectural/Engineering		% of Est. Cost	15%	$801,542
Construction Management		% of Est. Cost	10%	$534,361
Estimated Professional Fees				**$1,335,904**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$6,679,518**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R12: Washburn Way Realignment

Project Sheet: R12

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	8,170	$15.00	$122,544
Embankment (Fill)	cu. yd.	3,078	$20.00	$61,568
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	64,000	$8.00	$512,000
New Curb	lin. ft.	3,200	$15.00	$48,000
New Sidewalk & Concrete Median	sq. ft.	19,200	$5.00	$96,000
Pavement markings	lin. ft.	6,400	$1.00	$6,400
Signage	each	8	$500.00	$4,000
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$850,512*
Storm Drainage System		% of Subtotal A	20%	$170,102
Landscape Improvement		% of Subtotal A	5%	$42,526
Street Lighting	each	16	$7,000.00	$112,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$374,628*
Subtotal 1 (Subtotals A + B)				$1,225,140
Mobilization		% of Subtotal 1	10%	$122,514
Erosion Control		% of Subtotal 1	5%	$61,257
Traffic Control		% of Subtotal 1	5%	$61,257
Subtotal 2 (Mobilization & Traffic Control)				$245,028
Total (Subtotals 1 + 2)				$1,470,168
Plus Contingencies		% of Total	30%	$441,050
Estimated Construction Cost				**$1,911,218**
Architectural/Engineering		% of Est. Cost	15%	$286,683
Construction Management		% of Est. Cost	10%	$191,122
Estimated Professional Fees				**$477,805**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$2,389,023**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

R13: Brett Way Extension

Project Sheet: R13

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	21,512	$15.00	$322,677
Embankment (Fill)	cu. yd.	8,014	$20.00	$160,284
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	171,000	$8.00	$1,368,000
New Curb	lin. ft.	7,600	$15.00	$114,000
New Sidewalk & Concrete Median	sq. ft.	45,600	$5.00	$228,000
Pavement markings	lin. ft.	15,200	$1.00	$15,200
Signage	each	19	$500.00	$9,500
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$2,217,661*
Storm Drainage System		% of Subtotal A	20%	$443,532
Landscape Improvement		% of Subtotal A	5%	$110,883
Street Lighting	each	38	$7,000.00	$266,000
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	8,000	$150.00	$1,200,000
Railroad Crossing & Signalization	each	1	$750,000.00	$750,000
			Subtotal B (Other)	*$2,820,415*
Subtotal 1 (Subtotals A + B)				$5,038,076
Mobilization		% of Subtotal 1	10%	$503,808
Erosion Control		% of Subtotal 1	5%	$251,904
Traffic Control		% of Subtotal 1	5%	$251,904
Subtotal 2 (Mobilization & Traffic Control)				$1,007,615
Total (Subtotals 1 + 2)				$6,045,692
Plus Contingencies		% of Total	30%	$1,813,707
Estimated Construction Cost				**$7,859,399**
Architectural/Engineering		% of Est. Cost	15%	$1,178,910
Construction Management		% of Est. Cost	10%	$785,940
Estimated Professional Fees				**$1,964,850**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$9,824,249**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

M2: New Multi-Use Path Along Foothillls Boulevard

Project Sheet: M2

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	5,550	$15.00	$83,250
Embankment (Fill)	cu. yd.	3,700	$20.00	$74,000
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	100,000	$5.00	$500,000
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$657,250*
Storm Drainage System		% of Subtotal A	5%	$32,863
Landscape Improvement		% of Subtotal A	5%	$32,863
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$0.00	$0
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$65,725*
Subtotal 1 (Subtotals A + B)				$722,975
Mobilization		% of Subtotal 1	10%	$72,298
Erosion Control		% of Subtotal 1	5%	$36,149
Traffic Control		% of Subtotal 1	5%	$36,149
Subtotal 2 (Mobilization & Traffic Control)				$144,595
Total (Subtotals 1 + 2)				$867,570
Plus Contingencies		% of Total	30%	$260,271
Estimated Construction Cost				**$1,127,841**
Architectural/Engineering		% of Est. Cost	15%	$169,176
Construction Management		% of Est. Cost	10%	$112,784
Estimated Professional Fees				**$281,960**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$1,409,801**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

