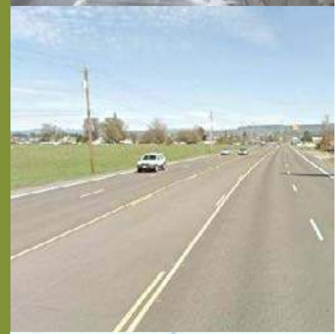
I-5 Exit 33 (Central Point)

Interchange Area Management Plan

Volume 2

June 2015



Oregon
Department
of Transportation

ACKNOWLEDGMENTS

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VOLUME 2: REFERENCE MATERIAL

This companion document to the I-5 Exit 33 (Central Point) Interchange Area Management Plan contains the technical memorandums and analysis that was prepared during the development of the plan. The IAMP has been revised and refined several times since these documents were finalized and includes some new data, projects, and ideas that are not addressed in the reference material.

In addition to the documents that supported development of the IAMP, a Traffic Impact Analysis for the Gebhard Road Intersection has been included in the reference materials. This report addresses the extension of Gebhard Road from Beebe Road to a new intersection with East Pine Street not included in the IAMP analysis.

I-5 Exit 33 (Central Point)
Interchange Area Management Plan

Technical Memorandum #1
Definition and Background

Prepared for

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June 2014

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1. DEFINITION AND BACKGROUND

The Oregon Department of Transportation (ODOT) encourages the development of Interchange Area Management Plans (IAMP) to maintain and improve highway performance and safety by improving system efficiency and management before adding capacity. Public investments for major interchange improvements are very costly, and it is in the interest of the State, local governments, citizens of Oregon, and the traveling public to ensure that the interchange functions as it is designed for as long as possible.

1.1. Purpose

As described in ODOT's Interchange Area Management Plan Guidelines, the objectives of an IAMP are:

- Protect the state and local investment in major facilities
- Establish the desired function of interchanges
- Protect the function of interchanges by maximizing the capacity of the interchanges for safe movement from the mainline highway facility
- Balance the need for efficient interstate and state travel with local use
- Preserve and improve safety of existing interchanges
- Provide safe and efficient operation between connecting roadways
- Adequately protect interchanges from unintended and unexpected development while accommodating planned community development
- Manage the existing interchange capacity and new capacity provided through interchange improvements
- Establish how future land use and transportation decisions will be coordinated in interchange areas between ODOT and the local governments
- Minimize impacts to farm and forest lands and other resource lands around rural interchanges in accordance with adopted Statewide Planning Goals
- Time development with appropriate improvements to the local system after the interchange improvement is in place

The IAMP planning process examines existing and potential future land use and transportation conditions along with opportunities and limitations and identifies long-range needs. Outcomes include improvements to the local street network in the vicinity of the interchange needed to accommodate anticipated growth in the region and land use actions and/or management measures to be applied in the management area.

State and local regulations, policies, and transportation and land use plans provided the framework for preparing the IAMP. The language contained within these documents provides guidance to the state and local jurisdictions on how to manage transportation and land uses in the interchange influence area to protect the interchange function, provide for safe and efficient operations, and minimize the need and expense for making major improvement to the interchange through the planning horizon. Hence, the IAMP documents relevant plans and policies, and identifies how they influence planning for the Interchange 33 area. The purpose of the review is to ensure the necessary compatibility, consistency, and compliance required by state law and ODOT policy. A summary description of the reviewed plans and policies is attached at the end of this technical memorandum as Appendix A.

1.2. Interchange Function

Interchange 33 is an urban interchange that currently functions as the main access to the City of Central Point in Jackson County as well as providing intermodal access to the Rogue Valley International-Medford Airport and developing industrial areas. It also connects to North Medford via Hanley Road to the west and Biddle Road to the east.

The interchange ramps connect with East Pine Street, the primary east-west route through Central Point. The type of development and subsequent function of East Pine Street differs significantly east and west of the interchange, as reflected by the different plan classifications and connecting roadway networks.

From the interchange eastward towards the airport, East Pine Street is part of the National Highway System (NHS) and is classified as an intermodal connector[1] from I-5 to OR Highway 62 (OR 62). It serves developing commercial and industrial areas along with the Rogue Valley International-Medford Airport to the east and some residential areas to the north. In general, intersections and other accesses are widely spaced with the emphasis on through traffic and freight movement. However, the first intersection, Peninger Road, is located just 500 feet east of the northbound ramp and provides access to the Jackson County Fairgrounds to the north and a truck stop to the south.

West of the interchange, East Pine Street serves downtown Central Point before it connects with OR Highway 99 (OR 99) and continues into primarily residential areas. Downtown Central Point is characterized by a traditional grid system layout of streets with the first intersection located just 400 feet from the southbound interchange ramps. The Central Point Transportation System Plan (TSP) classifies East Pine Street as a principal arterial from 10th Street eastward across the freeway to Peninger Road as reflected in the five-lane cross-section. West of 10th Street, as it enters downtown, East Pine Street is classified as a minor arterial and it narrows to four lanes with on-street parking.

The interchange itself has a standard diamond layout with approximately 1,200 feet between the northbound and southbound ramp terminals. The bridge over I-5 is five lanes wide with a sidewalk on the north side and bike lanes on both sides. Both the northbound and southbound ramp terminals have multi-lane approaches to East Pine Street.

[1] Intermodal Connectors are highways that provide access between major intermodal facilities and the other four subsystems making up the National Highway System. http://www.fhwa.dot.gov/planning/nhs/

1.3. Problem Statement

The current Central Point population is approximately 16,500 residents. By the year 2030, Central Point's population is estimated to be almost 26,000[2], making it the second largest city in the Rogue Valley. Interchange 33 will be affected by growing traffic volumes on OR 99, OR 62, and more traffic, including increased freight movements, will be destined for I-5. The potential for additional development, particularly to the north and east, where two urban reserve locations were identified in the *Greater Bear Creek Valley Regional Plan* (GBCVRP) and future fairground expansions, will further exacerbate these issues.

A geometric deficiency assessment, conducted in 2000 for the *I-5 State of the Interstate Report*, reached the following conclusions about the current design of the interchange:

- Designated right-turn lane on eastbound Pine Street at southbound ramp terminal does not have a through bike lane. Higher speeds combined with heavy vehicles create difficult weave maneuver for slow-moving bicyclists.
- Proximity of I-5 interchanges in Medford promotes local trips on I-5.

In addition to these deficiencies, the spacing of the ramp terminals and other access points along East Pine Street does not meet current access standards. Queue spillback between intersections can already be problematic at certain times of the day and during events at the Jackson County Fairgrounds. High truck volumes near the interchange exacerbate queuing issues since trucks require more storage space than passenger vehicles. As traffic volumes continue to grow, the proximity of these intersections will affect the safe function of the interchange area.

East Pine Street is one of three I-5 crossings in Central Point. The others, Upton Road and Table Rock Road, lie approximately one mile to the north and one and one-half miles to the south, respectively. These are also the only crossings of Bear Creek, which runs parallel to and east of I-5. Peninger Road, which serves those land uses between Bear Creek and I-5, connects northward to Upton Road but has no connections across either the freeway or the creek south of East Pine Street. With these limited crossings, demand will continue to grow and focus on East Pine Street.

Although not identified specifically in the current Rogue Valley Metropolitan Planning Organization (RVMPO) Regional Transportation Plan 2009 – 2034 (RTP) or City of Central Point TSP, interchange operational deficiencies were identified, and projects listed specifically, for the interchange in previous versions of the plans as well as in the East Pine Street Transportation Plan (2004) which is reviewed in Appendix A.

[2] City of Central Point Transportation System Plan, 2008 to 2030, December 18, 2008, page 14.

1.4. IAMP Goal and Objectives

The goals of this IAMP are to develop a plan for improvements for Interchange 33 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of the Central Point and other Rogue Valley communities.

The objectives of the IAMP are to:

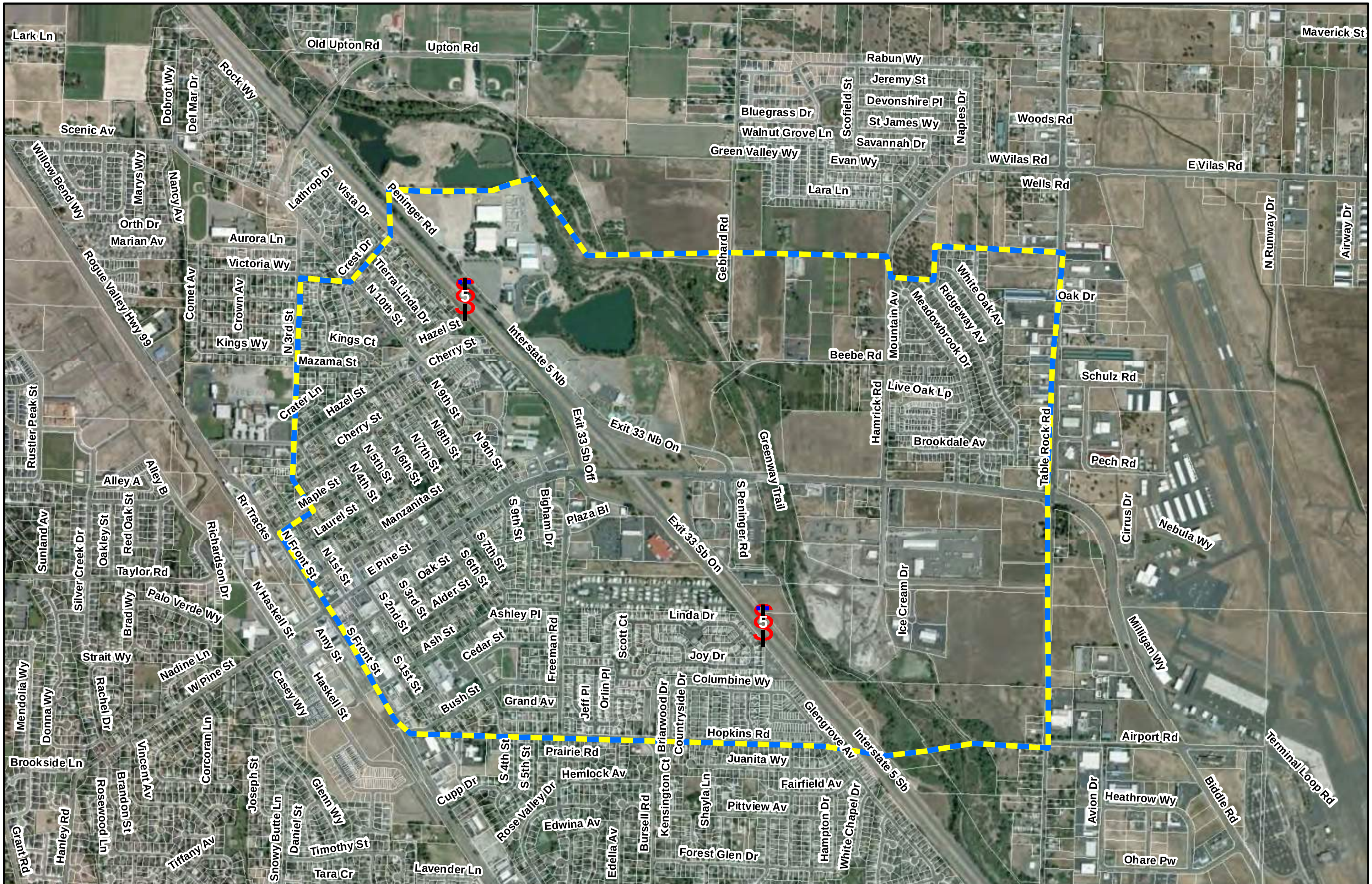
- Protect the function of the interchange and East Pine Street as specified in the Oregon Highway Plan (OHP), RVMPO Regional Transportation Plan, and City of Central Point Transportation System Plan.
- Develop concepts to improve safety and maximize operational efficiency of the freeway and interchange to address existing and future needs.
- Evaluate the need for capacity improvements based on the adopted comprehensive land use plans of Central Point and Jackson County.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and meets OHP requirements and the access spacing standards in Oregon Administrative Rule (OAR) 734-051.
- Incorporate the Greater Bear Creek Valley Regional Plan into the design and management systems for Interchange 33, including recommended strategies for land use control.
- Incorporate the analysis of the City's Pine Street Four-Lane to Three-Lane Conversion study.

1.5. IAMP Planning Area

The IAMP area delineates the vicinity in which transportation facilities, land uses, and approaches may affect operations at the interchange. The planning area, shown in Figure 1-1, generally encompasses properties within one-half mile of the interchange and includes the existing interchange, the immediate surrounding area where potential improvements to ramps could occur, developed areas of Central Point west of I-5, and largely undeveloped properties east of I-5.

Attachments:

Figure 1-1. IAMP Area and Street Network
Appendix A. Review of Plans and Policies



1,500 750 0 1,500 Feet

Source Data: ESRI, Jackson County, Microsoft (2001-09)

Legend

Study Area Boundary

Taxlot boundaries indicated in white

Figure 1-1

Project Vicinity and Study Area

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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I-5 Exit 33 (Central Point)

Interchange Area Management Plan

Appendix A

Review of Plans and Policies

Prepared for

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June 2014

This appendix documents the relevant state, regional, and local transportation and land use plans and policies, and identifies how they influence planning for the I-5 Interchange 33 (Central Point) area. The purpose of this review is to ensure the necessary compatibility, consistency, and compliance required by state law and ODOT policy. Relevant transportation and land use plans and regulations reviewed in this appendix are listed as follows:

- OAR 660 Division 12 (Transportation Planning Rule, including recent amendments)
- Oregon Transportation Plan, and amendments (OTP, Amended September 20, 2006);
- Oregon Highway Plan, and amendments (OHP 1999, Amended July 2006);
- ODOT Division 51 Interchange Access Management Area Spacing Standards for Approaches (OAR 734-051-0010)
- ODOT 2003 Highway Design Manual (HDM)
- Interstate 5 (I-5) State of the Interstate Report (2000)
- Rogue Valley Metropolitan Planning Organization (RVMPO) 2009-2034 Regional Transportation Plan (RTP)
- Regional Intelligent Transportation System (ITS) Operations & Implementation Plan for the Rogue Valley – Final Report, July 2004
- RVMPO North-South Travel Demand Study – Phase I
- Bear Creek Valley Regional Problem Solving Project – Planning Report
- Bear Creek Greenway Plan
- Jackson County Transportation System Plan
- Jackson County Comprehensive Plan
- Jackson County Zoning Ordinance
- Central Point Transportation System Plan
- Central Point Comprehensive Plan and Zoning Ordinance
- East Pine Street Plan

Two additional plans are currently in the development process and will need to be coordinated with the IAMP for Interchange 33:

- I-5 Rogue Valley Corridor Plan
- East Pine Street Corridor Refinement Plan

The I-5 Rogue Valley Corridor Plan is in the alternatives analysis phase while the East Pine Street Corridor Refinement Plan will be getting under way in the fall of 2010. Findings and recommendations from these plans will need to be tracked and incorporated into IAMP 33.

1.1. State of Oregon Goals, Plans and Reports

OAR 731-015-0065 requires IAMPs to be in compliance with applicable statewide planning goals. IAMPs also need to be consistent with applicable state plans.

1.1.1. Statewide Planning Goal 12 (Transportation) and OAR 660, Division 12

Goal 12, Transportation, requires cities, counties, metropolitan planning organizations (MPOs) 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.

Goal 12 is implemented through OAR 660, Division 12, the Transportation Planning Rule (TPR). The TPR contains numerous requirements governing transportation planning and project development, several of which warrant comment.

Project Relevance

The TPR requires local governments to adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions" (OAR 660-012-0045(2)). This policy is achieved through a variety of measures, including:

- Access control measures, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;
- Standards to protect future operations of roads;
- A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;
- A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;
- Regulations to provide notice to ODOT of land use applications that require public hearings, involve land divisions, or affect private access to roads; and
- Regulations ensuring that amendments to land use designations, densities, and design standards are consistent with the functions, capacities, and performance standards of facilities identified in the TSP. See also OAR 660-012-0060.

The Oregon Land Conservation and Development Commission's rules implementing Goal 12 do not regulate access management. ODOT adopted OAR Chapter 734, Division 51 to address access management and it is expected that ODOT, as part of this project, will engage in access management consistent with OAR Chapter 734, Division 51 (see page A-5).

1.1.2. Oregon Transportation Plan

The Oregon Transportation Plan (OTP) is the state's long-range multimodal transportation plan. The OTP is the overarching policy document among a series of plans that together form the state TSP. The OTP considers all modes of Oregon's transportation system as a single system and addresses the future needs of Oregon's airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation, and railroads. The current OTP assesses state, regional, and local public and private transportation facilities through 2030. The OTP establishes goals, policies, strategies, and initiatives that address the core challenges and opportunities facing Oregon. It also provides the framework for prioritizing transportation improvements based on varied future revenue conditions.

The OTP supersedes the 1992 Oregon Transportation Plan. The 1992 OTP established a vision of a balanced, multimodal transportation system and called for an expansion of ODOT's role in funding non-highway investments. The current OTP, adopted in 2006, furthers these policy objectives with an emphasis on maintaining the assets in place, optimizing the existing system performance, creating sustainable funding, and investing in strategic capacity enhancements. Development of IAMPs is integral to maintaining assets and optimizing system performance.

Project Relevance

The most pertinent OTP goals and policies for interchange planning are as follows:

- Goal 1 – Mobility and Accessibility
  - Policy 1.3 – Relationship of Interurban and Urban Mobility
- Goal 2 – Management of the System
  - Policy 2.1 – Capacity and Operational Efficiency
  - Policy 2.2 – Management of Assets
- Goal 3 – Economic Vitality
  - Policy 3.1 – An Integrated and Efficient Freight System
  - Policy 3.2 – Moving People to Support Economic Vitality
- Goal 4 – Sustainability
  - Policy 4.1 – Environmentally Responsible Transportation System
  - Policy 4.2 – Creating Communities
- Goal 5 – Safety and Security
  - Policy 5.1 – Safety and Security
- Goal 7 – Coordination, Communication and Cooperation
  - Policy 7.1 – A Coordinated Transportation System
  - Policy 7.3 – Public Involvement and Consultation
  - Policy 7.4 – Environmental Justice

An IAMP must be consistent with the applicable OTP goals and policies. Findings to the effect that the IAMP complies with all of the above pertinent policies need to be developed as part of an IAMP adoption package presented to the Oregon Transportation Commission (OTC).

1.1.3. Oregon Highway Plan

The OHP establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. 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.

Project Relevance

OAR 734-051-0155 requires IAMPs to be consistent with the Oregon Highway Plan (OHP). The policies applicable to planning for interchange improvements are described below, with impacts to interchange planning shown in italic.

Goal 1. System Definition, the following policies are applicable to the project:

Policy 1B (Land Use and Transportation), which recognizes the need for coordination between state and local jurisdictions;

Coordination with local jurisdictions will occur throughout the preparation of the IAMP. Advisory Committee's will inform the IAMP. Members from local jurisdictions will be included.

Policy 1C (State Highway Freight System), which states the need to balance the movement of goods and services with other uses;

The traffic operations analysis will account for freight movement as well as passenger vehicle movement. Interstate 5 is a designated freight route.

Policy 1F (Highway Mobility Standards), which sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the interchange to function in a manner consistent with OHP mobility standards; and

The purpose of the IAMP is to understand the relationship between land uses and traffic in the areas of the interchange, and to enable land uses to be planned so that the public investment in the facility is best protected.

Policy 1G (Major Improvements), which requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Reconstruction or redesign of Interchange 33 would be intended to reduce congestion while improving operations and safety, prior to adding capacity.

Goal 2. System Management, the following policies are applicable to the project:

Policy 2B (Off–System Improvements), which helps local jurisdictions adopt land use and access management policies; and

The IAMP will include sections describing existing and potential land use patterns and implementation measures, as well as summarize the traffic operations analysis conducted. Implementation of the IAMP may require an intergovernmental agreement between ODOT and the City of Central Point and may require amendments to city plans and ordinances.

Policy 2F (Traffic Safety), which improves the safety of the highway system.

The purpose of any reconstruction or redesign of the interchange will be to improve safety as well as traffic operations.

Goal 3. Access Management, the following policies are applicable to the project:

Policy 3A (Classification and Spacing Standards), which sets access spacing standards for driveways and approaches to the state highway system;

The access management plan component will compare access spacing with adopted access standards.

Policy 3C (Interchange Access Management Areas), which sets policy for managing interchange areas by developing an IAMP that identifies and addresses current interchange deficiencies and short-, medium-, and long-term solutions; and

This IAMP will analyze and address current and future interchange deficiencies and will suggest solutions both for the short and long term.

Policy 3D (Deviations), which establishes general policies and procedures for deviations from adopted access management standards and policies.

If proposed interchange improvements do not meet access spacing standards, the project would require deviation findings.

1.1.4. OAR Chapter 734, Division 51 (Highway Approaches, Access Control, Spacing Standards and Medians)

OAR 734-051 governs the permitting, management, and standards of approaches to state highways to ensure safe and efficient operation of the state highways.

OAR 734-051 policies address the following:

- How to bring existing and future approaches into compliance with access spacing standards, and ensure the safe and efficient operation of the highway
- The purpose and components of an access management plan
- Requirements regarding mitigation, modification, and closure of existing approaches as part of project development

Project Relevance

Section 734-051-0125, Access Management Spacing Standards for Approaches in an Interchange Area, establishes interchange management area access spacing standards. Section 734-051-0155 specifies elements that are to be included in IAMPs, such as short-, medium-, and long-range actions to improve and maintain safe and efficient roadway operations within the interchange area. The access management plan component of this project will compare access spacing with adopted access standards. If future proposed interchange improvements do not meet access spacing standards outlined in OAR 734-051-0125, the project will require deviation findings to interchange and roadway approach (public and private streets and driveways) access management spacing standards, as per OAR 734-051-0135.

1.1.5. Highway Design Manual (HDM) (2003, Revised 2008)

The HDM provides design standards for state highways and associated highway elements. These standards are dependent on the highway's functional classification and project type (e.g., Modernization, Preservation, Safety, Operations, or Maintenance). The purpose of the HDM is to establish mobility standards when evaluating potential design configurations.

<u>Project Relevance</u>

Application of these standards will be used in the development of the Alternatives and a Preferred Concept.

1.1.6. Interstate 5 State of the Interstate Report

The Interstate 5 State of the Interstate Report (2000) describes the existing and forecasted operating, geometric, safety, and physical conditions for the Interstate 5 mainline and interchanges within Oregon.

<u>Project Relevance</u>

Below is a description of Interchange 33 based on the Interstate 5 State of the Interstate Report:

Interchange 33, built in 1960, has a standard diamond configuration. The interchange provides access to Pine Street which changes to Biddle Road on the east side of the interchange. Pine Street is a five-lane arterial which serves as the primary east-west link between Highway 99 and I-5 in this area.

Although a project in 1991 improved the intersection spacing and driveway conditions on Pine Street, some deficiencies remain. A detailed deficiency assessment identified the following:

- Designated right turn lanes on eastbound Pine Street at southbound ramp terminal does not have a through bike lane. Higher speeds combined with heavy volumes create difficult weave maneuver for slowing bicyclists.
- Proximity of I-5 interchanges in Medford promotes local trips on I-5.

Year 2000 average daily traffic volumes on I-5 at the interchange were 33,000. Year 2000 average daily traffic levels on Pine Street is about 22,000. Peak hour turning movement counts were conducted at nine intersections on Pine Street at or near the interchange. West of the interchange, Pine Street's intersection with Highway 99 is currently operating at congested conditions. East of the interchange, Pine Street's intersection with Hamrick is operating at congested conditions and at Table Rock Road at very congested conditions. Year 2020 forecasts indicate these intersections should operate similarly or worse.

An investigation of detailed crash data revealed five accidents between 1994 and 1998 shows that fourteen crashes have been reported at the northbound ramp terminal. The crashes primarily involved vehicles pulling out onto Pine Street from the ramp at an unsignalized intersection. One crash was related to a row of trees at the toe of the fill slope of at the end of the northbound entrance ramp.

At the time of the report, the ODOT bridge inspection program determined that the bridge over Interstate 5 has a sufficiency rating of 88.8. A bridge sufficiency rating of 80 or more means the bridge is not eligible for rehabilitation, no feature of the structure is deficient or becoming deficient.

The Interstate Report references the 1997 Pavement Conditions Report. The 1997 report classifies the I-5 segment between milepost 28.33 and milepost 35.75 as having a 100.0 overall section index (very good condition) for both the northbound and southbound lanes. However, the information is outdated, because the 2008 Pavement Conditions Report is now available. The Oregon State Highway System 2008 Pavement Conditions map for Region 3 (December 2008) shows the condition north and south of Interchange 33 as fair. A fair rating means that cracking is easier to detect, the pavement is patched but not excessively, there is deformation more pronounced and easily noticed, ride qualities are good to acceptable, and rutting may be present but is less than three-quarters of an inch.

1.2. Regional Plans Reports and Studies

The following Plans, Reports and Studies were reviewed as they relate to Interchange 33:

1.2.1. Rogue Valley Metropolitan Planning Organization 2009-2034 Regional Transportation Plan

The Rogue Valley Council of Governments (RVCOG), the designated metropolitan planning organization (MPO) for Jackson County and the seven cities (Ashland, Talent, Phoenix, Jacksonville, Medford, Central Point, and the unincorporated community of White City,) prepared the Regional Transportation Plan (RTP) as one of its transportation planning responsibilities. The RTP is a multi-modal transportation plan designed to meet the anticipated 25 year transportation needs within the MPO planning area boundary. The RTP serves as a guide for the management of existing transportation facilities and for the design and implementation of future transportation facilities through the year 2034. The Rogue Valley Metropolitan Planning Organization updated and adopted the current Regional Transportation Plan for 2009-2034 on March 24, 2009. The RTP provides a summary of the regional transportation actions anticipated to occur in the planning area through 2034. The actions presented are in the context of the respective modes and planning issues and include: multi-modal safety and security; transportation system management; transportation demand management; street system; bicycle and pedestrian facilities; transit system; parking; future conditions; and plan consistency. The RTP goals, each of which has several associated policies, are:

> Goal 1. Plan for, develop, and maintain a balanced multi-modal transportation system that will address existing and future needs.
>
> Goal 2. Optimize safety and security on the transportation system.

Goal 3. Use transportation investments to foster compact, livable communities. Develop a plan that builds on the character of the community, is sensitive to the environment, and enhances quality of life.

Goal 4. Develop a plan that can be funded and that reflects responsible stewardship of public funds.

Goal 5. Maximize the efficient use of transportation infrastructure for all users and modes.

Goal 6. Use incentives and other strategies to reduce reliance on single-occupant vehicles.

Goal 7. Provide an open, balanced, credible process for planning and developing the transportation system.

Goal 8. Encourage use of cost-effective emerging technologies to achieve regional transportation goals.

Goal 9. Use transportation investments to foster economic opportunities.

Project Relevance

The Rogue Valley Metropolitan Planning Organization (RVMPO) Regional Transportation Plan 2009 – 2034 (RTP) includes two short-term projects that influence the interchange but do not constitute an actual redesign.

1. East Pine St., I-5 to Peninger St. (RTP 852): add a right turn lane with sidewalks. Estimated cost of $550,000.

2. East Pine St: Bear Creek Bridge-Medford city limit (RTP 851): overlay, signals and striping. Estimated to cost $600,000.

The 2005 – 2030 RVMPO RTP had two projects identified specifically for the interchange. The first project (RTP #912) was to be a short-term (2005-2009) improvement that includes extending and channelizing the southbound off-ramp for added storage. The second project (RTP #918) was a long-term (2016-2030) improvement including full interchange reconfiguration.

The land use element designates part of the City of Central Point along OR 99 west of the IAMP, as a Transit Oriented Development (TOD) high-growth area. The TODs were originally developed in the Transit Oriented Development and Transit Corridor Design Strategies Final Report (August 1999).

1.2.2. Rogue Valley Metropolitan Planning Organization, Regional Intelligent Transportation System (ITS) Operations & Implementation Plan for the Rogue Valley Metropolitan Area – Final Report (July 2004)

In 2004 the RVMPO completed a comprehensive Rogue Valley Intelligent Transportation Systems plan (RVITS). This 20-year plan identifies advanced technologies and management techniques that can relieve traffic congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. The project is part of a federal initiative to use ITS to increase the efficiency of existing transportation infrastructure, improving overall system performance and reducing the need to add capacity. Efficiency is achieved by providing services and information to travelers so that they can make better travel decisions and to transportation system managers so they can better manage the system. To ensure the development of a relevant plan, RVITS was produced with guidance from RVMPO member jurisdictions and key stakeholders from emergency services and communications agencies.

The RVITS plan provides a framework of policies, procedures, and strategies for integration of ITS with the region's existing resources to meet future regional transportation needs and expectations. The plan includes the continuation and expansion of Transportation System Management (TSM) projects and programs that have been under way for some time, such as coordination of traffic signals.

RVITS projects address the following categories:

- Travel and Traffic Management
- Communications
- Public Transportation Management
- Emergency Management
- Information Management
- Maintenance and Construction Management

Project Relevance

Applicable policies of the RVITS plan will be integrated into the development of alternatives and Preferred Concept for the redesign of Interchange 33.

1.2.3. Rogue Valley Metropolitan Planning Organization, North-South Travel Demand Study

The RVMPO is preparing to conduct a study intended to develop a long-term multimodal concept plan for the OR-99 Corridor Area as an alternative to I-5 north-south travel from Crowson Road in Ashland to Interchange 35 north of Central Point. The plan will include strategies that reduce vehicular traffic congestion, greenhouse gases, and support economic development along the north-south corridor and beyond the study area. In recognition of the strong influence of land use and multimodal transportation on peak-hour travel, the study will determine the appropriate population density and land use patterns necessary to support transit alternatives such as enhanced commuter transit, bus rapid transit, and commuter rail. The study will also identify transportation options and ITS strategies to reduce vehicle trips and improvements needed to improve bicycle and pedestrian connectivity. The study will develop and evaluate various alternatives to improve mobility of all modes within the study area.

Project Relevance

Available findings from the North-South Travel Demand Study will be taken into consideration in the development of alternatives for the redesign of Interchange 33.

1.2.4. Bear Creek Greenway Plan

The Bear Creek Greenway is a narrow corridor of publicly owned land that follows the Bear Creek streambed from Ashland (Nevada Street) to Central Point (Pine Street). Development of the Bear Creek Greenway bicycle and pedestrian path began in 1973 when ODOT built the first 3.4-mile section of the pedestrian/bicycle path through Medford. The Bear Creek Greenway currently includes two primary sections:

- Pine Street in Central Point to Barnett Road in Medford; and
- Blue Heron Park in Phoenix to Nevada Street in Ashland.

When complete, the Bear Creek Greenway will provide a 20-mile, multi-use path from the I-5/Seven Oaks Interchange in Central Point to Nevada Street in Ashland. It will serve as an important facility for intercity travel in the I-5/OR-99 corridor. Additionally, a Rogue River Greenway is currently in the planning stages. This greenway will connect the communities of Grants Pass, Rogue River, and Gold Hill and would eventually be linked to the Bear Creek Greenway at the Seven Oaks Interchange which is south of Interchange 33.

Project Relevance

The Bear Creek Greenway begins just southeast of the interchange, adjacent to Pine Street. Any redesign of Interchange will not interfere or impact this resource.

1.2.5. Greater Bear Creek Valley Regional Problem Solving Plan

The State of Oregon, Jackson County, and the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix, and Talent began a collaborative effort in April 2000 to launch the Greater Bear Creek Valley Regional Problem Solving (RPS) project. Under the authority of Oregon's Regional Problem Solving (RPS) Statute (Oregon Revised Statute (ORS) 197.652-658), multiple jurisdictions working in a collaborative effort may depart from state administrative rules where needed to implement creative solutions to mutually agreed-upon regional land use problems. The process must offer an opportunity to participate with appropriate state agencies and all local governments within the region affected by the problems that are the subject of the problem-solving process.

The RPS process has created a coordinated expansion plan for Jackson County and the cities of Ashland, Central Point, Eagle Point, Jacksonville, Medford, Phoenix, and Talent known as the *Greater Bear Creek Valley Regional Plan* (Regional Plan). Currently in the draft stage, the plan is the only effort of such complexity and scope under RPS to reach this final stage of adoption and acknowledgement. The Regional Plan, when implemented, will establish coordinated urban reserves between the seven participating cities and Jackson County, and will establish regional policies and mechanisms to balance rural and urban land needs to prepare for a future doubling of the regional population.

The purpose of the Greater Bear Creek Valley RPS process is to identify additional lands needed for urban development to accommodate a doubling of the region's population. The jurisdictions involved in the RPS project have agreed upon and adopted a set of goals and policies to guide the development of the Regional Plan.

Goal 1 – Manage Future Regional Growth for the Greater Public Good
Goal 1 includes policies calling for the use of intergovernmental agreements and amendments to comprehensive plans to implement the Regional Plan, increased residential densities across the region, identification of major infrastructure corridors, a more efficient network of public streets, and a balance of jobs and housing on the local and regional levels.

Goal 2 – Conserve Resource and Open Space Lands for their Important Economic, Cultural, and Livability Benefits
Goal 2 includes policies calling for a shared vision of maintaining a commercially viable agricultural land base, uniform standards of agricultural buffering, and the long-term preservation of regionally significant open space.

Goal 3 – Recognize and Emphasize the Individual Identity, Unique Features, and Relative Competitive Advantages and Disadvantages of Each Community within the Region
Goal 3 includes policies calling for mechanisms to enhance individual community identity, increase flexibility in the event of future boundary expansions, and permit an unequal distribution of certain land uses among jurisdictions, and the development of individual definitions of each community based on its unique identity and vision of future urban form.

Project Relevance

In the November 2009, Greater Bear Creek Valley Regional Draft Plan, the Management Area is represented in several different study areas. All the study areas which incorporate parts of the Management Area have been identified as suitable under Goal 14 for an Urban Reserve designation (Urban Reserve Areas (URAs) are areas proposed through this regional planning effort to accommodate the amount of growth projected over the next 50 years).

1.3. County and City Plans and Ordinances

Upon completion, the city, county and the MPO must adopt the IAMP as a policy and implementation document before ODOT can present the IAMP to the Oregon Transportation Commission (OTC) for review and approval. If the IAMP is adopted, subsequent changes to the city and county's plans and ordinances may be necessary to be compatible with the IAMP. Any necessary changes to the Plans and Ordinances will be identified in Technical Memorandum #8 after a Preferred Concept, Access Management Plan and Management Actions have been finalized.

1.3.1. Jackson County Transportation System Plan (2005)

Jackson County and ODOT began updating the transportation element of the comprehensive plan in 2001 and completed the adopted Jackson County TSP in March of 2005. The primary study area for the TSP consists of all areas of Jackson County located outside the Urban Growth Boundaries (UGBs) of incorporated cities, although it does include issues identified in local TSPs or the RTP that affect state and county facilities inside UGBs.

The TSP has three primary goals: livability, modal components, and integration. The TSP includes associated policies that provide direction for accomplishment of the goals and that "have the force of law."

Project Relevance

The goals and policies applicable to the Interchange are described below.

Goal 4.1 – Livability

The Livability Goal is to "develop and maintain a safe and multi-modal transportation system capable of meeting the diverse transportation needs of Jackson County while minimizing adverse impacts to the environment and to the County's quality of life." Policies applicable to Interchange 33 are as follows:

Policy 4.1.4-A – Jackson County will provide a transportation system that supports access for emergency vehicles and provides for evaluation in the event of a wildfire hazard or other emergency.

Policy 4.1.4-B – Public Safety will be a primary consideration in the planning, design, and maintenance of all Jackson County Transportation Systems (RTP 16-4).

Goal 4.2 – Modal Components

The Modal Components Goal is to plan an integrated transportation system that maintains existing facilities and responds to the changing needs of Jackson County by providing effective multimodal transportation options.

Policy 4.2.1-A – Jackson County will prioritize preservation and maintenance of the existing road system rather than increasing vehicular capacity.

Policy 4.2.1-B – Roadway Improvement projects will be consistent with the functional classification designations (arterial, major collector, etc.) in the TSP.

Policy 4.2.1-C – Implement transportation demand management primarily through application of an integrated land use and transportation plan. Encourage other methods of transportation demand management as feasible opportunities arise.

Policies 4.2.1-G through J – Jackson County will: Balance the need for movement of goods with other uses of county arterials and state highways by maintaining efficient through movement on major truck routes (G). Work with ODOT to identify roadway obstacles and barriers to efficient truck movements on state highways and coordinate highway projects with other freight movement projects and infrastructure (H). Support employment of technology to improve freight mobility (I). Jackson County is committed to maintaining and improving roadway facilities serving inter-modal freight facilities (J).

Policy 4.2.1-P – Jackson County will coordinate with ODOT to ensure that highway designations and management policies are appropriate and meet the Goals and Policies of the OHP and the Jackson County TSP. Jackson County will work with ODOT for effective management of highway capacity.

Policy 4.2.1-R – Jackson County will coordinate with cities on transportation planning and transportation projects to provide well-connected transitions from city to County transportation systems.

Policies 4.2.1-S and T – Jackson County is committed to maintaining a volume-to-capacity ratio of 0.95 for weekday peak hour vehicular traffic in the MPO area (S). Jackson County will engineer traffic flow to provide efficient transportation system management (T).

Policy 4.2.1-U – Jackson County will manage road approaches to preserve the safe and efficient operation of the County's roadways, consistent with their functional classification.

Policies 4.2.6-A and B – Bulk Transport and Mass Freight System: Jackson County will continue to plan for rail service as a viable long-term transportation option for the Rogue Valley (A). Jackson County will encourage bulk transportation facilities to provide efficient transport of bulk goods (B).

Goal 4.3 - Integration

The Integration Goal is to achieve the livability and modal elements goals by integrating land use planning, system financial planning, environmental planning and application of policies to address transportation needs in specific locations.

Policy 4.3.1-B – Plan amendments, zone changes and type 3 and 4 land use permits need to demonstrate that adequate transportation planning has been done to support the proposed land use.

Policy 4.3.1-C – Jackson County will establish and maintain land development ordinance regulations to protect and improve the transportation system.

Policy 4.3.1-D – Regardless of whether adequate capacity exists, changes in land use and new or expanded development proposals will not be approved if they will create, or would worsen, a safety problem on a public transportation system or facility. If a problem would be created or worsened without mitigation, then a mitigation plan that resolves the safety concern must also be approved and included in the proposal in border for the land use change and/or development proposal to be approved. Where a safety concern exists, study by a registered professional engineer with expertise in transportation will be considered to determine if a problem would be created or worsened.

The following projects listed in the TSP may have direct or indirect affects on the Interchange:

Tier 1 Short and Medium Range:

> 26. White City to I-5 Freight Improvements - This project is a funding placeholder that anticipates future projects that will be identified from the White City freight mobility planning project.
>
> 23. Table Rock Road (Biddle to Bear Creek) - To accommodate existing and future traffic volumes, this Tier 1 RTP project widens Table Rock Road to a three-lane cross-section with bike lanes and sidewalks between Biddle Road/Pine Street and Bear Creek. This project is one of the County's highest priorities because it makes substantial improvements on an alternate route to Highway 62. The middle component of the project from Biddle to Wilson is scheduled for construction during the period anticipated for TSP adoption. This project combined with the widening from Biddle to Wilson will address future volume needs, bringing the Biddle-Table Rock intersection to a projected 2023 v/c around .83.

Tier 2 (Unfunded) Projects:

> 41. Peninger Road - This Tier 2 RTP project widens Peninger Road from Pine Street to Expo Park to three lanes with bike lanes and sidewalks. The project provides additional roadway capacity and separates bicycle and pedestrian traffic from motor vehicles. This project will accommodate future volumes from fairground expansions. High traffic generating fairground uses tend to be event based. This project, along with any improvements to the Peninger-Pine intersection should consider the opportunity to use the center lane as a directional demand lane that would change directions to accommodate event based traffic demands.

1.3.2. Jackson County Comprehensive Plan

The Board of Commissioners approved amendments to the Jackson County Comprehensive Plan on January 12, 2004, which became effective March 12, 2004. Ordinance No. 2006-3 was adopted May 31, 2006 and became effective July 30, 2006. The Jackson County Comprehensive Plan and Map is the official long-range land use policy document for Jackson County. The plan sets forth general land use planning policies and allocates land uses to resource, residential, commercial and industrial categories. The plan serves as the basis for the coordinated development of physical resources and the development or redevelopment of the county based on physical, social, economic and environmental factors. The comprehensive plan establishes the purpose, map designation criteria, and the basis for determining the appropriate zoning district for each land use.

Project Relevance

The land within the Management Area and Jackson County which is outside of the UGB is designated Limited Use for the Jackson County Exposition Park (the Fairgrounds) and Agricultural east of the Fairgrounds. The Limited Use designation limits uses, densities, public facilities and services, and activities to those which do not fit under any other land use classification and which meet the requirements identified in a Comprehensive Plan Amendment goal exception statement. The Agricultural designation is intended to "preserve agricultural lands for farm use, preventing uses or activities that are incompatible with farm use within or near agricultural land".

Technical Report #2 will include a detailed analysis of comprehensive plan designations and land uses for the Management Area.

1.3.3. Jackson County Land Development Ordinance

The Jackson County LDO regulates uses, activities and structures on lands within the unincorporated areas of the County. The LDO provides the standards for construction of improvements which are monitored through the land use approvals/permitting process.

Project Relevance

The area adjacent to and northeast of the interchange and within the Management Area is regulated by the Jackson County Land Development Ordinance (LDO). The area of the Fairgrounds is zoned Rural Residential - 5 acres. The purpose of the rural residential zoning districts is to provide for large-lot residential areas, consistent with the predominant rural character of the area and the physical capability of the land. The land east of the Fairgrounds is designated EFU to conserve agricultural land. Chapter 1025, System Development Charges, of the Codified Ordinance is the only section of the code that provides provisions for impacts to the transportation system as related to development.

Technical Report #2 will include a detailed analysis of zoning designations within the Management Area.

1.3.4. City of Central Point Transportation System Plan (2008)

The City of Central Point TSP adopted its TSP on December 18, 2008. In acknowledgement of its relationship between the TPR and the RTP, the organization of the Central Point TSP closely follows the format described in the TPR – Elements of Transportation System Plans. The goals and policies described below are pertinent to the IAMP and represent the city's vision for maintaining and advancing its transportation system in coordination with its land use program through the year 2030. The ultimate objective of the Central Point TSP is to efficiently and effectively provide for the transportation needs of the community while improving the quality of life of its citizens.

Project Relevance

The following goals are relevant to planning of the Interchange:

> Goal 5.2 – Access Management
>
> The City of Central Point will employ access management strategies to ensure safe and efficient roadways consistent with their designated function.

Policy 5.2.2 - The city shall implement the access management strategies presented in the Access Management Plan for Front Street (Highway 99)/Pine Street and the Central Point Highway 99 Corridor Plan.

Goal 5.5 – Transportation Demand Management

The City of Central Point will maintain consistency between transportation demand management (TDM) measures promoted by the city with the regional transportation plan strategies aimed at reducing reliance on the single occupant vehicle (SOV) and reducing vehicle miles traveled (VMT) per capita.

Policy 5.5.1 - The city shall coordinate and maintain a consistency in the implementation of transportation demand management strategies with similar regional strategies as presented in the Regional Transportation Plan.

Goal 7.1 – Street System

Provide a comprehensive street system that serves the present and future mobility and travel needs of the Central Point urban area, including provisions for bicycle and pedestrian facilities.

Policy 7.1.2 - The city's street system shall contain a network of arterial and collector streets and highways that link the central core area and major industry with regional and statewide highways.

Policy 7.1.5 - The city shall actively pursue construction of I-5 interchange improvements at Pine Street.

Goal 10.1 – Rail Freight

The City of Central Point will provide efficient, safe, and effective movement of goods, services, and passengers by rail while maintaining the quality of life for the citizens of the Central Point urban area.

Policy 10.1.1 - The city shall encourage both freight and passenger service as part of statewide rail transportation planning efforts.

Goal 11.1 – Truck Freight

The City of Central Point will identify and maintain a truck freight system within the city that serves the city's and region's freight needs in an efficient and safe manner, with minimal adverse impacts on adjacent land uses.

Policy 11.1.1 - The city shall cooperate with the RVMPO, Jackson County, ODOT, and the City of Medford in the coordination of design, funding, and improvement of the freight system within the city that enhances freight movement, while improving the overall capacity of the city's street system.

Policy 11.1.2 - The Freight System Map presented in Figure 11.2 of the TSP shall be considered by the city as the official freight route system for the City of Central Point. The design and improvement of the street system designated on the Freight System Map shall accommodate large vehicles typical of freight movement.

Policy 11.1.3 - The city shall ensure access to truck freight via the local street system, with emphasis on maintaining an efficient and safe designated truck route system.

The City of Central Point TSP lists the following projects which are directly or indirectly related to the interchange:

Tier 1 - Long- term

- East Pine Street; I-5 to Peninger Road (TSP 226): Add right turn lane with sidewalks. Estimated Cost $125,912

Tier 2 - Unfunded

- East Pine Street: Hamrick Road to Bear Creek Bridge (TSP 233): Widen for deceleration/acceleration lanes, add bike lanes and sidewalks. Estimated Cost $800,000.
- East Pine Street: Bear Creek Bridge to Peninger Road (TSP 236): Widen for turn lanes, bike lanes, add sidewalks and third lane. Estimated Cost $120,000.
- Peninger Road Project (TSP 245): Extend Peninger Road from East Pine Street north across Bear Creek to Beebe Road and remove signal at Peninger /Pine Street and construct bridge across Bear Creek. Also, extend Peninger Road south across Bear Creek to intersect with S. Hamrick Road. Estimated Cost $10,566,108.
- East Pine Street; I-5 to Table Rock Road (TSP 255): Widen East Pine Street to add third westbound through lane from east side of Table Rock Road to I-5 SB off-ramp. Estimated Cost $7,000,000.

1.3.5. City of Central Point Comprehensive Plan

The City of Central Point Comprehensive Plan was adopted in 1991, with a planning period target date of 2010. The plan is divided into 10 functional elements: Planning area, land distribution, environmental factors, transportation land, commercial land, industrial land, housing land, amenity land, and implementation. The plan provides goals and policies for all but the land distribution and implementation elements.

Element 4: Transportation Land, describes the transportation systems in existence at the time the plan was written, including bus, taxi, air, and railroad services. The element describes functional classifications, identifies the functional classification of streets within the city, and provides standards. The transportation element goal is "to provide and encourage a safe, convenient and economic transportation system."

Project Relevance

Relevant objectives, including objectives that directly reference the Interchange, include:

4-1 Continue to work with the Oregon Department of Transportation and other transportation agencies to coordinate the local circulation/transportation system with local area freeway and major highways.

4-2 Formally purpose that the PineStreet/I-5 Interchange be upgraded to a full clover-leaf design and the bridge widened to adequately provide for the future growth of the City, Expo Park and the airport.

4-3 Work with transportation officials and the county to create an additional access point from the I-5 Freeway to Expo Park. (Possibilities should include a frontage road off-ramp for northbound traffic north of Pine Street, and the possible improvement of the Upton Road bridge to include freeway access)

4-4 Optimize the utilization and operation of existing streets and highways as the backbone of circulation facility extensions.

4-7 Continue to upgrade Pine Street through the downtown area to major arterial status as a high priority.

4-13 Coordinate all street planning and improvement efforts with the plans and activities of other jurisdictions and agencies.

4-15 Whenever feasible, the city will utilize existing streets, highways, and other transportation facilities to the fullest extent possible to maximize the return on past public investments.

4-20 The city will remain aware of the state planning programs and take part in the state's participatory transportation planning process.

An area designated by the Comprehensive Plan Map as Tourist and Office stretches from the eastside to the westside of I-5 around the interchange and Pine Street. Other nearby Comprehensive plan designations are: civic, parks and open space, and high density residential. Technical Report #2 will include a detailed analysis of comprehensive plan designations and land uses for the Management Area.

1.3.6. City of Central Point Zoning Ordinance of 1981

The City of Central Point Zoning Ordinance regulates land uses and activities on lands within the City. The Central Point Zoning Ordinance provides the standards for construction of improvements which are monitored through the land use approvals/permitting process.

Project Relevance

The area west of the interchange and the area southeast of the interchange are regulated by the Ordinance. An area designated by the Comprehensive Plan Map as Tourist and Office (C-4) stretches from the eastside to the westside of I-5 around the interchange and Pine Street. The C-4 district purpose is to provide tourist and entertainment facilities to serve residents and tourists passing through the area. Chapter 17.44C-4, Tourist and Office-Professional District states "development should occur at locations that will maximize ease of access and visibility from the Interstate 5 freeway and major arterial streets and to be convenient to the users of Expo Park, the airport, and downtown". There are no standards for access management for existing streets or standards requiring the identification of potential transportation system performance deficiencies as a result of development proposals.

Technical Report #2 will include an analysis of zoning designations and land uses within the Interchange Management Area.

1.3.7. East Pine Street Plan (2004)

The East Pine Street Plan was a collaborative effort between the City of Central Point, the Oregon Department of Transportation, Jackson County, and local stakeholders to identify needed projects within the East Pine Street Corridor to accommodate projected growth and added traffic from local development within the corridor.

Project Relevance

The East Pine Street Plan analyses the existing and future operations of the interchange and surrounding area. Some of the operational problems identified were:

- The proximity of Peninger Road to the northbound Interstate 5 ramp terminal intersection at East Pine Street creates queuing problems during certain times of the day and during events at the Jackson County Fairgrounds.
- The high percentage of truck traffic near the interchange complicates queuing problems, since fewer vehicles can be stored on East Pine Street between the signals.
- The existing signal spacing is well below the minimum spacing standards dictated in ODOT's Access Management Spacing Standards.

The Plan has six guiding policies all applicable to the IAMP.

Policy 1 - The principal function of East Pine Street shall be to provide for through traffic (regional) consistent with its Oregon Highway Plan designation as a National Highway System Intermodal Connector. Local development traffic will be served through access-managed connections to East Pine Street at locations that facilitate the progression of through traffic.

Policy 2 - Encourage traffic systems management strategies. These include signal timing enhancements to maximize the bandwidth for through traffic, traffic signal coordination, and spot improvements to provide additional capacity for traffic.

Policy 3 - Provide a secondary roadway system to allow for circulation of local traffic with managed access to East Pine Street.

Policy 4 - Encourage cooperative funding with a fair allocation between local, county, state and developer funding.

Policy 5 - Actively pursue construction of I-5 interchange improvements.

Policy 6 - Pursue inclusion of principal plan elements into the RTP, TSP.

Following are the recommended projects derived from the analysis done for the East Pine Street area that would improve the transportation system in the area to efficiently serve expected traffic levels:

- I-5/ East Pine Street Interchange – Initial improvements will add capacity to the northbound off-ramp to accommodate the high right-turn volume demand. Eventually, the left-turn lanes onto the ramps will be removed and replaced with loop ramps. Additional capacity improvements are also needed to accommodate added local development traffic.
- Peninger Road/ East Pine Street – The close proximity of this intersection to the northbound I-5 off-ramp intersection will necessitate the need to remove the signal and convert the intersection to a right-in/ right-out stop-controlled intersection. Intermediate capacity enhancements are considered as part of this plan to delay the need for removing the signal.
- East Pine Street – An additional westbound through lane will eventually be required based on projected traffic volumes from Table Rock Road to the southbound Interstate 5 off-ramp intersection.
- Hamrick Road/ East Pine Street and Table Rock Road/ East Pine Street – Major capacity enhancements are included in this plan for these intersections to accommodate heavy left-turn volume demand and added traffic due to developments along East Pine Street that will use existing and proposed cross-streets versus direct access to East Pine Street.
- Beebe Road/ Hamrick Road – A traffic signal is proposed at this location.
- New Public Streets – A new north-south running public street is proposed between the existing Peninger Road and Hamrick Road intersections. The new roadway will extend from Beebe Road to a new east-west running street south of East Pine Street. The new east-west street will allow Peninger Road traffic to use the new signalized intersection at East Pine Street. A new east-west street is also proposed north of East Pine Street to accommodate traffic to and from the Fairgrounds site once the Peninger signal is removed. The new public streets will relieve traffic demand on East Pine Street to facilitate the regional function of this roadway while accommodating local access.

I-5 Exit 33 (Central Point)
Interchange Area Management Plan

Technical Memorandum #2
Existing Conditions Analysis

Prepared for

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Table of Contents

2. EXISTING CONDITIONS ANALYSIS

This memorandum provides a summary of the existing transportation system and traffic conditions in the management area. It also discusses land use and environmental resources and identifies potential constraints found within the management area.

2.1. Existing Transportation System Inventory

Interchange 33 is an urban interchange that currently functions as the main access to the City of Central Point in Jackson County as well as providing intermodal access to the Rogue Valley International-Medford Airport and developing industrial areas. The interchange ramps connect with East Pine Street, the primary east-west route through Central Point. Table 2-1 presents a summary of management area roadways and classifications.

Table 2-1. Management Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT/Federal Functional Classification	City/County Functional Classification	Posted Speed (mph)	No. of Lanes
Interstate 5					
Mainline	ODOT	Interstate, NHS, FR, TR[1]	-	65	4
Interchange 33 Ramps	ODOT	Interstate, NHS, FR, TR[1]	-	-	1-2
East Pine St.[2]					
West of 10th St.	Central Point	Minor Arterial	Minor Arterial	25-35	4-5
10th St. - SB Ramps	Jackson County	Minor Arterial	Principal Arterial	35	5
SB Ramps - Peninger Rd.	ODOT	Minor Arterial, NHS Intermodal Connector[1,]	Principal Arterial	35	5
Peninger Rd. to East	Jackson County	Minor Arterial, NHS Intermodal Connector[1,]	Intermodal Connector	35-45	5
7th St.	Central Point	Local	Local	25[3]	2
8th St.	Central Point	Local	Local	25[3]	2
9th St.	Central Point	Local	Local	25[3]	2
10th St.	Central Point	Minor Arterial	Minor Arterial	25[3]	2
Freeman Rd.	Central Point	Minor Arterial	Minor Arterial	35	2
Jewett School Rd.	Central Point	Local	Local	25[3]	2
Peninger Rd.			-		
North of East Pine St.	Jackson County	Urban Collector/ Rural Major Collector	Urban Collector/ Rural Major Collector	45	2
South of East Pine St.	Central Point	Local	Local	25[3]	2
Hamrick Rd.					
North of East Pine St.	Jackson County	Minor Arterial	Minor Arterial	40	2
South of East Pine St.	Jackson County	Local	Collector	25[3]	2

Notes:

1. NHS: National Highway System; FR: State Freight Route; TR: Federally Designated Truck Route
2. The state functional classification maps denote East Pine Street as under state jurisdiction between the northbound and southbound ramp terminals, and under county jurisdiction outside of the ramp terminals.
3. No speed posted on these roadway sections; speed in table reflects default speeds based on functional classification.

The freeway, the interchange ramps, and the portion of East Pine Street east of the interchange are all part of the National Highway System (NHS). The freeway and its ramps are part of the interstate system while East Pine Street is classified as an intermodal connector[1] from I-5 eastward and southward to OR Highway 62 (OR 62).

Jurisdictional responsibility along East Pine Street varies by segment. Central Point maintains jurisdiction west of 10th Street. Jackson County maintains jurisdiction east of 10th Street except for the section between the southbound ramps and Peninger Road, which falls under ODOT jurisdiction.

[1] Intermodal Connectors are highways that provide access between major intermodal facilities and the other four subsystems making up the National Highway System. http://www.fhwa.dot.gov/planning/nhs/

The interchange itself has a standard diamond layout with approximately 1,200 feet between the northbound and southbound ramp terminals. The bridge over I-5 is five lanes wide with a sidewalk on the north side and bike lanes on both sides. Both the northbound and southbound ramp terminals have multi-lane approaches to East Pine Street.

The spacing of the ramp terminals and other access points along East Pine Street does not meet the ODOT ¼-mile spacing standard. Peninger Road, is located just 500 feet east of the northbound ramp with one driveway serving the truck stop and another 300 feet east of Peninger Road. East of Bear Creek, some driveway access points are located on the south side of East Pine Street but they are beyond the ¼-mile spacing. Jewett School Road is located just 400 feet from the southbound interchange ramps and the downtown grid system (starting with 10th Street) begins another 400 feet to the west of Jewett School Road. Some access control measures have already been implemented in this area so that few driveways connect directly onto East Pine Street.

The other roadways within the management area are largely urban in nature, with sidewalks but no marked bike lanes west of I-5. East of I-5, sidewalks are sparse, and if present, are located on the south side of East Pine Street.

2.2. Traffic Conditions

The assessment of traffic conditions includes development of existing traffic volumes, assessment of traffic operations, and a review of historical crash patterns.

2.2.1. Average Daily Traffic Volumes

The average daily traffic (ADT) volumes for I-5 and the Interchange 33 ramps are currently available for the year 2009. The volumes are summarized in Table 2-2.

Volumes on I-5 are higher south of Interchange 33 than north of the interchange. This is consistent with the ADT volumes on the ramps, which show more traffic traveling to and from the south, towards Medford.

Table 2-2. Average Daily Traffic Volumes

Location Description	Volume
Interstate 5	
North of Interchange 33	32,700 vpd
South of Interchange 33	34,700 vpd
Interchange 33	
Northbound Off-Ramp	6,100 vpd
Northbound On-Ramp	5,700 vpd
Southbound Off-Ramp	5,600 vpd
Southbound On-Ramp	7,200 vpd

vpd = vehicles per day

Source: 2009 Transportation Volume Tables, Oregon Department of Transportation

Traffic volumes on I-5 have been lower for the last three years than previous years, which is a reflection of the both local and national economic conditions. Volumes on I-5 through the Rogue Valley reached a high in 2006 and were lowest in 2008. The 2009 volumes are 1 to 3 percent higher than 2008 volumes through the Rogue Valley.

2.2.2. Turning Movement Counts

Traffic counts, collected on March 31, April 20, and May 11, 2010, consisted of 16-hour turning movement classification counts[2] on I-5 and at the ramp terminals, three 4-hour turning movement classification counts, and four 4-hour turning movement counts along Pine Street. Table 2-3 below provides a list of all intersection count locations and includes the type of count.

Table 2-3. Vehicle Count Locations and Types

Location	Type of Count	Count Date
7th St. & East Pine St.	4-hour (14:00-18:00), turning movement	4/20/2010
8th St. & East Pine St.	4-hour (14:00-18:00), turning movement	4/20/2010
9th St. & East Pine St.	4-hour (14:00-18:00), turning movement	4/20/2010
10th St./Freeman Rd. & East Pine St.	4-hour (14:00-18:00), turning movement, classification	4/20/2010
Jewett School Rd. & East Pine St.	4-hour (14:00-18:00), turning movement	4/20/2010
I-5 SB Ramps & East Pine St.	16-hour (06:00 - 22:00), turning movement, classification	5/11/2010
I-5 NB Ramps & East Pine St.	16-hour (06:00 - 22:00), turning movement, classification	5/11/2010
Peninger Rd. & East Pine St.	4-hour (14:00-18:00), turning movement, classification	4/20/2010
Hamrick Rd. & East Pine St.	4-hour (14:00-18:00), turning movement, classification	4/20/2010
I-5 Mainline South of Interchange 33	16-hour (06:00 - 22:00), directional, classification	3/31/2010

[2] The classification counts included full Federal Highway Administration (FHWA) 13-class vehicle classifications.

The traffic volume data was examined to determine a common peak hour for each of the intersections, which is the one-hour period when the sum of volumes entering at all management area intersections is highest. The common peak hour for the intersections was found to occur between 4:30 and 5:30 PM. The peak hour at each intersection may or may not correspond to the common peak hour.

2.2.3. Design Hourly Volumes

ODOT generally requires that transportation facilities be analyzed under design hourly volumes (DHVs), known as 30th highest hour volumes. The 30th highest hour volumes are used in traffic operations analysis so that results are valid for all but a few hours of the year. The procedure for determining 30th highest hour volumes is specified in ODOT's Analysis Procedures Manual (APM)[3] and briefly described below.

The 30th highest hour traffic volumes are calculated by multiplying the peak hour volumes by a seasonal factor. The seasonal factor is determined from automatic traffic recorders (ATR), which are electronic counting sites on roadways that count vehicles continuously. It is desirable to obtain data from ATRs that either (1) are within the management area or (2) are on similar roadway types or within similar area types. The seasonal factors for the management area use a combination of freeway and other ATR locations that reflect both the commuter characteristics as well as the summer recreational characteristics of the area. The data used in calculating the seasonal factors is included in Appendix A.

Peak hour count data was seasonally adjusted, and volumes were balanced to achieve a uniform dataset for analysis. Because the counts were done in 2010 (the baseline analysis year), an annual growth adjustment was not applied. Figure 2-1 shows the existing balanced PM peak hour volumes developed for this project.

2.2.4. Freight Traffic

Trucks are a major component of traffic around Interchange 33, especially because of the truck stop located on the south side of East Pine Street just east of Peninger Road. Table 2-4 summarizes the truck percentages from the 16-hour counts at the interchange ramps and the peak hour counts along East Pine Street.

The count data shows that truck traffic as a percentage of overall traffic peaks on the segment of East Pine Street between the interchange and Peninger Street. The 16-hour counts show that 10.2 percent of the total traffic on this segment is truck traffic and that most of these trucks (75 percent) are tractor trailers. Truck traffic percentages are lowest west of the interchange, towards downtown Central Point. Truck percentages also drop off to the east, beyond Peninger Road and continue to diminish east of Hamrick Road. The mix of trucks west

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[3] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

of the interchange and east of Peninger Road is also more evenly split between single unit vehicles and tractor trailers.

Table 2-4. Truck Percentages on Management Area Roadways

Location	6:00 AM – 10:00 PM			4:30 PM – 5:30 PM		
	Single Unit	Tractor Trailer	Total	Single Unit	Tractor Trailer	Total
East Pine Street						
West of I-5 Southbound Ramps[1]	1.9%	1.4%	3.2%	0.5%	0.6%	1.1%
On I-5 Overpass[1]	2.2%	4.4%	6.6%	0.9%	2.9%	3.8%
East of I-5 Northbound Ramps[1]	2.5%	7.7%	10.2%	1.4%	5.2%	6.6%
East of Peninger Rd.[2]	-	-	-	2.5%	2.1%	4.6%
East of Hamrick Rd.[2]	-	-	-	1.8%	1.6%	3.5%
Interchange 33 Ramps						
I-5 Southbound Off-Ramp[1]	3.2%	13.9%	17.1%	2.6%	12.8%	15.5%
I-5 Southbound On-Ramp[1]	1.3%	7.0%	8.4%	0.9%	5.8%	6.7%
I-5 Northbound Off-Ramp[1]	1.8%	9.3%	11.1%	1.1%	5.3%	6.4%
I-5 Northbound On-Ramp[1]	2.7%	14.7%	17.5%	2.1%	9.2%	11.3%
I-5 Mainline						
Northbound[3]	2.7%	14.1%	16.8%	4.0%	19.3%	23.3%
Southbound[3]	2.4%	11.8%	14.2%	2.7%	19.0%	21.7%

Notes:

1. 16-hour (6:00-22:00), turning movement, classification collected on May 11, 2010
2. 4-hour (14:00-18:00), turning movement, classification collected on April 20, 2010
3. 16-hour (6:00-22:00), turning movement, classification collected on March 31, 2010

Source: Traffic counts collected March 31, April 20, and May 11, 2010.

Truck percentages are high on the freeway itself as well as on the interchange ramps. The 16-hour counts show that trucks account for 16.8 percent of the northbound freeway traffic and 14.2 percent of the southbound traffic. Trucks on the ramps to and from the north are more than 17 percent of the traffic on the I-5 southbound off-ramp and northbound on-ramp. Truck percentages are slightly lower to and from the south with 8.4 percent on the southbound on-ramp and 11.1 percent on the northbound off-ramp. On the mainline and all of the ramps, tractor trailers comprise between 80 and 85 percent of the trucks.

Similar truck patterns are evident during the peak hour as well although the overall truck percentages are generally lower than those calculated based on the 16-hour count totals. Truck activity generally peaks earlier in the day than overall traffic volumes. Truck peaks also vary during the day, depending on the location and movement. Observed peaks varied from the hour beginning at 6:00 AM to the hour beginning 4:30 PM.

2.2.5. Operational Criteria

Transportation engineers have established various methods for measuring traffic operations of roadways and intersections. Most jurisdictions use either volume-to-capacity (v/c) ratio or level of service (LOS) to establish performance criteria. Both the LOS and v/c ratio concepts require consideration of factors that include traffic demand, capacity of the intersection or roadway, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost.

Volume-to-Capacity (V/C) Ratio

A comparison of traffic volume demand to intersection capacity is one method of evaluating how well an intersection is operating. This comparison is presented as a v/c ratio. A v/c ratio of less than 1.00 indicates that the volume is less than capacity. When it is closer to zero, traffic conditions are generally good, with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.00, traffic becomes more congested and unstable, with longer delays.

Level of Service (LOS)

Level of service is also a widely recognized and accepted measure and descriptor of traffic operations. At both stop-controlled and signalized intersections, LOS is a function of control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Six standards have been established, ranging from LOS A, where there is little or no delay, to LOS F, where there is delay of more than 50 seconds at unsignalized intersections, or more than 80 seconds at signalized intersections.

It should be noted that, although delays can sometimes be long for some movements at a STOP-controlled intersection, the v/c ratio may indicate that there is adequate capacity to process the demand for that movement. Similarly at signalized intersections, some movements, particularly side street approaches or left turns onto side streets, may experience longer delays because they receive only a small portion of the green time during a signal cycle, but their v/c ratio may be relatively low. For these reasons, it is important to examine both v/c ratio and LOS when evaluating overall intersection operations. Both are reported in the following section.

95th Percentile Queues

In addition to the operational criteria that measure intersection performance, it is also important to examine queuing and where demand may exceed available storage. Queues that spill out of storage bays and into adjacent travel lanes impair intersection performance by reducing capacity and creating potential safety concerns. Queues may also extend from one intersection through another upstream intersection which also impairs performance. The 95th percentile queue length (meaning 95 percent of all queues will be shorter) is used for this analysis.

2.2.6. Operational Standards

The Oregon Highway Plan (OHP)[4] has established several policies that enforce general objectives and approaches for maintaining highway mobility. Of these policies, the Highway Mobility Standards (Policy 1F) establish maximum v/c ratio standards for peak hour operating conditions for all highways in Oregon based on the location and classification of the highway segment being examined. The OHP policy also specifies that the v/c ratio standards be maintained for ODOT facilities through a 20-year horizon.

Both Central Point and Jackson County also have established performance standards. Central Point uses performance standards based on LOS while Jackson County standards are based on v/c ratio. The City TSP acknowledges the County's performance standards but includes the note that "all County roads will at some point come under the City's jurisdiction, and as such, the LOS mobility measure is used" in identifying system deficiencies. The County language also states that "where one or more approaches is maintained by a city or ODOT, the more restrictive of the County's or other agency's performance standards will be applied."

The freeway falls under state jurisdiction but jurisdictional responsibility along East Pine Street varies by segment. Central Point maintains jurisdiction west of 10th Street and Jackson County maintains jurisdiction east of 10th Street except for the section between the southbound ramps and Peninger Road, which falls under ODOT jurisdiction. The resulting operational standards applicable to the freeway and the management area intersections are shown in Table 2-5.

Table 2-5. Management Area Performance Measures

Location	Applicable Jurisdictional Performance Measures		
	ODOT[1]	Central Point[2]	Jackson County[3]
I-5 Mainline	V/C <= 0.80	-	-
7th St. & East Pine St.	-	LOS D or better	-
8th St. & East Pine St.	-	LOS D or better	-
9th St. & East Pine St.	-	LOS D or better	-
10th St./Freeman Rd. & East Pine St.[4]	-	LOS D or better	V/C <= 0.85
Jewett School Rd. & East Pine St.[4]		LOS D or better	V/C <= 0.85
I-5 SB Ramps & East Pine St.	V/C <= 0.85		
I-5 NB Ramps & East Pine St.	V/C <= 0.85		
Peninger Rd. & East Pine St.[4]	V/C <= 0.90		V/C <= 0.85
Hamrick Rd. & East Pine St.			V/C <= 0.85

Notes:
1. Table 6: Maximum volume to capacity ratios for peak hour operating conditions, 1999 Oregon Highway Plan, Amendment 05-16.
2. City of Central Point Transportation System Plan, 2008-2030, p. 26.
3. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
4. Operations at these locations will be compared with multiple agency performance standards since these intersections involve roadways under one or more jurisdictions.

[4] Table 6: Maximum volume to capacity ratios for peak hour operating conditions, 1999 Oregon Highway Plan, Amendment 05-16, Oregon Department of Transportation.

2.2.7. Traffic Operations Analysis Procedures

All operations were evaluated using the methodology outlined in the *2000 Highway Capacity Manual* (HCM) along with the procedures outlined in ODOT's Analysis Procedures Manual (APM). The Synchro/SimTraffic analysis software was selected to perform the intersection analysis since it can provide the v/c ratio and LOS output of an HCM analysis and consider the systematic interaction of the intersections with regard to queuing and delays.

Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the 2000 HCM. The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. The v/c ratios and LOS presented in this report are based on the Synchro model output.

SimTraffic animates traffic flow based on input volumes and signal timing and allows viewing of traffic flow under saturated traffic conditions where traffic may spill over from one intersection to another. It is particularly effective at evaluating closely spaced intersections. The SimTraffic model was run multiple times using different arrival patterns to determine how sensitive traffic operations are with subtle variations in traffic flows. The 95th percentile queues from the SimTraffic model are also considered in this report.

As noted above, the results from both Synchro and SimTraffic were considered in this document. Because these programs evaluate operations using different methodologies, the analysis results sometimes vary; however, the differences are generally minor unless saturated or congested conditions are present. Under saturated conditions, SimTraffic queuing and delays present results that reflect how congested intersections impact each other, while Synchro represents intersection performance in isolation and may reflect better performance results.

2.2.8. Existing Traffic Operations

Traffic operations were evaluated at the nine management area intersections and the freeway segments where ramp traffic is entering (i.e., merging) or exiting (i.e., diverging) the mainline traffic stream. Operations are described in the following sections and the detailed analysis worksheets are presented in Appendix B.

Intersection Operations

Table 2-6 summarizes the results of the traffic operations analysis and Figure 2-1 presents the v/c ratios and LOS performance by lane group for the area intersections. These findings reflect the signal timing plans recently implemented by ODOT in the East Pine Street corridor.

Table 2-6. Existing (2010) Design Hour Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Mobility Standard
7th St. & East Pine St.	SB L/T/R	0.48	E	LOS D
8th St. & East Pine St.	SB L/T/R	0.09	D	LOS D
9th St. & East Pine St.	NB L/T/R	0.12	B	LOS D
10th St./Freeman Rd. & East Pine St.	Overall	0.78	C	0.85/LOS D
Jewett School Rd. & East Pine St.	SB L/T/R	0.28	C	0.85/LOS D
I-5 SB Ramps & East Pine St.	Overall	0.52	A	0.85
I-5 NB Ramps & East Pine St.	Overall	0.53	B	0.85
Peninger Rd. & East Pine St.	Overall	0.71	B	0.85
Hamrick Rd. & East Pine St.	Overall	0.70	C	0.85

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Note: Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Only one intersection, 7th Street at East Pine Street, has a critical movement that does not meet the applicable mobility standard. The critical southbound approach operates at LOS E during the peak hour because of the relatively high volume of left turns from southbound 7th Street to eastbound East Pine Street. The v/c ratio of 0.48 indicates that demand uses less than half the estimated capacity of the approach. Furthermore, a review of the traffic simulation indicates that delays at this intersection may be less severe than the LOS indicates because of gaps in traffic resulting from upstream and downstream traffic signals. Preliminary signal warrants were not evaluated at the unsignalized locations because existing operational deficiencies at these locations are minimal.

A review of Figure 2-1 shows that the overall intersection operations of the Peninger Road/East Pine Street intersection meet the applicable standards but the northbound left-through lane on Peninger Road experiences LOS E conditions with a v/c ratio of 0.86. This minor street approach serves the Pilot Travel Center and has a particularly high (more than 25 percent) volume of tractor-trailers.

The figure also shows that the westbound left-turn movement from East Pine Street to Freeman Road has a v/c ratio of 0.90 and experiences LOS D conditions. Simulations show that this movement often has long queues that extend out of the available storage lane and interfere with the adjacent through travel lane, as discussed below.

Table 2-7 summarizes intersection movements where the calculated 95th percentile queues either exceed available storage or extend past the nearest upstream intersection.

Table 2-7. Existing (2010) 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked[1]
10th St./Freeman Rd. & East Pine St.	WB L	300	150[5]	41%
	WB T/R	450	350[2]	22%
	NB L	150	125[3]	3%
	SB L	225	100[3]	16%
Jewett School Rd. & East Pine St.	WB T/R	325	300[2]	7%
I-5 SB Ramps & East Pine St.	SB R	125	50[3]	6%
I-5 NB Ramps & East Pine St.	WB R	125	65[3]	2%
Peninger Rd. & East Pine St.	SB R	75	40[3]	7%
Hamrick Rd. & East Pine St.	EB L	425	400[5]	1%

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:

1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.
4. Two-way, left-turn lane (TWLTL) without a designated turn bay.
5. Storage distance reflects length of turn bay but TWLTL allows additional storage space.

Source: Synchro HCM Intersection Analysis Report

The 10th Street/Freeman Rd. intersection has several approaches where the 95th percentile queue exceeds available storage and one approach where queues extend through an upstream intersection. The westbound left-turn lane on East Pine Street is striped to provide approximately 150 feet (8 vehicles) of storage but the traffic simulations show that queues frequently extend out of that storage lane. Some drivers may choose to queue up in the two-way, left-turn lane (TWLTL) but others spill into the through travel lane which causes queues to build up in the westbound through lane. These queues can extend past Jewett School Road, as reflected by the queue shown for the westbound through movement at that intersection. The 95th percentile queues for the southbound left-turn lane on 10th Street also frequently exceeds available turn bay storage.

The southbound right-turn lane on the I-5 southbound ramps at East Pine Street provides approximately 50 feet (2 vehicles) of storage but the traffic simulations show that queues frequently extend beyond the available storage lane and sometimes interfere with the adjacent left-through travel lane.

The westbound right-turn movement on East Pine Street at the I-5 northbound ramps has 95th percentile queues that occasionally extend into the adjacent through travel lane. Jackson County has plans to extend this right-turn lane all the way back to Peninger Road.

The southbound right-turn lane on Peninger Road has 95th percentile queues that sometimes block the adjacent left-through travel lane. This blockage occurs less than 10 percent of the time during the PM peak hour but during events at the fairgrounds, long queues on Peninger can be problematic. The planned extension of the right-turn lane on East Pine Street from the I-5 northbound ramp to Peninger Road is intended to relieve this condition.

The left-turn lane on East Pine Street at Hamrick Road is the final location where queues occasionally extend out of the storage bay into the adjacent through travel lane. The very heavy turning volume is almost as great as the through movement on East Pine Street.

2.2.9. Merge and Diverge Operations

It is also important to evaluate how the interchange ramps interact with the mainline highway traffic on I-5 through an analysis of the points where traffic enters or merges onto the highway and where it exits or diverges from the highway. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analysis are summarized in Table 2-8.

The merge and diverge analyses for the design hour between 4:30 and 5:30 PM show that the freeway and the merge and diverge points associated with the Interchange 33 ramps are currently operating well below the mobility standard of 0.80. An alternate hour was also analyzed in the southbound direction because the freeway volumes actually peak between 7:00 and 8:00 AM while the northbound peak coincides with the design hour period. The alternate hour analysis also shows that freeway operations meet the state's mobility standard.

Table 2-8. Existing (2010) Freeway Operations

	V/C Ratio[1]	
Direction/Location	Design Hour[2]	Alternate Hour[3]
I-5 Northbound		
Mainline South of IC 33	0.45	NA
Diverge: IC 33 Northbound Off-Ramp	0.33	NA
Mainline between Off and On-Ramps	0.31	NA
Merge: IC 33 Northbound On-Ramp	0.41	NA
Mainline North of IC 33	0.41	NA
I-5 Southbound		
Mainline North of IC 33	0.26	0.33
Diverge: IC 33 Southbound Off-Ramp	0.14	0.17
Mainline between Off and On-Ramps	0.19	0.25
Merge: IC 33 Southbound On-Ramp	0.30	0.42
Mainline South of IC 33	0.30	0.41

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual.
2. The design hour is the hour between 4:30 and 5:30 PM, which coincides with system peaking.
3. The alternate hour is the highest volume hour occurring on the freeway by direction; the peak volume in northbound direction coincides with the design hour but the peak volume in the southbound direction occurs between 7:00 and 8:00 AM.

Acronyms: IC = Interchange, NA = Not Applicable

2.2.10. Crash Analysis

A crash analysis was conducted to determine whether any significant, documented safety issues exist within the management area and to identify measures at specific locations or general strategies for improving overall safety. As part of the crash analysis, historical crash data were reviewed, intersection and segment crash rates were calculated, and the state's Safety Priority Index System (SPIS) was examined.

Crash History

The crash analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2006, and December 31, 2008, which were the three most recent full years for which crash data were available at the time of the analysis. The data is summarized in Table 2-9 and the reports are contained in Appendix C.

The ODOT database has 127 crashes in the management area including 22 crashes on mainline I-5. Of these crashes, almost half resulted in an injury although there were no fatal collisions.

For intersections, the rear end collisions (52) were the most common type followed by turning collisions (32). Rear end collisions commonly occur at signalized intersections because so many vehicles are required to stop with signalized traffic control. Turning collisions also occur at signalized intersections, even when protected left-turn phases are included.

The signalized intersections in the management area had the greatest number of collisions, with the exception of Peninger Road which had only one recorded crash. The unsignalized intersections had very low crash rates because there are so many fewer vehicles stopping.

The intersection with the greatest number of coded collisions was the I-5 northbound ramps (30); however, some of these crashes may actually be associated with either the Peninger Road or the southbound ramps intersections because the coding does not always clearly indicate the exact location in the vicinity of the freeway overpass. The crashes were most frequently rear end or turning collisions but there were also some other types. This is the only location with a pedestrian crash which involved a northbound vehicle turning right onto East Pine Street colliding with a pedestrian in the crosswalk.

The 10th Street/Freeman Road intersection had the next greatest number of crashes (29). Most were rear end collisions associated with the northbound approach of Freeman Road at East Pine Street. The cause and error coding for these crashes do not indicate why there are so many collisions on the Freeman Road approach but sharp roadway curvature that begins just 100 feet southeast of East Pine Street may be a contributing factor.

The southbound ramps had 19 crashes that involved mostly rear end and turning collisions.

Hamrick Street had 16 crashes with more turning collisions than rear end collisions; most of the turning collisions involved eastbound vehicles turning north onto Hamrick Road.

Table 2-9. Management Area Crash Summary (2006-2008)

Intersection	Total	% of Total	Severity: PDO	Severity: Injury	Severity: Fatal	Crash Type: Rear End	Turning	Angle	Backing	Fixed Object	Sideswipe - Overtaking	Non Collision	Pedestrian	3-Year Intersection/ Segment Crash Rate
East Pine St.														
7th St.	1	1%	0	1	0	1	0	0	0	0	0	0	0	0.06
8th St.	1	1%	1	0	0	1	0	0	0	0	0	0	0	0.06
9th St.	2	2%	2	0	0	0	1	1	0	0	0	0	0	0.12
10th St./Freeman Rd.	29	23%	16	13	0	21	4	2	1	0	0	1	0	0.96
I-5 SB Ramps	19	15%	8	11	0	9	6	1	1	1	0	1	0	0.64
I-5 NB Ramps	30	24%	13	17	0	15	11	1	1	0	1	0	1	0.91
Peninger Rd.	1	1%	1	0	0	0	0	0	1	0	0	0	0	0.03
Hamrick Rd.	16	13%	8	8	0	5	10	0	1	0	0	0	0	0.63
Non-Intersection	4	3%	2	2	0	1	2	0	0	1	0	0	0	-
Subtotal	*103*	*81%*	*51*	*52*	*0*	*53*	*34*	*5*	*5*	*2*	*1*	*2*	*1*	4.02
I-5 Ramps (Non-Intersection)														
NB Off-Ramp	1	1%	1	0	0	0	0	0	0	1	0	0	0	-
SB On-Ramp	1	1%	0	1	0	0	0	0	0	0	0	1	0	-
Subtotal	*2*	*2%*	*1*	*1*	*0*	*0*	*0*	*0*	*0*	*1*	*0*	*1*	*0*	-
I-5 Mainline														
Northbound	8	6%	6	2	0	2	0	0	0	4	2	0	0	0.18
Southbound	14	11%	7	7	0	3	1	0	0	6	3	1	0	0.30
Subtotal	*22*	*17%*	*13*	*9*	*0*	*5*	*1*	*0*	*0*	*10*	*5*	*1*	*0*	*0.24*
Totals	127	100%	65	62	0	58	35	5	5	13	6	4	1	
Percent of Total Crashes			52%	48%	0%	45%	28%	4%	4%	10%	5%	3%	1%	

Source: ODOT Transportation Development Division, Transportation Data Section, Crash Analysis and Reporting Unit

Six crashes were not associated with intersections but occurred on either East Pine Street or on one of the freeway ramps. The crashes on East Pine Street involved vehicles using driveways or hitting parked vehicles. The crashes on the ramps involved only a single vehicle.

Mainline I-5 had 22 crashes between mileposts 31.5 and 34.5. One half of these crashes involved only a single vehicle while the other half were multi-vehicle crashes, primarily sideswipe overtaking and rear end collisions. Almost 60 percent of the freeway crashes resulted in an injury.

Crash Rates

Crash rates were calculated for the study area intersections and for the East Pine Street and I-5 mainline segments. At intersections, the crash rate is calculated as the number of crashes per million vehicles entering the intersection. Intersections with a crash rate greater than 1.0 crashes per million entering vehicles (crashes/mev) generally warrant closer investigation but are not necessarily indicative of safety concern. For segments, the crash rate is calculated as the number of crashes per million vehicle miles traveled (crashes/mvm). The East Pine Street corridor is compared to the average rate over the same period for an Urban-Non-Freeway/Minor Arterial while mainline I-5 is compared to Urban-Interstate Freeway.

Two intersections had crash rates approaching the 1.0 threshold. The 10th Street/Freeman Road intersection with East Pine Street had an intersection crash rate estimated at 0.96. Most or the reported crashes were rear end collisions associated with the northbound approach of Freeman Road at East Pine Street and, as noted above, may be associated with the sharp roadway curvature that begins just 100 feet southeast of East Pine Street. The I-5 northbound ramps had an intersection crash rate of 0.91. About half of the collisions involved vehicles turning to or from the freeway ramps but the other half involved two vehicles traveling straight on East Pine Street.

The segment crash rate for I-5 in the northbound direction is estimated at 0.18, while the southbound direction is estimated at 0.30. Both northbound and southbound segment crash rates are below the statewide average of 0.54 for a similar facility (urban, interstate freeway).

A segment crash rate was also evaluated for East Pine Street between 7th Street and Hamrick Road, a distance of about one mile. Included in the calculation are all the intersection crashes as well as the non-intersection crashes for the segment length. The resulting segment crash rate is approximately 4.02 and in excess of the statewide average for a similar facility (urban, non-freeway/minor arterial) value of 2.51. The shorter length of the segment, presence of four closely-spaced signalized intersections, and inclusion of the I-5 ramp terminals may contribute to the higher crash rate. ODOT has recently implemented new signal timing plans for the East Pine Street corridor which could help reduce the segment crash rate but data is not available to assess the effect of these changes.

Safety Priority Index System (SPIS)

The SPIS is a method used in Oregon to identify safety problem areas along state highways. Highways are evaluated in approximately one-tenth mile increments (often grouped into larger segments). Each year these segments are ranked by assigning a SPIS score based on the frequency and severity crashes observed, while taking traffic volume into account. When a segment is ranked in the top 10% of the index, a crash analysis is typically warranted and corrective actions are considered. There are no segments identified in the top 10% of the most recent (2008) SPIS rankings within the management area.

2.3. Land Use Summary

This section summarizes existing land use conditions and potential design constraints found within the management area. Figure 2-2 shows the Comprehensive Plan designations for the management area, and Figure 2-3 shows the zoning designations. The information in this section is taken primarily from published documents, maps, GIS data, the Jackson County website, and other Internet websites.

2.3.1. East of Interstate 5

In general, the area east of I-5 in the management area has tracts of undeveloped and less densely developed land, with pockets of denser development closer to Table Rock Road and a small area adjacent and south of the Interchange. The Jackson County Exposition Park (fairgrounds) occupies the large parcel of land immediately east of I-5 and north of East Pine Street. The fairgrounds are outside of Central Point city limits and thus are under Jackson County jurisdiction. The underlying zoning for the fairgrounds is Rural Residential. The Bear Creek Greenway borders the fairgrounds to the east adjacent to lower-density residential properties and pockets of denser residential areas past the rural residential areas. The eastern edge of the management area north of East Pine Street and adjacent to the City of Medford boundaries is designated industrial. Directly adjacent and along East Pine Street, the zoning is designated commercial and Central Point Tourist and Office (C-4). The C-4 district purpose is to provide tourist and entertainment facilities to serve residents and tourists passing through the area. Adjacent to the Interchange south of East Pine Street are commercial uses that support the traveling public, such as a truck stop, gas stations and hotels with a few undeveloped parcels intermixed. The Bear Creek Greenway also passes through this area, with lands to the east designated industrial.

2.3.2. West of Interstate 5

The area west of I-5 includes most of Central Point's historical downtown, which has a tighter street grid network and denser development than the west side of I-5. However, there still are pockets of small parcels of undeveloped lots south of East Pine Street between Freeman Road and I-5. East Pine Street itself is a commercial strip with mixed uses a block behind it, followed by residential development that gets less dense as one moves away from the downtown core. Jewett Elementary School is adjacent to I-5 and the southbound off-ramp of the interchange north of East Pine Street. Areas zoned Central Point Tourist (C4) are located adjacent to the southwest and southeast quadrants of Interchange 33, with a smaller area designated at the northwest quadrant adjacent to the elementary school.

Along OR 99, on the western edge of the management area, is a Transit Orientated Development (TOD) district. The intent of the TOD district and corridor is to "promote efficient and sustainable land development and the increased use of transit as required by the Oregon Transportation Planning Rule."

2.3.3. Potential Design Constraints

Within the City of Central Point, transportation improvements within existing right-of-way are permitted outright in any district. Additional standards may apply in the base district if projects include parcels outside of existing right-of-way. Furthermore, transportation projects may need to meet additional permitting requirements other than those associated with the base district zoning such as the Bear Creek Greenway overlay and Historic Preservation overlay. Within the jurisdiction of Jackson County, permitting and design requirements for transportation improvements vary depending on the type of improvement and zoning designation. Overlays with their own criteria and potential constraints in Jackson County include the Bear Creek Greenway, Historic Resources, Archaeological Sites, Floodplain, and Airport Approach (AA) and Airport Concern (AC) Overlays. Further potential topographical and regulatory design restraints are associated with the Bear Creek and Mingus Creek floodplains and wetlands and any other jurisdictional waters in the management area.

2.3.4. Community Features

Community features within the management area are listed below and are shown in Figure 2-4. Features in the area immediately adjacent to the Interchange or I-5 include:

- Jackson County Fairgrounds, 1 Peninger Street
- Rogue Valley Family Fun Center, 1A Peninger Street
- Jewett Elementary School, 1001 Manzanita Street

Community features within or near the management area include:

- Central Point Senior Citizens, 123 North 2nd Street
- City Hall, 140 S. 3rd Street, Central Point
- Central Point Library, 116 S. 3rd Street
- Joel Tanzi Skate Park, 403 South 4th Street, Central Point (.25 acres)
- Robert Pfaff Park, 635 Manzanita Street, Central Point (1.5 acres) Summerfied Park, off Upton Road along the overpass (approximately 2 acres)
- Shepherd of the Valley Catholic Church, 600 Beebe Road
- International Lutheran Laymens, 555 Freeman Road
- Rainbows End Preschool and Daycare, 511 South 4th Street
- Jackson County School District Administrative Offices, 450 South 4th Street
- Central Point Elementary School, 450 South 4th Street, Central Point
- Noah's Ark Early Learning Center, 305 Oak Street
- Grace Church of Central Point, 100 Oak Street
- Hope Christian Church, 325 Oak Street
- Southern Oregon Drug Awareness, 604 South 2nd Street
- Calvary Temple, 513 East Pine Street

- Central Point Assembly, 310 North 10th Street
- Crater School of Business Innovation and Science, 655 North 3rd Street
- Gloria Dei Lutheran Church, 745 North 10th Street
- Sunshine Early Learning Center, 500 North 10th Street

2.3.5. Section 4(f) Resources

Section 4(f) refers to a part of federal law that protects public parks, recreation lands, wildlife and waterfowl refuges, and public or private historic sites. Section 4(f) applies only to Departments of Transportation (DOTs) and their agencies. Highway projects that use public parks must fulfill the requirements of Title 23, USC Section 138, Section 4(f) of the Department of Transportation Act of 1966, as amended.