P1: Daggett Avenue Sidewalks

Project Sheet: P1

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	566	$15.00	$8,492
Embankment (Fill)	cu. yd.	377	$20.00	$7,548
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	1,700	$15.00	$25,500
New Sidewalk & Concrete Median	sq. ft.	10,200	$5.00	$51,000
Pavement markings	lin. ft.	1,700	$1.00	$1,700
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$94,240*
Storm Drainage System		% of Subtotal A	20%	$18,848
Landscape Improvement		% of Subtotal A	5%	$4,712
Street Lighting	each	9	$7,000.00	$59,500
Private Utility Coordination	Lump/Sum	1	$5,000.00	$5,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$88,060*
Subtotal 1 (Subtotals A + B)				$182,299
Mobilization		% of Subtotal 1	10%	$18,230
Erosion Control		% of Subtotal 1	5%	$9,115
Traffic Control		% of Subtotal 1	5%	$9,115
Subtotal 2 (Mobilization & Traffic Control)				$36,460
Total (Subtotals 1 + 2)				$218,759
Plus Contingencies		% of Total	30%	$65,628
Estimated Construction Cost				**$284,387**
Architectural/Engineering		% of Est. Cost	15%	$42,658
Construction Management		% of Est. Cost	10%	$28,439
Estimated Professional Fees				**$71,097**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$355,484**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

P2: El Dorado Avenue Sidewalks

Project Sheet: P2

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	1,032	$15.00	$15,485
Embankment (Fill)	cu. yd.	688	$20.00	$13,764
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	1,700	$15.00	$25,500
New Sidewalk & Concrete Median	sq. ft.	18,600	$5.00	$93,000
Pavement markings	lin. ft.	3,100	$1.00	$3,100
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$150,849*
Storm Drainage System		% of Subtotal A	20%	$30,170
Landscape Improvement		% of Subtotal A	5%	$7,542
Street Lighting	each	31	$7,000.00	$217,000
Private Utility Coordination	Lump/Sum	1	$15,000.00	$15,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$269,712*
Subtotal 1 (Subtotals A + B)				$420,561
Mobilization		% of Subtotal 1	10%	$42,056
Erosion Control		% of Subtotal 1	5%	$21,028
Traffic Control		% of Subtotal 1	5%	$21,028
Subtotal 2 (Mobilization & Traffic Control)				$84,112
Total (Subtotals 1 + 2)				$504,673
Plus Contingencies		% of Total	30%	$151,402
Estimated Construction Cost				**$656,075**
Architectural/Engineering		% of Est. Cost	15%	$98,411
Construction Management		% of Est. Cost	10%	$65,607
Estimated Professional Fees				**$164,019**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$820,093**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

P3: Washburn Way Sidewalks

Project Sheet: P3

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	2,420	$15.00	$36,297
Embankment (Fill)	cu. yd.	1,510	$20.00	$30,192
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	6,800	$15.00	$102,000
New Sidewalk & Concrete Median	sq. ft.	40,800	$5.00	$204,000
Pavement markings	lin. ft.	6,800	$1.00	$6,800
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$379,289*
Storm Drainage System		% of Subtotal A	20%	$75,858
Landscape Improvement		% of Subtotal A	5%	$18,964
Street Lighting	each	41	$7,000.00	$287,000
Private Utility Coordination	Lump/Sum	1	$20,000.00	$20,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$401,822*
Subtotal 1 (Subtotals A + B)				$781,111
Mobilization		% of Subtotal 1	10%	$78,111
Erosion Control		% of Subtotal 1	5%	$39,056
Traffic Control		% of Subtotal 1	5%	$39,056
Subtotal 2 (Mobilization & Traffic Control)				$156,222
Total (Subtotals 1 + 2)				$937,334
Plus Contingencies		% of Total	30%	$281,200
Estimated Construction Cost				**$1,218,534**
Architectural/Engineering		% of Est. Cost	15%	$182,780
Construction Management		% of Est. Cost	10%	$121,853
Estimated Professional Fees				**$304,633**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$1,523,167**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

P4: Eberlein Avenue Sidewalks

Project Sheet: P4

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	999	$15.00	$14,985
Embankment (Fill)	cu. yd.	666	$20.00	$13,320
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	3,000	$15.00	$45,000
New Sidewalk & Concrete Median	sq. ft.	18,000	$5.00	$90,000
Pavement markings	lin. ft.	3,000	$1.00	$3,000
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$166,305*
Storm Drainage System		% of Subtotal A	20%	$33,261
Landscape Improvement		% of Subtotal A	5%	$8,315
Street Lighting	each	15	$7,000.00	$105,000
Private Utility Coordination	Lump/Sum	1	$5,000.00	$5,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$151,576*
Subtotal 1 (Subtotals A + B)				$317,881
Mobilization		% of Subtotal 1	10%	$31,788
Erosion Control		% of Subtotal 1	5%	$15,894
Traffic Control		% of Subtotal 1	5%	$15,894
Subtotal 2 (Mobilization & Traffic Control)				$63,576
Total (Subtotals 1 + 2)				$381,458
Plus Contingencies		% of Total	30%	$114,437
Estimated Construction Cost				**$495,895**
Architectural/Engineering		% of Est. Cost	15%	$74,384
Construction Management		% of Est. Cost	10%	$49,589
Estimated Professional Fees				**$123,974**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$619,868**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

Crest Street and Clinton Street Sidewalks: Hilyard Avenue to Summers Lane

Project Sheet: P5

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	2,964	$15.00	$44,456
Embankment (Fill)	cu. yd.	1,976	$20.00	$39,516
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	8,900	$15.00	$133,500
New Sidewalk & Concrete Median	sq. ft.	53,400	$5.00	$267,000
Pavement markings	lin. ft.	8,900	$1.00	$8,900
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$493,372*
Storm Drainage System		% of Subtotal A	20%	$98,674
Landscape Improvement		% of Subtotal A	5%	$24,669
Street Lighting	each	45	$7,000.00	$311,500
Private Utility Coordination	Lump/Sum	1	$20,000.00	$20,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$454,843*
Subtotal 1 (Subtotals A + B)				$948,214
Mobilization		% of Subtotal 1	10%	$94,821
Erosion Control		% of Subtotal 1	5%	$47,411
Traffic Control		% of Subtotal 1	5%	$47,411
Subtotal 2 (Mobilization & Traffic Control)				$189,643
Total (Subtotals 1 + 2)				$1,137,857
Plus Contingencies		% of Total	30%	$341,357
Estimated Construction Cost				**$1,479,214**
Architectural/Engineering		% of Est. Cost	15%	$221,882
Construction Management		% of Est. Cost	10%	$147,921
Estimated Professional Fees				**$369,804**
Right-of-Way	sq. ft.	53,400	$20.00	$1,068,000
Estimated Property Acquisition Cost				**$1,068,000**
Estimated Project Cost				**$2,917,018**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

P5: Laverne Avenue Sidewalks: Washburn Way to Crest Street

Project Sheet: P6

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	2,664	$15.00	$39,960
Embankment (Fill)	cu. yd.	1,776	$20.00	$35,520
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	8,000	$15.00	$120,000
New Sidewalk & Concrete Median	sq. ft.	48,000	$5.00	$240,000
Pavement markings	lin. ft.	8,000	$1.00	$8,000
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$443,480*
Storm Drainage System		% of Subtotal A	20%	$88,696
Landscape Improvement		% of Subtotal A	5%	$22,174
Street Lighting	each	40	$7,000.00	$280,000
Private Utility Coordination	Lump/Sum	1	$20,000.00	$20,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$410,870*
Subtotal 1 (Subtotals A + B)				$854,350
Mobilization		% of Subtotal 1	10%	$85,435
Erosion Control		% of Subtotal 1	5%	$42,718
Traffic Control		% of Subtotal 1	5%	$42,718
Subtotal 2 (Mobilization & Traffic Control)				$170,870
Total (Subtotals 1 + 2)				$1,025,220
Plus Contingencies		% of Total	30%	$307,566
Estimated Construction Cost				**$1,332,786**
Architectural/Engineering		% of Est. Cost	15%	$199,918
Construction Management		% of Est. Cost	10%	$133,279
Estimated Professional Fees				**$333,197**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$1,665,983**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