A “use” that is subject to the provisions of Section 4(f) occurs:

- When land is permanently incorporated into a transportation facility
- When there is a temporary occupancy of land that is adverse in terms of the statute’s preservationist purpose
- When there is constructive use of the land

Federal and statewide transportation departments must demonstrate that a proposed project will not “use” the publicly owned parks and recreation land, where “use” can mean either actual conversion of recreation lands into a transportation use, or a “constructive use,” where off-site impacts of the transportation project substantially impair the site’s vital functions. Findings of “no feasible and prudent alternatives” and “all possible planning to minimize harm” must be well-documented and supported. A feasible alternative is an alternative that is possible to engineer, design, and build. To find that an alternative that avoids a 4(f) resource is not “prudent,” one must find that there are unique problems or unusual factors involved with the use of such an alternative. This means that the cost; the social, economic, and environmental impacts; and/or the community disruption resulting from such alternatives reach extraordinary magnitudes.

Section 4(f) resource lands within the management area consist of the Summerfield Park, Joel Tanzi Skate Park , and Robert Pfaff Park as well as the historic structures discussed previously in “Historic and Archaeological Resources,” and the Bear Creek Greenway. The Bear Creek Greenway, shown in Figure 2-5. Natural Resources, is a linear park that follows the lush Bear Creek streambed from Ashland to Central Point. The multi-use path, which follows the creek within the Bear Creek Greenway, was designated as a National Scenic Trail in 1975 and is part of the Oregon Recreational Trail system. The Bear Creek Greenway is spread out over 600 acres of pristine southern Oregon landscape and will one day include a continuous 21-mile path from Oak Street in Ashland to the Seven Oaks Interchange in Central Point.

In addition, structures eligible or potentially eligible for inclusion on the NRHP within the management area but not yet identified are potential candidates for Section 4(f) status. A

Section 4(f) evaluation will require ODOT to assess all reasonable alternatives that adversely affect protected lands. If every potential alternative that can meet the purpose and need for the project would impact some 4(f) property, then the alternative with the least impact must be selected unless it is not feasible and prudent.

2.4. Natural and Historic Resources

Environmental conditions are assessed to determine constraints within the management area. Sources of information for this section were primarily from published documents and maps, Geographic Information System (GIS) maps, and conversations with knowledgeable officials from the Oregon Department of Transportation (ODOT) and Jackson County.

2.4.1. Goal 5 Resources

Statewide Planning Goal 5 requires local jurisdictions to inventory riparian corridors, wetlands, wildlife habitat, scenic waterways, and other natural resources.

Bear Creek, which is indicated in Figure 2-5, is a key riparian resource that provides valuable habitat for wildlife and that spans the management area north to south east of the Interchange. Bear Creek is a tributary of the Rogue River, beginning south of downtown Ashland at the confluence of Emigrant Creek and Neil Creek and flowing north until it converges with the Rogue River near Gold Hill.

To comply with Goal 5 requirements for riparian corridors, the City of Central Point Zoning Ordinance and Jackson County Land Development Ordinance adopted a Bear Creek Greenway district intended to provide for environmental preservation and limited development within the district. Further discussion of Bear Creek is provided in the "Wetlands and Waters" subsection.

2.4.2. FEMA Floodplain/Floodway

The Federal Emergency Management Agency (FEMA), acting through the local planning authority, regulates development within floodplains. There are two printed FEMA Flood Insurance Rate Map panels that include portions of the management area (Community-Panel No. 4155890402B, 1982, and 4100920001C, 1982). FEMA Map Panel No. 4155890402B documents Bear Creek floodway from north to south just east of the interchange. On the west side of the interchange, FEMA Map Panel No. 4100920001C documents Mingus Creek and its floodway, north to south. Designated flood areas within the management area are listed in Table 2-10. Jackson County-designated Flood Hazard Areas within the management area, corresponding with the FEMA 100-year floodplain, are displayed in Figure 2-5.

Table 2-10. Federal Emergency Management Agency (FEMA) Designated Flood Areas

Zone	Description
A-12	Areas of 100-year flood; base flood elevations and no base flood elevation have been determined.
A	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
B	Areas between limits of the 100-year flood and the 500-year flood, or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees for the base flood.
C	Areas of minimal flooding (outside of 500-year floodplain).

Source: Federal Emergency Management Agency

2.4.3. Wetlands and Waters

Bear Creek runs north to south just east of the Interchange. Within the management area, there is a string of freshwater ponds associated with Bear Creek both north and south of East Pine Street. There are also wetlands in these areas. Riverine and Palustrine wetlands are located north of East Pine Street on the west side of Bear Creek, south of East Pine Street on the west bank of Bear Creek, and on the east bank of Bear Creek. There is a small Palustrine wetland located at a point short of where Mingus Creek passes under East Pine Street (see Figure 2-5).

Bear Creek is designated as Essential Salmonid Habitat (ESH) by the Oregon Department of State Lands (DSL). Bear Creek supports runs of Chinook, coho salmon, and steelhead. The U.S. Environmental Protection Agency lists Bear Creek as a "303(d)" stream because of its summer temperatures. Mingus Creek is not designated as ESH or listed as 303(d), nor does it support any salmon or steelhead runs.

2.4.4. Threatened and Endangered Species

The Oregon Natural Heritage Information Center (ORNHIC) database documents the federally listed and state-listed threatened or endangered species. The State of Oregon and the federal government maintain separate lists of Threatened and Endangered (T & E) species. These are species that are determined to be at some degree of risk of becoming extinct. The ORNHIC information, based on reported historical sightings in the vicinity of the management area, is summarized in Table 2-11. One species, the coho salmon, is listed as a threatened species in the area.

Table 2-11. ORNHIC-Identified Listed, Threatened, or Endangered Species

Common Name	Scientific Name	Federal Status	State Status
Invertebrate Animal			
Slender meadow-foam	*Limnanthes gracilis ssp. gracilis*	Species of Concern	-
Vertebrate Animal			
Tricolored blackbird	*Agelaius tricolor*	Species of Concern	-
Coho salmon (Southern Oregon/Northern California Coasts Evolutionarily Significant Unit [ESU])	*Oncorhynchus kisutch pop. 2*	Listed Threatened	Vulnerable Sensitive
Steelhead (Klamath Mountains Province ESU, summer run)	*Oncorhynchus mykiss pop. 24*	-	Vulnerable Sensitive
Chinook salmon (Southern Oregon/Northern California Coast ESU, fall run)	*Oncorhynchus tshawytscha pop. 26*	-	Vulnerable Sensitive

Source: Oregon Natural Heritage Information Center, 2009

Under federal law, the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) share responsibility for implementing the federal Endangered Species Act (ESA) of 1973 (Public Law 93-205, 16 United States Code [[USC] § 1531), as amended. In general, USFWS has oversight for land and freshwater species, and NOAA has oversight for marine and anadromous species. In addition to information about species already listed, the USFWS Oregon Field Office maintains a list of Species of Concern, as defined below.

Once listed as threatened or endangered, a species is afforded the full range of protections available under the ESA, including prohibitions on killing, harming or otherwise "taking" a species. In some instances, species listing can be avoided by the development of Candidate Conservation Agreements that may remove threats facing the candidate species.

A species is listed by the federal government under one of two categories, endangered or threatened, depending on its status and the degree of threat it faces. An "endangered species" is one that is in danger of extinction throughout all or a significant portion of its range. A "threatened species" is one that is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. "Species of Concern" is an informal term under the federal listing that is not specifically defined in the federal ESA. The term commonly refers to species that are declining or appear to be in need of conservation.

Under state law (ORS 496.171-496.192) the Fish and Wildlife Commission, through the Oregon Department of Fish and Wildlife (ODFW), maintains the list of native wildlife species in Oregon that have been determined to be either "threatened" or "endangered" according to criteria set forth by rule (OAR 635-100-0105). Plant listings are handled through the Oregon Department of Agriculture and follow the same format as federal listing as either threatened, endangered, or candidate species, while most invertebrate listings are conducted through the Oregon Natural Heritage Program.

Under Oregon's Sensitive Species Rule (OAR 635-100-040), a "sensitive" species classification was created that focuses fish and wildlife management and research activities on species that need conservation attention. "Sensitive" refers to naturally reproducing fish and wildlife species, subspecies, or populations that are facing one or more threats to their populations and/or habitats. Implementation of appropriate conservation measures to address the threats may prevent species, subspecies or populations from declining to the point of qualifying for threatened or endangered status.

Sensitive species are assigned one of two subcategories. "Critical" sensitive species are imperiled with extirpation from a specific geographical area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical sensitive species may decline to the point of qualifying for threatened or endangered status if conservation actions are not taken. "Vulnerable" sensitive species are facing one or more threats to their populations and/or habitats. Although not currently imperiled with extirpation from a specific geographical area of the state, vulnerable species could, however, become so if there are continued or increased threats to populations and/or habitats.

2.4.5. Air Quality

Under the 1990 Clean Air Act Amendments, the Rogue Valley (Jackson County, Ashland, Phoenix, Talent, Medford, Jacksonville, Central Point, White City, and Eagle Point) became a nonattainment area for particulate matter (PM_{10}). These communities share a common airshed, known as the Medford-Ashland Air Quality Maintenance Area (AQMA). During the 1980s, particulate pollution in the Medford-Ashland AQMA reached some of the highest levels in the nation and violated the federal air quality health standards also known as National Ambient Air Quality Standard (NAAQS). The area was designated a "Nonattainment Area," meaning that the geographic area had not consistently met the clean air levels set by the U.S. Environmental Protection Agency in the NAAQS. After implementation of a plan to reduce particulate pollution, the area within the AQMA was redesignated from non-attainment to attainment in 2005.

Carbon monoxide (CO) emissions from transportation sources are tied exclusively to tailpipe emissions and are generated from the combustion of fuel. Vehicle tailpipes emit the highest concentrations of CO when idling or traveling at low speeds. Emission rates decrease as speeds increase, reaching a minimum rate between 45 miles per hour (mph) and 50 mph, and gradually increase again as the vehicle speed surpasses 50 mph.

Particulate matter (PM) is a complex mixture of extremely small particles and liquid droplets that is made up of a number of components, including acids (such as nitrates and sulfates), organic chemicals, metals, and soil or dust particles. The size of particles is directly linked to their potential for causing health problems. The EPA monitors particles that are 10 micrometers in diameter or smaller because those are the particles that generally pass through the throat and nose and enter the lungs. Once inhaled, these particles can affect the heart and lungs and cause serious health effects. The EPA divides particle pollution into two categories differentiated by size, assigning them a notation of PM_{10} or $PM_{2.5}$:

1. PM_{10} (larger than 2.5 micrometers and smaller than 10 micrometers in diameter) are course particles, generally found near roadways and dusty industries.
2. $PM_{2.5}$ (smaller than 2.5 micrometers in diameter) are fine particles that can form when gases that are emitted from power plants, industries, and automobiles react in the air. They are also directly emitted from sources such as forest fires. Essentially, the smaller and lighter the particle is, the longer it will stay in the air.

Analysis by the Rogue Valley Metropolitan Planning Organization (RVMPO) has found that through the horizon of the 2009-2034 Regional Transportation Plan and the 2010 Metropolitan Transportation Improvement Plan (MTIP), and in intervening years, emissions from transportation will not exceed current federal and state air quality standards.

2.4.6. Hazardous Materials

A search through web-based databases was conducted to review the available federal and state records for identified hazardous waste sites within the management area. The federal databases reviewed include the National Priority List (NPL) and the Comprehensive Environmental National Response, Compensation, and Liability Information System (CERCLIS). Neither of the databases listed any such sites in the management area. The state databases reviewed include the Oregon Department of Environmental Quality (DEQ) Facility Profiler and the Fire Marshal's Database.

The identified hazardous waste sites found in the DEQ Profiler search in the management area are listed and shown geographically in Figure 2-6. The figure lists facilities that are permitted, regulated, and/or have had hazardous materials incidents, by the Oregon DEQ. The identified sites within the management area primarily are either permitted underground storage tanks (USTs) or leaking underground storage tanks (LUSTs) associated with gas stations that may service users of I-5. There are also several hazardous waste generators sites, environmental clean-up sites (ECSI), and air and water quality permitted sites within the management area. Multiple sites listed in the Oregon State Fire Marshal's (OSFM) Hazardous Materials Incidents log were found within the management area and are also geographically displayed on Figure 2-6. The sites include the following substance leaks: gas, propane, hydraulic fluid, and red phosphorus. In general, the hazardous sites appear to be consistent, both in type and quantity, with urbanized interstate corridors. Because the area is urbanized and most of it has been previously disturbed by transportation and other urban uses, more detailed site specific hazardous materials surveys will be necessary once specific transportation improvements are identified.

2.4.7. Historic and Archaeological Resources

Under Section 106 of the National Historic Preservation Act of 1966 (Public Law 89-665), 16 USC 470-470m, and under federal regulations governing the protection of historic and cultural resources (36 Code of Federal Regulations [CFR] 800), federal agencies, and the state and local agencies to which the federal agency has delegated responsibility, are directed to avoid undertakings that adversely affect properties that are included in or are eligible for inclusion in the National Register of Historic Places (NRHP). The NRHP identifies and documents (in partnership with state, federal, and tribal preservation programs) districts, sites, buildings, structures, and objects that are significant in American history, architecture, archaeology, engineering, and culture. This section summarizes NRHP resources near the management area, as well as other historic, prehistoric, and cultural resources.

The State Historic Preservation Office (SHPO) database shows that five archaeological surveys have been conducted that either overlap or are completely within the management area. No cultural resources are shown to have been identified within the management area. However, the majority of the management area has not been surveyed for cultural resources.

For the management area, the SHPO database shows historical resources listed on the NRHP and resources that are not listed on the register but are identified as potentially eligible for inclusion on the register or are identified resources but not yet reviewed. The identified resources are:

Listed on National Register of Historic Places:

- Central Point Public School, 450 S. 4th Street: Constructed – 1908, original use – school, style –Beaux Arts style.
- Welch, Mathias, House, 162 N. 2nd Street: Constructed – 1888, original use – single dwelling, style – Italianate.
- Fiero, Conro House "Woodlawn Acres," 4615 Hamrick Road: Constructed – 1910, original use – single dwelling, style – craftsman (this resources was destroyed by a fire on 01/11/2010).
- Faber, Edward Charles, House, 445 Manzanita Street: Constructed – 1910, original use – single dwelling, style – Queen Anne.
- Merritt, John W., Store and Residence, 117 East Pine Street, Constructed – 1888, original use – Department Store, style – Italianate.

Listed in Orego**n Historic Sites Database as either "undetermined" or "eligible/significant"** for listing on Register:

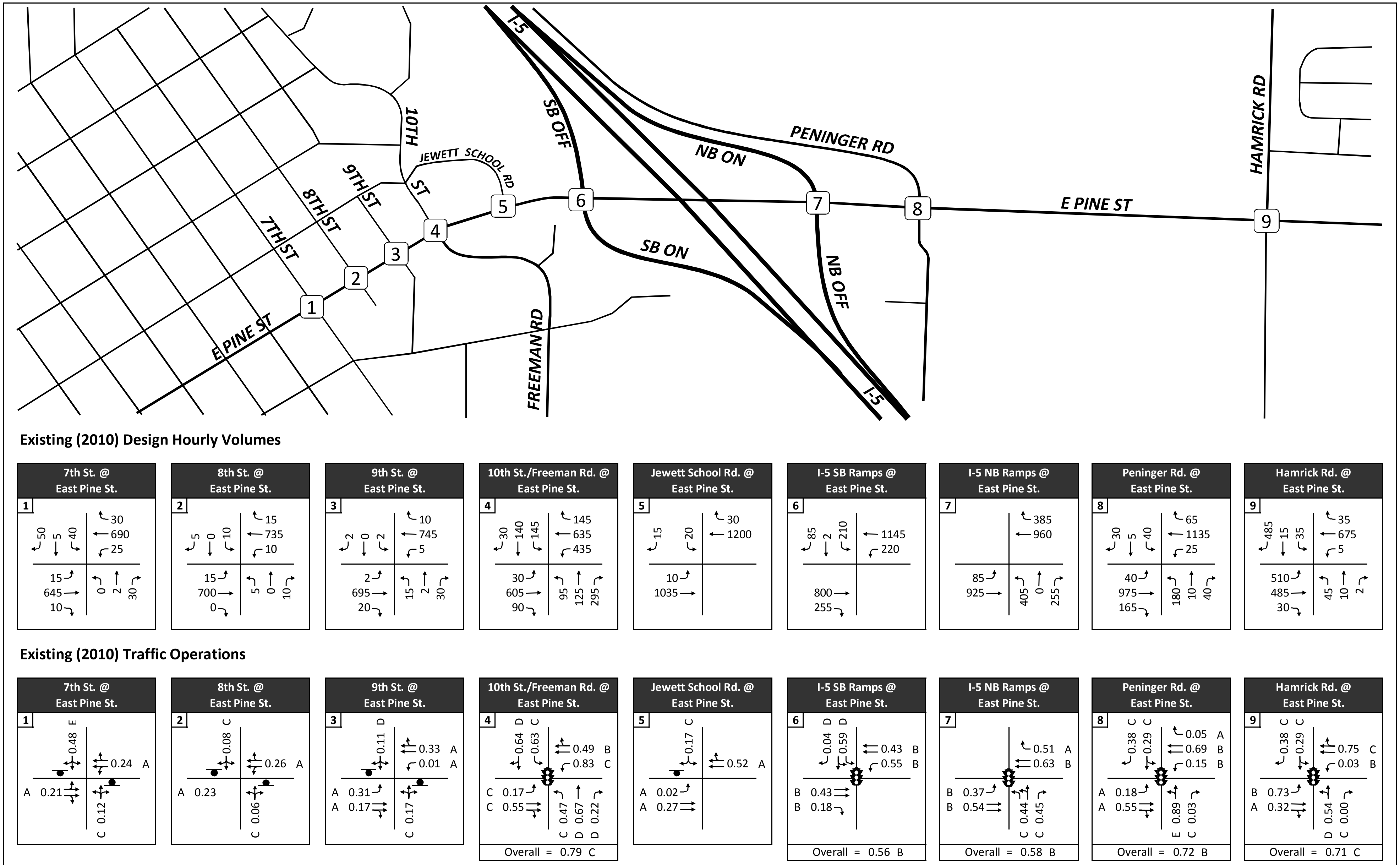
- Cowley Building, 222 East Pine Street: Constructed – 1911, original use – general commercial, style – not determined.
- Beebe, Adelphia W. and Mary S. House, 718 Beebe Road: Constructed – 1885, original use – farmstead, style – Gothic revival.
- Unnamed Resource, 239 Freeman Road: Constructed – 1920, original use – home, style – Bungalow.
- Central Point Presbyterian Church, 100 Oak: Constructed – 1915, original use – religious facility, style – Craftsman.

There may be additional historical and archeological resources in the management area that have not been identified or entered into the SHPO database, especially considering that the western portion of the management area is in Central Point's historical downtown. Historical and cultural resources surveys by professionals should be conducted during the development of specific transportation improvement projects to ensure there are no impacts to protected resources.

Attachments:

Figure 2-1. Existing (2010) Design Hour Traffic Volumes and Operations
Figure 2-2. Jackson County and City of Central Point Comprehensive Plans
Figure 2-3. Jackson County and City of Central Point Zoning Designations
Figure 2-4. Community and Historical Resources
Figure 2-5. Natural Resources
Figure 2-6. Hazardous Material Sites

Appendix A. Seasonal Adjustment Factors
Appendix B. Traffic Operations Worksheets
Appendix C. ODOT Crash Analysis Reports (January 1, 2005 through December 31, 2007)



Legend

Turning Movement

00 Turning Movement Volume

Lane Group

0.00 Volume-to-Capacity (V/C) Ratio

A Level of Service (LOS)

Traffic Signal

STOP Sign

Figure 2-1
Existing (2010) Design Hour Traffic Volumes and Operations

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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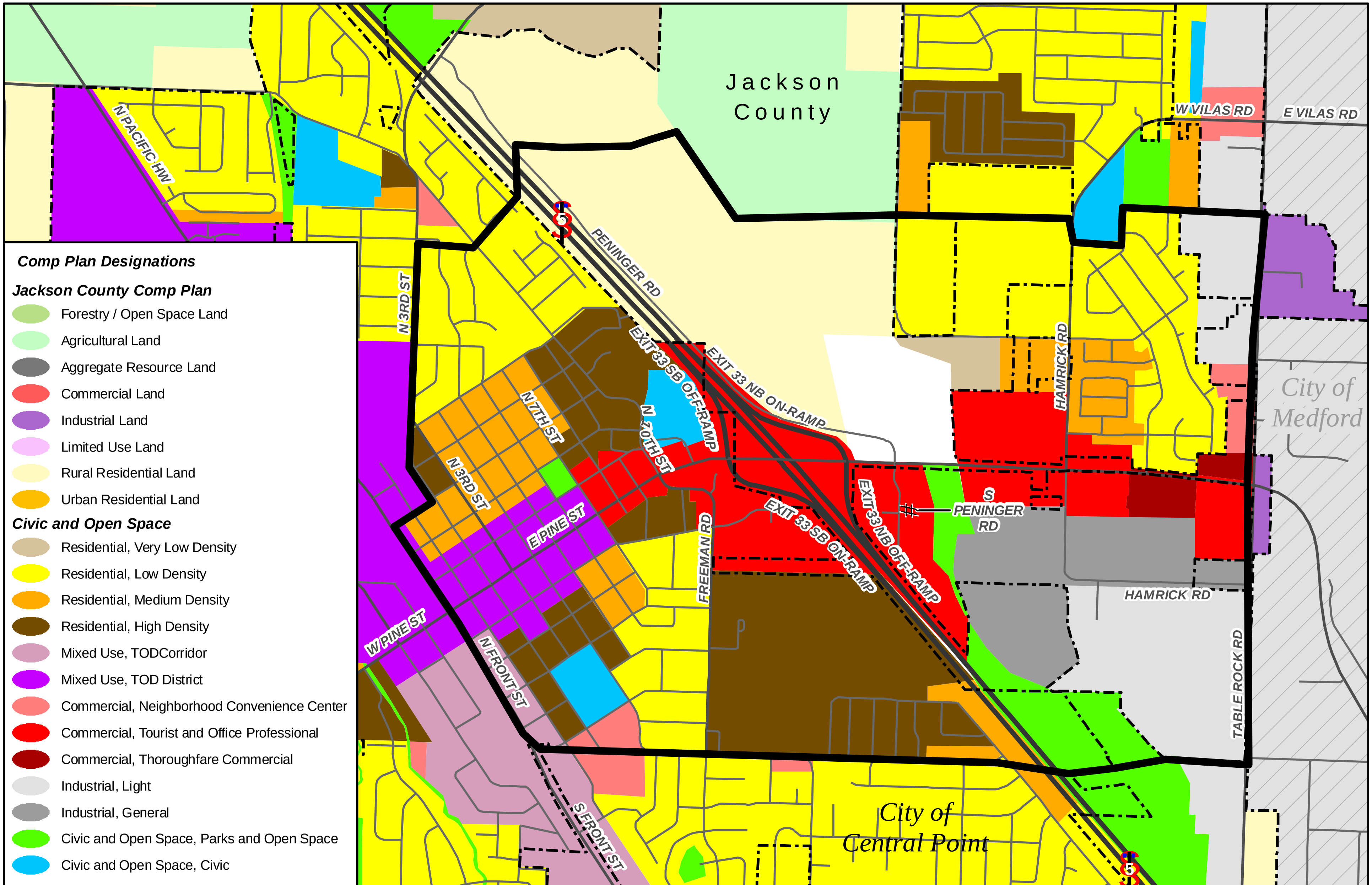

1,500 0 1,500

Feet

Source Data: *Jackson County GIS Data, City of Central Point, Comprehensive Land Use Plan 2008-2030*

Legend

City Limits

Study Area Boundary

Figure 2-2

Jackson County and City of Central Point Comprehensive Plans

I-5 Interchange 33 (Central Point) Interchange Area Management Plan Jackson County

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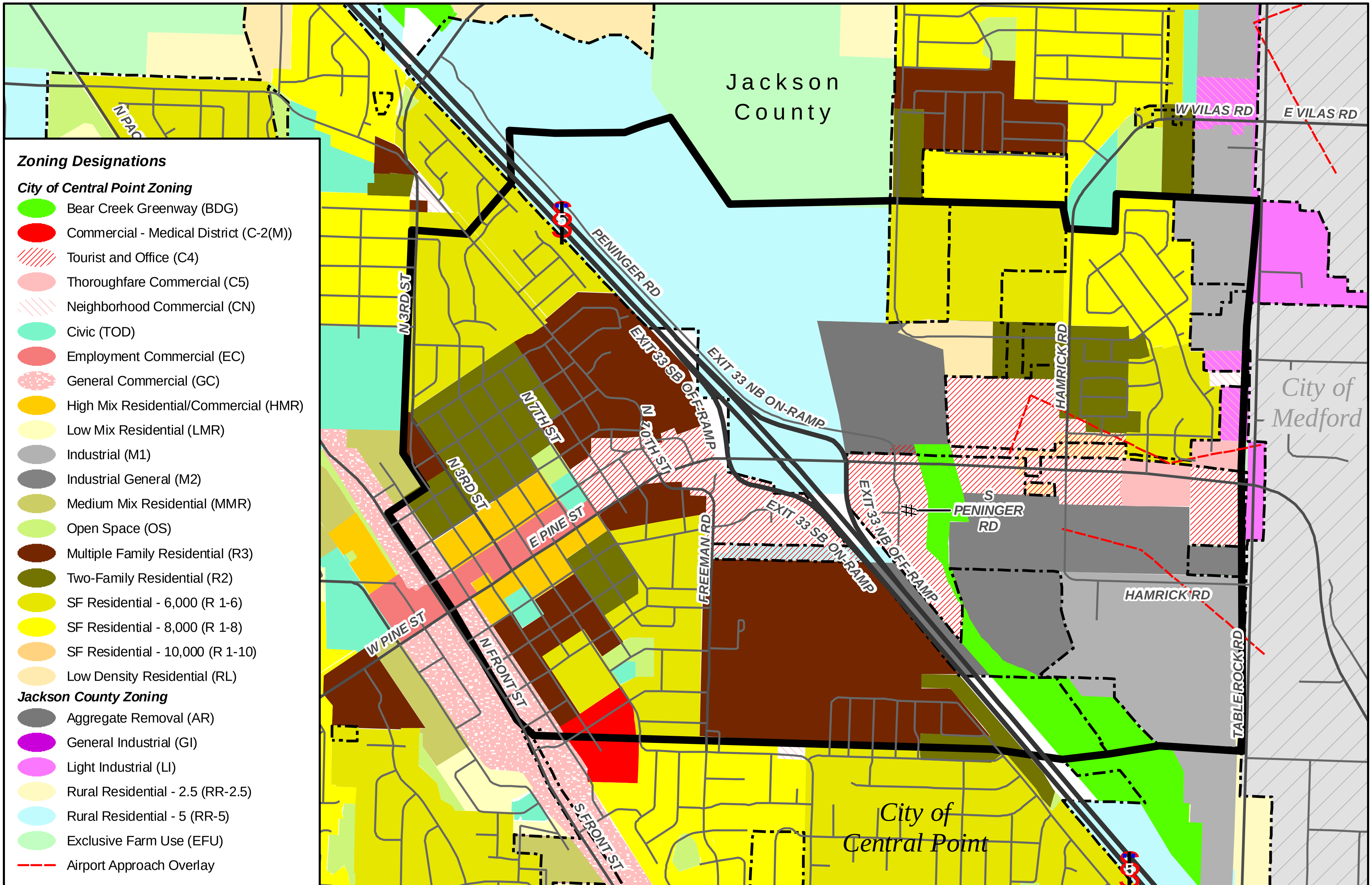

1,500 0 1,500
Feet

Source Data: *Jackson County GIS Data*

Legend

City Limits

Study Area Boundary

Figure 2-3

Jackson County and City of Central Point Zoning Designations

I-5 Interchange 33 (Central Point) Interchange Area Management Plan Jackson County

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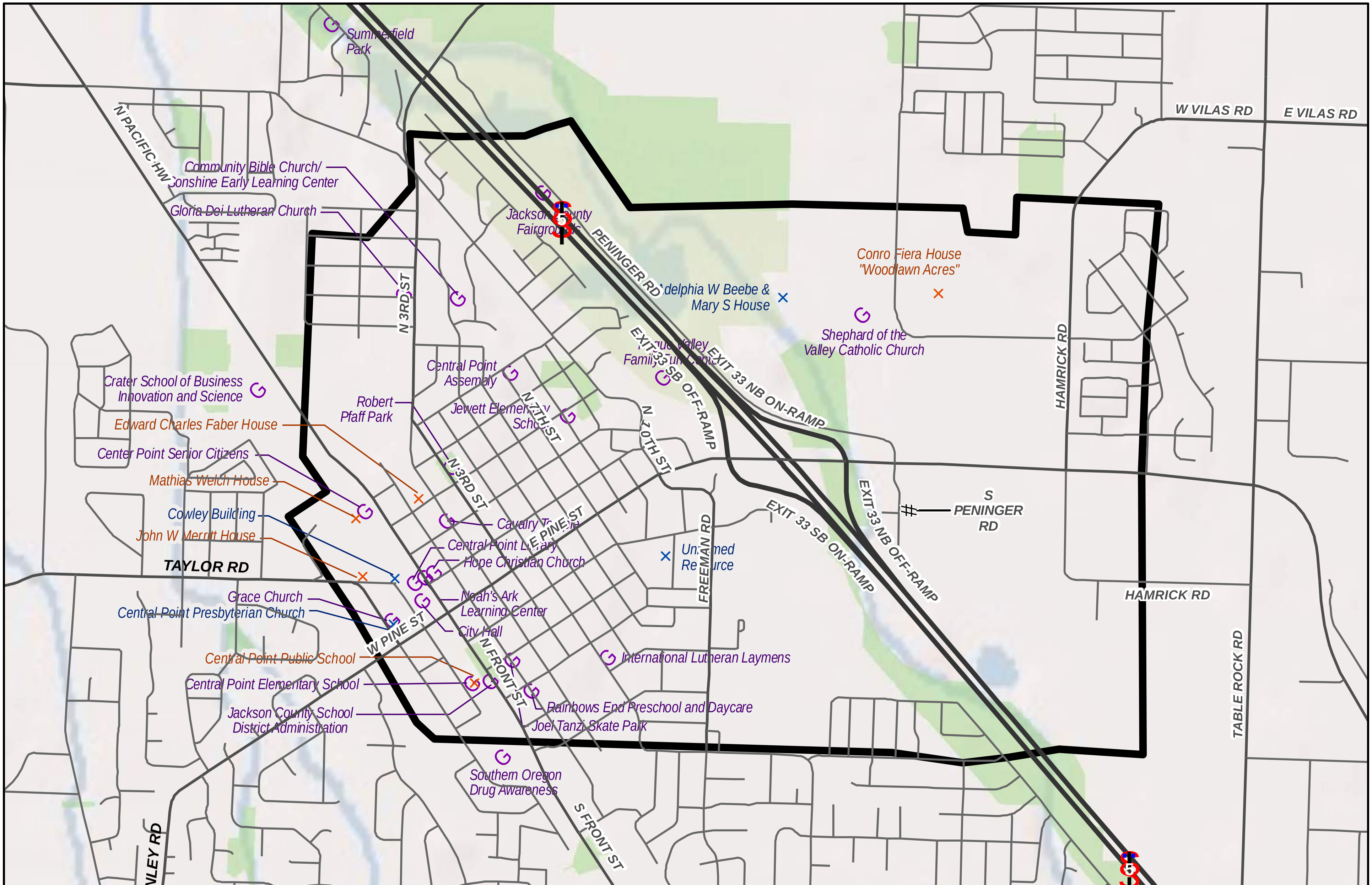

1,500 0 1,500
Feet

Source Data: ESRI, Jackson County GIS Data

Legend
- Study Area Boundary
- Community Resources
- Historic Resources
- Historic Resources (Undetermined or Eligible/Significant)

Figure 2-4

Community and Historical Resources

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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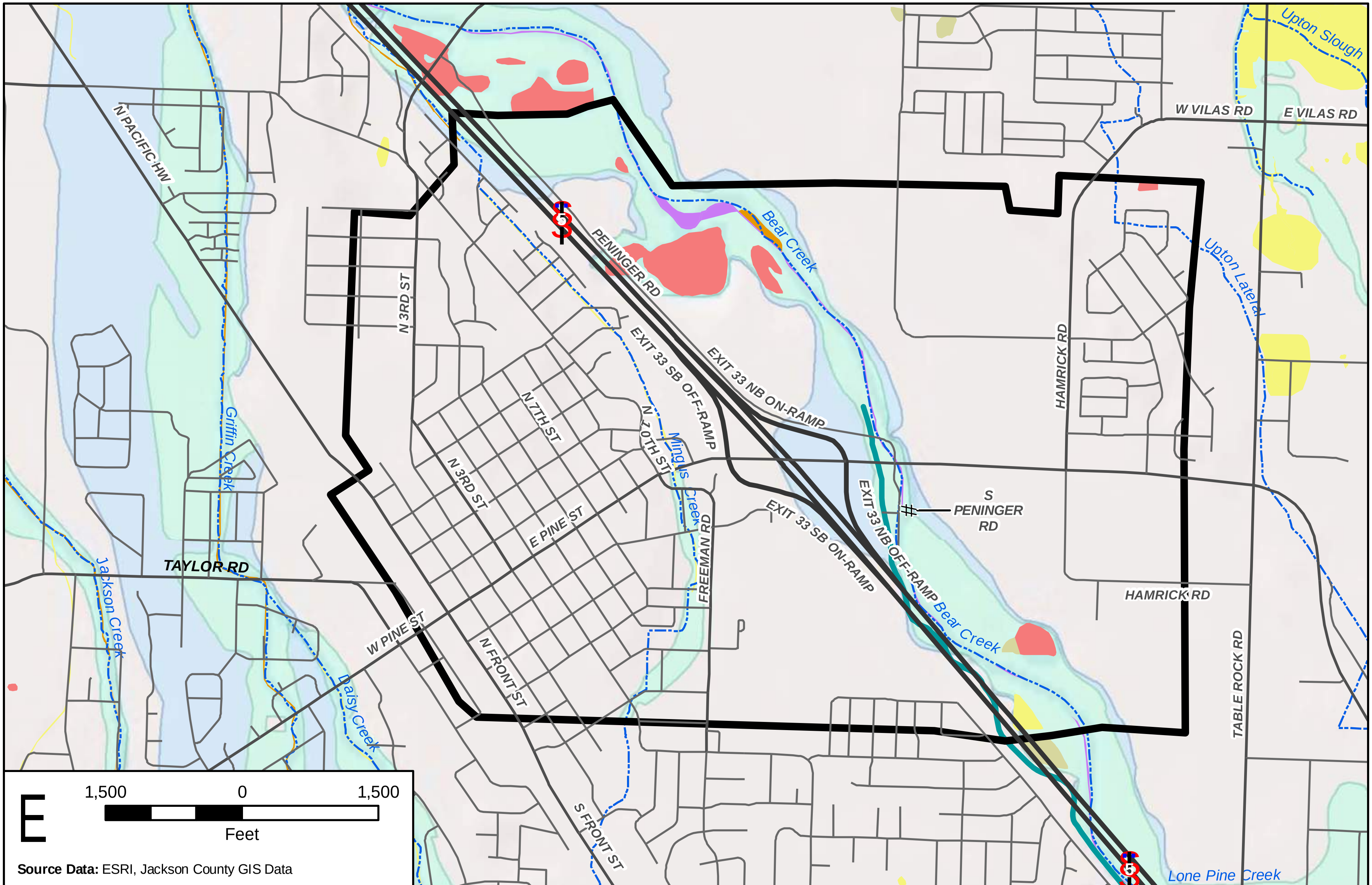

Source Data: ESRI, Jackson County GIS Data

Legend

- Study Area Boundary
- 100-Year Floodplain
- 500-Year Floodplain
- Rivers/Streams
- Bear Creek Greenway

Wetlands (Cowardin)

- Palustrine, Aquatic Bed
- Palustrine, Emergent
- Palustrine, Forest
- Palustrine, Scrub-Shrub
- Palustrine, Other
- Riverine, Upper Perennial
- Riverine, Intermittent

Figure 2-5

Natural Resources

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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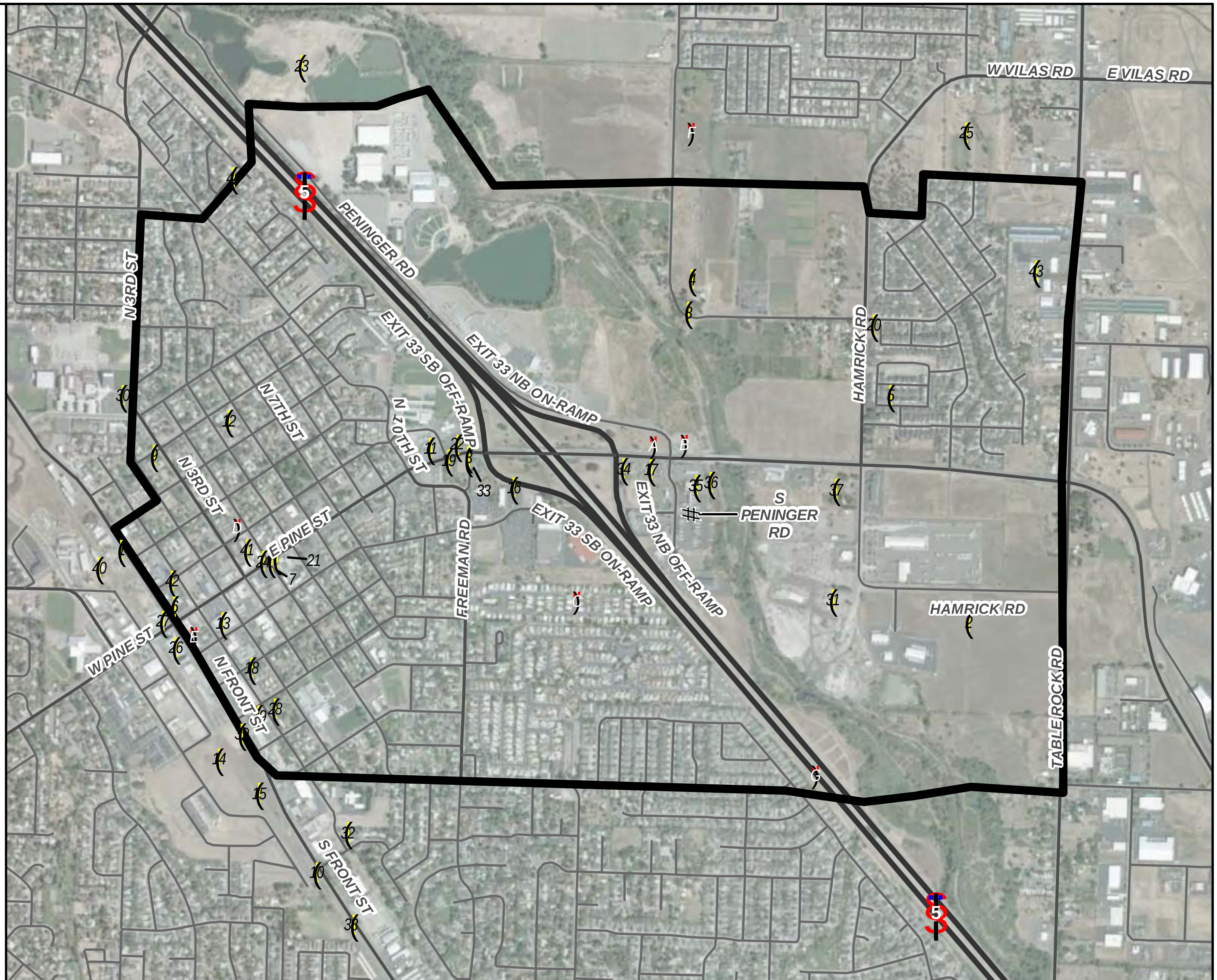
HAZARDOUS MATERIALS SITES

1 234 FRONT STREET
2 AIRPORT ORCHARD
3 ARS-FRESNO LLC
4 BEEBE ROAD
5 BEEBEWOOD ESTATES
6 BI-MOR STATIONS #7
7 BROCK PROPERTY (B & R TAX SERVICE INC.)
8 BROOKSTONE RANCH PUD
9 BUS BARN
10 C & M WESTERN INC.
11 CENTRAL POINT BP
12 CENTRAL POINT CITY SHOP
13 CENTRAL POINT CLEANERS
14 CENTRAL POINT LUMBER
15 CENTRAL POINT LUMBER CO.
16 CENTRAL POINT TIGER MART #2774
17 CHEVRON USA INC SS 98337
18 COLVIN OIL CO. JEFFERSON STATE
19 COLVIN OIL COMPANY
20 DECARLO HOMES OIL RELEASE
21 EAST PINE STREET GROUNDWATER\
22 EQUILON ENTERPRISES LLC
23 EXPO PONDS
24 FORMER CENTRAL POINT POST OFFICE HOT
25 FOUR SEASON'S SUBDIVISION
26 GRANGE CO-OP
27 GRANGE CO-OP CARDTROL
28 GRANGE COOP HOT
29 GRANGE COOPERATIVE SUPPLY ASSOCIATION
30 HARRIS M HOT
31 LTM INCORPORATED
32 MARBLE DESIGNS INC.
33 PACIFIC NW BELL - CENTRAL POINT
34 PANOCO INC #27
35 PILOT TRAVEL CENTER #391
36 PILOT TRAVEL CENTERS LLC
37 PINE STREET DEMO
38 PROVIDENCE
39 ROGUE CREAMERY
40 TWIN CREEKS CROSSING/THE NORTH VILLAGE
41 U S WEST COMMUNICATIONS
42 UNION PACIFIC RAILROAD
43 VIKING FREIGHT INC
44 WYSS DOMESTIC UST

FIRE MARSHALL SITES

A 1500 E PINE ST
B 1550 E PINE ST
C 301 FREEMAN RD
D 347 MANZANITA ST
E 43 N FRONT ST
F 4922 GEBHARD RD
G I-5 SB AT MP 32



1,500 0 1,500

Feet

Source Data: Jackson County GIS Data
Microsoft Aerial Photograph (2001-2009)

Legend

Study Area Boundary
Hazardous Material Sites
Fire Marshall Sites

Figure 2-6

Hazardous Materials Sites

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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I-5 Exit 33 (Central Point)

Interchange Area Management Plan

APPENDIX

Technical Memorandum #2

Existing Conditions Analysis

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

June 2014

Table of Contents

APPENDIX A.

Seasonal Adjustment Factors and Traffic Volumes

SEASONAL FACTOR CALCULATIONS

Project Title: I-5 Interchange 33
Project No. ODOT0000-0680

Other
April Seasonal Factor = 1.084 (Average of Commuter ATR 03-017, ATR 27-006 and Interstate ATR 15-001, ATR 15-019)
May Seasonal Factor = 1.080 (Average of Commuter ATR 03-017, ATR 27-006 and Interstate ATR 15-001, ATR 15-019)

I-5
Mainline (Mar/Apr) = 1.131 (Interstate Urbanized Seasonal Trend)
Ramps (May) = 1.105 (Average of East Pine Street Factor & Mainline Factor)

~~ATR 15-017: NORTH MEDFORD (OR 62)~~

	~~April~~	~~AWT~~	~~% of ADT~~
	~~2009~~	~~42787~~	~~102~~
	~~2008~~	~~44646~~	~~105~~
	~~2007~~	~~46000~~	~~104~~
	~~2006~~	~~39500~~	~~103~~
	~~2005~~	~~39900~~	~~104~~
	~~Average=~~	~~42567~~	~~104~~

	~~May~~	~~AWT~~	~~% of ADT~~
	~~2009~~	~~43254~~	~~103~~
	~~2008~~	~~44884~~	~~106~~
	~~2007~~	~~46866~~	~~106~~
	~~2006~~	~~39500~~	~~103~~
	~~2005~~	~~39800~~	~~103~~
	~~Average=~~	~~42861~~	~~104~~

~~Peak Mo.~~		~~AWT~~	~~% of ADT~~
~~Jul~~	~~2009~~	~~45638~~	~~109~~
~~Jul~~	~~2008~~	~~46085~~	~~109~~
~~Aug~~	~~2007~~	~~48649~~	~~110~~
~~Aug~~	~~2006~~	~~41600~~	~~108~~
~~Aug~~	~~2005~~	~~41900~~	~~109~~
	~~Average=~~	~~44774~~	~~109~~

~~pril Seasonal Factor =~~ ~~1.052~~ ~~1.052~~
~~Aay Seasonal Factor =~~ ~~1.045~~ ~~1.046~~

ATR 03-017: CLACKAMAS (OR 212/214)

	April	AWT	% of ADT
	2009	34564	108
	2008	35240	110
	2007	35955	107
	Average=	35253	108

	May	AWT	% of ADT
	2009	34287	107
	2008	34802	108
	2007	36098	108
	Average=	35062	108

Peak Mo.		AWT	% of ADT
Jul	2009	36535	114
Jul	2008	36436	113
Aug	2007	37900	113
	Average=	36957	113

April Seasonal Factor = 1.048 1.046
May Seasonal Factor = 1.054 1.053

ATR 27-006: OAK KNOLL (OR 22)

	April	AWT	% of ADT
	2009	27280	104
	2008	27284	106
	2007	28976	105
	2006	29156	104
	2005	27921	102
	Average=	28123	104

	May	AWT	% of ADT
	2009	27362	104
	2008	27506	107
	2007	28713	104
	2006	28323	101
	2005	28189	103
	Average=	28019	104

Peak Mo.		AWT	% of ADT
Jul	2009	28998	110
Aug	2008	28176	109
Aug	2007	30383	110
Aug	2006	29978	107
Aug	2005	29380	107
	Average=	29383	109

April Seasonal Factor = 1.045 1.042
May Seasonal Factor = 1.049 1.046

ATR 15-001: Gold Hill

	March	AWT	% of ADT
	2009	31847	96
	2008	33922	105
	2007	35263	100
	2006	34861	98
	2005	35925	101
	Average=	34364	100

	April	AWT	% of ADT
	2009	33361	101
	2008	33516	104
	2007	35997	102
	2006	36133	102
	2005	35290	100
	Average=	34859	102

	May	AWT	% of ADT
	2009	34234	103
	2008	34170	106
	2007	36244	103
	2006	36182	102
	2005	35252	100
	Average=	35216	103

Peak Mo.			
Jul	2009	38768	117
Jul	2008	37467	116
Aug	2007	41322	118
Aug	2006	40868	115
Jul	2005	41100	116
	Average=	39905	116

March/April Seasonal Factor = 1.153 1.154
April Seasonal Factor = 1.145 1.143
May Seasonal Factor = 1.133 1.132

ATR 15-019: Medford Viaduct

	March	AWT	% of ADT
	2009	47000	101
	2008	48638	106
	2007	49609	103
	2006	48000	100
	2005	50511	107
	Average=	48752	103

	April	AWT	% of ADT
	2009	48000	101
	2008	49100	107
	2007	50482	105
	2006	50140	104
	2005	49031	104
	Average=	49351	104

	May	AWT	% of ADT
	2009	48600	108
	2008	49622	108
	2007	51126	106
	2006	49785	103
	2005	49223	104
	Average=	49671	106

Peak Mo.			
Aug	2009	53400	116
Aug	2008	52206	114
Aug	2007	55312	115
Aug	2006	55791	116
Jun	2005	53904	114
	Average=	54123	115

March/April Seasonal Factor = 1.103 1.108
April Seasonal Factor = 1.097 1.104
May Seasonal Factor = 1.090 1.087

~~Commuter Trend~~
~~Late April Seasonal Factor =~~ ~~1.029~~
~~Early May Seasonal Factor =~~ ~~1.029~~

Summer Seasonal Trend
Late April Seasonal Factor = 1.236
Early May Seasonal Factor = 1.192

Interstate Urbanized Trend
Late April Seasonal Factor = 1.025
Early May Seasonal Factor = 1.033

2010 SEASONAL TREND TABLE (Printed: 07/07/10)

TREND	1-Jan	15-Jan	1-Feb	15-Feb	1-Mar	15-Mar	1-Apr	15-Apr	1-May	15-May	1-Jun	15-Jun	1-Jul	15-Jul	1-Aug	15-Aug	1-Sep	15-Sep	1-Oct	15-Oct	1-Nov	15-Nov	1-Dec	15-Dec	Peak Period
INTERSTATE URBAI	1.00	1.01	0.99	0.97	0.96	0.95	0.94	0.93	0.94	0.94	0.93	0.91	0.91	0.91	0.91	0.91	0.93	0.94	0.95	0.95	0.96	0.98	0.98	0.99	0.91
INTERSTATE NONUI	1.26	1.33	1.28	1.23	1.16	1.10	1.08	1.06	1.03	1.00	0.95	0.91	0.88	0.84	0.85	0.85	0.90	0.94	0.99	1.04	1.05	1.06	1.12	1.18	0.84
COMMUTER	1.01	1.02	1.01	0.99	0.98	0.98	0.95	0.93	0.93	0.93	0.92	0.90	0.90	0.90	0.90	0.90	0.91	0.93	0.93	0.94	0.96	0.99	1.00	1.01	0.90
COASTAL DESTINA	1.20	1.22	1.20	1.18	1.14	1.09	1.09	1.08	1.06	1.04	0.99	0.94	0.88	0.82	0.82	0.83	0.88	0.94	1.01	1.07	1.12	1.16	1.17	1.18	0.82
COASTAL DESTINA	1.46	1.53	1.49	1.44	1.36	1.28	1.24	1.20	1.15	1.09	1.03	0.96	0.86	0.76	0.77	0.77	0.85	0.93	1.06	1.18	1.25	1.32	1.36	1.39	0.76
AGRICULTURE	1.16	1.18	1.15	1.13	1.11	1.08	1.04	0.99	0.96	0.94	0.92	0.90	0.89	0.88	0.87	0.87	0.89	0.91	0.92	0.93	0.97	1.01	1.07	1.14	0.87
RECREATIONAL SU	1.82	1.95	1.90	1.84	1.73	1.63	1.51	1.40	1.22	1.03	0.95	0.87	0.80	0.74	0.75	0.77	0.82	0.88	1.00	1.11	1.30	1.48	1.59	1.69	0.74
RECREATIONAL SU	1.22	1.35	1.35	1.35	1.36	1.37	1.53	1.69	1.64	1.60	1.35	1.09	0.97	0.85	0.91	0.96	1.11	1.27	1.61	1.96	1.74	1.51	1.30	1.08	0.85
RECREATIONAL WI	0.98	1.07	1.16	1.25	1.07	0.89	1.30	1.72	2.26	2.80	2.23	1.66	1.42	1.19	1.27	1.35	1.48	1.61	2.05	2.49	2.10	1.71	1.31	0.90	0.89
SUMMER	1.19	1.23	1.20	1.17	1.14	1.12	1.07	1.02	0.99	0.95	0.92	0.89	0.86	0.83	0.84	0.84	0.88	0.91	0.95	0.99	1.04	1.09	1.12	1.16	0.83
SUMMER < 2500	1.34	1.41	1.37	1.33	1.25	1.18	1.10	1.03	0.96	0.90	0.87	0.83	0.81	0.80	0.81	0.82	0.83	0.84	0.89	0.93	1.01	1.08	1.18	1.27	0.80

***Seasonal Trend Table factors are based on previous year ATR data and the table is updated yearly.**

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **PM Turning Movement Volumes**
Created: 5/5/2010
Rev. Date: 8/16/2010

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
1	1	East Pine Street and N/S 7th Street		NEL	10	16	1.08	17			17	15
	1	4 hr PM Turning Movement Count	EB	NET	10	559	1.08	606		40	646	645
	1	Count Date: 4/20/2010		NER	10	9	1.08	10			10	10
	1	2010		SWL	10	21	1.08	23			23	25
	1		WB	SWT	10	617	1.08	669		20	689	690
	1			SWR	10	28	1.08	30			30	30
	1	PM Peak Hour: 3:30 PM-4:30 PM		NWL	10	4	1.08	4			4	5
	1	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	10	1	1.08	1			1	2
	1			NWR	10	27	1.08	29			29	30
	1			SEL	10	38	1.08	41			41	40
	1	PHF:	SB	SET	10	3	1.08	3			3	5
	1	0.92		SER	10	47	1.08	51			51	50
			TEV			**1370**		**1485**			**1545**	**1547**
2	2	East Pine Street and N/S 8th Street		NEL	20	13	1.08	14			14	15
	2	4 hr PM Turning Movement Count	EB	NET	20	625	1.08	677		25	702	700
	2	Count Date: 4/20/2010		NER	20	0	1.08	0			0	0
	2	2010		SWL	20	7	1.08	8			8	10
	2		WB	SWT	20	690	1.08	748		-15	733	735
	2			SWR	20	13	1.08	14			14	15
	2	PM Peak Hour: 3:30 PM-4:30 PM		NWL	20	3	1.08	3			3	5
	2	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	20	0	1.08	0			0	0
	2			NWR	20	8	1.08	9			9	10
	2			SEL	20	10	1.08	11			11	10
	2	PHF:	SB	SET	20	0	1.08	0			0	0
	2	0.88		SER	20	6	1.08	7			7	5
			TEV			**1375**		**1490**			**1500**	**1505**
3	3	East Pine Street and N/S 9th Street		NEL	30	1	1.08	1			1	2
	3	4 hr PM Turning Movement Count	EB	NET	30	618	1.08	670		25	695	695
	3	Count Date: 4/20/2010		NER	30	19	1.08	21			21	20
	3	2010		SWL	30	5	1.08	5			5	5
	3		WB	SWT	30	685	1.08	742		5	747	745
	3			SWR	30	8	1.08	9			9	10
	3	PM Peak Hour: 3:15 PM-4:15 PM		NWL	30	13	1.08	14			14	15
	3	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	30	1	1.08	1			1	2
	3			NWR	30	29	1.08	31			31	30
	3			SEL	30	2	1.08	2			2	2
	3	PHF:	SB	SET	30	0	1.08	0			0	0
	3	0.88		SER	30	1	1.08	1			1	2
			TEV			**1382**		**1498**			**1528**	**1528**
4	4	East Pine Street and N 10th Street/Freeman Road		EBL	40	29	1.08	31			31	30
	4	4 hr PM Intersection Classification Count	EB	EBT	40	545	1.08	591		15	606	605
	4	Count Date: 4/20/2010		EBR	40	81	1.08	88			88	90
	4	2010		WBL	40	401	1.08	435			435	435
	4		WB	WBT	40	590	1.08	639		-5	634	635
	4			WBR	40	133	1.08	144			144	145
	4	PM Peak Hour: 5:00 PM-6:00 PM		NBL	40	86	1.08	93			93	95
	4	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	40	117	1.08	127			127	125
	4			NBR	40	264	1.08	286		10	296	295
	4			SBL	40	129	1.08	140		5	145	145
	4	PHF:	SB	SBT	40	131	1.08	142			142	140
	4	0.89		SBR	40	26	1.08	28			28	30
			TEV			**2532**		**2744**			**2769**	**2770**

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **PM Turning Movement Volumes**
Created: 5/5/2010
Rev. Date: 8/16/2010

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
5	5	East Pine Street and Jewett School Road		EBL	50	9	1.08	10			10	10
	5	4 hr PM Turning Movement Count	EB	EBT	50	911	1.08	987		50	1037	1035
	5	Count Date: 4/20/2010		EBR	50	0	1.08	0			0	0
	5	2010		WBL	50	0	1.08	0			0	0
	5		WB	WBT	50	1110	1.08	1203		-5	1198	1200
	5			WBR	50	29	1.08	31			31	30
	5	PM Peak Hour: 3:15 PM-4:15 PM		NBL	50	0	1.08	0			0	0
	5	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	50	0	1.08	0			0	0
	5			NBR	50	0	1.08	0			0	0
	5			SBL	50	19	1.08	21			21	20
	5	PHF:	SB	SBT	50	0	1.08	0			0	0
	5	0.90		SBR	50	13	1.08	14			14	15
			TEV			**2091**		**2266**			**2311**	**2310**
6	6	East Pine Street and SB Ramps		EBL	60	0	1.08	0			0	0
	6	16 hr ODOT Turning Movement Count	EB	EBT	60	878	1.08	952		-150	802	800
	6	Count Date: 5/11/2010		EBR	60	250	1.11	276		-20	256	255
	6	2010		WBL	60	200	1.11	221			221	220
	6		WB	WBT	60	1079	1.08	1169		-25	1144	1145
	6			WBR	60	0	1.08	0			0	0
	6	PM Peak Hour: 4:30 PM-5:30 PM		NBL	60	0	1.08	0			0	0
	6	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	60	0	1.08	0			0	0
	6			NBR	60	0	1.08	0			0	0
	6			SBL	60	189	1.11	209			209	210
	6	PHF:	SB	SBT	60	1	1.11	1			1	2
	6	0.94		SBR	60	75	1.11	83			83	85
			TEV			**2672**		**2911**			**2716**	**2717**
7	7	East Pine Street and NB Ramps		EBL	70	77	1.11	85			85	85
	7	16 hr ODOT Turning Movement Count	EB	EBT	70	981	1.08	1063		-140	923	925
	7	Count Date: 5/11/2010		EBR	70	0	1.08	0			0	0
	7	2010		WBL	70	0	1.08	0			0	0
	7		WB	WBT	70	908	1.08	984		-25	959	960
	7			WBR	70	348	1.11	385			385	385
	7	PM Peak Hour: 4:30 PM-5:30 PM		NBL	70	366	1.11	404			404	405
	7	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	70	0	1.11	0			0	0
	7			NBR	70	255	1.11	282		-25	257	255
	7			SBL	70	0	1.08	0			0	0
	7	PHF:	SB	SBT	70	0	1.08	0			0	0
	7	0.96		SBR	70	0	1.08	0			0	0
			TEV			**2935**		**3203**			**3013**	**3015**
8	8	East Pine Street and Penninger Road (including westbound right		EBL	80	34	1.08	37	0%	5	42	40
	8	4 hr PM Intersection Classification Count	EB	EBT	80	786	1.08	852	2%	125	977	975
	8	Count Date: 4/20/2010		EBR	80	139	1.08	151	35%	15	166	165
	8	2010		WBL	80	24	1.08	26	13%		26	25
	8		WB	WBT	80	1017	1.08	1102	2%	35	1137	1135
	8			WBR	80	61	1.08	66	0%		66	65
	8	PM Peak Hour: 3:15 PM-4:15 PM		NBL	80	168	1.08	182	27%		182	180
	8	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	80	7	1.08	8	0%		8	10
	8			NBR	80	38	1.08	41	16%		41	40
	8			SBL	80	37	1.08	40	0%		40	40
	8	PHF:	SB	SBT	80	6	1.08	7	0%		7	5
	8	0.90		SBR	80	29	1.08	31	0%		31	30
			TEV			**2346**		**2543**	**1**		**2723**	**2710**

Project: IAMP 33
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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
9	9	East Pine Street and Hamrick Road		EBL	90	429	1.08	465		45	510	510
	9	4 hr PM Intersection Classification Count	EB	EBT	90	400	1.08	434		50	484	485
	9	Count Date: 4/20/2010		EBR	90	29	1.08	31			31	30
	9	2010		WBL	90	4	1.08	4			4	5
	9		WB	WBT	90	623	1.08	675			675	675
	9			WBR	90	34	1.08	37			37	35
	9	PM Peak Hour: 3:30 PM-4:30 PM		NBL	90	41	1.08	44			44	45
	9	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	90	10	1.08	11			11	10
	9			NBR	90	1	1.08	1			1	2
	9			SBL	90	33	1.08	36			36	35
	9	PHF:	SB	SBT	90	13	1.08	14			14	15
	9	0.90		SBR	90	447	1.08	484			484	485
			TEV			**2064**		**2237**			**2332**	**2332**
XX		I-5 Merge/Diverger Volumes		Main S		1852	1.13	2094			2094	2095
		16 hr ODOT Turning Movement Count		Off		621	1.11	686			661	660
		Count Date: 3/31/2010	NB	Through		1231		1408			1433	1435
		2010		On		425	1.11	470			470	470
				Main N		1656		1878			1903	1905
		PM Peak Hour Used: 4:30 PM-5:30 PM		Main N		1043		1184			1204	1205
		Alternate SB PM Peak Hour Used: 3:30 PM-4:30 PM		Off		265	1.11	293			293	295
		PHF (NB/SB):	SB	Through		778		891			911	910
		0.95		On		451	1.11	498			478	480
		0.95		Main S		1229	1.13	1390			1390	1390
		Alternate SB PHF:		Main N		1185		1346			1346	1350
		0.97		Off		238	1.11	263			263	265
			SB Alt	Through		947		1083			1083	1085
				On		476	1.11	526			526	525
				Main S		1423	1.13	1609			1609	1610
		SB AM PHF (7-8am)		Main N		1365		1552			1552	1550
		0.00		Off		328	1.11	362			362	360
		SB Alt AM values manually entered from ODOT counts, PHF reca	SB Alt AM	Through		1037		1190			1190	1190
				On		668	1.11	738			738	740
				Main S		1705	1.13	1928			1928	1930

Project: IAMP 33
Job #: ODOT0000-0680
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Created: 5/5/2010
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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
1	1	East Pine Street and N/S 7th Street		NEL	10	16	1.08	17	0.0		17	15
	1	4 hr PM Turning Movement Count	EB	NET	10	559	1.08	606	0.0	40	646	645
	1	Count Date: 4/20/2010		NER	10	9	1.08	10	0.0		10	10
	1	2010		SWL	10	21	1.08	23	0.0		23	25
	1		WB	SWT	10	617	1.08	669	0.1	20	689	690
	1			SWR	10	28	1.08	30	0.0		30	30
	1	PM Peak Hour: 3:30 PM-4:30 PM		NWL	10	4	1.08	4	0.0		4	5
	1	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	10	1	1.08	1	0.0		1	2
	1			NWR	10	27	1.08	29	0.0		29	30
	1			SEL	10	38	1.08	41	0.0		41	40
	1	PHF:	SB	SET	10	3	1.08	3	0.0		3	5
	1	0.92		SER	10	47	1.08	51	0.0		51	50
			TEV			**1370**		**1485**			**1545**	**1547**
			East			**1290**		**1398**			**1458**	**1460**
			West			**1252**		**1357**			**1417**	**1415**
2	2	East Pine Street and N/S 8th Street		NEL	20	13	1.08	14	0.0		14	15
	2	4 hr PM Turning Movement Count	EB	NET	20	625	1.08	677	0.0	25	702	700
	2	Count Date: 4/20/2010		NER	20	0	1.08	0	0.0		0	0
	2	2010		SWL	20	7	1.08	8	0.0		8	10
	2		WB	SWT	20	690	1.08	748	0.1	-15	733	735
	2			SWR	20	13	1.08	14	0.0		14	15
	2	PM Peak Hour: 3:30 PM-4:30 PM		NWL	20	3	1.08	3	0.0		3	5
	2	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	20	0	1.08	0	0.0		0	0
	2			NWR	20	8	1.08	9	0.0		9	10
	2			SEL	20	10	1.08	11	0.0		11	10
	2	PHF:	SB	SET	20	0	1.08	0	0.0		0	0
	2	0.88		SER	20	6	1.08	7	0.0		7	5
			TEV			**1375**		**1490**			**1500**	**1505**
			East			**1353**		**1466**			**1476**	**1480**
			West			**1337**		**1449**			**1459**	**1460**
3	3	East Pine Street and N/S 9th Street		NEL	30	1	1.08	1	0.0		1	2
	3	4 hr PM Turning Movement Count	EB	NET	30	618	1.08	670	0.0	25	695	695
	3	Count Date: 4/20/2010		NER	30	19	1.08	21	0.0		21	20
	3	2010		SWL	30	5	1.08	5	0.0		5	5
	3		WB	SWT	30	685	1.08	742	0.0	5	747	745
	3			SWR	30	8	1.08	9	0.0		9	10
	3	PM Peak Hour: 3:15 PM-4:15 PM		NWL	30	13	1.08	14	0.0		14	15
	3	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	30	1	1.08	1	0.0		1	2
	3			NWR	30	29	1.08	31	0.0		31	30
	3			SEL	30	2	1.08	2	0.0		2	2
	3	PHF:	SB	SET	30	0	1.08	0	0.0		0	0
	3	0.88		SER	30	1	1.08	1	0.0		1	2
			TEV			**1382**		**1498**			**1528**	**1528**
			East			**1347**		**1460**			**1490**	**1487**
			West			**1337**		**1449**			**1479**	**1479**
4	4	East Pine Street and N 10th Street/Freeman Road		EBL	40	29	1.08	31	0.0		31	30
	4	4 hr PM Intersection Classification Count	EB	EBT	40	545	1.08	591	0.0	15	606	605
	4	Count Date: 4/20/2010		EBR	40	81	1.08	88	0.0		88	90
	4	2010		WBL	40	401	1.08	435	0.0		435	435
	4		WB	WBT	40	590	1.08	639	0.2	-5	634	635
	4			WBR	40	133	1.08	144	0.0		144	145
	4	PM Peak Hour: 5:00 PM-6:00 PM		NBL	40	86	1.08	93	2.3		93	95
	4	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	40	117	1.08	127	0.0		127	125
	4			NBR	40	264	1.08	286	0.0	10	296	295
	4			SBL	40	129	1.08	140	0.0	5	145	145
	4	PHF:	SB	SBT	40	131	1.08	142	2.3		142	140
	4	0.89		SBR	40	26	1.08	28	3.8		28	30
			TEV			**2532**		**2744**			**2769**	**2770**
			East			**2062**		**2235**			**2260**	**2260**
			West			**1357**		**1471**			**1481**	**1485**

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **PM Turning Movement Volumes**
Created: 5/5/2010
Rev. Date: 8/16/2010

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak

Project: IAMP 33
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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
5	5	East Pine Street and Jewett School Road		EBL	50	9	1.08	10	0.0		10	10
	5	4 hr PM Turning Movement Count	EB	EBT	50	911	1.08	987	0.0	50	1037	1035
	5	Count Date: 4/20/2010		EBR	50	0	1.08	0	0.0		0	0
	5	2010		WBL	50	0	1.08	0	0.0		0	0
	5		WB	WBT	50	1110	1.08	1203	0.0	-5	1198	1200
	5			WBR	50	29	1.08	31	0.0		31	30
	5	PM Peak Hour: 3:15 PM-4:15 PM		NBL	50	0	1.08	0	0.0		0	0
	5	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	50	0	1.08	0	0.0		0	0
	5			NBR	50	0	1.08	0	0.0		0	0
	5			SBL	50	19	1.08	21	0.0		21	20
	5	PHF:	SB	SBT	50	0	1.08	0	0.0		0	0
	5	0.90		SBR	50	13	1.08	14	0.0		14	15
			TEV			**2091**		**2266**			**2311**	**2310**
			East			**2069**		**2243**			**2288**	**2285**
			West			**2043**		**2214**			**2259**	**2260**
6	6	East Pine Street and SB Ramps		EBL	60	0	1.08	0	0.0		0	0
	6	16 hr ODOT Turning Movement Count	EB	EBT	60	878	1.08	952	1.5	-150	802	800
	6	Count Date: 5/11/2010		EBR	60	250	1.11	276	0.0	-20	256	255
	6	2010		WBL	60	200	1.11	221	13.0		221	220
	6		WB	WBT	60	1079	1.08	1169	0.5	-25	1144	1145
	6			WBR	60	0	1.08	0	0.0		0	0
	6	PM Peak Hour: 4:30 PM-5:30 PM		NBL	60	0	1.08	0	0.0		0	0
	6	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	60	0	1.08	0	0.0		0	0
	6			NBR	60	0	1.08	0	0.0		0	0
	6			SBL	60	189	1.11	209	19.0		209	210
	6	PHF:	SB	SBT	60	1	1.11	1	0.0		1	2
	6	0.94		SBR	60	75	1.11	83	0.0		83	85
			TEV			**2672**		**2911**			**2716**	**2717**
			East			**2346**		**2551**			**2376**	**2375**
			West			**2282**		**2480**			**2285**	**2285**
7	7	East Pine Street and NB Ramps		EBL	70	77	1.11	85	0.0		85	85
	7	16 hr ODOT Turning Movement Count	EB	EBT	70	981	1.08	1063	4.4	-140	923	925
	7	Count Date: 5/11/2010		EBR	70	0	1.08	0	0.0		0	0
	7	2010		WBL	70	0	1.08	0	0.0		0	0
	7		WB	WBT	70	908	1.08	984	2.6	-25	959	960
	7			WBR	70	348	1.11	385	11.5		385	385
	7	PM Peak Hour: 4:30 PM-5:30 PM		NBL	70	366	1.11	404	0.5		404	405
	7	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	70	0	1.11	0	0.0		0	0
	7			NBR	70	255	1.11	282	12.2	-25	257	255
	7			SBL	70	0	1.08	0	0.0		0	0
	7	PHF:	SB	SBT	70	0	1.08	0	0.0		0	0
	7	0.96		SBR	70	0	1.08	0	0.0		0	0
			TEV			**2935**		**3203**			**3013**	**3015**
			East			**2492**		**2714**			**2524**	**2525**
			West			**2332**		**2537**			**2372**	**2375**
8	8	East Pine Street and Penninger Road (including westbound right		EBL	80	34	1.08	37	0.0	5	42	40
	8	4 hr PM Intersection Classification Count	EB	EBT	80	786	1.08	852	0.0	125	977	975
	8	Count Date: 4/20/2010		EBR	80	139	1.08	151	34.5	15	166	165
	8	2010		WBL	80	24	1.08	26	12.5		26	25
	8		WB	WBT	80	1017	1.08	1102	1.8	35	1137	1135
	8			WBR	80	61	1.08	66	0.0		66	65
	8	PM Peak Hour: 3:15 PM-4:15 PM		NBL	80	168	1.08	182	27.4		182	180
	8	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	80	7	1.08	8	0.0		8	10
	8			NBR	80	38	1.08	41	15.8		41	40
	8			SBL	80	37	1.08	40	0.0		40	40
	8	PHF:	SB	SBT	80	6	1.08	7	0.0		7	5
	8	0.90		SBR	80	29	1.08	31	0.0		31	30
			TEV			**2346**		**2543**			**2723**	**2710**
			East			**1963**		**2128**			**2288**	**2280**
			West			**2173**		**2355**			**2535**	**2525**

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **PM Turning Movement Volumes**
Created: 5/5/2010
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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak

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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	5 30st Highest Hour 2010 Balanced PM Peak	4 30th Highest Hour 2010 Rounded PM Peak
9	9	East Pine Street and Hamrick Road		EBL	90	429	1.08	465	2.6	45	510	510
	9	4 hr PM Intersection Classification Count	EB	EBT	90	400	1.08	434	4.8	50	484	485
	9	Count Date: 4/20/2010		EBR	90	29	1.08	31	62.1		31	30
	9	2010		WBL	90	4	1.08	4	0.0		4	5
	9		WB	WBT	90	623	1.08	675	3.0		675	675
	9			WBR	90	34	1.08	37	0.0		37	35
	9	PM Peak Hour: 3:30 PM-4:30 PM		NBL	90	41	1.08	44	29.3		44	45
	9	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	90	10	1.08	11	0.0		11	10
	9			NBR	90	1	1.08	1	0.0		1	2
	9			SBL	90	33	1.08	36	0.0		36	35
	9	PHF:	SB	SBT	90	13	1.08	14	15.4		14	15
	9	0.90		SBR	90	447	1.08	484	2.2		484	485
			TEV			**2064**		**2237**			**2332**	**2332**
			East			**1095**		**1187**			**1237**	**1237**
			West			**1969**		**2134**			**2229**	**2230**
XX		I-5 Merge/Diverger Volumes		Main S		1852	1.13	2094			2094	2095
		16 hr ODOT Turning Movement Count		Off		621	1.11	686			661	660
		Count Date: 3/31/2010	NB	Through		1231		1408			1433	1435
		2010		On		425	1.11	470			470	470
				Main N		1656		1878			1903	1905
		PM Peak Hour Used: 4:30 PM-5:30 PM		Main N		1043		1184			1204	1205
		Alternate SB PM Peak Hour Used: 3:30 PM-4:30 PM		Off		265	1.11	293			293	295
		PHF (NB/SB):	SB	Through		778		891			911	910
		0.95		On		451	1.11	498			478	480
		0.95		Main S		1229	1.13	1390			1390	1390
		Alternate SB PHF:		Main N		1185		1346			1346	1350
		0.97		Off		238	1.11	263			263	265
			SB Alt	Through		947		1083			1083	1085
				On		476	1.11	526			526	525
				Main S		1423	1.13	1609			1609	1610
		SB AM PHF (7-8am)		Main N		1365		1552			1552	1550
		0.00		Off		328	1.11	362			362	360
		SB Alt AM values manually entered from ODOT counts, PHF reca	SB Alt AM	Through		1037		1190			1190	1190
				On		668	1.11	738			738	740
				Main S		1705	1.13	1928			1928	1930

APPENDIX B.

Traffic Operations Worksheets

1: 7th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	0.4	0.1	0.1	0.2	0.8
Delay / Veh (s)	14.1	7.7	0.8	0.8	1.8

2: 8th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	0.1	0.0	0.1	0.1	0.3
Delay / Veh (s)	12.2	10.3	0.6	0.6	0.8

3: 9th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	0.0	0.2	0.1	0.2	0.4
Delay / Veh (s)	12.9	11.3	0.3	0.9	1.0

4: E Pine St & 10th St Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	4.7	10.9	3.6	4.2	23.4
Delay / Veh (s)	23.4	31.7	24.3	45.4	29.8

5: E Pine St & Jewett Dr Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	0.8	4.0	1.0	5.8
Delay / Veh (s)	2.7	11.4	102.7	8.8

6: E Pine St & SB Off Ramp Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	1.4	5.8	2.7	9.9
Delay / Veh (s)	4.8	15.2	32.9	13.0

7: E Pine St & NB On Ramp Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	3.6	3.8	5.4	12.7
Delay / Veh (s)	12.6	9.9	29.3	15.0

8: E Pine St & Peninger Rd Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	3.9	5.7	2.6	0.9	13.2
Delay / Veh (s)	11.7	16.4	39.8	28.4	16.9

9: E Pine St & Hamrick Rd Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	4.4	10.0	0.6	3.4	18.5
Delay / Veh (s)	14.3	49.5	36.3	22.8	27.2

Total Network Performance

Total Delay (hr)	86.7
Delay / Veh (s)	67.8

1: 7th St & E Pine St Performance by movement

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay (hr)	0.2	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0
Delay / Veh (s)	19.3	19.5	9.5	12.5	32.0	6.3	7.1	0.6	0.5	4.9	0.7	0.7

1: 7th St & E Pine St Performance by movement

Movement	All
Total Delay (hr)	0.8
Delay / Veh (s)	1.8

2: 8th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWR	NEL	NET	SWL	SWT	SWR	All
Total Delay (hr)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.3
Delay / Veh (s)	15.1	6.5	17.6	5.9	9.0	0.4	5.9	0.6	0.6	0.8

3: 9th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	All
Total Delay (hr)	0.0	0.0	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.2	0.0	0.4
Delay / Veh (s)	36.3	5.1	22.6	30.0	6.2	8.7	0.3	0.2	6.8	0.9	0.9	1.0

4: E Pine St & 10th St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.3	4.0	0.4	5.8	4.2	0.9	1.2	1.5	0.8	2.1	1.9	0.3
Delay / Veh (s)	35.3	23.8	16.8	46.2	23.8	21.9	47.8	43.7	9.1	49.0	44.6	30.3

4: E Pine St & 10th St Performance by movement

Movement	All
Total Delay (hr)	23.4
Delay / Veh (s)	29.8

5: E Pine St & Jewett Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Total Delay (hr)	0.0	0.8	3.9	0.0	0.5	0.4	5.8
Delay / Veh (s)	20.0	2.6	11.6	4.8	108.5	96.1	8.8

6: E Pine St & SB Off Ramp Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Total Delay (hr)	1.3	0.2	1.6	4.2	2.2	0.0	0.4	9.9
Delay / Veh (s)	5.5	2.4	25.7	13.1	38.1	43.3	19.2	13.0

7: E Pine St & NB On Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Total Delay (hr)	0.9	2.7	3.2	0.6	3.9	1.5	12.7
Delay / Veh (s)	35.2	10.4	11.6	5.5	34.6	21.0	15.0

8: E Pine St & Peninger Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.2	3.1	0.6	0.1	5.5	0.2	2.4	0.1	0.2	0.4	0.4	0.2
Delay / Veh (s)	20.4	11.3	12.4	23.3	16.7	8.6	45.3	48.8	14.0	30.1	32.2	20.7

8: E Pine St & Peninger Rd Performance by movement

Movement	All
Total Delay (hr)	13.2
Delay / Veh (s)	16.9

9: E Pine St & Hamrick Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	3.1	1.2	0.1	0.0	9.6	0.4	0.5	0.1	0.0	0.4	0.1	2.9
Delay / Veh (s)	22.2	7.7	6.5	13.9	50.3	41.0	39.0	31.7	10.5	36.4	31.2	21.5

9: E Pine St & Hamrick Rd Performance by movement

Movement	All
Total Delay (hr)	18.5
Delay / Veh (s)	27.2

Total Network Performance

Total Delay (hr)	86.7
Delay / Veh (s)	67.8

Intersection: 1: 7th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	126	50	75	25	115	54
Average Queue (ft)	50	24	12	1	16	3
95th Queue (ft)	92	52	49	14	65	27
Link Distance (ft)	348	352	517	517	241	241
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: 8th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LR	LR	LT	TR	LT	TR
Maximum Queue (ft)	45	39	76	60	109	82
Average Queue (ft)	14	14	10	3	11	3
95th Queue (ft)	43	42	47	31	56	37
Link Distance (ft)	351	162	241	241	203	203
Upstream Blk Time (%)					0	0
Queuing Penalty (veh)					0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: 9th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW	SW
Directions Served	LR	LTR	L	TR	L	T	TR
Maximum Queue (ft)	39	83	21	24	39	34	39
Average Queue (ft)	5	32	1	1	4	2	2
95th Queue (ft)	25	63	10	12	23	26	27
Link Distance (ft)	339	315		203		222	222
Upstream Blk Time (%)							
Queuing Penalty (veh)							
Storage Bay Dist (ft)			25		50		
Storage Blk Time (%)			0		0	0	
Queuing Penalty (veh)			1		0	0	

Intersection: 4: E Pine St & 10th St

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	83	204	214	194	250	364	366	194	200	54	199	247
Average Queue (ft)	28	123	126	101	235	296	213	78	99	3	119	143
95th Queue (ft)	65	195	195	180	296	449	400	147	170	25	201	250
Link Distance (ft)		222	222	222		329	329		263			229
Upstream Blk Time (%)		0	0	0		22	6					4
Queuing Penalty (veh)		0	0	0		141	37					0
Storage Bay Dist (ft)	100				150			125		130	100	
Storage Blk Time (%)	0	16			41	13		3	6		16	21
Queuing Penalty (veh)	0	5			133	56		13	23		28	32

Intersection: 5: E Pine St & Jewett Dr

Movement	EB	EB	WB	WB	SB
Directions Served	LT	T	T	TR	LR
Maximum Queue (ft)	119	20	350	343	147
Average Queue (ft)	18	2	166	97	51
95th Queue (ft)	74	24	394	307	140
Link Distance (ft)	329	329	327	327	306
Upstream Blk Time (%)			7	1	0
Queuing Penalty (veh)			46	7	0
Storage Bay Dist (ft)					
Storage Blk Time (%)					
Queuing Penalty (veh)					

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	LT	R
Maximum Queue (ft)	217	201	91	316	551	444	165	184	146
Average Queue (ft)	57	51	12	120	164	148	79	93	52
95th Queue (ft)	151	139	49	259	466	350	139	157	113
Link Distance (ft)	327	327	327		1230	1230		1401	
Upstream Blk Time (%)					0				
Queuing Penalty (veh)					1				
Storage Bay Dist (ft)				275			500		50
Storage Blk Time (%)				0	4			37	6
Queuing Penalty (veh)				0	10			71	13

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	R	L	LT	R
Maximum Queue (ft)	160	297	269	334	293	158	218	218	301
Average Queue (ft)	63	114	108	139	113	55	129	118	142
95th Queue (ft)	124	223	218	262	226	107	195	193	265
Link Distance (ft)		1230	1230	460	460			1042	
Upstream Blk Time (%)				0					
Queuing Penalty (veh)				0					
Storage Bay Dist (ft)	175					65	500		500
Storage Blk Time (%)	0	1			19	2			
Queuing Penalty (veh)	0	1			75	8			

Intersection: 8: E Pine St & Peninger Rd

Movement	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	T	R	LT	R	LT	R
Maximum Queue (ft)	68	234	287	95	434	419	193	344	165	135	88
Average Queue (ft)	24	89	112	18	172	205	14	175	27	60	28
95th Queue (ft)	59	180	222	58	345	374	122	296	92	120	71
Link Distance (ft)		460	460		1824	1824		346		790	
Upstream Blk Time (%)								0			
Queuing Penalty (veh)								0			
Storage Bay Dist (ft)	75			100			150		150		40
Storage Blk Time (%)	0	9		0	13	11		18		36	7
Queuing Penalty (veh)	2	4		1	3	7		7		11	7

Intersection: 9: E Pine St & Hamrick Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	467	338	256	28	434	441	148	35	97	311
Average Queue (ft)	219	57	74	2	234	246	56	2	39	151
95th Queue (ft)	404	209	170	15	388	405	121	16	84	255
Link Distance (ft)		1824	1824		823	823	495		685	
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (ft)	400			300				425		300
Storage Blk Time (%)	1				4					0
Queuing Penalty (veh)	4				0					0

Network Summary

Network wide Queuing Penalty: 748

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	40	5	50	5	2	30	15	645	10	25	690	30
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	43	5	54	5	2	33	16	701	11	27	750	33
Pedestrians		1						1			3	
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)											827	
pX, platoon unblocked	0.98	0.98	0.98	0.98	0.98		0.98					
vC, conflicting volume	1242	1566	393	1227	1577	359	784			712		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1198	1530	328	1182	1542	359	728			712		
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 %	65	95	92	96	98	95	98			97		
cM capacity (veh/h)	126	110	656	122	108	642	862			897		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	103	40	367	361	402	408
Volume Left	43	5	16	0	27	0
Volume Right	54	33	0	11	0	33
cSH	216	348	862	1700	897	1700
Volume to Capacity	0.48	0.12	0.02	0.21	0.03	0.24
Queue Length 95th (ft)	59	10	1	0	2	0
Control Delay (s)	36.1	16.7	0.6	0.0	0.9	0.0
Lane LOS	E	C	A		A	
Approach Delay (s)	36.1	16.7	0.3		0.5	
Approach LOS	E	C				

Intersection Summary			
Average Delay	3.0		
Intersection Capacity Utilization	61.9%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	5	5	0	10	15	700	0	10	735	15
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)	11	0	6	6	0	11	17	795	0	11	835	17
Pedestrians		3			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)											537	
pX, platoon unblocked	0.89	0.89	0.89	0.89	0.89		0.89					
vC, conflicting volume	1314	1702	429	1279	1711	402	855			798		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1113	1547	123	1073	1557	402	600			798		
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 %	92	100	99	96	100	98	98			99		
cM capacity (veh/h)	141	99	813	152	98	602	880			831		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	17	17	415	398	429	435
Volume Left	11	6	17	0	11	0
Volume Right	6	11	0	0	0	17
cSH	194	303	880	1700	831	1700
Volume to Capacity	0.09	0.06	0.02	0.23	0.01	0.26
Queue Length 95th (ft)	7	4	1	0	1	0
Control Delay (s)	25.3	17.6	0.6	0.0	0.4	0.0
Lane LOS	D	C	A		A	
Approach Delay (s)	25.3	17.6	0.3		0.2	
Approach LOS	D	C				

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	43.8%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	2	0	2	15	2	30	2	695	20	5	745	10
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)	2	0	2	17	2	34	2	790	23	6	847	11
Pedestrians		2			1			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			TWLTL	
Median storage veh)											2	
Upstream signal (ft)											285	
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85		0.85					
vC, conflicting volume	1300	1684	432	1245	1678	407	860			814		
vC1, stage 1 conf vol	866	866		807	807							
vC2, stage 2 conf vol	435	818		438	871							
vCu, unblocked vol	1007	1457	0	942	1450	407	491			814		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	95	99	94	100			99		
cM capacity (veh/h)	365	308	928	330	311	598	922			822		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3
Volume Total	5	53	2	527	286	6	564	294
Volume Left	2	17	2	0	0	6	0	0
Volume Right	2	34	0	0	23	0	0	11
cSH	524	461	922	1700	1700	822	1700	1700
Volume to Capacity	0.01	0.12	0.00	0.31	0.17	0.01	0.33	0.17
Queue Length 95th (ft)	1	10	0	0	0	1	0	0
Control Delay (s)	11.9	13.8	8.9	0.0	0.0	9.4	0.0	0.0
Lane LOS	B	B	A			A		
Approach Delay (s)	11.9	13.8	0.0			0.1		
Approach LOS	B	B						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	33.9%	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)	30	605	90	435	635	145	95	125	295	145	140	30
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	0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	4685		1662	3232		1630	1750	1488	1662	1664	
Flt Permitted	0.16	1.00		0.34	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	280	4685		602	3232		1630	1750	1488	1662	1664	
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)	34	680	101	489	713	163	107	140	331	163	157	34
RTOR Reduction (vph)	0	19	0	0	19	0	0	0	289	0	8	0
Lane Group Flow (vph)	34	762	0	489	857	0	107	140	42	163	183	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%	4%
Turn Type	pm+pt			pm+pt			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6					4			
Actuated Green, G (s)	34.0	34.0		50.3	50.3		8.9	12.0	12.0	13.1	16.2	
Effective Green, g (s)	34.0	34.0		50.3	50.3		8.9	12.0	12.0	13.1	16.2	
Actuated g/C Ratio	0.36	0.36		0.53	0.53		0.09	0.13	0.13	0.14	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)	2.5	4.6		2.5	4.6		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	153	1677		541	1711		153	221	188	229	284	
v/s Ratio Prot	0.01	c0.16		c0.19	0.27		0.07	0.08		c0.10	c0.11	
v/s Ratio Perm	0.07			c0.29					0.03			
v/c Ratio	0.22	0.45		0.90	0.50		0.70	0.63	0.22	0.71	0.64	
Uniform Delay, d1	21.3	23.4		20.9	14.3		41.8	39.4	37.3	39.1	36.7	
Progression Factor	1.00	1.00		0.93	0.74		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	0.9		17.2	0.4		12.1	5.1	0.4	9.3	4.4	
Delay (s)	21.9	24.3		36.7	11.0		53.9	44.5	37.7	48.5	41.1	
Level of Service	C	C		D	B		D	D	D	D	D	
Approach Delay (s)		24.2			20.2			42.4			44.5	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	28.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.78		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	70.2%	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)	10	1035	1200	30	20	15
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)	11	1150	1333	33	22	17
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		387	407			
pX, platoon unblocked	0.85				0.90	0.85
vC, conflicting volume	1367				1756	683
vC1, stage 1 conf vol					1350	
vC2, stage 2 conf vol					406	
vCu, unblocked vol	1083				938	281
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	98				91	97
cM capacity (veh/h)	555				247	615

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	241	460	460	889	478	39
Volume Left	11	0	0	0	0	22
Volume Right	0	0	0	0	33	17
cSH	555	1700	1700	1700	1700	333
Volume to Capacity	0.02	0.27	0.27	0.52	0.28	0.12
Queue Length 95th (ft)	2	0	0	0	0	10
Control Delay (s)	0.8	0.0	0.0	0.0	0.0	17.2
Lane LOS	A					C
Approach Delay (s)	0.2			0.0		17.2
Approach LOS						C

Intersection Summary			
Average Delay	0.3		
Intersection Capacity Utilization	47.9%	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)	0	800	255	220	1145	0	0	0	0	210	2	85
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		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1488	1471	3292					1322	1330	1467
Flt Permitted		1.00	1.00	0.25	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1488	392	3292					1322	1330	1467
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)	0	851	271	234	1218	0	0	0	0	223	2	90
RTOR Reduction (vph)	0	0	119	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	851	152	234	1218	0	0	0	0	111	114	30
Confl. Peds. (#/hr)										4		2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		53.3	53.3	71.2	71.2					14.8	14.8	14.8
Effective Green, g (s)		53.3	53.3	71.2	71.2					14.8	14.8	14.8
Actuated g/C Ratio		0.56	0.56	0.75	0.75					0.16	0.16	0.16
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1847	835	446	2467					206	207	229
v/s Ratio Prot		0.26		0.07	c0.37							
v/s Ratio Perm			0.10	c0.32						0.08	0.09	0.02
v/c Ratio		0.46	0.18	0.52	0.49					0.54	0.55	0.13
Uniform Delay, d1		12.3	10.2	5.4	4.7					37.0	37.0	34.6
Progression Factor		0.50	0.36	1.30	1.11					1.00	1.00	1.00
Incremental Delay, d2		0.7	0.4	0.7	0.2					2.1	2.5	0.2
Delay (s)		6.9	4.1	7.7	5.5					39.1	39.6	34.7
Level of Service		A	A	A	A					D	D	C
Approach Delay (s)		6.2			5.8			0.0			38.0	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	9.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.52		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	9.0
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)	85	925	0	0	960	385	405	0	255	0	0	0
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	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.99			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	1309			
Flt Permitted	0.22	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	389	3197			3228	1299	1564	1564	1309			
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)	89	964	0	0	1000	401	422	0	266	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	98	0	0	151	0	0	0
Lane Group Flow (vph)	89	964	0	0	1000	303	211	211	115	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	63.0	63.0			53.0	53.0	23.0	23.0	23.0			
Effective Green, g (s)	63.0	63.0			53.0	53.0	23.0	23.0	23.0			
Actuated g/C Ratio	0.66	0.66			0.56	0.56	0.24	0.24	0.24			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	332	2120			1801	725	379	379	317			
v/s Ratio Prot	0.02	c0.30			c0.31							
v/s Ratio Perm	0.16					0.23	c0.13	0.13	0.09			
v/c Ratio	0.27	0.45			0.56	0.42	0.56	0.56	0.36			
Uniform Delay, d1	12.9	7.7			13.5	12.1	31.5	31.5	29.9			
Progression Factor	0.99	1.27			0.78	0.77	1.00	1.00	1.00			
Incremental Delay, d2	0.3	0.3			0.9	1.3	1.8	1.8	0.7			
Delay (s)	13.0	10.0			11.4	10.6	33.3	33.3	30.6			
Level of Service	B	B			B	B	C	C	C			
Approach Delay (s)		10.3			11.2			32.3			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.53		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	9.0
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)	40	975	165	20	1135	65	180	10	40	45	45	30
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
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00		1.00	1.00
Frt	1.00	0.98		1.00	1.00	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.95	1.00		0.98	1.00
Satd. Flow (prot)	1662	3047		1471	3260	1488		1330	1282		1707	1488
Flt Permitted	0.14	1.00		0.14	1.00	1.00		0.67	1.00		0.78	1.00
Satd. Flow (perm)	236	3047		224	3260	1488		928	1282		1357	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)	44	1083	183	22	1261	72	200	11	44	50	50	33
RTOR Reduction (vph)	0	12	0	0	0	25	0	0	32	0	0	24
Lane Group Flow (vph)	44	1254	0	22	1261	47	0	211	12	0	100	9
Heavy Vehicles (%)	0%	2%	35%	13%	2%	0%	27%	0%	16%	0%	0%	0%
Turn Type	pm+pt			pm+pt		Perm	Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			4			8	
Permitted Phases	2			6		6	4		4	8		8
Actuated Green, G (s)	57.6	54.4		55.2	53.2	53.2		25.1	25.1		25.1	25.1
Effective Green, g (s)	57.6	54.4		55.2	53.2	53.2		25.1	25.1		25.1	25.1
Actuated g/C Ratio	0.61	0.57		0.58	0.56	0.56		0.26	0.26		0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5	4.5		4.5	4.5		4.5	4.5
Vehicle Extension (s)	2.5	1.0		2.5	1.0	1.0		2.5	2.5		4.0	4.0
Lane Grp Cap (vph)	191	1745		156	1826	833		245	339		359	393
v/s Ratio Prot	c0.01	c0.41		0.00	0.39							
v/s Ratio Perm	0.13			0.08		0.03		c0.23	0.01		0.07	0.01
v/c Ratio	0.23	0.72		0.14	0.69	0.06		0.86	0.03		0.28	0.02
Uniform Delay, d1	10.2	14.7		10.3	15.0	9.5		33.3	26.0		27.8	25.9
Progression Factor	0.35	0.44		1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	0.4	2.4		0.3	2.2	0.1		25.0	0.0		0.6	0.0
Delay (s)	4.0	9.0		10.6	17.2	9.6		58.3	26.0		28.3	25.9
Level of Service	A	A		B	B	A		E	C		C	C
Approach Delay (s)		8.8			16.7			52.7			27.7	
Approach LOS		A			B			D			C	

Intersection Summary			
HCM Average Control Delay	16.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	95.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	61.7%	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)	510	485	30	5	675	35	45	10	2	35	15	485
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.5	5.0		3.5	5.0			4.5	4.5		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	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1614	3044		1662	3209			1358	1488		1617	1458
Flt Permitted	0.17	1.00		0.44	1.00			0.73	1.00		0.76	1.00
Satd. Flow (perm)	282	3044		765	3209			1027	1488		1267	1458
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)	567	539	33	6	750	39	50	11	2	39	17	539
RTOR Reduction (vph)	0	2	0	0	3	0	0	0	2	0	0	471
Lane Group Flow (vph)	567	570	0	6	786	0	0	61	0	0	56	68
Heavy Vehicles (%)	3%	5%	62%	0%	3%	0%	29%	0%	0%	0%	15%	2%
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	60.2	55.8		25.7	24.8			10.1	10.1		10.1	10.1
Effective Green, g (s)	60.2	55.8		25.7	24.8			10.1	10.1		10.1	10.1
Actuated g/C Ratio	0.75	0.70		0.32	0.31			0.13	0.13		0.13	0.13
Clearance Time (s)	3.5	5.0		3.5	5.0			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	1.0		3.0	1.0			2.5	2.5		1.0	1.0
Lane Grp Cap (vph)	745	2129		256	997			130	188		160	185
v/s Ratio Prot	c0.30	0.19		0.00	0.24							
v/s Ratio Perm	c0.27			0.01				c0.06	0.00		0.04	0.05
v/c Ratio	0.76	0.27		0.02	0.79			0.47	0.00		0.35	0.37
Uniform Delay, d1	13.6	4.4		18.5	25.1			32.4	30.4		31.9	31.9
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	4.6	0.0		0.0	3.9			1.9	0.0		0.5	0.5
Delay (s)	18.2	4.5		18.5	29.0			34.3	30.4		32.3	32.4
Level of Service	B	A		B	C			C	C		C	C
Approach Delay (s)		11.3			28.9			34.2			32.4	
Approach LOS		B			C			C			C	

Intersection Summary			
HCM Average Control Delay	22.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	79.8	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.3%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

APPENDIX C.