B1: Washburn Way Bicycle Lanes

Project Sheet: B1

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	6,194	$15.00	$92,907
Embankment (Fill)	cu. yd.	2,753	$20.00	$55,056
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	37,200	$8.00	$297,600
New Curb	lin. ft.	6,200	$15.00	$93,000
New Sidewalk & Concrete Median	sq. ft.	37,200	$5.00	$186,000
Pavement markings	lin. ft.	62,000	$1.00	$62,000
Signage	each	16	$500.00	$8,000
Pavement Removal	sq. ft.	37,200	$2.00	$74,400
			Subtotal A (Roadworks)	*$868,963*
Storm Drainage System		% of Subtotal A	20%	$173,793
Landscape Improvement		% of Subtotal A	5%	$43,448
Street Lighting	each	31	$7,000.00	$217,000
Private Utility Coordination	Lump/Sum	1	$15,000.00	$15,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$449,241*
Subtotal 1 (Subtotals A + B)				$1,318,204
Mobilization		% of Subtotal 1	10%	$131,820
Erosion Control		% of Subtotal 1	5%	$65,910
Traffic Control		% of Subtotal 1	5%	$65,910
Subtotal 2 (Mobilization & Traffic Control)				$263,641
Total (Subtotals 1 + 2)				$1,581,845
Plus Contingencies		% of Total	30%	$474,553
Estimated Construction Cost				**$2,056,398**
Architectural/Engineering		% of Est. Cost	15%	$308,460
Construction Management		% of Est. Cost	10%	$205,640
Estimated Professional Fees				**$514,099**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$2,570,497**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I1: OR 39/Biehn Street/Campus Way - Modify Signal Timing

Project Sheet: I1

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	1,249	$15.00	$18,731
Embankment (Fill)	cu. yd.	455	$20.00	$9,102
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	10,200	$8.00	$81,600
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	2,100	$5.00	$10,500
Pavement markings	lin. ft.	2,700	$1.00	$2,700
Signage	each	3	$500.00	$1,500
Pavement Removal	sq. ft.	2,100	$2.00	$4,200
			Subtotal A (Roadworks)	*$128,333*
Storm Drainage System		% of Subtotal A	20%	$25,667
Landscape Improvement		% of Subtotal A	5%	$6,417
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$20,000.00	$20,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$302,083*
Subtotal 1 (Subtotals A + B)				$430,417
Mobilization		% of Subtotal 1	10%	$43,042
Erosion Control		% of Subtotal 1	5%	$21,521
Traffic Control		% of Subtotal 1	5%	$21,521
Subtotal 2 (Mobilization & Traffic Control)				$86,083
Total (Subtotals 1 + 2)				$516,500
Plus Contingencies		% of Total	30%	$154,950
Estimated Construction Cost				**$671,450**
Architectural/Engineering		% of Est. Cost	15%	$100,717
Construction Management		% of Est. Cost	10%	$67,145
Estimated Professional Fees				**$167,862**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$839,312**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I2: Biehn Street/Oregon Avenue - SB Left-Turn Lane

Project Sheet: I2

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	500	$15.00	$7,493
Embankment (Fill)	cu. yd.	200	$20.00	$3,996
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	3,600	$8.00	$28,800
New Curb	lin. ft.	300	$15.00	$4,500
New Sidewalk & Concrete Median	sq. ft.	1,800	$5.00	$9,000
Pavement markings	lin. ft.	900	$1.00	$900
Signage	each	2	$500.00	$1,000
Pavement Removal	sq. ft.	1,800	$2.00	$3,600
			Subtotal A (Roadworks)	*$59,289*
Storm Drainage System		% of Subtotal A	20%	$11,858
Landscape Improvement		% of Subtotal A	5%	$2,964
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$24,822*
Subtotal 1 (Subtotals A + B)				$84,111
Mobilization		% of Subtotal 1	10%	$8,411
Erosion Control		% of Subtotal 1	5%	$4,206
Traffic Control		% of Subtotal 1	5%	$4,206
Subtotal 2 (Mobilization & Traffic Control)				$16,822
Total (Subtotals 1 + 2)				$100,933
Plus Contingencies		% of Total	30%	$30,280
Estimated Construction Cost				**$131,213**
Architectural/Engineering		% of Est. Cost	15%	$19,682
Construction Management		% of Est. Cost	10%	$13,121
Estimated Professional Fees				**$32,803**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$164,016**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I3: Main Street/OR 39 - Modify Signal Timing

Project Sheet: I3

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$0.00	$0
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	1	$100,000.00	$100,000
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$100,000*
Subtotal 1 (Subtotals A + B)				$100,000
Mobilization		% of Subtotal 1	10%	$10,000
Erosion Control		% of Subtotal 1	5%	$5,000
Traffic Control		% of Subtotal 1	5%	$5,000
Subtotal 2 (Mobilization & Traffic Control)				$20,000
Total (Subtotals 1 + 2)				$120,000
Plus Contingencies		% of Total	30%	$36,000
Estimated Construction Cost				**$156,000**
Architectural/Engineering		% of Est. Cost	15%	$23,400
Construction Management		% of Est. Cost	10%	$15,600
Estimated Professional Fees				**$39,000**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$195,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I4: OR 39/Washburn Way - Modify Signal Phasing

Project Sheet: I4

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$0.00	$0
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	1	$100,000.00	$100,000
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$100,000*
Subtotal 1 (Subtotals A + B)				$100,000
Mobilization		% of Subtotal 1	10%	$10,000
Erosion Control		% of Subtotal 1	5%	$5,000
Traffic Control		% of Subtotal 1	5%	$5,000
Subtotal 2 (Mobilization & Traffic Control)				$20,000
Total (Subtotals 1 + 2)				$120,000
Plus Contingencies		% of Total	30%	$36,000
Estimated Construction Cost				**$156,000**
Architectural/Engineering		% of Est. Cost	15%	$23,400
Construction Management		% of Est. Cost	10%	$15,600
Estimated Professional Fees				**$39,000**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$195,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I5: Eberlein Avenue/OR 39 - Install Traffic Signal

Project Sheet: I5

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$260,000*
Subtotal 1 (Subtotals A + B)				$260,000
Mobilization		% of Subtotal 1	10%	$26,000
Erosion Control		% of Subtotal 1	5%	$13,000
Traffic Control		% of Subtotal 1	5%	$13,000
Subtotal 2 (Mobilization & Traffic Control)				$52,000
Total (Subtotals 1 + 2)				$312,000
Plus Contingencies		% of Total	30%	$93,600
Estimated Construction Cost				**$405,600**
Architectural/Engineering		% of Est. Cost	15%	$60,840
Construction Management		% of Est. Cost	10%	$40,560
Estimated Professional Fees				**$101,400**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$507,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I6: OR 39/Shasta Way - Modify Signal Phasing

Project Sheet: I6

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$0.00	$0
New Traffic Signal	each	0	$250,000.00	$0
Traffic Signal Modification	each	1	$100,000.00	$100,000
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$100,000*
Subtotal 1 (Subtotals A + B)				$100,000
Mobilization		% of Subtotal 1	10%	$10,000
Erosion Control		% of Subtotal 1	5%	$5,000
Traffic Control		% of Subtotal 1	5%	$5,000
Subtotal 2 (Mobilization & Traffic Control)				$20,000
Total (Subtotals 1 + 2)				$120,000
Plus Contingencies		% of Total	30%	$36,000
Estimated Construction Cost				**$156,000**
Architectural/Engineering		% of Est. Cost	15%	$23,400
Construction Management		% of Est. Cost	10%	$15,600
Estimated Professional Fees				**$39,000**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$195,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I7: Shasta Way/Homedale Road - Install Traffic Signal