ODOT Crash Analysis Reports

(January 1, 2006 through December 31, 2008)

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CRASH SUMMARIES BY YEAR BY COLLISION TYPE

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

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														
ANGLE	0	3	4	7	0	4	3	4	3	4	3	6	1	1
FIXED / OTHER OBJECT	0	2	0	2	0	2	0	2	0	2	0	0	0	2
REAR-END	0	8	6	14	0	14	0	12	2	11	3	12	0	0
SIDESWIPE - OVERTAKING	0	1	0	1	0	1	0	1	0	1	0	0	0	0
TURNING MOVEMENTS	0	7	10	17	0	14	0	16	1	14	3	15	1	1
2008 TOTAL	0	21	20	41	0	35	3	35	6	32	9	33	2	4
YEAR: 2007														
BACKING	0	1	3	4	0	4	1	4	0	3	1	4	0	0
FIXED / OTHER OBJECT	0	1	0	1	0	2	0	1	0	1	0	0	0	1
NON-COLLISION	0	1	0	1	0	1	0	0	1	1	0	1	0	0
PEDESTRIAN	0	1	0	1	0	1	0	1	0	0	1	0	0	0
REAR-END	0	14	11	25	0	23	1	18	7	20	5	16	0	0
SIDESWIPE - OVERTAKING	0	0	1	1	0	0	0	1	0	1	0	0	0	0
TURNING MOVEMENTS	0	8	4	12	0	14	2	10	2	9	3	11	0	0
2007 TOTAL	0	26	19	45	0	45	4	35	10	35	10	32	0	1
YEAR: 2006														
ANGLE	0	1	0	1	0	1	0	0	1	1	0	1	0	0
BACKING	0	0	2	2	0	0	1	2	0	2	0	2	0	0
NON-COLLISION	0	0	1	1	0	0	1	0	1	1	0	1	0	0
REAR-END	0	10	11	21	0	13	3	17	3	17	4	12	5	0
TURNING MOVEMENTS	0	7	10	17	0	16	0	10	7	10	7	12	0	1
2006 TOTAL	0	18	24	42	0	30	5	29	12	31	11	28	5	1
FINAL TOTAL	0	65	63	128	0	110	12	99	28	98	30	93	7	6

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
CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
      S  D
      P  R S W                                RD#  FC                                  INT-TYP                                  SPCL USE
      E A U C O  DATE         COUNTY          COMPNT    CONN #             RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP     TRLR QTY  MOVE                     A  S
SER#  E L G H R  DAY          CITY            MLG TYP   FIRST  STREET      DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP      OWNER     FROM      PRTC INJ       G  E  LICNS PED
INVEST D C S L K TIME         URBAN AREA      MILEPNT   SECOND STREET      LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY     V#  VEH TYPE  TO    P#  TYPE SVRTY    E  X  RES   LOC ERROR      ACTN EVENT   CAUSE

00257  Y N N     02/01/2006  JACKSON           1  19   5               INTER     CROSS   N            N RAIN  OVERTURN  01  NONE   1  TURN-L                                                      01,24
STATE            Wed                            6 0                    S                 TRF SIGNAL   N WET   NCOL          PRVTE     E  S                                          088          24
                 8A          MEDFORD UA        32.21                   05          0                  N DAY   PDO           SEMI TOW        01  DRVR NONE   54  M  OR-Y      083,047    017          01
                                                                                                                                                                   OR>25

00521  N N N     03/28/2006  JACKSON           1  16   2               INTER     CROSS   N            N CLD   S-1STOP   01  NONE      STRGHT                                                         07
COUNTY           Tue                            6 0                    E                 TRF SIGNAL   N DRY   REAR          PRVTE     E  W                                          000          00
                 2P          MEDFORD UA        32.63                   06          0                  N DAY   INJ           PSNGR CAR       01  DRVR INJB   20  F  OR-Y      043        000          07
                                                                                                                                                                   OR>25

                                                                                                                        02  NONE      STOP
                                                                                                                            PRVTE     E  W                                          011          00
                                                                                                                            PSNGR CAR       01  DRVR INJC   32  F  OR-Y      000        000          00
                                                                                                                                                                   OR<25

02611  N N N     11/02/2006  JACKSON           1  16   2               INTER     CROSS   N            N RAIN  S-1STOP   01  NONE      STRGHT                                                         07,22
CITY             Thu                            6 0                    E                 TRF SIGNAL   N WET   REAR          PRVTE     E  W                                          000          22
                 4P          MEDFORD UA        32.63                   06          0                  N DUSK  PDO           PSNGR CAR       01  DRVR NONE   16  M  OR-Y      043        000          07
                                                                                                                                                                   OR<25

                                                                                                                        02  NONE      STOP
                                                                                                                            PRVTE     E  W                                          012          00
                                                                                                                            PSNGR CAR       01  DRVR NONE   45  M  OR-Y      000        000          00
                                                                                                                                                                   OR<25

01186  N N N     06/04/2007  JACKSON           1  16   2               INTER     CROSS   N            N CLR   ANGL-STP  01  NONE   1  TURN-L                                                      08
NO RPT           Mon                            6 0                    E                 TRF SIGNAL   N DRY   TURN          PRVTE     N  E                                          000          00
                 11A         MEDFORD UA        32.63                   06          0                  N DAY   PDO           SEMI TOW        01  DRVR NONE   75  M  OR-Y      002        000          08
                                                                                                                                                                   OR<25

                                                                                                                        02  NONE      STOP
                                                                                                                            PRVTE     E  W                                          012          00
                                                                                                                            PSNGR CAR       01  DRVR NONE   40  F  OR-Y      000        000          00
                                                                                                                                                                   OR<25

02070  N N N N N 11/29/2008  JACKSON           1  16   2               INTER     CROSS   N            N CLR   S-1STOP   01  NONE      STRGHT                                                         13
CITY             Sat                            6 0                    W                 TRF SIGNAL   N DRY   REAR          PRVTE     W  E                                          000          00
                 9P          MEDFORD UA        32.63                   06          0                  N DLIT  INJ           PSNGR CAR       01  DRVR NONE   31  M  SUSP      045,080    000          13
                                                                                                                                                                   OR<25

                                                                                                                        02  NONE      STOP
                                                                                                                            PRVTE     W  E                                          011          00
                                                                                                                            PSNGR CAR       01  DRVR INJC   21  F  OR-Y      000        000          00
                                                                                                                                                                   OR<25
                                                                                                                                            02  PSNG INJC   22  M            000        000          00
                                                                                                                                            03  PSNG NO<5   03  F            000        000          00

00375  N N N     02/22/2008  JACKSON           1  16   2               INTER     CROSS   N            N CLR   O-1TURN   01  NONE      TURN-L                                                         02
NO RPT           Fri                            6 0                    CN                TRF SIGNAL   N DRY   TURN          PRVTE     E  S                                          000          00
                 7P          MEDFORD UA        32.63                   03          0                  N DLIT  INJ           PSNGR CAR       01  DRVR NONE   18  M  OTH-Y     004,028    000          02
                                                                                                                                                                   N-RES
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
       S  D
       P  R S W                                                     INT-TYP                                  SPCL USE
       E A U C O DATE      COUNTY           RD# FC                  RD CHAR (MEDIAN) INT-REL OFFRD WTHR CRASH TYP  TRLR QTY  MOVE                    A S
SER#   E L G H R DAY       CITY             COMPNT  CONN #          DIRECT    LEGS   TRAF-   RNDBT SURF COLL TYP   OWNER     FROM      PRTC INJ      G E LICNS PED
INVEST D C S L K TIME      URBAN AREA       MLG TYP FIRST STREET    LOCTN  (#LANES)  CNTL    DRVWY LIGHT SVRTY  V# VEH TYPE  TO    P# TYPE SVRTY  E X RES   LOC ERROR     ACTN EVENT  CAUSE
                                            MILEPNT SECOND STREET

                                                                                                           02 NONE      STRGHT
                                                                                                              PRVTE     W  E                                         000          00
                                                                                                             PSNGR CAR        01 DRVR INJC  23 F OR-Y      000      000          00
                                                                                                                                                 OR<25

01021  N N N   06/28/2008 JACKSON        1  16  2           INTER     CROSS  N           N CLR  ANGL-OTH   01 NONE      STRGHT                                                     02
NONE           Sat                        6 0               CN               TRF SIGNAL  N DRY  ANGL          PRVTE     N  S                                         000          00
               11P        MEDFORD UA     32.63              03          0                N DARK PDO          PSNGR CAR        01 DRVR NONE  25 M OR-Y      028      000          02
                                                                                                                                                 OR<25

                                                                                                           02 NONE      STRGHT
                                                                                                              PRVTE     W  E                                         000          00
                                                                                                             PSNGR CAR        01 DRVR NONE  70 M OR-Y      000      000          00
                                                                                                                                                 OR<25

01869  N N N   10/24/2008 JACKSON        1  16  2           INTER     CROSS  N           N CLR  ANGL-OTH   01 NONE      TURN-L                                                     04
NONE           Fri                        6 0               CN               TRF SIGNAL  N DRY  TURN          PRVTE     N  E                                         000          00
               9A         MEDFORD UA     32.63              03          0                N DAY  PDO          PSNGR CAR        01 DRVR NONE  58 M OR-Y      000      000          00
                                                                                                                                                 OR>25

                                                                                                           02 NONE      STRGHT
                                                                                                              PRVTE     W  E                                         000          00
                                                                                                             PSNGR CAR        01 DRVR NONE  63 F OR-Y      020      000          04
                                                                                                                                                 OR<25

02071  N N N   11/30/2008 JACKSON        1  16  2           INTER     CROSS  N           N CLD  S-1TURN    01 NONE      TURN-R                                            043      08
NO RPT         Sun                        6 0               CN               TRF SIGNAL  N WET  TURN          PRVTE     W  S                                         000          00
               10A        MEDFORD UA     32.63              03          0                N DAY  INJ          PSNGR CAR        01 DRVR NONE  75 F OR-Y      006      000          08
                                                                                                                                                 OR>25

                                                                                                           02 NONE      STRGHT
                                                                                                              PRVTE     W  E                                         000  043     00
                                                                                                             PSNGR CAR        01 DRVR INJC  20 F OR-Y      000      000          00
                                                                                                                                                 OR<25

00466  N N N   02/27/2007 JACKSON        1  16  2           STRGHT           N           N CLD  S-1STOP    01 NONE      STRGHT                                                     07,22
COUNTY         Tue                        6 0               UN       (NONE)  L-TURN REF  N WET  REAR          PRVTE     E  W                                         000          22
               4P         MEDFORD UA     32.65              05                           N DAY  INJ          PSNGR CAR        01 DRVR NONE  17 F OR-Y      026      000          07
                                                                       (05)                                                                      OR<25

                                                                                                           02 NONE      STOP
                                                                                                              PRVTE     E  W                                         011          00
                                                                                                             PSNGR CAR        01 DRVR INJC  18 M OR-Y      000      000          00
                                                                                                                                                 OR<25

00735  N N N   04/03/2007 JACKSON        1  19  1           STRGHT           N           N CLR  S-1STOP    01 NONE      STRGHT                                                     07
NO RPT         Tue                        6 0               UN       (NONE)  TRF SIGNAL  N DRY  REAR          PRVTE     S  N                                         000          00
               9A         MEDFORD UA     32.69              05                           N DAY  PDO          PSNGR CAR        01 DRVR NONE  55 M OR-Y      014,026  000          07
                                                                       (04)                                                                      OR<25

                                                                                                           02 NONE      STOP
                                                                                                              PRVTE     S  N                                         011          00
                                                                                                             PSNGR CAR        01 DRVR NONE  34 M OR-Y      000      000          00
                                                                                                                                                 OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
       S  D
       P  R S W                                                     INT-TYP                            SPCL USE
       E A U C O  DATE       COUNTY           RD#  FC                       RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP  TRLR QTY  MOVE                    A  S
SER#   E L G H R  DAY        CITY             COMPNT   CONN #         DIRECT     LEGS    TRAF-    RNDBT SURF  COLL TYP   OWNER     FROM      PRTC INJ     G  E LICNS PED
INVEST D C S L K  TIME       URBAN AREA       MLG TYP  FIRST  STREET  LOCTN    (#LANES)  CNTL     DRVWY LIGHT SVRTY   V# VEH TYPE  TO    P# TYPE SVRTY  E  X RES   LOC ERROR      ACTN EVENT   CAUSE
                                              MILEPNT  SECOND STREET

00492  N N N   03/07/2007 JACKSON          1  19  1               INTER      CROSS  N           N CLR  S-1STOP   01 NONE     STRGHT                                                      07
NONE           Wed                         6 0                    S                 TRF SIGNAL  N DRY  REAR         PRVTE    S  N                                            000          00
               11A        MEDFORD UA      32.70                   06           0                N DAY  INJ         PSNGR CAR        01 DRVR NONE  00 M OR-Y      026        000          07
                                                                                                                                                       OR<25

                                                                                                                   02 NONE     STOP
                                                                                                                     PRVTE    S  N                                            011          00
                                                                                                                    PSNGR CAR        01 DRVR INJC  79 M OR-Y      000        000          00
                                                                                                                                                       OR>25

80283  N N N   03/08/2007 JACKSON          1  19  1               INTER      CROSS  N           N CLR  O-1STOP   01 NONE     BACK                                                        10
NONE           Thu                         6 0                    S                 TRF SIGNAL  N DRY  BACK         PRVTE    N  S                                            000          00
               3P         MEDFORD UA      32.70                   06           0                N DAY  INJ         PSNGR CAR        01 DRVR NONE  53 M OTH-Y     011        000          10
                                                                                                                                                       N-RES

                                                                                                                   02 NONE     STOP
                                                                                                                     PRVTE    S  N                                            011          00
                                                                                                                    PSNGR CAR        01 DRVR INJC  21 M OR-Y      000        000          00
                                                                                                                                                       OR>25
                                                                                                                                     02 PSNG INJC  16 M           000        000          00
                                                                                                                                     03 PSNG INJC  21 F           000        000          00
                                                                                                                                     04 PSNG INJC  04 F           000        000          00

01350  N N N   07/09/2007 JACKSON          1  19  1               INTER      CROSS  N           N CLR  S-1TURN   01 NONE     STRGHT                                                      07,27
NONE           Mon                         6 0                    S                 TRF SIGNAL  N DRY  REAR         PRVTE    S  N                                            000          00
               4P         MEDFORD UA      32.70                   06           1                N DAY  INJ         PSNGR CAR        01 DRVR NONE  52 F OR-Y      026        038          07
                                                                                                                                                       OR>25

                                                                                                                   02 NONE     STOP
                                                                                                                     PRVTE    S  E                                            013          00
                                                                                                                    PSNGR CAR        01 DRVR INJC  33 F OR-Y      000        000          00
                                                                                                                                                       OR<25

01225  N N N   06/14/2007 JACKSON          1  16  2               STRGHT            N           N CLR  S-STRGHT  01 NONE     STRGHT                                                      13
NONE           Thu                         6 0                    UN        (NONE)  UNKNOWN     N DRY  SS-O         PRVTE    E  W                                            000          00
               2P         MEDFORD UA      32.71                   05                            N DAY  PDO         PSNGR CAR        01 DRVR NONE  44 M OR-Y      045        000          13
                                                                             (04)                                                                      OR<25

                                                                                                                   02 NONE     STRGHT
                                                                                                                     PRVTE    E  W                                            000          00
                                                                                                                    PSNGR CAR        01 DRVR NONE  29 F OR-Y      000        000          00
                                                                                                                                                       OR<25

00052  N N N   01/02/2006 JACKSON          1  16  2               STRGHT            Y           N RAIN S-1STOP   01 NONE     STRGHT                                                 013  10
COUNTY         Mon                         6 0                    UN        (NONE)  TRF SIGNAL  N WET  REAR         PRVTE    W  E                                            000          00
               12P        MEDFORD UA      32.81                   03                            N DAY  INJ         PSNGR CAR        01 DRVR NONE  87 M OR-Y      026,052    000          10
                                                                             (04)                                                                      OR<25

                                                                                                                   02 NONE     STOP
                                                                                                                     PRVTE    W  E                                            011  013     00
                                                                                                                    PSNGR CAR        01 DRVR NONE  40 F OR-Y      000        000          00
                                                                                                                                                       OR>25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet

January 1, 2006 through December 31, 2008

```
      S  D
      P  R S W                                                             INT-TYP                              SPCL USE
      E A U C O  DATE        COUNTY           RD#  FC                          (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                      A  S
SER#  E L G H R  DAY         CITY             COMPNT    CONN #           RD CHAR   LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM      PRTC INJ       G  E  LICNS PED
INVEST D C S L K TIME        URBAN AREA       MLG TYP   FIRST  STREET    DIRECT  (#LANES)  CNTL     DRVWY LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY   E  X  RES   LOC ERROR      ACTN EVENT        CAUSE
                                              MILEPNT   SECOND STREET    LOCTN

                                                                                                                          03 NONE      STOP
                                                                                                                             PRVTE     W  E                                              011                00
                                                                                                                            PSNGR CAR         01 DRVR INJC  57 F OR-Y        000         000                00
                                                                                                                                                                  OR<25

01931  N N N     09/05/2007 JACKSON           1  16  2               STRGHT          N         N CLR  S-1STOP     01 NONE      STRGHT                                                        013          07
NO RPT           Wed                           6 0                   UN       (NONE) UNKNOWN   N DRY  REAR           PRVTE     W  E                                              000                00
                 12P        MEDFORD UA        32.81                  03                        N DAY  INJ           PSNGR CAR         01 DRVR NONE  17 M OR-Y        026         026                07
                                                                              (04)                                                                                OR<25

                                                                                                                          02 NONE      STOP
                                                                                                                             PRVTE     E  W                                              011  013           00
                                                                                                                            PSNGR CAR         01 DRVR NONE  17 M OR-Y        000         000                00
                                                                                                                                                                  OR<25

                                                                                                                          03 NONE      STOP
                                                                                                                             PRVTE     W  E                                              011                00
                                                                                                                            PSNGR CAR         01 DRVR INJC  17 M OR-Y        000         000                00
                                                                                                                                                                  OR<25

02164  N N N N N 10/12/2007 JACKSON           1  16  2               ALLEY           N         Y CLR  FIX OBJ     01 NONE      STRGHT                                                  040,053,058  10
CITY             Fri                           6 0                   UN       (NONE) NONE      N DRY  FIX            PRVTE     W  E                                              088  040,053,058  00
                 2P         MEDFORD UA        32.84                  01                        N DAY  INJ           PSNGR CAR         01 DRVR INJB  77 F OR-Y        080,081     000                10
                                                                              (04)                                                                                OR>25
                                                                                                                                      02 PSNG INJB  82 F             000         000                00

00769  N N N     04/17/2007 JACKSON           1  16  2               STRGHT          N         N RAIN S-1STOP     01 NONE      STRGHT                                                             07,27
NONE             Tue                           6 0                   UN       (NONE) TRF SIGNAL N WET  REAR          PRVTE     W  E                                              000                00
                 12P        MEDFORD UA        32.85                  03                        N DAY  PDO           PSNGR CAR         01 DRVR NONE  18 F OR-Y        026         038                07
                                                                              (04)                                                                                OR<25

                                                                                                                          02 NONE      STOP
                                                                                                                             PRVTE     W  E                                              011                00
                                                                                                                            PSNGR CAR         01 DRVR NONE  56 M OR-Y        000         000                00
                                                                                                                                                                  OR<25

01879  N N N     10/22/2008 JACKSON           1  16  2               INTER     CROSS N         N CLR  S-OTHER     01 NONE      TURN-L                                                             08
NONE             Wed                           6 0                   W               TRF SIGNAL N DRY  TURN          PRVTE     S  W                                              000                00
                 7P         MEDFORD UA        32.87                  05          0             N DLIT PDO           PSNGR CAR         01 DRVR NONE  00 F OR-Y        007         000                08
                                                                                                                                                                  OR<25

                                                                                                                          02 NONE      TURN-L
                                                                                                                             PRVTE     S  W                                              000                00
                                                                                                                            PSNGR CAR         01 DRVR NONE  51 M OR-Y        000         000                00
                                                                                                                                                                  OR<25

00128  N N N     01/25/2006 JACKSON           1  16  2               INTER     CROSS N         N CLR  S-1STOP     01 NONE      STRGHT                                                        013          07
NO RPT           Wed                           6 0                   W               TRF SIGNAL N DRY  REAR          PRVTE     W  E                                              000                00
                 2P         MEDFORD UA        32.87                  06          0             N DAY  INJ           PSNGR CAR         01 DRVR NONE  32 M OR-Y        026         000                07
                                                                                                                                                                  OR<25
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
       S  D
       P  R S W                                  RD#  FC                                INT-TYP                                     SPCL USE
       E A U C O  DATE        COUNTY             COMPNT   CONN #              RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP    TRLR QTY  MOVE                    A  S
SER#   E L G H R  DAY         CITY               MLG TYP  FIRST  STREET       DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP     OWNER     FROM      PRTC  INJ     G  E  LICNS  PED
INVEST D C S L K  TIME        URBAN AREA         MILEPNT  SECOND STREET       LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY    V#  VEH TYPE  TO    P#  TYPE  SVRTY   E  X  RES    LOC  ERROR      ACTN  EVENT    CAUSE

                                                                                                                          02  NONE      STOP
                                                                                                                              PRVTE     W  E                                                       011   013      00
                                                                                                                              PSNGR CAR       01  DRVR  NONE    30 M  OR-Y        000        000            00
                                                                                                                                                                      OR<25

                                                                                                                          03  NONE      STOP
                                                                                                                              PRVTE     W  E                                                       011            00
                                                                                                                              PSNGR CAR       01  DRVR  INJC    44 F  OR-Y        000        000            00
                                                                                                                                                                      OR<25

00626  N N N      03/18/2006  JACKSON             1  16   2                   INTER     CROSS   N          N CLR  S-1STOP     01  NONE      STRGHT                                                                    07
COUNTY            Sat                              6 0                        W                 TRF SIGNAL N DRY  REAR            PRVTE     W  E                                                       000            00
                  10A         MEDFORD UA          32.87                       06        0                  N DAY  PDO             PSNGR CAR       01  DRVR  NONE    43 M  OR-Y        043        000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                              PRVTE     W  E                                                       011            00
                                                                                                                              PSNGR CAR       01  DRVR  NONE    67 M  OR-Y        000        000            00
                                                                                                                                                                      OR>25

00381  N N N N N  02/24/2008  JACKSON             1  16   2                   INTER     CROSS   N          N RAIN S-1STOP     01  NONE      STRGHT                                                                    32
STATE             Sun                              6 0                        W                 TRF SIGNAL N WET  REAR            PRVTE     W  E                                                       001            00
                  4P          MEDFORD UA          32.87                       06        0                  N DAY  INJ             PSNGR CAR       01  DRVR  INJC    65 F  OR-Y        026,052    000            32
                                                                                                                                                                      OR>25

                                                                                                                          02  NONE      STOP
                                                                                                                              PRVTE     W  E                                                       011            00
                                                                                                                              PSNGR CAR       01  DRVR  NONE    27 F  OR-Y        000        000            00
                                                                                                                                                                      OR<25

02414  N N N      11/21/2006  JACKSON             1  16   2                   INTER     CROSS   N          N RAIN ANGL-OTH    01  NONE      STRGHT                                                             013      04
COUNTY            Tue                              6 0                        CN                TRF SIGNAL N WET  TURN            PRVTE     E  W                                                       000            00
                  5P          MEDFORD UA          32.87                       02        0                  N DLIT INJ             PSNGR CAR       01  DRVR  NONE    73 M  OR-Y        020        000            04
                                                                                                                                                                      OR<25
                                                                                                                                              02  PSNG  INJB    69 F              000        000            00

                                                                                                                          02  NONE      TURN-L
                                                                                                                              PRVTE     S  W                                                       000   013      00
                                                                                                                              PSNGR CAR       01  DRVR  NONE    36 M  OR-Y        000        000            00
                                                                                                                                                                      OR<25

                                                                                                                          03  NONE      TURN-L
                                                                                                                              PRVTE     S  W                                                       000            00
                                                                                                                              PSNGR CAR       01  DRVR  NONE    32 F  OR-Y        000        000            00
                                                                                                                                                                      OR<25
                                                                                                                                              02  PSNG  NO<5    04 F              000        000            00
                                                                                                                                              03  PSNG  NO<5    02 M              000        000            00

00445  N N N      03/22/2008  JACKSON             1  16   2                   INTER     CROSS   N          N CLR  ANGL-OTH    01  NONE      STRGHT                                                                    04
NO RPT            Sat                              6 0                        CN                TRF SIGNAL N DRY  TURN            PRVTE     E  W                                                       000            00
                  12P         MEDFORD UA          32.87                       02        0                  N DAY  PDO             PSNGR CAR       01  DRVR  NONE    70 F  OR-Y        020        000            04
                                                                                                                                                                      OR<25
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CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
       S  D
       P  R S W                                RD#  FC                              INT-TYP                                    SPCL USE
       E A U C O  DATE       COUNTY            COMPNT   CONN #              RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                    A  S
SER#   E L G H R  DAY        CITY              MLG TYP  FIRST  STREET       DIRECT     LEGS   TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM      PRTC INJ    G  E LICNS PED
INVEST D C S L K  TIME       URBAN AREA        MILEPNT  SECOND STREET       LOCTN    (#LANES) CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO     P# TYPE SVRTY E  X RES   LOC ERROR        ACTN EVENT      CAUSE

                                                                                                                        02 NONE       TURN-L
                                                                                                                           PRVTE      S  W                                                 000             00
                                                                                                                          PSNGR CAR          01 DRVR NONE  58 M OR-Y       000             000             00
                                                                                                                                                                OR<25

02076  N N N      09/10/2006 JACKSON           1  16  2                 INTER     CROSS  N        N CLR  ANGL-OTH    01 NONE       STRGHT                                                                      04
NO RPT            Sun                           6 0                     CN                TRF SIGNAL N DRY  TURN         PRVTE      W  E                                                 000             00
                  8P         MEDFORD UA        32.87                    04          0              N DLIT PDO           PSNGR CAR          01 DRVR NONE  19 M OR-Y       000             000             00
                                                                                                                                                                OR<25

                                                                                                                        02 NONE       TURN-L
                                                                                                                           PRVTE      S  W                                                 000             00
                                                                                                                          PSNGR CAR          01 DRVR NONE  16 F OR-Y       020             000             04
                                                                                                                                                                OR<25

02400  N N N      11/08/2006 JACKSON           1  16  2                 INTER     CROSS  N        N RAIN ANGL-OTH    01 NONE       STRGHT                                                                      04
NO RPT            Wed                           6 0                     CN                TRF SIGNAL N WET  TURN         PRVTE      W  E                                                 000             00
                  11P        MEDFORD UA        32.87                    04          0              N DLIT PDO           PSNGR CAR          01 DRVR NONE  37 M OR-Y       020             000             04
                                                                                                                                                                OR>25

                                                                                                                        02 NONE       TURN-R
                                                                                                                           PRVTE      S  E                                                 000             00
                                                                                                                          PSNGR CAR          01 DRVR NONE  21 M OR-Y       000             000             00
                                                                                                                                                                OR<25

01396  N N N N N  07/20/2007 JACKSON           1  16  2                 ALLEY            N        N CLR  O-1TURN     01 NONE       STRGHT                                                                      02,08
CITY              Fri                           6 0                     UN        (NONE) NONE     N DRY  TURN        PRVTE      W  E                                                 000             00
                  4P         MEDFORD UA        32.89                    04                         N DAY  INJ           PSNGR CAR          01 DRVR INJB  21 F OR-Y       000             000             00
                                                                                  (04)                                                                          OR<25

                                                                                                                        02 NONE       TURN-L
                                                                                                                           PRVTE      E  S                                                 019             00
                                                                                                                          PSNGR CAR          01 DRVR INJC  19 M OR-Y       004,028         000             02
                                                                                                                                                                OR>25

01380  N N N N N  07/17/2007 JACKSON           1  16  2                 STRGHT           N        N RAIN S-1STOP     01 NONE       STRGHT                                                                      07
COUNTY            Tue                           6 0                     UN        (NONE) TRF SIGNAL N WET  REAR      PRVTE      E  W                                                 001             00
                  9P         MEDFORD UA        32.89                    05                         N DLIT INJ           PSNGR CAR          01 DRVR NONE  17 M OR-Y       043             000             07
                                                                                  (04)                                                                          OR<25

                                                                                                                        02 NONE       STOP
                                                                                                                           PRVTE      E  W                                                 011             00
                                                                                                                          PSNGR CAR          01 DRVR INJC  30 M OR-Y       000             000             00
                                                                                                                                                                OR<25
                                                                                                                                             02 PSNG INJC  28 F            000             000             00

01678  N N N      08/04/2006 JACKSON           1  16  2                 STRGHT           N        N CLR  S-1STOP     01 NONE    1 STRGHT                                                                      07,32
CITY              Fri                           6 0                     UN        (NONE) TRF SIGNAL N DRY  REAR      PRVTE      W  E                                                 000             00
                  1P         MEDFORD UA        32.90                    03                         N DAY  INJ           SEMI TOW           01 DRVR NONE  62 M OR-Y       052,043         000             07,32
                                                                                  (04)                                                                          OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CONTINUOUS SYSTEM CRASH LISTING

001 PACIFIC

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
      S  D
      P  R S W                                   RD#  FC                             INT-TYP                                   SPCL USE
      E A U C O  DATE        COUNTY              COMPNT   CONN #           RD CHAR (MEDIAN)  INT-REL  OFFRD WTHR  CRASH TYP   TRLR QTY  MOVE                A S
SER#  E L G H R  DAY         CITY                MLG TYP  FIRST  STREET    DIRECT    LEGS    TRAF-    RNDBT SURF  COLL TYP    OWNER     FROM      PRTC INJ   G E LICNS PED
INVEST D C S L K TIME        URBAN AREA          MILEPNT  SECOND STREET    LOCTN   (#LANES)  CNTL     DRVWY LIGHT SVRTY    V# VEH TYPE  TO     P# TYPE SVRTY E X RES   LOC ERROR        ACTN EVENT    CAUSE

                                                                                                                   02 NONE      STOP
                                                                                                                      PRVTE     W  E                                               011           00
                                                                                                                     PSNGR CAR         01 DRVR INJB  16 M OR-Y      000          000           00
                                                                                                                                                          OR<25

01398  N N N N N 06/29/2007 JACKSON              1  16  2               INTER     CROSS  N          N CLR  ANGL-OTH    01 NONE      STRGHT                                                   093      04,27
COUNTY           Fri                              6 0                   CN               TRF SIGNAL  N DRY  TURN          PRVTE     E  W                                               000           00
                 8A          MEDFORD UA          32.91                  01          0               N DAY  PDO           PSNGR CAR         01 DRVR NONE  62 F OR-Y      016,020      038  093      04
                                                                                                                                                          OR>25

                                                                                                                   02 NONE      TURN-L
                                                                                                                      PRVTE     N  E                                               000           00
                                                                                                                     PSNGR CAR         01 DRVR NONE  18 F OR-Y      000          000           00
                                                                                                                                                          OR<25

02177  Y N N     10/18/2006 JACKSON              1  19  4               INTER     CROSS  N          N CLR  S-1STOP     01 NONE   1 STRGHT                                                   013      01,22
STATE            Wed                              6 0                   N                TRF SIGNAL  N DRY  REAR          PRVTE     N  S                                               000           22
                 5P          MEDFORD UA          33.24                  06          0               N DAY  INJ            TRUCK            01 DRVR NONE  51 M OR-Y      047          000           01
                                                                                                                                                          OR<25

                                                                                                                   02 NONE   1 STOP
                                                                                                                      PRVTE     N  S                                               011  013      00
                                                                                                                     SEMI TOW          01 DRVR INJB  25 M OR-Y      000          000           00
                                                                                                                                                          OR<25
                                                                                                                                       02 PSNG INJB  31 M           000          000           00

                                                                                                                   03 NONE      STOP
                                                                                                                      PRVTE     N  S                                               011           00
                                                                                                                     PSNGR CAR         01 DRVR NONE  00 U UNK       000          000           00
                                                                                                                                                          UNK

00654  N N N     03/26/2007 JACKSON              1  19  4               INTER     CROSS  N          N CLR  O-1STOP     01 NONE      BACK                                                              10
NO RPT           Mon                              6 0                   N                UNKNOWN     N DRY  BACK          PRVTE     S  N                                               000           00
                 2P          MEDFORD UA          33.24                  06          0               N DAY  PDO           PSNGR CAR         01 DRVR NONE  45 M OR-Y      011          000           10
                                                                                                                                                          OR>25

                                                                                                                   02 NONE      STRGHT
                                                                                                                      PRVTE     N  S                                               000           00
                                                                                                                     PSNGR CAR         01 DRVR NONE  29 F OR-Y      000          000           00
                                                                                                                                                          OR<25
                                                                                                                                       02 PSNG NO<5  04 M           000          000           00
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E L C / D R A U L G S C H L W O R K	DATE DAY TIME	MILEPNT DIST FROM INTERSECT	COUNTY ROADS 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
02191	N N N	10/16/2006	0.92	E PINE ST	ALLEY		N	N	RAIN	ANGL-OTH	01	NONE	TURN-L										082	02
COUNTY		Mon			UN	(NONE)	NONE	N	WET	TURN		PRVTE	S W									018		00
		6P			04			N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	34	F	OR-Y		028	000	082	02
						(04)													OR<25					
														02	PSNG	NO<5	02	F			000	000		00
											02	NONE	STRGHT											
												PRVTE	W E									000		00
												PSNGR CAR		01	DRVR	INJC	36	F	OR-Y		000	000		00
																			OR<25					
02565	N N N	11/17/2006	0.94	E PINE ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07,32
COUNTY		Fri			E		TRF SIGNAL	N	DRY	REAR		PRVTE	E W									000		00
		5P			06	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	45	F	OR-Y		043,052	000		07,32
																			OR<25					
											02	NONE	STOP											
												PRVTE	E W									011		00
												PSNGR CAR		01	DRVR	NONE	53	F	OR-Y		000	000		00
																			OR<25					
00720	N N N	4/4/2006	0.94	E PINE ST	INTER	3-LEG	N	N	CLR	ANGL-OTH	01	NONE 0	TURN-L											02
NO RPT		Tue			CN		UNKNOWN	N	DRY	TURN		PRVTE	S W									000		00
		11A			01	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	76	F	OR-Y		028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	W E									000		00
												PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		000	000		00
																			OR<25					
01559	N N N	7/21/2006	0.94	E PINE ST	INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
COUNTY		Fri			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E W									000		00
		11A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	NO<5	02	F			000	000		00
														03	PSNG	NO<5	01	M			000	000		00
														04	PSNG	NO<5	04	M			000	000		00
											02	NONE	TURN-L											
												PRVTE	W N									000		00
												PSNGR CAR		01	DRVR	NONE	37	F	OR-Y		004,028	000		02
																			OR<25					
01545	N N N	7/20/2006	0.95	E PINE ST	STRGHT		N	N	CLR	S-1STOP	01	NONE	STRGHT											07,13
NO RPT		Thu			UN	(NONE)	TRF SIGNAL	N	DRY	REAR		PRVTE	E W									088		00
		5P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		045,026	000		07,13
						(04)													OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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COUNTY ROAD CRASH LISTING

JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E (SPEC) / D R A U L G C (C) / S C H O R L K	DATE DAY TIME	MILEPNT DIST FROM INTERSECT	COUNTY ROADS 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	STOP									
											PRVTE	E W							011		00
											PSNGR CAR		01 DRVR NONE	39	F	OR-Y		000	000		00
																OR<25					
02521	N N N	11/30/2006	0.99	E PINE ST	STRGHT		Y	N	CLR	S-1STOP	01 NONE	STRGHT									07
NONE		Thu			UN	(NONE)	TRF SIGNAL	N	DRY	REAR	PRVTE	E W							000		00
		5P			03			N	DARK	INJ	PSNGR CAR		01 DRVR NONE	60	F	OR-Y		014,026	000		07
						(02)										OR<25					
											02 NONE	STOP									
											PRVTE	E W							011		00
											PSNGR CAR		01 DRVR INJC	40	F	OR-Y		000	000		00
																OR<25					
00693	N N N	3/30/2006	1.00	E PINE ST	ALLEY		N	N	CLR	ANGL-OTH	01 NONE	STRGHT									02,10
CITY		Thu			UN	(NONE)	L-TURN REF	N	DRY	TURN	PRVTE	W E							031		00
		12P			05			N	DAY	PDO	PSNGR CAR		01 DRVR NONE	26	M	OR-Y		044	000		10
						(05)										OR<25					
											02 NONE	TURN-L									
											PRVTE	S W							018		00
											PSNGR CAR		01 DRVR NONE	29	F	OR-Y		028	000		02
																OR<25					
01855	N N N	8/16/2006	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1STOP	01 NONE 2	BACK									10
NONE		Wed			W		TRF SIGNAL	N	DRY	BACK	PRVTE	E W							000		00
		5P			06	0		N	DAY	PDO	TRUCK		01 DRVR NONE	00	U	UNK		011	000		10
																UNK					
											02 NONE	STOP									
											PRVTE	W E							011		00
											PSNGR CAR		01 DRVR NONE	44	M	OR-Y		000	000		00
																OR<25					
01609	N N N	7/29/2006	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01 NONE	STRGHT								093	02,27
COUNTY		Sat			CN		TRF SIGNAL	N	DRY	TURN	PRVTE	N S							000		00
		12P			01	0		N	DAY	INJ	PSNGR CAR		01 DRVR INJB	37	M	OR-Y		000	000		00
																OR<25					
													02 PSNG INJB	38	M			000	000		00
											02 NONE	TURN-L									
											PRVTE	S W							000		00
											PSNGR CAR		01 DRVR INJB	19	F	OR-Y		004,028	038	092	02
																OR<25					
													02 PSNG INJB	20	F			000	000		00
00832	N N N	4/8/2006	1.80	E PINE ST	INTER	CROSS	N	N	CLD	O-1TURN	01 NONE 0	STRGHT									04
COUNTY		Sat			CN		TRF SIGNAL	N	DRY	TURN	PRVTE	E W							000		00
		12P			02	0		N	DAY	INJ	PSNGR CAR		01 DRVR INJC	26	M	OR-Y		000	000		00
																OR<25					
													02 PSNG INJB	22	M			000	000		00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LISTING

JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E A U C O / D R S W / E L G H R / C L K	DATE DAY TIME	MILEPNT DIST FROM INTERSECT	COUNTY ROADS 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 OWNER VEH TYPE	TRLR QTY	MOVE FROM TO	P#	PRTC TYPE	INJ SVRTY	AGE	SEX	LICNS RES	PED LOC	ERROR	ACTN EVENT	CAUSE
											02	NONE	0	TURN-L										
												PRVTE		W N									000	00
												PSNGR CAR			01	DRVR	NONE	21	M	OR-Y		020	000	04
																				OR<25				
01785	N N N	8/30/2006	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE		STRGHT										04
COUNTY		Wed			CN		L-GRN-SIG	N	DRY	TURN		PRVTE		E W									000	00
		9A			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	29	F	OR-Y		000	000	00
																				OR>25				
											02	NONE		TURN-L										
												PRVTE		W N									000	00
												PSNGR CAR			01	DRVR	NONE	43	M	OR-Y		020,004	000	04
																				OR<25				
00203	N N N	1/27/2006	1.80	E PINE ST	INTER	CROSS	N	N	RAIN	O-1TURN	01	NONE		TURN-L										04,08
COUNTY		Fri			CN		TRF SIGNAL	N	WET	TURN		PRVTE		N E									000	00
		5P			04	0		N	DLIT	INJ		PSNGR CAR			01	DRVR	INJB	19	F	OR-Y		004,020	000	04,08
																				OR<25				
															02	PSNG	INJB	45	F			000	000	00
											02	NONE		STRGHT										
												PRVTE		S N									000	00
												PSNGR CAR			01	DRVR	INJB	24	M	OR-Y		000	000	00
																				OR>25				
															02	PSNG	INJB	30	M			000	000	00
02499	N N N	11/14/2006	1.80	E PINE ST	INTER	CROSS	N	N	CLD	O-1TURN	01	NONE		TURN-L										04
COUNTY		Tue			CN		TRF SIGNAL	N	WET	TURN		PRVTE		N E									000	00
		6P			04	0		N	DLIT	PDO		PSNGR CAR			01	DRVR	NONE	47	F	OR-Y		020	000	04
																				OR<25				
											02	NONE		STRGHT										
												PRVTE		S N									000	00
												PSNGR CAR			01	DRVR	NONE	42	M	OR-Y		000	000	00
																				OR<25				
00946	N N N	5/14/2007	0.94	E PINE ST	INTER	CROSS	N	N	CLR	ANGL-STP	01	NONE	1	TURN-L										08
COUNTY		Mon			N		TRF SIGNAL	N	DRY	TURN		PRVTE		W N									000	00
		8A			06	0		N	DAY	PDO		SEMI TOW			01	DRVR	NONE	52	M	OR-Y		002,082	000	08
																				OR<25				
											02	NONE		STOP										
												PRVTE		N S									012	00
												PSNGR CAR			01	DRVR	NONE	61	F	OR-Y		000	000	00
																				OR<25				
00905	N N N	5/3/2007	0.94	E PINE ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE		STRGHT										07
NO RPT		Thu			E		TRF SIGNAL	N	DRY	REAR		PRVTE		E W									000	00
		4P			06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	46	M	OR-Y		026	000	07
																				OR<25				

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                                                                          TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
                                                                                             COUNTY ROAD CRASH LISTING

JACKSON COUNTY                                                          Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
                                                                                      January 1, 2006 through December 31, 2008

       S   D
       P   R S W                                                                  INT-TYP                                             SPCL USE
       E A U C O  DATE        MILEPNT   COUNTY ROADS                      RD CHAR  (MEDIAN) INT-REL  OFF-RD WTHR  CRASH TYP   TRLR QTY MOVE                      A S
SER#   E L G H R  DAY         DIST FROM FIRST  STREET                     DIRECT     LEGS   TRAF-    RNDBT  SURF  COLL TYP    OWNER    FROM     PRTC INJ       G E LICNS PED
INVEST   C   L K  TIME        INTERSECT SECOND STREET                     LOCTN    (#LANES) CONTL    DRVWY  LIGHT SVRTY    V# VEH TYPE TO    P# TYPE SVRTY E X RES   LOC ERROR      ACTN EVENT    CAUSE

                                                                                                                       02 NONE      STOP
                                                                                                                          PRVTE     E  W                                             011            00
                                                                                                                         PSNGR CAR         01 DRVR NONE  47 M OR-Y      000          000            00
                                                                                                                                                            OR<25
00663  N N N     3/29/2007    0.94    E PINE ST                           STRGHT            N          N   CLR   S-1STOP   01 NONE   1  STRGHT                                              013         07
CITY             Thu                                                      W        (NONE)   NONE       N   DRY   REAR         PRVTE     E  W                                             000            00
                 4P                                                       05                           N   DAY   INJ         PSNGR CAR         01 DRVR NONE  53 M SUSP      043          000            07
                                                                                    (04)                                                                    OR<25
                                                                                                                       02 NONE      STOP
                                                                                                                          PRVTE     E  W                                             011 013        00
                                                                                                                         PSNGR CAR         01 DRVR INJB  51 F OR-Y      000          000            00
                                                                                                                                                            OR<25
                                                                                                                       03 NONE      STOP
                                                                                                                          PRVTE     E  W                                             011            00
                                                                                                                         PSNGR CAR         01 DRVR NONE  52 M OR-Y      000          000            00
                                                                                                                                                            OR<25
00788  N N N     4/24/2007    0.94    E PINE ST                           INTER     CROSS   N          N   CLR   O-1TURN   01 NONE      STRGHT                                                         04
COUNTY           Tue                                                      CN                L-GRN-SIG  N   DRY   TURN         PRVTE     E  W                                             000            00
                 4P                                                       02          0                N   DAY   INJ         MTRCYCLE          01 DRVR INJC  18 M OR-Y      000          000            00
                                                                                                                                                            OR<25
                                                                                                                       02 NONE      TURN-L
                                                                                                                          PRVTE     W  N                                             000            00
                                                                                                                         PSNGR CAR         01 DRVR NONE  25 M OR-Y      020,004      000            04
                                                                                                                                                            OR<25
00650  N N N N N 4/12/2008    0.94    E PINE ST                           INTER     CROSS   N          N   CLR   O-1TURN   01 NONE      STRGHT                                                         02
COUNTY           Sat                                                      CN                TRF SIGNAL N   DRY   TURN         PRVTE     E  W                                             000            00
                 1P                                                       02          0                N   DAY   INJ         PSNGR CAR         01 DRVR INJC  59 M OR-Y      000          000            00
                                                                                                                                                            OR<25
                                                                                                                                           02 PSNG INJC  47 F           000          000            00
                                                                                                                                           03 PSNG INJC  53 M           000          000            00
                                                                                                                       02 NONE      TURN-L
                                                                                                                          PRVTE     W  N                                             000            00
                                                                                                                         PSNGR CAR         01 DRVR INJB  72 F OR-Y      004,028      000            02
                                                                                                                                                            OR<25
                                                                                                                                           02 PSNG INJB  85 F           000          000            00
01755  N N N N N 10/16/2008   0.94    E PINE ST                           INTER     CROSS   N          N   CLR   ANGL-OTH  01 NONE   0  STRGHT                                              013         04
CITY             Thu                                                      CN                TRF SIGNAL N   DRY   ANGL         PRVTE     W  E                                             000            00
                 8A                                                       03          0                N   DAY   INJ         PSNGR CAR         01 DRVR NONE  80 F OR-Y      020          000            04
                                                                                                                                                            OR<25
                                                                                                                       02 NONE   0  STRGHT
                                                                                                                          PRVTE     N  S                                             000 013        00
                                                                                                                         PSNGR CAR         01 DRVR INJC  16 F OR-Y      000          000            00
                                                                                                                                                            OR<25
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COUNTY ROAD CRASH LISTING

JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
       S   D
       P   R S W                                                                 INT-TYP                                      SPCL USE
       E A U C O  DATE       MILEPNT    COUNTY ROADS                   RD CHAR  (MEDIAN) INT-REL  OFF-RD WTHR  CRASH TYP     TRLR QTY  MOVE                    A S
SER#   E L G H R  DAY        DIST FROM  FIRST  STREET                  DIRECT     LEGS   TRAF-    RNDBT  SURF  COLL TYP      OWNER     FROM     PRTC INJ     G E LICNS PED
INVEST   C   L K  TIME       INTERSECT  SECOND STREET                  LOCTN    (#LANES) CONTL    DRVWY  LIGHT SVRTY      V# VEH TYPE  TO    P# TYPE SVRTY E X RES   LOC ERROR       ACTN EVENT   CAUSE
--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------
                                                                                                                      03 NONE  1  STOP
                                                                                                                         PRVTE    N  S                                          022          00
                                                                                                                         SEMI TOW          01 DRVR NONE  44 M OTH-Y      000     000          00
                                                                                                                                                              N-RES
00027  N N N      1/5/2007      0.95    E PINE ST                      STRGHT             N          N   RAIN  S-1STOP    01 NONE     STRGHT                                           013        07
COUNTY            Fri                                                  W         (NONE)   UNKNOWN    N   WET   REAR          PRVTE    E  W                                          000          00
                  5P                                                   04                            N   DUSK  INJ           PSNGR CAR         01 DRVR NONE  16 F OR-Y       043     000          07
                                                                                  (04)                                                                        OR<25
                                                                                                                      02 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011 013      00
                                                                                                                         PSNGR CAR         01 DRVR INJC  64 F OR-Y       000     000          00
                                                                                                                                                              OR<25
                                                                                                                      03 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011 013      00
                                                                                                                         PSNGR CAR         01 DRVR NONE  24 M OR-Y       000     000          00
                                                                                                                                                              OR<25
                                                                                                                      04 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011          00
                                                                                                                         PSNGR CAR         01 DRVR INJC  30 F OR-Y       000     000          00
                                                                                                                                                              OR<25
02267  N N N      11/25/2007    0.96    E PINE ST                      ALLEY              N          N   CLD   PED        01 NONE     TURN-R                                                     02
CITY              Sun                                                  UN        (NONE)   UNKNOWN    N   DRY   PED           PRVTE    W  S                                          019          00
                  7A                                                   03                            N   DAWN  INJ           PSNGR CAR         01 DRVR NONE  84 M OR-Y       029     000          02
                                                                                  (04)                                                                        OR<25
                                                                                                                                  STRGHT  01 PED  INJC  54 M        09  000     039          00
                                                                                                                                  W  E
00813  N N N N N  5/8/2008      0.96    E PINE ST                      STRGHT             N          N   CLR   S-1STOP    01 NONE     STRGHT                                           013,093    27,32
COUNTY            Thu                                                  UN        (NONE)   UNKNOWN    N   DRY   REAR          PRVTE    E  W                                          000          00
                  3P                                                   06                            N   DAY   INJ           PSNGR CAR         01 DRVR INJC  49 F OR-Y       016,052 038 093      27,32
                                                                                  (04)                                                                        OR<25
                                                                                                                      02 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011 013      00
                                                                                                                         PSNGR CAR         01 DRVR INJB  53 F OR-Y       000     000          00
                                                                                                                                                              OR<25
                                                                                                                      03 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011 013      00
                                                                                                                         PSNGR CAR         01 DRVR INJC  50 M OR-Y       000     000          00
                                                                                                                                                              OR<25
                                                                                                                      04 NONE     STOP
                                                                                                                         PRVTE    E  W                                          011          00
                                                                                                                         PSNGR CAR         01 DRVR INJC  36 M OR-Y       000     000          00
                                                                                                                                                              OR<25
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
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January 1, 2006 through December 31, 2008

```
       S   D
       P   R S W                                                  INT-TYP                                     SPCL USE
       E A U C O DATE       MILEPNT   COUNTY ROADS       RD CHAR  (MEDIAN) INT-REL    OFF-RD WTHR  CRASH TYP     TRLR QTY MOVE                       A S
SER#   E L G H R DAY        DIST FROM FIRST  STREET      DIRECT     LEGS   TRAF-      RNDBT  SURF  COLL TYP      OWNER    FROM      PRTC INJ        G E LICNS PED
INVEST   C   L K TIME       INTERSECT SECOND STREET      LOCTN    (#LANES) CONTL      DRVWY  LIGHT SVRTY     V# VEH TYPE  TO     P# TYPE SVRTY     E X RES   LOC ERROR   ACTN EVENT   CAUSE

01224  N N N     6/14/2007    0.98    E PINE ST          STRGHT            N          N      CLR   S-1STOP   01 NONE      STRGHT                                               013       07
NO RPT           Thu                                     UN        (NONE)  TRF SIGNAL N      DRY   REAR         PRVTE     E  W                                           000             00
                 5P                                      03                           N      DAY   INJ         PSNGR CAR        01 DRVR NONE  36 M OR-Y      026     000             07
                                                                    (04)                                                                          OR<25

                                                                                                             02 NONE      STOP
                                                                                                                PRVTE     E  W                                           011 013         00
                                                                                                               PSNGR CAR        01 DRVR INJC  39 F OR-Y      000     000             00
                                                                                                                                                  OR<25
                                                                                                                                02 PSNG INJB  08 M           000     000             00

                                                                                                             03 NONE      STOP
                                                                                                                PRVTE     E  W                                           011             00
                                                                                                               PSNGR CAR        01 DRVR NONE  23 M OR-Y      000     000             00
                                                                                                                                                  OR<25

02104  N N N N N 11/21/2008   1.40    E PINE ST          INTER      CROSS  N          N      CLR   S-1STOP   01 NONE   0  STRGHT                                               040       10
COUNTY           Fri                                     E                 TRF SIGNAL N      DRY   REAR         PRVTE     E  W                                           000             00
                 2P                                      06           0               N      DAY   INJ         PSNGR CAR        01 DRVR INJA  81 M OR-Y      026     028             10
                                                                                                                                                  OR<25

                                                                                                             02 NONE   0  STOP
                                                                                                                PRVTE     E  W                                           011             00
                                                                                                               PSNGR CAR        01 DRVR NONE  68 M OR-Y      000     000             00
                                                                                                                                                  OR<25

01052  N N N     6/13/2008    1.80    E PINE ST          INTER      CROSS  N          N      CLR   S-1STOP   01 NONE      STRGHT                                                         07
NO RPT           Fri                                     W                 TRF SIGNAL N      DRY   REAR         PRVTE     W  E                                           000             00
                 3P                                      06           0               N      DAY   PDO         PSNGR CAR        01 DRVR NONE  18 F OR-Y      026     000             07
                                                                                                                                                  OR<25

                                                                                                             02 NONE      STOP
                                                                                                                PRVTE     W  E                                           011             00
                                                                                                               PSNGR CAR        01 DRVR NONE  60 F OR-Y      000     000             00
                                                                                                                                                  OR<25

00812  N N N N N 5/6/2008     1.80    E PINE ST          INTER      CROSS  N          N      CLD   ANGL-OTH  01 NONE      STRGHT                                                         04
COUNTY           Tue                                     CN                TRF SIGNAL N      DRY   ANGL         PRVTE     E  W                                           007             00
                 9P                                      02           0               N      DLIT  INJ         PSNGR CAR        01 DRVR INJB  27 F OR-Y      020     000             04
                                                                                                                                                  OR<25

                                                                                                             02 NONE   1  STRGHT
                                                                                                                PRVTE     S  N                                           000             00
                                                                                                               SEMI TOW         01 DRVR INJB  61 M OR-Y      000     000             00
                                                                                                                                                  OR<25

01358  N N N N N 8/20/2008    1.80    E PINE ST          INTER      CROSS  N          N      CLR   O-1TURN   01 NONE      STRGHT                                                         02
COUNTY           Wed                                     CN                TRF SIGNAL N      DRY   TURN         PRVTE     E  W                                           000             00
                 6P                                      02           0               N      DAY   INJ         PSNGR CAR        01 DRVR INJC  34 M OR-Y      000     000             00
                                                                                                                                                  OR<25
                                                                                                                                02 PSNG INJB  07 M           000     000             00
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SER# / INVEST	S P E E / D A U L C G / R C H / S O R L / W K	DATE / DAY / TIME	MILEPNT / DIST FROM INTERSECT	COUNTY ROADS / 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	TURN-L											
												PRVTE	W N									000		00
												PSNGR CAR		01	DRVR	INJB	41	F	OR-Y		004,028	000		02
																			OR<25					
01437	N N N	8/25/2008	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
NONE		Mon			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	E W									000		00
		3P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		000	000		00
																			UNK					
											02	NONE	TURN-L											
												PRVTE	W N									000		00
												PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		004,028	000		02
																			OR<25					
01270	N N N	7/26/2008	1.80	E PINE ST	INTER	CROSS	N	N	CLR	ANGL-OTH	01	NONE	STRGHT										082	04
NO RPT		Sat			CN		TRF SIGNAL	N	DRY	ANGL		PRVTE	W E									000		00
		9A			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	23	F	OR-Y		000	000		00
																			OR<25					
											02	NONE	STRGHT											
												PRVTE	N S									000		00
												TRUCK		01	DRVR	NONE	57	M	OR-Y		020	000	082	04
																			OR<25					
01280	N N N	7/30/2008	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											08
NO RPT		Wed			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W E									000		00
		10A			03	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		000	000		00
																			OR<25					
											02	NONE	TURN-L											
												PRVTE	E S									000		00
												PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		004	000		08
																			OR<25					
01639	N N N N N	9/23/2008	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
COUNTY		Tue			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W E									000		00
		3P			03	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		000	000		00
																			OR<25					
											02	NONE	TURN-L											
												PRVTE	E S									000		00
												PSNGR CAR		01	DRVR	INJC	55	F	OR-Y		004,028	000		02
																			OR<25					
01642	N N N N N	9/24/2008	1.80	E PINE ST	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
COUNTY		Wed			CN		TRF SIGNAL	N	DRY	TURN		PRVTE	S N									000		00
		5A			04	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	32	M	OR-Y		000	000		00
																			OR<25					

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January 1, 2006 through December 31, 2008

SER# INVEST	S P E A U C L G H R S D W O C K	DATE DAY TIME	MILEPNT DIST FROM INTERSECT	COUNTY ROADS 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	TURN-L											
												PRVTE	N E									000		00
												PSNGR CAR		01	DRVR	NONE	26	M	OR-Y		004,028	000		02
																			OR<25					
01933	N N N N N	9/5/2007	0.00	PENNINGER RD	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE 1	BACK											10
CITY		Wed			N		TRF SIGNAL	N	DRY	BACK		PRVTE	S N									000		00
		2P			06	0		N	DAY	PDO		SEMI TOW		01	DRVR	NONE	00	U	UNK		011	000		10
																			UNK					
											02	NONE	STOP											
												PRVTE	N S									011		00
												PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		000	000		00
																			OR<25					
01354	N N N	6/19/2006	0.02	PENNINGER RD	STRGHT		N	N	CLR	S-OTHER	01	NONE	U-TURN											02
NONE		Mon			UN	(NONE)	UNKNOWN	N	DRY	TURN		PRVTE	S S									051		00
		1P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		008,028	000		02
						(02)													OR<25					
											02	NONE	STRGHT											
												PRVTE	S N									000		00
												PSNGR CAR		01	DRVR	NONE	22	F	OR-Y		000	000		00
																			OR<25					
00835	Y N N	4/8/2006	2.25	TABLE ROCK RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											01,07
COUNTY		Sat			SW		TRF SIGNAL	N	DRY	REAR		PRVTE	SW NE									000		00
		2P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		047,026	000		01,07
																			UNK					
											02	NONE 0	STOP											
												PRVTE	SW NE									011		00
												PSNGR CAR		01	DRVR	NONE	24	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	NO<5	01	M			000	000		00
														03	PSNG	NO<5	04	F			000	000		00
00660	N N N	4/15/2008	2.28	TABLE ROCK RD	STRGHT		N	N	CLR	S-STRGHT	01	NONE	STRGHT											13
NO RPT		Tue			UN	(NONE)	UNKNOWN	N	DRY	SS-O		PRVTE	N S									000		00
		4P			06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	22	M	OR-Y		045	000		13
						(05)													OR<25					
											02	NONE	STRGHT											
												PRVTE	N S									000		00
												PSNGR CAR		01	DRVR	NONE	52	M	OR-Y		000	000		00
																			OR<25					
														02	PSNG	INJB	50	F			000	000		00
00139	N N N	1/8/2008	2.30	TABLE ROCK RD	STRGHT		N	N	RAIN	S-1STOP	01	NONE	STRGHT											07
NONE		Tue			UN	(NONE)	UNKNOWN	N	WET	REAR		PRVTE	N S									000		00
		4P			03			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000		07
						(04)													OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

COUNTY ROAD CRASH LISTING

JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet

January 1, 2006 through December 31, 2008

SER# / INVEST	S P E E / A L C / D R U G L / S C H L / W O R K	DATE / DAY / TIME	MILEPNT / DIST FROM / INTERSECT	COUNTY ROADS / 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	STOP											
												PRVTE	N S									011		00
												PSNGR CAR		01	DRVR	NONE	47	M	OR-Y		000	000		00
																			OR<25					
00095	Y N N	1/22/2008	2.31	TABLE ROCK RD	ALLEY		Y	Y	CLR	PRKD MV	01	NONE	TURN-L											01
NONE		Tue			UN	(NONE)	UNKNOWN	N	ICE	ANGL		PRVTE	E S									001		00
		UNK			01			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	56	M	OR-Y		047,001	000		01
						(02)													OR<25					
											02	NONE	PRKD-P											
												PRVTE	W E									032		00
												PSNGR CAR												

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                                                                                                                         TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
                                                                                                                                     URBAN NON-SYSTEM CRASH LISTING
CITY OF CENTRAL POINT,  JACKSON COUNTY                                                                       Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
                                                                                                                            January 1, 2006 through December 31, 2008

          S   D
          P   R S W                                                          INT-TYP                                                  SPCL USE
          E A U C O  DATE          CLASS  CITY STREET                RD CHAR  (MEDIAN) INT-REL OFF-RD WTHR  CRASH TYP       TRLR QTY  MOVE                   A  S
SER#      E L G H R  DAY           DIST   FIRST STREET               DIRECT    LEGS    TRAF-   RNDBT  SURF  COLL TYP        OWNER     FROM        PRTC INJ   G  E LICNS  PED
INVEST      C   L K  TIME          FROM   SECOND STREET              LOCTN    (#LANES) CONTL   DRVWY  LIGHT SVRTY      V#  VEH TYPE  TO       P# TYPE SVRTY E  X RES    LOC ERROR        ACTN EVENT      CAUSE

00324  N N Y         02/08/2008   19      6TH ST                     ALLEY             N           Y  CLR   FIX OBJ    01  NONE      TURN-L                                                   045        33
CITY                 Fri           200    E PINE ST                  SE        (NONE)  UNKNOWN     N  DRY   FIX              PRVTE   SE  SW                                             019 045        00
                     11A                                             07                            N  DAY   INJ            PSNGR CAR          01 DRVR INJC  55 M OR-Y       001,051      000            33
                                                                                (02)                                                                           OR<25

                                                                                                                       02  NONE      PRKD-P
                                                                                                                             PRVTE   NW  SE                                                 008            00
                                                                                                                           PSNGR CAR

00422  N N N         02/21/2007   16      BIDDLE RD                  INTER     CROSS   N           N  RAIN  O-1TURN    01  NONE      STRGHT                                                                02
COUNTY               Wed           0      HAMRICK RD                 CN                TRF SIGNAL  N  WET   TURN             PRVTE   E   W                                                  000            00
                     2P                                              02          0                 N  DAY   INJ            PSNGR CAR          01 DRVR INJB  46 M OR-Y       000          000            00
                                                                                                                                                               OR<25

                                                                                                                       02  NONE      TURN-L
                                                                                                                             PRVTE   W   N                                                  000            00
                                                                                                                           PSNGR CAR          01 DRVR INJC  20 F OTH-Y      004,028      000            02
                                                                                                                                                               N-RES
                                                                                                                                              02 PSNG INJC  36 M            000          000            00
                                                                                                                                              03 PSNG NO<5  02 M            000          000            00

02460  N N N N N     11/16/2007   16      BIDDLE RD                  INTER     CROSS   N           N  CLD   O-1TURN    01  NONE      STRGHT                                                                04
CITY                 Fri           0      HAMRICK RD                 CN                TRF SIGNAL  N  DRY   TURN             PRVTE   E   W                                                  000            00
                     12P                                             02          0                 N  DAY   INJ            PSNGR CAR          01 DRVR NONE  75 M OR-Y       000          000            00
                                                                                                                                                               OR<25

                                                                                                                       02  NONE      TURN-L
                                                                                                                             PRVTE   W   N                                                  000            00
                                                                                                                           PSNGR CAR          01 DRVR INJB  27 F OR-Y       020          000            04
                                                                                                                                                               OR<25

02253  N N N N N     11/22/2007   16      BIDDLE RD                  INTER     CROSS   N           N  CLR   O-1TURN    01  NONE      TURN-L                                                                04
CITY                 Thu           0      HAMRICK RD                 CN                TRF SIGNAL  N  DRY   TURN             PRVTE   W   N                                                  000            00
                     5P                                              02          0                 N  DLIT  INJ            PSNGR CAR          01 DRVR INJC  74 F OR-Y       020          000            04
                                                                                                                                                               OR<25

                                                                                                                       02  NONE      STRGHT
                                                                                                                             PRVTE   E   W                                                  000            00
                                                                                                                           PSNGR CAR          01 DRVR INJB  25 F OR-Y       000          000            00
                                                                                                                                                               OR<25
                                                                                                                                              02 PSNG NO<5  04 M            000          000            00

90057  N N N         01/13/2007   16      E PINE ST                  INTER     CROSS   N           N  CLR   S-1STOP    01  NONE    0 STRGHT                                                     012        10
NONE                 Sat           0      10TH ST                    NE                TRF SIGNAL  N  DRY   REAR             PRVTE   NE  SW                                                 000            00
                     7P                                              06          0                 N  DLIT  PDO            PSNGR CAR          01 DRVR NONE  90 M OR-Y       014,026      000            10
                                                                                                                                                               OR<25

                                                                                                                       02  UNKN    1 STOP
                                                                                                                             UNKN    NE  SW                                                 011 012        00
                                                                                                                           SEMI TOW           01 DRVR NONE  00 U UNK        000          000            00
                                                                                                                                                               UNK

02456  N N N N N     11/19/2007   16      E PINE ST                  INTER     CROSS   N           N  RAIN  S-1STOP    01  NONE      STRGHT                                                                07
CITY                 Mon           0      10TH ST                    NE                NONE        N  WET   REAR             PRVTE   NE  SW                                                 000            00
                     1P                                              06          1                 N  DAY   PDO            PSNGR CAR          01 DRVR NONE  65 M OR-Y       019,043      000            07
                                                                                                                                                               OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E	A L C	D R U G	S C H L	W O R K	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	STOP											
																PRVTE	NE SW									011		00
																PSNGR CAR		01	DRVR	NONE	19	F	OR-Y		000	000		00
																							OR<25					
01202	N	N	N			07/21/2008	16	E PINE ST	ALLEY		N	N	CLR	ANGL-OTH	01	NONE	TURN-L											02
NO RPT						Mon	200	10TH ST	NE	(NONE)	UNKNOWN	N	DRY	TURN		PRVTE	SE SW									018		00
						2P			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	F	OR-Y		028	000		02
										(04)													OR<25					
															02	NONE	TURN-L											
																PRVTE	NE SE									019		00
																PSNGR CAR		01	DRVR	NONE	36	F	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NO<5	01	F			000	000		00
																		03	PSNG	NO<5	02	M			000	000		00
00756	N	N	N			04/12/2006	17	E PINE ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											10
NONE						Wed	0	10TH ST	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									088		00
						3P			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	28	M	OR-Y		014,026	000		10
																							OR<25					
															02	NONE 0	STOP											
																PRVTE	NW SE									012		00
																PSNGR CAR		01	DRVR	INJC	40	M	OR-Y		000	000		00
																							OR<25					
02729	N	N	N			12/13/2007	16	E PINE ST	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE	BACK											10
NONE						Thu	0	10TH ST	NW		TRF SIGNAL	N	DRY	BACK		PRVTE	SE NW									000		00
						7P			06	1		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		011	000		10
																							OR<25					
															02	NONE	STOP											
																PRVTE	NW SE									011		00
																PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		000	000		00
																							OR<25					
																		02	PSNG	NO<5	02	F			000	000		00
02079	N	N	N	Y	N	10/28/2007	16	E PINE ST	INTER	CROSS	N	N	CLD	OVERTURN	01	NONE	TURN-L										001	10
CITY						Sun	0	10TH ST	CN		TRF SIGNAL	N	WET	NCOL		PRVTE	NW NE									001		00
						7A			02	0		N	DAY	INJ		MTRCYCLE		01	DRVR	INJA	53	M	OR-Y		080	017	001	10
																							OR<25					
01281	N	N	N			07/30/2008	16	E PINE ST	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
NO RPT						Wed	0	6TH ST	NE		NONE	N	DRY	REAR		PRVTE	NE SW									000		00
						3P			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	40	M	OR-Y		014,026	000		07
																							OR<25					
															02	NONE	STOP											
																PRVTE	NE SW									011		00
																PSNGR CAR		01	DRVR	NONE	34	M	OR-Y		000	000		00
																							OR<25					

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                                               TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
                                                              URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT,  JACKSON COUNTY          Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
                                                          January 1, 2006 through December 31, 2008

        S   D
        P   R S W                                              INT-TYP                                       SPCL USE
        E A U C O  DATE        CLASS  CITY STREET          RD CHAR  (MEDIAN) INT-REL OFF-RD WTHR  CRASH TYP    TRLR QTY  MOVE                          A S
SER#    E L G H R  DAY         DIST   FIRST STREET         DIRECT    LEGS    TRAF-   RNDBT  SURF  COLL TYP     OWNER     FROM       PRTC INJ      G E LICNS  PED
INVEST    C   L K  TIME        FROM   SECOND STREET        LOCTN   (#LANES)  CONTL   DRVWY  LIGHT SVRTY     V# VEH TYPE  TO      P# TYPE SVRTY  E X RES    LOC ERROR      ACTN EVENT     CAUSE

02061  N N N       09/07/2006  16     E PINE ST            INTER    CROSS    N          N CLR   S-1STOP   01 NONE      STRGHT                                                              07,32
NO RPT             Thu          0     6TH ST               SW                UNKNOWN    N DRY   REAR         PRVTE     SW  NE                                              000            00
                   4P                                      06         0                 N DAY   INJ        PSNGR CAR           01 DRVR NONE  20 M OR-Y       026,052      000            07,32
                                                                                                                                              OR<25
                                                                                                                           02 PSNG INJB  16 M            000          000            00

                                                                                                          02 NONE      STOP
                                                                                                             PRVTE     SW  NE                                              012            00
                                                                                                           PSNGR CAR           01 DRVR INJC  55 F OR-Y       000          000            00
                                                                                                                                              OR<25
00485  N N N       03/09/2007  16     E PINE ST            INTER    CROSS    N          N RAIN  S-1STOP   01 NONE      STRGHT                                                  013        07
CITY               Fri          0     6TH ST               SW                UNKNOWN    N WET   REAR         PRVTE     SW  NE                                              000            00
                   8A                                      06         0                 N DAY   INJ        PSNGR CAR           01 DRVR NONE  20 M OR-Y       043          000            07
                                                                                                                                              OR<25

                                                                                                          02 NONE      STOP
                                                                                                             PRVTE     SW  NE                                              011 013        00
                                                                                                           PSNGR CAR           01 DRVR INJC  22 F OR-Y       000          000            00
                                                                                                                                              OR<25

                                                                                                          03 NONE      STOP
                                                                                                             PRVTE     SW  NE                                              011            00
                                                                                                           PSNGR CAR           01 DRVR NONE  53 M OR-Y       000          000            00
                                                                                                                                              OR<25
01016  N N N N N   05/22/2007  16     E PINE ST            INTER    CROSS    N          N CLR   S-1STOP   01 NONE      STRGHT                                                  013        07
CITY               Tue          0     6TH ST               SW                NONE       N DRY   REAR         PRVTE     SW  NE                                              000            00
                   3P                                      06         0                 N DAY   INJ        PSNGR CAR           01 DRVR NONE  32 M OR-Y       045,043      000            07
                                                                                                                                              OR<25

                                                                                                          02 NONE      STOP
                                                                                                             PRVTE     SW  NE                                              011 013        00
                                                                                                           PSNGR CAR           01 DRVR NONE  18 M OR-Y       000          000            00
                                                                                                                                              OR<25

                                                                                                          03 NONE      STOP
                                                                                                             PRVTE     SW  NE                                              012            00
                                                                                                           PSNGR CAR           01 DRVR INJC  24 F OR-Y       000          000            00
                                                                                                                                              OR<25
01478  N N N N N   07/11/2007  16     E PINE ST            INTER    CROSS    N          N CLR   S-1STOP   01 NONE      STRGHT                                                  013,002    07,27
CITY               Wed          0     7TH ST               NE                UNKNOWN    N DRY   REAR         PRVTE     NE  SW                                              000            00
                   5P                                      06         0                 N DAY   INJ        PSNGR CAR           01 DRVR NONE  28 F OR-Y       016,043      038 002        07,27
                                                                                                                                              OR<25
                                                                                                           02 PSNG NO<5  01 M            000          000            00

                                                                                                          02 NONE      STOP
                                                                                                             PRVTE     NE  SW                                              011 013        00
                                                                                                           PSNGR CAR           01 DRVR INJC  46 M OR-Y       000          000            00
                                                                                                                                              OR<25

                                                                                                          03 NONE      STOP
                                                                                                             PRVTE     NE  SW                                              012            00
                                                                                                           PSNGR CAR           01 DRVR INJC  51 M OR-Y       000          000            00
                                                                                                                                              OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

```
         S   D
         P   R S W                                                        INT-TYP                                    SPCL USE
         E A U C O  DATE        CLASS  CITY STREET              RD CHAR   (MEDIAN)  INT-REL OFF-RD WTHR  CRASH TYP      TRLR QTY  MOVE                   A S
SER#     E L G H R  DAY         DIST   FIRST STREET             DIRECT      LEGS    TRAF-   RNDBT  SURF  COLL TYP       OWNER     FROM       PRTC INJ    G E LICNS  PED
INVEST     C    L K TIME        FROM   SECOND STREET            LOCTN     (#LANES)  CONTL   DRVWY  LIGHT SVRTY      V# VEH TYPE   TO      P# TYPE SVRTY  E X RES    LOC ERROR      ACTN EVENT     CAUSE

90324   N N Y       02/08/2008  16     E PINE ST                STRGHT              Y          Y  CLR   PRKD MV    01 NONE      TURN-L                                                    08,33
CITY                Fri          20    7TH ST                   NE        (NONE)    UNKNOWN    N  DRY   TURN          PRVTE     NW  NE                                        088         00
                    11A                                         06                             N  DAY   INJ         PSNGR CAR          01 DRVR INJC  55 M OR-Y       001,051  000         08,33
                                                                            (04)                                                                          OR<25

                                                                                                                   02 NONE      PRKD-P
                                                                                                                      PRVTE     NE  SW                                        008         00
                                                                                                                    PSNGR CAR

00501   Y N N       03/09/2007  16     E PINE ST                STRGHT              N          N  CLD   S-STRGHT   01 NONE      STRGHT                                                    01,07
NONE                Fri          50    8TH ST                   NE        (NONE)    UNKNOWN    N  ICE   REAR          PRVTE     NE  SW                                        000         00
                    8A                                          06                             N  DAY   PDO         PSNGR CAR          01 DRVR NONE  00 M OR-Y       042      000         07,01
                                                                            (02)                                                                          OR<25

                                                                                                                   02 NONE      STRGHT
                                                                                                                      PRVTE     NE  SW                                        006         00
                                                                                                                    PSNGR CAR          01 DRVR NONE  56 M OR-Y       000      000         00
                                                                                                                                                          OR<25

01665   N N N N N   09/16/2008  16     E PINE ST                STRGHT              N          Y  CLR   FIX OBJ    01 NONE      STRGHT                                            040,010     10
CITY                Tue          30    9TH ST                   SW        (NONE)    UNKNOWN    N  DRY   FIX           PRVTE     NE  SW                                        088 040,010     00
                    8A                                          05                             N  DAY   INJ         PSNGR CAR          01 DRVR INJA  83 M OR-Y       080,081  028         10
                                                                            (02)                                                                          OR<25

                                                                                                                   02 NONE      PRKD-P
                                                                                                                      PRVTE     N   S                                         032         00
                                                                                                                    PSNGR CAR

00025   N N N       01/10/2006  16     E PINE ST                STRGHT              N          N  RAIN  S-1STOP    01 NONE      STRGHT                                                    07
CITY                Tue         100    9TH ST                   SW        (NONE)    BUS STPSGN N  WET   REAR          PRVTE     NE  SW                                        088         00
                    7A                                          07                             N  DAWN  PDO         PSNGR CAR          01 DRVR NONE  45 M OR-Y       043,041  000         07
                                                                            (05)                                                                          OR<25

                                                                                                                   02 NONE      STOP
                                                                                                                      PRVTE     NE  SW                                        011         00
                                                                                                                    PSNGR CAR          01 DRVR NONE  41 M OR-Y       000      000         00
                                                                                                                                                          OR<25

02730   N N N       12/13/2007  16     E PINE ST                INTER     CROSS     N          N  CLR   ANGL-OTH   01 NONE      TURN-R                                                    02
NO RPT              Thu          0     9TH ST                   CN                  UNKNOWN    N  DRY   TURN          PRVTE     NW  SW                                        000         00
                    5P                                          03          0                  N  DUSK  PDO         PSNGR CAR          01 DRVR NONE  00 F OR-Y       028      000         02
                                                                                                                                                          OR<25

                                                                                                                   02 NONE      STRGHT
                                                                                                                      PRVTE     NE  SW                                        000         00
                                                                                                                    PSNGR CAR          01 DRVR NONE  22 F OR-Y       000      000         00
                                                                                                                                                          OR<25

02290   N N N N N   12/01/2008  19     E PINE ST                INTER     CROSS     N          N  FOG   ANGL-OTH   01 NONE    0 STRGHT                                                    02
CITY                Mon          0     9TH ST                   CN                  STOP SIGN  N  WET   ANGL          PRVTE     SW  NE                                        000         00
                    12P                                         04          0                  N  DAY   PDO         PSNGR CAR          01 DRVR NONE  41 M OR-Y       000      000         00
                                                                                                                                                          OR<25
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OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E / D R A U L G C / S C H W O R L K	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	STRGHT NW SE	01	DRVR	NONE	16	F	OR-Y OR<25		028	015 000		00 02
00779 CITY	N N N	04/18/2006 Tue 10A	16 0	FREEMAN RD PINE ST	INTER E 09	CROSS 1	N STOP SIGN	N N N	CLR DRY DAY	S-1STOP REAR INJ	01	NONE PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	47	M	OR-Y OR>25		014,026	000 000		07 00 07
											02	NONE PRVTE PSNGR CAR	STOP S N	01	DRVR	INJA	24	F	OTH-Y N-RES		000	011 000		00 00
01005 NONE	N N N	05/12/2006 Fri 3P	16 0	FREEMAN RD PINE ST	INTER E 09	CROSS 1	N STOP SIGN	N N N	CLR DRY DAY	S-1STOP REAR PDO	01	NONE PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	00	F	OR-Y OR>25		026	000 000		10 00 10
											02	NONE PRVTE PSNGR CAR	STOP S N	01	DRVR	NONE	28	M	OR-Y OR<25		000	011 000		00 00
01169 NONE	N N N	05/31/2006 Wed 4P	16 0	FREEMAN RD PINE ST	INTER E 09	CROSS 1	N STOP SIGN	N N N	CLR DRY DAY	S-1TURN REAR PDO	01	NONE PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	00	M	UNK UNK		026	000 038		07,27 00 07
											02	NONE PRVTE PSNGR CAR	TURN-R S NE	01	DRVR	NONE	62	F	OR-Y OR<25		000	013 000		00 00
00402 NONE	N N N	01/23/2007 Tue 1P	16 0	FREEMAN RD PINE ST	INTER E 09	CROSS 1	N STOP SIGN	N N N	CLR DRY DAY	S-OTHER TURN INJ	01	NONE 0 PRVTE PSNGR CAR	TURN-R SE NE	01	DRVR	NONE	45	F	OR-Y OR<25		026	015 000		07 00 07
											02	NONE 0 PRVTE PSNGR CAR	TURN-R SE NE	01	DRVR	INJC	57	F	OR-Y OR<25		000	013 000		00 00
00522 NO RPT	N N N	03/13/2007 Tue 8A	16 0	FREEMAN RD PINE ST	INTER E 09	CROSS 1	N STOP SIGN	N N N	CLR DRY DAY	S-1TURN REAR INJ	01	NONE PRVTE PSNGR CAR	STRGHT S N	01	DRVR	NONE	41	F	OR-Y OR<25		016,026	000 038		07,27 00 07
											02	NONE PRVTE PSNGR CAR	STOP S NE	01	DRVR	INJC	69	M	OR-Y OR<25		000	013 000		00 00

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT

URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet

January 1, 2006 through December 31, 2008

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       S   D
       P   R S W                                                                INT-TYP                                        SPCL USE
       E A U C O  DATE         CLASS  CITY STREET                  RD CHAR     (MEDIAN) INT-REL OFF-RD  WTHR  CRASH TYP        TRLR QTY  MOVE                      A  S
SER#   E L G H R  DAY          DIST   FIRST STREET                 DIRECT       LEGS    TRAF-   RNDBT   SURF  COLL TYP         OWNER     FROM       PRTC  INJ    G  E LICNS  PED
INVEST   C   L K  TIME         FROM   SECOND STREET                LOCTN      (#LANES)  CONTL   DRVWY   LIGHT SVRTY       V#   VEH TYPE  TO     P#  TYPE  SVRTY  E  X RES    LOC ERROR         ACTN EVENT      CAUSE

00765  N N N      04/16/2007   16     FREEMAN RD                   INTER        CROSS   N            N  CLR   S-1TURN     01  NONE      STRGHT                                                               07,27
NONE              Mon           0     PINE ST                      E                    STOP SIGN    N  DRY   REAR             PRVTE     S  N                                                 000            00
                  8A                                               09             1                  N  DAY   INJ             PSNGR CAR         01  DRVR  NONE  78  M OR-Y       026          000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                               PRVTE     S  NE                                                013            00
                                                                                                                              PSNGR CAR         01  DRVR  INJC  42  F OR-Y       000          000            00
                                                                                                                                                                      OR<25
                                                                                                                                                02  PSNG  INJC  68  M            000          000            00
                                                                                                                                                03  PSNG  INJC  39  F            000          000            00
                                                                                                                                                04  PSNG  INJC  13  M            000          000            00
                                                                                                                                                05  PSNG  INJC  15  F            000          000            00

00917  N N N N N  05/11/2007   16     FREEMAN RD                   INTER        CROSS   N            N  CLR   S-1TURN     01  NONE      STRGHT                                                               07
CITY              Fri           0     PINE ST                      E                    STOP SIGN    N  DRY   REAR             PRVTE     S  N                                                 000            00
                  9A                                               09             1                  N  DAY   PDO             PSNGR CAR         01  DRVR  NONE  81  M OR-Y       043          000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                               PRVTE     S  NE                                                013            00
                                                                                                                              PSNGR CAR         01  DRVR  NONE  70  F OR-Y       000          000            00
                                                                                                                                                                      OR<25

01533  N N N      07/31/2007   16     FREEMAN RD                   INTER        CROSS   N            N  CLR   S-1TURN     01  NONE      STRGHT                                                               07
CITY              Tue           0     PINE ST                      E                    STOP SIGN    N  DRY   REAR             PRVTE     S  N                                                 000            00
                  1P                                               09             1                  N  DAY   PDO             PSNGR CAR         01  DRVR  NONE  20  M OR-Y       043          000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                               PRVTE     S  NE                                                013            00
                                                                                                                              PSNGR CAR         01  DRVR  NONE  51  F OR-Y       000          000            00
                                                                                                                                                                      OR<25

02716  N N N      12/12/2007   16     FREEMAN RD                   INTER        CROSS   N            N  CLR   S-1STOP     01  NONE      STRGHT                                                               07
NO RPT            Wed           0     PINE ST                      E                    STOP SIGN    N  DRY   REAR             PRVTE     S  N                                                 000            00
                  6P                                               09             1                  N  DLIT  INJ             PSNGR CAR         01  DRVR  NONE  17  M OR-Y       026          000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                               PRVTE     S  N                                                 011            00
                                                                                                                              PSNGR CAR         01  DRVR  INJC  61  M OR-Y       000          000            00
                                                                                                                                                                      OR<25
                                                                                                                                                02  PSNG  INJC  00  F            000          000            00

00070  N N N      01/15/2008   19     FREEMAN RD                   INTER        CROSS   N            N  CLD   S-1TURN     01  NONE      STRGHT                                                     099       07
NONE              Tue           0     PINE ST                      E                    STOP SIGN    N  DRY   REAR             PRVTE     S  N                                                 000            00
                  6P                                               09             1                  N  DLIT  PDO             PSNGR CAR         01  DRVR  NONE  64  F OR-Y       026          000            07
                                                                                                                                                                      OR<25

                                                                                                                          02  NONE      STOP
                                                                                                                               PRVTE     S  NE                                                013            00
                                                                                                                              PSNGR CAR         01  DRVR  NONE  44  F OR-Y       000          000 099        00
                                                                                                                                                                      OR<25
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TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E / D R A L U C G H / S W C O R L K	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
01043	N N N	06/12/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	STRGHT										07
NONE		Thu	0	PINE ST	E		STOP SIGN	N	DRY	REAR		PRVTE	S N									000	00
		8A			09	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	39	M	OR-Y		026	038	07
																			OR<25				
											02	NONE	STOP										
												PRVTE	S NE									013	00
												PSNGR CAR		01	DRVR	NONE	55	F	OR-Y		000	000	00
																			OR<25				
01343	N N N	08/20/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	STRGHT										07
NONE		Wed	0	PINE ST	E		STOP SIGN	N	DRY	REAR		PRVTE	S N									000	00
		6P			09	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	27	F	OR-Y		026	038	07
																			OR<25				
														02	PSNG	NO<5	01	M			000	000	00
											02	NONE	STOP										
												PRVTE	S NE									013	00
												PSNGR CAR		01	DRVR	INJC	77	F	OR-Y		000	000	00
																			OR<25				
														02	PSNG	INJC	00	M			000	000	00
01656	N N N	09/19/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLR	S-1TURN	01	NONE	STRGHT										07
NONE		Fri	0	PINE ST	E		STOP SIGN	N	DRY	REAR		PRVTE	S N									000	00
		5P			09	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	29	M	OR-Y		026	000	07
																			OR<25				
											02	NONE	STOP										
												PRVTE	S NE									013	00
												PSNGR CAR		01	DRVR	INJC	43	F	OR-Y		000	000	00
																			OR<25				
00115	N N N	01/09/2007	16	FREEMAN RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE 0	STRGHT										07
NONE		Tue	0	PINE ST	SE		TRF SIGNAL	N	DRY	REAR		UNKN	SE NW									000	00
		8A			06	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	OR-Y		026	000	07
																			UNK				
											02	NONE 0	STOP										
												PRVTE	SE NW									011	00
												PSNGR CAR		01	DRVR	NONE	51	F	OR-Y		000	000	00
																			OR<25				
01485	N N N	07/12/2007	16	FREEMAN RD	INTER	CROSS	N	N	CLR	S-1STOP	01	NONE	STRGHT										07
NONE		Thu	0	PINE ST	SE		TRF SIGNAL	N	DRY	REAR		PRVTE	SE NW									000	00
		8P			06	1		N	DUSK	PDO		PSNGR CAR		01	DRVR	NONE	00	F	UNK		026	000	07
																			UNK				
											02	NONE	STOP										
												PRVTE	SE NW									012	00
												PSNGR CAR		01	DRVR	NONE	50	F	OR-Y		000	000	00
																			OR<25				
01735	N N N N N	10/06/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE 0	TURN-R										07
CITY		Mon	0	PINE ST	SE		STOP SIGN	N	DRY	REAR		PRVTE	SE NE									000	00
		10A			06	0		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	34	F	OR-Y		026	000	07
																			OR<25				

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# INVEST	S P E E / A L / D U G / R C H / S O R / W L K	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	STOP											
												PRVTE	SE NE									013		00
												PSNGR CAR		01	DRVR	INJC	25	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	NO<5	02	M			000	000		00
														03	PSNG	NO<5	04	M			000	000		00
01191	N N N	06/07/2006	16	FREEMAN RD	STRGHT		Y	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NONE		Wed	20	PINE ST	SE	(NONE)	UNKNOWN	N	DRY	REAR		PRVTE	SE NW									000		00
		3P			06			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	00	M	UNK		026	000		07
						(02)													UNK					
											02	NONE 0	STOP											
												PRVTE	SE NW									011		00
												PSNGR CAR		01	DRVR	NONE	38	F	OR-Y		000	000		00
																			OR<25					
02007	N N N	11/13/2008	19	FREEMAN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE 0	STRGHT											07
NO RPT		Thu	0	PINE ST	SW		STOP SIGN	N	DRY	REAR		PRVTE	SW NE									000		00
		11A			09	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	73	F	OR-Y		026	000		07
																			OR<25					
											02	NONE 0	STOP											
												PRVTE	SW E									013		00
												PSNGR CAR		01	DRVR	INJC	19	F	OR-Y		000	000		00
																			OR<25					
														02	PSNG	INJC	42	F			000	000		00
00360	N N N Y Y	02/09/2007	09	FREEMAN RD	INTER	3-LEG	N	N	CLR	S-1STOP	01	NONE	STRGHT											07
		Fri	0	PINE ST	NW		TRF SIGNAL	N	DRY	REAR		PRVTE	NW SE									000		00
		8A			06	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		026	000		07
																			OR<25					
											02	NONE	STOP											
												PRVTE	NW SE									011		00
												PSNGR CAR		01	DRVR	NONE	00	F	UNK		000	000		00
																			OR<25					
00953	N N N	06/02/2008	16	FREEMAN RD	INTER	CROSS	N	N	RAIN	ANGL-OTH	01	NONE	STRGHT											04
NO RPT		Mon	0	PINE ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	NE SW									000		00
		10P			01	0		N	DLIT	PDO		PSNGR CAR		01	DRVR	NONE	60	F	OR-Y		020	000		04
																			OR<25					
											02	NONE	STRGHT											
												PRVTE	SE NW									000		00
												MTRCYCLE		01	DRVR	NONE	25	M	OR-Y		000	000		00
																			OR<25					
02194	N N N	10/16/2006	16	FREEMAN RD	INTER	CROSS	N	N	CLD	ANGL-OTH	01	NONE	STRGHT											04
CITY		Mon	0	PINE ST	CN		TRF SIGNAL	N	WET	ANGL		PRVTE	SW NE									000		00
		10A			02	1		N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	37	F	OR-Y		020	000		04
																			OR<25					

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
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January 1, 2006 through December 31, 2008

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											02	NONE	STRGHT											
												PRVTE	SE NW									000		00
												PSNGR CAR		01	DRVR	INJB	73	F	OR-Y		000	000		00
																			OR<25					
02451	N N N	11/25/2006	16	FREEMAN RD	INTER	CROSS	N	N	CLD	O-1TURN	01	NONE	TURN-L											04,27
CITY		Sat	0	PINE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	NE SE									000		00
		9A			04	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	63	M	OR-Y		000	000		00
																			OR<25					
											02	NONE	STRGHT											
												PRVTE	SW NE									000		00
												PSNGR CAR		01	DRVR	NONE	32	F	OR-Y		020	038		04
																			OR<25					
														02	PSNG	NO<5	04	M			000	000		00
01662	N N N Y N	09/16/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											04
CITY		Tue	0	PINE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW NE									000		00
		11A			04	1		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	20	M	OR-Y		000	000		00
																			OR<25					
											02	NONE	TURN-L											
												PRVTE	NE SE									000		00
												PSNGR CAR		01	DRVR	NONE	85	F	OR-Y		020	000		04
																			OR<25					
01682	N N N Y N	09/20/2008	16	FREEMAN RD	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	STRGHT											02
CITY		Sat	0	PINE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	SW NE									000		00
		11A			04	1		N	DAY	INJ		PSNGR CAR		01	DRVR	INJC	21	F	OR-Y		000	000		00
																			OR<25					
											02	NONE	TURN-L											
												PRVTE	NE SE									000		00
												PSNGR CAR		01	DRVR	INJB	84	F	OR-Y		004,028	000		02
																			OR<25					
01017	N N N	05/15/2006	16	HAMRICK RD	STRGHT		Y	N	CLR	S-1STOP	01	NONE	STRGHT											07
CITY		Mon	50	BIDDLE RD	N	(NONE)	TRF SIGNAL	N	DRY	REAR		PRVTE	N S									000		00
		4P			06			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	27	M	OR-Y		043	000		07
						(04)													OR<25					
											02	NONE	STOP											
												PRVTE	N S									011		00
												PSNGR CAR		01	DRVR	NONE	21	F	OR-Y		000	000		00
																			OR<25					
02653	N N N	12/26/2006	16	HAMRICK RD	ALLEY		N	Y	CLD	PRKD MV	01	NONE	TURN-L											08
NO RPT		Tue	60	BIDDLE RD	S	(NONE)	UNKNOWN	N	WET	TURN		PRVTE	E S									018		00
		8P			06			N	DARK	PDO		PSNGR CAR		01	DRVR	NONE	18	M	OR-Y		002	000		08
						(02)													OR<25					
											02	NONE	PRKD-P											
												PRVTE	S N									008		00
												PSNGR CAR												

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January 1, 2006 through December 31, 2008

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00752	N N N	04/11/2006	16	HAMRICK RD	STRGHT		Y	N	UNK	S-1STOP	01	NONE	0	STRGHT											07
NO RPT		Tue	150	BIDDLE RD	S	(NONE)	UNKNOWN	N	UNK	REAR		PRVTE		S N									000		00
		3P			08			N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	42	F	OR-Y		026	000		07
						(02)														OR<25					
											02	UNKN	9	STOP											
												UNKN		S N									011		00
												UNKNOWN			01	DRVR	NONE	00	M	OR-Y		000	000		00
																				UNK					
01950	N N N	09/19/2006	16	HAMRICK RD	INTER	CROSS	N	N	CLR	O-1STOP	01	NONE		BACK											10
NO RPT		Tue	0	PINE ST	N		TRF SIGNAL	N	DRY	BACK		PRVTE		S N									000		00
		1P			06	0		N	DAY	PDO		PSNGR CAR			01	DRVR	NONE	59	F	OR-Y		011	000		10
																				OR<25					
											02	NONE		STOP											
												PRVTE		N S									011		00
												PSNGR CAR			01	DRVR	NONE	73	M	OR-Y		000	000		00
																				OR>25					
02021	N N N N N	11/13/2008	16	HAMRICK RD	INTER	CROSS	N	N	CLD	S-1STOP	01	NONE	0	STRGHT											07
STATE		Thu	0	PINE ST	E		TRF SIGNAL	N	DRY	REAR		PRVTE		E W									000		00
		4P			06	0		N	DUSK	PDO		PSNGR CAR			01	DRVR	NONE	60	F	OR-Y		043,026	000		07
																				OR<25					
											02	NONE	0	STOP											
												PRVTE		E W									011		00
												PSNGR CAR			01	DRVR	NONE	17	M	OR-Y		000	000		00
																				OR<25					
02202	N N N	10/17/2006	16	HAMRICK RD	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE		STRGHT											02,04,27
CITY		Tue	0	PINE ST	CN		L-GRN-SIG	N	DRY	TURN		PRVTE		E W									000		00
		6P			02	0		N	DUSK	INJ		PSNGR CAR			01	DRVR	NONE	49	M	OR-Y		000	000		00
																				OR<25					
											02	NONE		TURN-L											
												PRVTE		W N									000		00
												PSNGR CAR			01	DRVR	INJB	29	M	OR-Y		004,020,028	038		02,04
																				OR<25					
															02	PSNG	INJB	17	M			000	000		00
00324	N N N	02/14/2007	16	HAMRICK RD	INTER	CROSS	N	N	RAIN	O-1TURN	01	NONE	0	TURN-L											02
NO RPT		Wed	0	PINE ST	CN		TRF SIGNAL	N	WET	TURN		PRVTE		W N									000		00
		6P			02	0		N	DLIT	INJ		PSNGR CAR			01	DRVR	NONE	17	F	OR-Y		004,028	000		02
																				OR<25					
															02	PSNG	NO<5	01	M			000	000		00
											02	NONE	0	STRGHT											
												PRVTE		E W									000		00
												PSNGR CAR			01	DRVR	INJB	23	F	OR-Y		000	000		00
																				OR<25					
01701	N N N N N	08/23/2007	16	HAMRICK RD	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE		STRGHT											04
CITY		Thu	0	PINE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE		E W									000		00
		7P			02	0		N	DAY	INJ		PSNGR CAR			01	DRVR	INJB	31	F	OR-Y		000	000		00
																				OR<25					

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
URBAN NON-SYSTEM CRASH LISTING

CITY OF CENTRAL POINT, JACKSON COUNTY

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SER# / INVEST	S P E E / A L C / D R U G / S C H L / W O R K	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	PSNG	INJB	07	M			000	000		00
											02	NONE	TURN-L											
												PRVTE	W N									000		00
												PSNGR CAR		01	DRVR	INJB	64	M	OR-Y		020	000		04
																			OR<25					
01258	N N N N N	07/27/2008	16	HAMRICK RD	INTER	CROSS	N	N	CLR	O-1TURN	01	NONE	TURN-L										013	02
CITY		Sun	0	PINE ST	CN		TRF SIGNAL	N	DRY	TURN		PRVTE	W N									000		00
		3P			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	30	M	OR-Y		004,028	000		02
																			OR<25					
											02	NONE	STRGHT											
												PRVTE	E W									000	013	00
												PSNGR CAR		01	DRVR	NONE	62	F	OR-Y		000	000		00
																			OR<25					
											03	NONE	STOP											
												PRVTE	N S									011		00
												PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
																			OR<25					
02054	N N N	11/07/2008	17	HAMRICK RD	INTER	3-LEG	N	N	CLR	O-1TURN	01	NONE 0	TURN-L											02
NO RPT		Fri	0	PINE ST	CN		FLASHBCN-A	N	DRY	TURN		PRVTE	W N									000		00
		9A			02	0		N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	19	M	OR-Y		004,028	000		02
																			OR<25					
											02	NONE 0	STRGHT											
												PRVTE	E W									000		00
												PSNGR CAR		01	DRVR	NONE	45	F	OR-Y		000	000		00
																			OR<25					
01928	N N N	09/18/2006	16	PINE ST	STRGHT		N	N	CLR	S-1STOP	01	NONE	STRGHT											07,27
COUNTY		Mon	50	HAMRICK RD	W	(NONE)	L-TURN REF	N	DRY	REAR		PRVTE	W E									000		00
		1P			06			N	DAY	INJ		PSNGR CAR		01	DRVR	NONE	57	M	OR-Y		043	038		07
						(03)													OR<25					
											02	NONE	STOP											
												PRVTE	W E									011		00
												PSNGR CAR		01	DRVR	INJB	47	M	OR-Y		000	000		00
																			OR<25					
01148	N N N	05/26/2006	16	PINE ST	ALLEY		N	N	RAIN	ANGL-OTH	01	NONE	STRGHT											02
CITY		Fri	100	HAMRICK RD	W	(NONE)	UNKNOWN	N	WET	TURN		PRVTE	W E									088		00
		10A			08			N	DAY	PDO		PSNGR CAR		01	DRVR	NONE	61	M	OR-Y		000	000		00
						(04)													OR>25					
											02	NONE	TURN-L											
												PRVTE	S W									018		00
												PSNGR CAR		01	DRVR	NONE	33	F	OR-Y		028	000		02
																			OR<25					
														02	PSNG	NO<5	01	F			000	000		00

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

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

095	BUS STPSGN	BUS STOP SIGN AND RED LIGHTS
099	UNKNOWN	UNKNOWN OR NOT DEFINITE

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

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
STATE HIGHWAY SYSTEM CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	COMPNT	MLG TYP	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOT VEH	VEHICLE TYP/OWN #1	#2	KILL	INJ	ALC	SPEED
00257	02/01/2006	8A	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.21	NCOL		01,24	083,047	WET	1	041		0	0	N	Y
00521	03/28/2006	2P	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	REAR		07	043	DRY	2	011	011	0	2	N	N
02611	11/02/2006	4P	TH	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	REAR		07,22	043	WET	2	011	011	0	0	N	N
01186	06/04/2007	11A	MO	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	TURN		08	002	DRY	2	041	011	0	0	N	N
01021	06/28/2008	11P	SA	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	ANGL		02	028	DRY	2	011	011	0	0	N	N
02070	11/29/2008	9P	SA	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	REAR		13	045,080	DRY	2	011	011	0	2	N	N
00375	02/22/2008	7P	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	TURN		02	004,028	DRY	2	011	011	0	1	N	N
01869	10/24/2008	9A	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	TURN		04	020	DRY	2	011	011	0	0	N	N
02071	11/30/2008	10A	SU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.63	TURN	043	08	006	WET	2	011	011	0	1	N	N
00466	02/27/2007	4P	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.65	REAR		07,22	026	WET	2	011	011	0	1	N	N
00735	04/03/2007	9A	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.69	REAR		07	014,026	DRY	2	011	011	0	0	N	N
80283	03/08/2007	3P	TH	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.70	BACK		10	011	DRY	2	011	011	0	4	N	N
00492	03/07/2007	11A	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.70	REAR		07	026	DRY	2	011	011	0	1	N	N
01350	07/09/2007	4P	MO	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.70	REAR		07,27	026	DRY	2	011	011	0	1	N	N
01225	06/14/2007	2P	TH	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.71	SS-O		13	045	DRY	2	011	011	0	0	N	N
00052	01/02/2006	12P	MO	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.81	REAR	013	10	026,052	WET	3	011	011	0	1	N	N
01931	09/05/2007	12P	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.81	REAR	013	07	026	DRY	3	011	011	0	1	N	N
02164	10/12/2007	2P	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.84	FIX	040,053,058	10	080,081	DRY	1	011		0	2	N	N
00769	04/17/2007	12P	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.85	REAR		07,27	026	WET	2	011	011	0	0	N	N
00128	01/25/2006	2P	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	REAR	013	07	026	DRY	3	011	011	0	1	N	N
00626	03/18/2006	10A	SA	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	REAR		07	043	DRY	2	011	011	0	0	N	N
02076	09/10/2006	8P	SU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	TURN		04	020	DRY	2	011	011	0	0	N	N
02400	11/08/2006	11P	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	TURN		04	020	WET	2	011	011	0	0	N	N
02414	11/21/2006	5P	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	TURN	013	04	020	WET	3	011	011	0	1	N	N
00381	02/24/2008	4P	SU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	REAR		32	026,052	WET	2	011	011	0	1	N	N
00445	03/22/2008	12P	SA	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	TURN		04	020	DRY	2	011	011	0	0	N	N
01879	10/22/2008	7P	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.87	TURN		08	007	DRY	2	011	011	0	0	N	N
01380	07/17/2007	9P	TU	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.89	REAR		07	043	WET	2	011	011	0	2	N	N
01396	07/20/2007	4P	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.89	TURN		02,08	004,028	DRY	2	011	011	0	2	N	N
01678	08/04/2006	1P	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.90	REAR		07,32	052,043	DRY	2	041	011	0	1	N	N
01398	06/29/2007	8A	FR	*Jackson	CN	R	HY 001, PACIFIC AT MP 32.91	TURN	093	04,27	016,020	DRY	2	011	011	0	0	N	N
00654	03/26/2007	2P	MO	*Jackson	CN	R	HY 001, PACIFIC AT MP 33.24	BACK		10	011	DRY	2	011	011	0	0	N	N
02177	10/18/2006	5P	WE	*Jackson	CN	R	HY 001, PACIFIC AT MP 33.24	REAR	013	01,22	047	DRY	3	051	041	0	2	N	Y

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
COUNTY ROAD CRASH LOCATIONS - DRIVER BEHAVIOR FORMAT

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOT VEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPEED
02191	10/16/2006	6P	MO	*Jackson	RD #00724 AT MP 0.92	TURN	082	02	028	WET	2	011	011	0	2	N	N
02565	11/17/2006	5P	FR	*Jackson	RD #00724 AT MP 0.94	REAR		07,32	043,052	DRY	2	011	011	0	0	N	N
00720	04/04/2006	11A	TU	*Jackson	RD #00724 AT MP 0.94	TURN		02	028	DRY	2	011	011	0	0	N	N
01559	07/21/2006	11A	FR	*Jackson	RD #00724 AT MP 0.94	TURN		02	004,028	DRY	2	011	011	0	0	N	N
01545	07/20/2006	5P	TH	*Jackson	RD #00724 AT MP 0.95	REAR		07,13	045,026	DRY	2	011	011	0	0	N	N
02521	11/30/2006	5P	TH	*Jackson	RD #00724 AT MP 0.99	REAR		07	014,026	DRY	2	011	011	0	1	N	N
00693	03/30/2006	12P	TH	*Jackson	RD #00724 AT MP 1.00	TURN		02,10	044,028	DRY	2	011	011	0	0	N	N
01855	08/16/2006	5P	WE	*Jackson	RD #00724 AT MP 1.80	BACK		10	011	DRY	2	051	011	0	0	N	N
00203	01/27/2006	5P	FR	*Jackson	RD #00724 AT MP 1.80	TURN		04,08	004,020	WET	2	011	011	0	4	N	N
00832	04/08/2006	12P	SA	*Jackson	RD #00724 AT MP 1.80	TURN		04	020	DRY	2	011	011	0	2	N	N
01609	07/29/2006	12P	SA	*Jackson	RD #00724 AT MP 1.80	TURN	093	02,27	004,028	DRY	2	011	011	0	4	N	N
01785	08/30/2006	9A	WE	*Jackson	RD #00724 AT MP 1.80	TURN		04	020,004	DRY	2	011	011	0	1	N	N
02499	11/14/2006	6P	TU	*Jackson	RD #00724 AT MP 1.80	TURN		04	020	WET	2	011	011	0	0	N	N
01755	10/16/2008	8A	TH	*Jackson	RD #00724 AT MP 0.94	ANGL	013	04	020	DRY	3	011	011	0	1	N	N
00663	03/29/2007	4P	TH	*Jackson	RD #00724 AT MP 0.94	REAR	013	07	043	DRY	3	011	011	0	1	N	N
00905	05/03/2007	4P	TH	*Jackson	RD #00724 AT MP 0.94	REAR		07	026	DRY	2	011	011	0	0	N	N
00788	04/24/2007	4P	TU	*Jackson	RD #00724 AT MP 0.94	TURN		04	020,004	DRY	2	091	011	0	1	N	N
00946	05/14/2007	8A	MO	*Jackson	RD #00724 AT MP 0.94	TURN		08	002,082	DRY	2	041	011	0	0	N	N
00650	04/12/2008	1P	SA	*Jackson	RD #00724 AT MP 0.94	TURN		02	004,028	DRY	2	011	011	0	5	N	N
00027	01/05/2007	5P	FR	*Jackson	RD #00724 AT MP 0.95	REAR	013	07	043	WET	4	011	011	0	2	N	N
02267	11/25/2007	7A	SU	*Jackson	RD #00724 AT MP 0.96	PED		02	029	DRY	1	011		0	1	N	N
00813	05/08/2008	3P	TH	*Jackson	RD #00724 AT MP 0.96	REAR	013,093	27,32	016,052	DRY	4	011	011	0	4	N	N
01224	06/14/2007	5P	TH	*Jackson	RD #00724 AT MP 0.98	REAR	013	07	026	DRY	3	011	011	0	2	N	N
02104	11/21/2008	2P	FR	*Jackson	RD #00724 AT MP 1.40	REAR	040	10	026	DRY	2	011	011	0	1	N	N
00812	05/06/2008	9P	TU	*Jackson	RD #00724 AT MP 1.80	ANGL		04	020	DRY	2	011	041	0	2	N	N
01270	07/26/2008	9A	SA	*Jackson	RD #00724 AT MP 1.80	ANGL	082	04	020	DRY	2	011	051	0	1	N	N
01052	06/13/2008	3P	FR	*Jackson	RD #00724 AT MP 1.80	REAR		07	026	DRY	2	011	011	0	0	N	N
01280	07/30/2008	10A	WE	*Jackson	RD #00724 AT MP 1.80	TURN		08	004	DRY	2	011	011	0	0	N	N
01358	08/20/2008	6P	WE	*Jackson	RD #00724 AT MP 1.80	TURN		02	004,028	DRY	2	011	011	0	3	N	N
01437	08/25/2008	3P	MO	*Jackson	RD #00724 AT MP 1.80	TURN		02	004,028	DRY	2	011	011	0	0	N	N
01639	09/23/2008	3P	TU	*Jackson	RD #00724 AT MP 1.80	TURN		02	004,028	DRY	2	011	011	0	1	N	N
01642	09/24/2008	5A	WE	*Jackson	RD #00724 AT MP 1.80	TURN		02	004,028	DRY	2	011	011	0	0	N	N
01933	09/05/2007	2P	WE	*Jackson	RD #01036 AT MP 0.00	BACK		10	011	DRY	2	041	011	0	0	N	N
01354	06/19/2006	1P	MO	*Jackson	RD #01036 AT MP 0.02	TURN		02	008,028	DRY	2	011	011	0	0	N	N
00835	04/08/2006	2P	SA	*Jackson	RD #00778 AT MP 2.25	REAR		01,07	047,026	DRY	2	011	011	0	0	N	Y
00660	04/15/2008	4P	TU	*Jackson	RD #00778 AT MP 2.28	SS-O		13	045	DRY	2	011	011	0	1	N	N
00139	01/08/2008	4P	TU	*Jackson	RD #00778 AT MP 2.30	REAR		07	026	WET	2	011	011	0	0	N	N
00095	01/22/2008	UNK	TU	*Jackson	RD #00778 AT MP 2.31	ANGL		01	047,001	ICE	2	011	011	0	0	N	Y

TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

JACKSON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOT VEH	VEHICLE TYP/OWN #1	#2	PEOPLE KILL	INJ	ALC	SPEED
00324	02/08/2008	11A	FR	Central Point	6TH ST 200 FT SE OF E PINE ST	FIX	045	33	001,051	DRY	2	011	011	0	1	N	N
00422	02/21/2007	2P	WE	Central Point	BIDDLE RD AT HAMRICK RD	TURN		02	004,028	WET	2	011	011	0	3	N	N
02460	11/16/2007	12P	FR	Central Point	BIDDLE RD AT HAMRICK RD	TURN		04	020	DRY	2	011	011	0	1	N	N
02253	11/22/2007	5P	TH	Central Point	BIDDLE RD AT HAMRICK RD	TURN		04	020	DRY	2	011	011	0	2	N	N
02729	12/13/2007	7P	TH	Central Point	E PINE ST AT 10TH ST	BACK		10	011	DRY	2	011	011	0	0	N	N
00756	04/12/2006	3P	WE	Central Point	E PINE ST AT 10TH ST	REAR		10	014,026	DRY	2	011	011	0	1	N	N
90057	01/13/2007	7P	SA	Central Point	E PINE ST AT 10TH ST	REAR	012	10	014,026	DRY	2	011	049	0	0	N	N
02456	11/19/2007	1P	MO	Central Point	E PINE ST AT 10TH ST	REAR		07	019,043	WET	2	011	011	0	0	N	N
01202	07/21/2008	2P	MO	Central Point	E PINE ST 200 FT NE OF 10TH ST	TURN		02	028	DRY	2	011	011	0	0	N	N
02079	10/28/2007	7A	SU	Central Point	E PINE ST AT 10TH ST	NCOL	001	10	080	WET	1	091		0	1	N	N
02061	09/07/2006	4P	TH	Central Point	E PINE ST AT 6TH ST	REAR		07,32	026,052	DRY	2	011	011	0	2	N	N
00485	03/09/2007	8A	FR	Central Point	E PINE ST AT 6TH ST	REAR	013	07	043	WET	3	011	011	0	1	N	N
01016	05/22/2007	3P	TU	Central Point	E PINE ST AT 6TH ST	REAR	013	07	045,043	DRY	3	011	011	0	1	N	N
01281	07/30/2008	3P	WE	Central Point	E PINE ST AT 6TH ST	REAR		07	014,026	DRY	2	011	011	0	0	N	N
01478	07/11/2007	5P	WE	Central Point	E PINE ST AT 7TH ST	REAR	013,002	07,27	016,043	DRY	3	011	011	0	2	N	N
90324	02/08/2008	11A	FR	Central Point	E PINE ST 20 FT NE OF 7TH ST	TURN		08,33	001,051	DRY	2	011	011	0	1	N	N
00501	03/09/2007	8A	FR	Central Point	E PINE ST 50 FT NE OF 8TH ST	REAR		01,07	042	ICE	2	011	011	0	0	N	Y
02290	12/01/2008	12P	MO	Central Point	E PINE ST AT 9TH ST	ANGL		02	028	WET	2	011	011	0	0	N	N
00025	01/10/2006	7A	TU	Central Point	E PINE ST 100 FT SW OF 9TH ST	REAR		07	043,041	WET	2	011	011	0	0	N	N
02730	12/13/2007	5P	TH	Central Point	E PINE ST AT 9TH ST	TURN		02	028	DRY	2	011	011	0	0	N	N
01665	09/16/2008	8A	TU	Central Point	E PINE ST 30 FT SW OF 9TH ST	FIX	040,010	10	080,081	DRY	2	011	011	0	1	N	N
02194	10/16/2006	10A	MO	Central Point	FREEMAN RD AT PINE ST	ANGL		04	020	WET	2	011	011	0	1	N	N
00953	06/02/2008	10P	MO	Central Point	FREEMAN RD AT PINE ST	ANGL		04	020	WET	2	011	091	0	0	N	N
00779	04/18/2006	10A	TU	Central Point	FREEMAN RD AT PINE ST	REAR		07	014,026	DRY	2	011	011	0	1	N	N
01005	05/12/2006	3P	FR	Central Point	FREEMAN RD AT PINE ST	REAR		10	026	DRY	2	011	011	0	0	N	N
01169	05/31/2006	4P	WE	Central Point	FREEMAN RD AT PINE ST	REAR		07,27	026	DRY	2	011	011	0	0	N	N
01191	06/07/2006	3P	WE	Central Point	FREEMAN RD 20 FT SE OF PINE ST	REAR		07	026	DRY	2	011	011	0	0	N	N
00115	01/09/2007	8A	TU	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	019	011	0	0	N	N
00360	02/09/2007	8A	FR	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	0	N	N
00522	03/13/2007	8A	TU	Central Point	FREEMAN RD AT PINE ST	REAR		07,27	016,026	DRY	2	011	011	0	1	N	N
00765	04/16/2007	8A	MO	Central Point	FREEMAN RD AT PINE ST	REAR		07,27	026	DRY	2	011	011	0	5	N	N
00917	05/11/2007	9A	FR	Central Point	FREEMAN RD AT PINE ST	REAR		07	043	DRY	2	011	011	0	0	N	N
01485	07/12/2007	8P	TH	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	0	N	N
01533	07/31/2007	1P	TU	Central Point	FREEMAN RD AT PINE ST	REAR		07	043	DRY	2	011	011	0	0	N	N
02716	12/12/2007	6P	WE	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	2	N	N
00070	01/15/2008	6P	TU	Central Point	FREEMAN RD AT PINE ST	REAR	099	07	026	DRY	2	011	011	0	0	N	N
01043	06/12/2008	8A	TH	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	0	N	N
01343	08/20/2008	6P	WE	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	2	N	N
01656	09/19/2008	5P	FR	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	1	N	N
01735	10/06/2008	10A	MO	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	1	N	N
02007	11/13/2008	11A	TH	Central Point	FREEMAN RD AT PINE ST	REAR		07	026	DRY	2	011	011	0	2	N	N
02451	11/25/2006	9A	SA	Central Point	FREEMAN RD AT PINE ST	TURN		04,27	020	DRY	2	011	011	0	0	N	N
00402	01/23/2007	1P	TU	Central Point	FREEMAN RD AT PINE ST	TURN		07	026	DRY	2	011	011	0	1	N	N
01662	09/16/2008	11A	TU	Central Point	FREEMAN RD AT PINE ST	TURN		04	020	DRY	2	011	011	0	0	N	N
01682	09/20/2008	11A	SA	Central Point	FREEMAN RD AT PINE ST	TURN		02	004,028	DRY	2	011	011	0	2	N	N
00752	04/11/2006	3P	TU	Central Point	HAMRICK RD 150 FT S OF BIDDLE RD	REAR		07	026	UNK	2	011	999	0	0	N	N
01017	05/15/2006	4P	MO	Central Point	HAMRICK RD 50 FT N OF BIDDLE RD	REAR		07	043	DRY	2	011	011	0	0	N	N
02653	12/26/2006	8P	TU	Central Point	HAMRICK RD 60 FT S OF BIDDLE RD	TURN		08	002	WET	2	011	011	0	0	N	N
01950	09/19/2006	1P	TU	Central Point	HAMRICK RD AT PINE ST	BACK		10	011	DRY	2	011	011	0	0	N	N
02021	11/13/2008	4P	TH	Central Point	HAMRICK RD AT PINE ST	REAR		07	043,026	DRY	2	011	011	0	0	N	N
02202	10/17/2006	6P	TU	Central Point	HAMRICK RD AT PINE ST	TURN		02,04,27	004,020,028	DRY	2	011	011	0	2	N	N

OREGON DEPARTMENT OF TRANSPORTATION - TRANSPORTATION DEVELOPMENT DIVISION
TRANSPORTATION DATA SECTION - CRASH ANALYSIS AND REPORTING UNIT
CITY STREET LOCATIONS BY COUNTY - DRIVER BEHAVIOR FORMAT

Pine Street / Biddle Road from 6th Street to Table Rock Road plus 265 feet
January 1, 2006 through December 31, 2008

JACKSON COUNTY

SERIAL NO	DATE	TIME	DAY	*COUNTY OR CITY NAME	CRASH LOCATION	COLL TYPE	EVENT	CAUSE	ERROR	SURF	TOT VEH	VEHICLE TYP/OWN #1	VEHICLE TYP/OWN #2	PEOPLE KILL	PEOPLE INJ	ALC	SPEED
00324	02/14/2007	6P	WE	Central Point	HAMRICK RD AT PINE ST	TURN		02	004,028	WET	2	011	011	0	1	N	N
01701	08/23/2007	7P	TH	Central Point	HAMRICK RD AT PINE ST	TURN		04	020	DRY	2	011	011	0	3	N	N
01258	07/27/2008	3P	SU	Central Point	HAMRICK RD AT PINE ST	TURN	013	02	004,028	DRY	3	011	011	0	0	N	N
02054	11/07/2008	9A	FR	Central Point	HAMRICK RD AT PINE ST	TURN		02	004,028	DRY	2	011	011	0	0	N	N
01928	09/18/2006	1P	MO	Central Point	PINE ST 50 FT W OF HAMRICK RD	REAR		07,27	043	DRY	2	011	011	0	1	N	N
01148	05/26/2006	10A	FR	Central Point	PINE ST 100 FT W OF HAMRICK RD	TURN		02	028	WET	2	011	011	0	0	N	N

VEHICLE OWNERSHIP CODES

Code	Short Description	Long Description
1	PRVTE	Private
2	GOVMT	Government
3	PUBLC	Public
4	RENTL	Rental vehicle
5	STOLN	Stolen vehicle
9	UNKN	Unknown ownership

VEHICLE TYPE CODES

Code	Short Description	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

CAUSE CODES

Code	Short Description	Medium Description	Long Description
00	NO CODE	NO CODE APPLICABLE	No cause associated at this level
01	TOO-FAST	TOO FAST FOR COND	Too fast for conditions (not exceed posted speed)
02	NO-YIELD	FAILED YIELD ROW	Did not yield right-of-way
03	PAS-STOP	PASSED STOP SIGN	Passed stop sign or red flasher
04	DIS--RAG	DISREGARD R-A-G	Disregarded R-A-G traffic signal.
05	LEFT-CTR	DROVE WRONG SIDE	Drove left of center on two-way road
06	IMP-OVER	IMPROPER PASSING	Improper overtaking
07	TOO-CLOS	FOLLOW TOO CLOSE	Followed too closely
08	IMP-TURN	IMPROPER TURN	Made improper turn
09	DRINKING	ALC OR DRUGS	Alcohol or Drug Involved
10	OTHR-IMP	OTHER DRIVE ERR	Other improper driving
11	MECH-DEF	MECH DEFECT	Mechanical defect
12	OTHER	OTHER	Other (not improper driving)
13	IMP LN C	IMP LANE CHANGE	Improper change of traffic lanes
14	DIS TCD	DISRG OTHR TCD	Disregarded other traffic control device
15	WRNG WAY	WRONG WAY/1 WAY	Wrong way on one-way roadway
16	FATIGUE	DRIVER FATIGUED	Driver drowsy/fatigued/sleepy
18	IN RDWY	ILLEGALLY IN RDWY	Non-motorist illegally in roadway
19	NT VISBL	NOT VISIBLE	Non-motorist clothing not visible
20	IMP PKNG	IMPROPER PARKING	Vehicle improperly parked
21	DEF STER	DEFECTIVE STEERING	Defective steering mechanism
22	DEF BRKE	DEFECTIVE BRAKES	Inadequate or no brakes
24	LOADSHFT	LOAD SHIFTED	Vehicle lost load or load shifted
25	TIREFAIL	TIRE FAILURE	Tire Failure
26	PHANTOM	PHANTOM VEHICLE	Phantom / Non-contact Vehicle
27	INATTENT	INATTENTION	Inattention
30	SPEED	EXCED POSTED SPEED	Driving in excess of posted speed
31	RACING	SPEED RACING	Speed Racing (per PAR)
32	CARELESS	CARELESS DRIVING	Careless Driving (citation issued)
33	RECKLESS	RECKLESS DRIVING	Reckless Driving (citation issued)
34	AGGRESV	AGGRESSIVE DRIVING	Aggressive Driving (per PAR)
35	RD RAGE	ROAD RAGE	Road Rage (per PAR)

ERR CODES

Code	Short Description	Medium Description	Long Description
000	NONE	NO ERROR	No error
001	WIDE TRN	WIDE TURN	Wide turn
002	CUT CORN	CUT CORNER	Cut corner on turn
003	FAIL TRN	F OBEY TRN	Failed to obey mandatory traffic turn signal, sign or lane markings
004	L IN TRF	LTRN FNT TRAF	Left turn in front of oncoming traffic
005	L PROHIB	LTRN PROHIB	Left turn where prohibited
006	FRM WRNG	T FRM WRNG LN	Turned from wrong lane
007	TO WRONG	T TO WRONG LN	Turned into wrong lane
008	ILLEG U	ILLEG U-TURN	U-turned illegally
009	IMP STOP	IMP STOP	Improperly stopped in traffic lane
010	IMP SIG	IMP/FAIL SIG	Improper signal or failure to signal
011	IMP BACK	IMP BACKING	Backing improperly (Not parking)
012	IMP PARK	IMP PARKED	Improperly parked
013	UNPARK	IMP STRT PARK	Improper start leaving parked position
014	IMP STRT	IMP STRT STOP	Improper start from stopped position
015	IMP LGHT	IMP/NO LIGHTS	Improper or no lights (vehicle in traffic)
016	INATTENT	INATTENTION	Failed to dim lights (until 4/1/97) / Inattention (after 4/1/97)
017	UNSF VEH	DR UNSAFE VEH	Driving unsafe vehicle (no other error apparent)
018	OTH PARK	PRK MAN N/CLR	Entering, exiting parked position with insufficient clearance or other improper parking maneuver
019	DIS DRIV	DISRG DR SIG	Disregarded other driver's signal
020	DIS SGNL	DISRG TRF SIG	Disregarded traffic signal
021	RAN STOP	DISRG STP SGN	Disregarded stop sign or flashing red
022	DIS SIGN	DISRG WRN SGN	Disregarded warning sign, flares or flashing amber
023	DIS OFCR	DISRG POL/FLG	Disregarded police officer or flagman
024	DIS EMER	DISRG SIR/EMR	Disregarded siren or warning of emergency vehicle
025	DIS RR	DISRG RR SIG	Disregarded RR signal, RR sign, or RR flagman
026	REAR-END	F AVOID STP V	Failed to avoid stopped or parked vehicle ahead other than school bus
027	BIKE ROW	F/YLD ROW BIK	Did not have right-of-way over pedalcyclist
028	NO ROW	NO R-O-W	Did not have right-of-way
029	PED ROW	F/YLD ROW PED	Failed to yield right-of-way to pedestrian
030	PAS CURV	PASS ON CURVE	Passing on a curve
031	PAS WRNG	PASS WRNG SID	Passing on the wrong side
032	PAS TANG	PASS TANGENT	Passing on straight road under unsafe conditions
033	PAS X-WK	PASS STP4PED	Passed vehicle stopped at crosswalk for pedestrian
034	PAS INTR	PASS AT INTER	Passing at intersection
035	PAS HILL	PASS ON HILL	Passing on crest of hill
036	N/PAS ZN	PASS N/PASSNG	Passing in "No Passing" zone
037	PAS TRAF	PASS ONC TRAF	Passing in front of oncoming traffic
038	CUT-IN	CUTTING IN	Cutting in (two lanes - two way only)
039	WRNGSIDE	DR WRONG SIDE	Driving on wrong side of the road
040	THRU MED	DR THRU MEDN	Driving through safety zone or over island
041	F/ST BUS	F/STP SCHLBUS	Failed to stop for school bus
042	F/SLO MV	F/SLO SLO VEH	Failed to decrease speed for slower moving vehicle
043	TO CLOSE	FOLLW TO CLOS	Following too closely (Must be on Officer's Report)
044	STRDL LN	STRD/DR WRNG	Straddling or driving on wrong lanes
045	IMP CHG	IMP LANE CHG	Improper change of traffic lanes

Code	Short Description	Medium Description	Long Description
046	WRNG WAY	WRNG WY/1 WAY	Wrong way on one-way roadway (Vehicle is deliberately traveling on wrong side)
047	BASCRULE	V BASIC RULE	Driving too fast for conditions (Not exceeding posted speed)
048	OPN DOOR	OPN DOOR TRAF	Opened door into adjacent traffic lane
049	IMPEDING	IMPEDING TRAF	Impeding Traffic
050	SPEED	SPEED	Driving in excess of posted speed
051	RECKLESS	RECKLSS DRVNG	Reckless driving (per PAR)
052	CARELESS	CARELSS DRVNG	Careless driving (per PAR)
053	RACING	RACING	Speed Racing (per PAR)
054	X N/SGNL	X-INT NO SGNL	Crossing at intersection – no traffic signal present
055	X W/SGNL	X-INT W/ SGNL	Crossing at intersection – traffic signal present
056	DIAGONAL	X-INT DIAGNL	Crossing at intersection - diagonally
057	BTWN INT	X-BTWN INTER	Crossing between intersections
059	W/TRAF-S	W SHLD W/TRAF	Walking, running, riding, etc., on shoulder WITH traffic
060	A/TRAF-S	W SHLD A/TRAF	Walking, running, riding, etc., on shoulder FACING traffic
061	W/TRAF-P	W PAVE W/TRAF	Walking, running, riding, etc., on pavement WITH traffic
062	A/TRAF-P	W PAVE A/TRAF	Walking, running, riding, etc., on pavement FACING traffic
063	PLAYINRD	PLAY IN RDWY	Playing in street or road
064	PUSH MV	PUSH MV IN RD	Pushing or working on vehicle in road or on shoulder
065	WK IN RD	WORK IN RD	Working in roadway or along shoulder
070	LAYON RD	LYING IN RD	Standing or lying in roadway
073	DIS POL	DISRG POL/FLG	Disregarding Police (eluding)
080	FAIL LN	F MAINT LANE	Failed to maintain lane
081	OFF RD	RAN OFF RD	Ran off road
082	NO CLEAR	MISJUDGE CLR	Driver misjudged clearance
083	OVRSTEER	OVERSTEER	Over Correcting
084	NOT USED	NOT USED	Code not in use
085	OVRLOAD	OVERLOAD	Overloading or improper loading of vehicle with cargo or passengers
097	UNA DIS TC	UNA DISRG TCD	Unable to determine which driver disregarded traffic control device

EVENT CODES

Code	Short Description	Medium Description	Long Description
001	FEL/JUMP	FELL/JUMPED MV	Occupant fell, jumped or was ejected from moving vehicle
002	INTERFER	PSNGR INTERFERED	Passenger interfered with driver
003	BUG INTF	ANML INTERFERED	Animal or insect in vehicle interfered with driver
004	PED INV	PED INVOLVED	Pedestrian involved (Non-pedestrian accident)
005	SUB-PED	SUBSEQUENT PED	“Sub-Ped”: pedestrian injured subsequent to collision, etc.
006	BIKE INV	PEDALCYCLE INV	Tricycle-Bicycle involved
007	HITCHIKR	HITCHHIKER	Hitchhiker (soliciting a ride)
008	PSNGR TOW	PSNGR TOWED	Passenger being towed or pushed on conveyance
009	ON/OFF V	ON/OFF STOP VEH	Getting on or off stopped or parked vehicle (occupants only)
010	SUB OTRN	SUBSEQ OVERTURN	Overturned after first harmful event
011	MV PUSHD	VEH BEING PUSHED	Vehicle being pushed
012	MV TOWED	VEH TOWED/TOWING	Vehicle towed or had been towing another vehicle
013	FORCED	FORCED BY IMPACT	Vehicle forced by impact into another vehicle, pedalcyclist or pedestrian
014	SET MOTN	MV SET IN MOTION	Vehicle set in motion by non-driver (child released brakes, etc.)
015	RR ROW	RAILROAD ROW	At or on railroad right-of-way (not Light Rail)
016	LT RL ROW	LIGHT RAIL ROW	At or on Light-Rail right-of-way
017	RR HIT V	TRAIN HIT VEH	Train struck vehicle
018	V HIT RR	VEH HIT TRAIN	Vehicle struck train
019	HIT RR CAR	VEH HIT RR CAR	Vehicle struck railroad car on roadway
020	JACKNIFE	JACKKNIFE	Jackknife; trailer or towed vehicle struck towing vehicle
021	TRL OTRN	TRAILER O’TURN	Trailer or towed vehicle overturned
022	CN BROKE	TRLR CONN BROKE	Trailer connection broke
023	DETACH TRL	DETCHD TRLR STRKNG	Detached trailing object struck other vehicle, non-motorist, or object
024	V DOOR OPN	V DOOR OPN IN TRAF	Vehicle door opened into adjacent traffic lane
025	WHEELOFF	WHEEL CAME OFF	Wheel came off
026	HOOD UP	HOOD FLEW UP	Hood flew up
028	LOAD SHIFT	LOAD SHIFTED	Lost load, load moved or shifted
029	TIREFAIL	TIRE FAILURE	Tire Failure
030	PET	PET	Pet: cat, dog and similar
031	LVSTOCK	LIVESTOCK	Stock: cow, calf, bull, steer, sheep, etc.
032	HORSE	HORSE	Horse, mule, or donkey
033	HRSE&RID	HORSE & RIDER	Horse and rider
034	GAME	GAME NO DEER/ELK	Wild animal, game (includes birds; not deer or elk)
035	DEER ELK	DEER OR ELK	Deer or elk, wapiti
036	ANML VEH	ANIMAL-DRAWN VEH	Animal-drawn vehicle
037	CULVERT	CULVERT/MANHOLE	Culvert, open low or high manhole
038	ATENUATN	IMPACT CUSHION	Impact attenuator
039	PK METER	PARKING METER	Parking meter
040	CURB	CURB	Curb (also narrow sidewalks on bridges)
041	JIGGLE	JIGGLE BAR N/MED	Jiggle bars or traffic snake for channelization

EVENT CODES

Code	Short Description	Medium Description	Long Description
042	GDRL END	GUARDRAIL END	Leading edge of guardrail
043	GARDRAIL	GUARDRAIL	Guard rail (not metal median barrier)
044	BARRIER	MEDIAN BARRIER	Median barrier (raised or metal)
045	WALL	WALL	Retaining wall or tunnel wall
046	BR RAIL	BRIDGE RAIL	Bridge railing (on bridge and approach)
047	BR ABUT	BRIDGE ABUTMENT	Bridge abutment (approach ends)
048	BR COLMN	BRIDGE COLUMN	Bridge pillar or column (even though struck protective guard rail first)
049	BR GIRDR	BRIDGE GIRDER	Bridge girder (horizontal structure overhead)
050	ISLAND	TRAFFIC ISLAND	Traffic raised island
051	GORE	GORE	Gore
052	POLE UNK	POLE-UNKNOWN	Pole – type unknown
053	POLE UTL	POLE-UTILITY	Pole – power or telephone
054	ST LIGHT	POLE-ST LIGHT	Pole – street light only
055	TRF SGNL	POLE-TRAF SIGNAL	Pole – traffic signal and ped signal only
056	SGN BRDG	POLE-SIGN BRIDGE	Pole – sign bridge
057	STOPSIGN	STOP/YIELD SIGN	Stop or yield sign
058	OTH SIGN	OTHER SIGN	Other sign, including street signs
059	HYDRANT	HYDRANT	Hydrant
060	MARKER	DELINEATOR	Delineator or marker (reflector posts)
061	MAILBOX	MAILBOX	Mailbox
062	TREE	TREE/STUMP	Tree, stump or shrubs
063	VEG OHED	VEGTN OVER RDWY	Tree branch or other vegetation overhead, etc.
064	WIRE/CBL	CABLE ACROSS RD	Wire or cable across or over the road
065	TEMP SGN	TEMP SIGN/BARR	Temporary sign or barricade in road, etc.
066	PERM SGN	PERM SIGN/BARR	Permanent sign or barricade in/off road
067	SLIDE	SLIDE/ROCKS	Slides, rocks off or on road, falling rocks
068	FRGN OBJ	FOREIGN OBJECT	Foreign obstruction/debris in road (not gravel)
069	EQP WORK	EQUIP WORKING	Equipment working in/off road
070	OTH EQP	OTHER EQUIPMENT	Other equipment in or off road (includes parked trailer, boat)
071	MAIN EQP	MAINTNCE EQUIP	Wrecker, street sweeper, snow plow or sanding equipment
072	OTHER WALL	OTHER WALL	Rock, brick or other solid wall
073	IRRGL PVMT	IRREGULAR PAVEMENT	Speed bump, other bump, pothole or pavement irregularity (per PAR)
075	CAVE IN	CAVE IN	Bridge or road cave in
076	HI WATER	HIGH WATER	High Water
077	SNO BANK	SNOW BANK	Snow Bank
078	HOLE	HOLE/RDWY EDGE	Chuckhole in road, low or high shoulder at pavement edge
079	DITCH	CUT SLOPE/DITCH	Cut slope or ditch embankment
080	OBJ F MV	OBJ FRM OTHR VEH	Struck by rock or other object set in motion by other vehicle (incl. lost loads)
081	FLY-OBJ	OTHER MOVING OBJ	Struck by other moving or flying object
082	VEH HID	VEH OBSCURE VIEW	Vehicle obscured view
083	VEG HID	VEG OBSCURE VIEW	Vegetation obscured view
084	BLDG HID	BLD OBSCURE VIEW	View obscured by fence, sign, phone booth, etc.

Code	Short Description	Medium Description	Long Description
085	WIND GUST	WIND GUST	Wind Gust
086	IMMERSED	IMMERSION	Vehicle immersed in body of water
087	FIRE/EXP	FIRE/EXPLOSION	Fire or Explosion
088	FENC/BLD	FENCE/BUILDING	Fence or building, etc.
089	OTH ACDT	REFER OTHER ACDT	Accident related to another separate accident
090	TO 1 SIDE	TWO WAY ONE SIDE	Two-way traffic on divided roadway all routed to one side
092	PHANTOM	PHANTOM VEH	Other (phantom) non-contact vehicle (on PAR or report)
093	CELL-POL	CELLPHONE-POLICE	Cell phone (on PAR or driver in use)
094	VIOL GDL	VIOL GRAD DR LIC	Teenage driver in violation of graduated license pgm
095	GUY WIRE	GUY WIRE	Guy wire
096	BERM	BERM	Berm (earthen or gravel mound)
097	GRAVEL	GRAVEL IN RDWY	Gravel in roadway
098	ABR EDGE	ABRUPT EDGE	Abrupt edge
099	CELL-WTN	CELLPHONE-WITNSS	Cell Phone use witnessed by other participant
100	UNK FIXD	UNK FIX OBJ	Unknown type of fixed object
101	OTHER OBJ	OTHER OBJ NOT FIXED	Other or unknown object, not fixed
104	OUTSIDE V	PSGR OUTSIDE VEHICLE	Passenger riding on vehicle exterior
105	PEDAL PSGR	PSNGR ON PEDALCYCLE	Passenger riding on pedalcycle
106	MAN WHLCHR	NONMOTOR WHEELCHAIR	Pedestrian in non-motorized wheelchair
107	MTR WHLCHR	MOTORIZED WHEELCHAIR	Pedestrian in motorized wheelchair
110	N-MTR	NM STR VEH	Non-motorist struck vehicle
111	S CAR VS V	ST CAR STRUCK VEH	Street Car/Trolley (on rails and/or overhead wire system) struck vehicle
112	V VS S CAR	VEH STRUCK ST CAR	Vehicle struck Street Car/Trolley (on rails and/or overhead wire system)
113	S CAR ROW	STREET CAR ROW	At or on Street Car/Trolley right-of-way
114	RR EQUIP	VEH STRUCK RR EQUIP	Vehicle struck railroad equipment (not train) on tracks
120	WIRE BAR	WIRE BARRIER	Wire or cable median barrier
124	SLIPPERY	SLIPPERY SURFACE	Sliding or swerving due to wet, icy, slippery or loose surface
125	SHLDR	SHLDR GAVE	Shoulder gave way

I-5 Exit 33 (Central Point)
Interchange Area Management Plan

Technical Memorandum #3
Future Baseline Traffic Conditions

Prepared for

Oregon Department of Transportation, Region 3
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3. FUTURE BASELINE TRAFFIC CONDITIONS

This technical memorandum provides a summary of the future baseline traffic conditions in the Interchange 33 management area. The analysis was conducted for two long-range planning scenarios.

3.1. Future Traffic Volume Development

The future baseline analysis is based on two land use scenarios. One scenario is consistent with the Rogue Valley Metropolitan Planning Organization (RVMPO) Regional Transportation Plan (RTP) forecasts through the year 2034. The second scenario examines the long-term impact of potential development in the area based on an alternative 2034 land use scenario (ALUS).

3.1.1. Travel Demand Forecasting Models

The future traffic model volumes are developed from travel demand forecasting models. Travel demand models have been in use since the 1950s and employ a market-based approach by considering both transportation supply and travel demand for producing traffic forecasts. The model relies on socioeconomic data (e.g., households and employment) to determine travel demand and system attributes (e.g., roadway capacity, speeds, and distances) to represent the transportation supply.

The RVMPO currently uses the EMME computer program for estimating travel demand.

Regional Transportation Plan Model

The travel demand model for the RTP was developed for a base year of 2006 and a forecast year of 2034. Population forecasts were developed from Jackson County's comprehensive plan and are consistent with the official forecasts produced by the Office of Economic Analysis (OEA). The employment forecasts were developed from a number of different sources including the Economic Opportunities Analysis conducted in the RVMPO planning area in 2007 for the RPS project, U.S. Commerce Department data, shorter term economic forecasts by the state OEA, Oregon Employment Department data and outlook, and consultation with local jurisdictions. The resulting population and employment forecasts for the region are summarized in Table 3-1.

Table 3-1. Regional Transportation Plan Growth Forecasts

	2006	2009	2015	2020	2026	2034
Households	64,678	69,302	76,670	82,582	89,504	98,486
Population	157,272	172,665	191,994	207,502	225,596	248,324
Employment	110,459	115,430	125,371	133,566	148,772	150,666

Source: 2009-2034 Regional Transportation Plan, April 27, 2009, Table 2.2-3: RTP Summary Forecasts

The network used in the forecasts for the Interchange 33 IAMP is the financially-constrained RTP network. Traffic volumes and analysis based on RVMPO model data is referred to as the 2034 RTP scenario.

Alternative Land Use Scenario

In addition to the RTP baseline land development/traffic volume scenario, an Alternative Land Use Scenario (ALUS) was developed for the purpose of evaluating the impacts of potential future development in excess of that predicted by the RVMPO model. The ALUS is intended to for use only to understand how sensitive the area may be to more intense or accelerated rates of growth. It will primarily be used as a basis for evaluation of potential management measures, which could include local system improvements, access management, transportation system management measures, transportation demand management measures, or land use and development actions. These actions will be addressed specifically in subsequent technical memoranda.

The ALUS was developed assuming that available buildable land within the Interchange 33 study area is fully built to the maximum allowable intensity designated in the Central Point and Jackson County Comprehensive Plans. For the purposes of this study, the build out analysis focuses on the lands east of I-5 that have the majority of the buildable acreage. Figure 3-1 shows the boundary of build out area in red. The boundary extends beyond the study area boundaries to include most of Urban Reserve Area CP-2B and all of CP-3[1] to conform to traffic analysis zones in the RVMPO model.

Using mapping and the Comprehensive Plan designations, estimates of build out population, housing, and employment were prepared for the lands within the build out boundary. Fully developed areas along with parks and open space were excluded from the calculations. The estimates were then compared with the housing and employment assumptions in the RVMPO model to determine the location and intensity of the additional growth in the build out area. The resulting forecasts are summarized in Table 3-2.

Table 3-2. Comparison of RTP and ALUS Growth

Build Out Boundary	2034 RTP	Build Out
Population	5,330	8,690
Housing	1,920	2,990
Employment	2,270	6,720

Figure 3-1 also illustrates the boundaries used in the East Pine Street Corridor Refinement Plan (EPSCRP) Aggressive Redevelopment Scenario. The EPSCRP redevelopment scenario was developed to “assess the impact of an aggressive downtown redevelopment scenario on future

[1] Draft Regional Plan for the Greater Bear Creek Valley, Jackson County, Oregon, November 2009

traffic conditions" and assumes "accelerated population and employment growth within the downtown area, and correspondingly less growth in outlying areas of Central Point." The darker blue shading indicates areas with increased growth while the lighter blue indicates areas with decreased growth. The ALUS builds on this scenario.

The combined land use changes were input into the RVMPO model to create the ALUS forecasts. The land use forecasts were applied to the same transportation network used for the 2034 RTP Scenario. No specific year is associated with these forecasts; rather, they represent a condition that could occur sometime in the future as the area builds out.

3.1.2. Turning Movement Volumes

Turning movement traffic forecasts for the study area intersections were developed from the 2006, 2034 RTP, and 2034 ALUS forecasting models and the 2010 existing traffic data. The process followed the procedures from ODOT's Analysis Procedures Manual (APM)[2]. The resulting volumes are shown in Figure 3-2 for the 2034 RTP scenario and Figure 3-3 for the ALUS. The worksheets and model plots are provided in Appendix A. The figures illustrate PM peak hour volumes for the entire study area and AM peak hour volumes for the interchange only.

A comparison of the 2034 RTP and ALUS forecast volumes shows areas where future growth would not change much between scenarios and areas with significant increases in demand. Volumes on the downtown portion of the corridor would not change much between the RTP and ALUS scenarios since the more aggressive growth assumptions downtown were off-set by less growth in outlying areas. Volumes in the corridor east of I-5 would be measurably higher with the ALUS as new areas develop and traffic filters down to East Pine Street to access the freeway.

3.2. Future Transportation Network

The transportation network used in the future baseline analysis is the financially-constrained RTP system with additional changes at two locations: Peninger Road and the northbound on-ramp. The Peninger Road intersection modifications occur on the west, north, and south approaches. On the north approach, the lane configuration was changed (now a designated left turn, shared through-right) to facilitate protected left-turn phasing and the southbound through/right-turn lane was extended to provide additional storage. On the south approach, lane configuration was modified to match that of the north approach to provide protected left-turn phasing. The west approach added a right-turn lane, while retaining two through movements and a left-turn bay. The Northbound ramp terminal has one slight modification to the east approach, an extension of the westbound right-turn lane for additional storage.

[2] Analysis Procedures Manual, Oregon Department of Transportation, Transportation Development Division Planning Section, Transportation Planning and Analysis Unit, Salem, Oregon, April, 2006, Section 4.3.

3.3. 2034 RTP Scenario - Analysis Results

Traffic analysis for the 2034 RTP future baseline scenario was performed for the nine study area intersections and for the merge-diverge sections of the freeway.

3.3.1. 2034 RTP Scenario – Intersection Analysis

Table 3-3 and Figure 3-2 summarize the results of the traffic operations analysis on critical intersection approaches for the 2034 RTP scenario and Table 3-4 presents the 95th percentile queuing estimates. The Oregon Highway Plan (OHP) mobility standards are presented in the summary tables. All Synchro and SimTraffic output worksheets are provided in Appendix B.

The analysis results show that, under 2034 future baseline conditions, five of the study area intersections would not meet operational standards: four during the PM peak hour and one during the AM peak hour. Some of these intersections would have queue storage issues as would some of the adjacent intersections expected to meet mobility standards.

Table 3-3. Future (2034 RTP) Baseline Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Mobility Standard
PM Peak Hour				
7th St. & East Pine St.	SB L/T/R	0.90	F	LOS D
8th St. & East Pine St.	SB L/T/R	0.17	E	LOS D
9th St. & East Pine St.	NB L/T/R	0.17	C	LOS D
10th St./Freeman Rd. & East Pine St.	Overall	0.88	D	0.95/LOS D
Jewett School Rd. & East Pine St.	SB L/T/R	0.22	C	0.95/LOS D
I-5 SB Ramps & East Pine St.	Overall	0.75	A	0.85
I-5 NB Ramps & East Pine St.	Overall	0.83	B	0.85
Peninger Rd. & East Pine St.	Overall	0.94	C	0.95
Hamrick Rd. & East Pine St.	Overall	0.98	D	0.95
Table Rock Rd. & Biddle Rd.	Overall	1.00	E	0.95
AM Peak Hour				
I-5 SB Ramps & East Pine St.	Overall	0.94	C	0.85
I-5 NB Ramps & East Pine St.	Overall	0.60	A	0.85

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Note: Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Table 3-4. Future (2034 RTP) Baseline 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked[1]
PM Peak Hour				
10th St./Freeman Rd. & East Pine St.	EB L	125	100 [5]	1%
	EB T/R	275	200 [2]	47%
	WB L	275	150 [5]	53%
	WB T/R	425	350 [2]	15%
	NB L	200	125 [3]	8%
	SB L	250	100 [3]	35%
	SB T/R	275	250 [2]	22%
Jewett School Rd. & East Pine St.	EB L	175	150 [5]	
	WB T/R	450	300 [2]	
I-5 SB Ramps & East Pine St.	EB T	350	275 [2]	
	WB L	375	275 [5]	3%
	SB R	150	50 [3]	
I-5 NB Ramps & East Pine St.	EB L	225	175 [5]	0%
	WB T	475	425 [2]	6%
	WB R	300	250 [3]	0%
	NB R	750	500 [3]	23%
Peninger Rd. & East Pine St.	EB L	150	75 [5]	2%
	EB T	625	400 [2]	45%
	WB L	325	215 [3]	0%
	WB R	150	100 [5]	1%
	NB L	300	150 [3]	43%
	NB T/R	475	450 [3]	2%
Hamrick Rd. & East Pine St.	EB L	575	400 [5]	50%
	EB T/R	2250	1775 [2]	9%
	SB L/T	800	300 [2]	12%
	SB R	600	300 [2]	24%
Table Rock Rd. & Biddle Rd.	EB L	650	600 [5]	73%
	EB T	2425	775 [2]	2%
	WB R	325	200 [3]	1%
	NB L	225	175 [3]	1%
	SB L	275	225 [5]	61%
AM Peak Hour				
I-5 SB Ramps & East Pine St.	EB R	325	200 [3]	1%
	WB L	200	175 [3]	3%
	SB L	300	225 [5]	36%
	SB T	675	630 [2]	36%

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:
1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.
4. Two-way, left-turn lane (TWLTL) without a designated turn bay.
5. Storage distance reflects length of turn bay but TWLTL allows additional storage space.

Source: SimTraffic Intersection Analysis Report

As identified in the existing conditions, the critical southbound movement at the 7th Street and East Pine Street intersection would continue to experience long side street delays and not meet mobility standards in the future. The critical southbound approach is shown to operate with LOS F conditions during the peak hour due to relatively high volume of left turns from southbound 7th Street to eastbound East Pine Street. The v/c ratio of 0.90 indicates that demand is nearing estimated capacity for this approach, likely due to the large increase in cross-traffic along East Pine Street. A review of the traffic simulations for the corridor indicates that delays for this movement may not be as severe as LOS F because the upstream traffic signals at 10th Street and 4th Street may provide additional gaps in the traffic flow that are not accounted for in the LOS analysis. The traffic simulation delays are estimated at about 30 seconds per vehicle and average queues would be three vehicles.

The intersection of 8th Street and East Pine Street has a critical movement that would not meet mobility standards in the future. The critical southbound approach is expected to operate at LOS E during the peak hour. The expected v/c ratio of 0.17 indicates ample capacity for the approach; however because of the high traffic volumes along East Pine Street southbound left turning vehicles (8th Street to eastbound East Pine Street) will have fewer available gaps and thus longer delays. Again, a review of the traffic simulations indicates that delays for this movement may not be as severe as LOS E because of the upstream traffic signals. The traffic simulation delays are estimated at about 20 seconds per vehicle at this intersection and average queues would only be one vehicle.

The intersection of 9th Street and East Pine Street is not expected to have any operational issues with the 2034 RTP scenario.

The only signalized intersection on the west side of I-5, 10th Street/Freeman Road, would be approaching mobility standards in the future with an overall v/c ratio of 0.88. A review of the individual approaches shown in Figure 3-2, reveals that one movement would be very close to capacity: the westbound left-turn from East Pine Street to Freeman Road would have a v/c ratio of 0.96. Due to storage constraints, queues for this movement could spill into the adjacent through lane. While most vehicles may actually queue in the two-way, left-turn lane (TWLTL), the through lane would likely be blocked some of the time. Jewett School Road and the southbound ramp terminal intersections to the east would be occasionally impacted by the westbound queue.

Although the future operations at the East Pine Street intersection with Jewett School Road are expected to meet mobility standards, queues from the adjacent intersections would influence operations. The westbound queue from 10th Street/Freeman Road and the eastbound queue from the southbound ramp terminal would each extend past Jewett School Road for a period of the peak hour. This is particularly a problem for the southbound movement because, as the queues build from the adjacent intersections, the number of sufficient gaps for southbound traffic will significantly decrease. Additionally, the eastbound left-turn queue from East Pine Street to Jewett School Road would fully utilize the available storage at times and could spill out into the adjacent through lane.

The intersection of East Pine Street with the southbound ramp terminal is expected to meet mobility standards during the PM peak hour but not the AM peak hour, when the overall v/c ratio is estimated at 0.94. The AM eastbound queue would only occasionally extend through Jewett School Road. The southbound off-ramp is expected to have queues that build the length of the ramp in the future morning peak period. This is a significant safety concern as traffic exiting the freeway would have insufficient distance to slow and come to a stop on the ramp itself. The queue could cause some additional turbulence on the freeway itself as drivers have to slow in the mainline travel lanes in anticipation of stopping on the ramp.

The northbound ramp terminal is expected to meet mobility standards during both peak hours; however, queuing issues would be present for the westbound and northbound movements during the evening. The westbound through movement would occasionally extend through the adjacent Peninger Road intersection. The northbound off-ramp is expected to have queues that build the length of the ramp in the PM peak period. As with the southbound ramp, this is a significant safety concern as traffic exiting the freeway would have insufficient distance to slow and come to a stop on the ramp itself. Additional turbulence on the freeway may also occur as drivers have to slow in the mainline travel lanes in anticipation of stopping on the ramp.

The intersection of Peninger Road and East Pine Street would have a v/c ratio of 0.94, almost at the Jackson County standard (0.95). Queues would consistently extend along East Pine Street in both directions with eastbound queues expected to affect the northbound ramps almost 45 percent of the time. Queues would also be present on northbound Peninger Road.

The Hamrick Road and East Pine Street intersection would exceed mobility standards with a v/c ratio of 0.98. The eastbound left-turn (v/c ratio of 0.98) and westbound through (v/c ratio of 1.09) movements would both have demand near or exceeding capacity. These movements are also expected to experience substantial queuing. The eastbound left-turn queue would spill into the adjacent through lane about 50 percent of the time. On the side street, southbound approaches at Hamrick Road have adequate operating capacity however; the southbound right-turn would have insufficient storage and would spill into the adjacent through lane about 25 percent of the time. Queues on the westbound approach would also be very long.

The Table Rock Road and Biddle Road intersection would exceed capacity with a v/c ratio of 1.00. The westbound and southbound approaches would have one or more movements where demand would exceed capacity. The southbound left-turn lane queue would spill into the adjacent through lane about 35 percent of the time and queues from the southbound approach would block the upstream intersection. The westbound right-turn and northbound left-turn lane queues would occasionally spill into the adjacent through lanes.

3.3.2. 2034 RTP Scenario – Merge/Diverge Analysis

The 2034 operations of the interchange ramp interaction with the mainline highway traffic were also evaluated. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analyses are summarized in Table 3-5.

The merge and diverge analyses for both the future design hour (PM peak hour) and the AM peak hour show that the freeway and the merge and diverge points associated with the Interchange 33 ramps would operate below the mobility standard of 0.85 for the 2034 RTP scenario.

Table 3-5. Future (2034 RTP) Baseline Freeway Operations

Direction/Location	V/C Ratio[1]	
	PM Peak Hour[2]	AM Peak Hour
I-5 Northbound		
Mainline South of IC 33	0.67	0.30
Diverge: IC 33 Northbound Off-Ramp	0.48	0.21
Mainline between Off and On-Ramps	0.47	0.21
Merge: IC 33 Northbound On-Ramp	0.61	0.47
Mainline North of IC 33	0.59	0.46
I-5 Southbound		
Mainline North of IC 33	0.39	0.49
Diverge: IC 33 Southbound Off-Ramp	0.17	0.21
Mainline between Off and On-Ramps	0.32	0.39
Merge: IC 33 Southbound On-Ramp	0.47	0.63
Mainline South of IC 33	0.46	0.62

Acronyms: IC = Interchange

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual.
2. The design hour is the hour between 4:30 and 5:30 PM, which coincides with system peaking.

3.4. ALUS - Analysis Results

The ALUS is being evaluated to provide a land use sensitivity analysis that takes into account the impacts of potential future development in excess of that predicted by the RVMPO 2034 RTP model. It is important to remember that the ALUS will only be used to evaluate sensitivity to land use changes/development in the interchange area.

3.4.1. ALUS - Intersection Analysis

Table 3-6 presents the results of the traffic operations analysis on critical intersection approaches for the ALUS. Queuing results are not summarized for this sensitivity scenario but queuing issues would generally be worse for this scenario than those described for the 2034 RTP scenario. The results show that, with the ALUS, two additional intersections (seven total) would not meet operational mobility standards compared to the 2034 RTP scenario.

Table 3-6. Future (ALUS) Baseline Intersection Operations

Intersection	Critical Movement	V/C Ratio	LOS	Mobility Standard
PM Peak Hour				
7th St. & East Pine St.	SB L/T/R	1.04	F	LOS D
8th St. & East Pine St.	SB L/T/R	0.21	F	LOS D
9th St. & East Pine St.	NB L/T/R	0.22	C	LOS D
10th St./Freeman Rd. & East Pine St.	Overall	0.93	D	0.95/LOS D
Jewett School Rd. & East Pine St.	SB L/T/R	0.29	D	0.95/LOS D
I-5 SB Ramps & East Pine St.	Overall	0.88	C	0.85
I-5 NB Ramps & East Pine St.	Overall	1.06	C	0.85
Peninger Rd. & East Pine St.	Overall	1.12	E	0.95
Hamrick Rd. & East Pine St.	Overall	1.16	E	0.95
Table Rock Rd. & Biddle Rd.	Overall	1.10	F	0.95
AM Peak Hour				
I-5 SB Ramps & East Pine St.	Overall	1.00	D	0.85
I-5 NB Ramps & East Pine St.	Overall	0.72	B	0.85

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Note: Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The critical southbound movement at the 7th Street and East Pine Street intersection would experience long side street delays and exceed mobility standards in the future. The critical southbound approach is expected to operate at LOS F conditions with a v/c ratio of 1.04. Because forecast traffic volumes are higher than those for the 2034 RTP scenario, delays would be longer but the upstream traffic signals at 10th Street and 4th Street would continue to provide additional gaps in the traffic flow that are not accounted for in the LOS analysis.

The intersection of 8th Street and East Pine Street has a critical movement that would not meet mobility standards in the future. The critical southbound approach is expected to operate at LOS F during the peak hour. As with the 2034 RTP scenario, the expected v/c ratio of 0.21 indicates ample capacity for the approach with upstream traffic signals providing gaps in traffic not accounted for in the LOS analysis.

The signalized intersection of 10th Street/Freeman Road and East Pine Street, would be nearing mobility standards in the future with an overall v/c ratio of 0.93. The intersection would have one movement at capacity, the westbound left-turn lane (v/c ratio of 1.0) and two movements approaching capacity, eastbound through-right lanes (v/c ratio of 0.96) and southbound left-turn lane (v/c ratio of 0.94). These movements would have similar, but more extensive, queuing issues to those described for the 2034 RTP scenario.

The intersection of East Pine Street with the southbound ramp terminal would not meet mobility standards during either the PM peak hour (v/c ratio of 0.88) or AM peak hour (v/c ratio of 1.00). Significant safety concerns on the southbound ramp would be expected as detailed for the 2034 RTP scenario.

The northbound ramp terminal would exceed both mobility standards and capacity with an overall v/c ratio of 1.06. Both the northbound right-turn lanes and westbound through lanes are expected to exceed capacity and experience very long delays. Queues on the off-ramp could interfere with freeway operations and are a serious safety concern because of insufficient stopping distance.

The ALUS forecast demand for the intersection of Peninger Road and East Pine Street is measurably higher than the RTP scenario, resulting in significantly higher v/c ratio calculations. The overall v/c ratio of 1.12 would exceed capacity with significant congestion on all approaches.

The Hamrick Road and East Pine Street intersection would experience the greatest increase in traffic demand when comparing the ALUS with the RTP scenario. As a result, the overall intersection v/c ratio of 1.16 would greatly exceed mobility standards. Significant congestion would be present on all approaches except southbound Hamrick Road.

The Table Rock Road and Biddle Road intersection would experience some increases and some decreases in demand with the ALUS when compared with the RTP scenario. The result of the shifting demand patterns is an overall v/c ratio estimated at 1.10. While this is an improvement compared to the 2034 RTP scenario, the intersection would still operate over capacity with significant congestion on all approaches.

3.4.2. ALUS - Merge/Diverge Analysis

The operations of the interchange ramp interaction with the mainline highway traffic were also evaluated for the ALUS. These analyses were conducted in accordance with the methodology prescribed in ODOT's APM to determine v/c ratio performance. The results of the analyses are summarized in Table 3-7.