Project Sheet: I7

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$260,000*
Subtotal 1 (Subtotals A + B)				$260,000
Mobilization		% of Subtotal 1	10%	$26,000
Erosion Control		% of Subtotal 1	5%	$13,000
Traffic Control		% of Subtotal 1	5%	$13,000
Subtotal 2 (Mobilization & Traffic Control)				$52,000
Total (Subtotals 1 + 2)				$312,000
Plus Contingencies		% of Total	30%	$93,600
Estimated Construction Cost				**$405,600**
Architectural/Engineering		% of Est. Cost	15%	$60,840
Construction Management		% of Est. Cost	10%	$40,560
Estimated Professional Fees				**$101,400**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$507,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I8: Homedale Road/OR 39 - Construct EB Right-Turn Lane

Project Sheet: I8

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	833	$15.00	$12,488
Embankment (Fill)	cu. yd.	333	$20.00	$6,660
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	6,000	$8.00	$48,000
New Curb	lin. ft.	500	$15.00	$7,500
New Sidewalk & Concrete Median	sq. ft.	3,000	$5.00	$15,000
Pavement markings	lin. ft.	1,500	$1.00	$1,500
Signage	each	3	$500.00	$1,500
Pavement Removal	sq. ft.	2,100	$2.00	$4,200
			Subtotal A (Roadworks)	*$96,848*
Storm Drainage System		% of Subtotal A	20%	$19,370
Landscape Improvement		% of Subtotal A	5%	$4,842
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$284,212*
Subtotal 1 (Subtotals A + B)				$381,059
Mobilization		% of Subtotal 1	10%	$38,106
Erosion Control		% of Subtotal 1	5%	$19,053
Traffic Control		% of Subtotal 1	5%	$19,053
Subtotal 2 (Mobilization & Traffic Control)				$76,212
Total (Subtotals 1 + 2)				$457,271
Plus Contingencies		% of Total	30%	$137,181
Estimated Construction Cost				**$594,453**
Architectural/Engineering		% of Est. Cost	15%	$89,168
Construction Management		% of Est. Cost	10%	$59,445
Estimated Professional Fees				**$148,613**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$743,066**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I9: Summers Lane/Clinton Aveneu - Install Traffic Signal

Project Sheet: I9

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$260,000*
Subtotal 1 (Subtotals A + B)				$260,000
Mobilization		% of Subtotal 1	10%	$26,000
Erosion Control		% of Subtotal 1	5%	$13,000
Traffic Control		% of Subtotal 1	5%	$13,000
Subtotal 2 (Mobilization & Traffic Control)				$52,000
Total (Subtotals 1 + 2)				$312,000
Plus Contingencies		% of Total	30%	$93,600
Estimated Construction Cost				**$405,600**
Architectural/Engineering		% of Est. Cost	15%	$60,840
Construction Management		% of Est. Cost	10%	$40,560
Estimated Professional Fees				**$101,400**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$507,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I10: OR 39/OR140 (Big Y) - Construct SB Left-Turn Lane