The merge and diverge analyses for both the future design hour (PM peak hour) and the AM peak hour show that the freeway and the merge and diverge points associated with the Interchange 33 ramps would operate below the mobility standard of 0.85 for the ALUS.

Table 3-7. Future (2050 RPS) Baseline Freeway Operations

Direction/Location	V/C Ratio[1]	
	PM Peak Hour[2]	AM Peak Hour
I-5 Northbound		
Mainline South of IC 33	0.69	0.31
Diverge: IC 33 Northbound Off-Ramp	0.54	0.26
Mainline between Off and On-Ramps	0.46	0.20
Merge: IC 33 Northbound On-Ramp	0.61	0.49
Mainline North of IC 33	0.59	0.48
I-5 Southbound		
Mainline North of IC 33	0.39	0.48
Diverge: IC 33 Southbound Off-Ramp	0.18	0.23
Mainline between Off and On-Ramps	0.31	0.38
Merge: IC 33 Southbound On-Ramp	0.49	0.65
Mainline South of IC 33	0.48	0.63

Acronyms: IC = Interchange

Notes:

1. The v/c ratios for the merge/diverge analysis are calculated based on the methodologies outlined in ODOT's Analysis Procedures Manual.
2. The design hour is the hour between 4:30 and 5:30 PM, which coincides with system peaking.

3.5. Future Traffic Safety Considerations

Future traffic operations highlight a number of safety issues for consideration in the interchange management area. These safety concerns include access spacing, queue spillback into adjacent intersections, two-way left-turn lane overlapping demand, and excessive side street delay. Below is a summary by intersection of issues for consideration for future traffic safety.

- 7th Street and East Pine Street: Safety concerns at this intersection are focused on the limited number of adequate gaps in traffic which might result in an increased crash rate as drivers engage in riskier behaviors to enter the traffic stream. Crash frequency and severity should be monitored in the future as adequate gaps along East Pine Street decrease and the delays for side street traffic increase. Additionally, this intersection may benefit from signalization when the warrant is met.
- 8th Street and East Pine Street: Future safety concerns at this intersection would be similar to 7th Street, with the limited number of adequate gaps for southbound traffic potentially resulting in riskier driver behaviors. Crash frequency and severity should be monitored in the future as adequate gaps along East Pine Street decrease and the delays for side street traffic increase.
- 9th Street and East Pine Street: No future traffic considerations at this time based on operational analyses.

- 10th Street/Freeman Road and East Pine Street: Safety concerns at this intersection may arise because the queue storage in the two-way left-turn lane between 10th Street/ Freeman Road and Jewett School Road would not be adequate to accommodate forecast demand and queues would spill out into the adjacent through lane. This queue spillover could result in an increase in rear end or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic. Existing conditions have already highlighted queuing problems for westbound through traffic which extends beyond Jewett School Road and occasionally the southbound ramp terminal. Another concern with the westbound left-turn movement is a potential head-on conflict with the eastbound left-turn movement at Jewett School Road as the queue extends into the two-way left-turn lane. Opportunities to reduce queuing should be investigated and access management in the corridor should also be considered.
- Jewett Road and East Pine Street: In addition to safety concerns about the two-way left-turn lane between 10th Street/Freeman Road and Jewett School Road, several other concerns should be highlighted. The limited number of adequate gaps for southbound traffic might result in an increased crash rate as drivers engage in riskier behaviors to enter the traffic stream. Proximity to adjacent intersections (access management) already results in numerous conflicting movements within a short distance but this condition could be exacerbated by increased traffic volumes and queuing. This intersection should be considered for access management actions, monitored for crash severity and frequency (sufficient gaps for southbound traffic), and assessed for alternative eastbound left-turn solutions. Extra storage in the east/west directions should be provided where possible.
- Southbound ramp terminal and East Pine Street: The queue spillback, particularly the westbound traffic through the northbound ramp terminal, is both a safety and operational concern at this intersection. The southbound off-ramp is expected to have queues that build the length of the ramp in the future morning peak period. Rear-end collisions may increase as traffic exiting the freeway would have insufficient distance to slow and come to a stop on the ramp itself. The queue could cause some additional turbulence on the freeway itself as drivers have to slow in the mainline travel lanes in anticipation of stopping on the ramp. Monitoring of crash patterns at this location must focus on both the intersection and its potential effects on the freeway. Although operations at this intersection are impacted by other nearby intersections ultimately additional capacity and storage may be needed.
- Northbound ramp terminal and East Pine Street: Queue spillback from this intersection and from other adjacent intersections will be a significant safety concern in the future. The northbound off-ramp is expected to have queues that build the length of the ramp in the future. Rear-end collisions may increase as traffic exiting the freeway would have insufficient distance to slow and come to a stop on the ramp itself. The queue could cause some additional turbulence on the freeway itself as drivers have to slow in the mainline travel lanes in anticipation of stopping on the ramp. Monitoring of crash patterns at this location must focus on both the intersection and its potential effects on

the freeway. Although operations at this intersection are impacted by other nearby intersections ultimately additional capacity and storage may be needed.

- Peninger Road and East Pine Street: Operational analysis of future conditions shows that several movements and approaches at Peninger Road would have queues that exceed available storage and queues building back from the northbound ramp terminal would affect this intersection. Queue spillover and spillback could result in an increase in rearend or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic. Continue to monitor movement capacity on all approaches. Extra storage should be provided where possible, and storage needs must account for the high number of semi-trailer trucks going through the intersection.
- Hamrick Road and East Pine Street: Queue spillback and spillover are both significant safety concerns at this intersection as v/c ratios at the intersection begin to approach 1.0. As westbound queue spillback begins to affect the Table Rock Road intersection, additional safety concerns will arise at that location as well. Some operational relief could be provided if some of the through traffic on Hamrick Road, especially trucks, could be rerouted to Table Rock Road. However, the Table Rock Road intersection is also expected to be congested and improvements at the Hamrick Road intersection and additional storage may still be needed.
- Table Rock Road and Biddle Road: Queue spillback and spillover are both significant safety concerns at this intersection as v/c ratios would exceed 1.0 (capacity). As the eastbound and southbound left-turn queues spillover and begin to affect the through lanes, additional safety concerns will arise.

The ALUS is being evaluated to provide a land use sensitivity analysis that takes into account the potential areas for development beyond what is assumed in the RTP model. However, the intersections from the I-5 ramps to Hamrick Road would experience measurable volume increases and worsening operations if the surrounding lands develop more intensively that currently assumed over the next 20 years. Safety concerns at intersection most greatly impacted by the ALUS would become even more critical.

3.6. Conclusions

Four study area intersections would exceed mobility standards under the 2034 RTP scenario. The sensitivity scenario (ALUS) would worsen conditions from the I-5 ramp terminals to Hamrick Road. Future operational issues are summarized below:

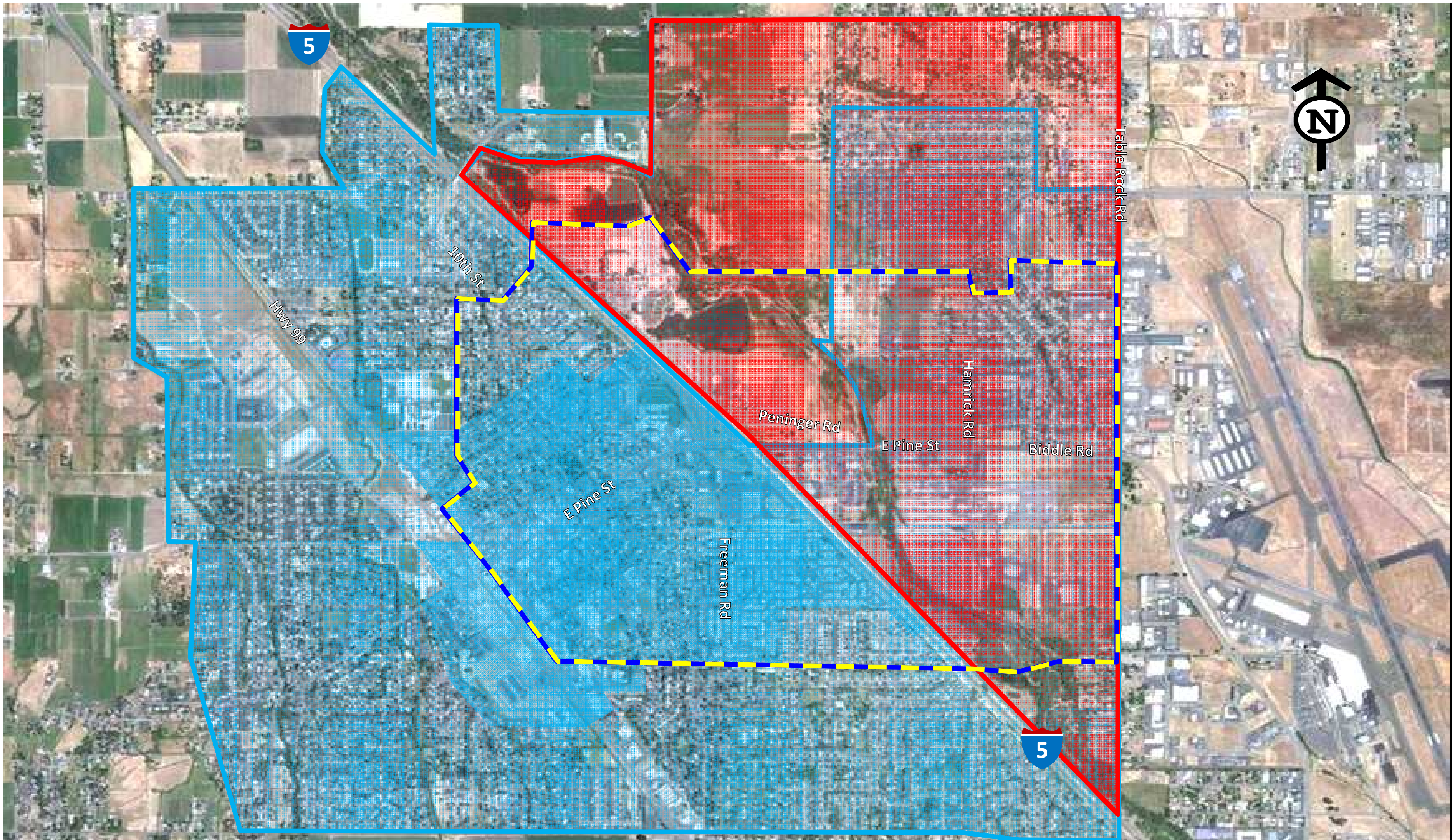
- On the west side of I-5 substantial increases in eastbound/westbound traffic along East Pine Street would create fewer adequate gaps for traffic from non-signalized side street approaches.
- The signal at 10th Street/Freeman Road would exceed operational and storage capacity for the westbound left-turn movement, which would spill into through lanes of traffic and impact operations at several intersections to the east.

- The southbound ramp terminal would experience operations in excess of mobility standards during the AM peak period with queuing along the southbound off-ramp. The southbound off-ramp queue may extend the length of the ramp resulting in inadequate stopping sight distance and potential impacts to southbound I-5.
- The northbound ramp terminal will meet mobility standards in 2034 but queuing on the northbound off-ramp would be a concern and should be monitored for safe stopping sight distance and impacts to mainline I-5.
- The intersections on the east side of I-5 would not meet mobility standards during the 2034 RTP scenario and would worsen should some of the urban reserves develop, as evaluated under the 2050 RPS sensitivity scenario.
- In 2034, Peninger Road would exceed the mobility standard and would have some movements that would exceed capacity. Queues and interaction between the nearby northbound ramp terminal would become safety concerns. Development of some of the urban reserves would exacerbate operations and safety.
- Operations at Hamrick Road would be the worst in the corridor and would approach capacity in 2034. Queue spillback into upstream intersections and spillover from turn lanes into adjacent through lanes would be a major operational and safety concern. This intersection would be greatly impacted by development of some of the urban reserves.
- Table Rock Road would operate in excess of mobility standards and capacity for both the 2034 RTP and ALUS scenarios. Queue spillback and spillover will both be significant safety concerns, particularly in the eastbound and southbound directions.

Attachments:

Figure 3-1. Alternative Land Use Scenario Boundaries
Figure 3-2. Future Baseline Conditions – 2034 RTP Scenario – Traffic Volumes and Operations
Figure 3-3. Future Baseline Conditions – Alternative Land Use Scenario – Traffic Volumes and Operations

Appendix A. Future Traffic Volume Development
Appendix B. Synchro Output Worksheets
Appendix C. ODOT's Preliminary Traffic Signal Warrants



Legend

Build Out Area

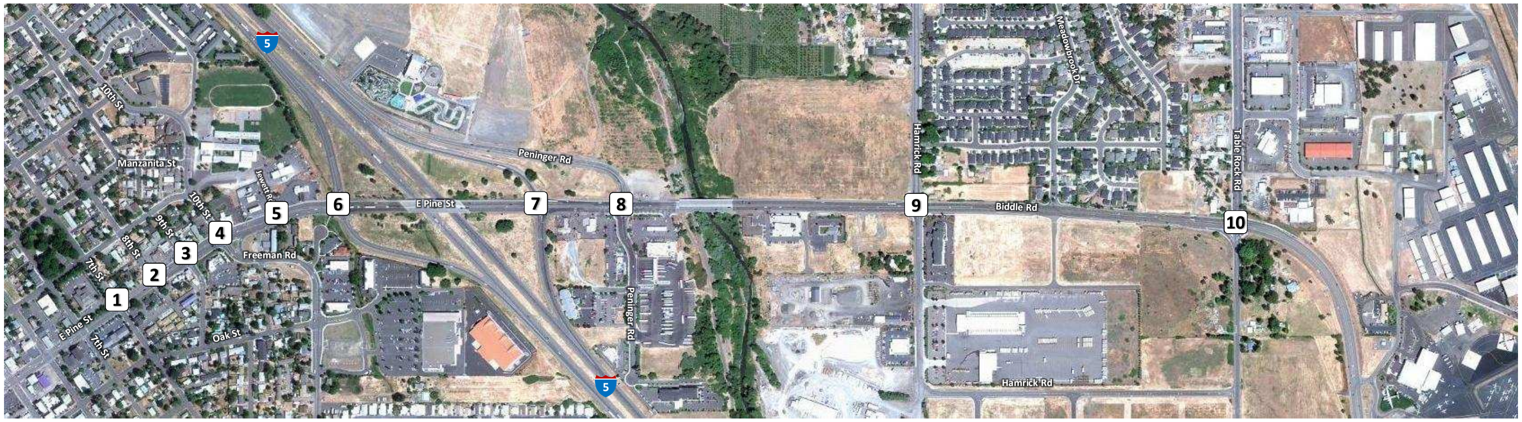
IAMP Study Area

E Pine St Corridor Refinement Plan Land Use Area

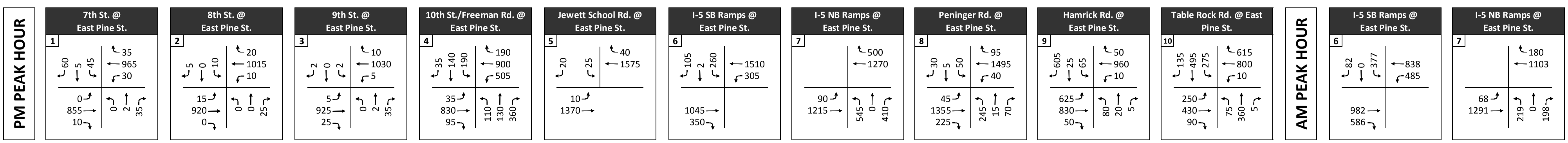
Note: Build out area extends beyond study area boundaries to conform to traffic analysis zone boundaries in the model and incorporate Urban Reserve Areas.

Figure 3-1

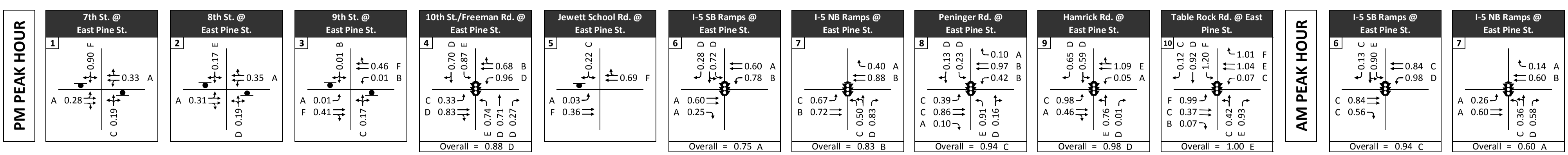
Alternative Land Use Scenario Boundaries



2034 Regional Transportation Plan Scenario - Traffic Volumes



2034 Regional Transportation Plan Scenario - Intersection Operations



Interchange Area Management Plan 33

Legend

Turning Movement

Traffic Volume

Lane Group

0.00 Volume-to-Capacity (V/C) Ratio

A Level of Service (LOS)

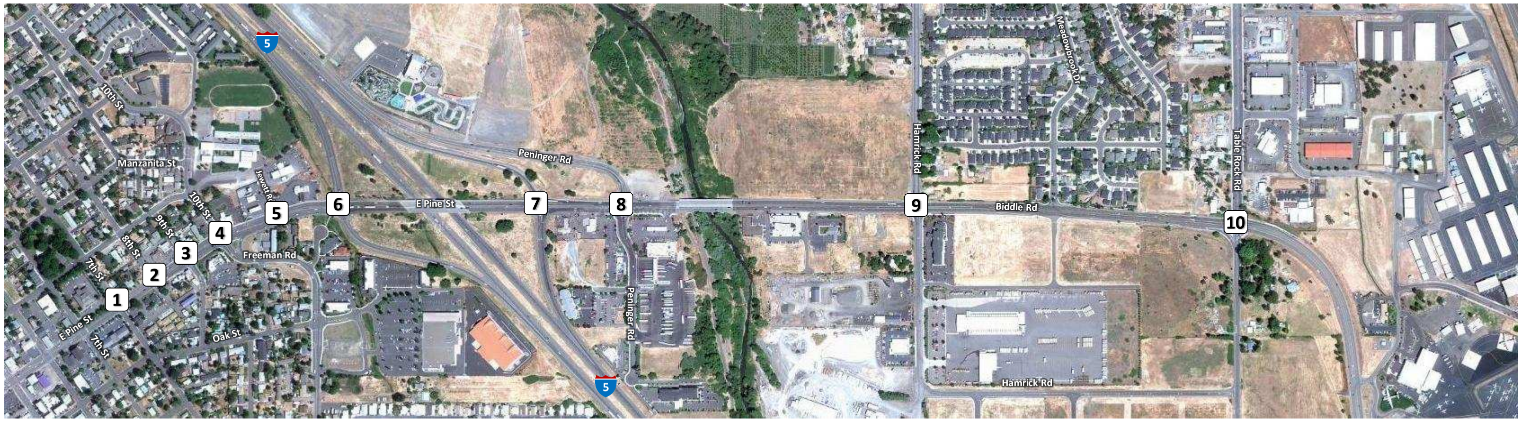
Traffic Signal

STOP Sign

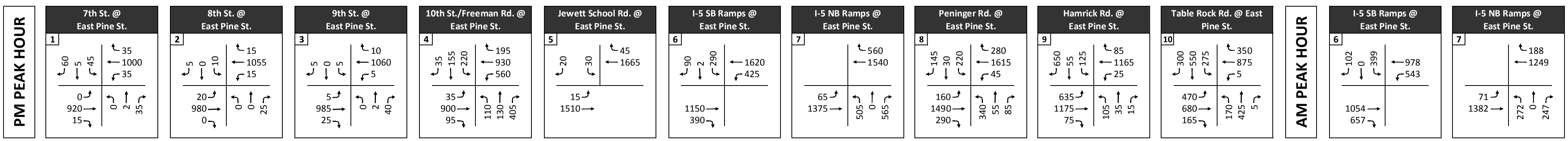
DRAFT Figure 3-2

Future Baseline Conditions
2034 RTP Scenario
Traffic Volumes and Operations

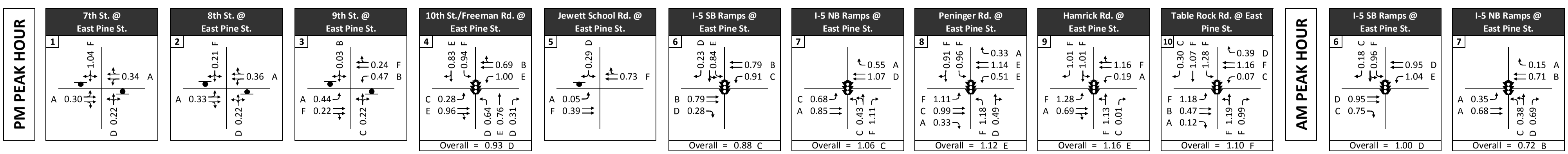
P:\O\ODOT00000680\0600INFO\0670Reports\TM3 - Future Baseline\Revised with 2034 LU scenario\2034 Figures_NoBuild.xlsx:2034 Figures_NoBuild.xlsx:Figure 3-2



Alternative Land Use Scenario - Traffic Volumes



Alternative Land Use Scenario - Intersection Operations



Interchange Area Management Plan 33

Legend

Turning Movement	Lane Group	Traffic Signal
## Traffic Volume	0.00 Volume-to-Capacity (V/C) Ratio	STOP Sign
	A Level of Service (LOS)	

DRAFT Figure 3-3

Future Baseline Conditions
Alternative Land Use Scenario
Traffic Volumes and Operations

I-5 Exit 33 (Central Point)

Interchange Area Management Plan

APPENDIX

Technical Memorandum #3

Future Baseline Traffic Conditions

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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2100 SW River Parkway
Portland, Oregon

June 2014

Table of Contents

APPENDIX A.

Future Traffic Volume Development

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **PM Turning Movement Volumes**
Created: 5/5/2010
Rev. Date: 1/24/2011

E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	1 Existing Counts 2010 1-Hr Volume PM Peak	2 Seasonal Adjustment Factor	3 Seasonal Adjusted 2010 Unbalanced PM Peak	Existing 2010 Heavy Vehicle Percentage	Adjustment	4 30st Highest Hour 2010 Balanced PM Peak	5 30th Highest Hour 2010 Rounded PM Peak
1	1	East Pine Street and N/S 7th Street		NEL	10	16	1.08	17	0.0		17	15
	1	4 hr PM Turning Movement Count	EB	NET	10	559	1.08	606	0.0	40	646	645
	1	Count Date: 4/20/2010		NER	10	9	1.08	10	0.0		10	10
	1	2010		SWL	10	21	1.08	23	0.0		23	25
	1		WB	SWT	10	617	1.08	669	0.1	20	689	690
	1			SWR	10	28	1.08	30	0.0		30	30
	1	PM Peak Hour: 3:30 PM-4:30 PM		NWL	10	4	1.08	4	0.0		4	5
	1	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	10	1	1.08	1	0.0		1	2
	1			NWR	10	27	1.08	29	0.0		29	30
	1			SEL	10	38	1.08	41	0.0		41	40
	1	PHF:	SB	SET	10	3	1.08	3	0.0		3	5
	1	0.92		SER	10	47	1.08	51	0.0		51	50
		Future PHF:	**TEV**			**1370**		**1485**			**1545**	**1547**
		0.92	**East**			**1290**		**1398**			**1458**	**1460**
			West			**1252**		**1357**			**1417**	**1415**
2	2	East Pine Street and N/S 8th Street		NEL	20	13	1.08	14	0.0		14	15
	2	4 hr PM Turning Movement Count	EB	NET	20	625	1.08	677	0.0	25	702	700
	2	Count Date: 4/20/2010		NER	20	0	1.08	0	0.0		0	0
	2	2010		SWL	20	7	1.08	8	0.0		8	10
	2		WB	SWT	20	690	1.08	748	0.1	-15	733	735
	2			SWR	20	13	1.08	14	0.0		14	15
	2	PM Peak Hour: 3:30 PM-4:30 PM		NWL	20	3	1.08	3	0.0		3	5
	2	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	20	0	1.08	0	0.0		0	0
	2			NWR	20	8	1.08	9	0.0		9	10
	2			SEL	20	10	1.08	11	0.0		11	10
	2	PHF:	SB	SET	20	0	1.08	0	0.0		0	0
	2	0.88		SER	20	6	1.08	7	0.0		7	5
		Future PHF:	**TEV**			**1375**		**1490**			**1500**	**1505**
		0.88	**East**			**1353**		**1466**			**1476**	**1480**
			West			**1337**		**1449**			**1459**	**1460**
3	3	East Pine Street and N/S 9th Street		NEL	30	1	1.08	1	0.0		1	2
	3	4 hr PM Turning Movement Count	EB	NET	30	618	1.08	670	0.0	25	695	695
	3	Count Date: 4/20/2010		NER	30	19	1.08	21	0.0		21	20
	3	2010		SWL	30	5	1.08	5	0.0		5	5
	3		WB	SWT	30	685	1.08	742	0.0	5	747	745
	3			SWR	30	8	1.08	9	0.0		9	10
	3	PM Peak Hour: 3:15 PM-4:15 PM		NWL	30	13	1.08	14	0.0		14	15
	3	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	30	1	1.08	1	0.0		1	2
	3			NWR	30	29	1.08	31	0.0		31	30
	3			SEL	30	2	1.08	2	0.0		2	2
	3	PHF:	SB	SET	30	0	1.08	0	0.0		0	0
	3	0.88		SER	30	1	1.08	1	0.0		1	2
		0.88	**TEV**			**1382**		**1498**			**1528**	**1528**
			East			**1347**		**1460**			**1490**	**1487**
			West			**1337**		**1449**			**1479**	**1479**

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4	4	East Pine Street and N 10th Street/Freeman Road		EBL	40	29	1.08	31	0.0		31	30
	4	4 hr PM Intersection Classification Count	EB	EBT	40	545	1.08	591	0.0	15	606	605
	4	Count Date: 4/20/2010		EBR	40	81	1.08	88	0.0		88	90
	4	2010		WBL	40	401	1.08	435	0.0		435	435
	4		WB	WBT	40	590	1.08	639	0.2	-5	634	635
	4			WBR	40	133	1.08	144	0.0		144	145
	4	PM Peak Hour: 5:00 PM-6:00 PM		NBL	40	86	1.08	93	2.3		93	95
	4	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	40	117	1.08	127	0.0		127	125
	4			NBR	40	264	1.08	286	0.0	10	296	295
	4			SBL	40	129	1.08	140	0.0	5	145	145
	4	PHF:	SB	SBT	40	131	1.08	142	2.3		142	140
	4	0.89		SBR	40	26	1.08	28	3.8		28	30
		Future PHF:	**TEV**			**2532**		**2744**			**2769**	**2770**
		0.89	**East**			**2062**		**2235**			**2260**	**2260**
			West			**1357**		**1471**			**1481**	**1485**
5	5	East Pine Street and Jewett School Road		EBL	50	9	1.08	10	0.0		10	10
	5	4 hr PM Turning Movement Count	EB	EBT	50	911	1.08	987	0.0	50	1037	1035
	5	Count Date: 4/20/2010		EBR	50	0	1.08	0	0.0		0	0
	5	2010		WBL	50	0	1.08	0	0.0		0	0
	5		WB	WBT	50	1110	1.08	1203	0.0	-5	1198	1200
	5			WBR	50	29	1.08	31	0.0		31	30
	5	PM Peak Hour: 3:15 PM-4:15 PM		NBL	50	0	1.08	0	0.0		0	0
	5	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	50	0	1.08	0	0.0		0	0
	5			NBR	50	0	1.08	0	0.0		0	0
	5			SBL	50	19	1.08	21	0.0		21	20
	5	PHF:	SB	SBT	50	0	1.08	0	0.0		0	0
	5	0.90		SBR	50	13	1.08	14	0.0		14	15
		Future PHF:	**TEV**			**2091**		**2266**			**2311**	**2310**
		0.9	**East**			**2069**		**2243**			**2288**	**2285**
			West			**2043**		**2214**			**2259**	**2260**
6	6	East Pine Street and SB Ramps		EBL	60	0	1.08	0	0.0		0	0
	6	16 hr ODOT Turning Movement Count	EB	EBT	60	878	1.08	952	1.5	-150	802	800
	6	Count Date: 5/11/2010		EBR	60	250	1.11	276	0.0	-20	256	255
	6	2010		WBL	60	200	1.11	221	13.0		221	220
	6		WB	WBT	60	1079	1.08	1169	0.5	-25	1144	1145
	6			WBR	60	0	1.08	0	0.0		0	0
	6	PM Peak Hour: 4:30 PM-5:30 PM		NBL	60	0	1.08	0	0.0		0	0
	6	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	60	0	1.08	0	0.0		0	0
	6			NBR	60	0	1.08	0	0.0		0	0
	6			SBL	60	189	1.11	209	19.0		209	210
	6	PHF:	SB	SBT	60	1	1.11	1	0.0		1	2
	6	0.94		SBR	60	75	1.11	83	0.0		83	85
		Future PHF:	**TEV**			**2672**		**2911**			**2716**	**2717**
		0.95	**East**			**2346**		**2551**			**2376**	**2375**
			West			**2282**		**2480**			**2285**	**2285**

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7	7	East Pine Street and NB Ramps		EBL	70	77	1.11	85	0.0		85	85
	7	16 hr ODOT Turning Movement Count	EB	EBT	70	981	1.08	1063	4.4	-140	923	925
	7	Count Date: 5/11/2010		EBR	70	0	1.08	0	0.0		0	0
	7	2010		WBL	70	0	1.08	0	0.0		0	0
	7		WB	WBT	70	908	1.08	984	2.6	-25	959	960
	7			WBR	70	348	1.11	385	11.5		385	385
	7	PM Peak Hour: 4:30 PM-5:30 PM		NBL	70	366	1.11	404	0.5		404	405
	7	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	70	0	1.11	0	0.0		0	0
	7			NBR	70	255	1.11	282	12.2	-25	257	255
	7			SBL	70	0	1.08	0	0.0		0	0
	7	PHF:	SB	SBT	70	0	1.08	0	0.0		0	0
	7	0.96		SBR	70	0	1.08	0	0.0		0	0
		Future PHF:	**TEV**			**2935**		**3203**			**3013**	**3015**
		0.96	**East**			**2492**		**2714**			**2524**	**2525**
			West			**2332**		**2537**			**2372**	**2375**
8	8	East Pine Street and Penninger Road (including westbound righ		EBL	80	34	1.08	37	0.0	5	42	40
	8	4 hr PM Intersection Classification Count	EB	EBT	80	786	1.08	852	0.0	125	977	975
	8	Count Date: 4/20/2010		EBR	80	139	1.08	151	34.5	15	166	165
	8	2010		WBL	80	24	1.08	26	12.5		26	25
	8		WB	WBT	80	1017	1.08	1102	1.8	35	1137	1135
	8			WBR	80	61	1.08	66	0.0		66	65
	8	PM Peak Hour: 3:15 PM-4:15 PM		NBL	80	168	1.08	182	27.4		182	180
	8	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	80	7	1.08	8	0.0		8	10
	8			NBR	80	38	1.08	41	15.8		41	40
	8			SBL	80	37	1.08	40	0.0		40	40
	8	PHF:	SB	SBT	80	6	1.08	7	0.0		7	5
	8	0.90		SBR	80	29	1.08	31	0.0		31	30
		Future PHF:	**TEV**			**2346**		**2543**			**2723**	**2710**
		0.9	**East**			**1963**		**2128**			**2288**	**2280**
			West			**2173**		**2355**			**2535**	**2525**
9	9	East Pine Street and Hamrick Road		EBL	90	429	1.08	465	2.6	45	510	510
	9	4 hr PM Intersection Classification Count	EB	EBT	90	400	1.08	434	4.8	50	484	485
	9	Count Date: 4/20/2010		EBR	90	29	1.08	31	62.1		31	30
	9	2010		WBL	90	4	1.08	4	0.0		4	5
	9		WB	WBT	90	623	1.08	675	3.0		675	675
	9			WBR	90	34	1.08	37	0.0		37	35
	9	PM Peak Hour: 3:30 PM-4:30 PM		NBL	90	41	1.08	44	29.3		44	45
	9	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	90	10	1.08	11	0.0		11	10
	9			NBR	90	1	1.08	1	0.0		1	2
	9			SBL	90	33	1.08	36	0.0		36	35
	9	PHF:	SB	SBT	90	13	1.08	14	15.4		14	15
	9	0.90		SBR	90	447	1.08	484	2.2		484	485
		Future PHF:	**TEV**			**2064**		**2237**			**2332**	**2332**
		0.9	**East**			**1095**		**1187**			**1237**	**1237**
			West			**1969**		**2134**			**2229**	**2230**

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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	6 30th Highest Hour 2035 PM Peak	7 30th Highest Hour 2035 Rounded PM Peak	8 30th Highest Hour 2035 Balanced PM Peak	9 30th Highest Hour 2050 PM Peak	10 30th Highest Hour 2050 Rounded PM Peak	11 30th Highest Hour 2050 Balanced PM Peak
1	1	East Pine Street and N/S 7th Street		NEL	10	18	20	20	18	20	20
	1	4 hr PM Turning Movement Count	EB	NET	10	856	855	855	881	880	880
	1	Count Date: 4/20/2010		NER	10	12	10	10	13	15	15
	1	2010		SWL	10	31	30	30	31	30	30
	1		WB	SWT	10	962	960	965	1004	1005	1005
	1			SWR	10	34	35	35	35	35	35
	1	PM Peak Hour: 3:30 PM-4:30 PM		NWL	10	6	5	5	6	5	5
	1	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	10	2	2	2	2	2	2
	1			NWR	10	34	35	35	34	35	35
	1			SEL	10	44	45	45	44	45	45
	1	PHF:	SB	SET	10	5	5	5	5	5	5
	1	0.92		SER	10	59	60	60	60	60	60
		Future PHF:	**TEV**			**2064**	**2062**	**2067**	**2133**	**2137**	**2137**
		0.92	**East**			**1961**	**1960**	**1965**	**2029**	**2030**	**2030**
			West			**1913**	**1910**	**1915**	**1982**	**1985**	**1985**
2	2	East Pine Street and N/S 8th Street		NEL	20	17	15	15	18	20	20
	2	4 hr PM Turning Movement Count	EB	NET	20	910	910	920	928	930	940
	2	Count Date: 4/20/2010		NER	20	0	0	0	0	0	0
	2	2010		SWL	20	12	10	10	12	10	10
	2		WB	SWT	20	1010	1010	1015	1051	1050	1055
	2			SWR	20	18	20	20	17	15	15
	2	PM Peak Hour: 3:30 PM-4:30 PM		NWL	20	11	10	10	12	10	10
	2	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	20	0	0	0	0	0	0
	2			NWR	20	23	25	25	22	20	20
	2			SEL	20	11	10	10	11	10	10
	2	PHF:	SB	SET	20	0	0	0	0	0	0
	2	0.88		SER	20	6	5	5	6	5	5
		Future PHF:	**TEV**			**2018**	**2015**	**2030**	**2077**	**2070**	**2085**
		0.88	**East**			**1984**	**1985**	**2000**	**2041**	**2035**	**2050**
			West			**1954**	**1950**	**1965**	**2015**	**2015**	**2030**
3	3	East Pine Street and N/S 9th Street		NEL	30	1	2	5	1	2	5
	3	4 hr PM Turning Movement Count	EB	NET	30	915	915	925	931	930	940
	3	Count Date: 4/20/2010		NER	30	24	25	25	24	25	25
	3	2010		SWL	30	6	5	5	6	5	5
	3		WB	SWT	30	1027	1025	1030	1065	1065	1060
	3			SWR	30	8	10	10	8	10	10
	3	PM Peak Hour: 3:15 PM-4:15 PM		NWL	30	17	15	15	17	15	15
	3	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NWT	30	1	2	2	1	2	2
	3			NWR	30	35	35	35	35	35	35
	3			SEL	30	2	2	2	2	2	5
	3	PHF:	SB	SET	30	0	0	0	0	0	0
	3	0.88		SER	30	2	2	2	2	2	5
		0.88	**TEV**			**2039**	**2038**	**2056**	**2092**	**2093**	**2107**
			East			**1993**	**1992**	**2007**	**2047**	**2047**	**2055**
			West			**1986**	**1984**	**2002**	**2040**	**2039**	**2050**

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Subject: **PM Turning Movement Volumes**
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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	6 30th Highest Hour 2035 PM Peak	7 30th Highest Hour 2035 Rounded PM Peak	8 30th Highest Hour 2035 Balanced PM Peak	9 30th Highest Hour 2050 PM Peak	10 30th Highest Hour 2050 Rounded PM Peak	11 30th Highest Hour 2050 Balanced PM Peak
4	4	East Pine Street and N 10th Street/Freeman Road		EBL	40	34	35	35	34	35	35
	4	4 hr PM Intersection Classification Count	EB	EBT	40	822	820	830	855	855	860
	4	Count Date: 4/20/2010		EBR	40	94	95	95	83	85	85
	4	2010		WBL	40	506	505	505	481	480	480
	4		WB	WBT	40	901	900	900	937	935	925
	4			WBR	40	186	185	190	197	195	195
	4	PM Peak Hour: 5:00 PM-6:00 PM		NBL	40	109	110	110	99	100	100
	4	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	40	129	130	130	120	120	120
	4			NBR	40	361	360	360	353	355	355
	4			SBL	40	191	190	190	267	265	265
	4	PHF:	SB	SBT	40	141	140	140	169	170	170
	4	0.89		SBR	40	37	35	35	48	50	50
		Future PHF:	**TEV**			**3511**	**3505**	**3520**	**3643**	**3645**	**3640**
		0.89	**East**			**2967**	**2960**	**2975**	**3090**	**3085**	**3080**
			West			**1997**	**1995**	**2005**	**2056**	**2060**	**2055**
5	5	East Pine Street and Jewett School Road		EBL	50	12	10	10	9	10	10
	5	4 hr PM Turning Movement Count	EB	EBT	50	1368	1370	1370	1472	1470	1470
	5	Count Date: 4/20/2010		EBR	50	0	0	0	0	0	0
	5	2010		WBL	50	0	0	0	0	0	0
	5		WB	WBT	50	1577	1575	1575	1599	1600	1590
	5			WBR	50	40	40	40	26	25	25
	5	PM Peak Hour: 3:15 PM-4:15 PM		NBL	50	0	0	0	0	0	0
	5	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	50	0	0	0	0	0	0
	5			NBR	50	0	0	0	0	0	0
	5			SBL	50	27	25	25	16	15	15
	5	PHF:	SB	SBT	50	0	0	0	0	0	0
	5	0.90		SBR	50	19	20	20	11	10	10
		Future PHF:	**TEV**			**3042**	**3040**	**3040**	**3133**	**3130**	**3120**
		0.9	**East**			**3011**	**3010**	**3010**	**3113**	**3110**	**3100**
			West			**2975**	**2975**	**2975**	**3091**	**3090**	**3080**
6	6	East Pine Street and SB Ramps		EBL	60	0	0	0	0	0	0
	6	16 hr ODOT Turning Movement Count	EB	EBT	60	1047	1045	1045	1080	1080	1065
	6	Count Date: 5/11/2010		EBR	60	355	355	350	421	420	420
	6	2010		WBL	60	306	305	305	353	355	355
	6		WB	WBT	60	1517	1515	1510	1486	1485	1470
	6			WBR	60	0	0	0	0	0	0
	6	PM Peak Hour: 4:30 PM-5:30 PM		NBL	60	0	0	0	0	0	0
	6	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	60	0	0	0	0	0	0
	6			NBR	60	0	0	0	0	0	0
	6			SBL	60	255	255	260	361	360	360
	6	PHF:	SB	SBT	60	3	2	2	4	5	5
	6	0.94		SBR	60	105	105	105	144	145	145
		Future PHF:	**TEV**			**3587**	**3582**	**3577**	**3849**	**3850**	**3820**
		0.95	**East**			**3125**	**3120**	**3120**	**3280**	**3280**	**3250**
			West			**3024**	**3020**	**3010**	**3131**	**3130**	**3100**

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E-W ID	Synchro ID	Intersection	Direction	Movement	Int ID	6 30th Highest Hour 2035 PM Peak	7 30th Highest Hour 2035 Rounded PM Peak	8 30th Highest Hour 2035 Balanced PM Peak	9 30th Highest Hour 2050 PM Peak	10 30th Highest Hour 2050 Rounded PM Peak	11 30th Highest Hour 2050 Balanced PM Peak
7	7	East Pine Street and NB Ramps		EBL	70	89	90	90	95	95	95
	7	16 hr ODOT Turning Movement Count	EB	EBT	70	1214	1215	1215	1349	1350	1330
	7	Count Date: 5/11/2010		EBR	70	0	0	0	0	0	0
	7	2010		WBL	70	0	0	0	0	0	0
	7		WB	WBT	70	1269	1270	1270	1314	1315	1315
	7			WBR	70	500	500	500	684	685	685
	7	PM Peak Hour: 4:30 PM-5:30 PM		NBL	70	543	545	545	510	510	510
	7	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	70	0	0	0	0	0	0
	7			NBR	70	420	420	410	543	545	545
	7			SBL	70	0	0	0	0	0	0
	7	PHF:	SB	SBT	70	0	0	0	0	0	0
	7	0.96		SBR	70	0	0	0	0	0	0
		Future PHF:	**TEV**			**4036**	**4040**	**4030**	**4495**	**4500**	**4480**
		0.96	**East**			**3403**	**3405**	**3395**	**3890**	**3895**	**3875**
			West			**3116**	**3120**	**3120**	**3268**	**3270**	**3250**
8	8	East Pine Street and Penninger Road (including westbound righ		EBL	80	47	45	45	177	175	175
	8	4 hr PM Intersection Classification Count	EB	EBT	80	1357	1355	1355	1515	1515	1515
	8	Count Date: 4/20/2010		EBR	80	224	225	225	185	185	185
	8	2010		WBL	80	42	40	40	27	25	25
	8		WB	WBT	80	1497	1495	1495	1721	1720	1720
	8			WBR	80	93	95	95	282	280	280
	8	PM Peak Hour: 3:15 PM-4:15 PM		NBL	80	244	245	245	190	190	190
	8	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	80	15	15	15	30	30	30
	8			NBR	80	71	70	70	43	45	45
	8			SBL	80	50	50	50	121	120	120
	8	PHF:	SB	SBT	80	6	5	5	11	10	10
	8	0.90		SBR	80	29	30	30	90	90	90
		Future PHF:	**TEV**			**3674**	**3670**	**3670**	**4392**	**4385**	**4385**
		0.9	**East**			**3110**	**3105**	**3105**	**3709**	**3705**	**3705**
			West			**3398**	**3395**	**3395**	**3878**	**3875**	**3875**
9	9	East Pine Street and Hamrick Road		EBL	90	627	625	625	746	745	745
	9	4 hr PM Intersection Classification Count	EB	EBT	90	830	830	830	880	880	880
	9	Count Date: 4/20/2010		EBR	90	52	50	50	56	55	55
	9	2010		WBL	90	10	10	10	10	10	10
	9		WB	WBT	90	963	965	960	1230	1230	1230
	9			WBR	90	51	50	50	56	55	55
	9	PM Peak Hour: 3:30 PM-4:30 PM		NBL	90	83	85	80	90	90	90
	9	PM Peak Hour Used: 4:30 PM-5:30 PM	NB	NBT	90	19	20	20	18	20	20
	9			NBR	90	5	5	5	4	5	5
	9			SBL	90	63	65	65	57	55	55
	9	PHF:	SB	SBT	90	27	25	25	25	25	25
	9	0.90		SBR	90	609	610	605	724	725	725
		Future PHF:	**TEV**			**3341**	**3340**	**3325**	**3896**	**3895**	**3895**
		0.9	**East**			**1923**	**1925**	**1920**	**2237**	**2235**	**2235**
			West			**3165**	**3165**	**3150**	**3726**	**3725**	**3725**

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Job #: ODOT0000-0680
Subject: **Future Baseline Traffic Forecasts - 2034 RTP Model**
PM Volumes

Road	From	To	Direction	Existing Volumes 2010	Baseline Model 2006	Future Ref Model 2034	2006-2034 Model Comparison: Annual Growth	2006-2034 Model Comparison: Total Growth	2006-2034 Model Comparison: Volume Difference	2034 Volume Estimates: Volume Difference	2034 Volume Estimates: Volume Growth	2034 Volume Estimates: Absolute Difference	2034 Volume Estimates: Average	Forecast Used	Method Used	Comments	Additional Comments
East Pine St	6th	7th	EB	670	378	634	2.4%	67.7%	256	889	1059	17%	974	**889**	Difference Method	Absolute difference >10% --> Used difference only	
	7th	6th	WB	745	454	783	2.6%	72.5%	329	1027	1208	16%	1117	**1027**	Difference Method	Absolute difference >10% --> Used difference only	
	7th	8th	EB	715	378	634	2.4%	67.7%	256	934	1130	19%	1032	**934**	Difference Method	Absolute difference >10% --> Used difference only	
	8th	7th	WB	745	454	783	2.6%	72.5%	329	1027	1208	16%	1117	**1027**	Difference Method	Absolute difference >10% --> Used difference only	
	8th	9th	EB	717	386	651	2.5%	68.7%	265	944	1139	19%	1042	**944**	Difference Method	Absolute difference >10% --> Used difference only	
	9th	8th	WB	760	460	794	2.6%	72.6%	334	1046	1233	16%	1140	**1046**	Difference Method	Absolute difference >10% --> Used difference only	
	9th	10th	EB	725	386	651	2.5%	68.7%	265	952	1152	19%	1052	**952**	Difference Method	Absolute difference >10% --> Used difference only	
	10th	9th	WB	760	460	794	2.6%	72.6%	334	1046	1233	16%	1140	**1046**	Difference Method	Absolute difference >10% --> Used difference only	
	10th	Jewett School	EB	1045	694	1078	2.0%	55.3%	384	1374	1541	11%	1457	**1374**	Difference Method	Absolute difference >10% --> Used difference only	
	Jewett School	10th	WB	1215	779	1223	2.0%	57.0%	444	1596	1809	13%	1702	**1596**	Difference Method	Absolute difference >10% --> Used difference only	
	Jewett School	SB Ramps	EB	1055	733	1129	1.9%	54.0%	396	1394	1544	10%	1469	**1394**	Difference Method	Absolute difference >10% --> Used difference only	
	SB Ramps	Jewett School	WB	1230	808	1265	2.0%	56.6%	457	1622	1826	12%	1724	**1622**	Difference Method	Absolute difference >10% --> Used difference only	
	SB Ramps	NB Ramps	EB	1010	486	827	2.5%	70.2%	341	1302	1617	22%	1460	**1302**	Difference Method	Absolute difference >10% --> Used difference only	
	NB Ramps	SB Ramps	WB	1365	849	1371	2.2%	61.5%	522	1812	2084	14%	1948	**1812**	Difference Method	Absolute difference >10% --> Used difference only	
	NB Ramps	Peninger	EB	1180	661	1191	2.9%	80.2%	530	1634	1991	20%	1813	**1634**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	NB Ramps	WB	1345	705	1201	2.5%	70.4%	496	1770	2156	20%	1963	**1770**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	Hamrick Rd	EB	1025	636	1164	3.0%	83.0%	528	1478	1754	17%	1616	**1478**	Difference Method	Absolute difference >10% --> Used difference only	
	Hamrick	Peninger	WB	1225	668	1170	2.7%	75.1%	502	1655	2014	20%	1835	**1655**	Difference Method	Absolute difference >10% --> Used difference only	
	Hamrick	Table Rock	EB	522	211	650	7.4%	208.1%	439	898	1453	47%	1176	**898**	Difference Method	Absolute difference >10% --> Used difference only	
	Table Rock	Hamrick Rd	WB	715	250	595	4.9%	138.0%	345	1011	1561	43%	1286	**1011**	Difference Method	Absolute difference >10% --> Used difference only	
7th	Manzanita	East Pine	SB	95	19	35	3.0%	82.6%	16	109	162	40%	135	**109**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	47	11	20	2.6%	71.4%	8	54	76	34%	65	**54**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	40	27	37	1.3%	35.3%	10	48	52	8%	50	**48**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	37	16	22	1.4%	39.6%	6	42	50	16%	46	**42**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
8th	Manzanita	East Pine	SB	15	3	6	3.0%	82.6%	3	17	26	40%	21	**17**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	30	7	13	2.6%	71.4%	5	34	48	34%	41	**34**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	10	7	9	1.3%	35.3%	2	12	13	8%	13	**12**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	30	13	18	1.4%	39.6%	5	34	40	16%	37	**34**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
9th	Manzanita	East Pine	SB	4	1	1	3.0%	82.6%	1	5	7	40%	6	**5**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	9	2	4	2.6%	71.4%	2	10	15	34%	12	**10**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	25	17	23	1.3%	35.3%	6	30	33	8%	31	**30**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	47	20	28	1.4%	39.6%	8	54	63	16%	58	**54**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
10th	Manzanita	East Pine	SB	315	166	210	0.9%	26.5%	44	353	387	9%	370	**370**	Average of Difference and Growth		
	East Pine	Manzanita	NB	300	185	229	0.8%	23.8%	44	338	361	7%	349	**349**	Average of Difference and Growth		
	East Pine	Oak St	SB	665	228	317	1.4%	39.0%	89	741	888	18%	814	**741**	Difference Method	Absolute difference >10% --> Used difference only	
	Oak St	East Pine	NB	515	236	335	1.5%	41.9%	99	600	700	15%	650	**600**	Difference Method	Absolute difference >10% --> Used difference only	
Jewett School	Manzanita	East Pine	SB	35	90	102	0.5%	13.3%	12	45	39	15%	42	**45**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	Manzanita	NB	40	80	94	0.6%	17.5%	14	52	46	12%	49	**52**	Difference Method	Absolute difference >10% --> Used difference only	
SB Ramps	I-5	East Pine	SB	297	96	170	2.8%	77.1%	74	360	493	31%	427	**360**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	I-5	SB	477	384	578	1.8%	50.5%	194	643	684	6%	663	**663**	Average of Difference and Growth		
NB Ramps	I-5	East Pine	NB	660	492	846	2.6%	72.0%	354	963	1067	10%	1015	**963**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	I-5	NB	470	173	312	2.9%	80.3%	139	589	794	30%	691	**589**	Difference Method	Absolute difference >10% --> Used difference only	
Peninger	N of Peninger	Peninger	SB	75	28	40	1.5%	42.9%	12	85	103	18%	94	**85**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	N of Peninger	NB	115	81	127	2.0%	56.8%	46	154	171	10%	163	**154**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	Larue	SB	195	105	195	3.1%	85.7%	90	272	338	22%	305	**272**	Difference Method	Absolute difference >10% --> Used difference only	
	Larue	Peninger	NB	230	163	284	2.7%	74.2%	121	334	376	12%	355	**334**	Difference Method	Absolute difference >10% --> Used difference only	
Hamrick	Brookdale	East Pine	SB	535	500	674	1.2%	34.8%	174	684	695	2%	689	**689**	Average of Difference and Growth		
	East Pine	Brookdale	NB	555	545	710	1.1%	30.3%	165	696	699	0%	698	**698**	Average of Difference and Growth		
	East Pine	S of Hamrick	SB	50	36	82	4.6%	127.8%	46	89	105	16%	97	**89**	Difference Method	Distributed N/S growth from centroid 218 and 219	
	S of Hamrick	East Pine	NB	57	57	114	3.6%	100.0%	57	106	106	0%	106	**106**	Difference Method	Distributed N/S growth from centroid 218 and 219	To be Consistent with Opposing Movement
Table Rock	N of E Pine	East Pine	SB		517	886	2.5%	71.4%	369	316	0	200%	158	**158**			
	East Pine	N of E Pine	NB		533	1046	3.4%	96.2%	513	440	0	200%	220	**220**			
	East Pine	S of E Pine	SB		344	519	1.8%	50.9%	175	150	0	200%	75	**150**			
	S of E Pine	East Pine	NB		315	422	1.2%	34.0%	107	92	0	200%	46	**92**			
I-5 Merge/Diverge (SB)	N. off-ramp	off-ramp	SB	1205	1166	1929	2.3%	65.4%	763	1859	1881	1%	1870	**1859**	Difference Method		To be Consistent with Opposing Movement
	Off-ramp	On-ramp	SB	910	1070	1759	2.3%	64.4%	689	1501	1412	6%	1456	**1501**	Difference Method		To be Consistent with Opposing Movement
	On-ramp	S. of on-ramp	SB	1390	1454	2336	2.2%	60.7%	882	2146	2113	2%	2129	**2146**	Difference Method		To be Consistent with Opposing Movement
I-5 Merge/Diverge (NB)	S. off-ramp	off-ramp	NB	2095	1914	3158	2.3%	65.0%	1244	3161	3262	3%	3212	**3161**	Difference Method		To be Consistent with Opposing Movement
	Off-ramp	On-ramp	NB	1435	1422	2312	2.2%	62.6%	890	2198	2205	0%	2201	**2198**	Difference Method		To be Consistent with Opposing Movement
	On-ramp	N. on-ramp	NB	1905	1596	2623	2.3%	64.3%	1027	2785	2956	6%	2871	**2785**	Difference Method		To be Consistent with Opposing Movement

Sidestreets not included in the regional model
Greater than 10% difference between difference and growth methods

Centroid	2006 SB	2006 NB	2034 SB	2034 NB
8th	23	21	42	36
6th	51	48	69	67
Total	**74**	**69**	**111**	**103**
218	21	33	32	44
219	15	24	50	70
Total	**36**	**57**	**82**	**114**

Project: IAMP 33
Job #: ODOT0000-0680
Subject: **Future Baseline Traffic Forecasts - 2050 RPS Model**
PM Volumes

				Existing Volumes	Baseline Model	Future Ref Model	2006-2034 Model Comparison			2034 Volume Estimates							
Road	**From**	**To**	**Direction**	**2010**	**2006**	**2050**	**Annual Growth**	**Total Growth**	**Volume Difference**	**Volume Difference**	**Volume Growth**	**Absolute Difference**	**Average**	**Forecast Used**	**Method Used**	**Comments**	**Additional Comments**
East Pine St	6th	7th	EB	670	378	647	1.6%	71.2%	269	915	1103	19%	1009	**915**	Difference Method	Absolute difference >10% --> Used difference only	
	7th	6th	WB	745	454	811	1.8%	78.6%	357	1070	1278	18%	1174	**1070**	Difference Method	Absolute difference >10% --> Used difference only	
	7th	8th	EB	715	378	647	1.6%	71.2%	269	960	1178	20%	1069	**960**	Difference Method	Absolute difference >10% --> Used difference only	
	8th	7th	WB	745	454	811	1.8%	78.6%	357	1070	1278	18%	1174	**1070**	Difference Method	Absolute difference >10% --> Used difference only	
	8th	9th	EB	717	386	654	1.6%	69.4%	268	961	1170	20%	1065	**961**	Difference Method	Absolute difference >10% --> Used difference only	
	9th	8th	WB	760	460	817	1.8%	77.6%	357	1085	1296	18%	1190	**1085**	Difference Method	Absolute difference >10% --> Used difference only	
	9th	10th	EB	725	386	654	1.6%	69.4%	268	969	1183	20%	1076	**969**	Difference Method	Absolute difference >10% --> Used difference only	
	10th	9th	WB	760	460	817	1.8%	77.6%	357	1085	1296	18%	1190	**1085**	Difference Method	Absolute difference >10% --> Used difference only	
	10th	Jewett School	EB	1045	694	1167	1.5%	68.2%	473	1475	1692	14%	1584	**1475**	Difference Method	Absolute difference >10% --> Used difference only	
	Jewett School	10th	WB	1215	779	1214	1.3%	55.8%	435	1610	1832	13%	1721	**1610**	Difference Method	Absolute difference >10% --> Used difference only	
	Jewett School	SB Ramps	EB	1055	733	1210	1.5%	65.1%	477	1489	1679	12%	1584	**1489**	Difference Method	Absolute difference >10% --> Used difference only	
	SB Ramps	Jewett School	WB	1230	808	1248	1.2%	54.5%	440	1630	1839	12%	1734	**1630**	Difference Method	Absolute difference >10% --> Used difference only	
	SB Ramps	NB Ramps	EB	1010	486	960	2.2%	97.5%	474	1441	1906	28%	1673	**1441**	Difference Method	Absolute difference >10% --> Used difference only	
	NB Ramps	SB Ramps	WB	1365	849	1354	1.4%	59.5%	505	1824	2103	14%	1964	**1824**	Difference Method	Absolute difference >10% --> Used difference only	
	NB Ramps	Peninger	EB	1180	661	1444	2.7%	118.5%	783	1892	2451	26%	2171	**1892**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	NB Ramps	WB	1345	705	1427	2.3%	102.4%	722	2001	2597	26%	2299	**2001**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	Hamrick Rd	EB	1025	636	1354	2.6%	112.9%	718	1678	2077	21%	1877	**1678**	Difference Method	Absolute difference >10% --> Used difference only	
	Hamrick	Peninger	WB	1225	668	1569	3.1%	134.9%	901	2044	2727	29%	2386	**2044**	Difference Method	Absolute difference >10% --> Used difference only	
	Hamrick	Table Rock	EB	522	211	672	5.0%	218.5%	461	941	1559	49%	1250	**941**	Difference Method	Absolute difference >10% --> Used difference only	
	Table Rock	Hamrick Rd	WB	715	250	885	5.8%	254.0%	635	1292	2366	59%	1829	**1292**	Difference Method	Absolute difference >10% --> Used difference only	
7th	Manzanita	East Pine	SB	95	19	35	1.9%	82.6%	16	109	166	41%	138	**109**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	47	11	20	1.6%	71.4%	8	54	78	35%	66	**54**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	40	27	37	0.8%	35.3%	10	49	53	8%	51	**49**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	37	16	22	0.9%	39.6%	6	43	50	17%	46	**43**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
8th	Manzanita	East Pine	SB	15	3	6	1.9%	82.6%	3	17	26	41%	22	**17**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	30	7	13	1.6%	71.4%	5	35	49	35%	42	**35**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	10	7	9	0.8%	35.3%	2	12	13	8%	13	**12**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	30	13	18	0.9%	39.6%	5	35	41	17%	38	**35**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
9th	Manzanita	East Pine	SB	4	1	1	1.9%	82.6%	1	5	7	41%	6	**5**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Manzanita	NB	9	2	4	1.6%	71.4%	2	10	15	35%	13	**10**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
	East Pine	Oak St	SB	25	17	23	0.8%	35.3%	6	30	33	8%	32	**30**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	To be Consistent with Opposing Movement
	Oak St	East Pine	NB	47	20	28	0.9%	39.6%	8	54	64	17%	59	**54**	Difference Method	Distributed N/S growth from centroid at 8th and 6th, E/W growth from 10th	
10th	Manzanita	East Pine	SB	315	166	350	2.5%	110.8%	184	482	632	27%	557	**482**	Difference Method		
	East Pine	Manzanita	NB	300	185	228	0.5%	23.2%	43	339	363	7%	351	**351**	Average of Difference and Growth		
	East Pine	Oak St	SB	665	228	303	0.7%	32.9%	75	733	864	16%	799	**733**	Difference Method	Absolute difference >10% --> Used difference only	
	Oak St	East Pine	NB	515	236	297	0.6%	25.8%	61	570	636	11%	603	**570**	Difference Method	Absolute difference >10% --> Used difference only	
Jewett School	Manzanita	East Pine	SB	35	90	82	-0.2%	-8.9%	-8	28	32	15%	30	**28**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	Manzanita	NB	40	80	73	-0.2%	-8.8%	-7	34	37	9%	35	**35**	Average of Difference and Growth	Absolute difference >10% --> Used difference only	
SB Ramps	I-5	East Pine	SB	297	96	325	5.4%	238.5%	229	505	941	60%	723	**505**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	I-5	SB	477	384	680	1.8%	77.1%	296	746	811	8%	779	**779**	Average of Difference and Growth		
NB Ramps	I-5	East Pine	NB	660	492	923	2.0%	87.6%	431	1052	1186	12%	1119	**1052**	Difference Method	Absolute difference >10% --> Used difference only	
	East Pine	I-5	NB	470	173	513	4.5%	196.5%	340	779	1310	51%	1044	**779**	Difference Method	Absolute difference >10% --> Used difference only	
Peninger	N of Peninger	Peninger	SB	75	28	191	13.2%	582.1%	163	223	472	72%	348	**223**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	N of Peninger	NB	115	81	492	11.5%	507.4%	411	489	645	28%	567	**489**	Difference Method	Absolute difference >10% --> Used difference only	
	Peninger	Larue	SB	195	105	136	0.7%	29.5%	31	223	247	10%	235	**223**	Difference Method	Absolute difference >10% --> Used difference only	
	Larue	Peninger	NB	230	163	195	0.4%	19.6%	32	259	271	5%	265	**265**	Average of Difference and Growth	Absolute difference >10% --> Used difference only	
Hamrick	Brookdale	East Pine	SB	535	500	786	1.3%	57.2%	286	795	813	2%	804	**804**	Average of Difference and Growth		
	East Pine	Brookdale	NB	555	545	834	1.2%	53.0%	289	818	823	1%	820	**820**	Average of Difference and Growth		
	East Pine	S of Hamrick	SB	50	36	82	2.9%	127.8%	46	92	108	16%	100	**92**	Difference Method	Distributed N/S growth from centroid 218 and 219	
	S of Hamrick	East Pine	NB	57	57	117	2.4%	105.3%	60	112	112	0%	112	**112**	Difference Method	Distributed N/S growth from centroid 218 and 219	To be Consistent with Opposing Movement
Table Rock	N of E Pine	East Pine	SB		517	1381	3.8%	167.1%	864	785	0	200%	393	**393**			
	East Pine	N of E Pine	NB		533	1591	4.5%	198.5%	1058	962	0	200%	481	**481**			
	East Pine	S of E Pine	SB		344	554	1.4%	61.0%	210	191	0	200%	95	**191**			
	S of E Pine	East Pine	NB		315	495	1.3%	57.1%	180	164	0	200%	82	**164**			

I-5 Merge/Diverge (SB)	N. off-ramp	off-ramp	SB	1205	1166	2381	2.4%	104.2%	1215	2310	2346	2%	2328	**2310**	Difference Method		To be Consistent with Opposing Movement
	Off-ramp	On-ramp	SB	910	1070	2056	2.1%	92.1%	986	1806	1672	8%	1739	**1806**	Difference Method		To be Consistent with Opposing Movement
	On-ramp	S. of on-ramp	SB	1390	1454	2737	2.0%	88.2%	1283	2556	2505	2%	2531	**2556**	Difference Method		To be Consistent with Opposing Movement
I-5 Merge/Diverge (NB)	S. off-ramp	off-ramp	NB	2095	1914	3573	2.0%	86.7%	1659	3603	3746	4%	3674	**3603**	Difference Method		To be Consistent with Opposing Movement
	Off-ramp	On-ramp	NB	1435	1422	2649	2.0%	86.3%	1227	2550	2561	0%	2556	**2550**	Difference Method		To be Consistent with Opposing Movement
	On-ramp	N. on-ramp	NB	1905	1596	3163	2.2%	98.2%	1567	3330	3605	8%	3467	**3330**	Difference Method		To be Consistent with Opposing Movement

Sidestreets not included in the regional model
Greater than 10% difference between difference and growth methods

	2006		2034		2050	
Centroid	SB	NB	SB	NB	SB	NB
8th	23	21	42	36	18	18
6th	51	48	69	67	45	40
Total	**74**	**69**	**111**	**103**	**63**	**58**
218	21	33	32	44	25	41
219	15	24	50	70	48	73
Total	**36**	**57**	**82**	**117**	**73**	**114**

APPENDIX B.

Synchro Output Worksheets

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	45	5	60	5	2	35	20	855	10	30	965	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	5	65	5	2	38	22	929	11	33	1049	38
Pedestrians		1						1			3	
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)											827	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1684	2118	545	1637	2131	473	1088			940		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1428	1946	67	1371	1962	473	715			940		
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 %	29	89	92	92	96	93	97			96		
cM capacity (veh/h)	69	51	827	72	50	542	748			737		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	120	46	486	476	557	562
Volume Left	49	5	22	0	33	0
Volume Right	65	38	0	11	0	38
cSH	133	240	748	1700	737	1700
Volume to Capacity	0.90	0.19	0.03	0.28	0.04	0.33
Queue Length 95th (ft)	147	17	2	0	3	0
Control Delay (s)	115.7	23.5	0.8	0.0	1.2	0.0
Lane LOS	F	C	A		A	
Approach Delay (s)	115.7	23.5	0.4		0.6	
Approach LOS	F	C				

Intersection Summary			
Average Delay	7.1		
Intersection Capacity Utilization	75.0%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	5	10	0	25	15	920	0	10	1015	20
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)	11	0	6	11	0	28	17	1045	0	11	1153	23
Pedestrians		3			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)											537	
pX, platoon unblocked	0.78	0.78	0.78	0.78	0.78		0.78					
vC, conflicting volume	1777	2273	591	1688	2284	527	1179			1048		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1422	2062	0	1307	2077	527	651			1048		
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 %	84	100	99	87	100	94	98			98		
cM capacity (veh/h)	69	41	844	89	40	499	731			670		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	17	40	540	523	588	599
Volume Left	11	11	17	0	11	0
Volume Right	6	28	0	0	0	23
cSH	100	215	731	1700	670	1700
Volume to Capacity	0.17	0.19	0.02	0.31	0.02	0.35
Queue Length 95th (ft)	15	17	2	0	1	0
Control Delay (s)	48.5	25.5	0.6	0.0	0.5	0.0
Lane LOS	E	D	A		A	
Approach Delay (s)	48.5	25.5	0.3		0.2	
Approach LOS	E	D				

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	2	0	2	15	2	35	5	925	25	5	1030	10
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)	2	0	2	17	2	40	6	1051	28	6	1170	11
Pedestrians		2			1			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			TWLTL	
Median storage veh)											2	
Upstream signal (ft)											285	
pX, platoon unblocked	0.75	0.75	0.75	0.75	0.75		0.75					
vC, conflicting volume	1767	2281	594	1678	2273	541	1184			1081		
vC1, stage 1 conf vol	1190	1190		1078	1078							
vC2, stage 2 conf vol	578	1092		600	1195							
vCu, unblocked vol	1348	2037	0	1228	2026	541	566			1081		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	100	92	99	92	99			99		
cM capacity (veh/h)	273	222	812	225	225	490	757			653		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3
Volume Total	5	59	6	701	379	6	780	402
Volume Left	2	17	6	0	0	6	0	0
Volume Right	2	40	0	0	28	0	0	11
cSH	408	354	757	1700	1700	653	1700	1700
Volume to Capacity	0.01	0.17	0.01	0.41	0.22	0.01	0.46	0.24
Queue Length 95th (ft)	1	15	1	0	0	1	0	0
Control Delay (s)	13.9	17.2	9.8	0.0	0.0	10.6	0.0	0.0
Lane LOS	B	C	A			B		
Approach Delay (s)	13.9	17.2	0.1			0.1		
Approach LOS	B	C						

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	42.4%	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 (vph)	35	830	95	505	900	190	110	130	360	190	140	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	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.98		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	4704		1662	3238		1630	1750	1488	1662	1658	
Flt Permitted	0.17	1.00		0.17	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	299	4704		299	3238		1630	1750	1488	1662	1658	
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)	39	933	107	567	1011	213	124	146	404	213	157	39
RTOR Reduction (vph)	0	13	0	0	16	0	0	0	357	0	9	0
Lane Group Flow (vph)	39	1027	0	567	1208	0	124	146	47	213	187	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%	4%
Turn Type	pm+pt			pm+pt			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6					4			
Actuated Green, G (s)	26.4	26.4		54.6	54.6		10.3	11.7	11.7	14.7	16.1	
Effective Green, g (s)	26.4	26.4		54.6	54.6		10.3	11.7	11.7	14.7	16.1	
Actuated g/C Ratio	0.26	0.26		0.55	0.55		0.10	0.12	0.12	0.15	0.16	
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	4.6		2.5	4.6		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	120	1242		589	1768		168	205	174	244	267	
v/s Ratio Prot	0.01	c0.22		c0.30	0.37		0.08	0.08		c0.13	c0.11	
v/s Ratio Perm	0.08			c0.23					0.03			
v/c Ratio	0.33	0.83		0.96	0.68		0.74	0.71	0.27	0.87	0.70	
Uniform Delay, d1	29.7	34.6		27.0	16.4		43.5	42.5	40.3	41.7	39.7	
Progression Factor	1.00	1.00		0.95	0.98		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.2	6.4		24.8	1.1		14.7	10.4	0.6	27.0	7.2	
Delay (s)	30.8	41.0		50.5	17.2		58.3	52.9	40.9	68.8	46.8	
Level of Service	C	D		D	B		E	D	D	E	D	
Approach Delay (s)		40.7			27.7			46.7			58.3	
Approach LOS		D			C			D			E	

Intersection Summary			
HCM Average Control Delay	37.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	82.3%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	10	1370	1575	40	25	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)	11	1522	1750	44	28	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		387	407			
pX, platoon unblocked	0.77				0.86	0.77
vC, conflicting volume	1794				2302	897
vC1, stage 1 conf vol					1772	
vC2, stage 2 conf vol					530	
vCu, unblocked vol	1431				877	264
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				82	96
cM capacity (veh/h)	370				150	569

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	316	609	609	1167	628	50
Volume Left	11	0	0	0	0	28
Volume Right	0	0	0	0	44	22
cSH	370	1700	1700	1700	1700	224
Volume to Capacity	0.03	0.36	0.36	0.69	0.37	0.22
Queue Length 95th (ft)	2	0	0	0	0	21
Control Delay (s)	1.1	0.0	0.0	0.0	0.0	25.7
Lane LOS	A					D
Approach Delay (s)	0.2			0.0		25.7
Approach LOS						D

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	59.5%	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)	0	1045	350	305	1510	0	0	0	0	260	2	105
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		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1488	1471	3292					1321	1329	1466
Flt Permitted		1.00	1.00	0.19	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1488	293	3292					1321	1329	1466
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	1100	368	321	1589	0	0	0	0	274	2	111
RTOR Reduction (vph)	0	0	162	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	1100	206	321	1589	0	0	0	0	137	139	59
Confl. Peds. (#/hr)										4		2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		55.9	55.9	76.5	76.5					14.5	14.5	14.5
Effective Green, g (s)		55.9	55.9	76.5	76.5					14.5	14.5	14.5
Actuated g/C Ratio		0.56	0.56	0.76	0.76					0.14	0.14	0.14
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1840	832	414	2518					192	193	213
v/s Ratio Prot		0.33		c0.12	0.48							
v/s Ratio Perm			0.14	c0.47						0.10	0.10	0.04
v/c Ratio		0.60	0.25	0.78	0.63					0.71	0.72	0.28
Uniform Delay, d1		14.6	11.3	18.1	5.3					40.8	40.8	38.1
Progression Factor		0.29	0.17	0.59	0.45					1.00	1.00	1.00
Incremental Delay, d2		0.9	0.4	5.6	0.4					11.1	11.7	0.5
Delay (s)		5.1	2.4	16.2	2.8					51.9	52.5	38.6
Level of Service		A	A	B	A					D	D	D
Approach Delay (s)		4.4			5.1			0.0			48.3	
Approach LOS		A			A			A			D	

Intersection Summary			
HCM Average Control Delay	9.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
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 (vph)	90	1215	0	0	1270	500	545	0	410	0	0	0
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	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.99			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	1309			
Flt Permitted	0.09	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	156	3197			3228	1299	1564	1564	1309			
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)	94	1266	0	0	1323	521	568	0	427	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	278	0	0	34	0	0	0
Lane Group Flow (vph)	94	1266	0	0	1323	243	284	284	393	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	54.7	54.7			46.6	46.6	36.3	36.3	36.3			
Effective Green, g (s)	54.7	54.7			46.6	46.6	36.3	36.3	36.3			
Actuated g/C Ratio	0.55	0.55			0.47	0.47	0.36	0.36	0.36			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	140	1749			1504	605	568	568	475			
v/s Ratio Prot	0.02	c0.40			c0.41							
v/s Ratio Perm	0.35					0.19	0.18	0.18	c0.30			
v/c Ratio	0.67	0.72			0.88	0.40	0.50	0.50	0.83			
Uniform Delay, d1	36.1	17.0			24.2	17.5	24.8	24.8	29.0			
Progression Factor	0.64	0.59			0.42	0.08	1.00	1.00	1.00			
Incremental Delay, d2	8.9	1.4			3.3	0.8	0.7	0.7	11.2			
Delay (s)	31.8	11.5			13.3	2.2	25.5	25.5	40.2			
Level of Service	C	B			B	A	C	C	D			
Approach Delay (s)		12.9			10.2			31.8			0.0	
Approach LOS		B			B			C			A	

Intersection Summary			
HCM Average Control Delay	16.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.83		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	9.0
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 (vph)	45	1355	225	40	1495	95	245	15	70	50	5	30
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	4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.88		1.00	0.87	
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	3260	1102	1471	3260	1488	1309	1356		1662	1528	
Flt Permitted	0.08	1.00	1.00	0.09	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	140	3260	1102	139	3260	1488	1309	1356		1662	1528	
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)	50	1506	250	44	1661	106	272	17	78	56	6	33
RTOR Reduction (vph)	0	0	106	0	0	30	0	69	0	0	32	0
Lane Group Flow (vph)	50	1506	144	44	1661	76	272	26	0	56	7	0
Heavy Vehicles (%)	0%	2%	35%	13%	2%	0%	27%	0%	16%	0%	0%	0%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	53.6	53.6	53.6	52.5	52.5	52.5	22.9	11.8		14.7	3.6	
Effective Green, g (s)	53.6	53.6	53.6	52.5	52.5	52.5	22.9	11.8		14.7	3.6	
Actuated g/C Ratio	0.54	0.54	0.54	0.52	0.52	0.52	0.23	0.12		0.15	0.04	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.5	1.0	1.0	2.5	1.0	1.0	2.5	2.5		2.5	4.0	
Lane Grp Cap (vph)	128	1747	591	105	1712	781	300	160		244	55	
v/s Ratio Prot	0.01	c0.46		0.01	c0.51		c0.21	c0.02		0.03	0.00	
v/s Ratio Perm	0.20		0.13	0.21		0.05						
v/c Ratio	0.39	0.86	0.24	0.42	0.97	0.10	0.91	0.16		0.23	0.13	
Uniform Delay, d1	21.5	20.0	12.4	30.6	23.0	11.9	37.5	39.7		37.7	46.7	
Progression Factor	1.13	0.94	1.74	0.51	0.42	0.30	1.00	1.00		1.00	1.00	
Incremental Delay, d2	1.0	4.3	0.7	0.5	6.3	0.1	29.0	0.4		0.4	1.5	
Delay (s)	25.5	23.0	22.2	16.2	16.0	3.6	66.5	40.0		38.0	48.2	
Level of Service	C	C	C	B	B	A	E	D		D	D	
Approach Delay (s)		23.0			15.3			59.6			42.2	
Approach LOS		C			B			E			D	

Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	17.5
Intersection Capacity Utilization	73.8%	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)	625	830	50	10	960	50	80	20	5	65	25	605
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	3.5	5.0		3.5	5.0			4.5	4.5		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	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1614	3045		1662	3209			1365	1488		1621	1458
Flt Permitted	0.14	1.00		0.29	1.00			0.68	1.00		0.67	1.00
Satd. Flow (perm)	232	3045		513	3209			964	1488		1118	1458
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)	694	922	56	11	1067	56	89	22	6	72	28	672
RTOR Reduction (vph)	0	4	0	0	4	0	0	0	5	0	0	530
Lane Group Flow (vph)	694	974	0	11	1119	0	0	111	1	0	100	142
Heavy Vehicles (%)	3%	5%	62%	0%	3%	0%	29%	0%	0%	0%	15%	2%
Turn Type	pm+pt			pm+pt			Perm		Perm	Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases	2			6			8		8	4		4
Actuated Green, G (s)	69.1	69.1		33.6	32.1			15.1	15.1		15.1	15.1
Effective Green, g (s)	69.1	69.1		33.6	32.1			15.1	15.1		15.1	15.1
Actuated g/C Ratio	0.69	0.69		0.34	0.32			0.15	0.15		0.15	0.15
Clearance Time (s)	3.5	5.0		3.5	5.0			4.5	4.5		4.5	4.5
Vehicle Extension (s)	3.0	1.0		3.0	1.0			2.5	2.5		1.0	1.0
Lane Grp Cap (vph)	710	2104		205	1030			146	225		169	220
v/s Ratio Prot	c0.39	0.32		0.00	c0.35							
v/s Ratio Perm	0.29			0.02				c0.12	0.00		0.09	0.10
v/c Ratio	0.98	0.46		0.05	1.09			0.76	0.00		0.59	0.65
Uniform Delay, d1	24.5	7.0		22.5	34.0			40.7	36.1		39.6	39.9
Progression Factor	0.50	0.28		0.30	0.30			1.00	1.00		1.00	1.00
Incremental Delay, d2	21.5	0.5		0.1	48.4			19.7	0.0		3.7	4.8
Delay (s)	33.7	2.4		6.8	58.5			60.4	36.1		43.2	44.8
Level of Service	C	A		A	E			E	D		D	D
Approach Delay (s)		15.4			58.0			59.2			44.6	
Approach LOS		B			E			E			D	

Intersection Summary			
HCM Average Control Delay	36.0	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	13.0
Intersection Capacity Utilization	92.0%	ICU Level of Service	F
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)	250	430	90	10	800	615	75	360	5	275	495	135
Ideal Flow (vphpl)	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750
Total Lost time (s)	4.5	6.5	6.5	4.5	6.5	6.5	4.5	6.5		4.5	6.5	6.5
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1511	3228	1458	1630	3260	1444	1630	1664		1630	1699	1271
Flt Permitted	0.15	1.00	1.00	0.34	1.00	1.00	0.35	1.00		0.17	1.00	1.00
Satd. Flow (perm)	244	3228	1458	577	3260	1444	598	1664		292	1699	1271
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)	278	478	100	11	889	683	83	400	6	306	550	150
RTOR Reduction (vph)	0	0	60	0	0	299	0	1	0	0	0	98
Lane Group Flow (vph)	278	478	40	11	889	384	83	405	0	306	550	53
Heavy Vehicles (%)	10%	3%	2%	2%	2%	3%	2%	5%	2%	2%	3%	17%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	42.5	40.5	40.5	26.8	26.8	26.8	28.7	26.7		35.5	35.5	35.5
Effective Green, g (s)	42.0	40.0	40.0	26.3	26.3	26.3	28.2	26.2		35.0	35.0	35.0
Actuated g/C Ratio	0.42	0.40	0.40	0.26	0.26	0.26	0.28	0.26		0.35	0.35	0.35
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	1.5	4.6	4.6	1.5	3.8	3.8	1.5	3.5		1.5	3.5	3.5
Lane Grp Cap (vph)	280	1291	583	155	857	380	197	436		256	595	445
v/s Ratio Prot	c0.14	0.15		0.00	c0.27		0.01	c0.24		c0.14	0.32	
v/s Ratio Perm	c0.28		0.03	0.02		0.27	0.11			c0.28		0.04
v/c Ratio	0.99	0.37	0.07	0.07	1.04	1.01	0.42	0.93		1.20	0.92	0.12
Uniform Delay, d1	35.5	21.1	18.5	30.0	36.9	36.9	33.9	36.0		28.0	31.2	22.0
Progression Factor	0.87	0.95	0.85	1.00	1.00	1.00	1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	49.3	0.8	0.2	0.1	40.8	48.7	0.5	26.4		119.5	20.5	0.1
Delay (s)	80.4	20.8	15.9	30.1	77.7	85.5	34.5	62.4		147.6	51.7	22.2
Level of Service	F	C	B	C	E	F	C	E		F	D	C
Approach Delay (s)		39.6			80.7			57.6			76.5	
Approach LOS		D			F			E			E	

Intersection Summary			
HCM Average Control Delay	67.8	HCM Level of Service	E
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	15.5
Intersection Capacity Utilization	94.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

1: 7th St & E Pine St Performance by movement

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay (hr)	0.9	0.1	1.1	0.2	0.1	0.5	0.3	8.9	0.2	0.0	0.2	0.0
Delay / Veh (s)	72.4	45.5	68.1	140.9	210.6	51.4	50.0	39.7	84.8	7.0	0.8	0.9

1: 7th St & E Pine St Performance by movement

Movement	All
Total Delay (hr)	12.4
Delay / Veh (s)	23.7

2: 8th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWR	NEL	NET	SWL	SWT	SWR	All
Total Delay (hr)	0.2	0.2	0.2	0.5	0.1	2.5	0.0	0.2	0.0	3.9
Delay / Veh (s)	74.7	146.3	100.7	77.3	16.0	10.2	10.2	0.6	0.8	7.5

3: 9th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	All
Total Delay (hr)	0.0	0.0	0.3	0.0	0.6	0.0	3.2	0.1	0.0	0.2	0.0	4.5
Delay / Veh (s)	83.1	14.1	69.2	31.7	73.0	16.8	13.3	6.8	12.8	1.0	1.6	8.7

4: E Pine St & 10th St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.5	11.5	1.0	8.6	5.1	0.9	3.8	3.4	5.8	9.8	5.3	1.7
Delay / Veh (s)	55.5	53.0	43.7	69.9	23.4	19.5	133.3	103.6	63.4	197.6	147.2	153.6

4: E Pine St & 10th St Performance by movement

Movement	All
Total Delay (hr)	57.3
Delay / Veh (s)	64.8

5: E Pine St & Jewett Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Total Delay (hr)	0.2	4.3	11.0	0.1	6.8	6.1	28.5
Delay / Veh (s)	82.1	12.1	28.5	14.9	1354.3	1460.0	37.3

6: E Pine St & SB Off Ramp Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Total Delay (hr)	5.3	0.6	7.6	23.0	8.1	0.1	3.9	48.5
Delay / Veh (s)	19.0	6.3	97.5	62.8	125.4	152.0	140.8	53.7

7: E Pine St & NB On Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Total Delay (hr)	2.3	8.4	11.9	1.3	14.6	10.2	48.7
Delay / Veh (s)	89.9	26.9	37.4	10.2	109.6	97.8	47.7

8: E Pine St & Peninger Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.6	10.1	0.7	1.0	33.4	1.5	8.8	0.4	1.8	0.6	0.1	0.4
Delay / Veh (s)	55.2	28.3	12.9	105.8	87.9	69.1	141.7	122.3	95.0	44.3	59.9	51.3

8: E Pine St & Peninger Rd Performance by movement

Movement	All
Total Delay (hr)	59.4
Delay / Veh (s)	63.1

9: E Pine St & Hamrick Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	28.9	15.2	3.8	0.5	56.5	2.7	2.0	0.4	0.0	2.1	0.8	23.3
Delay / Veh (s)	186.8	68.7	307.7	150.5	229.2	224.2	98.8	84.2	11.1	123.4	110.1	145.4

9: E Pine St & Hamrick Rd Performance by movement

Movement	All
Total Delay (hr)	135.9
Delay / Veh (s)	158.1

11: E Pine St & Table Rock Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	6.7	2.8	0.2	0.4	26.2	13.9	1.9	8.3	0.1	43.9	75.0	18.6
Delay / Veh (s)	106.5	18.7	8.9	122.1	120.7	85.3	97.5	82.5	83.7	702.1	647.9	633.1

11: E Pine St & Table Rock Performance by movement

Movement	All
Total Delay (hr)	198.1
Delay / Veh (s)	209.1

Total Network Performance

Total Delay (hr)	599.9
Delay / Veh (s)	304.8

Intersection: 1: 7th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	246	128	209	195	104	74
Average Queue (ft)	92	43	56	45	23	9
95th Queue (ft)	211	128	257	251	78	55
Link Distance (ft)	348	352	517	517	241	241
Upstream Blk Time (%)	3		5	5		
Queuing Penalty (veh)	0		0	0		
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: 8th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LR	LR	LT	TR	LT	TR
Maximum Queue (ft)	106	111	225	229	143	130
Average Queue (ft)	23	37	60	54	14	6
95th Queue (ft)	79	104	208	206	70	54
Link Distance (ft)	351	162	241	241	203	203
Upstream Blk Time (%)		5	9	9	0	
Queuing Penalty (veh)		0	39	41	0	
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: 9th St & E Pine St

Movement	SE	NW	NE	NE	NE	SW	SW	SW
Directions Served	LR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	35	155	37	216	222	26	12	7
Average Queue (ft)	5	48	4	87	94	5	0	0
95th Queue (ft)	25	149	21	231	241	23	6	5
Link Distance (ft)	339	315		203	203		222	222
Upstream Blk Time (%)		3		13	14			
Queuing Penalty (veh)		0		61	66			
Storage Bay Dist (ft)			25			50		
Storage Blk Time (%)			2	23		0		
Queuing Penalty (veh)			7	1		0		

Intersection: 4: E Pine St & 10th St

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	152	250	250	266	250	364	387	203	243	159	200	248
Average Queue (ft)	33	208	211	195	246	329	287	95	112	37	165	164
95th Queue (ft)	98	266	268	269	261	396	416	172	219	164	239	303
Link Distance (ft)		222	222	222		329	329		263			229
Upstream Blk Time (%)		25	24	14		47	14		8	8		20
Queuing Penalty (veh)		81	76	44		378	112		0	0		0
Storage Bay Dist (ft)	100				150			125		130	100	
Storage Blk Time (%)	0	52			63	14		7	6	8	51	23
Queuing Penalty (veh)	0	19			282	72		36	27	19	90	45

Intersection: 5: E Pine St & Jewett Dr

Movement	EB	EB	EB	WB	WB	SB
Directions Served	LT	T	T	T	TR	LR
Maximum Queue (ft)	281	352	262	363	416	310
Average Queue (ft)	90	92	53	283	230	225
95th Queue (ft)	284	323	265	478	494	388
Link Distance (ft)	329	329	329	337	337	306
Upstream Blk Time (%)	3	8	9	24	11	45
Queuing Penalty (veh)	13	37	38	196	89	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	LT	R
Maximum Queue (ft)	360	374	245	374	984	960	212	436	150
Average Queue (ft)	177	174	66	234	596	529	96	222	56
95th Queue (ft)	360	355	169	440	1365	1263	183	742	166
Link Distance (ft)	337	337	337		1231	1231		1226	
Upstream Blk Time (%)	4	4	0		12	8		8	
Queuing Penalty (veh)	19	18	0		111	75		0	
Storage Bay Dist (ft)				275			400		50
Storage Blk Time (%)				7	27			42	0
Queuing Penalty (veh)				49	83			100	0

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	R	L	LT	R
Maximum Queue (ft)	242	535	525	467	466	373	411	604	497
Average Queue (ft)	97	238	229	346	315	131	208	328	328
95th Queue (ft)	209	456	442	544	535	352	411	883	631
Link Distance (ft)		1231	1231	461	461			1042	
Upstream Blk Time (%)				12	10			8	
Queuing Penalty (veh)				101	87			0	
Storage Bay Dist (ft)	175					250	500		500
Storage Blk Time (%)	5	20			17	0	6	7	17
Queuing Penalty (veh)	28	18			82	0	39	47	92

Intersection: 8: E Pine St & Peninger Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	159	475	540	358	183	1104	1153	260	250	384	118	94
Average Queue (ft)	45	294	296	81	43	683	713	31	218	205	43	33
95th Queue (ft)	131	514	567	249	122	1773	1784	188	292	447	96	76
Link Distance (ft)		461	461			1829	1829			334	790	
Upstream Blk Time (%)		2	6			7	6			22		
Queuing Penalty (veh)		15	45			52	47			0		
Storage Bay Dist (ft)	75			215	100			150	150			300
Storage Blk Time (%)	2	34	14	0	0	39	36		48	1		
Queuing Penalty (veh)	12	15	31	1	3	16	34		41	3		

Intersection: 9: E Pine St & Hamrick Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	510	1848	1671	128	1560	1579	319	40	725	490
Average Queue (ft)	474	1223	890	16	1008	1015	122	4	459	429
95th Queue (ft)	661	2225	1844	100	1681	1673	266	23	961	598
Link Distance (ft)		1829	1829		1927	1927	494		685	
Upstream Blk Time (%)		5	1		4	4	1		18	
Queuing Penalty (veh)		36	5		20	20	0		0	
Storage Bay Dist (ft)	400			300				425		300
Storage Blk Time (%)	49	1			68		2			49
Queuing Penalty (veh)	204	6			7		0			44

Intersection: 11: E Pine St & Table Rock

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	498	221	258	173	135	771	780	225	199	540	250	601
Average Queue (ft)	273	80	93	19	17	405	438	128	86	397	227	578
95th Queue (ft)	482	180	202	94	78	710	790	311	197	594	298	658
Link Distance (ft)		1927	1927			759	759			521		564
Upstream Blk Time (%)						4	5			10		49
Queuing Penalty (veh)						0	0			0		0
Storage Bay Dist (ft)	600			150	130			200	175		225	
Storage Blk Time (%)	0		3	0	0	47	28	1	3	45	36	36
Queuing Penalty (veh)	0		3	0	0	5	170	4	12	34	181	98

Intersection: 11: E Pine St & Table Rock

Movement	SB
Directions Served	R
Maximum Queue (ft)	507
Average Queue (ft)	162
95th Queue (ft)	459
Link Distance (ft)	564
Upstream Blk Time (%)	4
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 3982

1: 7th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	2.1	0.7	9.4	0.3	12.4
Delay / Veh (s)	68.5	64.4	40.6	1.0	23.7

2: 8th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	0.5	0.7	2.5	0.2	3.9
Delay / Veh (s)	108.3	85.6	10.3	0.7	7.5

3: 9th St & E Pine St Performance by approach

Approach	SE	NW	NE	SW	All
Total Delay (hr)	0.0	0.9	3.3	0.3	4.5
Delay / Veh (s)	31.4	69.4	13.1	1.0	8.7

4: E Pine St & 10th St Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	13.0	14.5	13.0	16.7	57.3
Delay / Veh (s)	52.2	37.7	85.0	174.3	64.8

5: E Pine St & Jewett Dr Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	4.5	11.2	12.9	28.5
Delay / Veh (s)	12.5	28.1	1402.4	37.3

6: E Pine St & SB Off Ramp Performance by approach

Approach	EB	WB	SB	All
Total Delay (hr)	5.8	30.6	12.1	48.5
Delay / Veh (s)	15.9	68.9	130.2	53.7

7: E Pine St & NB On Ramp Performance by approach

Approach	EB	WB	NB	All
Total Delay (hr)	10.7	13.2	24.8	48.7
Delay / Veh (s)	31.6	29.8	104.3	47.7

8: E Pine St & Peninger Rd Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	11.4	35.9	11.0	1.1	59.4
Delay / Veh (s)	26.9	87.3	130.5	48.5	63.1

9: E Pine St & Hamrick Rd Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	47.8	59.6	2.4	26.1	135.9
Delay / Veh (s)	123.4	227.8	91.0	142.0	158.1

11: E Pine St & Table Rock Performance by approach

Approach	EB	WB	NB	SB	All
Total Delay (hr)	9.7	40.6	10.3	137.6	198.1
Delay / Veh (s)	41.1	105.7	85.0	663.0	209.1

Total Network Performance

Total Delay (hr)	599.9
Delay / Veh (s)	304.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	980	585	485	840	0	0	0	0	375	0	80
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		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1488	1471	3292					1322	1322	1467
Flt Permitted		1.00	1.00	0.10	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1488	162	3292					1322	1322	1467
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	1032	616	511	884	0	0	0	0	395	0	84
RTOR Reduction (vph)	0	0	303	0	0	0	0	0	0	0	0	52
Lane Group Flow (vph)	0	1032	313	511	884	0	0	0	0	197	198	32
Confl. Peds. (#/hr)										4		2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		33.7	33.7	66.0	66.0					15.0	15.0	15.0
Effective Green, g (s)		33.7	33.7	66.0	66.0					15.0	15.0	15.0
Actuated g/C Ratio		0.37	0.37	0.73	0.73					0.17	0.17	0.17
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1233	557	523	2414					220	220	245
v/s Ratio Prot		0.31		c0.30	0.27							
v/s Ratio Perm			0.21	c0.41						0.15	0.15	0.02
v/c Ratio		0.84	0.56	0.98	0.37					0.90	0.90	0.13
Uniform Delay, d1		25.6	22.3	24.7	4.4					36.7	36.8	32.0
Progression Factor		1.00	1.00	0.66	0.31					1.00	1.00	1.00
Incremental Delay, d2		6.9	4.1	30.3	0.1					33.6	34.9	0.2
Delay (s)		32.5	26.4	46.6	1.5					70.3	71.6	32.1
Level of Service		C	C	D	A					E	E	C
Approach Delay (s)		30.2			18.0			0.0			64.2	
Approach LOS		C			B			A			E	

Intersection Summary			
HCM Average Control Delay	30.0	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
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)	70	1290	0	0	1105	180	220	0	200	0	0	0
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	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.99			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	1310			
Flt Permitted	0.17	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	292	3197			3228	1299	1564	1564	1310			
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)	73	1344	0	0	1151	188	229	0	208	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	77	0	0	55	0	0	0
Lane Group Flow (vph)	73	1344	0	0	1151	111	114	115	153	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	62.8	62.8			53.3	53.3	18.2	18.2	18.2			
Effective Green, g (s)	62.8	62.8			53.3	53.3	18.2	18.2	18.2			
Actuated g/C Ratio	0.70	0.70			0.59	0.59	0.20	0.20	0.20			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	280	2231			1912	769	316	316	265			
v/s Ratio Prot	0.01	c0.42			0.36							
v/s Ratio Perm	0.17					0.09	0.07	0.07	c0.12			
v/c Ratio	0.26	0.60			0.60	0.14	0.36	0.36	0.58			
Uniform Delay, d1	6.6	7.1			11.6	8.2	30.9	30.9	32.4			
Progression Factor	0.00	0.02			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.3			1.4	0.4	0.7	0.7	3.0			
Delay (s)	0.2	0.4			13.0	8.6	31.6	31.6	35.5			
Level of Service	A	A			B	A	C	C	D			
Approach Delay (s)		0.4			12.4			33.4			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	10.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.60		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

6: E Pine St & SB Off Ramp Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBR	All
Total Delay (hr)	10.3	3.8	9.6	2.6	19.9	3.1	49.3
Delay / Veh (s)	37.0	22.9	72.3	10.7	190.7	128.5	52.1

7: E Pine St & NB On Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Total Delay (hr)	0.4	3.4	3.2	0.1	2.0	1.0	10.1
Delay / Veh (s)	21.6	9.0	10.5	2.4	33.9	18.3	11.7

Total Network Performance

Total Delay (hr)	63.7
Delay / Veh (s)	59.9

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	LT	R
Maximum Queue (ft)	516	543	550	375	991	790	516	900	150
Average Queue (ft)	296	313	268	314	377	291	358	550	80
95th Queue (ft)	480	491	483	453	971	764	643	1191	200
Link Distance (ft)	595	595	595		1233	1233		1194	
Upstream Blk Time (%)	0	0	1		1			6	
Queuing Penalty (veh)	0	0	0		5			0	
Storage Bay Dist (ft)				275			400		50
Storage Blk Time (%)				32			32	80	
Queuing Penalty (veh)				133			85	214	

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	R	L	LT	R
Maximum Queue (ft)	99	278	314	322	314	89	135	135	221
Average Queue (ft)	41	92	96	153	142	34	71	69	104
95th Queue (ft)	79	205	223	275	262	65	118	114	208
Link Distance (ft)		1233	1233	849	849	849		1042	
Upstream Blk Time (%)									
Queuing Penalty (veh)									
Storage Bay Dist (ft)	175						500		500
Storage Blk Time (%)		1							
Queuing Penalty (veh)		1							

Network Summary

Network wide Queuing Penalty: 438

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	45	5	60	5	2	35	20	920	15	35	1000	35
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	49	5	65	5	2	38	22	1000	16	38	1087	38
Pedestrians		1						1			3	
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)											827	
pX, platoon unblocked	0.82	0.82	0.82	0.82	0.82		0.82					
vC, conflicting volume	1769	2243	564	1740	2254	511	1126			1016		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1493	2073	19	1458	2087	511	706			1016		
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 %	17	87	92	91	95	93	97			94		
cM capacity (veh/h)	59	41	865	59	40	512	736			690		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	120	46	522	516	582	582
Volume Left	49	5	22	0	38	0
Volume Right	65	38	0	16	0	38
cSH	115	206	736	1700	690	1700
Volume to Capacity	1.04	0.22	0.03	0.30	0.06	0.34
Queue Length 95th (ft)	175	20	2	0	4	0
Control Delay (s)	166.8	27.4	0.8	0.0	1.5	0.0
Lane LOS	F	D	A		A	
Approach Delay (s)	166.8	27.4	0.4		0.7	
Approach LOS	F	D				

Intersection Summary			
Average Delay	9.5		
Intersection Capacity Utilization	80.2%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	10	0	5	10	0	25	20	980	0	15	1055	15
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)	11	0	6	11	0	28	23	1114	0	17	1199	17
Pedestrians		3			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)											537	
pX, platoon unblocked	0.76	0.76	0.76	0.76	0.76		0.76					
vC, conflicting volume	1876	2407	611	1801	2415	561	1219			1117		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1527	2222	0	1429	2233	561	665			1117		
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 %	80	100	99	84	100	94	97			97		
cM capacity (veh/h)	56	31	830	70	31	475	710			631		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	SW 1	SW 2
Volume Total	17	40	580	557	616	616
Volume Left	11	11	23	0	17	0
Volume Right	6	28	0	0	0	17
cSH	81	179	710	1700	631	1700
Volume to Capacity	0.21	0.22	0.03	0.33	0.03	0.36
Queue Length 95th (ft)	18	21	2	0	2	0
Control Delay (s)	60.9	30.8	0.9	0.0	0.7	0.0
Lane LOS	F	D	A		A	
Approach Delay (s)	60.9	30.8	0.4		0.4	
Approach LOS	F	D				

Intersection Summary			
Average Delay	1.3		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Lane Configurations												
Volume (veh/h)	5	0	5	20	2	40	5	985	25	5	1060	10
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)	6	0	6	23	2	45	6	1119	28	6	1205	11
Pedestrians		2			1			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			TWLTL	
Median storage veh)											2	
Upstream signal (ft)											285	
pX, platoon unblocked	0.74	0.74	0.74	0.74	0.74		0.74					
vC, conflicting volume	1841	2384	611	1766	2375	575	1218			1149		
vC1, stage 1 conf vol	1224	1224		1146	1146							
vC2, stage 2 conf vol	618	1160		620	1229							
vCu, unblocked vol	1428	2164	0	1327	2153	575	583			1149		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	99	89	99	90	99			99		
cM capacity (veh/h)	257	208	802	204	211	466	737			615		

Direction, Lane #	SE 1	NW 1	NE 1	NE 2	NE 3	SW 1	SW 2	SW 3
Volume Total	11	70	6	746	402	6	803	413
Volume Left	6	23	6	0	0	6	0	0
Volume Right	6	45	0	0	28	0	0	11
cSH	389	321	737	1700	1700	615	1700	1700
Volume to Capacity	0.03	0.22	0.01	0.44	0.24	0.01	0.47	0.24
Queue Length 95th (ft)	2	21	1	0	0	1	0	0
Control Delay (s)	14.5	19.3	9.9	0.0	0.0	10.9	0.0	0.0
Lane LOS	B	C	A			B		
Approach Delay (s)	14.5	19.3	0.0			0.1		
Approach LOS	B	C						

Intersection Summary			
Average Delay	0.7		
Intersection Capacity Utilization	44.1%	ICU Level of Service	A
Analysis Period (min)	15		

HCM Signalized Intersection Capacity Analysis
4: E Pine St & 10th St

12/12/2012

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	35	900	95	560	930	195	110	130	405	220	155	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	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.91		1.00	0.95		1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.99		1.00	0.97		1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1662	4709		1662	3239		1630	1750	1488	1662	1663	
Flt Permitted	0.22	1.00		0.13	1.00		0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	385	4709		227	3239		1630	1750	1488	1662	1663	
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)	39	1011	107	629	1045	219	124	146	455	247	174	39
RTOR Reduction (vph)	0	11	0	0	15	0	0	0	405	0	8	0
Lane Group Flow (vph)	39	1107	0	629	1249	0	124	146	50	247	205	0
Heavy Vehicles (%)	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	2%	4%
Turn Type	pm+pt			pm+pt			Prot		Perm	Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2			6					4			
Actuated Green, G (s)	29.9	26.9		68.5	61.5		13.1	12.0	12.0	17.5	16.4	
Effective Green, g (s)	29.9	26.9		68.5	61.5		13.1	12.0	12.0	17.5	16.4	
Actuated g/C Ratio	0.27	0.24		0.62	0.56		0.12	0.11	0.11	0.16	0.15	
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	4.6		2.5	4.6		2.5	2.5	2.5	2.5	2.5	
Lane Grp Cap (vph)	139	1152		632	1811		194	191	162	264	248	
v/s Ratio Prot	0.01	0.24		c0.34	0.39		0.08	0.08		c0.15	c0.12	
v/s Ratio Perm	0.07			c0.28					0.03			
v/c Ratio	0.28	0.96		1.00	0.69		0.64	0.76	0.31	0.94	0.83	
Uniform Delay, d1	29.9	41.0		29.7	17.4		46.2	47.6	45.2	45.7	45.4	
Progression Factor	1.00	1.00		1.05	0.64		1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.8	18.6		30.7	1.1		5.9	15.9	0.8	38.0	19.4	
Delay (s)	30.7	59.6		62.0	12.2		52.1	63.5	45.9	83.7	64.9	
Level of Service	C	E		E	B		D	E	D	F	E	
Approach Delay (s)		58.7			28.7			50.5			75.0	
Approach LOS		E			C			D			E	

Intersection Summary			
HCM Average Control Delay	45.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Volume (veh/h)	15	1510	1665	45	30	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)	17	1678	1850	50	33	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (ft)		387	407			
pX, platoon unblocked	0.75				0.85	0.75
vC, conflicting volume	1900				2468	950
vC1, stage 1 conf vol					1875	
vC2, stage 2 conf vol					593	
vCu, unblocked vol	1525				847	250
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	95				75	96
cM capacity (veh/h)	330				135	563

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	352	671	671	1233	667	56
Volume Left	17	0	0	0	0	33
Volume Right	0	0	0	0	50	22
cSH	330	1700	1700	1700	1700	194
Volume to Capacity	0.05	0.39	0.39	0.73	0.39	0.29
Queue Length 95th (ft)	4	0	0	0	0	28
Control Delay (s)	1.8	0.0	0.0	0.0	0.0	30.8
Lane LOS	A					D
Approach Delay (s)	0.4			0.0		30.8
Approach LOS						D

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	62.4%	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)	0	1150	390	425	1620	0	0	0	0	290	2	90
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		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1488	1471	3292					1321	1328	1466
Flt Permitted		1.00	1.00	0.12	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1488	183	3292					1321	1328	1466
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	1211	411	447	1705	0	0	0	0	305	2	95
RTOR Reduction (vph)	0	0	218	0	0	0	0	0	0	0	0	48
Lane Group Flow (vph)	0	1211	193	447	1705	0	0	0	0	152	155	47
Confl. Peds. (#/hr)										4		2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		51.5	51.5	85.7	85.7					15.3	15.3	15.3
Effective Green, g (s)		51.5	51.5	85.7	85.7					15.3	15.3	15.3
Actuated g/C Ratio		0.47	0.47	0.78	0.78					0.14	0.14	0.14
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1541	697	490	2565					184	185	204
v/s Ratio Prot		0.37		c0.25	0.52							
v/s Ratio Perm			0.13	c0.47						0.12	0.12	0.03
v/c Ratio		0.79	0.28	0.91	0.66					0.83	0.84	0.23
Uniform Delay, d1		24.6	17.9	25.6	5.6					46.1	46.1	42.1
Progression Factor		0.68	2.41	0.65	0.70					1.00	1.00	1.00
Incremental Delay, d2		1.8	0.4	11.1	0.4					24.6	26.4	0.4
Delay (s)		18.6	43.5	27.7	4.3					70.7	72.5	42.5
Level of Service		B	D	C	A					E	E	D
Approach Delay (s)		24.9			9.1			0.0			64.7	
Approach LOS		C			A			A			E	

Intersection Summary			
HCM Average Control Delay	20.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.0%	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)	65	1375	0	0	1540	560	505	0	565	0	0	0
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	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.99			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	1309			
Flt Permitted	0.07	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	126	3197			3228	1299	1564	1564	1309			
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)	68	1432	0	0	1604	583	526	0	589	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	253	0	0	18	0	0	0
Lane Group Flow (vph)	68	1432	0	0	1604	330	263	263	571	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	58.0	58.0			51.1	51.1	43.0	43.0	43.0			
Effective Green, g (s)	58.0	58.0			51.1	51.1	43.0	43.0	43.0			
Actuated g/C Ratio	0.53	0.53			0.46	0.46	0.39	0.39	0.39			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	100	1686			1500	603	611	611	512			
v/s Ratio Prot	0.01	c0.45			c0.50							
v/s Ratio Perm	0.34					0.25	0.17	0.17	c0.44			
v/c Ratio	0.68	0.85			1.07	0.55	0.43	0.43	1.11			
Uniform Delay, d1	48.7	22.3			29.4	21.2	24.5	24.5	33.5			
Progression Factor	0.30	0.17			0.41	0.03	1.00	1.00	1.00			
Incremental Delay, d2	9.9	2.8			32.8	0.3	0.5	0.5	75.1			
Delay (s)	24.5	6.7			44.9	0.9	25.0	25.0	108.6			
Level of Service	C	A			D	A	C	C	F			
Approach Delay (s)		7.5			33.2			69.2			0.0	
Approach LOS		A			C			E			A	

Intersection Summary			
HCM Average Control Delay	33.5	HCM Level of Service	C
HCM Volume to Capacity ratio	1.06		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	87.0%	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)	160	1490	290	45	1615	280	340	55	85	220	30	145
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	4.0	4.5		4.0	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	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	0.91		1.00	0.88	
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	3260	1102	1471	3260	1488	1309	1450		1662	1532	
Flt Permitted	0.08	1.00	1.00	0.08	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	140	3260	1102	124	3260	1488	1309	1450		1662	1532	
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)	178	1656	322	50	1794	311	378	61	94	244	33	161
RTOR Reduction (vph)	0	0	114	0	0	77	0	50	0	0	117	0
Lane Group Flow (vph)	178	1656	208	50	1794	234	378	105	0	244	77	0
Heavy Vehicles (%)	0%	2%	35%	13%	2%	0%	27%	0%	16%	0%	0%	0%
Turn Type	pm+pt		Perm	pm+pt		Perm	Prot			Prot		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6		6						
Actuated Green, G (s)	56.3	56.3	56.3	53.1	53.1	53.1	27.0	16.1		16.9	6.0	
Effective Green, g (s)	56.3	56.3	56.3	53.1	53.1	53.1	27.0	16.1		16.9	6.0	
Actuated g/C Ratio	0.51	0.51	0.51	0.48	0.48	0.48	0.25	0.15		0.15	0.05	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	4.5	4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.5	1.0	1.0	2.5	1.0	1.0	2.5	2.5		2.5	4.0	
Lane Grp Cap (vph)	160	1669	564	99	1574	718	321	212		255	84	
v/s Ratio Prot	0.06	c0.51		0.01	c0.55		c0.29	0.07		c0.15	0.05	
v/s Ratio Perm	0.50		0.19	0.23		0.16						
v/c Ratio	1.11	0.99	0.37	0.51	1.14	0.33	1.18	0.49		0.96	0.91	
Uniform Delay, d1	48.4	26.6	16.2	25.1	28.4	17.5	41.5	43.2		46.2	51.7	
Progression Factor	0.78	0.68	0.55	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	83.7	13.7	0.9	2.9	71.1	1.2	107.5	1.3		44.1	70.5	
Delay (s)	121.3	31.8	9.7	28.1	99.6	18.7	149.0	44.5		90.2	122.2	
Level of Service	F	C	A	C	F	B	F	D		F	F	
Approach Delay (s)		35.9			86.3			118.6			104.4	
Approach LOS		D			F			F			F	

Intersection Summary			
HCM Average Control Delay	70.5	HCM Level of Service	E
HCM Volume to Capacity ratio	1.12		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.5
Intersection Capacity Utilization	104.5%	ICU Level of Service	G
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)	635	1175	75	25	1165	85	105	35	15	125	55	650
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	0.99		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.97	1.00
Satd. Flow (prot)	1614	3040		1662	3202			1385	1488		1617	1458
Flt Permitted	0.95	1.00		0.19	1.00			0.48	1.00		0.58	1.00
Satd. Flow (perm)	1614	3040		340	3202			691	1488		972	1458
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)	706	1306	83	28	1294	94	117	39	17	139	61	722
RTOR Reduction (vph)	0	4	0	0	4	0	0	0	13	0	0	3
Lane Group Flow (vph)	706	1385	0	28	1384	0	0	156	4	0	200	719
Heavy Vehicles (%)	3%	5%	62%	0%	3%	0%	29%	0%	0%	0%	15%	2%
Turn Type	Prot			pm+pt			Perm		Perm	Perm		pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases				6			8		8	4		4
Actuated Green, G (s)	35.1	75.9		45.4	43.1			27.2	27.2		27.2	62.3
Effective Green, g (s)	35.1	76.9		45.4	44.1			27.7	27.7		27.7	62.3
Actuated g/C Ratio	0.30	0.65		0.38	0.37			0.23	0.23		0.23	0.52
Clearance Time (s)	4.0	5.0		4.0	5.0			4.5	4.5		4.5	4.0
Vehicle Extension (s)	2.5	4.3		2.5	4.0			2.5	2.5		2.5	2.5
Lane Grp Cap (vph)	476	1966		155	1188			161	347		226	764
v/s Ratio Prot	c0.44	0.46		0.00	c0.43							0.28
v/s Ratio Perm				0.07				c0.23	0.00		0.21	0.22
v/c Ratio	1.48	0.70		0.18	1.16			0.97	0.01		0.88	0.94
Uniform Delay, d1	41.9	13.6		24.8	37.4			45.2	35.1		44.1	26.6
Progression Factor	1.00	1.00		1.00	1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2	228.5	1.3		0.4	83.6			60.9	0.0		30.9	19.5
Delay (s)	270.4	14.9		25.2	121.0			106.1	35.1		74.9	46.1
Level of Service	F	B		C	F			F	D		E	D
Approach Delay (s)		101.0			119.1			99.1			52.3	
Approach LOS		F			F			F			D	

Intersection Summary			
HCM Average Control Delay	96.8	HCM Level of Service	F
HCM Volume to Capacity ratio	1.22		
Actuated Cycle Length (s)	118.9	Sum of lost time (s)	12.0
Intersection Capacity Utilization	103.4%	ICU Level of Service	G
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)	470	680	165	5	875	350	170	425	5	275	550	300
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	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	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00		1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1511	3228	1458	1630	3260	1444	1630	1664		1630	1699	1271
Flt Permitted	0.15	1.00	1.00	0.17	1.00	1.00	0.17	1.00		0.18	1.00	1.00
Satd. Flow (perm)	245	3228	1458	286	3260	1444	286	1664		312	1699	1271
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)	495	716	174	5	921	368	179	447	5	289	579	316
RTOR Reduction (vph)	0	0	91	0	0	229	0	1	0	0	0	196
Lane Group Flow (vph)	495	716	83	5	921	139	179	451	0	289	579	120
Heavy Vehicles (%)	10%	3%	2%	2%	2%	3%	2%	5%	2%	2%	3%	17%
Turn Type	pm+pt		Perm	pm+pt		Perm	pm+pt			pm+pt		Perm
Protected Phases	5	2		1	6		3	8		7	4	
Permitted Phases	2		2	6		6	8			4		4
Actuated Green, G (s)	52.2	50.2	50.2	24.8	24.8	24.8	30.0	28.0		33.0	33.0	33.0
Effective Green, g (s)	52.2	52.2	52.2	24.8	26.8	26.8	30.0	30.0		33.0	35.0	35.0
Actuated g/C Ratio	0.47	0.47	0.47	0.23	0.24	0.24	0.27	0.27		0.30	0.32	0.32
Clearance Time (s)	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0		4.0	6.0	6.0
Vehicle Extension (s)	1.5	4.6	4.6	1.5	3.8	3.8	1.5	3.5		1.5	3.5	3.5
Lane Grp Cap (vph)	418	1532	692	74	794	352	151	454		225	541	404
v/s Ratio Prot	c0.28	0.22		0.00	c0.28		0.06	c0.27		c0.13	0.34	
v/s Ratio Perm	0.28		0.06	0.01		0.10	0.26			c0.26		0.09
v/c Ratio	1.18	0.47	0.12	0.07	1.16	0.39	1.19	0.99		1.28	1.07	0.30
Uniform Delay, d1	38.5	19.5	16.1	34.2	41.6	34.8	47.3	39.9		34.5	37.5	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	104.8	1.0	0.4	0.1	85.8	3.3	131.7	40.5		157.4	58.8	0.5
Delay (s)	143.3	20.5	16.4	34.3	127.4	38.1	179.0	80.4		191.9	96.3	28.7
Level of Service	F	C	B	C	F	D	F	F		F	F	C
Approach Delay (s)		63.9			101.6			108.4			101.6	
Approach LOS		E			F			F			F	

Intersection Summary			
HCM Average Control Delay	90.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.10		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	109.5%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

1: 7th St & E Pine St Performance by movement

Movement	SEL	SET	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR
Total Delay (hr)	4.4	0.5	7.8	0.5	0.2	4.2	0.2	9.8	0.2	0.1	0.3	0.0
Delay / Veh (s)	480.7	367.9	572.7	427.4	667.3	563.8	46.9	39.3	52.2	9.4	1.3	1.3

1: 7th St & E Pine St Performance by movement

Movement	All
Total Delay (hr)	28.3
Delay / Veh (s)	52.1

2: 8th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWR	NEL	NET	SWL	SWT	SWR	All
Total Delay (hr)	1.4	0.7	2.2	3.4	0.2	8.2	0.0	0.2	0.0	16.2
Delay / Veh (s)	867.7	473.7	969.8	671.5	34.4	31.4	9.6	0.7	0.7	30.8

3: 9th St & E Pine St Performance by movement

Movement	SEL	SER	NWL	NWT	NWR	NEL	NET	NER	SWL	SWT	SWR	All
Total Delay (hr)	1.1	0.6	0.3	0.1	0.6	0.0	8.7	0.2	0.0	0.2	0.0	11.9
Delay / Veh (s)	826.7	542.0	56.6	70.3	46.9	29.9	34.4	32.3	23.7	1.0	1.1	22.6

4: E Pine St & 10th St Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	0.3	16.4	1.3	6.2	3.2	0.6	10.6	15.6	34.0	53.8	36.1	10.4
Delay / Veh (s)	34.8	71.2	48.9	49.0	14.9	12.4	456.4	544.5	415.1	1759.5	1585.2	1554.1

4: E Pine St & 10th St Performance by movement

Movement	All
Total Delay (hr)	188.4
Delay / Veh (s)	222.1

5: E Pine St & Jewett Dr Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Total Delay (hr)	0.2	13.8	6.6	0.1	12.8	9.1	42.6
Delay / Veh (s)	79.4	41.1	16.6	7.9	4604.8	4658.9	56.6

6: E Pine St & SB Off Ramp Performance by movement

Movement	EBT	EBR	WBL	WBT	SBL	SBT	SBR	All
Total Delay (hr)	21.1	1.3	6.8	12.4	34.2	0.3	12.1	88.3
Delay / Veh (s)	84.2	15.1	68.1	32.2	560.4	585.8	701.0	97.8

7: E Pine St & NB On Ramp Performance by movement

Movement	EBL	EBT	WBT	WBR	NBL	NBR	All
Total Delay (hr)	3.6	60.3	9.3	0.9	60.9	78.8	213.8
Delay / Veh (s)	265.8	214.4	24.6	6.9	531.1	619.0	203.5

8: E Pine St & Peninger Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	7.0	24.5	3.2	1.8	50.0	7.1	41.8	6.9	10.8	20.0	3.2	10.5
Delay / Veh (s)	222.6	78.1	51.4	169.7	124.9	102.5	500.5	525.5	497.5	351.6	366.4	278.8

8: E Pine St & Peninger Rd Performance by movement

Movement	All
Total Delay (hr)	186.7
Delay / Veh (s)	168.4

9: E Pine St & Hamrick Rd Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	37.6	27.1	6.2	0.6	44.1	3.2	1.6	0.6	0.0	2.5	1.1	8.9
Delay / Veh (s)	285.4	109.2	527.6	97.3	155.5	166.5	53.2	53.3	10.8	71.6	67.5	49.1

9: E Pine St & Hamrick Rd Performance by movement

Movement	All
Total Delay (hr)	133.5
Delay / Veh (s)	136.4

10: E Pine St & Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Total Delay (hr)	16.0	3.7	0.3	0.6	92.5	29.0	18.7	48.3	0.7	62.6	118.5	60.4
Delay / Veh (s)	161.1	23.5	9.0	403.2	431.4	346.6	472.8	469.5	532.2	1259.9	1140.8	1055.6

10: E Pine St & Performance by movement

Movement	All
Total Delay (hr)	451.3
Delay / Veh (s)	476.9

Total Network Performance

Total Delay (hr)	1364.1
Delay / Veh (s)	665.5

Intersection: 1: 7th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LTR	LTR	LT	TR	LT	TR
Maximum Queue (ft)	334	239	438	444	161	160
Average Queue (ft)	185	119	205	211	31	13
95th Queue (ft)	411	311	543	560	110	85
Link Distance (ft)	348	352	517	517	241	241
Upstream Blk Time (%)	31	10	7	8	0	0
Queuing Penalty (veh)	0	0	0	0	1	1
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 2: 8th St & E Pine St

Movement	SE	NW	NE	NE	SW	SW
Directions Served	LR	LR	LT	TR	LT	TR
Maximum Queue (ft)	154	176	278	283	107	100
Average Queue (ft)	61	97	180	187	13	6
95th Queue (ft)	181	198	339	353	66	51
Link Distance (ft)	351	162	241	241	203	203
Upstream Blk Time (%)		35	26	31	0	0
Queuing Penalty (veh)		0	127	150	0	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 3: 9th St & E Pine St

Movement	SE	NW	NE	NE	NE	SW	SW	SW
Directions Served	LR	LTR	L	T	TR	L	T	TR
Maximum Queue (ft)	137	130	40	236	265	38	48	68
Average Queue (ft)	50	54	4	183	192	3	3	3
95th Queue (ft)	137	109	22	284	294	20	34	37
Link Distance (ft)	339	315		203	203		222	222
Upstream Blk Time (%)				40	42			
Queuing Penalty (veh)				200	211			
Storage Bay Dist (ft)			25			50		
Storage Blk Time (%)			1	58		0	0	
Queuing Penalty (veh)			3	3		1	0	

Intersection: 4: E Pine St & 10th St

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	TR	L	T	TR	L	T	R	L	TR
Maximum Queue (ft)	199	263	276	259	250	372	367	224	282	281	200	262
Average Queue (ft)	45	231	236	214	233	282	220	107	192	184	191	230
95th Queue (ft)	145	249	270	276	296	461	377	243	355	367	228	298
Link Distance (ft)		222	222	222		329	329		263			229
Upstream Blk Time (%)		56	48	22		23	2		19	24		73
Queuing Penalty (veh)		192	165	75		196	22		0	0		0
Storage Bay Dist (ft)	100				150			125		130	100	
Storage Blk Time (%)	0	70			44	5		10	55	31	83	28
Queuing Penalty (veh)	0	25			210	30		53	283	72	155	64

Intersection: 5: E Pine St & Jewett Dr

Movement	EB	EB	EB	WB	WB	SB
Directions Served	LT	T	T	T	TR	LR
Maximum Queue (ft)	371	408	408	389	414	325
Average Queue (ft)	285	282	229	169	124	276
95th Queue (ft)	451	456	508	413	370	390
Link Distance (ft)	329	329	329	338	338	306
Upstream Blk Time (%)	23	19	19	7	3	73
Queuing Penalty (veh)	111	96	94	59	26	0
Storage Bay Dist (ft)						
Storage Blk Time (%)						
Queuing Penalty (veh)						

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	SB	SB	SB
Directions Served	T	T	R	L	T	T	L	LT	R
Maximum Queue (ft)	380	377	383	375	1197	1011	397	692	150
Average Queue (ft)	338	338	120	275	478	398	120	474	89
95th Queue (ft)	410	414	279	426	1055	892	290	1226	207
Link Distance (ft)	338	338	338		1232	1232		1184	
Upstream Blk Time (%)	46	44	1		2	1		25	
Queuing Penalty (veh)	231	223	3		18	6		0	
Storage Bay Dist (ft)				275			400		50
Storage Blk Time (%)				13	12			42	
Queuing Penalty (veh)				102	53			99	

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB
Directions Served	L	T	T	T	T	R	L	LT	R
Maximum Queue (ft)	275	1272	1282	500	492	424	599	1082	655
Average Queue (ft)	120	1148	1130	334	281	90	240	870	628
95th Queue (ft)	303	1497	1532	531	491	244	513	1401	740
Link Distance (ft)		1232	1232	461	461			1042	
Upstream Blk Time (%)		24	21	3	1			19	
Queuing Penalty (veh)		169	150	28	11			0	
Storage Bay Dist (ft)	175					250	500		500
Storage Blk Time (%)	0	71			5		0	4	51
Queuing Penalty (veh)	2	46			30		0	33	256

Intersection: 8: E Pine St & Peninger Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	TR
Maximum Queue (ft)	175	510	569	390	199	1706	1716	325	250	402	637	397
Average Queue (ft)	155	463	503	160	55	1208	1251	160	246	355	430	238
95th Queue (ft)	216	519	599	406	145	2059	2080	425	258	378	891	493
Link Distance (ft)		461	461			1829	1829			334	790	
Upstream Blk Time (%)		21	33			2	3			58	23	
Queuing Penalty (veh)		205	318			21	28			0	0	
Storage Bay Dist (ft)	75			215	100			150	150			300
Storage Blk Time (%)	68	49	35	0	6	51	46		70	10	36	13
Queuing Penalty (veh)	508	78	100	1	50	23	129		98	33	62	29

Intersection: 9: E Pine St & Hamrick Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	LT	R	LT	R
Maximum Queue (ft)	510	1865	1882	362	1360	1399	292	43	438	477
Average Queue (ft)	507	1612	1199	39	880	889	147	10	169	319
95th Queue (ft)	518	2180	2207	209	1634	1642	256	36	340	473
Link Distance (ft)		1829	1829		1927	1927	494		685	
Upstream Blk Time (%)		15	4		1	3			1	
Queuing Penalty (veh)		130	31		5	23			0	
Storage Bay Dist (ft)	400			300				425		300
Storage Blk Time (%)	60				52		0		0	10
Queuing Penalty (veh)	354				13		0		0	18

Intersection: 10: E Pine St &

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	R	L	TR	L	T
Maximum Queue (ft)	646	1001	921	74	74	790	794	350	265	566	315	593
Average Queue (ft)	499	443	315	8	6	758	766	226	190	540	294	578
95th Queue (ft)	800	1193	893	43	41	859	859	500	321	552	361	637
Link Distance (ft)		1927	1927			759	759			521		564
Upstream Blk Time (%)						30	43			61		56
Queuing Penalty (veh)						0	0			0		0
Storage Bay Dist (ft)	600			150	130			200	175		225	
Storage Blk Time (%)	26	0	4			72	69		19	65	64	43
Queuing Penalty (veh)	89	2	7			4	242		84	111	354	120

Intersection: 10: E Pine St &

Movement	SB
Directions Served	R
Maximum Queue (ft)	580
Average Queue (ft)	222
95th Queue (ft)	487
Link Distance (ft)	564
Upstream Blk Time (%)	3
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 7352

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	0	1055	655	545	980	0	0	0	0	400	0	100
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		0.95	1.00	1.00	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	0.99
Flpb, ped/bikes		1.00	1.00	1.00	1.00					1.00	1.00	1.00
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1488	1471	3292					1322	1322	1467
Flt Permitted		1.00	1.00	0.11	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1488	169	3292					1322	1322	1467
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	1111	689	574	1032	0	0	0	0	421	0	105
RTOR Reduction (vph)	0	0	291	0	0	0	0	0	0	0	0	60
Lane Group Flow (vph)	0	1111	398	574	1032	0	0	0	0	210	211	45
Confl. Peds. (#/hr)										4		2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	pm+pt						Perm		Perm
Protected Phases		2		1	6						4	
Permitted Phases			2	6						4		4
Actuated Green, G (s)		32.1	32.1	66.1	66.1					14.9	14.9	14.9
Effective Green, g (s)		32.1	32.1	66.1	66.1					14.9	14.9	14.9
Actuated g/C Ratio		0.36	0.36	0.73	0.73					0.17	0.17	0.17
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1174	531	551	2418					219	219	243
v/s Ratio Prot		0.34		c0.34	0.31							
v/s Ratio Perm			0.27	c0.42						0.16	0.16	0.03
v/c Ratio		0.95	0.75	1.04	0.43					0.96	0.96	0.18
Uniform Delay, d1		28.1	25.4	24.9	4.6					37.2	37.3	32.3
Progression Factor		1.00	1.00	0.69	0.31					1.00	1.00	1.00
Incremental Delay, d2		16.2	9.4	45.1	0.2					48.6	50.1	0.3
Delay (s)		44.3	34.8	62.3	1.6					85.9	87.4	32.6
Level of Service		D	C	E	A					F	F	C
Approach Delay (s)		40.7			23.3			0.0			75.8	
Approach LOS		D			C			A			E	

Intersection Summary			
HCM Average Control Delay	38.3	HCM Level of Service	D
HCM Volume to Capacity ratio	1.00		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	9.0
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
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)	70	1380	0	0	1250	190	270	0	245	0	0	0
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	0.95			0.95	1.00	0.95	0.95	1.00			
Frpb, ped/bikes	1.00	1.00			1.00	0.98	1.00	1.00	0.99			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	1310			
Flt Permitted	0.12	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	209	3197			3228	1299	1564	1564	1310			
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)	73	1438	0	0	1302	198	281	0	255	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	86	0	0	40	0	0	0
Lane Group Flow (vph)	73	1438	0	0	1302	112	140	141	215	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	5	2			6			8				
Permitted Phases	2					6	8		8			
Actuated Green, G (s)	59.7	59.7			50.8	50.8	21.3	21.3	21.3			
Effective Green, g (s)	59.7	59.7			50.8	50.8	21.3	21.3	21.3			
Actuated g/C Ratio	0.66	0.66			0.56	0.56	0.24	0.24	0.24			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	210	2121			1822	733	370	370	310			
v/s Ratio Prot	0.02	c0.45			c0.40							
v/s Ratio Perm	0.21					0.09	0.09	0.09	c0.16			
v/c Ratio	0.35	0.68			0.71	0.15	0.38	0.38	0.69			
Uniform Delay, d1	9.4	9.3			14.3	9.3	28.8	28.8	31.4			
Progression Factor	0.61	0.04			1.00	1.00	1.00	1.00	1.00			
Incremental Delay, d2	0.2	0.3			2.4	0.4	0.6	0.7	6.5			
Delay (s)	5.9	0.7			16.7	9.8	29.4	29.5	37.9			
Level of Service	A	A			B	A	C	C	D			
Approach Delay (s)		0.9			15.8			33.5			0.0	
Approach LOS		A			B			C			A	

Intersection Summary			
HCM Average Control Delay	12.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	100.8%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

APPENDIX C.

ODOT's Preliminary Traffic Signal Warrants

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	East Pine Street	**Minor Street:**	7th Street
Project:	IAMP 33	**City/County:**	Central Point
Year:	2010	**Alternative:**	Existing

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250

X	100 percent of standard warrants
	70 percent of standard warrants[2]

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	2	10600	14150	N
	Minor	1	2650	450	
Case B	Major	2	15900	14150	N
	Minor	1	1350	450	

Analyst and Date:	Reviewer and Date:

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Major Street:	East Pine Street
Minor Street:	7th Street
Project Name:	IAMP 33
City/County:	Central Point
Analysis Year:	2010
Alternative:	Existing
Meet 70% Warrants?:	No
	100%

Major Approach Lanes:	2
Minor Approach Lanes:	1
Major Approach Volumes (vph):	1415
Minor Approach Volume (vph):	95
Right Turn Volume (vph):	50
Capacity of Shared/Exclusive Right Turn Lane[1]:	216
Right Turn Discount:	184
Right Turn Volume included in Warrant:	0
Minor Approach Volume in Warrant:	45
Major Approach K factor:	
Minor Approach K factor:	

[1] Capacity obtained from unsignalized intersection analysis
For guidance on preliminary signal warrant analysis, refer to the Analysis Procedures Manual.

Last Updated: February 2009

Oregon Department of Transportation

Transportation Development Branch

Transportation Planning Analysis Unit

Preliminary Traffic Signal Warrant Analysis[1]

Major Street:	East Pine Street	**Minor Street:**	7th Street
Project:	IAMP 33	**City/County:**	Central Point
Year:	2034	**Alternative:**	Future Baseline

Preliminary Signal Warrant Volumes

Number of Approach lanes		ADT on major street approaching from both directions		ADT on minor street, highest approaching volume	
Major Street	Minor Street	Percent of standard warrants 100	70	Percent of standard warrants 100	70
Case A: Minimum Vehicular Traffic					
1	1	8850	6200	2650	1850
2 or more	1	10600	7400	2650	1850
2 or more	2 or more	10600	7400	3550	2500
1	2 or more	8850	6200	3550	2500
Case B: Interruption of Continuous Traffic					
1	1	13300	9300	1350	950
2 or more	1	15900	11100	1350	950
2 or more	2 or more	15900	11100	1750	1250
1	2 or more	13300	9300	1750	1250
X	100 percent of standard warrants				
	70 percent of standard warrants[2]				

Preliminary Signal Warrant Calculation

	Street	Number of Lanes	Warrant Volumes	Approach Volumes	Warrant Met
Case A	Major	2	10600	19150	N
	Minor	1	2650	500	
Case B	Major	2	15900	19150	N
	Minor	1	1350	500	
Analyst and Date:			Reviewer and Date:		

[1] Meeting preliminary signal warrants does **not** guarantee that a signal will be installed. When preliminary signal warrants are met, project analysts need to coordinate with Region Traffic to initiate the traffic signal engineering investigation as outlined in the Traffic Manual. Before a signal can be installed, the engineering investigation must be conducted or reviewed by the Region Traffic Manager who will forward signal recommendations to headquarters. Traffic signal warrants must be met and the State Traffic Engineer's approval obtained before a traffic signal can be installed on a state highway.

[2] Used due to 85th percentile speed in excess of 40 mph or isolated community with population of less than 10,000.

Major Street:	East Pine Street
Minor Street:	7th Street
Project Name:	IAMP 33
City/County:	Central Point
Analysis Year:	2034
Alternative:	Future Baseline
Meet 70% Warrants?:	No
	100%

Major Approach Lanes:	2
Minor Approach Lanes:	1
Major Approach Volumes (vph):	1915
Minor Approach Volume (vph):	110
Right Turn Volume (vph):	60
Capacity of Shared/Exclusive Right Turn Lane[1]:	138
Right Turn Discount:	117
Right Turn Volume included in Warrant:	0
Minor Approach Volume in Warrant:	50
Major Approach K factor:	
Minor Approach K factor:	

[1] Capacity obtained from unsignalized intersection analysis

For guidance on preliminary signal warrant analysis, refer to the Analysis Procedures Manual.

Last Updated: February 2009

I-5 Exit 33 (Central Point):
Interchange Area Management Plan

Technical Memorandum #4
Alternatives Analysis

Prepared for

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Prepared by

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June 2014

Table of Contents

4. ALTERNATIVES ANALYSIS

This technical memorandum presents the conceptual development of improvements to address deficiencies within the Interchange 33 Area Management Plan influence area as identified through existing and future baseline analysis.

4.1. Concept Development

The alternatives analysis focused on four areas for consideration within the Interchange 33 influence area:

- Enhanced Network – This network incorporates most of the improvements identified in the E Pine Street Plan which are not currently included in the financially-constrained list of projects in the 2009-2034 Regional Transportation Plan (RTP).
- Interchange Improvements – These concepts identify potential improvements that address deficiencies at the interchange ramps that would still remain with the Enhanced Network.
- West Side Improvements – These concepts focus on the 10th Street/Freeman Road intersection and identify potential improvements to address deficiencies remaining with the Enhanced Network. The concepts build on the downtown 4-lane to 3-lane conversion work that has been done to-date and focus on the area between the southbound ramp terminal and the 10th Street/Freeman Road intersection.
- East Side Improvements – These concepts identify potential improvements east of the interchange ramp terminals that would still remain with the Enhanced Network.

The Interchange, West Side, and East Side concepts all build on the assumptions in the enhanced network and could ultimately be combined in various ways within the study area network.

4.2. Alternatives Evaluation

The alternatives analysis includes traffic operations and safety, road geometries and right-of-way requirements, environmental and land use consequences, and cost opinions. In some cases, cost opinions from other documents have been provided. Some concepts do not have improvement layouts or cost opinions at this time because they build on other improvements.

4.2.1. Traffic Operations and Safety

Traffic operations were evaluated for concepts that were identified as having future operational deficiencies. The operational deficiencies assessment focuses on the volume-to-capacity (v/c) ratio and level of service (LOS) for the 2034 future condition. Operational results for the alternatives were compared to the mobility standards set forth in the Highway Design Manual[1] (HDM) for the state facilities and local agency standards for other locations.

Two forecast development scenarios were evaluated for each category of concepts. The first forecast development scenario is consistent with the Rogue Valley Metropolitan Planning Organization (RVMPO) land use forecasts assumed in the preparation of the RTP. The second forecast development scenario includes an alternative land use scenario (ALUS) to assess the operational sensitivity to changes in land use. The assumptions for these scenarios are discussed in more detail in *Revised Draft Technical Memorandum #3: Future Baseline Traffic Conditions.*

Traffic volumes for the interchange ramps were also developed for the AM peak hour because peaking characteristics at the interchange are very different in the morning and afternoon. The AM volumes were developed for both the baseline scenario and the ALUS.

The 2010 existing, 2034 RTP land use, ALUS traffic volumes are presented in Figure 4-1 for easy reference.

Some improvements address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2005 through 2009) are discussed for those improvements that address safety.

4.2.2. Basic Roadway Geometries and Right-of-Way Requirements

Illustrations of basic roadway geometry and right-of-way (ROW) needs were developed for concepts that involve infrastructure improvements. The drawings approximate roadway centerlines, edge of roadway and ROW using available base mapping.

4.2.3. Environmental and Land Use Assessment

Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.

4.2.4. Concepts Cost Opinions

Rough order of magnitude cost opinions have been developed for some concepts using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor but do not include ROW costs, utility relocation, or mitigation of hazardous materials sites. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each project.

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[1] Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity [V/C] Ratio), Highway Design Manual, 2003, online reference: http://egov.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml

4.3. Enhanced Network

The enhanced network combines the future financially-constrained (funded) projects from the RTP with the improvements identified in the East Pine Street Transportation Plan (completed in October 2004 by JRH Transportation Engineering). The East Pine Street Plan recommends a number of improvements; however, not all improvements were included in the analysis for the enhanced network. A brief summary of the improvements assumed in the enhanced network is presented in Table 4-1 and shown in Figure 4-2.

Table 4-1. Enhanced Network Improvements

Projects from E Pine Street Plan Included in Network	Projects from E Pine Street Plan Not Included in Network
• Peninger: Remove signal and convert to right-in/right-out • E Pine from I-5 NB Ramp to Table Rock: Widen to add third westbound through lane • New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick • New north-south street connecting Beebe and new connection to south located between Peninger and Hamrick • Hamrick extension to Peninger south of E Pine • E Pine/Table Rock – Dual eastbound left-turn lanes	• Interchange 33 – Replace left-turn lanes with loop ramps • E Pine from I-5 SB Ramp to I-5 NB Ramp: Widen to add third westbound through lane • E Pine/Hamrick – Dual eastbound left-turn lanes with second northbound receiving lane • Southern extension of Peninger

The Enhanced Network provides additional connectivity, supports development of lands north and south of E Pine Street, and addresses some of the operational issues highlighted in the future baseline analysis. This concept is evaluated with the future baseline forecast volumes as well as the ALUS forecast volume set.

Enhanced Network Traffic Operations and Safety

The traffic operations with the Enhanced Network concept are summarized in Table 4-2. Results are presented for the intersections that would remain signalized within the study area. These locations do not include Peninger, which would be converted to right-in/right-out movements only, or the intersection formed by the new north-south street between Beebe and development south of E Pine Street. The latter location was excluded because it is assumed that the intersection would be designed with adequate capacity to meet mobility standards with forecast demand.

Table 4-2: Intersection Operations with Enhanced Network Concept

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.94	LOS = C	Queuing – WB Left. SB	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.61	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with 2034 RTP Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.86	LOS = D	Queuing – SB Left	V/C <= 0.85[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.78	LOS = B	Queuing – WB Left	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.86	LOS = C	Queuing – NB	V/C <= 0.80[1]
Hamrick:	V/C = 0.94	LOS = C	Queuing – EB Left, SB	V/C <= 0.85[2]
Table Rock:	V/C = 0.88	LOS = D	Queuing – SB Left	V/C <= 0.85[2]
Operations with ALUS Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.95	LOS = D	Queuing – EB, WB Left, SB	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.71	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with ALUS Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.95	LOS = D	Queuing – EB, WB Left, SB Left	V/C <= 0.85[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.90	LOS = B	Queuing – WB	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.96	LOS = C	Queuing – NB	V/C <= 0.80[1]
Hamrick:	V/C = 1.05	LOS = D	Queuing – EB Left, SB	V/C <= 0.85[2]
Table Rock:	V/C = 1.05	LOS = E	Queuing – NB, SB Left	V/C <= 0.85[2]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
3. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The combination of the 2034 RTP land use forecasts with the enhanced network for the PM peak hour would result in forecast operations that exceed mobility standards at four of five signalized intersections during the PM peak hour although none are expected to have demand which exceeds capacity. Only the I-5 southbound ramps are expected to operate below the mobility standards during the PM peak hour; however, the southbound ramps would exceed standards during the AM peak hour. Although overall LOS at the signalized intersections would be D or better, a number of individual movements would experience extensive queuing and long delays.

Operations with the ALUS forecasts would worsen at all locations. During the PM peak hour, all five signalized intersections would exceed mobility standards with two intersections, Hamrick and Table Rock, which would have demand that exceeds capacity. Extensive queuing at many approaches would occur.

Although the improvements associated with the Enhanced Network concept would improve operations at many of the study area intersections, queues at many locations would remain a significant safety concern. On the freeway ramps, rear end collisions may increase as traffic exiting the freeway would have less distance to slow and come to a stop and queues could cause some additional turbulence on the freeway itself as drivers have to slow in the mainline travel lanes in anticipation of stopping on the ramp. At other locations, queues that spill out of storage bays into the adjacent through lane may result in an increase of rear end or sideswipe collisions as drivers encounter stopped traffic or change lanes to avoid stopped traffic.

Basic Roadway Geometries and Right-of-Way Requirements

No illustrations of basic roadway geometry and ROW needs were developed for the Enhanced Network concept because all of the projects are already listed in the Central Point Transportation System Plan (TSP).

Environmental and Land Use Assessment

No environmental or land use assessment was performed for the Enhanced Network concept because all of the projects are already listed in the Central Point TSP.

Concepts Cost Opinions

The Central Point TSP includes the cost estimates shown in Table 4-3 for the projects included in the Enhanced Network.

Table 4-3. Enhanced Network Costs

Improvement Project	Central Point TSP Reference Number	Estimated Cost
East Pine/Table Rock – Dual eastbound left-turn lanes	#218 – Tier 1 Long Term	$500,000
East Pine from I-5 NB Ramp to Table Rock: Widen to add third westbound through lane	#255– Tier 2	$7,000,000
New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick & New north-south street connecting Beebe and new connection to south located between Peninger and Hamrick & Peninger: Remove signal and convert to right-in/right-out	#245 & #240 – Tier 2	$11,000,000
Hamrick extension to Peninger south of E Pine	#234 – Tier 2	$1,200,000

4.4. Interchange Improvements

Seven potential interchange improvements were identified during the conceptual development to bring the operations up to state standards, provide additional capacity, or address safety concerns. Some of these projects are standalone concepts while others may ultimately be combined into an overall interchange concept. A brief summary of the projects is presented in Table 4-4.

Table 4-4. Summary of Interchange 33 Concepts – Interchange Improvements

ID	Location	General Description	Reason
I-1	I-5 Northbound Off-ramp	Widen the northbound off-ramp to add a second right-turn lane	Safety and Capacity
I-2	I-5 Northbound Off-ramp	Add Northbound loop off-ramp to accommodate high demand for traffic destined for west along E Pine Street	Safety and Capacity
I-3	I-5 Southbound On-ramp	Widen E Pine to provide second westbound left-turn lane	Safety and Capacity
I-4	I-5 Southbound On-ramp	Add Southbound loop on-ramp to accommodate high demand for traffic destined for west along E Pine Street	Safety and Capacity
I-5	I-5 Northbound and Southbound ramp terminals	Modify interchange to create a diverging diamond (with existing structure)	Safety and Capacity
I-6	I-5 Northbound and Southbound ramp terminals	Modify interchange to create a diverging diamond (widening or replacement of structure)	Safety and Capacity
I-7	I-5 Northbound and Southbound ramp terminals	Bridge (Overpass) Widening or Replacement depending on combination of concepts I-1 through I-4	Safety and Capacity

4.4.1. Concept I-1 – I-5 Northbound Off-Ramp – Dual Right-Turn Lanes

Concept I-1 would widen the I-5 northbound off-ramp to add a second right-turn lane at the approach to E Pine Street. The current approach has three lanes (left turn only, left-through, and right turn only). As illustrated in Figure 4-3, the improvement would add a second right-turn lane to provide approximately 350 feet of additional storage for the right-turn movement.

Concept I-1 Traffic Operations and Safety

The traffic operations with Concept I-1 are summarized in Table 4-5. With the 2034 RTP forecasts, the intersection would meet state mobility standards for both AM and PM peak hours. With the ALUS forecasts, the PM peak hour would be slightly higher than the standard but substantially improved when compared with the Enhanced Network concept.

Table 4-5: Intersection Operations for Concept I-1

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
I-5 NB Ramps AM:	V/C = 0.56	LOS A	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps PM:	V/C = 0.72	LOS B	Queuing – None	V/C <= 0.80[1]
Operations with ALUS Forecasts				
I-5 NB Ramps AM:	V/C = 0.62	LOS B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps PM:	V/C = 0.82	LOS B	Queuing – None	V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 30 crashes at this intersection, including 15 rear end, 11 turning, 1 pedestrian, 3 other assorted collisions. Concept I-1 would reduce the length of the queues on the ramp while also providing additional storage capacity. As a result, the safety issues associated with long queues extending in the deceleration zone on the ramp would not be a concern. Furthermore, improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes. Improved operations would not have a substantial affect on turning crashes. If no turn on red is permitted for the dual northbound right-turn movement, there may be some improvement in conditions for pedestrians.

Concept I-1 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-1 would widen the I-5 northbound off-ramp to add a second right-turn lane at the approach to E Pine Street. As illustrated in Figure 4-3, the improvement would add a second right-turn lane to provide approximately 350 feet of additional storage for the right-turn movement. Most of the improvement could be accommodated within the existing ROW; however, the second right-turn lane would likely require some additional ROW at the intersection with the current design shown.

Concept I-1 Environmental and Land Use Assessment

Some additional ROW would likely be needed on the ramp near E Pine Street to accommodate the second right-turn lane. This could have some minor impact to the parcel on the southeast corner of the intersection.

The area around the interchange is disturbed by existing development. It lies within the 500-year floodplain for Bear Creek but improvements would not have any direct impact on the creek. There is a hazardous materials site located near the intersection, which will need to be considered if this concept is carried forward.

Concept I-1 Concepts Cost Opinions

The estimate for this concept is $1.3 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

4.4.2. Concept I-2 – I-5 Northbound Off-Ramp – New Loop Ramp

Concept I-2 presents an alternative solution to addressing capacity and queuing concerns on the I-5 northbound off-ramp. Rather than providing more capacity on the existing ramp, as considered with Concept I-1, this concept would add a loop ramp on the north side of the interchange to accommodate high demand by traffic heading westbound on E Pine Street. The existing northbound ramp would remain in place but would be restriped to allow the through movement across E Pine Street and dual right turns for highway traffic heading eastbound on E Pine Street. This improvement was also identified in the E Pine Street Plan. *Figure 4-4* illustrates the concept.

Concept I-2 Traffic Operations and Safety

The traffic operations with the Concept I-2 are summarized in Table 4-6. The results are very similar to those associated with the ramp widening considered with Concept I-1. With the 2034 RTP forecasts, the intersection would meet state mobility standards for both AM and PM peak hours. With the ALUS forecasts, the PM peak hour would be slightly higher than the standard but substantially improved when compared with the Enhanced Network concept.

Table 4-6: Intersection Operations for Concept I-2

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
I-5 NB Ramps AM: I-5 NB Ramps PM:	V/C = 0.57 V/C = 0.71	LOS A LOS B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]
Operations with ALUS Forecasts				
I-5 NB Ramps AM: I-5 NB Ramps PM:	V/C = 0.64 V/C = 0.82	LOS B LOS B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Similar to Concept I-1, Concept I-2 would provide several safety benefits. It would reduce the length of the queues on the northbound off-ramp and the safety issues associated with long queues extending in the deceleration zone on the ramp would not be a concern. Improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes. Improved operations would not have a substantial affect on turning crashes. If no turn on red is permitted for the dual southbound right-turn movement, there may be some improvement in conditions for pedestrians on the south side of E Pine Street but an additional conflict point between vehicles and pedestrians would be added on the north side where the sidewalk crosses the bridge.

Concept I-2 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-2 would add a loop ramp on the north side of the interchange to accommodate high demand by traffic heading westbound on E Pine Street, as illustrated in *Figure 4-4*. The ramp would provide approximately 400 to 450 feet of storage in two lanes.

Adding the loop ramp would require substantial structural work to replace two existing bridge spans with a single span and a substantial retaining wall. Only minimal clearance would be available between the loop ramp barrier and the remaining bridge columns.

The loop ramp would also require realignment of the existing northbound entrance ramp bringing it much closer to Peninger Road. Adding a barrier between the ramp and Peninger would likely be necessary.

These improvements can all be constructed within the existing ROW for I-5 or the abutting ROW for Peninger Road.

Concept I-2 Environmental and Land Use Assessment

The area around the interchange is disturbed by existing development. It lies within the 500-year floodplain for Bear Creek but improvements would not have any direct impact on the creek.

No land use or natural resource impacts are anticipated.

Concept I-2 Concepts Cost Opinions

The estimate for this concept is $9.7 million. This cost does not include acquisition of additional ROW or utility relocation.

4.4.3. Concept I-3 – I-5 Southbound On-Ramp – Dual Westbound Left-Turn Lanes

Concept I-3 would widen E Pine Street to add dual westbound left-turn lanes onto the I-5 southbound on-ramp, as illustrated in *Figure 4-5*. The southbound on-ramp would be widened to provide two receiving lanes that merge before traffic enters the freeway. The widening of E Pine Street would begin just west of the bridge structure and the second left-turn lane would have 150 to 200 feet of additional storage. The existing left-turn lane would be restriped to provide additional storage as well.

Concept I-3 Traffic Operations and Safety

The traffic operations with Concept I-3 are summarized in Table 4-7. The intersection would meet state mobility standards for both AM and PM peak hours with both the 2034 RTP and ALUS forecasts.

Table 4-7: Intersection Operations for Concept I-3

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
I-5 SB Ramps AM: I-5 SB Ramps PM:	V/C = 0.74 V/C = 0.66	LOS B LOS B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]
Operations with ALUS Forecasts				
I-5 SB Ramps AM: I-5 SB Ramps PM:	V/C = 0.79 V/C = 0.79	LOS B LOS B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 19 crashes at this intersection, including 9 rear end, 6 turning, 4 assorted collisions. Concept I-3 would reduce the queue spillover on the westbound approach which would reduce future safety hazards at the intersection. Improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes. Improved operations would not have a substantial affect on turning crashes.

Concept I-3 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-3 would widen E Pine Street to add dual westbound left-turn lanes onto the I-5 southbound on-ramp, as illustrated in *Figure 4-5*. The southbound on-ramp would be widened to provide two receiving lanes that merge before traffic enters the freeway. The widening of E Pine Street would begin just west of the bridge structure and the second left-turn lane would have 150 to 200 feet of additional storage.

The concept as illustrated, assumes that widening would occur on the south side only and was based on a 30 mph design speed, which could require a design exception. Some widening and realignment for a distance of 350 to 400 feet would be needed on the west side of the intersection to minimize the through lane offset for eastbound traffic. This widening would impact ROW in the southwest quadrant of the intersection.

Widening to both sides would allow a 35 mph design speed but would impact ROW in the northwest quadrant of the intersection as well.

Concept I-3 Environmental and Land Use Assessment

Some additional ROW would likely be needed along E Pine Street west of the southbound ramp to accommodate the second left-turn lane. This could have some impact to several parcels in the southwest quadrant of the intersection. No structure impacts are expected based on the basic roadway geometries.

The area around the interchange is disturbed by existing development. There are several hazardous materials sites located in the southwest quadrant of the intersection, which will need to be considered if this concept is carried forward.

Concept I-3 Concepts Cost Opinions

The estimate for this concept is $1.7 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

4.4.4. Concept I-4 – I-5 Southbound On-Ramp – New Loop Ramp

Concept I-4 presents an alternative solution to addressing capacity and queuing concerns at the I-5 southbound ramp intersection. Rather than providing more capacity for the westbound left-turn movement from E Pine Street, as considered with Concept I-3, this concept would add a loop ramp on the north side of the interchange to accommodate the high demand from traffic heading westbound on E Pine Street to southbound I-5. The existing southbound ramp would remain in place but would only serve traffic heading eastbound on E Pine Street. This improvement was also identified in the E Pine Street Plan. *Figure 4-6* illustrates the concept.

Concept I-4 would reduce the number of travel lanes on the bridge. With fewer travel lanes, a sidewalk on the south side of E Pine Street could be added without widening the bridge although some widening on the south side would be needed near the northbound ramp terminal. Adding sidewalk was not included in basic roadway geometry for this concept.

Concept I-4 Traffic Operations and Safety

The traffic operations with the Concept I-4 are summarized in Table 4-8. The results are very similar to those associated with the ramp widening considered with Concept I-3. The intersection would meet state mobility standards for both AM and PM peak hours with both the 2034 RTP and ALUS forecasts.

Table 4-8: Intersection Operations for Concept I-4

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
I-5 SB Ramps AM: I-5 SB Ramps PM:	V/C = 0.53 V/C = 0.66	LOS B LOS B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]
Operations with ALUS Forecasts				
I-5 SB Ramps AM: I-5 SB Ramps PM:	V/C = 0.58 V/C = 0.74	LOS B LOS A	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Similar to Concept I-3, Concept I-4 would provide several safety benefits. It would remove the westbound left-turn movement which would eliminate any queue spillover and also reduce the number of conflict movements. Reduced turning conflicts could result in few turning collisions. However, an additional conflict point between vehicles and pedestrians would be added on the north side of E Pine Street where the sidewalk crosses the bridge.

Concept I-4 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-4 would add a loop ramp on the north side of the interchange to accommodate high demand from traffic heading westbound on E Pine Street to southbound I-5, as illustrated in Figure 4-6. A free flow right-turn configuration was not utilized with the loop ramp because it would require substantial realignment of existing SB exit ramp to fit minimum radius curve.

Adding the loop ramp would require substantial structural work to replace two existing bridge spans with a single span and a substantial retaining wall. Only minimal clearance would be available between the loop ramp barrier and the remaining bridge columns.

The loop ramp would also require extending the existing southbound entrance ramp to meet standard spacing for consecutive entrance ramps. Extending the existing ramp would have significant ROW requirements from the parcels adjacent to the ramp and along the highway. It will also require some retaining walls because of the grade differential with the adjacent properties.

Although not included in the basic roadway geometry for Concept I-4, a sidewalk on the south side of E Pine Street could be added because there would be fewer travel lanes on the bridge. Some widening on the south side would be needed near the northbound ramp terminal.

Concept I-4 Environmental and Land Use Assessment

Additional ROW would be needed along the existing southbound on-ramp and a stretch of I-5. This would impact several parcels in the southwest quadrant of the intersection. No structure impacts are expected based on the basic roadway geometries but loss of parking for some businesses would be likely even with substantial retaining walls.

The area around the interchange is disturbed by existing development. There are several hazardous materials sites located in the southwest quadrant of the intersection, which will need to be considered if this concept is carried forward.

Concept I-4 Concepts Cost Opinions

The estimate for this concept is $11.0 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

No cost opinion was prepared for adding a sidewalk to the south side of E Pine Street.

4.4.5. Concept I-5 – Diverging Diamond Interchange with No Bridge Widening

Concept I-5 would modify the entire interchange to a diverging diamond interchange (DDI) form, as illustrated in *Figure 4-7*. The DDI design can sometimes result in a smaller footprint at high volume interchange locations. At the same time, the DDI provides a number of operational and safety benefits over traditional interchange designs. Concept I-5 was developed to determine if a DDI could be created using the existing bridge across the freeway. Concept I-6 considers a DDI with bridge widening.

Concept I-5 Traffic Operations and Safety

Although the initial concept appears complicated, a DDI actually simplifies the traffic movements through an interchange. Some of the general operational and safety benefits include:

- All turning movements become “free” left or right turns onto and off of the ramps.
- The crossover intersections would remain signalized but would only have two phases of operation, which increases capacity and can allow for shorter cycle lengths and better progression between traffic lights.
- Increased capacity for left-turn movements without having to add more turn lanes.

- Fewer vehicular conflict points (i.e., locations where vehicle paths cross, merge, or separate).
- Shorter pedestrian crossings can be created that have fewer conflict points with vehicles.

Traffic operations with the DDI in Concept I-5 are summarized in Table 4-9. Because of the lane limitations imposed by maintaining the existing bridge cross-section, the east crossover intersection (near the northbound ramps) would exceed the mobility standard during both the AM and PM peak hours with the 2034 RTP forecasts. Some minor queuing would be present at both of the signalized crossovers that could impact nearby intersections (10th/Freeman to the west and Peninger to the east). Conditions would worsen with the ALUS with significant congestion at the east crossover intersection during both peak hours and an overall v/c ratio that would exceed mobility standards at the west crossover intersection (near the southbound ramps). Queuing across the bridge would affect the southbound off-ramp as well.

Table 4-9: Intersection Operations for Concept I-5

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
West Crossover AM:	V/C = 0.56	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover AM:	V/C = 0.88	LOS C	Queuing – None	V/C <= 0.80[1]
West Crossover PM:	V/C = 0.75	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover PM:	V/C = 0.91	LOS C	Queuing – WB, EB	V/C <= 0.80[1]
Operations with ALUS Forecasts				
West Crossover AM:	V/C = 0.64	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover AM:	V/C = 0.96	LOS D	Queuing – EB	V/C <= 0.80[1]
West Crossover PM:	V/C = 0.82	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover PM:	V/C = 1.07	LOS E	Queuing – EB, WB	V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 49 crashes at the two ramp intersections, including 24 rear end, 17 turning, 2 angle, 1 pedestrian, and 5 assorted collisions. Concept I-5 would eliminate many of the conflicts that can result in turning or angle collisions. With fewer vehicles stopping at the traffic signals, there may also be some reduction in rear end collisions. Shorter crossing distances and few simultaneous conflict points could improve pedestrian safety but the benefits could be off-set by more unsignalized pedestrian crossings.

Concept I-5 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-5 would modify the entire interchange to a diverging diamond interchange (DDI) form, as illustrated in *Figure 4-7*. The layout was developed using the existing bridge across the freeway. It includes two travel lanes in each direction, bike lanes in both directions, and a pedestrian pathway in the center of the bridge, as shown in the DDI cross-section.

Bicycles would remain on the right side of the travel lanes as they move through the interchange. Bicycle-vehicle conflict points would remain at four locations (westbound to northbound on-ramp, southbound to westbound off-ramp, eastbound to southbound on-ramp, and northbound to eastbound off-ramp) but would be eliminated at the traffic signals since no turns would be made.

Pedestrians would connect to a center pathway using the two signalized crossover intersections at either end of the interchange. The center pathway would connect to sidewalks on both the north and south sides of E Pine Street. By relocating the sidewalk from the north side of the bridge to the center of the bridge, this concept would address the existing deficiency of no sidewalks on the south side of E Pine Street. Pedestrian-vehicle conflict points would remain at four locations (westbound to northbound on-ramp, southbound to westbound off-ramp, eastbound to southbound on-ramp, and northbound to eastbound off-ramp) but would be eliminated at the traffic signals since no turns would be made.

Because I-5 crosses E Pine Street at a skewed angle rather than a right angle, some of the ramps would be more sharply curved than others. The sharper curves already exist for the northbound and southbound entrance ramps but accommodating the DDI design may be more difficult with some of the terrain.

Additional ROW would be needed on both sides of the interchange. The east crossover and northbound ramp connections could potentially shift further west to reduce impacts to the parcels on the south side of E Pine Street (southeast quadrant of the interchange). The west crossover and southbound ramps would have significant ROW needs on the north side of E Pine Street (northwest quadrant) due to three lanes westbound. Some ROW would also be needed along the south side of E Pine Street in the southwest quadrant of the interchange. The crossover could potentially be shifted southwards to reduce impacts on the north side of E Pine Street.

Concept I-5 Environmental and Land Use Assessment

Additional ROW would be needed with DDI in several quadrants. Some additional ROW could be needed from the corner parcel in the southeast quadrant but a shift in the crossover and ramps could possibly avoid impacts. More significant ROW impacts would occur on the west side of the interchange. As laid out in *Figure 4-7*, the gas station in the northwest quadrant would be significantly impacted by construction and there would be some minor ROW acquisition needed in the southwest quadrant. If the intersection is shifted to the south, the gas station impacts could potentially be reduced but impacts on the south side of E Pine Street would be greater.

There are several hazardous materials sites located around the interchange which will need to be considered if this concept is carried forward.

Concept I-5 Concepts Cost Opinions

The estimate for this concept is $8.6 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

4.4.6. Concept I-6 – Diverging Diamond with Bridge Widening

Concept I-6 would also modify the entire interchange to a diverging diamond interchange (DDI) form but would widen the bridge across the freeway to provide a third westbound travel lane and a wider center pathway. In *Figure 4-8*, the widening of the bridge is shown to occur on the south side of the structure.

Concept I-6 Traffic Operations and Safety

Traffic operations with the DDI in Concept I-6 are summarized in Table 4-10. Without lane limitations on the bridge, both the east and west crossover intersections would meet mobility standards with the 2034 RTP forecasts during the AM and PM peak hours. Conditions would worsen with the ALUS and mobility standards would not be met during either the AM or PM peak hours. However, neither of the crossover intersections would have demand that exceeds capacity. While there would be some queuing, impacts to the off ramps would occur only occasionally rather than throughout the peak.

Table 4-10: Intersection Operations for Concept I-6

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
West Crossover AM:	V/C = 0.55	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover AM:	V/C = 0.75	LOS C	Queuing – None	V/C <= 0.80[1]
West Crossover PM:	V/C = 0.74	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover PM:	V/C = 0.76	LOS C	Queuing – EB	V/C <= 0.80[1]
Operations with ALUS Forecasts				
West Crossover AM:	V/C = 0.63	LOS B	Queuing – EB	V/C <= 0.80[1]
East Crossover AM:	V/C = 0.82	LOS D	Queuing – EB	V/C <= 0.80[1]
West Crossover PM:	V/C = 0.81	LOS B	Queuing – WB, EB	V/C <= 0.80[1]
East Crossover PM:	V/C = 0.89	LOS D	Queuing – EB	V/C <= 0.80[1]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Safety benefits of Concept I-6 would be similar to those identified for Concept I-5.

Concept I-6 Basic Roadway Geometries and Right-of-Way Requirements

A revised layout has not been prepared for Concept I-6 but *Figure 4-8* illustrates where the roadway would be wider than Concept I-5. It includes two travel lanes in the eastbound direction, three travel lanes in the westbound direction, bike lanes in both directions, and a pedestrian pathway in the center of the bridge, as shown in the DDI cross-section.

To provide the additional travel lane and wider center pedestrian pathway, the bridge across the freeway would need to be widened. *Figure 4-8* indicates widening to the south, which is where the original portion of the bridge is located. The original bridge was constructed in the 1960's and still has a sufficiency rating of 75.

Bicycle and pedestrian movements through the interchange would be the same as those discussed with Concept I-5.

ROW needs would not be significantly different than those discussed for Concept I-5. Some minor impacts are shown in the southeast quadrant which might be minimized by shifting the crossover and ramps to the west. More significant impacts would occur on the west side of the interchange in both the northwest and southwest quadrants.

Concept I-6 Environmental and Land Use Assessment

Additional ROW needs for Concept I-6 would be basically the same as those identified for Concept I-5. Some additional ROW could be needed from the corner parcel in the southeast quadrant but a shift in the crossover and ramps could possibly avoid impacts. More significant ROW impacts would occur on the west side of the interchange. As laid out in *Figure 4-7*, the gas station in the northwest quadrant would be significantly impacted by construction and there would be some minor ROW acquisition needed in the southwest quadrant. If the intersection is shifted to the south, the gas station impacts could potentially be reduced but impacts on the south side of E Pine Street would be greater.

There are several hazardous materials sites located around the interchange which will need to be considered if this concept is carried forward.

Concept I-6 Concepts Cost Opinions

Cost opinions have not been developed for this concept at this time; however, widening the bridge would substantially increase the cost estimated for Concept I-5.

4.4.7. Concept I-7 – Bridge (Overpass) Widening or Replacement

The existing bridge over I-5 provides two through travel lanes in each direction, a center refuge lane, bike lanes in both direction of travel, and a sidewalk on the north side only. While some solutions address capacity deficiencies at the interchange ramps, many do not address the sidewalk deficiency on the south side of the overpass.

Concept I-7 is intended to be paired with some combination of the first four interchange concepts and will vary depending on the preferred concepts selected. The extent of the widening and/or the potential replacement of the bridge are discussed for the different pairings of concepts Table 4-11.

Table 4-11. Bridge Options with Combined Interchange Improvements	
Interchange Concept Combination	Concept I-7 Improvements
Option 1: *I-1 – I-5 NB Off-Ramp – Dual NB Right-Turn Lanes* *I-3 – I-5 SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine Street • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 2: *I-2 – I-5 NB Off-Ramp – New Loop Ramp* *I-3 – I-5 SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine Street • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 3: *I-1 – I-5 NB Off-Ramp – Dual NB Right-Turn Lanes* *I-4 – I-5 SB On-Ramp – New Loop Ramp*	• Add sidewalk to south side of E Pine Street which may be accomplished without widening
Option 4: *I-2 – I-5 NB Off-Ramp – New Loop Ramp* *I-4 – I-5 SB On-Ramp – New Loop Ramp*	• Consider bridge replacement because combination of significant structural work at either end may require as much work as replacement • Add sidewalk to south side of E Pine Street which may be accomplished without any widening

Concept I-7 Traffic Operations and Safety

The traffic operations with Concept I-7 would depend on the option considered. The findings from Table 4-5 through Table 4-9 would apply at the intersections.

Improvements to safety would also depend on the option considered; however, in all cases, a sidewalk would be included on the south side of E Pine Street. Pedestrians traveling along the roadway between origins and destinations south of E Pine Street would no longer be required to cross over to the north side of the roadway. As a result, pedestrian-vehicle conflict points would be reduced from four crossings to two crossings. Thus pedestrian safety as well as convenience would be improved.

Concept I-7 Basic Roadway Geometries and Right-of-Way Requirements

Concept I-7 is intended to be paired with some combination of the first four interchange concepts. No layouts have been prepared at this point in the analysis because the extent of improvements will vary depending on the preferred concepts selected. The range of potential improvements is listed below from least cost to greatest cost:

- Add sidewalk to south side of E Pine Street without any widening
- Widen bridge to add sidewalk to south side of E Pine Street
- Widen bridge to add sidewalk to south side of E Pine Street and to extend second WB left-turn to provide greater storage distance
- Replace bridge because combination of structural work at either end may require as much work as replacement

Any of these improvements could likely be implemented without additional ROW acquisition beyond the impacts identified under Concepts I-1 through I-4.

Concept I-7 Environmental and Land Use Assessment

The potential bridge improvements could likely be implemented without additional ROW acquisition beyond the impacts identified under Concepts I-1 through I-4.

Concept I-7 Concepts Cost Opinions

Cost opinions have not been developed for this concept at this time.

4.5. West Side Improvements

Four potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns. A brief summary of the projects is presented in Table 4-12.

Table 4-12. Summary of Interchange 33 Concepts – West Side Improvements

ID	Location	General Description	Reason
W-1	I-5 southbound ramps terminal to 10th St/Freeman Rd	• Jewett School Rd: Restrict access to right-in/right-out • E Pine St: Add second westbound left-turn lane onto Freeman and minimize ROW impacts by reducing number of eastbound through travel lanes • Freeman Rd: Add second southbound receiving lane on Freeman from E Pine to Oak • 10th Street: Extend left-turn lane striping to Manzanita	Safety and Capacity
W-2	I-5 southbound ramps terminal to 10th St/Freeman Rd	• Jewett School Rd: Restrict access to right-in/right-out • E Pine St: Add second westbound left-turn lane onto Freeman • Freeman Rd: Add second southbound receiving lane on Freeman from E Pine to Oak • 10th Street: Extend left-turn lane striping to Manzanita	Safety and Capacity
W-3	I-5 southbound ramps terminal to 7th Street	• Jewett School Rd: Restrict access to right-in/right-out • 10th St/Freeman Rd: Restrict access to right-in/right-out/left-in (left out and through movements diverted) • 7th St: Add signal to accommodate shift in left-turn and through movements and keep 4 lanes on E Pine	Safety and Capacity
W-4	I-5 southbound ramps terminal to 7th Street	• Jewett School Rd: Restrict access to right-in/right-out • 10th St/Freeman Rd: Restrict access to right-in/right-out/left-in (left out and through movements diverted) • 7th St: Add signal and widen for left-turn lanes but reduce E Pine to 3 lanes	Safety and Capacity

4.5.1. Concept W-1 – 10th Street/Freeman Road Improvements – Option 1

Concept W-1 was developed to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/Freeman Road. As illustrated in *Figure 4-9*, the concept would include the following elements:

- Jewett School Road: Restrict access to right-in/right-out and create public connection or easement to 10th Street opposite Manzanita Street to accommodate other turn movements.
- E Pine Street: Add second westbound left-turn lane onto Freeman Road and minimize ROW impacts by reducing number of eastbound through travel lanes from three lanes to two lanes through the intersection.
- Freeman Road: Add second southbound receiving lane on Freeman from E Pine Street to Oak Street
- 10th Street: Extend left-turn lane striping to Manzanita Street.
- Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road may also be closed as part of the plan to improve safety and capacity. At minimum, all accesses would need to be restricted to right-in/right-out with the dual left-turn lanes at Freeman Road.

Concept W-1 Traffic Operations and Safety

The traffic operations with Concept W-1 are summarized in Table 4-13. With the 2034 RTP forecasts, the intersection would meet City and County mobility standards for the PM peak hours. With the ALUS forecasts, the PM peak hour would exceed the County standard but meet the City standard. The benefits of the dual left-turn lanes associated with this concept would be limited by the reduction in eastbound through travel lanes.

Table 4-13: Intersection Operations for Concept W-1

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
10th/Freeman:	V/C = 0.85	LOS C	Queuing – EB, SB Left	V/C <= 0.85[1]/LOS D[2]
Operations with ALUS Forecasts				
10th/Freeman:	V/C = 0.94	LOS D	Queuing – EB, SB Left	V/C <= 0.85[1]/LOS D[2]

Notes:
1. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
2. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Queuing in the westbound left-turn lanes would be substantially reduced with the addition of the dual left-turn lane and the turn limitations at Jewett School Road. However, queuing would be present on the eastbound approach, making it harder to turn out of the unsignalized intersection at 9th Street. Queuing in the southbound left-turn lane would still spill over into the adjacent through lane even with the turn lane extension.

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 21 crashes at the 10th Street/Freeman Road intersection; most were rear end collisions on northbound Freeman Road. Although Concept W-1 may not substantially reduce the likelihood of the northbound collisions, the additional westbound storage may reduce the potential for rear end collisions associated with queue spillover. The turn restrictions at Jewett School Road will reduce the number of conflict points at that intersection, which would also improve safety on the adjacent stretch of E Pine Street.

Concept W-1 Basic Roadway Geometries and Right-of-Way Requirements

Concept W-1 would address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/Freeman Road through a combination of improvements, as illustrated in *Figure 4-9*.

Access at Jewett School Road would be restricted to right-in/right-out movements only. This action would not require any construction although a raised median should be considered for enforcement because of the dual left-turn lanes on E Pine Street at Freeman Road. To minimize the impacts to adjacent businesses, a public connection or easement through the school property to 10th Street opposite Manzanita Street would be desirable.

A second westbound left-turn lane onto Freeman Road would be added to E Pine Street. To minimize ROW impacts from the widening, the eastbound through travel lanes would be reduced from three lanes to two lanes through the intersection. By limiting the number of lanes on E Pine Street to a total of six, the conceptual cross-section could potentially be accommodated within the existing 100-foot ROW. However, even with the through travel lane reduction, there could be some ROW required east of the intersection to provide for lane tapers and alignment. West of 10th Street/Freeman Road, the ROW on E Pine Street is 90 feet. Some additional ROW acquisition may be needed just west of 10th Street/Freeman Road to accommodate lane tapers and alignment.

Freeman Road would need to be widened to accommodate a second southbound receiving lane for the dual westbound left turn from E Pine Street. The roadway geometry assumes that Freeman Road would be widened to a three-lane cross-section from E Pine Street to Oak Street. The existing ROW on Freeman Road is 60 feet, which could accommodate three travel lanes with bike lanes and sidewalks but exceptions may be required. Therefore, some additional ROW may be needed. Although Concept W-1 illustrates the Freeman Road widening along its existing alignment, some consideration should be given to straightening the curves which might help reduce the number of rear end collisions in the northbound direction.

Concept W-1 Environmental and Land Use Assessment

Some additional ROW would likely be needed along both E Pine Street and Freeman Road. Concept W-1 focuses on minimizing ROW impacts to adjacent properties but there would still be some impacts along E Pine Street. The widening on Freeman Road could possibly be accommodated within existing ROW but it is more likely that some ROW acquisitions from adjacent properties would be necessary.

Turn limitations at Jewett School Road and driveway restrictions, consolidations, and/or closures along E Pine Street between the freeway ramps and 10th Street/Freeman Road would also impact properties. Alternative access via Jewett School Road and formalized access to 10th Street would mitigate some of the business impacts associated with the changes.

There are some hazardous materials sites located both north and south of E Pine Street, which will need to be considered if this concept is carried forward.

Concept W-1 Concepts Cost Opinions

The estimate for this concept is $2.2 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

4.5.2. Concept WS-2 – 10th Street/Freeman Road Improvements – Option 2

Concept W-2 is similar to Concept W-1 but does not reduce the number of eastbound travel lanes in order to maximize capacity at the intersection. As illustrated in *Figure 4-10*, the concept would include the following elements:

- Jewett School Road: Restrict access to right-in/right-out and create public connection or easement to 10th Street opposite Manzanita Street to accommodate other turn movements.
- E Pine St: Add second westbound left-turn lane onto Freeman Road.
- Freeman Rd: Add second southbound receiving lane on Freeman from E Pine Street to Oak Street
- 10th Street: Extend left-turn lane striping to Manzanita Street.
- Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road may also be closed as part of the plan to improve safety and capacity. At minimum, all accesses would need to be restricted to right-in/right-out with the dual left-turn lanes at Freeman Road.

Concept W-2 Traffic Operations and Safety

The traffic operations with Concept W-2 are summarized in Table 4-14. Both City and County mobility standards would be met for the PM peak hours under both future land use scenarios.

Table 4-14: Intersection Operations for Concept W-2

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
10th/Freeman:	V/C = 0.73	LOS C	Queuing – SB	V/C <= 0.85[1]/LOS D[2]
Operations with ALUS Forecasts				
10th/Freeman:	V/C = 0.79	LOS C	Queuing – SB	V/C <= 0.85[1]/LOS D[2]

Notes:
1. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
2. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Compared with Concept W-1, queuing would be reduced on all approaches; however, the southbound left-turn lane would still sometimes spill over into the adjacent through lane.

Safety benefits for Concept W-2 would be similar to those listed for Concept W-1. Additional storage for turning vehicles and a reduced number of conflict points would improve safety along E Pine Street. One disadvantage of Concept W-2 versus W-1 is the increase pedestrian crossing distance on E Pine Street.

Concept W-2 Basic Roadway Geometries and Right-of-Way Requirements

Concept W-2 would address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/Freeman Road through a combination of improvements, as illustrated in *Figure 4-10*.

Access at Jewett School Road would be restricted to right-in/right-out movements only. This action would not require any construction although a raised median should be considered for enforcement because of the dual left-turn lanes on E Pine Street at Freeman Road. To minimize the impacts to adjacent businesses, a public connection or easement through the school property to 10th Street opposite Manzanita Street would be desirable.

Concept W-2 would add a second westbound left-turn lane from E Pine Street onto Freeman Road; but unlike Concept W-1, there would be no change to the existing number of eastbound through travel lanes. The wider cross-section would require additional ROW along E Pine Street both east and west of the intersection. The seven-lane cross-section east of 10th Street/ Freeman Road could not be accommodated within the existing 100-foot ROW. The extent of the impacts to adjacent properties is hard to determine without more detailed design layouts; however, it is possible that there could be structure as well as property impacts. Some additional roadway widening would also be needed west of the intersection to provide adequate lane tapers and alignment. Additional ROW would be needed beyond the current 90 feet.

Freeman Road would need to be widened to accommodate a second southbound receiving lane for the dual westbound left turn from E Pine Street. The roadway geometry assumes that Freeman Road would be widened to a three-lane cross-section from E Pine Street to Oak Street. The existing ROW on Freeman Road is 60 feet, which could accommodate three travel lanes with bike lanes and sidewalks but exceptions may be required. Therefore, some additional ROW may be needed. Although Concept W-2 illustrates the Freeman Road widening along its existing alignment, some consideration should be given to straightening the curves which might help reduce the number of rear end collisions in the northbound direction.

Concept W-2 Environmental and Land Use Assessment

Additional ROW would be required along E Pine Street both east and west of the 10th Street/Freeman Road intersection. The extent of the impacts to adjacent properties is hard to determine without more detailed design layouts; however, it is possible that there could be structure as well as property impacts east of the intersection while only property impacts are likely west of the intersection.

The widening on Freeman Road could possibly be accommodated within existing ROW but it is more likely that some ROW acquisitions from adjacent properties would be necessary.

Turn limitations at Jewett School Road and driveway restrictions, consolidations, and/or closures along E Pine Street between the freeway ramps and 10th Street/Freeman Road would also impact properties. Alternative access via Jewett School Road and formalized access to 10th Street would mitigate some of the business impacts associated with the changes.

There are some hazardous materials sites located both north and south of E Pine Street, which will need to be considered if this concept is carried forward.

Concept W-2 Concepts Cost Opinions

The estimate for this concept is $2.6 million. This cost does not include acquisition of additional ROW, utility relocation, or costs to address potential hazardous waste.

4.5.3. Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1

There are two ways to improve operations at an intersection: one is to increase capacity, the other is to reduce demand. Concept W-3 focuses on demand reduction rather increasing capacity. As illustrated in *Figure 4-11*, the concept would include the following elements:

- E Pine Street & 10th Street/Freeman Road Intersection: Add a median barrier along E Pine Street to restrict turning movements to right-in/right-out/left-in on 10th Street and Freeman Road. Left-turn movements from 10th Street and Freeman Road would not be permitted onto E Pine Street and through movements between the two roadways would also be prohibited. Traffic that previously made these left-turn and through movements would need to divert to other roadways.
- E Pine Street & 7th Street: To accommodate some of the traffic diverted from 10th Street and Freeman Road, a traffic signal would be installed on E Pine Street at 7th Street. Concept W-3 assumes that the existing four-lane cross-section on E Pine Street would remain in place to maintain capacity through the intersection. (Note that Concept W-4 assumes the conversion to three lanes.)

Other access control measures are also assumed to be in place along E Pine Street between the freeway ramps and 10th Street/Freeman Road as part of the plan to improve safety and capacity. At minimum, all accesses could be restricted to right-in/right-out but some could eventually be closed.

Concept W-3 Traffic Operations and Safety

The traffic operations with Concept W-3 are summarized in Table 4-15. The 10th Street/ Freeman Road intersection would meet the mobility standards which was the intent of the concept. However, while the 7th Street would meet the city mobility standards queuing would be present along E Pine Street due to the new traffic signal, which would sometimes affect operations at other nearby intersections. With the ALUS forecasts, longer queues would form, spilling back through other nearby intersections.

Table 4-15: Intersection Operations for Concept W-3

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
7th: 10th/Freeman:	V/C = 0.80 V/C = 0.67	LOS C LOS B	Queuing – WB, SB Queuing – WB	LOS D[1] V/C <= 0.85[2]/LOS D[1]
Operations with ALUS Forecasts				
7th: 10th/Freeman:	V/C = 0.80 V/C = 0.73	LOS C LOS B	Queuing – EB, WB, SB Queuing – WB	LOS D[1] V/C <= 0.85[2]/LOS D[1]

Notes:
1. City of Central Point Transportation System Plan, 2008-2030, p. 26.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 21 crashes at the 10th Street/Freeman Road intersection and one crash at the 7th Street intersection. The reduced traffic demand on Freeman Road may result in fewer northbound crashes at that location but diverted traffic may increase crash frequency at other locations. Crash rates at 7th Street would likely increase because traffic signals generally have higher crash rates than locations with STOP control.

Concept W-3 Basic Roadway Geometries and Right-of-Way Requirements

A design layout was not prepared for Concept W-3. The changes in traffic control and turn prohibitions could largely be achieved within existing ROW.

Concept W-3 Environmental and Land Use Assessment

Although this concept would not require additional ROW, the changes in traffic control and turn prohibitions would impact businesses in the area. By permitting the left-in movement at 10th Street and Freeman Road, the ability to gain access into nearby businesses would be similar to Concepts W-1 and W-2. However, most movements exiting the area businesses would likely be restricted to right-out movements, which could discourage some visitors in the area.

In the vicinity of 7th Street, added traffic congestion would affect adjacent properties on both E Pine Street and 7th Street.

Traffic volumes on 7th Street, Manzanita Street, and Oak Street would all be higher with this concept than other concepts under consideration. While this higher pass-by traffic could benefit some adjacent businesses, most property owners are likely to perceive the higher volumes negatively.

Concept W-3 Concepts Cost Opinions

No cost opinion was prepared for Concept W-3 at this time.

4.5.4. Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2

Concept W-4 is similar to Concept W-3 but assumes conversion of E Pine Street from a four-lane roadway to a three-lane roadway in downtown Central Point. As illustrated in *Figure 4-12*, the concept would include the following elements:

- E Pine Street & 10th Street/Freeman Road Intersection: Improvements at this location would be the same as those detailed for Concept W-3. Add a median barrier along E Pine Street to restrict turning movements to right-in/right-out/left-in on 10th Street and Freeman Road. Prohibit left-turn movements from 10th Street and Freeman Road onto E Pine Street and through movements between the two roadways. Traffic that previously made these movements (left-turn and through) would need to divert to other roadways.
- E Pine Street & 7th Street: Concept W-4 assumes a three-lane cross-section on E Pine Street. To accommodate some of the traffic diverted from 10th Street and Freeman Road, 7th Street would be widened to include separate left-turn lanes with at least 100 feet of storage for left-turning vehicles. A traffic signal would be installed on E Pine Street at 7th Street.

Other access control measures are also assumed to be in place along E Pine Street between the freeway ramps and 10th Street/Freeman Road as part of the plan to improve safety and capacity. At minimum, all accesses could be restricted to right-in/right-out but some could eventually be closed.

Concept W-4 Traffic Operations and Safety

The traffic operations with Concept W-4 are summarized in Table 4-15. The 10th Street/ Freeman Road intersection would meet the mobility standards which was the intent of the concept. However, while the 7th Street would meet the city mobility standards queuing would be present along E Pine Street due to the new traffic signal, which would sometimes affect operations at other nearby intersections. With the ALUS forecasts, the demand at the intersection would begin to approach the capacity of the intersection and longer queues would form, spilling back through other nearby intersections.

Concept W-4 would have similar safety benefits and impacts to Concept W-3. Some areas would benefit from a reduction in traffic demand while others could see higher crash rates. The traffic signal would likely result in more crashes at the 7th Street intersection with E Pine Street.

Table 4-16: Intersection Operations for Concept W-4

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
7th: 10th/Freeman:	V/C = 0.82 V/C = 0.67	LOS C LOS B	Queuing – EB, WB Queuing – WB	LOS D[1] V/C <= 0.85[2]/LOS D[1]
Operations with ALUS Forecasts				
7th: 10th/Freeman:	V/C = 0.93 V/C = 0.73	LOS C LOS B	Queuing – EB, WB, SB Queuing – WB	LOS D[1] V/C <= 0.85[2]/LOS D[1]

Notes:
1. City of Central Point Transportation System Plan, 2008-2030, p. 26.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Concept W-4 Basic Roadway Geometries and Right-of-Way Requirements

A design layout was not prepared for Concept W-4. The changes in traffic control and turn prohibitions could largely be achieved within existing ROW with the exception of the addition of left-turn lanes on 7th Street. The existing roadway width is approximately 32 feet within a 60-foot ROW. The current roadway is not wide enough to restripe for left-turn lanes. On-street parking would need to be eliminated and the roadway would need to be reconstructed to a width of approximately 40 feet without on-street parking. Sidewalks would need to be relocated, possibly on both sides of the street, depending on whether widening occurs on only one side of the roadway or not.

Concept W-4 Environmental and Land Use Assessment

Concept W-4 would have similar land use benefits and impacts to Concept W-3 due to access restrictions and changes in traffic volumes.

The biggest difference between the two concepts is that 7th Street would need to be widened from its current width of approximately 32 feet to approximately 40 feet. The on-street parking would still be eliminated with the roadway widening.

Concept W-4 Concepts Cost Opinions

No cost opinion was prepared for Concept W-4 at this time.

4.6. East Side Improvements

Three potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns. A brief summary of the projects is presented in Table 4-17.

Table 4-17. Summary of Interchange 33 Concepts – East Side Improvements

ID	Location	General Description	Reason
E-1	Hamrick Road	• E Pine St: Add second eastbound left-turn lane • Hamrick Rd: Add second northbound receiving lane	Capacity
E-2	Table Rock Road	• Table Rock Rd: Widen Table Rock south of E Pine to 5-lane cross-section and add second southbound left-turn lane along Table Rock.	Capacity
E-3	Hamrick Road/ Table Rock Road	• Hamrick Rd: Restrict allocation of green time for eastbound left turn and southbound right turn to encourage traffic shift to Table Rock Rd in combination with other traffic calming measures on Hamrick Rd • Table Rock Road: Add southbound right-turn lane in addition to improvements identified in E-2	Capacity

4.6.1. Concept E-1 – Hamrick Road – Dual Eastbound Left-Turn Lanes