Project Sheet: I10

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	833	$15.00	$12,488
Embankment (Fill)	cu. yd.	333	$20.00	$6,660
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	6,000	$8.00	$48,000
New Curb	lin. ft.	500	$15.00	$7,500
New Sidewalk & Concrete Median	sq. ft.	3,000	$5.00	$15,000
Pavement markings	lin. ft.	2,500	$1.00	$2,500
Signage	each	1	$500.00	$500
Pavement Removal	sq. ft.	3,000	$2.00	$6,000
			Subtotal A (Roadworks)	*$98,648*
Storm Drainage System		% of Subtotal A	20%	$19,730
Landscape Improvement		% of Subtotal A	5%	$4,932
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$50,000.00	$50,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$324,662*
Subtotal 1 (Subtotals A + B)				$423,309
Mobilization		% of Subtotal 1	10%	$42,331
Erosion Control		% of Subtotal 1	5%	$21,165
Traffic Control		% of Subtotal 1	5%	$21,165
Subtotal 2 (Mobilization & Traffic Control)				$84,662
Total (Subtotals 1 + 2)				$507,971
Plus Contingencies		% of Total	30%	$152,391
Estimated Construction Cost				**$660,363**
Architectural/Engineering		% of Est. Cost	15%	$99,054
Construction Management		% of Est. Cost	10%	$66,036
Estimated Professional Fees				**$165,091**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$825,453**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I11: Washburn Way/OR 140 EB Ramps - Install Traffic Signal

Project Sheet: I11

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$260,000*
Subtotal 1 (Subtotals A + B)				$260,000
Mobilization		% of Subtotal 1	10%	$26,000
Erosion Control		% of Subtotal 1	5%	$13,000
Traffic Control		% of Subtotal 1	5%	$13,000
Subtotal 2 (Mobilization & Traffic Control)				$52,000
Total (Subtotals 1 + 2)				$312,000
Plus Contingencies		% of Total	30%	$93,600
Estimated Construction Cost				**$405,600**
Architectural/Engineering		% of Est. Cost	15%	$60,840
Construction Management		% of Est. Cost	10%	$40,560
Estimated Professional Fees				**$101,400**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$507,000**

KLAMATH FALLS URBAN AREA TRANSPORTATION SYSTEM PLAN

I12: OR 39/OR 140 (South of Big Y) - Install Traffic Signal

Project Sheet: I12

Note: The Construction Cost Index for 2010 was estimated to be 219

Proposed Road Improvements				
Item	**Unit**	**Quantity**	**Unit Cost**	**Total**
Excavation (Cut)	cu. yd.	0	$15.00	$0
Embankment (Fill)	cu. yd.	0	$20.00	$0
Pavement Rehabilitation	sq. ft.	0	$4.00	$0
New Pavement	sq. ft.	0	$8.00	$0
New Curb	lin. ft.	0	$15.00	$0
New Sidewalk & Concrete Median	sq. ft.	0	$5.00	$0
Pavement markings	lin. ft.	0	$1.00	$0
Signage	each	0	$500.00	$0
Pavement Removal	sq. ft.	0	$2.00	$0
			Subtotal A (Roadworks)	*$0*
Storm Drainage System		% of Subtotal A	20%	$0
Landscape Improvement		% of Subtotal A	5%	$0
Street Lighting	each	0	$7,000.00	$0
Private Utility Coordination	Lump/Sum	1	$10,000.00	$10,000
New Traffic Signal	each	1	$250,000.00	$250,000
Traffic Signal Modification	each	0	$100,000.00	$0
Retaining Walls (less than 5 feet)	sq. ft.	0	$50.00	$0
Structures	sq. ft.	0	$150.00	$0
Railroad Crossing & Signalization	each	0	$750,000.00	$0
			Subtotal B (Other)	*$260,000*
Subtotal 1 (Subtotals A + B)				$260,000
Mobilization		% of Subtotal 1	10%	$26,000
Erosion Control		% of Subtotal 1	5%	$13,000
Traffic Control		% of Subtotal 1	5%	$13,000
Subtotal 2 (Mobilization & Traffic Control)				$52,000
Total (Subtotals 1 + 2)				$312,000
Plus Contingencies		% of Total	30%	$93,600
Estimated Construction Cost				**$405,600**
Architectural/Engineering		% of Est. Cost	15%	$60,840
Construction Management		% of Est. Cost	10%	$40,560
Estimated Professional Fees				**$101,400**
Right-of-Way	sq. ft.	0	$20.00	$0
Estimated Property Acquisition Cost				**$0**
Estimated Project Cost				**$507,000**