The E Pine Street/Hamrick Road intersection is expected to exceed mobility standards with the 2034 RTP land use forecasts and would fail with the ALUS forecast. The Central Point TSP includes a project (reference number 216) to add a second left-turn lane on the eastbound approach of E Pine Street and a second northbound receiving lane on Hamrick Road. This project is identified as a medium-term, Tier 1 project, and is also included in the RTP. Concept E-1 evaluates this improvement for comparison with other options for addressing this deficiency. The Concept E-1 lane configuration for Hamrick Road is illustrated in *Figure 4-13*.

Hamrick Road runs north-south from E Pine Street but eventually turns east-west and becomes Vilas Road, an arterial through Medford. These two roads together provide a slightly shorter route to the intersection of Vilas Road and Table Rock Road. Thus, many drivers currently choose to travel through this neighborhood, as indicated by the traffic volumes show in *Figure 4-1*.

The concern with the high use of this "short-cut" is that Hamrick Road runs through residential neighborhoods with a major park abutting a portion of the roadway. As these neighborhoods continue to develop, there may be increasing conflicts between residents accessing the park as pedestrians and traffic traveling through the area to get somewhere else. There is a 25 mph posted speed in the vicinity of the park entrance on New Haven Road.

Concept E-1 Traffic Operations and Safety

The traffic operations with Concept E-1 are summarized in Table 4-18. The intersection would meet County mobility standards for the PM peak hour with both the 2034 RTP and ALUS forecasts. No queuing issues are identified.

Table 4-18: Intersection Operations for Concept E-1

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
Hamrick:	V/C = 0.65	LOS C	Queuing – None	V/C <= 0.85[1]
Operations with ALUS Forecasts				
Hamrick:	V/C = 0.73	LOS C	Queuing – None	V/C <= 0.85[1]

Notes:
1. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The five-year crash analysis, conducted as part of the existing conditions evaluation, identified 16 crashes at the Hamrick Road intersection; including 5 rear end, 10 turning, and 1 other collision. Most of the turning collisions involved eastbound vehicles turning north onto Hamrick Road. With the high demand and queuing present right now in the eastbound left-turn lane, drivers may be taking risks rather than waiting through multiple signal cycles. The increased capacity for this movement may alter this type of risky behavior.

Concept E-1 Basic Roadway Geometries and Right-of-Way Requirements

A layout has not been prepared for Concept E-1 because the enhanced network substantially changes the nature of E Pine Street east of the freeway. ROW along E Pine Street varies considerably in the vicinity of Hamrick Road. If the second left-turn lane is added before other improvements are made, it could potentially be accommodated in the 100-foot cross section immediately west of Hamrick Road. However, there could be some additional ROW needed to the east Hamrick Road for the taper and lane alignment since this section has approximately 80 feet of ROW available.

Existing ROW along Hamrick Road is 80 feet, which could be adequate to accommodate a second northbound lane. However, if a separate southbound right-turn lane is added, as suggested in the Enhanced Network concept, then additional ROW may be needed on Hamrick Road as well.

Concept E-1 Environmental and Land Use Assessment

Some additional ROW could be needed on both E Pine Street and Hamrick Road, depending on whether this project is constructed before or after other improvements identified in the Enhanced Network concept. Some of the adjacent lands are currently vacant, which could make ROW acquisition easier, if needed.

By facilitating the eastbound left-turn movement, “short-cut” traffic will continue to travel through the residential areas along Hamrick Street.

Concept E-1 Concepts Cost Opinions

No cost opinion was prepared for this concept but the project cost is estimated as $0.6 million in the Central Point TSP.

4.6.2. Concept E-2 – Table Rock Road Improvements

Although the Table Rock Road intersection with Biddle Road (E Pine Street) is not part of the IAMP study area, it does play an important role in the transportation network. Concept E-2 examines the types of improvements that would be needed to accommodate the forecast demand at Table Rock Road based on the improvements identified in the Enhanced Network concept.

The Enhanced Network concept includes the addition of a second eastbound left-turn lane on Biddle Road at Table Rock Road. With that improvement, the intersection is expected to operation at a v/c ratio of 0.88 with the 2034 RTP forecasts and over capacity (v/c ratio 1.05) with the ALUS forecasts. These operations for the RTP forecasts would be slightly over the County mobility standard of 0.85, and greatly over the standard for the ALUS forecasts.

To bring intersection operations below 0.85, the five-lane cross-section on Table Rock Road was assumed to continue south of Biddle Road. The RTP has Jackson County project 821 to "widen to 3 & 5 lanes, curb, gutter, & sidewalk + bike lanes" list as long-term, Tier 1. It's not clear from this description where the five-lane sections would be located but Concept E-2 does appear to be consistent with County plans in the corridor.

The Concept E-2 lane configuration for Table Rock Road is illustrated in *Figure 4-13*.

Concept E-2 Traffic Operations and Safety

The traffic operations with Concept E-2 are summarized in Table 4-19. The intersection would be well below the County mobility standards for the PM peak hour with the 2034 RTP. Although operations would improve somewhat with the ALUS forecasts, demand would still exceed capacity.

Table 4-19: Intersection Operations for Concept E-2

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
Table Rock:	V/C = 0.75	LOS C	Queuing – SB	V/C <= 0.85[1]
Operations with ALUS Forecasts				
Table Rock:	V/C = 1.01	LOS D	Queuing – All approaches	V/C <= 0.85[1]

Notes:
1. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

No crash data was analyzed for this intersection because it is outside the IAMP study area.

Concept E-2 Basic Roadway Geometries and Right-of-Way Requirements

A layout has not been prepared for Concept E-2 because it lies outside the IAMP study area boundary. From tax maps, it appears that Table Rock Road has about 60 feet of ROW south of Biddle Road. Additional ROW would be needed to widen the roadway to five lanes.

Concept E-2 Environmental and Land Use Assessment

Additional ROW would be needed on Table Rock Road south of Biddle Road to widen to a five-lane cross-section. Most of the adjacent lands in the vicinity are currently vacant.

Concept E-2 Concepts Cost Opinions

No cost opinion was prepared for this concept but RTP Project 821 is estimated at $2.7 million for improvements on Table Rock Road from the I-5 Crossing to Biddle Road.

4.6.3. Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts

Concept E-3 examines what improvements would be needed if through traffic were discouraged from using Hamrick Road and encouraged to use Table Rock Road instead. The combined elements of this concept include:

- Discourage through traffic on Hamrick with traffic calming measures.
- Restrict allocation of green time at Hamrick to encourage a shift in eastbound lefts and southbound rights to Table Rock. (No second left-turn lane added.)
- Add a second southbound left-turn lane and a southbound right-turn lane on Table Rock in addition to the improvements in E-2.

The Concept E-3 lane configurations for both Hamrick Road and Table Rock Road are illustrated in *Figure 4-14*.

Concept E-3 Traffic Operations and Safety

For the traffic analysis, a 30 percent shift in through traffic was assumed to occur. The eastbound left-turn volume and southbound right-turn volumes at the Hamrick Road/E Pine Street intersection were each reduced by 30 percent. That reduction was then added to the same turning movements at the Table Rock Road/Biddle Road intersection. It should be noted that the shifted traffic would still travel through the Hamrick Road/E Pine Street intersection but as east-west through movements rather than the original turning movements.

The traffic operations with Concept E-3 are summarized in Table 4-20. Both intersections would be well below the County mobility standards for the PM peak hour with the 2034 RTP. Improvements on the southbound Table Rock Road approach could potentially be limited to just the right-turn lane. With the ALUS forecasts, both intersections would exceed the mobility standards.

Table 4-20: Intersection Operations for Concept E-3

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts				
Hamrick: Table Rock:	V/C = 0.77 V/C = 0.75	LOS C LOS C	Queuing – None Queuing – None	V/C <= 0.85[1] V/C <= 0.85[1]
Operations with ALUS Forecasts				
Hamrick: Table Rock:	V/C = 0.91 V/C = 0.97	LOS C LOS D	Queuing – EB Left Queuing – NB Left	V/C <= 0.85[1] V/C <= 0.85[1]

Notes:
1. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

The focus on this improvement was to improve safety on Hamrick Road in the residential area and near the park facility on New Haven Road, particularly for pedestrians. The lower volumes would reduce the number of potential conflicts.

An overall reduction in congestion would also benefit safety.

Concept E-3 Basic Roadway Geometries and Right-of-Way Requirements

A layout has not been prepared for Concept E-3 because it lies outside the IAMP study area boundary. From tax maps, it appears that Table Rock Road has about 90 feet of ROW north of Biddle Road and 60 feet of ROW to the south. Additional ROW would be needed to widen the roadway to provide the two additional turn lanes. There would be some impact to the south side of the intersection as well to account for tapers and lane alignment.

Concept E-3 Environmental and Land Use Assessment

One focus of this option was to improve the neighborhood environment along Hamrick Road, the lower and slower traffic volumes would achieve this affect. Traffic would remain in areas zoned for commercial and industrial uses.

Additional ROW would be needed on Table Rock Road both north and south of Biddle Road to increase capacity. Most of the adjacent lands south of the intersection are currently vacant but the adjacent lands are developed on the north side. The northwest quadrant has a structure close to the intersection which would likely be impacted by any widening.

Concept E-3 Concepts Cost Opinions

No cost opinion was prepared for this concept.

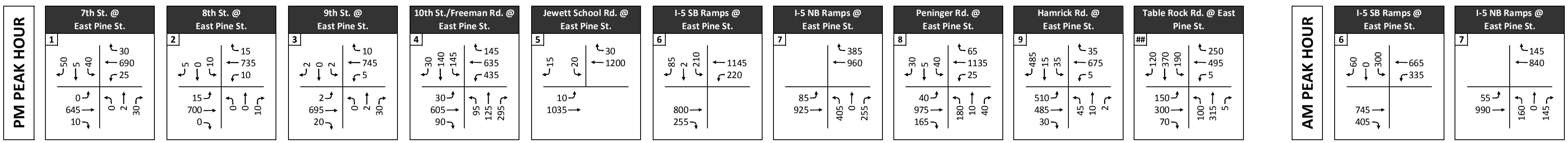
4.7. Evaluation Matrix

The information presented in this memo will also be summarized in a separate matrix for comparison of alternatives.

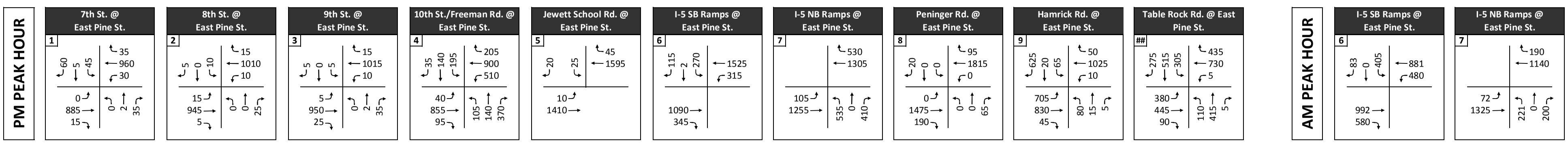
Attachments:

Figure 4-1. Study Area Traffic Volumes
Figure 4-2. Enhanced Network Concept
Figure 4-3. Concept I-1 – I-5 Northbound Off-Ramp – Dual Northbound Right-Turn Lanes
Figure 4-4. Concept I-2 – I-5 Northbound Off-Ramp – New Loop Ramp
Figure 4-5. Concept I-3 – I-5 Southbound On-Ramp – Dual Westbound Left-Turn Lanes
Figure 4-6. Concept I-4 – I-5 Southbound On-Ramp – New Loop Ramp
Figure 4-7. Concept I-5 – Diverging Diamond Interchange with No Bridge Widening
Figure 4-8. Concept I-6 – Diverging Diamond Interchange with Bridge Widening
Figure 4-9. Concept W-1 – 10th Street/Freeman Road Improvements – Option 1
Figure 4-10. Concept W-2 – 10th Street/Freeman Road Improvements – Option 2
Figure 4-11. Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1
Figure 4-12. Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2
Figure 4-13. Concept E-1 – Hamrick Road and Concept E-2 – Table Rock Road
Figure 4-14. Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts

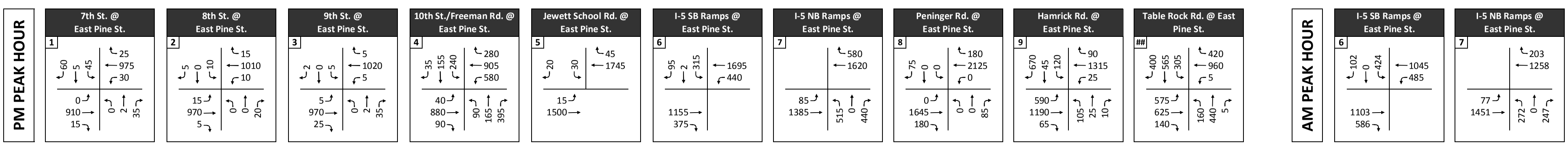
2010 Existing Conditions



2034 Regional Transportation Plan Scenario with Enhanced Network



Alternative Land Use Scenario with Enhanced Network



Legend

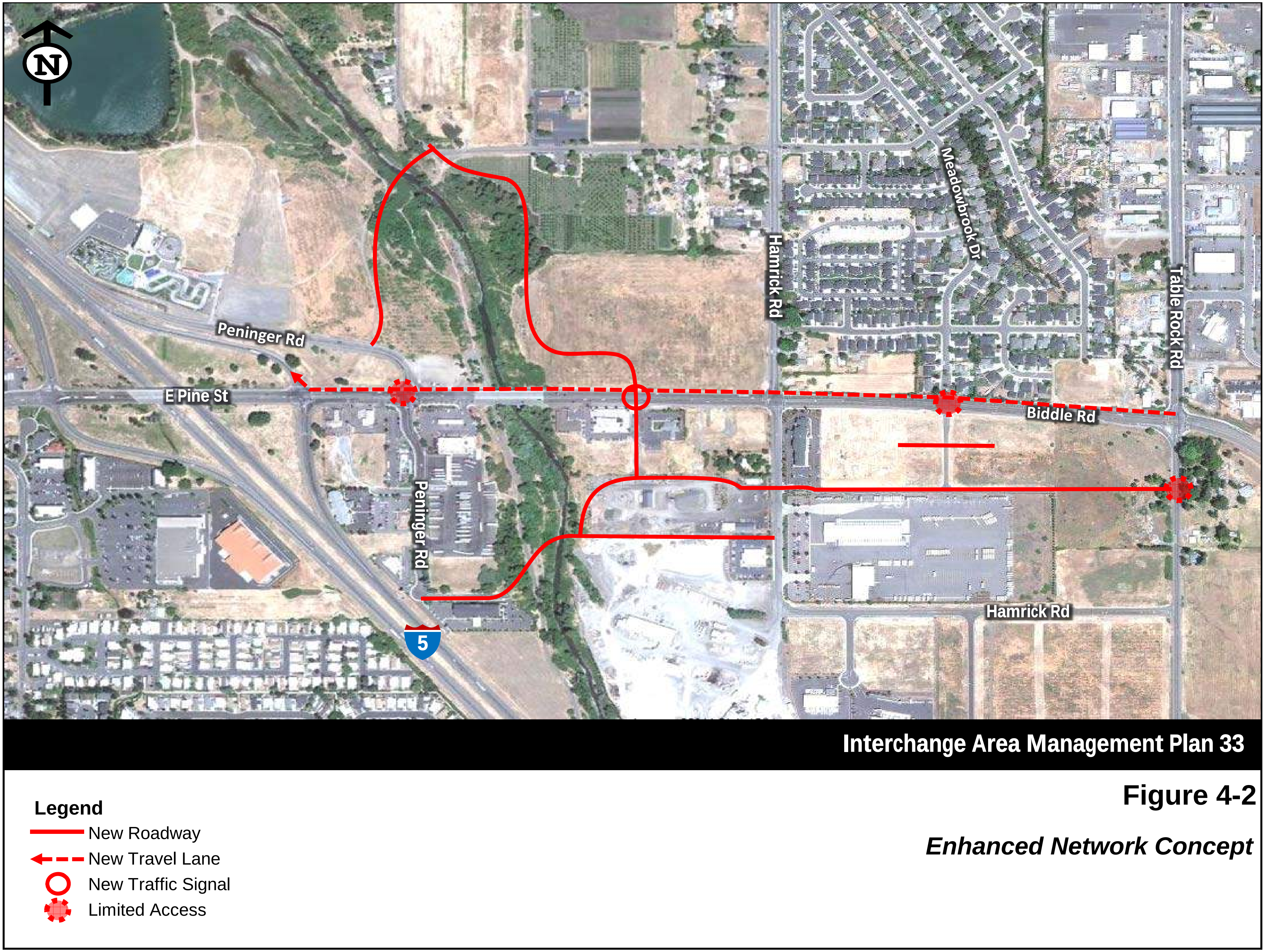
Turning Movement

\## Traffic Volume

DRAFT Figure 4-1

Study Area Traffic Volumes

P:\O\ODOT00000680\0600INFO\0670Reports\TM4 -Alternatives Analysis\Traffic Volumes.xlsx:Traffic Volumes.xlsx:Figure 4-1



Interchange Area Management Plan 33

Figure 4-2

Enhanced Network Concept

Figure 4-3

Legend

- Right of Way Line
- Edge of Pavement

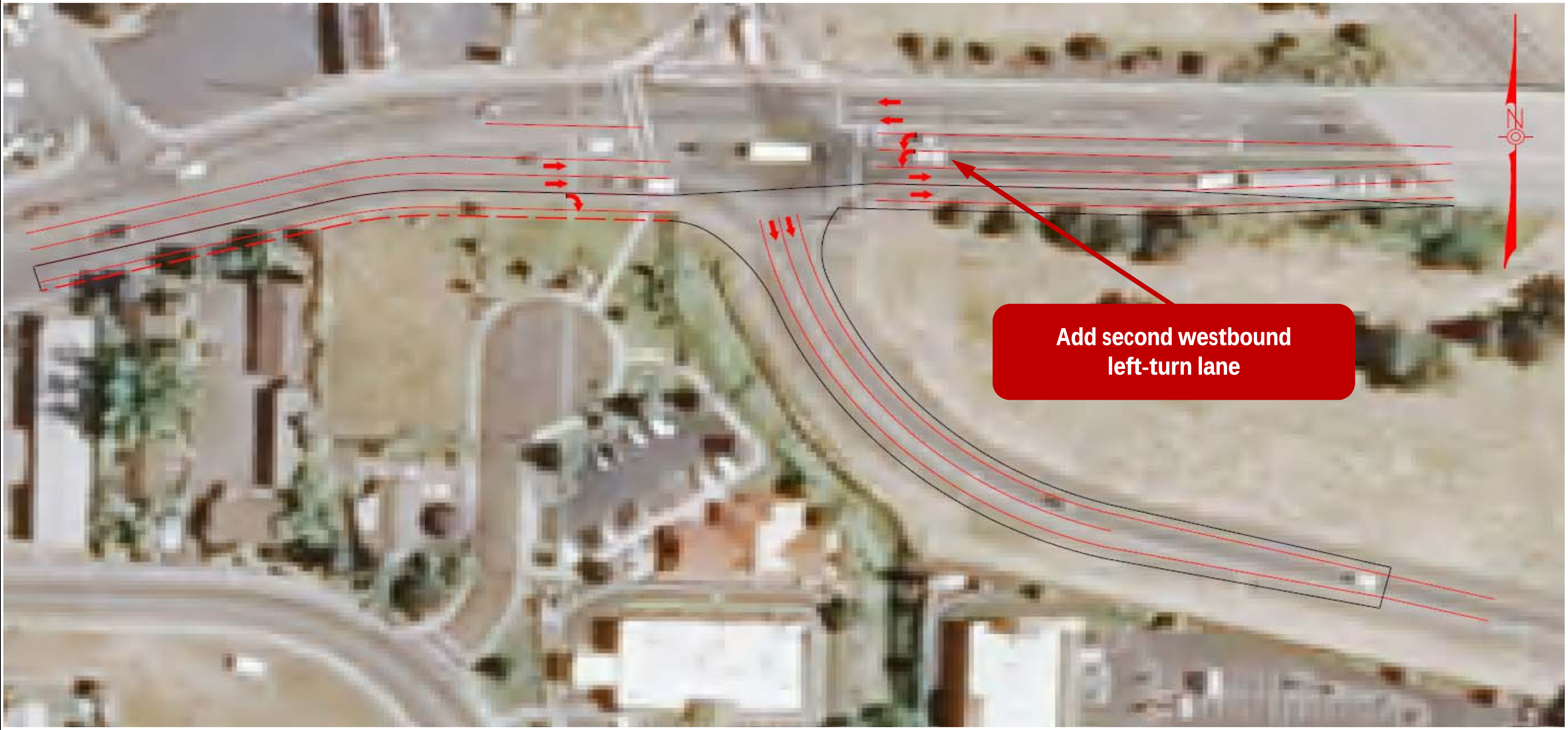
Concept I-1
I-5 Nortbound Off-Ramp
Dual Northbound Right-Turn Lanes

Legend

Right of Way Line
Edge of Pavement

Figure 4-4

Concept I-2
I-5 Nortbound Off-Ramp
New Loop Ramp

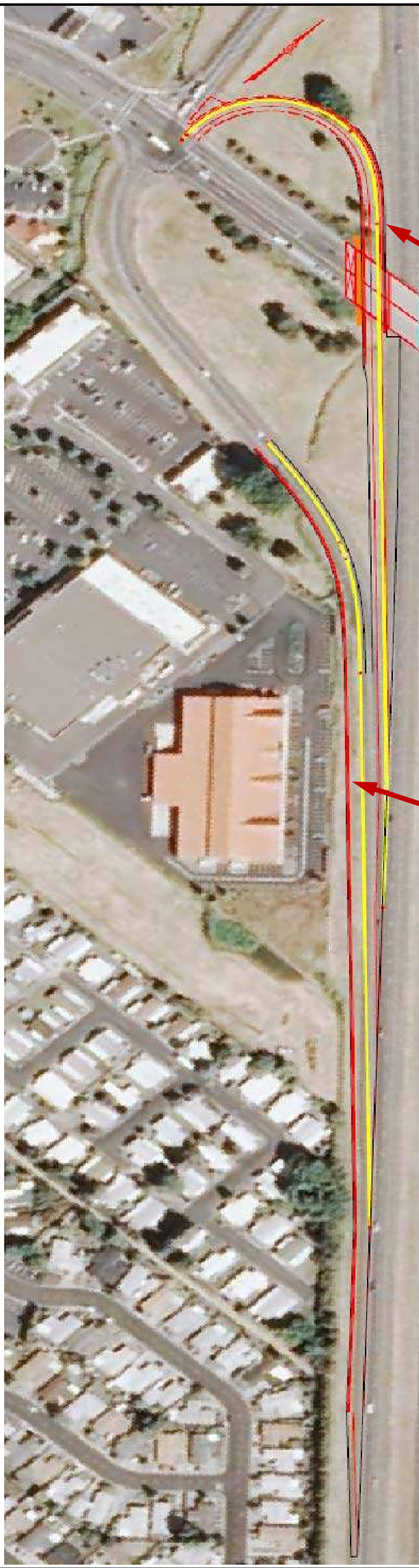


Interchange Area Management Plan 33

Figure 4-5

Concept I-3
I-5 Southbound On-Ramp
Dual Westbound Left-Turn Lanes

Legend
Right of Way Line
Edge of Pavement



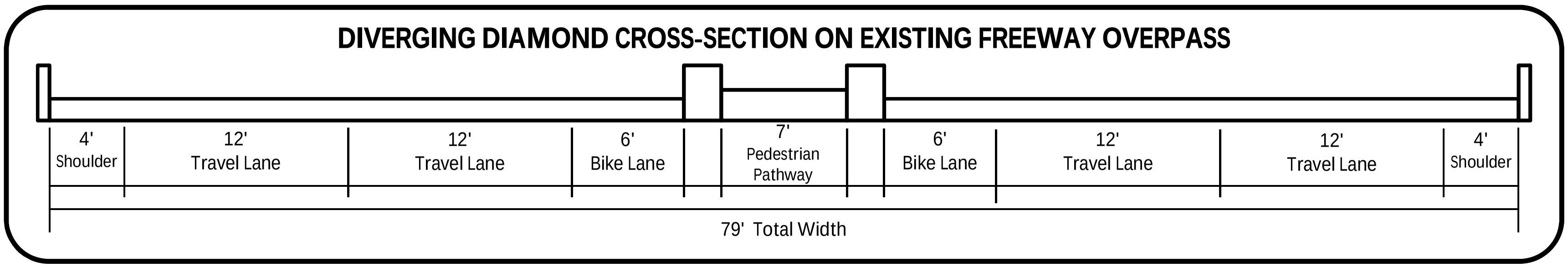
Legend

- Right of Way Line
- Edge of Pavement

Interchange Area Management Plan 33

Figure 4-6

Concept I-4
I-5 Southbound On-Ramp
New Loop Ramp

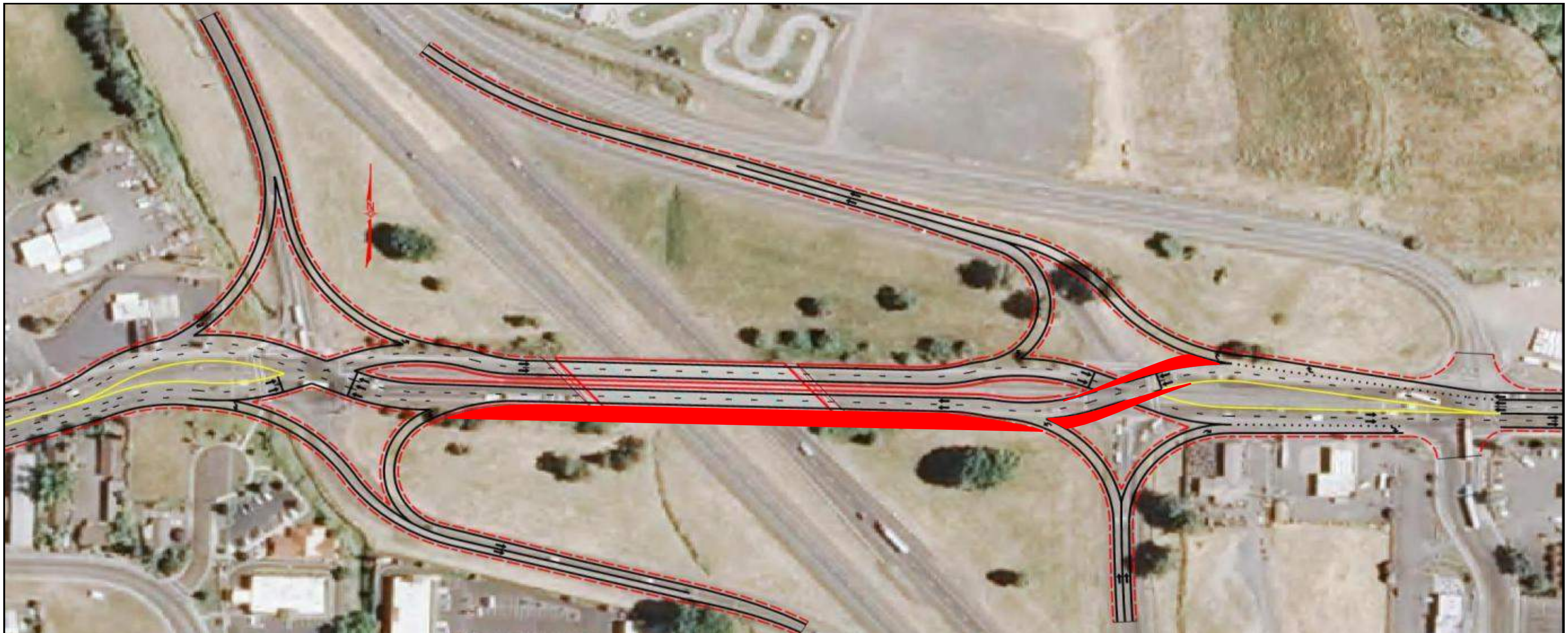


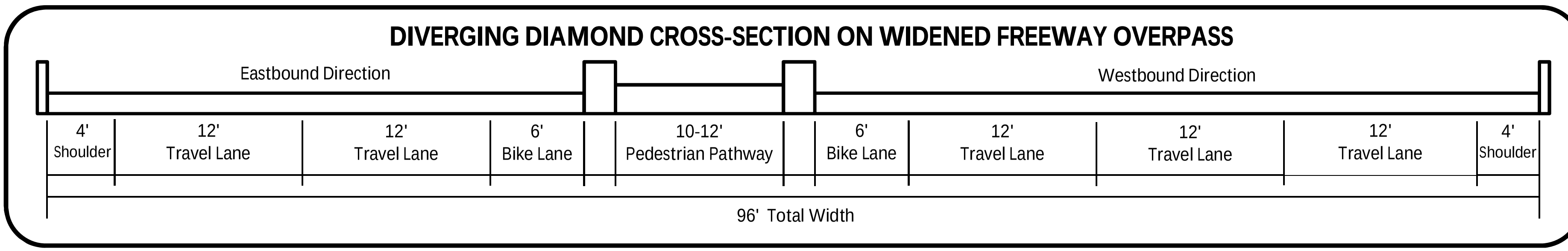
Legend

- Edge of Pavement
- Right of Way Line

Figure 4-7

Concept I-5
Diverging Diamond Interchange with No Bridge Widening





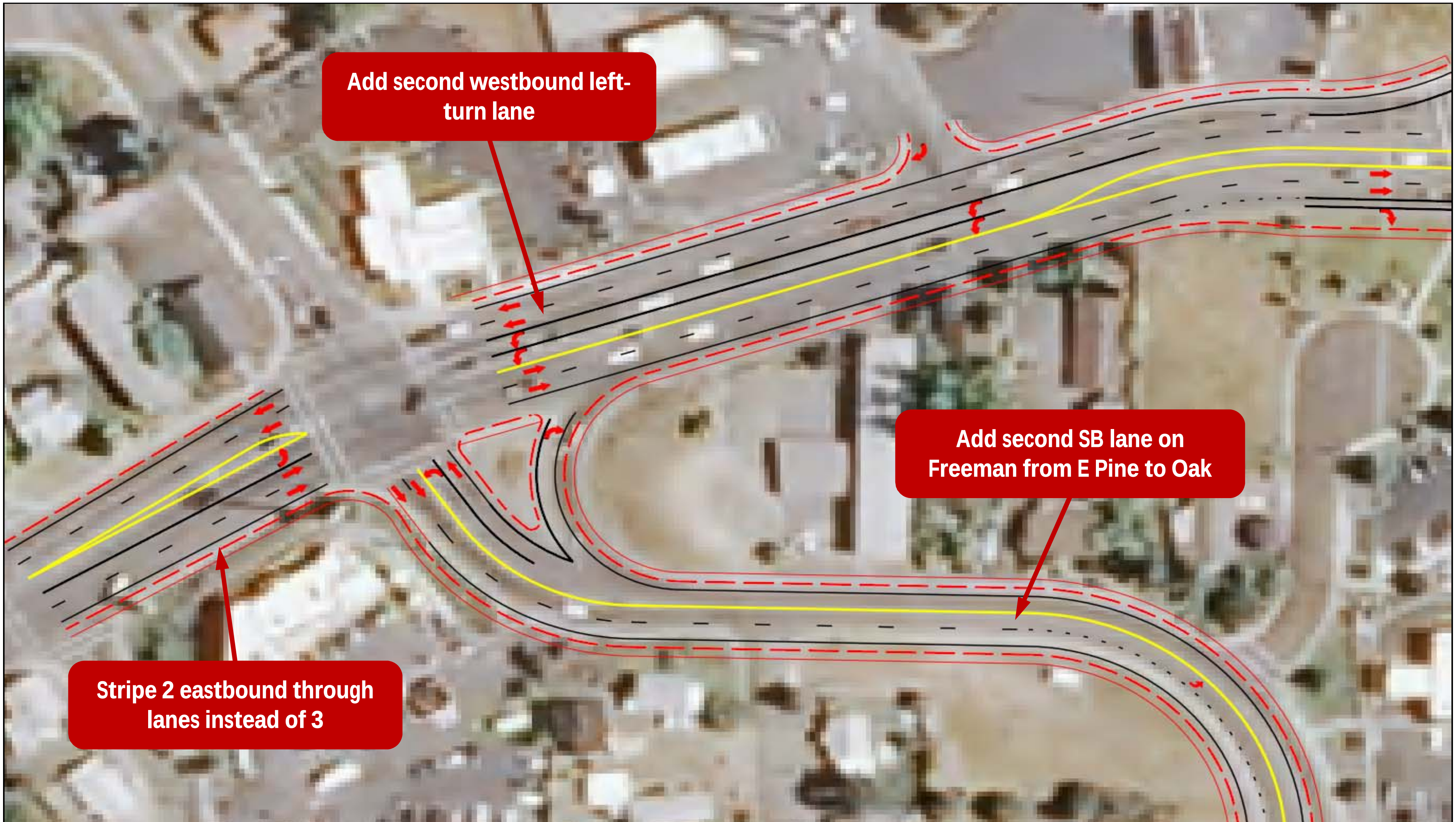
Interchange Area Management Plan 33

Legend

- Edge of Pavement
- Right of Way Line
- Additional Widening to Provide 3 Westbound Lanes and wider center pathway

Figure 4-8

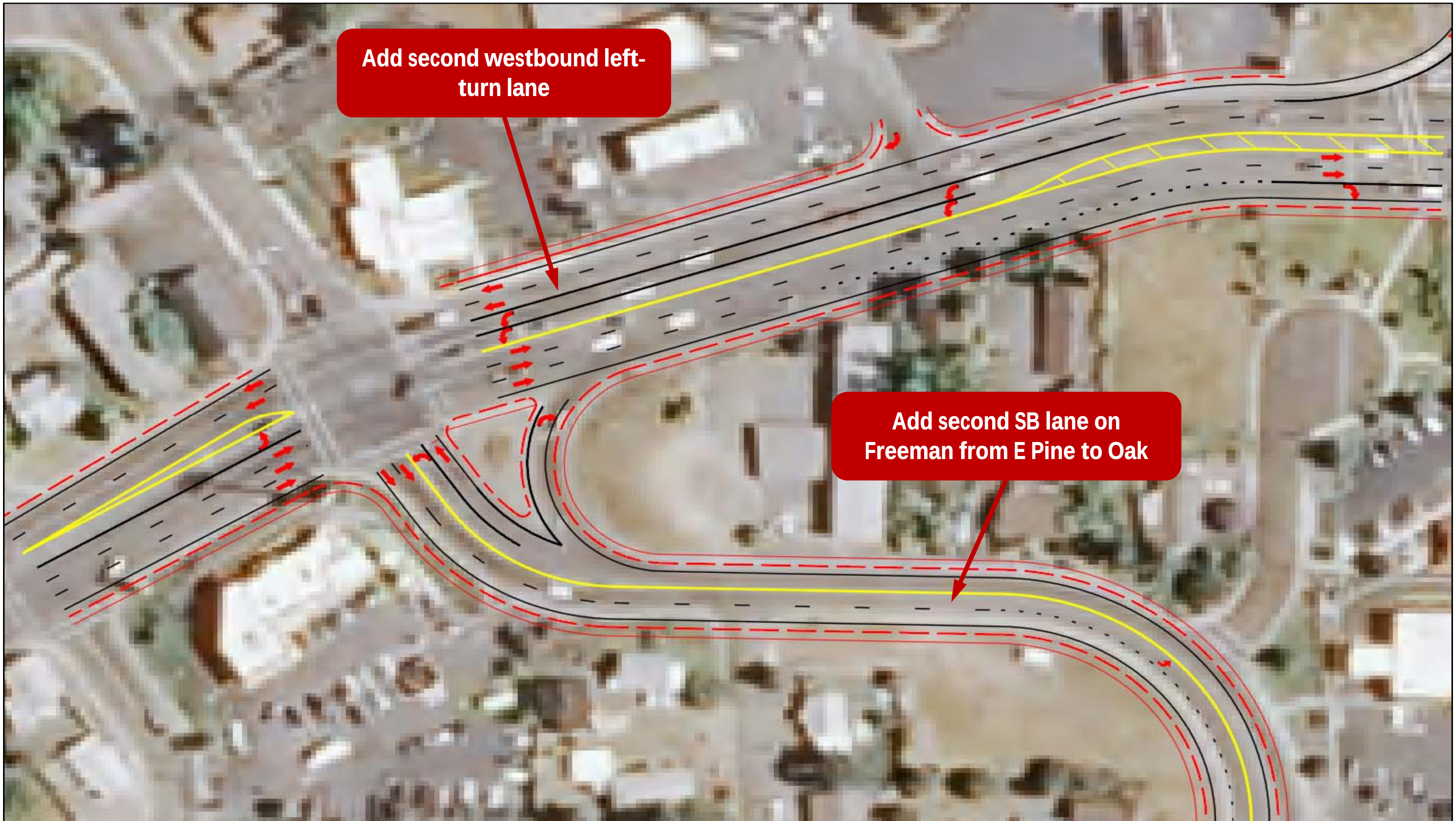
Concept I-6
Diverging Diamond Interchange with Bridge Widening



Legend
- Edge of Pavement
- Right of Way Line
- Centerline Striping

Figure 4-9

Concept W-1
10th Street/Freeman Road Improvements - Option 1



Legend
- Edge of Pavement
- Right of Way Line
- Centerline Striping

Figure 4-10

Concept W-2
10th Street/Freeman Road Improvements - Option 2

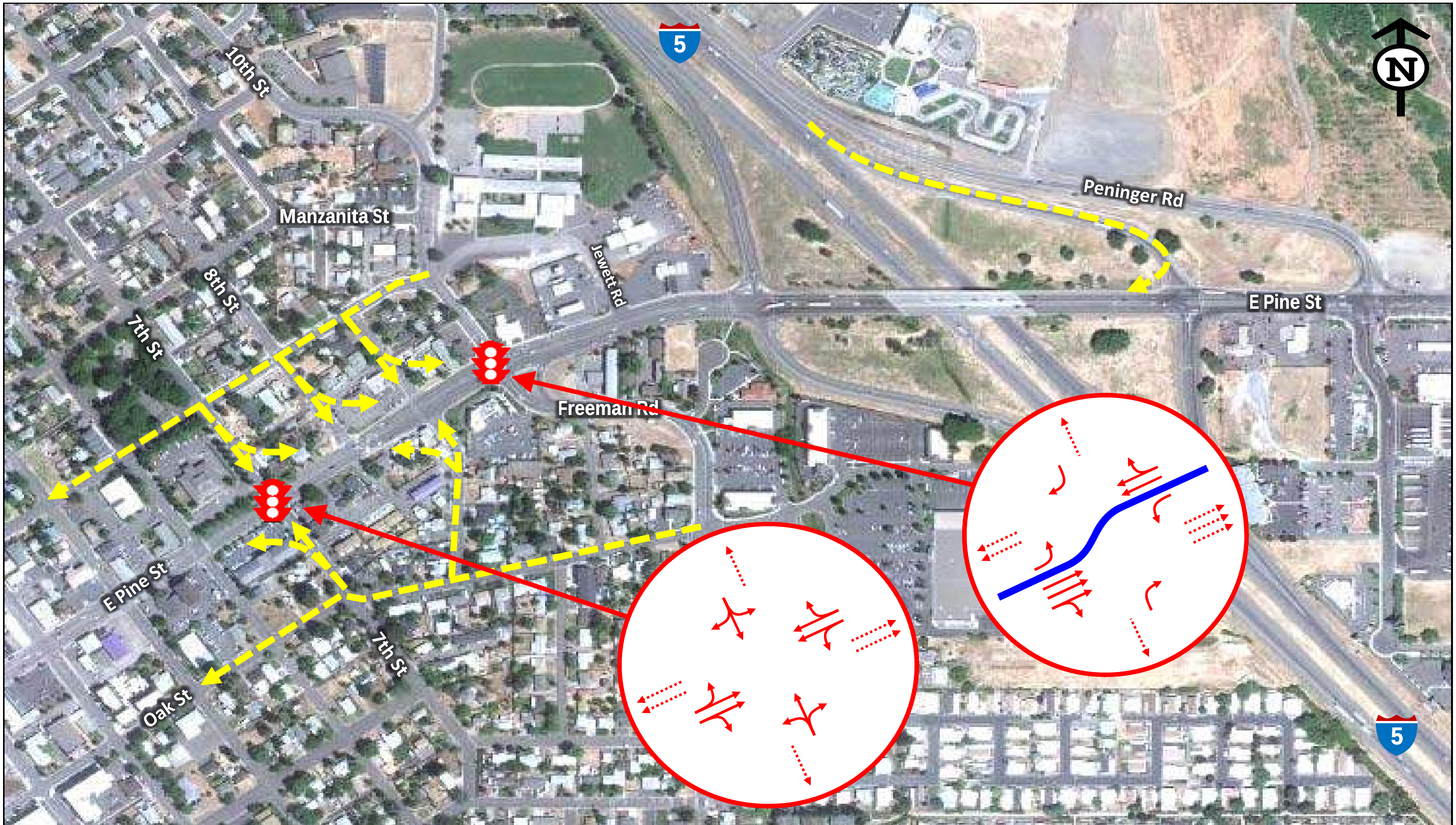
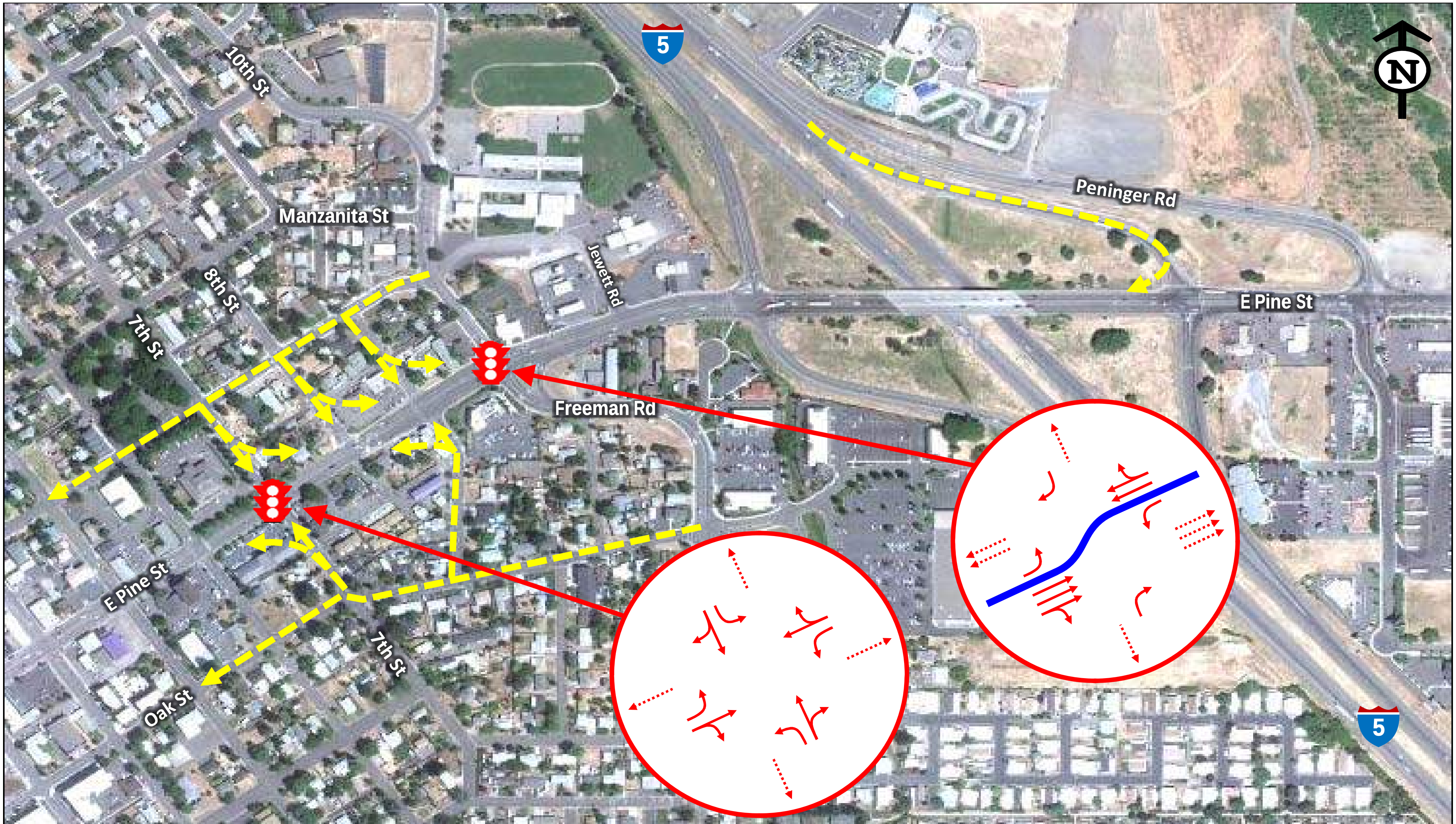


Figure 4-11

Concept W-3
10th Street/Freeman Road Turn Restrictions – Option 1

Legend

- Turning Movement
- Receving Lane
- Raised Barrier
- Diverted Traffic Routes
- Traffic Signal



Legend

- Turning Movement
- Receving Lane
- Raised Barrier
- Diverted Traffic Routes
- Traffic Signal

Figure 4-12

Concept W-4
10th Street/Freeman Road Turn Restrictions – Option 2

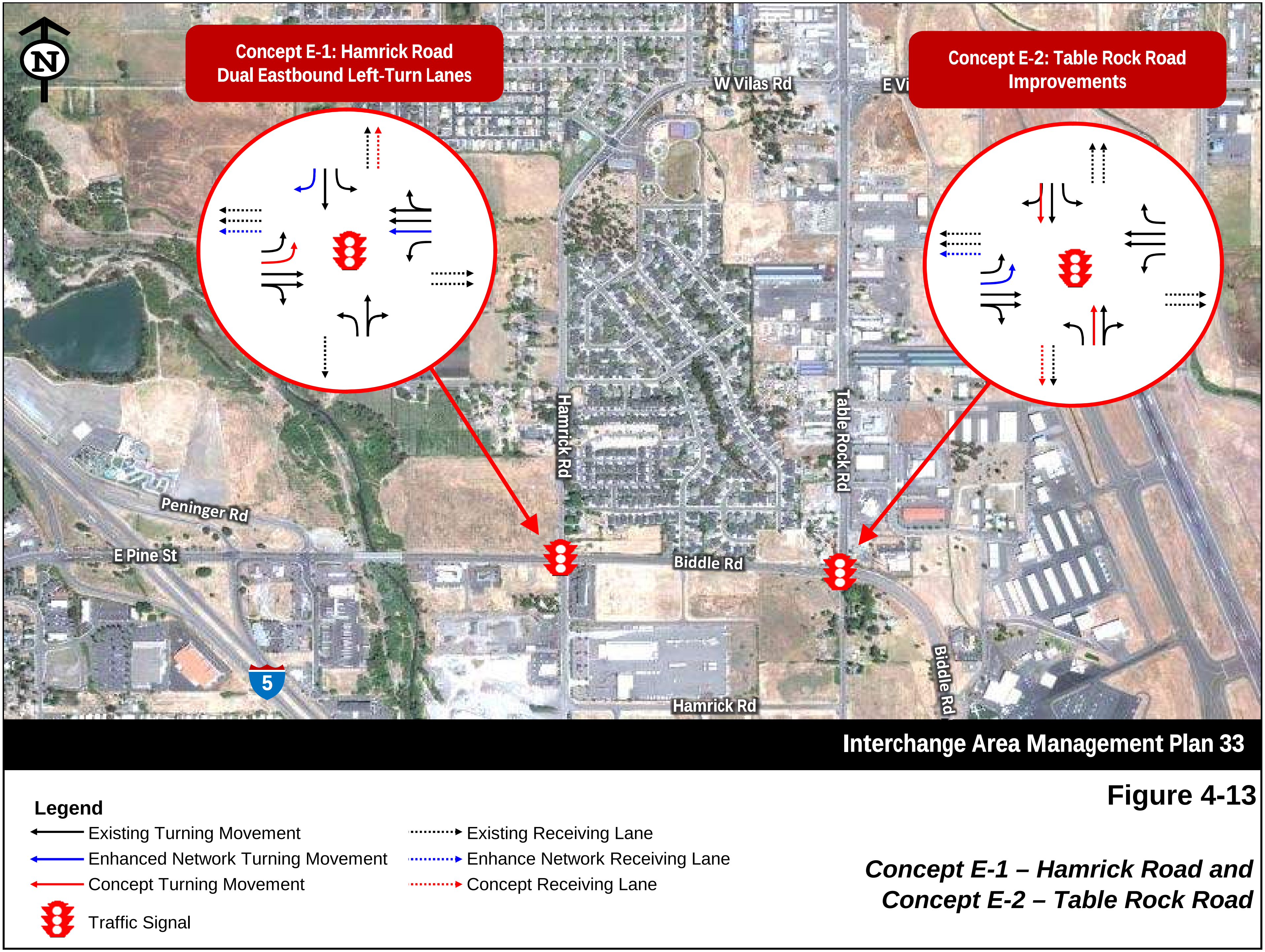
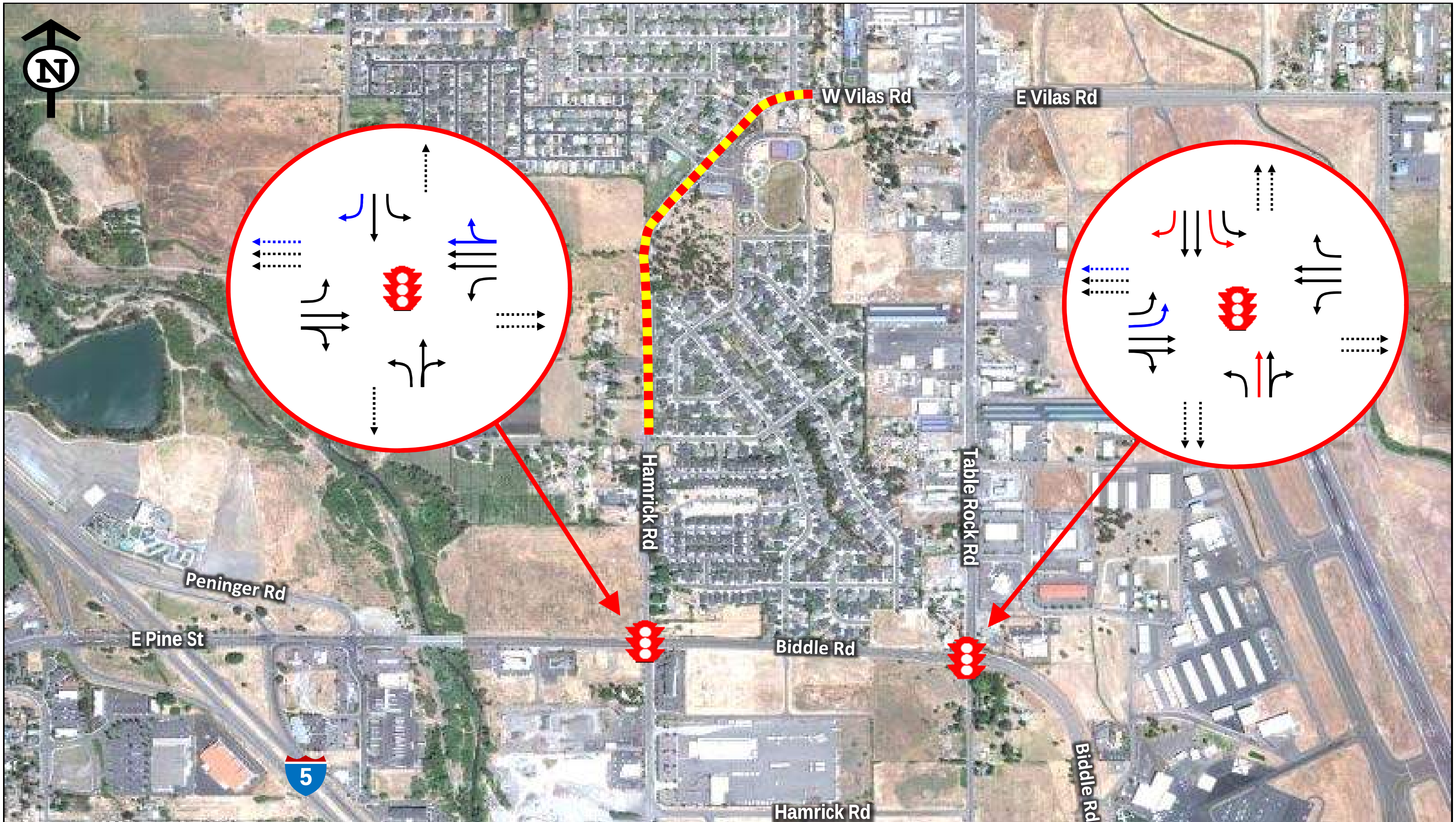


Figure 4-13

Concept E-1 – Hamrick Road and
Concept E-2 – Table Rock Road



Legend

- Existing Turning Movement
- Enhanced Network Turning Movement
- Concept Turning Movement
- Traffic Signal
- Existing Receiving Lane
- Enhance Network Receiving Lane
- Concept Receiving Lane
- Traffic Calming Measures

Figure 4-14

Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts

IAMP 33 Improvement Concepts – Summary Evaluation Matrix

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental and Land Use[5]	Cost Opinion[6]
BASELINE IMPROVEMENTS – NO BUILD ANALYSIS							
NA	Study Area	RTP Financially Constrained: ▪ Peninger Improvements ▪ Extension of westbound right-turn lane at NB On-Ramp	Establish baseline condition and identify future deficiencies	Operations with 2034 RTP Forecasts (AM Peak Hour): I-5 SB Ramps: V/C = 0.94 LOS C Queuing – WB Left, SB I-5 NB Ramps: V/C = 0.60 LOS A Queuing – None Operations with 2034 RTP Forecasts (PM Peak Hour): 10th/Freeman: V/C = 0.88 LOS D Queuing – WB Left, SB Left I-5 SB Ramps: V/C = 0.75 LOS A Queuing – WB Left I-5 NB Ramps: V/C = 0.83 LOS B Queuing – WB, NB Peninger: V/C = 0.94 LOS C Queuing – NB Hamrick: V/C = 0.98 LOS D Queuing – EB Left, SB Table Rock: V/C = 1.22 LOS E Queuing – EB Left, SB Left Operations with 2034 Sensitivity Analysis Forecasts (AM Peak Hour): I-5 SB Ramps: V/C = 1.00 LOS D Queuing – EB, WB Left, SB I-5 NB Ramps: V/C = 0.72 LOS B Queuing – None Operations with 2034 Sensitivity Analysis Forecasts (PM Peak Hour): 10th/Freeman: V/C = 0.93 LOS D Queuing – EB, WB Left, NB, SB I-5 SB Ramps: V/C = 0.90 LOS C Queuing – EB, WB Left I-5 NB Ramps: V/C = 1.06 LOS C Queuing – WB, NB Peninger: V/C = 1.12 LOS E Queuing – WB, NB Hamrick: V/C = 1.16 LOS E Queuing – EB Left, WB, SB Table Rock: V/C = 1.10 LOS F Queuing – WB, NB, SB Left Safety: ▪ Safety concerns throughout the project area due to long queues and congestion.	NA	NA	NA
ENHANCED BASELINE IMPROVEMENTS – E PINE STREET IMPROVEMENTS							
NA	Study Area	Enhanced Network Projects: • Peninger: Remove signal and convert to right-in/right-out • E Pine from I-5 NB Ramp to Table Rock: Widen to add third westbound through lane • New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick • New north-south street connecting Beebe and new connection to south located between Peninger and Hamrick • Hamrick extension to Peninger south of E Pine ▪ E Pine/Table Rock – Dual eastbound left-turn lanes	Establish baseline condition and identify future deficiencies	Operations with 2034 RTP Forecasts (AM Peak Hour): I-5 SB Ramps: V/C = 0.94 LOS C Queuing – WB Left. SB I-5 NB Ramps: V/C = 0.61 LOS B Queuing – None Operations with 2034 RTP Forecasts (PM Peak Hour): 10th/Freeman: V/C = 0.86 LOS = D Queuing – WB Left, SB Left I-5 SB Ramps: V/C = 0.78 LOC = B Queuing – WB Left I-5 NB Ramps: V/C = 0.86 LOC = C Queuing – NB Hamrick: V/C = 0.94 LOC = C Queuing – EB Left, SB Table Rock: V/C = 0.88 LOS = D Queuing – SB Left Operations with 2034 Sensitivity Analysis Forecasts (AM Peak Hour): I-5 SB Ramps: V/C = 0.95 LOS D Queuing – EB, WB Left, SB I-5 NB Ramps: V/C = 0.71 LOS B Queuing – None Operations with 2034 RTP Forecasts (PM Peak Hour): 10th/Freeman: V/C = 0.95 LOS = D Queuing – EB, WB Left, SB Left I-5 SB Ramps: V/C = 0.90 LOC = B Queuing – WB I-5 NB Ramps: V/C = 0.96 LOC = C Queuing – NB Hamrick: V/C = 1.05 LOC = D Queuing – EB Left, SB Table Rock: V/C = 1.05 LOS = E Queuing – NB, SB Left Safety: ▪ Improvements do not address congestion or queuing at all intersections.	NA	NA	• Central Point TSP estimates improvement costs of $19.7 Million

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental and Land Use[5]	Cost Opinion[6]
INTERCHANGE IMPROVEMENTS							
I-1	I-5 Northbound Off-Ramp	Add a second right-turn lane on the NB off-ramp	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: I-5 NB Ramps AM: V/C = 0.56 LOS A Queuing – None I-5 NB Ramps PM: V/C = 0.72 LOS B Queuing – None Operations with 2034 Sensitivity Analysis Forecasts: I-5 NB Ramps AM: V/C = 0.62 LOS B Queuing – None I-5 NB Ramps PM: V/C = 0.82 LOS B Queuing – None Safety: ▪ 5-year analysis showed 30 collisions (15 rear end, 11 turning, 1 pedestrian, and 3 assorted) ▪ Improved operations could mean fewer stops at the intersection thus reducing rear end collision potential ▪ The additional lane will not address conditions for pedestrians unless no turn on red is implemented for the northbound right-turn movement	▪ Additional storage lane of 350' ▪ Would result in ROW impacts	▪ Wouldresult in impact to properties adjacent to the Northbound ramp terminal ▪ The ramp is located within the 500-year flood plain, though the improvement would have no direct impacted on Bear Creek ▪ There is a hazardous material site located near the intersection	▪ $1.3 Million
I-2	I-5 Northbound Off-Ramp	Add a NB off-ramp loop to accommodate high demand by traffic heading westbound on E Pine	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: I-5 NB Ramps AM: V/C = 0.57 LOS A Queuing – None I-5 NB Ramps PM: V/C = 0.71 LOS B Queuing – None Operations with 2034 Sensitivity Analysis Forecasts: I-5 NB Ramps AM: V/C = 0.64 LOS B Queuing – None I-5 NB Ramps PM: V/C = 0.82 LOS B Queuing – None Safety: ▪ 5-year analysis showed 30 collisions ▪ Loop ramp adds traffic to north side of the intersection in direct conflict with the only sidewalk across the bridge ▪ Improved operations could mean fewer stops at the intersection thus reducing rear end collision potential	▪ Northbound loop added in northeast quadrant ▪ Approximately 400-450' of storage in two lanes ▪ Requires reconstruction of bridge to combine two structural spans into a single span for the loop ramp, addition of a substantial retaining wall, and realignment of existing northbound entrance ramp	▪ The loop ramp would be located within the 500-year flood plain, though the improvement would have no direct impacted on Bear Creek	▪ $9.7 Million
I-3	I-5 Southbound On-Ramp	Add a second westbound left-turn lane on E Pine without widening the bridge over the highway	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: I-5 SB Ramps AM: V/C = 0.74 LOS B Queuing – None I-5 SB Ramps PM: V/C = 0.66 LOS B Queuing – None Operations with 2034 Sensitivity Analysis Forecasts: I-5 SB Ramps AM: V/C = 0.79 LOS B Queuing – None I-5 SB Ramps PM: V/C = 0.79 LOS B Queuing – None Safety: ▪ 5-year analysis showed 19 collisions (9 rear end, 6 turning, and 4 assorted) ▪ Improved operations could mean fewer stops at the intersection thus reducing rear end collision potential	▪ Additional storage lane of 150-200' ▪ Modification would require a design exception or have ROW impacts in the northwest quadrant	▪ Wouldresult in impact to properties adjacent to the Southbound ramp terminal ▪ There are several hazardous material sites located within the southwest quadrant of the intersection	▪ $1.7 Million

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental and Land Use[5]	Cost Opinion[6]
I-4	I-5 Southbound On-Ramp	Add a SB on-ramp loop to accommodate high demand by traffic heading westbound on E Pine	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: I-5 SB Ramps AM: V/C = 0.53 LOS B Queuing – None I-5 SB Ramps PM: V/C = 0.66 LOS B Queuing – None Operations with 2034 Sensitivity Analysis Forecasts: I-5 SB Ramps AM: V/C = 0.58 LOS B Queuing – None I-5 SB Ramps PM: V/C = 0.74 LOS A Queuing – None Safety: ▪ 5-year analysis showed 19 collisions ▪ Improved operations could mean fewer stops at the intersection thus reducing rear end collision potential ▪ Loop ramp adds traffic to north side of the intersection in direct conflict with the only sidewalk across the bridge	▪ Southbound loop added in northwest quadrant ▪ Would requires reconstruction of bridge to accommodate loop ramp through structure bents ▪ Would require movement of the current on-ramp connection to I-5 to the south to maintain access spacing ▪ Would allow for sidewalk placement on the south side of E Pine Street	▪ The loop ramp would be located within the 500-year flood plain ▪ Would impact properties adjacent to the existing Southbound on-ramp ▪ There are several hazardous material sites located within the southwest quadrant of the intersection	▪ $11 Million
I-5	I-5 Northbound Off-Ramp and Southbound On-Ramp	Modify interchange to create a diverging diamond (existing bridge, 4-lanes)	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: West Crossover AM: V/C = 0.56 LOS B Queuing – EB East Crossover AM: V/C = 0.88 LOS C Queuing –None West Crossover PM: V/C = 0.75 LOS B Queuing –EB East Crossover PM: V/C = 0.91 LOS C Queuing –WB, EB Operations with 2034 Sensitivity Analysis Forecasts: West Crossover AM: V/C = 0.64 LOS B Queuing – EB East Crossover AM: V/C = 0.96 LOS D Queuing –EB West Crossover PM: V/C = 0.82 LOS B Queuing –EB East Crossover PM: V/C = 1.07 LOS E Queuing –EB, WB Safety: ▪ Northbound ramp terminal: 30 collisions including 1 pedestrian; Southbound ramp terminal: 19 collisions ▪ Provides centrally located multi-use path accessible via cross walk at signalized ramp terminals ▪ Reduces the number of conflict points at both ramp terminals	▪ Diverging diamond interchange using existing bridge ▪ Slight realignment of ramp terminal approaches ▪ Includes centrally located multi-use path between the ramp terminals accessible via cross-walk at the signalized ramp terminals ▪ Would result in ROW impacts adjacent to the ramwould be needed for the widening to 3 lanes at the southbound ramp terminal	▪ Would result in impact to properties adjacent to the ramp terminals ▪ There are several hazardous material sites located around the interchange	▪ $8.6 Million
I-6	I-5 Northbound Off-Ramp and Southbound On-Ramp	Modify interchange to create a diverging diamond with 5 lanes (widen or replace bridge structure)	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts: West Crossover AM: V/C = 0.55 LOS B Queuing – EB East Crossover AM: V/C = 0.75 LOS C Queuing – None West Crossover PM: V/C = 0.74 LOS B Queuing – EB East Crossover PM: V/C = 0.76 LOS C Queuing – EB Operations with 2034 Sensitivity Analysis Forecasts: West Crossover AM: V/C = 0.63 LOS B Queuing – EB East Crossover AM: V/C = 0.82 LOS D Queuing – EB West Crossover PM: V/C = 0.81 LOS B Queuing – WB, EB East Crossover PM: V/C = 0.89 LOS D Queuing – EB Safety: ▪ Northbound ramp terminal: 30 collisions including 1 pedestrian; Southbound ramp terminal: 19 collisions ▪ Provides centrally located multi-use path accessible via cross walk at signalized ramp terminals ▪ Reduces the number of conflict points at both ramp terminals	▪ Diverging diamond interchange on widened or replaced bridge structure ▪ Would require slight realignment of ramp terminal approaches ▪ Includes centrally located multi-use path between the ramp terminals accessible via cross-walk at the signalized ramp terminals ▪ Would result in ROW impacts adjacent to the ramp terminals	▪ Would require new bent locations within the 500-year flood plain ▪ There are several hazardous material sites located around the interchange	TBD

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental and Land Use[5]	Cost Opinion[6]
I-7	I-5 Northbound Off-Ramp and Southbound On-Ramp	Bridge Improvements combined with concepts I-1 through I-4: ▪ Add capacity at the Northbound ramp terminal (I-1, I-2) ▪ Add capacity at the Southbound ramp terminal (I-3,I-4) ▪ Sidewalk on south side of bridge	Improve operations and reduce queuing	Dependent on capacity improvements selected (I-1 through I-4)	Dependent on capacity improvements selected	Dependent on capacity improvements selected	Dependent on capacity improvements selected
WEST SIDE IMPROVEMENTS							
W-1	10^{th} Street/Freeman Road and Jewett School Road	Combined Improvements: ▪ Restrict turn movements to Right-In/Right-Out at Jewett ▪ Add a second westbound left-turn lane on E Pine at 10^{th}/Freeman ▪ Reduce eastbound E Pine to two through travel lanes to off-set second westbound left-turn lane ▪ Add second southbound lane on Freeman from E Pine to Oak ▪ Restripe 10^{th} to extend southbound left-turn lane to Manzanita	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): 10^{th}/Freeman: V/C = 0.85 LOS C Queuing – EB, SB Left Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): 10^{th}/Freeman: V/C = 0.94 LOS D Queuing – EB, SB Left Safety: ▪ 21 rear end collisions, spillback into adjacent intersections (Jewett and Southbound ramp terminal) ▪ Reduce the number of conflict points at Jewett ▪ Additional storage may reduce the potential for rear end collisions	▪ Restrict turn movements to Right-In/Right-Out at Jewett ▪ Additional left-turn storage ▪ Would reduce the number of eastbound through lanes from 3to 2 ▪ Add second southbound travel lane to Freeman Rd ▪ Would have ROW impacts on E Pine and Freeman Rd	▪ Would have impacts on businesses adjacent to E Pine ▪ Would have ROW impacts to adjacent properties along 10^{th} St ▪ There are some hazardous material sites located along E Pine Street between 10^{th}/Freeman and the I-5 southbound ramp terminal	▪ $2.2 Million
W-2	10^{th} Street/Freeman Road and Jewett School Road	Combined Improvements: ▪ Restrict turn movements to Right-In/Right-Out at Jewett ▪ Add a second westbound left-turn lane on E Pine at 10^{th}/Freeman ▪ Retain eastbound E Pine through travel lanes (3) ▪ Add second southbound lane on Freeman from E Pine to Oak ▪ Restripe 10^{th} to extend southbound left-turn lane to Manzanita	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): 10^{th}/Freeman: V/C = 0.73 LOS C Queuing – SB Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): 10^{th}/Freeman: V/C = 0.79 LOS C Queuing – SB Safety: ▪ 21 rear end collisionsReduce the number of conflict points at Jewett ▪ Increases the pedestrian crossing distance of E Pine ▪ Increases the pedestrian crossing distance of Freeman ▪ Additional storage may reduce the potential for rear end collisions	▪ Would restrict turn movements to Right-In/Right-Out at Jewett ▪ Additional storage left-turn ▪ Southbound exit ramp right-turn add-lane would have ROW impacts ▪ Add second southbound travel lane to Freeman Rd ▪ Would result in ROW impacts to both sides of E Pine	▪ Would have ROW impacts to adjacent properties along E Pine ▪ Would have ROW impacts to adjacent properties along Freeman Rd and 10^{th} St ▪ There are some hazardous material sites located along E Pine Street between 10^{th}/Freeman and the I-5 southbound ramp terminal	▪ $2.6 Million
W-3	10^{th} Street/Freeman Road and Jewett School Road and 7^{th} Street	Combined Improvements: ▪ Restrict turn movements to Right-In/Right-Out at Jewett ▪ Restrict turn movements to Right-In/Right-Out/Left-In at 10^{th}/Freeman with median barrier ▪ Add signal at 7^{th} St to accommodate shift in left-turn and through movements (4 lanes on E Pine) ▪ Retain existing 4 lane cross section on E Pine St	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): 7th: V/C = 0.80 LOS C Queuing – WB, SB 10^{th}/Freeman: V/C = 0.67 LOS B Queuing – WB Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): 7th: V/C = 0.80 LOS C Queuing – EB, WB, SB 10^{th}/Freeman: V/C = 0.73 LOS B Queuing – WB Safety: ▪ 21 rear end collisionsReduce the number of conflict points at Jewett ▪ Increases the potential for rear end collisions at the 7^{th} Street intersection	▪ Assumes 4 lanes on E Pine St. at 7^{th} Street ▪ Would restrict business access along E Pine St to Right-In/Right-Out ▪ Would require installation of a traffic signal at 7^{th} Street	▪ Would be contrary to proposed conversion (4 lanes to 3 lanes) west of 7^{th} St ▪ Would impact adjacent businesses alongE Pine St and 7^{th} St ▪	▪ TBD

ID	Location	General Description	Purpose	Traffic Operations and Safety[1,2,3]	Basic Roadway Geometry and Right of Way[4]	Environmental and Land Use[5]	Cost Opinion[6]
W-4	10th Street/Freeman Road and Jewett School Road and 7th Street	Combined Improvements: ▪ Restrict turn movements to Right-In/Right-Out at Jewett ▪ Restrict turn movements to Right-In/Right-Out/Left-In at 10th/Freeman with median barrier ▪ Add signal at 7th St to accommodate shift in left-turn and through movements (3 lanes on E Pine) ▪ Assumes conversion to 3 lanes along E Pine St ▪ Widen 7th to provide left-turn lanes	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): 7th: V/C = 0.82 LOS C Queuing – EB, WB 10th/Freeman: V/C = 0.67 LOS B Queuing – WB Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): 7th: V/C = 0.93 LOS C Queuing – EB, WB, SB 10th/Freeman: V/C = 0.73 LOS B Queuing – WB Safety: ▪ 21 rear end collisions ▪ Reduce the number of conflict points at Jewett ▪ Increases the potential for rear end collisions at the 7th Street intersection ▪ Increases the crossing distance of 7th Street	▪ Assumes 3 lanes on E Pine St at 7th Street ▪ Would require widening of the 7th Street approach and installation of a traffic signal ▪ Would result in ROW impacts along 7th Street due to widening ▪ May result in loss of on-street parking along 7th St	▪ Would have ROW impacts to adjacent properties along 7th Street, may have ROW impacts along E Pine St.	▪ TBD
EAST SIDE IMPROVEMENTS							
E-1	Hamrick Road	Combined Improvements: ▪ Add a second eastbound left-turn lane on E Pine at Hamrick ▪ Add second northbound lane on Hamrick extending ~700' north of E Pine before merging to a single lane	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): Hamrick: V/C = 0.65 LOS C Queuing – None Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): Hamrick: V/C = 0.73 LOS C Queuing – None Safety: ▪ 5-year analysis showed 16 crashes including 5 rear end and 10 turning ▪ May reduce the potential of rear end collisions by providing extra capacity and reducing queues	▪ Additional storage lane provided, layout not prepared at this time ▪ Add second northbound receiving lane on Hamrick, approximately 700' before merging to single lane ▪ Will have ROW impacts along E Pine (west of Hamirck) and Hamrick (north of E Pine)	▪ 'Would result in ROW impacts to adjacent properties along both E Pine and Hamrick Rd, concept	▪ TBD
E-2	Table Rock Road (OUTSIDE OF INTERCHANGE STUDY AREA)	Combined Improvements: ▪ Widen Table Rock south of Biddle to provide a 5-lane cross-section ▪ Restripe the southbound approach to provide two left-turn travel lanes	Improve operations and reduce queuing	Operations with 2034 RTP Forecasts (PM Peak): Table Rock: V/C = 0.75 LOS C Queuing – SB Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): Table Rock: V/C = 1.01 LOS D Queuing – All approaches Safety: ▪ No safety analysis has been conducted.	▪ Additional storage lane provided, layout not prepared at this time ▪ Additional through travel lanes in the northbound and southbound directions	▪ Would result in ROW impacts to adjacent properties along both E Pine and Table Rock Rd	▪ TBD
E-3	Hamrick Road	Combined Improvements: ▪ Discourage through traffic on Hamrick with traffic calming measures ▪ Restrict allocation of green time at Hamrick to encourage 30% shift in eastbound lefts and southbound rights to Table Rock Rd ▪ Add southbound right-turn lane on Table Rock in addition to the improvements in E-2	Shift traffic demand to higher function roadway	Operations with 2034 RTP Forecasts (PM Peak): Hamrick: V/C = 0.77 LOS C Queuing – None Table Rock: V/C = 0.75 LOS C Queuing – None Operations with 2034 Sensitivity Analysis Forecasts (PM Peak): Hamrick: V/C = 0.91 LOS C Queuing – EB Left Table Rock: V/C = 0.97 LOS D Queuing – NB Left Safety: ▪ 5-year analysis showed 16 crashes including 5 rear end and 10 turning ▪ May reduce the potential of rear end collision by providing extra capacity and reducing queues	▪ Enhanced Network improvements at Hamrick Rd ▪ Traffic calming along Hamrick Rd ▪ Additional through travel lane in the northbound direction, additional left- and right-turn lanes in the southbound direction	▪ Would result in ROW impacts to adjacent properties along E Pine, Hamrick Rd and Table Rock Rd	▪ TBD

Notes:

1. Traffic operations were evaluated for concepts that were identified to address operational deficiencies. The operational assessment focuses on the volume-to-capacity (v/c) ratio and level of service (LOS) for the 2010 existing and 2034 future condition.
2. At intersections where potential changes in traffic control or turn lanes were considered, the procedures in the ODOT Analysis Procedures Manual (APM) were followed.
3. Some improvements are focused on addressing safety concerns or may address safety as well as traffic operations deficiencies. Crash patterns from the five-year analysis period (2005 through 2009) are discussed for those improvements that address safety.
4. Illustrations of basic roadway geometry and right-of-way needs were developed for concepts that involve infrastructure improvements. The drawings approximate roadway centerlines, edge of roadway and right of way using available base mapping.
5. Impacts to resources were qualitatively assessed based on the data assembled for the environmental and land use reconnaissance. The level of analysis of the study area is designed to identify those areas judged to have considerable potential for conflict.
6. Rough order of magnitude cost opinions were developed using present day dollars and are consistent with standard estimating methods. The estimates include a contingency factor but do not include right-of-way costs. The cost opinions are intended to help differentiate alternatives by approximating the relative costs of each project.

I-5 Exit 33 (Central Point):
Interchange Area Management Plan

Technical Memorandum #5
Preferred Alternative

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

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5. PREFERRED ALTERNATIVE

This technical memorandum summarizes the recommendations for the improvements that would constitute the preferred alternative for the I-5 Exit 33 IAMP. These recommendations are based on feedback from the Technical and Citizen Advisory Committees, comments received at the Public Open House, and input from ODOT, City, and County staff.

5.1. Alternatives Considered

The alternatives analysis presented in Technical Memorandum #4 focused on four areas for consideration within the interchange study area:

- Enhanced Network
- Interchange Improvements
- West Side Improvements
- East Side Improvements

During and following the presentations of the alternatives analysis, several other ideas were identified for consideration. These have been assessed and recommendations are presented in a new category of improvements: *Additional Improvements*. A table at the end of the memorandum summarizes the recommendations for all of the concepts considered.

The figures illustrating the alternatives previously discussed in Technical Memorandum #4 have not been repeated in this memorandum; however, new figures illustrating the additional improvements are attached.

5.1.1. Enhanced Network

The Enhanced Network concept combines the future financially-constrained (funded) projects from the RTP with the improvements identified in the City of Central Point TSP. The Enhanced Network provides additional connectivity, supports development of lands north and south of E Pine Street, and addresses some of the operational issues highlighted in the future baseline analysis.

Discussion

The Enhanced Network improvements that were assumed in this alternative include:

- New connections across Bear Creek: Connect Peninger Road to Beebe Road north of E Pine Street and connect Peninger Road to Hamrick Road south of E Pine Street (Central Point TSP Project #240, Tier 2 and Project #245, Tier 2)
- New north-south street: Connect Beebe Road across E Pine Street to the east-west collector street (Hamrick Road) south of E Pine Street (East Pine Street Plan – assumed to be development driven)
- Peninger Road/E Pine Street Intersection: Remove traffic signal and convert to right-in/right-out (Central Point TSP Project #245, Tier 2)

- E Pine Street from I-5 NB Ramp to Table Rock Road: Widen to add third westbound through lane (Central Point TSP Project #233, Tier 2, Project #236, Tier 2, and Project #255, Tier 2)
- Hamrick Road: Extend to Peninger Road connection south of E Pine Street (Central Point TSP Project #234, Tier 2)
- E Pine Street/Table Rock Road intersection: Add a second eastbound left-turn lane (Central Point TSP Project #218, Tier 1, Long)

Because of the additional network capacity created by the third westbound through lane on E Pine Street, traffic volume forecasts with the enhanced network are higher than estimated for the future baseline scenario. Traffic that would otherwise travel using different roadways in the larger regional network would be attracted to this higher capacity route.

Although the improvements associated with the Enhanced Network concept would improve operations at many of the study area intersections, operations and queues at many locations would remain a significant safety concern.

Recommendation

The improvements in the Enhanced Network concept are recommended as an element of the I-5 Exit 33 IAMP. However, many of these projects are Tier 2 projects with no clear funding available. Thus, additional analysis should consider how the timing of project completion could affect other elements of the IAMP.

5.1.2. Interchange Improvements

Seven potential interchange improvements were identified during the conceptual development to bring the operations up to state standards, provide additional capacity, or address safety concerns. Some of these projects are standalone concepts while others may ultimately be combined into an overall interchange concept.

Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes

Concept I-1 is one of two concepts that address safety and operations at the northbound ramp terminal (see also Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp). It considers widening the I-5 northbound off-ramp to add a second right-turn lane at the approach to E Pine Street. The purpose of the improvement is to address safety concerns associated with queuing on the off-ramp by increasing intersection capacity.

Discussion

The current northbound off-ramp has three lanes (left turn only, left-through, and right turn only). Concept I-1 would add a second right-turn lane to provide approximately 350 feet of additional storage for the right-turn movement. Most of the improvement could be accommodated within the existing ROW; however, the second right-turn lane could require some additional ROW at the intersection.

With the 2034 RTP forecasts and Concept I-1, the intersection would meet state mobility standards for both AM and PM peak hours and reduce the length of the queues on the northbound off-ramp while also providing additional storage capacity. As a result, the vehicular safety issues associated with long queues extending in the deceleration zone on the ramp would not be a concern. Furthermore, improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes. This improvement would create a wider pedestrian crossing distance on the south side of the intersection that would need to be addressed in the design process.

Recommendation

Concept I-1 is recommended as an element of the I-5 Exit 33 IAMP. Ramp safety is the primary reason for this improvement with intersection capacity as an important factor. Queuing on the northbound off-ramp should be monitored at this location to maintain safe operations. In the short term, traffic signal timing may be used to manage queues on the ramps. In the long term, additional storage and capacity for the right-turn movement will be needed, particularly if lands within the area develop more quickly than currently forecast in the 2034 RTP model. At this time, Concept I-1 should be a medium to low priority project.

Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp

Concept I-2 considers adding a looping northbound off-ramp on the north side of the interchange. The existing northbound off-ramp would remain in place but would be restriped to allow the through movement across E Pine Street and dual right turns for northbound highway traffic heading eastbound on E Pine Street. Similarly to Concept I-1, the purpose of the improvement is to address safety concerns associated with queuing on the northbound off-ramp.

Discussion

Concept I-2 would add a loop off-ramp on the north side of the interchange to accommodate high demand from northbound I-5 to westbound E Pine Street. Construction of the loop ramp would be complicated by the existing roadway geometry. Substantial structural work on the overpass would be needed to achieve minimum design standards, the on-ramp would need to be relocated, and Peninger Road would potentially be impacted as well.

The safety and operational benefits of Concept I-2 would be similar to Concept I-1. However, an additional conflict point between vehicles and pedestrians would be added on the north side where the sidewalk would cross the new ramp.

Recommendation

Concept I-2 is not recommended for the I-5 Exit 33 IAMP. Although it would address safety and operational deficiencies, it would do so at substantially higher cost that Concept I-1.

Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes

Concept I-3 is one of two concepts that address safety and operations at the southbound ramp terminal (see also Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp). It considers widening E Pine Street to add dual westbound left-turn lanes onto the I-5 southbound on-ramp. The purpose of the improvement is to address safety concerns associated with queuing on the off-ramp by increasing intersection capacity.

Discussion

Concept I-3 would widen the southbound on-ramp to provide two receiving lanes that merge before traffic enters the freeway. E Pine Street would be widened to add a second westbound left-turn lane. This improvement was initially conceived with the widening of E Pine Street beginning just west of the freeway overpass bridge structure to provide a second left-turn lane with up to 200 feet of additional storage. However, it could be considered the first phase of a more extensive project that would involve widening the freeway overpass structure to provide additional left-turn lane storage. Most of the improvement could be accommodated within the existing ROW; however, some additional ROW would likely be needed along E Pine Street west of the southbound ramp to accommodate the second left-turn lane.

With the 2034 RTP forecasts and Concept I-3, the intersection would meet state mobility standards for both AM and PM peak hours and reduce the length of the queues on the southbound off-ramp by improving overall intersection capacity. As a result, the safety issues associated with long queues extending in the deceleration zone on the off-ramp would not be a concern. Furthermore, improved operations could mean that fewer vehicles would be required to stop at the intersection, which could reduce the potential for rear end crashes.

Because there is no sidewalk on the south side of E Pine Street between the freeway ramps, there are no concerns about the increased pedestrian crossing distance with the ramp widening. If a sidewalk is added to the south side of E Pine Street, as discussed under Concept A-1, then the wider pedestrian crossing distance would need to be addressed in design.

Recommendation

Concept I-3 is recommended as an element of the I-5 Exit 33 IAMP. Ramp safety is the primary reason for this improvement with intersection capacity as an important factor. Queuing on the southbound off-ramp should be monitored at this location to maintain safe operations. In the short term, traffic signal timing may be used to manage queues on the ramps. In the long term, additional intersection capacity will be needed, particularly if lands within the area develop more quickly than currently forecast in the 2034 RTP model. At this time, Concept I-3 should be a medium to low priority project.

Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp

Concept I-4 considers adding a looping southbound on-ramp on the north side of the interchange that would serve traffic heading westbound on E Pine Street. The existing southbound on-ramp would remain in place but would only serve traffic heading eastbound on

E Pine Street. Similarly to Concept I-3, the purpose of the improvement is to address safety concerns associated with queuing on the southbound off-ramp.

Discussion

Concept I-4 would add a loop ramp on the north side of the interchange to accommodate high demand from traffic heading westbound on E Pine Street to southbound I-5. Construction of the loop ramp would be complicated by the existing roadway geometry. Substantial structural work on the overpass would be needed to achieve minimum design standards and the existing southbound entrance ramp would need to be extended to meet standard spacing for consecutive entrance ramps. Extending the existing ramp would have significant ROW requirements from the parcels adjacent to the ramp and along the highway. It will also require some retaining walls because of the grade differential with the adjacent properties.

Although not included in the basic roadway geometry for Concept I-4, a sidewalk on the south side of E Pine Street could be added because there would be fewer travel lanes on the bridge. Some widening on the south side would be needed near the northbound ramp terminal.

The safety and operational benefits of Concept I-4 would be similar to Concept I-3. However, an additional conflict point between vehicles and pedestrians would be added on the north side where the sidewalk would cross the new ramp.

Recommendation

Concept I-4 is not recommended for the I-5 Exit 33 IAMP. Although it would address safety and operational deficiencies, it would do so at substantially higher cost that Concept I-3.

Concept I-5 – Diverging Diamond Interchange with No Bridge Widening

Concept I-5 is one of two concepts that address safety and operations at the ramp terminals using a diverging diamond interchange (DDI) design. Concept I-5 considers a DDI using the existing bridge across the freeway (two travel lanes in each direction, bike lanes in both directions, and a pedestrian pathway in the center) while Concept I-6 considers a DDI with bridge widening the existing freeway overpass. The purpose of the improvement is to address safety and long-term operational concerns at both ramp terminals.

Discussion

A DDI provides a number of operational and safety benefits over traditional interchange designs. However, because of the lane limitations imposed by maintaining the existing bridge cross-section, operations with Concept I-5 could not meet state mobility standards during both the AM and PM peak hours with the 2034 RTP forecasts.

Concept I-5 would eliminate many of the conflicts that can result in turning or angle collisions. With fewer vehicles stopping at the traffic signals, there may also be some reduction in rear end collisions. Bicycle safety would be improved with fewer conflict points. Shorter crossing distances and few simultaneous conflict points could improve pedestrian safety but the benefits could be off-set by more unsignalized pedestrian crossings.

Although the DDI design can sometimes result in a smaller footprint at high volume interchange locations, additional ROW would be needed on both sides of the interchange and impacts to adjacent properties would be realized.

Recommendation

Concept I-5 is not recommended for the I-5 Exit 33 IAMP. It would not address operational concerns and has high costs and impacts to adjacent lands.

Concept I-6 – Diverging Diamond with Bridge Widening

Concept I-6 would also modify the entire interchange to a diverging diamond interchange (DDI) design but would widen the bridge across the freeway to provide a third westbound travel lane and a wider center pathway. Similarly to Concept I-5, the purpose of the improvement is to address safety and long-term operational concerns at both ramp terminals.

Discussion

With the additional capacity associated with Concept I-6, operations would meet state mobility standards during both the AM and PM peak hours with the 2034 RTP forecasts. Safety benefits of Concept I-6 would be similar to those identified for Concept I-5.

In addition to all of the construction costs and ROW impacts associated with Concept I-5, Concept I-6 would require widening the bridge across the freeway.

Recommendation

Concept I-6 is not recommended for the I-5 Exit 33 IAMP. Although it would address operational concerns, it has much higher costs and impacts to adjacent lands than the combination of Concepts I-1 and I-3. Furthermore, it would have to be constructed all at once with no option to phase projects in response to need and available funding.

Concept I-7 – Bridge (Overpass) Widening or Replacement

Concept I-7 considers what bridge (freeway overpass) improvements may be needed depending on how deficiencies at the ramp terminals were addressed. The purpose of the concept was to address the sidewalk deficiency on the south side of the overpass.

Discussion

Concept I-7 identified four options to be paired with some combination of the first four interchange concepts. The extent of the bridge improvements would depend on the different pairings of concepts.

With the recommended pairing of Concepts I-1 and I-3, Concept I-7 includes the following improvement elements:

- Widen bridge to add sidewalk to south side of E Pine Street
- Potentially widen more extensively to extend second WB left-turn to provide greater storage distance

Recommendation

Since no design-specific evaluation was performed for this improvement, Concept I-7 is not recommended as an element of the I-5 Exit 33 IAMP. However, based on the preferred combination of Concepts I-1 and I-3, an improvement to address the sidewalk deficiency on the south side of the bridge is needed. Concept A-1 under Additional Improvements addresses this recommendation.

5.1.3. West Side Improvements

Four potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns west of the interchange.

Concept W-1 – 10th Street/Freeman Road Improvements – Option 1

Concept W-1 is one of two concepts that address operations at the 10th Street/Freeman Road intersection through increased capacity (see also Concept W-2 – 10th Street/Freeman Road Improvements – Option 2). It considers capacity improvements at the 10th Street/Freeman Road intersection combined with access restrictions along E Pine Street. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

Concept W-1 would add a second westbound left-turn lane from E Pine Street to Freeman Road and minimize ROW impacts by reducing the number of eastbound through travel lanes from three lanes to two lanes through the intersection. A second southbound receiving lane would be added on Freeman from E Pine Street to Oak Street. Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road, including Jewett School Road, would be restricted to right-in/right-out or possibly closed.

With the 2034 RTP forecasts and Concept W-1, the intersection would meet City and County mobility standards for the PM peak hour. The benefits of the dual left-turn lanes associated with this concept would be limited by the reduction in eastbound through travel lanes.

Access at Jewett School Road would be restricted to right-in/right-out movements only. This action would not require any construction although a raised median should be considered for enforcement because of the dual left-turn lanes on E Pine Street at Freeman Road. To minimize the impacts to adjacent businesses, a public connection or easement, potentially through the school property, to 10th Street opposite Manzanita Street would be desirable.

Some additional ROW would likely be needed along both E Pine Street and Freeman Road. Concept W-1 focuses on minimizing ROW impacts to adjacent properties but there would still be some potential minor impacts along E Pine Street.

Recommendation

Concept W-1 is recommended as an element of the I-5 Exit 33 IAMP. The access management measures between the southbound ramp terminal and 10th Street/Freeman Road could be implemented at any time and should be considered if a clear pattern of crashes develops. A public connection or easement, potentially through the school property, to 10th Street opposite Manzanita Street would be desirable to offset the impacts of access restrictions. The need for the second westbound left-turn lane is principally driven by the queuing of the westbound left-turning vehicles during the PM peak hour. As long as the queuing does not interfere with the southbound ramp terminal operations, the second left-turn lane on E Pine Street and second receiving lane on Freeman Road should be considered a medium- to long-term priority improvement.

Concept W-2 – 10th Street/Freeman Road Improvements – Option 2

Concept W-2 considers improvements similar to Concept W-1 but does not reduce the number of eastbound travel lanes on E Pine Street in order to maximize capacity at the intersection. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

Concept W-2 would widen E Pine Street to add a second westbound left-turn lane from E Pine Street to Freeman Road. A second southbound receiving lane would be added on Freeman from E Pine Street to Oak Street. Private access points along E Pine Street between the freeway ramps and 10th Street/Freeman Road, including Jewett School Road, would be restricted to right right-in/right-out or possibly closed.

Concept W-2 would provide a greater increase in capacity than Concept W-1 because there would be no reduction in travel lanes on E Pine Street. With the 2034 RTP forecasts and Concept W-2, the intersection would meet City and County mobility standards for the PM peak hour and have substantial reserve capacity for future growth.

Access management and the associated issues would be the same as those for Concept W-1. However, with the additional ROW required for the second westbound left-turn lane, more extensive property and access impacts would occur.

Recommendation

Concept W-2 is not recommended for the I-5 Exit 33 IAMP. Although it would address operational concerns at the 10th Street/Freeman Road intersection, the additional ROW impacts make this option less desirable than Concept W-1.

Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1

Concept W-3 considers turn movement restrictions that would shift traffic demand at the 10th Street/Freeman Road intersection rather than increasing capacity. It is one of two concepts that address operations at the 10th Street/Freeman Road intersection through shifts in traffic demand (see also Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2). The purpose of this concept is to address capacity and operational concerns.

Discussion

Concept W-3 would add a median barrier along E Pine Street to restrict turning movements to right-in/right-out/left-in at the intersection with 10th Street/Freeman Road. Left-turn movements from 10th Street and Freeman Road would not be permitted onto E Pine Street and through movements between the two roadways would also be prohibited. Traffic that previously made these movements (left-turn and through) would need to divert to other roadways. Traffic demand at 7th Street would likely increase with traffic diverted from 10th Street and Freeman Road; as a result, a traffic signal would need to be installed on E Pine Street at 7th Street. Concept W-3 assumes that the existing four-lane cross-section on E Pine Street would remain in place to maintain capacity through the intersection. (Note that Concept W-4 assumes the conversion to three lanes.) Other access control measures are also assumed to be in place along E Pine Street between the freeway ramps and 10th Street/Freeman Road as part of the plan to improve safety and capacity.

While the 10th Street/ Freeman Road intersection would meet the mobility standards with Concept W-3, the new traffic signal at 7th Street would cause additional downtown queuing that could sometimes affect operations at other nearby intersections. Traffic volumes on 7th Street, Manzanita Street, and Oak Street would all be higher with this concept than other concepts under consideration.

Access issues associated with Concept W-3 would be more extensive than discussed for Concepts W-1 and W-2 because of the additional turn restrictions at 10th Street and Freeman Road.

The changes in traffic control and turn prohibitions could largely be achieved within existing ROW.

Recommendation

Concept W-3 is not recommended for the I-5 Exit 33 IAMP. The changes in traffic circulation would have generally adverse impacts to adjacent neighborhoods and downtown Central Point.

Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2

Concept W-4 considers similar changes as Concept W-3 but assumes conversion of E Pine Street from a four-lane roadway to a three-lane roadway in downtown Central Point. The purpose of this concept is to address capacity and safety concerns between the I-5 southbound ramp terminal and 10th Street/ Freeman Road.

Discussion

The elements of Concept W-4 are the same as Concept W-3 but are based on conversion of E Pine Street from a four lanes to three lanes in downtown. Because of the three-lane cross-section on E Pine Street, 7th Street would be widened to include separate left-turn lanes with at least 100 feet of storage for left-turning vehicles. The other changes to traffic control and access would be the same as Concept W-3.

The benefits and impacts of Concept W-4 are very similar to those of Concept W-3.

Recommendation

Concept W-4 is not recommended for the I-5 Exit 33 IAMP. The changes in traffic circulation would have generally adverse impacts to adjacent neighborhoods and downtown Central Point.

5.1.4. East Side Improvements

Three potential intersection improvements were identified to improve traffic flow, provide additional capacity, or address safety concerns.

Concept E-1 – Hamrick Road – Dual Eastbound Left-Turn Lanes

Concept E-1 considers adding a second left-turn lane on the eastbound approach of E Pine Street and a second northbound receiving lane on Hamrick Road. The Central Point TSP already includes this improvement (reference number 216) as a medium-term, Tier 1 project, and it is also included in the RTP. Concept E-1 evaluates this improvement for comparison with other options with the purpose of addressing an identified capacity deficiency.

Discussion

Concept E-1 would add a second eastbound left-turn lane on E Pine Street and a second northbound receiving lane on Hamrick Road. This concept effectively addresses the operational issues associated with the high eastbound left-turning traffic volume. Most of the improvement could be addressed within existing ROW although some minor ROW impacts on E Pine Street east of the intersection may be necessary to provide for the taper and lane alignment.

The concerns raised about this improvement are associated with facilitating through traffic movements through residential neighborhoods with a major park abutting a portion of the roadway. Hamrick Road runs north-south at E Pine Street but eventually turns east-west and becomes Vilas Road north of E Pine Street, an arterial through Medford. These two roads together provide a slightly shorter route than using the arterial routes (E Pine Street and Table Rock Road) to reach Vilas Road. . As these neighborhoods continue to develop, there may be increasing conflicts between residents accessing the park as pedestrians and traffic traveling through the area to get somewhere else. There is a 25 mph posted speed in the vicinity of the park entrance on New Haven Road.

Recommendation

As long as the intersection operations at Hamrick Road are not adversely affecting the interchange almost ½ mile away, the decision to add this second left-turn lane can be addressed through the local agency TSP process. Therefore, Concept E-1 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

Concept E-2 – Table Rock Road Improvements

Although the Table Rock Road intersection with Biddle Road (E Pine Street) is not part of the IAMP study area, it does play an important role in the transportation network. Concept E-2 considers the types of improvements that would be needed to accommodate the forecast demand at Table Rock Road with the purpose of addressing capacity deficiencies.

Discussion

Concept E-2 includes two improvements already identified in the RTP and the local TSPs. One improvement is the addition of a second eastbound left-turn lane on Biddle Road at Table Rock Road (Central Point TSP Project #218, Tier 1 Long Term). The second improvement would widen Table Rock Road from two lanes to five lanes south of Biddle Road. The RTP has Jackson County project 821 to "widen to 3 & 5 lanes, curb, gutter, & sidewalk + bike lanes" listed as long-term, Tier 1. It's not clear from this description where the five-lane sections would be located but Concept E-2 does appear to be consistent with County plans in the corridor.

With the Concept E-2 improvements, Table Rock Road intersection with Biddle Road would be well below the County mobility standards for the PM peak hour with the 2034 RTP with substantial reserve capacity for future growth.

Recommendation

The Table Rock Road intersection with Biddle Road is more than 0.8 miles east of the interchange and intersection operations are not expected to adversely affect the interchange. The decision to implement these improvements can be addressed through the local agency TSP process. Therefore, Concept E-2 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts

Concept E-3 considers what improvements would be needed if through traffic were discouraged from using Hamrick Road and encouraged to use Table Rock Road instead. The purpose of this concept is to address capacity deficiencies that could arise from a shift in traffic demand.

Discussion

Concept E-3 would change traffic patterns through a combination of traffic calming measures on Hamrick Road, turning capacity restrictions at the Hamrick Road/E Pine Street intersection, and increased capacity at the Table Rock Road/Biddle Road intersection.

The traffic analysis for Concept E-3 assumed that the eastbound left-turn volume and southbound right-turn volumes at the Hamrick Road/E Pine Street intersection were each reduced by 30 percent. With that reduction, the intersection would meet operational standards with the 2034 RTP forecasts and the existing lane configurations. Further analysis indicates that a shift in at least 15 percent would be necessary to meet forecast demand.

As traffic is assumed to shift from Hamrick Road to Table Rock Road, additional capacity would be needed at the Table Rock Road/Biddle Road intersection. The extent of these improvements depends on how much traffic is assumed to shift. The traffic evaluation assumes that capacity would be in place to accommodate changing demand. In reality, traffic will not shift from one route to another unless there are measurable travel time benefits.

Recommendation

As with Concepts E-1 and E-2, the decision to implement these improvements can be addressed through the local agency TSP process. Therefore, Concept E-3 is not specifically recommended as an element of the I-5 Exit 33 IAMP.

5.1.5. Additional Improvements

During and following the presentations of the alternatives analysis, several other ideas were identified for consideration. These ideas are discussed below with recommendations for those improvements that would be included in the preferred alternative for the I-5 Exit 33 IAMP.

Concept A-1 – South Sidewalk

Concept A-1 considers the addition of a sidewalk on the south side of E Pine Street between the northbound and southbound ramp terminals. The purpose of this improvement is to address the existing pedestrian network deficiency. *Figure 5-1* illustrates the concept showing the location of the improvement and potential cross-sections on and off the bridge.

Discussion

E Pine Street has sidewalks through the study area with the exception of the segment on the south side between the northbound and southbound ramp terminals. This section is part of the original freeway overpass bridge that was constructed in the 1960's. The 5-foot sidewalk on the north side was added when the bridge was widened in the 1990's.

Comments at meetings have indicated that some pedestrians use the bike lane on the south side of E Pine Street rather than crossing over to the north side of the roadway, as indicated by signage at both ramp terminals. This anecdotal information is supported by field observations of several pedestrians using the bike lane.

Additional investigation into the bridge dimensions indicates that it may be possible to add a sidewalk on the south side of the bridge without widening the structure. Currently, the existing sidewalk on the north side is 5 feet wide and the paved surface is 74 feet (6-foot bike lane, 12-

foot travel lane, 12-foot travel lane, 14-foot median lane, 12-foot travel lane, 12-foot travel lane, 6-foot bike lane). The total width is 79 feet inside the bridge railings.

If the existing railing on the south side of the bridge was replaced with a railing similar to the one on the north side of the bridge, it may be possible to obtain another 2 feet of width between the railings for a total of 81 feet. With a 5-foot sidewalk added to the south side of the bridge and the existing 5-foot sidewalk on the north side, there would be 71 feet for bike lanes and travel lanes. If the bike lanes are narrowed to 5 feet, the bridge could have four 12-foot travel lanes (2 in each direction) and a 13-foot center median. Although these lane widths would require a design exception, they are within the range of acceptable widths.

Once a sidewalk is added to the bridge structure, it can be connected to the rest of the network with relative ease. A more typical 6-foot sidewalk could be constructed to connect to the existing facilities at the ramp terminals and the bike and vehicle lanes could resume standard widths.

The cost opinion for Concept A-1 is estimated at $1.2 million. On the bridge, this estimate assumes removal of the existing railing and some decking and construction of a 5-foot sidewalk, railing, and fencing. No seismic retrofitting is included in the cost estimate. Off the bridge, the estimate assumes a new 6-foot sidewalk extending to the I-5 ramp terminals, with new curb and relocated drainage inlets, but not complete reconstruction of the drainage system. New guardrail would be required at the bridge approach with widened slopes to minimize guardrail needs. Some signal and lighting poles would need to be relocated.

Recommendation

Concept A-1 is recommended as an element of the I-5 Exit 33 IAMP. The pedestrian system deficiency is present today and the improvement is recommended as a high- to medium priority project.

Concept A-2 – Bike Lane Improvements

Concept A-2 considers the addition of a bicycle signal at the I-5 southbound ramp terminal intersection to address the existing conflict between vehicles and bicyclists in the eastbound direction. The purpose of this improvement is to address the existing safety concern for bicyclists. *Figure 5-2* illustrates the concept showing the location of the improvement and examples of bicycle signal installations elsewhere in Oregon.

Discussion

The existing safety concern focuses on the block between Freeman Road and the I-5 southbound on-ramp. The eastbound bike lane on E Pine Street is located on the outside of the vehicular travel lanes and adjacent to the curb, as is typical for most bike lanes. However, east of Freeman Road, the outermost travel lane becomes a right-turn lane and all traffic most turn right onto the I-5 southbound on-ramp. Bicyclists trying to travel eastbound along E Pine Street become trapped by the right-turn lane and must cross a stream of right-turning vehicles to continue through the intersection.

Typically, this conflict is addressed by striping the bike lane between the through travel lanes and the right-turn lane but the complex traffic patterns in this block make this transition very difficult to implement safely. Therefore, options to modify the traffic signal were considered as an alternative because bicyclists on the roadway follow the traffic signal indications like vehicles.

Concept A-2 would provide additional traffic control to the southbound ramp terminal signal in the eastbound direction to separate the two movements, specifically a bicycle signal. The bicycle signal would be tied to the existing signal, similar to a pedestrian phase, and could be activated with sensors in the pavement, by pushbutton, or video detection. Prior to activation the signal would appear in the stop mode (red), once activated the eastbound right-turn traffic would be stopped to allow the cyclists to safely continue through the intersection. See examples in *Figure 5-2*.

Some impacts to intersection operations would occur when the bicycle signal is activated. Additional delay would be experienced for the eastbound right-turn traffic and other movements might be affected by signal timing adjustments as well. Prohibiting right-turn-on-red movements may also be required for the eastbound movement onto the southbound ramp.

The cost opinion for Concept A-2 is estimated at $25,000. This improvement would require new signal heads for the eastbound right-turn traffic and the bicycle lane and ideally some type of automated bicycle detection. Additional signage would be needed as well.

Recommendation

Concept A-2 is recommended as an element of the I-5 Exit 33 IAMP. The bicycle system deficiency is present today and the improvement is recommended as a high-priority project. Ultimately, Concept W-1 – 10th Street/Freeman Road Improvements – Option 1 would allow restriping for the bike lane that would address the conflict between vehicular and bicycle traffic; however, it is a longer-term project and will not address the current safety concern.

5.1.6. Summary of Recommendations

The following table summarizes each of the concepts and the recommendations for implementation.

Table 5-1. Summary of IAMP 33 Concepts

Concept	Recommendation
ENHANCED NETWORK	
Enhanced Network	Recommended
Interchange Improvements	
Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes	Recommended
Concept I-2 – I-5 Northbound Ramp Terminal – New Loop Off-Ramp	Not Recommended
Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes	Recommended
Concept I-4 – I-5 Southbound Ramp Terminal – New Loop On-Ramp	Not Recommended
Concept I-5 – Diverging Diamond Interchange with No Bridge Widening	Not Recommended
Concept I-6 – Diverging Diamond with Bridge Widening	Not Recommended
Concept I-7 – Bridge (Overpass) Widening or Replacement	See Additional Improvements
West Side Improvements	
Concept W-1 – 10th Street/Freeman Road Improvements – Option 1	Recommended
Concept W-2 – 10th Street/Freeman Road Improvements – Option 2	Not Recommended
Concept W-3 – 10th Street/Freeman Road Turn Restrictions – Option 1	Not Recommended
Concept W-4 – 10th Street/Freeman Road Turn Restrictions – Option 2	Not Recommended
East Side Improvements	
Concept E-1 – Hamrick Road – Dual Eastbound Left-Turn Lanes	Defer to Local TSP
Concept E-2 – Table Rock Road Improvements	Defer to Local TSP
Concept E-3 – Hamrick Road to Table Rock Road Traffic Shifts	Defer to Local TSP
ADDITIONAL CONSIDERATION CONCEPTS	
Concept A-1 – South Sidewalk	Recommended
Concept A-2 – Bike Lane Improvements	Recommended

5.2. Operations with Recommended Improvements

Although operations at relevant intersections were evaluated with all of the concepts considered, traffic operations with the combined recommendations have not been evaluated. Table 5-2 summarizes operations for the intersections using the 2034 RTP forecasts. Operational results are also presented for the forecasts based on the alternative land use scenario (ALUS) developed to represent more intense or accelerated rates of growth than assumed in the RTP model.

All improved intersections would meet mobility standards with the 2034 RTP forecasts but two intersections would exceed mobility standards with the ALUS forecasts. The intersection with I-5 northbound ramps at E Pine Street would meet the Highway Design Manual standard under the 2034 RTP scenario but would just exceed the mobility standard with the ALUS forecasts. Furthermore, the intersection would meet the Oregon Highway Plan standard even with the more intense land use scenario. The intersection of 10th Street/Freeman Road at E Pine Street would just exceed the County mobility standard. Because the ALUS forecasts are only intended to provide a sensitivity analysis to address more rapid development, this result is not anticipated to be an issue when developing the project.

Table 5-2: Operations with Recommended Improvements

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts (AM Peak Hour)				
I-5 SB Ramps: I-5 NB Ramps:	V/C = 0.65 V/C = 0.55	LOS = B LOS = B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]
Operations with 2034 RTP Forecasts (PM Peak Hour)				
10th/Freeman: I-5 SB Ramps: I-5 NB Ramps: Hamrick:	V/C = 0.83 V/C = 0.65 V/C = 0.72 V/C = 0.91	LOS = C LOC = A LOC = B LOC = B	Queuing – SB Left Queuing – None Queuing – None Queuing – None	V/C <= 0.95[2]/LOS D[3] V/C <= 0.80[1] V/C <= 0.80[1] V/C <= 0.95[2]
Operations with ALUS Forecasts (AM Peak Hour)				
I-5 SB Ramps: I-5 NB Ramps:	V/C = 0.72 V/C = 0.62	LOS = B LOS = B	Queuing – None Queuing – None	V/C <= 0.80[1] V/C <= 0.80[1]
Operations with ALUS Forecasts (PM Peak Hour)				
10th/Freeman: I-5 SB Ramps: I-5 NB Ramps: Hamrick:	V/C = 0.96 V/C = 0.73 V/C = 0.81 V/C = 0.95	LOS = D LOC = B LOC = B LOC = B	Queuing – SB Left Queuing – None Queuing – None Queuing – None	V/C <= 0.95[2]/LOS D[3] V/C <= 0.80[1] V/C <= 0.80[1] V/C <= 0.95[2]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
3. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

5.3. Project Phasing

In addition to the elements of the enhanced network already included in the City of Central Point TSP, five concepts are recommended for the I-5 Exit 33 IAMP. Some of these improvements address existing operational or safety deficiencies while others would address future deficiencies. Overall, the combination of state and local improvements will eventually provide a multi-modal network that would meet forecast traffic demand based on adopted comprehensive plans and regional population and employment forecasts.

With the recommended improvements for the IAMP now identified, two phasing questions need to be answered:

- What happens if the local system improvements (i.e., the enhanced network) are not implemented within the 20-year planning horizon?
- What transportation system management measures can be implemented before more substantial capital investments must occur?

Each of these questions is answered in the following sections.

5.3.1. Slower Implementation of Tier 2 TSP Projects

Only one of the projects in the enhanced network concept is included in the financially constrained list of projects in the Central Point TSP. According to the financing program in the TSP, Tier 2 projects have no specifically identified funding sources. Thus, while some of these projects may be constructed during the 20-year planning horizon, there is a possibility that many will not.

To understand how slower implementation of the local system improvements would affect the projects identified in the IAMP preferred alternative, additional analysis was performed. For this analysis, the recommended capacity improvements from the preferred alternative were added to the network without any of the elements identified in the enhanced network. The analysis used the future baseline traffic forecasts which do not include traffic pattern shifts due to enhanced network improvements. (See the discussion under Section 5.1.1 Enhanced Network.) The results are summarized in Table 5-3.

Table 5-3: Operations with Recommended Improvements but Delayed TSP Projects

Intersection	V/C Ratio	LOS	Queuing Issues	Mobility Standard
Operations with 2034 RTP Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.70	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.54	LOS = A	Queuing – None	V/C <= 0.80[1]
Operations with 2034 RTP Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.84	LOS = D	Queuing – SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.64	LOC = A	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.72	LOC = B	Queuing – None	V/C <= 0.80[1]
Peninger:	V/C = 0.85	LOC = C	Queuing – NB Left, WB	V/C <= 0.95[2]
Hamrick:	V/C = 0.98	LOC = D	Queuing – EB Left, WB, SB	V/C <= 0.95[2]
Operations with ALUS Forecasts (AM Peak Hour)				
I-5 SB Ramps:	V/C = 0.72	LOS = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.62	LOS = B	Queuing – None	V/C <= 0.80[1]
Operations with ALUS Forecasts (PM Peak Hour)				
10th/Freeman:	V/C = 0.93	LOS = E	Queuing – EB, WB, SB Left	V/C <= 0.95[2]/LOS D[3]
I-5 SB Ramps:	V/C = 0.69	LOC = B	Queuing – None	V/C <= 0.80[1]
I-5 NB Ramps:	V/C = 0.88	LOC = B	Queuing – None	V/C <= 0.80[1]
Peninger:	V/C = 1.02	LOC = F	Queuing – All approaches	V/C <= 0.95[2]
Hamrick:	V/C = 1.23	LOC = F	Queuing – All approaches	V/C <= 0.95[2]

Notes:
1. Table 10-1: 20 Year Design-Mobility Standards (Volume/Capacity Ratio), 2003 Highway Design Manual.
2. Jackson County Transportation System Plan, Ordinance 2005-3, p. 61.
3. City of Central Point Transportation System Plan, 2008-2030, p. 26.

Shaded results indicate where mobility standards are not met

Source: Synchro HCM Intersection Analysis Report

Even with a delay in the construction of City TSP projects, intersections with the recommended capacity improvements would meet mobility standards with the 2034 RTP forecasts except for the Hamrick Road intersection. This intersection would have measurable queuing on several approaches because the TSP Project #233 (E Pine Street from I-5 NB Ramp to Table Rock Road: Widen to add third westbound through lane) was not included in the analysis. The Peninger Road intersection would remain signalized with full turning movements and would meet the mobility standard but would have some long queues building on some approaches.

Four intersections would exceed mobility standards with the ALUS forecasts and a delay in the construction of City TSP projects. Although the ALUS forecasts are only intended to provide a sensitivity analysis, these results indicate that implementation of the City TSP projects is critical to supporting more rapid development in the study, particularly on the vacant lands to the east of the interchange.

5.3.2. Potential Transportation System Management Measures

To manage the intersections in the study area most efficiently and delay the need for more substantial capital investments which must occur, several transportation system management (TSM) strategies and investments were investigated. These TSM measures focus on the signalized intersections in the corridor.

E Pine Street at 10th Street/Freeman Road

Prior to adding the design features recommended in Concept W-1 – 10th Street/Freeman Road Improvements – Option 1, several TSM measures should be considered:

- Change from protected left-turn phasing on the northbound (Freeman Road) and southbound (10th Street) approaches to protected/permissive left-turn phasing.

  This measure would potentially increase capacity for the north-south movements and reduce queuing in the left-turn lanes. Protective/permissive phasing is already allowed on E Pine Street. Under existing conditions, this phasing change could improve the overall intersection v/c ratio from 0.78 to 0.73. Under future baseline conditions, without construction of any elements of the preferred alternative, the overall intersection v/c ratio could improve from 0.89 to 0.87.
- Extend the left-turn lane on E Pine Street striping to provide more queue storage for the westbound left-turn movement and restrict access points between 10th Street and Jewett School Road to right turns only.

  This measure would reduce the likelihood that vehicles queuing for the westbound left-turn movement will block the adjacent through travel lane. Although the two-way center lane can accommodate longer queues, some drivers are reluctant to use this lane because it is supposed to serve as a refuge for stopped vehicles not vehicles that will continue to travel towards the intersection.

I-5 Southbound Ramp Terminal

Prior to adding the design features recommended in Concept I-3 – I-5 Southbound Ramp Terminal – Dual Westbound Left-Turn Lanes, the following TSM measure should be considered:

- Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp.

  This measure would prevent queues on the off-ramp from extending into the deceleration zone from the freeway by allocating more green time to the southbound ramp. It would also reduce delays for vehicles using the off-ramp, particularly during the morning peak period. However, shifting green time from E Pine Street to the off-ramp would eventually impact operations on E Pine Street and some vehicles would experience more queuing and delays.

I-5 Northbound Ramp Terminal

Prior to adding the design features recommended in Concept I-1 – I-5 Northbound Ramp Terminal – Dual Right-Turn Lanes, the following TSM measure should be considered:

- Monitor queuing on the northbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp.

  This measure would prevent queues on the off-ramp from extending into the deceleration zone from the freeway by allocating more green time to the northbound ramp. It would also reduce delays for vehicles using the off-ramp, particularly during the evening peak period. However, shifting green time from E Pine Street to the off-ramp would eventually impact operations on E Pine Street and some vehicles would experience more queuing and delays.

E Pine Street at Peninger Road

Until the City of Central Point can construct the bridges that would connect Peninger Road to other roadways east of Bear Creek, Peninger Road must remain a signalized intersection to serve the landlocked businesses on the south side of E Pine Street. Several TSM measures should be considered to increase the capacity of this intersection:

- Restripe the northbound Peninger Road approach to provide a left-turn lane and a left-through-right lane and change the northbound-southbound signal timing to split phasing.

  This measure would increase capacity for the northbound Peninger Road left-turn movement and reduce delays and queuing for vehicles making left turns although vehicles making right turns may experience some more delay. Vehicles traveling southbound would also have longer delays as green times would be reduced with the split phasing. This lane configuration may also reduce weaving movements in the short segment between Peninger Road and the I-5 northbound ramp terminal by allowing vehicles to legally turn from two lanes rather than one. Additional consideration would be needed for the pedestrian crosswalk timing with the dual left-turn movement. Under *existing conditions, this phasing change could improve the overall intersection v/c ratio from 0.71 to 0.67. Under future baseline conditions, without construction of any elements of the preferred alternative, the overall intersection v/c ratio could improve from 0.85 to 0.81.*

E Pine Street at Hamrick Road

The preferred alternative recommends deferring to the City TSP process to address this intersection. The City's TSP includes two improvements at the intersection of E Pine Street and Hamrick Road: 1) a second eastbound left-turn lane from E Pine Street to a second northbound lane on Hamrick Road and 2) a third westbound through lane on E Pine Street (through Peninger Road to the I-5 northbound ramp terminal). Prior to implementing either of these projects, several TSM measures should be considered:

- Modify the signal phasing to include an overlap of the southbound right-turn movement with the eastbound left-turn phase.

  This measure would potentially increase capacity for the southbound right-turn movement even though right turns on red are already permitted because vehicles would not be required to stop to look for oncoming traffic. Under existing conditions, this phasing change could improve the overall v/c ratio from 0.70 to 0.68. Under future baseline conditions, this improvement would not change the overall v/c ratio for the intersection but it would reduce queuing for the southbound approach by allowing the movement to flow more smoothly.

- Extend the left-turn lane on E Pine Street striping to provide more queue storage for the eastbound left-turn movement. The lane cannot be significantly extended without interfering with driveways on E Pine Street; therefore, driveway access restrictions to right turns only may also need to be a part of this measure.

  This measure would reduce the likelihood that vehicles queuing for the eastbound left-turn movement will block the adjacent through travel lane. Although the two-way center lane can accommodate longer queues, some drivers are reluctant to use this lane because it is supposed to serve as a refuge for stopped vehicles not vehicles that will continue to travel towards the intersection.

5.3.3. Recommended Project Phasing

Through the concept analysis with and without the TSP projects, a preferred alternative and potential project phasing plan have been developed for the IAMP. The elements of the plan have been broken into groups: 1) recommendations for coordination and/or modification of related Central Point TSP projects and 2) additional improvements recommended as part of the IAMP development.

Table 5-4 summarizes related projects in the Central Point TSP and provides comments and recommendations. Some of the recommendations include changes to TSP projects for better coordination with the IAMP preferred alternative. Other projects have no recommended changes but options for phasing and coordination are suggested.

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Category/Purpose	Comments and Recommendations
	Tier 1 TSP Projects	
TSP #216 – E Pine St & Hamrick Rd • Widen west and south approaches to add a second eastbound left-turn lane and second receiving lane • Restripe northbound approach to include dual left-turn lanes and a single through-right lane • Restripe southbound approach to include left-turn, through, and right-turn lanes	• Tier 1, Medium Term • Safety • Operations	• No changes recommended • Project should be reconsidered with update to TSP because of concerns raised about cut-through traffic volumes on Hamrick Rd • Interim TSM measures identified under IAMP projects could delay need for this improvement • Without this project, modified projects #236 and #233 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection • Implementation of this project is not necessary for other IAMP projects
	Tier 2 TSP Projects	
TSP #233 – E Pine Street: Hamrick Rd to Bear Creek Bridge • Widen for deceleration/acceleration lanes • Add bike lanes and sidewalks	• Tier 2 (Unfunded) • Safety • Urban Upgrade	• Delete project as described and replace with: *E Pine St: Bear Creek Bridge to east of Hamrick Rd* *- Widen bridge and roadway to accommodate third westbound through travel lane* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented after modified #236 and prior to modified #255 • Without project #216, this project along with modified project #236 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection • Implementation of this project is not necessary for other IAMP projects
TSP #234 – E-W Hamrick Rd extension (south of E Pine St) • Extend Hamrick Rd westerly to intersect with Peninger Rd (collector standards)	• Tier 2 (Unfunded) • Operations	• No changes recommended • Implementation of this project is not necessary for other IAMP projects
TSP #236 – E Pine Street: Bear Creek Bridge to Peninger Rd • Widen for turn lanes, bike lanes, add sidewalks • Add third lane	• Tier 2 (Unfunded) • Safety	• Delete project as described and replace with: *E Pine St: West of Peninger Rd to west of Bear Creek Bridge* *- Widen roadway to accommodate third westbound through travel lane that will feed into right-turn lane at I-5 northbound on-ramp* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented prior to modified #233 and modified #255 • Interim TSM measures identified under IAMP projects could delay need for this improvement • Implementation of this project is not necessary for other IAMP projects

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Category/Purpose	Comments and Recommendations
TSP #240 - Peninger Rd Extension, South • Extend Peninger Rd south across Bear Creek to Hamrick Rd • Construct new bridge across Bear Creek	• Tier 2 (Unfunded) • Operations	• No changes recommended • Implementation of this project is not necessary for other IAMP projects
TSP #245 – Peninger Rd Project • Extend Peninger Rd across Bear Creek to Beebe Road • Remove signal at Peninger/E Pine St • Construct bridge across Bear Creek	• Tier 2 (Unfunded) • Operations	• No changes recommended • Interim TSM measures identified under IAMP projects could address operations until this project and project #240 are constructed • Implementation of this project is not necessary for other IAMP projects
TSP #255 – E Pine St: I-5 to Table Rock Rd • Widen E Pine St to add third westbound through lane from east side of Table Rock Rd to I-5 SB off-ramp	• Tier 2 (Unfunded) • Operations • Truck Traffic	• Delete project as described and replace with: *E Pine St: East of Hamrick Rd to east of Table Rock Rd* *- Widen roadway to accommodate third westbound through travel lane* *- Maintain bike lanes and add sidewalks where necessary* • Project should be implemented after modified #233 and modified #236 • Implementation of this project is not necessary for other IAMP projects
TSP #916 – I-5 & E Pine St, SB Off-Ramp • Extend and channelize southbound off-ramp	• Tier 2 (Unfunded)	• Delete project and replace with IAMP project at I-5 southbound ramp terminal
TSP#917 – I-5 Central Point Interchange (Exit 33) • Interchange reconfiguration	• Tier 2 (Unfunded)	• Delete project
TSP #918 – I-5 & E Pine St, NB Ramp • Northbound and eastbound capacity improvements	• Tier 2 (Unfunded)	• Delete project and replace with IAMP project at I-5 northbound ramp terminal

Table 5-5 summarizes the preferred improvements developed through the concept analysis for the IAMP as well as recommendations for timing and triggers. Notes provide additional information related to each improvement including whether or not the improvement is contingent upon another improvement (TSP or IAMP) or development.

Table 5-5. Summary of Recommended IAMP Improvements

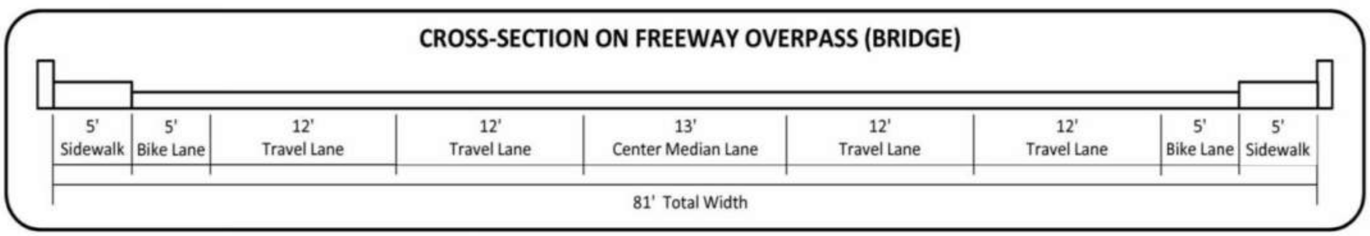
Concept	Phasing	
	Timing/Trigger	Notes
Roadway Improvements		
E Pine St/10th St/ Freeman Rd Improvements • TSM Measures: - Change from protected left-turn phasing on the northbound and southbound approaches to protected/permissive left-turn phasing - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the westbound left-turn movement and restrict access points between 10th Street and Jewett School Road to right turns only • Capital Improvement: - Add a second westbound left-turn lane from E Pine St to Freeman Rd - Reduce the eastbound through travel lanes from three lanes to two lanes from 9th St through Freeman Rd - Add a second southbound receiving lane on Freeman Rd from E Pine St to Oak St - Restrict or close access points along E Pine St between the freeway ramps and 10th St/Freeman Rd	• TSM measures can be implemented when needed in response to queuing and congestion • Capital improvement should be medium to low priority triggered by excessive queuing on westbound approach (i.e., interfering with I-5 southbound ramp operations)	• A public connection or easement, potentially through the school property, to 10th St opposite Manzanita St would be desirable to offset the impacts of access restrictions • Improvement is not contingent on other projects but should be coordinated with improvements at the I-5 southbound ramp terminal
E Pine St/I-5 Southbound Ramp Terminal Improvements • TSM Measures: - Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp • Capital Improvement: - Widen E Pine St beginning at the west end of the freeway overpass to add a second westbound left-turn lane with up to 200 ft of additional storage - Widen the southbound on-ramp to provide two receiving lanes that merge to a single lane	• TSM measures would be an ongoing effort until funding for the capital improvement could be designated • Capital improvement should be a medium to low priority triggered by unmanageable queuing on the ramp	• Bridge widening would allow for longer dual left-turn lanes • Improvement is not contingent on other projects but should be coordinated with improvements at 10th St/Freeman Rd
E Pine St/I-5 Northbound Ramp Terminal Improvements • TSM Measures: - Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp • Capital Improvement: - Widen northbound off-ramp to provide a second right-turn lane with approximately 350 ft of storage	• TSM measures would be an ongoing effort until funding for the capital improvement could be designated • Capital improvement should be a medium to low priority triggered by unmanageable queuing on the ramp	• Improvement is not contingent on other projects

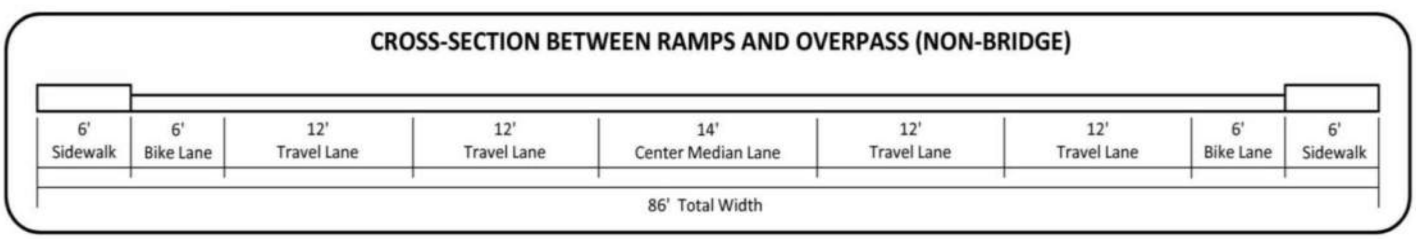
Table 5-5. Summary of Recommended IAMP Improvements

Concept	Phasing	
	Timing/Trigger	Notes
E Pine St/Peninger Rd Improvements • TSM Measures - Restripe the northbound Peninger Road approach to provide a left-turn lane and a left-through-right lane and change the northbound-southbound signal timing to split phasing. • Capital Improvements - Implement TSP Project #236 - Implement TSP Project #240 - Implement TSP Project #245	• TSM measures can be implemented when needed in response to queuing and congestion • TSP Project #236 should be low priority unless the nearby vacant lands develop more intensively than anticipated in the TSP • TSP Projects #240 and #245 should be low priority and many not be necessary within 20-year planning horizon	• Improvement is not contingent on other projects • TSP Projects #240 and #245 could be implemented prior to Project #236
E Pine St/Hamrick Rd Improvements • TSM Measures - Modify the signal phasing to include an overlap of the southbound right-turn movement with the eastbound left-turn phase - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the eastbound left-turn movement • Capital Improvements - Implement TSP Project #216 - Implement TSP Project #233	• TSM measures can be implemented when needed in response to queuing and congestion • TSP Project #216 should be medium priority unless the nearby vacant lands develop more intensively than anticipated in the TSP • TSP Project #233 should be low priority and may not be necessary within the 20-year planning horizon	• Improvement is not contingent on other projects • Left-turn lane striping cannot be significantly extended without considering driveway restrictions on E Pine Street • If TSP Project #216 is not implemented because of concerns about cut-through traffic volumes on Hamrick Rd, Project #233 may become more elevated in priority
Bicycle and Pedestrian Improvements		
South Sidewalk between Ramp Terminals: • Add a 5-ft sidewalk to south side of bridge by replacing railing and restriping roadway with narrower travel lanes • Connect bridge sidewalk to the existing sidewalk network and the ramp terminals	• High priority to address current deficiency	• Improvement is not contingent on other projects • Lane width reductions would only be necessary on the bridge itself
Bicycle Signal at I-5 Southbound Ramp Terminal: • Install a bicycle signal on the eastbound approach to regulate the eastbound right-turn movement when bicyclists are present	• High priority to address current deficiency	• Improvement is not contingent on other projects

Attachments:

Figure 5-1. Concept A-1 – South Sidewalk
Figure 5-2. Concept A-2 – Bike Lane Improvements





Legend

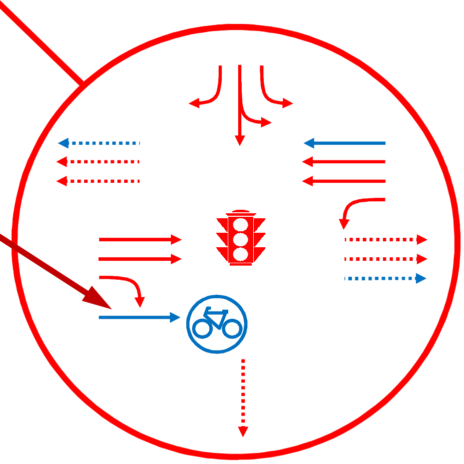
Bridge Cross Section

Non-Bridge Cross Section

Figure 5-1

Concept A-1
South Sidewalk

Install a bicycle signal on the eastbound approach to reduce conflict between bicycles and right-turning vehicles



Existing Bicycle Signal in Portland

Legend

Vehicular Travel Lane

Bike Lane

Traffic Signal

Traffic Signal

Figure 5-2

Concept A-2
Bike Lane Improvements

I-5 Interchange 33 (Central Point):
Interchange Area Management Plan

Technical Memorandum #6
Access Management Plan

Prepared for

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June 2014

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6. ACCESS MANAGEMENT PLAN

Access management is an essential tool for protecting the function of an interchange and included in the Interchange Area Management Plan (IAMP) process. In the vicinity of the interchange it includes consideration of access to and from the interchange, maintaining capacity for traffic flow and operations, and safety.

Implementation of access management measures has the effect of protecting the public investment in an interchange and enabling it to accommodate traffic volumes safely and efficiently into the future while ensuring circulation necessary for good access to the freeway. The IAMP acknowledges the vital need of adjacent property owners to maintain roadway access to their businesses and residences. However, a proliferation of driveways and minor street intersections near an interchange multiplies the number of conflicts along a roadway segment, thus reducing the capacity of intersections, increasing the probability of crashes, and generally degrading service for all system users. Hence, the access management plan must balance the competing needs of compatible land uses, private access, and the function of the transportation system.

Although access management imposes some restrictions and a reduction of access for properties along E Pine Street, access management actions in this plan do not prevent the properties from being used and developed in a manner consistent with their adopted comprehensive planning designations. Access management instead will help to ensure that property owners continue to be able to utilize site advantages of the properties by improving traffic circulation and mobility.

The access management measures identified in this plan represent medium- and long-term actions that may be triggered as land use changes occur (new development or redevelopment), future improvement projects are implemented, or as safety and operational issues arise.

6.1. Access Standards

The 1999 Oregon Highway Plan (OHP) devotes an entire section to the discussion of access management with the most recent revisions adopted in March 2012[1]. More detailed requirements, action definitions, and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians[2].

Ideally, a project will include provisions by which access within the project limits can be made fully compliant with Division 51. In many instances, however, access needed for existing

[1] 1999 Oregon Highway Plan Revisions to Address Senate Bill 264 (2011) Policy 3A, website: http://www.oregon.gov/ODOT/TD/TP/docs/ohp_am/accessm.pdf

[2] Oregon Administrative Rules Chapter 734, Division 51, Highway Approaches, Access Control, Spacing Standards, and Medians, Temporary Rules Effective January 1, 2012, Amended May 3, 2012, website: http://www.oregon.gov/ODOT/HWY/ACCESSMGT/docs/pdf/734-051.pdf

development will not allow these standards to be met. When the requirements and standards cannot be met, progress toward meeting the applicable standards must be demonstrated.

Division 51 and the OHP contain standards for private driveway and public road approach spacing based on roadway classifications and speeds. Access spacing standards are measured from the center of one access to the center of the next access on the same side of the road. These standards were used in the preparation of this access management plan.

Elevated above I-5 at Interchange 33, E Pine Street is not a state facility. However, ODOT does have jurisdiction of the section of roadway between the southbound ramp terminal and Peninger Road. The jurisdiction of the roadway in the remainder of the study area is split between the City of Central Point and Jackson County. The City of Central Point has jurisdiction west of 10th Street. The County has jurisdiction between 10th Street and the southbound ramp terminal as well as east of Peninger Road.

The access management standards applicable to this project are summarized in Table 6-1.

Table 6-1. Access Spacing Standards

Segment Characteristic	Access Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
Distance from off-ramp to first approach on the right, right-turn movements only	750 feet[2]
Distance from off-ramp to first intersection where left turns are allowed	1320 feet[2]
Distance from last approach road to the start of the taper for the on-ramp	1320 feet[2]
Distance from last right in/right out approach road to the start of the taper for the on-ramp	750 feet[2]
Other Public/Private Access Points	
Central Point - Urban Business District (Speed: 25-35 mph)	350 feet[3]
Jackson County - Arterial (Minor and Major)	300 feet[4]

Notes:
1. Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the developable frontage area are developed at urban densities and many have driveways connecting to the crossroad. See definition in the Oregon Highway Plan.
2. Table 18 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads
3. City of Central Point Transportation System Plan.
4. Jackson County Transportation System Plan.

The revisions to Division 51 specifically note that the spacing standards do not apply to approaches in existence prior to January 1, 2012 except for changes in use, new approach requests, infill development/redevelopment, and highway construction projects[3]. Under these circumstances, ODOT "shall determine whether the approach road spacing or safety is improved by moving in the direction of the spacing standards."

[3] OAR 734-051-4020, Standards and Criteria for Approval of Private Approaches, Note (8)(c).

Requests for deviations from these standards can be made, and the process is outlined in OAR 734-051-3050[4].

6.2. Existing Access Inventory

Access inventory data was obtained from aerial photography and a site visit for E Pine Street from 7th Street to Table Rock Road. This data includes public street intersections and public/private approaches to E Pine Street. A total of 70 accesses were identified (30 on the north side, 40 on the south side).

Aerial mapping depicting access locations is shown in a figure at the end of this memorandum (Figure 6-1). Table 6-2 and Table 6-3 accompany *Figure 6-1* and provide details for public and private approaches including: use, width, and distance to next intersection/driveway along the same side. Because access spacing is measured along one side of the roadway without regard for connections on the opposite side, Table 6-2 summarizes accesses on the north side and Table 6-3 summarizes accesses on the south side of the roadway separately.

E Pine Street has 30 access points that intersect on the north side and 40 segments that intersect on the south side. When compared to the applicable spacing standards, few of the driveway accesses meet current spacing standards based on existing average annual daily traffic (AADT) volumes, roadway jurisdiction, and speeds. There are 30 access points within a quarter mile of the northbound and southbound ramp terminals. None of these access points meet the 1320 feet spacing standard set forth by ODOT.

Outside the ¼ mile influence area of the ramp terminals the west side of the study area uses the 350 feet spacing standards identified in the City of Central Point TSP. None of the accesses within this segment meet the City standards currently. An Access Management Plan is in place (2003 and 2005) for the short section of E Pine Street between 1st Street and Front Street. On the east side of the interchange (outside the ¼ mile influence area) a County spacing standard of 300 feet applies. This is the least restrictive standard within the study area. There are six access points that meet this standard, 3 on the north and 3 on the south. They are primarily located near Hamrick Road.

While ODOT requires approach permits for approaches to highways under its jurisdiction, many counties and cities do not. E Pine Street is not a highway and does not have specific approach permit requirements. Within the last decade, during construction of improvements on E Pine Street/Biddle Road, ODOT and Jackson County discussed implementing complete access control between Freeman Road and Table Rock Road; however, no permits were issued at that time. E Pine Street west of Freeman Road is a city street and does not require permits for approaches taken from their roadway.

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[4] OAR 734-051-3050 Deviations from Approach Road Spacing, Sight Distance, and Channelization Standards for a Private Approach

Table 6-2. Driveway Access Spacing between Public Roadways – North Side of E Pine Street

<table>
<tr><th rowspan="2">Map ID</th><th rowspan="2">Type</th><th rowspan="2">Description</th><th rowspan="2">Access Width (ft)</th><th rowspan="2">Distance to Next Access (ft)</th><th colspan="3">Spacing Standard (ft)</th></tr>
<tr><th colspan="2">State</th><th>Local</th></tr>
<tr><td>1</td><td>Public</td><td>N Front St/OR 99</td><td>78</td><td>150</td><td colspan="2" rowspan="10">NA</td><td rowspan="15">350[1]</td></tr>
<tr><td>4</td><td>Private</td><td>Commercial</td><td>32</td><td>145</td></tr>
<tr><td>8</td><td>Public</td><td>N 1st St</td><td>20</td><td>179</td></tr>
<tr><td>9</td><td>Private</td><td>Commercial</td><td>32</td><td>104</td></tr>
<tr><td>10</td><td>Public</td><td>N 2nd St</td><td>40</td><td>278</td></tr>
<tr><td>13</td><td>Public</td><td>N 3rd St</td><td>40</td><td>282</td></tr>
<tr><td>16</td><td>Public</td><td>N 4th St</td><td>42</td><td>279</td></tr>
<tr><td>18</td><td>Public</td><td>N 5th St</td><td>34</td><td>283</td></tr>
<tr><td>23</td><td>Public</td><td>N 6th St</td><td>34</td><td>281</td></tr>
<tr><td>24</td><td>Public</td><td>N 7th St</td><td>34</td><td>189</td></tr>
<tr><td>27</td><td>Private</td><td>Residential</td><td>20</td><td>91</td><td rowspan="15">1320[2]</td><td rowspan="4">--</td></tr>
<tr><td>28</td><td>Public</td><td>N 8th St</td><td>38</td><td>149</td></tr>
<tr><td>32</td><td>Private</td><td>Commercial</td><td>15</td><td>112</td></tr>
<tr><td>35</td><td>Public</td><td>N 9th St</td><td>32</td><td>262</td></tr>
<tr><td>36</td><td>Public</td><td>N 10th St</td><td>38</td><td>147</td><td rowspan="11">750[2]</td></tr>
<tr><td>38</td><td>Private</td><td>Commercial</td><td>18</td><td>140</td><td rowspan="4">300[3]</td></tr>
<tr><td>39</td><td>Private</td><td>Commercial</td><td>73</td><td>125</td></tr>
<tr><td>40</td><td>Public</td><td>Jewett School Dr</td><td>28</td><td>76</td></tr>
<tr><td>41</td><td>Private</td><td>Commercial</td><td>50</td><td>341</td></tr>
<tr><td>42</td><td>Public</td><td>Exit 33 SB Off</td><td>30</td><td>1262</td><td rowspan="2">NA</td></tr>
<tr><td>44</td><td>Public</td><td>Exit 33 NB On</td><td>52</td><td>542</td></tr>
<tr><td>50</td><td>Public</td><td>Peninger Rd</td><td>45</td><td>91</td><td rowspan="9">300[3]</td></tr>
<tr><td>52</td><td>Public</td><td>Peninger Rd WB On</td><td>24</td><td>146</td></tr>
<tr><td>53</td><td>Public</td><td>Government</td><td>42</td><td>50</td></tr>
<tr><td>54</td><td>Public</td><td>Government</td><td>20</td><td>1610</td></tr>
<tr><td>62</td><td>Public</td><td>Hamrick Rd</td><td>50</td><td>887</td><td colspan="2" rowspan="5">NA</td></tr>
<tr><td>63</td><td>Public</td><td>Meadowbrook Dr</td><td>45</td><td>581</td></tr>
<tr><td>65</td><td>Public</td><td>Government</td><td>30</td><td>321</td></tr>
<tr><td>67</td><td>Private</td><td>Residential</td><td>30</td><td>278</td></tr>
<tr><td>69</td><td>Public</td><td>Table Rock Rd</td><td>60</td><td>--</td></tr>
</table>

Notes:
1. City of Central Point Transportation System Plan.
2. Access spacing standard for statewide highways come from Table 7 of OAR 734-51 Temporary Rules – Effective January 1, 2012 Amended May 3, 2012 (Table 18 in the revised OHP).
3. Jackson County Transportation System Plan.

Source David Evans and Associates, Inc.:

Table 6-3. Driveway Access Spacing between Public Roadways – South Side of E Pine Street

<table>
<tr><th rowspan="2">Map ID</th><th rowspan="2">Type</th><th rowspan="2">Description</th><th rowspan="2">Access Width (ft)</th><th rowspan="2">Distance to Next Access (ft)</th><th colspan="3">Spacing Standard (ft)</th></tr>
<tr><th colspan="2">State</th><th>Local</th></tr>
<tr><td>2</td><td>Public</td><td>S Front St/OR 99</td><td>64</td><td>65</td><td colspan="2" rowspan="16">NA</td><td rowspan="22">350[1]</td></tr>
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<tr><td>5</td><td>Private</td><td>Commercial</td><td>15</td><td>85</td></tr>
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<tr><td>7</td><td>Public</td><td>S 1st St</td><td>20</td><td>282</td></tr>
<tr><td>11</td><td>Public</td><td>S 2nd St</td><td>40</td><td>278</td></tr>
<tr><td>12</td><td>Public</td><td>S 3rd St</td><td>40</td><td>127</td></tr>
<tr><td>14</td><td>Private</td><td>Commercial</td><td>32</td><td>154</td></tr>
<tr><td>15</td><td>Public</td><td>S 4th St</td><td>42</td><td>56</td></tr>
<tr><td>17</td><td>Private</td><td>Commercial</td><td>27</td><td>225</td></tr>
<tr><td>19</td><td>Public</td><td>S 5th St</td><td>34</td><td>60</td></tr>
<tr><td>20</td><td>Private</td><td>Commercial</td><td>19</td><td>68</td></tr>
<tr><td>21</td><td>Private</td><td>Commercial</td><td>15</td><td>154</td></tr>
<tr><td>22</td><td>Public</td><td>S 6th St</td><td>34</td><td>281</td></tr>
<tr><td>25</td><td>Public</td><td>S 7th St</td><td>34</td><td>142</td></tr>
<tr><td>26</td><td>Private</td><td>Residential</td><td>19</td><td>140</td></tr>
<tr><td>29</td><td>Public</td><td>S 8th St</td><td>34</td><td>84</td><td rowspan="14">1320[2]</td><td rowspan="5">--</td></tr>
<tr><td>30</td><td>Private</td><td>Residential</td><td>12</td><td>54</td></tr>
<tr><td>31</td><td>Private</td><td>Residential</td><td>12</td><td>55</td></tr>
<tr><td>33</td><td>Private</td><td>Residential</td><td>10</td><td>68</td></tr>
<tr><td>34</td><td>Public</td><td>S 9th St</td><td>32</td><td>253</td></tr>
<tr><td>37</td><td>Public</td><td>Freeman Rd</td><td>50</td><td>800</td><td rowspan="8">750[2]</td></tr>
<tr><td>43</td><td>Public</td><td>Exit 33 SB On</td><td>32</td><td>1270</td><td rowspan="7">NA</td></tr>
<tr><td>45</td><td>Public</td><td>Exit 33 NB Off</td><td>72</td><td>123</td></tr>
<tr><td>46</td><td>Private</td><td>Commercial</td><td>38</td><td>80</td></tr>
<tr><td>47</td><td>Private</td><td>Commercial</td><td>20</td><td>79</td></tr>
<tr><td>48</td><td>Private</td><td>Commercial</td><td>68</td><td>99</td></tr>
<tr><td>49</td><td>Private</td><td>Commercial</td><td>50</td><td>148</td></tr>
<tr><td>51</td><td>Public</td><td>Peninger Rd</td><td>62</td><td>283</td></tr>
<tr><td>55</td><td>Private</td><td>Commercial</td><td>36</td><td>640</td><td>--</td><td rowspan="11">300[3]</td></tr>
<tr><td>56</td><td>Private</td><td>Commercial</td><td>22</td><td>234</td><td colspan="2" rowspan="10">NA</td></tr>
<tr><td>57</td><td>Private</td><td>Commercial</td><td>38</td><td>344</td></tr>
<tr><td>58</td><td>Private</td><td>Undeveloped</td><td>12</td><td>39</td></tr>
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<tr><td>64</td><td>Public</td><td>Biddle Rd</td><td>32</td><td>762</td></tr>
<tr><td>66</td><td>Public</td><td>Undeveloped</td><td>18</td><td>293</td></tr>
<tr><td>68</td><td>Public</td><td>Table Rock Rd</td><td>30</td><td>133</td></tr>
<tr><td>70</td><td>Public</td><td>Table Rock Rd</td><td>52</td><td>--</td></tr>
</table>

Notes:
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3. Jackson County Transportation System Plan.

Source David Evans and Associates, Inc.:

6.3. Access Management Techniques and Objectives

Access management is a set of techniques that the state can use to control access to a highway that extend the operational life of the facility by reducing congestion, improving traffic flow, reducing crashes, and reducing conflicting vehicle movements. Access management techniques applicable to E Pine Street include:

- *Controlling Intersection Spacing*: Maintaining minimum distances between intersections, particularly those with traffic signals, can improve the flow of traffic, which reduces congestion and improves air quality for heavily traveled corridors.
- *Managing Driveway Spacing*: Fewer driveways spaced further apart can allow for more orderly merging of traffic and present fewer challenges to drivers.
- *Adding Turning Lanes*: Dedicated left- and right-turn lanes keep through-traffic flowing.
- *Installing Median Treatments*: Two-way left-turn lanes and non-traversable, raised medians are some of the most effective means to regulate access and reduce crashes.
- *Improving the Local Street Network*: Local system improvements provide access to property, ensure sufficient capacity for development to occur, and can reduce the demand of local traffic on the highway system.

Proposed construction projects and land use changes along E Pine Street, within ¼ mile of the interchange ramp terminals, will require approach permits from ODOT in order to demonstrate compliance or movement towards compliance with the standards applicable to this corridor. Objectives when implementing access management along E Pine Street include:

- Consider exceptions to access spacing standards to take advantage of existing property boundaries and existing or planned public streets and to accommodate environmental constraints.
- Replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties.
- Ensure all properties impacted by improvements on the roadway are provided reasonable access to the transportation system.
- Align approaches on opposite sides of roadways where feasible to reduce turning conflicts.

6.4. Access Management and Implementation

The access management plan for E Pine Street includes a variety of techniques that can be applied as appropriate to the roadways and adjacent land use characteristics. Access management techniques shall be applied with a desire to move towards achieving applicable access spacing standards over time.

Access management techniques would be implemented when one or more of the following triggers occur:

- Applications for land use changes or development are submitted
- Future roadway improvements move into design and construction
- Safety and/or operational problems arise

However, approval or delay of implementation may be determined by the Region Access Management Engineer.

6.4.1. E Pine Street from Front Street to 7th Street

The IAMP does not evaluate operations along this section of roadway but the E Pine Street Refinement Project focuses on this area and recommends changes to improve traffic flow, pedestrian circulation, bicycling options, and parking. The section of E Pine Street between Front Street and 1st Street currently has access management strategies including median placement and driveway modifications near Front Street/OR 99[5].

This section of roadway is beyond the ¼-mile (1,320-foot) influence area of the interchange and should continue to be managed by the City of Central Point to serve the needs of downtown businesses and residents. The City should consider consolidation or closure of driveways when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.

6.4.2. E Pine Street from 7th Street to 10th Street

This section of roadway lies within the ¼-mile (1,320-foot) influence area of the interchange but is part of the existing downtown grid network. It should continue to be managed by the City of Central Point to serve the needs of downtown businesses and residents. The City should consider consolidation or closure of driveways when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.

6.4.3. E Pine Street from 10th Street to I-5 Southbound Ramp Terminal

Two projects have been identified along this segment of roadway as part of the IAMP: one at 10th Street/Freeman Road and the other at the southbound ramp terminal. Each includes modifications to lane capacity and/or safety enhancements for bicycle traffic (eastbound). The 10th Street/Freeman Road intersection modifications include additional lane capacity for the westbound left-turn movement which may impact nearby Jewett School Road.

Recommended access management actions are illustrated in *Figure 6-2* and summarized below:

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.

[5] 2003 Access Management Plan for Front Street (Highway 99)/Pine Street Plan and Central Point Highway 99 Corridor Plan

- *Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
- *Consolidation or closure of driveways should be considered when 10th Street/Freeman Road improvements are constructed to reduce turning conflicts along the north side of the roadway between 10th Street and the northbound ramp terminal, including Jewett Road.*
- *Consolidation or closure of driveways should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways.*

2. Expand the local street network.
    - *Local network improvements should be considered when 10th Street/Freeman Road improvements are constructed to provide an alternative, especially if turn restrictions are put in place.*

6.4.4. E Pine Street from I-5 Northbound Ramp Terminal to Peninger Road

Several projects have been identified along this segment of roadway as part of the IAMP. One is located at the northbound ramp terminal to address safety issues on the off-ramp. The others are a combination of related projects that expand the transportation network in the area and subsequently modify access at Peninger Road, as identified in the Central Point TSP.

Recommended access management actions are illustrated in *Figure 6-2* and summarized below:

3. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
    - *Consolidation or closure of driveways and/or turn movement restrictions should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
    - *Consolidation or closure of driveways and/or turn movement restrictions should be considered at Peninger Road when alternative access becomes available, including new route connections to nearby roadway facilities or a new connection between Peninger Road and Hamrick Road. (local TSP projects)*
    - *Consolidation or closure of driveways and/or turn movement restrictions should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT Safety Priority Index System (SPIS) rating in the top 10 percent.*
4. Expand the local street network.
    - *Network improvements both north and south of E Pine Street identified in the Central Point TSP should be implemented with adjacent development and as funding for the improvements becomes available.*
    - *Other local connections should be considered with adjacent development to expand access options for both future and existing parcels.*

5. Evaluate traffic control, potential turn limitations, left-turn lane, and right-turn lane needs for the Peninger Road intersection.
    - *Analysis should be completed when planning and design begins for the expanded local road network to the north and south of E Pine Street.*

6.4.5. E Pine Street from Peninger Road to Hamrick Road

The IAMP includes no new projects along this segment of E Pine Street between Peninger Road and Hamrick Road. A combination of related projects that expand the transportation network in the area have been identified in the Central Point TSP and are assumed in the IAMP. These projects include a new intersection between Peninger Road and Hamrick Road.

Recommended access management actions are illustrated in *Figure 6-2* and summarized below:

6. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
    - *Consolidation or closure of driveways and/or turn movement restrictions should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street.*
    - *Consolidation or closure of driveways and/or turn movement restrictions should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways.*
7. Expand the local street network.
    - *Network improvements both north and south of E Pine Street identified in the Central Point TSP should be implemented with adjacent development and as funding for the improvements becomes available.*
    - *Other local connections should be considered with adjacent development to expand access options for both future and existing parcels.*

6.4.6. E Pine Street/Biddle Road from Hamrick Road to Table Rock Road

This section of roadway lies beyond the ¼-mile (1,320-foot) influence area of the interchange. It should continue to be managed by Jackson County to serve the needs of adjacent businesses while maintaining safe and efficient operations of the arterial. Few existing accesses are located along this section of roadway and the County (together with the City of Central Point) has the opportunity to manage future accesses in the corridor.

Attachments:

Figure 6-1. Existing Access
Figure 6-2. Access Management Plan Actions

Interchange Area Management Plan 33

Legend

Private Access

Public Access

Private Access ID Corresponding to Tables 6-2 and 6-3

Public Access ID Corresponding to Tables 6-2 and 6-3

Source Data: ESRI, Jackson County, Microsoft (2001-12)

DRAFT Figure 6-1

Existing Access

DRAFT Figure 6-2

Access Management Plan Actions

I-5 Interchange 33 (Central Point):
Interchange Area Management Plan

Technical Memorandum #7
Interchange Management Actions

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

June 2014

Table of Contents

7. INTERCHANGE MANAGEMENT ACTIONS

An integral part of the IAMP process is providing an action plan to protect the function of the interchange and its influence area. This memorandum explores a set of measures under the heading "management actions" that could be employed at or near Interchange 33. It is a companion to *Technical Memorandum #5: Preferred Alternative*, which identifies the system improvements needed to meet forecast demand, and *Technical Memorandum #6: Access Management Plan*. While some actions are also discussed in these other documents, additional options that do not require surface improvements are presented here.

7.1. Potential Management Actions

Management actions, as applied to Interchange Area Management Plans (IAMPs) are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- Local System Improvements that enhance the local street network to disperse trips and reduce congestion near an interchange
- Transportation Demand Management Strategies that provide travel options to reduce the number of trips or vehicles on the road
- Transportation System Management Measures that improve system efficiency and reduce delays
- Land Use and Development Strategies that guide land use development to result in fewer trips in the interchange area

Many management actions are most applicable when applied throughout a region or in a large urban area. Nonetheless, a positive impact may be produced even if the action is limited to the Interchange 33 study area. The management tools with potential to preserve capacity at Interchange 33 are described below. The discussion includes a brief description, a qualitative assessment of applicability and potential benefits, a summary of the issues that would be required to implement them, a qualitative assessment of potential adverse impacts, and identification of the implementing agency.

7.1.1. Benefits of Management Actions at Interchange 33

Interchange 33 has great potential for traffic growth between the ramp terminals as well as on and off of Interstate 5 (I-5). Roadway improvements have been identified to address area growth which requires an investment by ODOT, Jackson County, and the City of Central Point. As such, a plan to assist these agencies with the long-term transportation system management in the area around the interchange is critical.

As described in the *Technical Memorandum #3: Future Baseline Traffic Conditions*, five of the study area intersections would not meet operational standards: four during the PM peak hour and one during the AM peak hour with the forecasts developed from the 2034 Regional Transportation Plan (RTP). Furthermore, an alternative land use scenario (ALUS) analysis of full build out conditions in the IAMP study area was also performed. Depending on the speed and type of growth that occurs in the area, additional capacity increases or modifications to the timing of improvements may be needed in the study area.

Management actions have the potential to reduce the total traffic at the interchange and manage the rate of growth. These actions can extend the life of the interchange and provide for incremental implementation of additional Interchange 33 area improvements, allowing individual components to be funded and built when needed. Given the funding constraints and statewide demand for interchange improvements, it could take many years to develop a funding package and construct any additional improvements recommended in the IAMP.

7.2. Local System Improvements

Local system improvements relate to enhancing the effectiveness of the local street network to provide circulation and access for the community near the interchange without relying solely on the interchange or its approach roadways.

7.2.1. General Description

Local system improvements can include enhancing the local street network, developing an access management plan, and considering alternative mobility standards. These actions are described below followed by a summary of their application for IAMP 33.

Enhancing the Local Street Network

A robust and well-connected local street network provides many benefits to the surrounding area. Local street networks are critical to providing access to property and they also distribute traffic over a number of streets rather than concentrating trips on just a few arterial roadways thus ensuring sufficient capacity for development to occur. As a local roadway network is developed to support property development, traffic circulation can be enhanced by limiting the use of cul-de-sacs and requiring new streets to connect with existing streets.

An enhanced local street network also dovetails with access management on higher volume roadways. By providing access to properties, the local street network also reduces the need to provide direct property access on major roadways, such as state highways and arterial streets. As a result, the local network can improve overall traffic flow and safety of the transportation system.

Access Management

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management strategies are designed to extend the operational life of the interchange by reducing congestion, improving traffic flow, reducing crashes, and reducing conflicting vehicle movements. Access management techniques are discussed in *Technical Memorandum #6, Access Management Plan*, and include:

- *Access Spacing*: By increasing the distance between traffic signals and other public roadway connections, flow of traffic on major arterials can be improved. This also reduces congestion and improves air quality for heavily traveled corridors.
- *Driveway Spacing*: Fewer driveways spaced further apart could allow for more orderly merging of traffic and present fewer challenges to drivers.
- *Turning Lanes:* Dedicated left- and right-turn lanes, and indirect left-turns and U-turns could be considered to keep through-traffic flowing.
- *Median Treatments:* Two-way left-turn lanes and non-traversable, raised medians are examples of some of the most effective means to regulate access and reduce crashes.

The Oregon Highway Plan (OHP) spacing standards are 1,320 feet (¼ mile) from the interchange for a full access (with or without a traffic signal). In fully developed urban areas, limited access (right-in/right-out) access may be permitted 750 feet from the interchange off ramps or before the interchange on ramps.

Establish Lower Mobility Standards

The majority of the management action tools consider modifications to demand (controlling growth) or providing/modifying roadway capacity. This action is more focused on policy and creates a lower mobility standard (higher acceptable v/c ratio standard) to acknowledge physical and financial constraints at the interchange. It provides for increased congestion in accordance with the existing adopted local land use plan and becomes part of the OHP.

7.2.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 33

The interchange ramps connect with E Pine Street, the primary east-west route through Central Point. The type of development and subsequent function of E Pine Street differs significantly east and west of the interchange, as reflected by the different plan classifications and connecting roadway networks. On the west side of the interchange E Pine Street acts as the backbone to a robust grid-like street system to serve the downtown core of Central Point. To the west of the interchange there are two crossroads within 800 feet of the southbound ramp terminal Jewett Road (within 400 feet) and 10th Street/Freeman Road (within 800 feet).

While the west side has a grid-like street system and is relatively well connected, the east side acts as an intermodal connector and is still developing. In general, intersections and other accesses are widely spaced with the emphasis on through traffic and freight movement. However, the first intersection, Peninger Road, is located just 500 feet east of the northbound ramp terminal. Peninger Road provides access to the Jackson County Fairgrounds to the north and a truck stop (and other travel services) on to the south E Pine Street. Future development around the interchange will likely be concentrated to the east, where current City zoning would allow both industrial and commercial development to occur.

Both sides of the interchange have roadways that do not meet the desired access spacing standards identified in OAR 734, Division 51. To support long-range development on the east side of the interchange, a local street network needs to be identified that can serve the adjacent land uses, accommodate the forecast demand, and meet the state access spacing standards.

East of the interchange, there is a need to serve potential commercial and industrial development to the north and south of E Pine Street as well as the future expansion of the Jackson County Fairgrounds. This growth could trigger a need to enhance the local street network in the interchange study area. Several projects have already been identified in the Central Point Transportation System Plan (TSP). The west side of the interchange is primarily built out and would not likely see major modifications to the local street system.

Local system improvements are critical to providing access to property and ensuring sufficient capacity for development to occur. To minimize conflicts along existing roadways, an enhanced street network combined with access management measures should be explored both east and west of the interchange. These improvements were initially documented in *Technical Memorandum #4: Alternatives Analysis* and then incorporated into a preferred alternative and access management plan in *Technical Memorandum #5: Preferred Alternative and Technical Memorandum #6: Access Management Plan.*

East of Interchange 33

To support long-range development of Central Point and meet the state access spacing standards, a local street network concept was initially developed in the E Pine Street Transportation Plan (JRH Transportation, 2004) and incorporated into the Central Point TSP. In the vicinity of the interchange, the concept consists of two new Bear Creek crossings (one on each side of E Pine Street), new street connections, and limited access at some existing intersections. In this plan, Peninger Road would become a limited access (right-in, right-out) intersection, rerouting traffic to a new full-access intersection more than ¼ mile from the existing northbound ramp terminal. The new access point could serve both existing development as well as future development.

West of Interchange 33

The IAMP has identified one project on E Pine Street west of the interchange at the intersection of 10th Street/Freeman Road with E Pine Street. This project would add a second westbound left-turn lane from E Pine Street to Freeman Road, which will require limiting access to right-in/right-out movements only for driveways and the Jewett School Road intersection. To provide additional property access a new connection from 10th Street to Jewett School Road is also under consideration.

Alternative Mobility Standards

In response to the current economic environment and physical/environmental constraints, alternative mobility standards have been considered for the ramp terminals, but will not likely be pursued at this time.

7.3. Transportation Demand Management Strategies

Transportation Demand Management (TDM) strategies are designed to reduce vehicle demand, especially for commuter trips in the peak periods.

7.3.1. General Description

Typically, TDM strategies include provision of services or facilities intended to shift travelers to different modes, to non-peak times, or by trip elimination choices, such as telecommuting. TDM strategies are most effective in areas with high concentrations of employment and where a robust transit system exists. Generally, the strategies are easiest to implement where there are large employers or where a transportation management association (TMA) has been established to pool the efforts of many smaller employers.

TDM Strategies that Shift Modes

The following strategies are designed to offer choices and encourage people to commute in a way other than driving alone, resulting in fewer vehicles on the road during the peak periods.

Carpool Programs: This strategy encourages and supports commuters to share the ride with other commuters who live and work in the same general area. Carpools may receive preferential parking, or incentives such as a small stipend, reduced parking rate or coupons. Carpools enjoy the benefit of a reduced commute cost because the price of gasoline and parking is typically shared.

Vanpool Programs: This strategy involves providing vans for groups to use for commuting. These can be employer sponsored vans, private vans, or agency sponsored vans. Vanpools can be arranged for large employers, or for locations where several employers are located in close proximity.

Transit: Transit can be a cost saving and stress-reducing alternative to commuting by personal automobile. In order for transit to be a reliable alternative to personal automobiles, transit service should be offered approximately every 30 minutes and extend beyond the peak periods. Transit commuters need to have confidence that they will be able to get home if they need to leave work early or stay late.

Bicycling: Many people choose to commute by bicycle for health, stress-reduction, and environmental reasons. The provision of safe and convenient bicycle facilities have long been recognized as one of the key prerequisites for increased bicycling for transportation purposes. Conversely, the absence of good, safe bicycle facilities discourages all but the most dedicated cyclists from using this mode for transportation. In addition, the provision of showers, clothing storage, and safe, secure bicycle parking is recommended.

Walking: When people live close to work, they may have the option to walk. Some do so for health reasons, stress reduction, and for the connection they feel with their community when they do so. Most transit riders are also walkers for some portion of their commute. Safe walking facilities such as sidewalks and separated paths are important features to incorporate in projects to encourage walking.

TDM Strategies that Shift Trips to Non-Peak Periods

Employers can have a significant impact on reducing peak hour trips by reducing the number of employees who are expected to arrive during the morning peak (approximately 7 am to 9 am) and depart during the evening peak (approximately 4 pm to 6 pm). Methods to reduce peak hour arrivals and departures include offering flexible work schedules, and shifting work schedules.

Flexible Work Schedules: An example of a flexible work schedule might require employees to be present during core hours of 9:30 to 3:30, and allowing arrivals and departures around that time while maintaining an 8 hour work day. Another example involves working fewer days per week, such as working 4-10s (four ten-hour days), with one day off.

Off-Peak Shifts: An example of an off-peak shift might be having a work day start at 6 am and end at 2 pm. Another shift might start at 2 pm and end at 9 pm. This is a common practice in industry because it allows for multiple shifts in a 24-hour period.

TDM Strategy that Eliminates Trips

One TDM strategy can eliminate trips altogether.

Telecommuting: This strategy allows employees to work from home for some portion of or all of their work. Telecommuting is gaining popularity and acceptance and is available to more professions as a result of improvements in technology. Various office functions including technical support, call center operations, and order processing are increasingly being conducted using telecommuting and dispersed workers. Employers who offer telecommuting are able to market it as a benefit, and telecommuting often results in cost savings to the employer because of reduced office space and equipment requirements.

7.3.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 33

Goals and policies from the State, Rogue Valley Metropolitan Planning Organization (RVMPO), Jackson County, and City of Central Point contain provisions that embrace TDM measures. Urban areas with populations over 25,000 are required by the Oregon Transportation Planning Rule (TPR) to address TDM.

The Rogue Valley Regional Transportation Plan (RTP) includes the following goals and policies related to TDM:

Goal 6: Use incentives and other strategies to reduce reliance on single-occupant vehicles.

Policy 6.1: Support Transportation Demand Management strategies.

In Chapter 5.5, the RTP addresses TDM and lists a variety of outreach strategies and examples of policies and programs that support TDM. A variety of marketing and promotional activities, such as flyers, trip reduction programs, and other incentives, are available to employers interested in promoting alternate commute options. Informing the general population about non-SOV travel options relies more on public outreach. Reaching the public at-large relies on general marketing such as brochures, commercials, and special events such as Car Free Day.

The Jackson County TSP addresses TDM in its goal related to multi-modal transportation options:

> Policy 4.2.1-C: Implement transportation demand management primarily through application of an integrated land use and transportation plan. Encourage other methods of transportation demand management as feasible opportunities arise. (RTP 7-1)

The City of Central Point TSP includes a chapter on transportation management. Three of the goals within the chapter specifically address TDM:

> Goal 5.3: To reduce the demands placed on the current and future transportation system by the single-occupant vehicle.
>
> Goal 5.4: To reduce the vehicle miles traveled (VMT) in the Central Point urban area by assisting individuals in choosing alternative travel modes.
>
> Goal 5.5: To maintain consistency between Transportation Demand Management (TDM) measures promoted by the City with the Regional Transportation Plan strategies aimed at reducing reliance on the single occupant vehicle (SOV) and reducing vehicle miles traveled (VMT) per capita.

The Rogue Valley Transit District (RVTD) has had a TDM program in place for the region since 1993. RVTD currently provide bus service between Medford and downtown Central Point (Bus Route 40). There is currently no bus service linking both sides of the interchange or the internal or external trips from on the east side of the interchange. However, outside the eastern edge of the study area Bus Route 60 provides service from Medford to the Rogue Valley International-Medford Airport. As development occurs to the east of interchange 33 extension of Bus Route 60, a shuttle to connect both sides of the interchange, or a feeder route(s) may become feasible.

Implementing TDM strategies is most successful when there are incentives and when making the switch to a non-personal-auto mode of travel is relatively simple – particularly for intermediate to long distance trips. Establishment of Transportation Management Associations (TMA) are useful because a TMA typically takes on the responsibility of promoting TDM programs, organizing carpool and vanpool programs, obtaining grants, distributing incentives, and working with transit agencies to provide additional transit service and/or reduced cost transit passes.

The Rogue Valley Transportation Management Association (TMA), encompassing the Medford metropolitan area (including the City of Central Point) is a voluntary alliance of private and public sector interests established in 2002 to increase the efficiency of the local transportation system. The RVTMA has been inactive in recent years and does not have any identified funding at this time.

RVTD provides some rideshare links on their website and is planning to expand their rideshare coordination. Funds for the program are identified in the RTP and are programmed in the current MTIP.

The adopted Greater Bear Creek Valley Regional Plan (GBCVRP) identifies multiple urban reserve areas (CP-2B and CP-3) designated for future residential, open space, and employment lands. TDM strategies that have proven successful with these types of land uses include carpool and vanpool, transit (if the transit frequency and routing is increased), flexible work schedules, and telecommuting. Because of the nearby residential areas in Central Point, bicycle riding and walking may also be reasonable commute options.

7.4. Transportation System Management Measures

Transportation System Management (TSM) measures are designed to make maximum use of existing transportation facilities.

7.4.1. General Description

TSM measures typically include:

- Traffic engineering measures that improve the operations and efficiency of streets and intersections
- System monitoring and traveler information systems (e.g., ITS systems, variable message signs, etc.) including incident management systems (e.g., incident response and recovery teams)
- Facility management systems (e.g., ramp meters, special use lanes, signal priority for special users such as transit).

These strategies are described below.

Traffic Engineering Measures

Traffic engineering measures such as signal timing changes, provision of turn lanes, turn restrictions, and restricting on-street parking to increase the number of travel lanes without road widening are included in this category. These traffic engineering measures are routinely included as part of the traffic analyses used in conjunction with the design process for intersection and roadway projects. Optimizing traffic signal operations, for example, is performed by the traffic engineer before specifying the number of lanes and queue storage requirements for the intersection design.

Such measures must consider all movements at an intersection, including side-street traffic, main street traffic, transit, bicycles, and pedestrians. Competing priorities can arise between modes and directions of traffic and both county and state policy and objectives must be considered when setting priorities. For example, additional turn lanes may reduce delay at intersections for automobiles, but increase the crossing distance for pedestrians, making their crossing less safe. Or, turn movement restrictions may increase throughput on a roadway, but reduce access to business. Decisions regarding access restrictions especially require involvement and input from the community.

System Monitoring and Traveler Information Systems

System monitoring employs Intelligent Transportation Systems (ITS) technologies that enable jurisdictions to monitor traffic, respond to traffic crashes and vehicle breakdowns more quickly, and communicate with the motoring public in real time. System monitoring requires deployment of infrastructure like a Traffic Operations Center (TOC) with video and closed circuit TV, and surveillance cameras, detection cameras and traffic sensors on highways to improve the capability of agencies to keep track of the transportation system on a real time basis. This system monitoring capability allows the operators in a TOC to dynamically adjust signal timing, dispatch emergency vehicles, and provide information to the motorists.

The real time traffic information can be shared with travelers in a variety of ways, by variable message signs, highway advisory radio, 5-1-1 Traveler Phone Information, web sites, and specialized warning systems (such as fog warnings), to let them make their own decisions about when to drive and what route to choose.

Facility Management Measures

Facilities can be managed to improve the performance of the street and highway system or provide operational advantages for specific users. Facility management measures are tied into the system monitoring and traveler information systems discussed above and can be used to benefit users of alternative modes of transportation and TDM programs discussed in the previous section of this memorandum.

> *Ramp Meters:* Ramp meters, which are used on the on-ramps to freeways and other limited access highways, can be used for two different purposes. First, ramp meters can discourage drivers from using freeways to bypass congestion on local roads. Second, when traffic demand is high, ramp metering can adjust the metering rate such that the density on the freeway remains below the critical value, thereby increasing flow or preventing traffic breakdown of the freeway mainline. Its benefits can be reaped when the traffic flows are neither too light (in which case metering is not needed) nor too high (in which breakdown will happen anyway). Ramp meters increase travel times and meter the rate of flow entering the highway. In its simplest application, ramp meters set minimum intervals between vehicles entering the freeway from the ramp with a fixed-time signal.
>
> *Preferential lanes:* This measure involves the reservation of a travel lane for a preferred group such as high occupancy vehicles and transit. It is often used at ramp meter locations, allowing transit to bypass waiting vehicles and providing travel time savings and reliability for transit.
>
> *Traffic Signal Priority*: This measure is used primarily for transit in regions that experience significant congestion and delay at intersections. In general, prioritization allows transit to receive a green light for a few seconds before other vehicles so that it can advance ahead of a queue, or it can hold a light green for a few seconds longer to allow a bus to get through a signal before it turns red.

7.4.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 33

A number of transportation system management measures were evaluated in *Technical Memorandum #4 – Alternative Analysis and Technical Memorandum #5: Preferred Alternative.* Concepts considered included traffic control, turn restrictions, restriping, bicycle and pedestrian connections between the ramp terminals and adjacent roadways, and additional turn lanes needed to address future operational deficiencies at the interchange.

In addition to traffic signal optimization and coordination between signals that was assumed for the future analysis of the interchange study area, the following TSM improvements are recommended:

- E Pine St/10th St/ Freeman Rd:
  - Change from protected left-turn phasing on the northbound and southbound approaches to protected/permissive left-turn phasing
  - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the westbound left-turn movement and restrict access points between 10th Street and Jewett School Road to right turns only
- E Pine St/I-5 Southbound Ramp Terminal:
  - Monitor queuing on the southbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp
  - Install a bicycle signal on the eastbound approach to regulate the eastbound right-turn movement when bicyclists are present
- E Pine St/I-5 Northbound Ramp Terminal:
  - Monitor queuing on the northbound off-ramp and maintain traffic signal timing to safely manage queues on the ramp
- E Pine St/Peninger Rd:
  - Restripe the northbound Peninger Road approach to provide a left-turn lane and a left-through-right lane and change the northbound-southbound signal timing to split phasing
- E Pine St/Hamrick Rd:
  - Modify the signal phasing to include an overlap of the southbound right-turn movement with the eastbound left-turn phase
  - Extend the left-turn lane on E Pine Street striping to provide more queue storage for the eastbound left-turn movement

In addition to these TSM measures, coordination with the Rogue Valley Intelligent Transportation Systems (RVITS) plan is recommended. Completed in 2004, the RVITS plan is a 20-year plan that identifies advanced technologies and management techniques that can relieve traffic congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management measures. RVITS projects recommended for implementation address the following categories:

- Travel and Traffic Management: improve travel time, reduce crashes, provide incident response, and provide traveler information
- Communications: e.g., provide early warning for delays or closure of the Siskiyou Pass
- Public Transportation Management: intended to enhance existing RVTD systems and to improve transit traveler information
- Emergency Management: reduce emergency response times and integrate emergency management with transportation and transit management
- Information Management: collect, archive, and manage various types of transportation-related data
- Maintenance and Construction Management: aimed at improving the safety of motorists and workers in construction zones, improve efficiency of construction management and control, enhance construction scheduling, and tracking weather conditions that affect maintenance

Facility management measures, such as ramp meters, preferential lanes, and signal priority, will not likely be considered at Interchange 33 in the short term since freeway congestion is not expected to be a concern in 2034. If I-5 should become congested in the future, metering of interchange ramp terminals throughout the Rogue Valley region may become necessary. The *I-5 Rogue Valley Corridor Plan* includes ramp metering as a management tool.

7.5. Land Use and Development Strategies

Several potential land use and development strategies are available with the potential to directly or indirectly influence the transportation impacts of future development.

7.5.1. General Description

Some potential land use and development strategies include:

- Using trip budgets or trip caps to directly manage traffic impacts of developments;
- Retaining the current Comprehensive Plan designations and land use zoning
- Creating land use designations or overlay zones as part of the City of Central Point Conceptual Land Use Plan and UGB expansion and annexation process

These strategies are described below.

Directly Manage Traffic from Development

The practice of limiting trips, or placing “trip caps” or “trip budgets” involves permitting development projects based on the number of trips each will generate, in the context of development within a specified area. These programs can provide a measure of flexibility for developers while limiting the total impact of development. A development that did not use all the allowable traffic generation potential might be able to pass on its unused traffic potential to an adjacent development that could be allowed to generate more traffic. As long as the total traffic generation from the area remained within limits, the interchange operations would be protected.

Trip Caps: A trip cap program is implemented when capacity at the interchange is limited. By establishing the maximum number of trips that can be accommodated at the interchange, more strategic development decisions can be made.

Trip Budgets: A trip budget program may be implemented when a reasonable build out growth scenario can be accommodated at the interchange. The trip budget allocates trips over time in support of long-term economic goals.

Retain Current Comprehensive Plan and Land Development Ordinance Designations and Regulations

Transportation modeling draws guidance from comprehensive plans, but requires making assumptions about the type, intensity and location of development that can occur within each zone. Changes to the current land use zoning could dramatically affect the number of trips generated, trip patterns, and traffic volumes at intersections and the interchange. As a result, traffic operations at the interchange may approach capacity more rapidly than anticipated, shortening the life of the updated interchange and hastening the need for costly investments for additional interchange improvements.

Vehicle trip generation associated with potential future growth in the region could cause traffic operations at Interchange 33 to exceed ODOT mobility standards within the 20-year planning horizon. The intensity, timing and location of actual development may result in more congestion than is estimated by the model.

ODOT is relying on the currently adopted plans, policies, designations and codes to ensure that the land uses remain supportive of the function of the interchange. This management strategy is essentially a reaffirmation by the City of Central Point and Jackson County that their Comprehensive Plans and TSPs remain valid or, if changes are needed, the TPR requirements will be met and the City or County will notify ODOT and jointly undertake an evaluation of impacts to the interchange. The Transportation Planning Rule (TPR) provides specifications on what must be addressed by agencies when seeking a comprehensive plan amendment or rezoning. *Technical Memorandum 1: Definition and Background, Appendix A – Review of Plans and Policies* and *Technical Memorandum 2: Existing Conditions Analysis* cite the standards that the IAMP relies on for consistency and implementation and associates them with the applicable IAMP sections. Specifically, these are:

- City of Central Point Comprehensive Plan: Comprehensive Plan Map (2008).
- City of Central Point Transportation System Plan, 3.6 Land Use Goals and Policies.
- City of Central Point Development Ordinance: Chapter 17.10 Zoning Map and Text Amendments, Section 17.10.600 Transportation planning rule compliance.

- Jackson County Comprehensive Plan: Map Designations, Establishment of Map Designations and Corresponding Zoning Districts, Policy 1: Minor Map Amendment Requests Process, and policies in the Agricultural Lands Element, Economy Element, Environmental Quality Element, Rural and Suburban Lands Element, and Urban Land Goals and Policies.
- Jackson County Transportation System Plan: Section 4, Goals and Policies
- Land Development Ordinance of Jackson County, Oregon: Chapter 3. Application Review and Decision, 3.7 Amendments to the Comprehensive Plan or Zoning Maps, 3.10 Creation Of New Roads Without Land Division, 5.1 General Provisions, and 9.5 Access Design Standards.

Preparation of City of Central Point Conceptual Land Use Plan and UGB Expansion and Annexation Process

Jackson County and the City of Central Point have undertaken extensive planning efforts in the study area through the Greater Bear Creek Valley Regional Planning (GBCVRP) process. The GBCVRP work evaluated land use and transportation-related planning and design issues associated with the UGB expansion and the future development of the area. The Jackson County Board of Commissioners adopted the GBCVRP Plan as an amendment to its comprehensive plan on November 23, 2011. The Oregon Department of Land Conservation and Development requested that the County make changes to the plan. Jackson County held two public hearings one before the Jackson County Planning Commission and one before the Jackson County Board of Commissioners. The City of Central Point will adopt the GBCVRP before the end of 2012.

7.5.2. Applicable Actions, Benefits, and Implementation Issues for IAMP 33

Technical Memorandum #:3 Future Baseline Traffic Conditions evaluated two future condition scenarios. One scenario was consistent with the forecasting used for the 2034 RTP and the current Jackson County zoning. The second scenario, Alternative Land Use Scenario (ALUS), assumed a development scenario more intense than the RVMPO predictions to assess the sensitivity of the area to more intense or accelerated rates of growth.

Even with the uses permitted under current Jackson County and City of Central Point zoning, the ramp terminals would be near or exceed OHP mobility standards in 2034. A change in zoning and development in the area could increase demand at the interchange ramps up to 40 percent (approximately 3-10% on the west side, and 20-45% on the east side) which, in turn, could lead to even more congestion and failing traffic operations at the interchange.

Implementing a “trip budget” program for the Interchange 33 study area would be a specific solution that would help protect the function of the interchange and keep intersections operating acceptably. By limiting the total traffic in the study area, the community could be reasonably assured that a preferred interchange concept could operate well for a period of at least 20 years.

Implementing a "trip cap" or "trip budget" program could also be tied to various intermediate phases of the interchange and other infrastructure improvements. Trip caps might specify what total development would be allowed prior to modifying one or the other of the interchange ramps under the preferred concept. Under this "trip cap" or "trip budget" approach, transportation improvements would be tied with the development necessitating them.

Implementation of trip budgets is typically controversial and viewed as anti-development. However, as proposed here the objective is to simply ensure that transportation infrastructure keeps pace with and supports development, which in turn, supports the useful life of the interchange. It can be challenging for small local governments to administer trip budget programs with limited staff and without established tracking systems.

7.6. Summary of Recommended Actions

Vehicle trip generation associated with potential future growth in the region could cause traffic operations at Interchange 33 to exceed ODOT mobility standards prior to the 20-year planning horizon. The intensity, timing and location of actual development may result in more congestion than is estimated by the model. Therefore, several actions are recommended to maintain and preserve the capacity of the interchange and key area intersections.

Recommended actions include:

- ODOT and Central Point: Enhance the local street network to support future development and address access in the vicinity of the interchange. Improving the local street network in the vicinity of the interchange is essential to maximizing the life of Interchange 33. The Central Point TSP identifies several new connections and roadways to expand the local network. These are augmented by additional connections for consideration that are identified in *Technical Memorandum #6: Access Management Plan.*
- ODOT: Adopt an Access Management Plan for the Interchange 33 area. Adoption of the access management plan is critical to the long-term safe and efficient operations of the interchange. Local street network enhancements partnered with access management improvements in the Interchange 33 area should be implemented.
- Jackson County and City of Central Point: Implement Transportation Demand Management strategies in cooperation with other jurisdictions within the RVMPO. TDM strategies that encourage the use of carpools, vanpools, bicycling and walking should be continued. Reactivation of the Transportation Management Association (TMA) should be pursued to promote travel options, coordinate shared rides, obtain grants, advocate for transit service, and provide incentives to participants. Jackson County and the City of Central Point may wish to establish a mechanism by which employers of a certain size are required to participate in a TMA, or provide incentives to employers who choose to participate in a TMA.

- ODOT: Apply Transportation System Management measures when adding traffic signals to the system. Signal interconnection, coordination, and optimization should be included when future signals (new street connection between Peninger Road and Hamrick Road) are designed and constructed. The recommended improvements in *Technical Memorandum #5: Preferred Alternative* and *Technical Memorandum #6: Access Management Plan* include additional TSM measures such as signal phasing changes, lane restriping, access management, and the installation of a bicycle signal. It also recommends monitoring queuing and managing traffic operations for safety at the interchange ramp terminals until funding for capital improvements becomes available.
- Jackson County and City of Central Point: Retain, through adoption of the IAMP, current adopted Jackson County Comprehensive Plan and Land Development Ordinance designations and regulations to ensure that the land uses within the IAMP study area remain supportive of the function of the interchange. The IAMP assumes that, within the study area, Jackson County and the City of Central Point will maintain their:
    - Current land use designations with current uses and densities;
    - Plan and code amendment processes;
    - Requirements for traffic impact studies; and
    - Processes for notification to ODOT regarding land use actions that may affect state transportation facilities.

I-5 Exit 33 (Central Point):
Interchange Area Management Plan

Technical Memorandum #8:
Public Involvement Summary

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
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Portland, Oregon 97201

June 2014

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8. PUBLIC INVOLVEMENT SUMMARY

The public involvement process for IAMP 33 included a technical advisory committee (TAC), a project focus group (PFG), and general public outreach.

8.1. Technical Advisory Committee

The TAC provided technical and policy guidance and will serve as the primary body making recommendations about the project. The committee was composed primarily of ODOT and local jurisdiction staff.

Five TAC meetings were held during development of the IAMP 33 Management Plan. Meetings were held on the following dates:

1. December 2nd, 2010 – Topic: Introduction and Existing Deficiencies
2. February 22nd, 2011 – Topic: Future Deficiencies and Concept Development
3. January 25th, 2012 – Topic: Future Forecasting and Interchange Improvement Concepts
4. February 17th, 2012 – Topic: Summary of Concepts and Additional Concepts
5. November 7th, 2012 – Topic: Preferred Alternative and Next Steps

Meeting materials, including agendas and summaries (with presentations) are attached in Appendix A.

8.2. Project Focus Group

The PFG provided stakeholder input and offer recommendations to the TAC. The committee was composed of interested citizens, property owners, business representatives, and other stakeholders along the corridor.

Three PFG meetings were held during development of the IAMP 33 Management Plan. Meetings were held on the following dates:

1. February 22nd, 2011 – Topic: Existing Conditions and Future Baseline Analysis
2. February 16th, 2012 – Topic: Project Status and Area Improvement Concepts
3. November 6th, 2012 – Topic: Preferred Alternative and Next Steps

Meeting materials, including agendas and summaries (with presentations) are attached in Appendix B.

8.3. General Public Outreach

General public outreach included web-accessible materials and three public open houses.

8.3.1. Website

ODOT project documents (technical memoranda and reports) were posted on the ODOT Region 3 website (http://www.oregon.gov/ODOT/HWY/REGION3/pages/index.aspx) for public access.

8.3.2. Public Open Houses

Public open houses were held as informational exchanges where staff and consultant present and explain project information and the general public could provide input and comment on issues and concerns of importance to them.

Two public open houses were held during development of the IAMP 33 Management Plan. Open houses were held on the following dates:

1. February 16th, 2012 – Topic: Existing and Future Deficiencies
2. November 6th, 2012 – Topic: Draft Corridor Plan

Meeting materials, including agendas and summaries (with presentations) are attached in Appendix C.

Attachments:

Appendix A. Technical Advisory Committee Meeting Materials
Appendix B. Project Focus Group Meeting Materials
Appendix C. Public Open House Meeting Materials

I-5 Exit 33 (Central Point):
Interchange Area Management Plan

APPENDIX

Technical Memorandum #8

Public Involvement Summary

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

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June 2014

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APPENDIX A.

Technical Advisory Committee Meeting Materials

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #1

1:30 PM to 3:00 PM

December 2, 2010

Central Point City Hall – City Council Chambers

AGENDA

1.	Introductions	Lisa Cortes, ODOT Tom Humphrey, Central Point
2.	Project Overview	Jennifer Danziger, DEA Shelly Alexander, DEA
3.	Review of Existing Conditions	Jennifer Danziger, DEA Shelly Alexander, DEA
4.	Existing Conditions Discussion	All
5.	Next Steps	Jennifer Danziger, DEA

Attachments:
DRAFT Technical Memorandum #1 – Definition and Background
DRAFT Appendix A – Review of Plans and Policies
DRAFT Technical Memorandum #2 – Existing Conditions Analysis

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #1 - December 2, 2010

Draft Meeting Notes

Attendees: Tom Humphrey (Central Point)
Mike Quilty (Central Point)
Phil Messina (Central Point)
Matt Samitore (Central Point)
John Vial (Jackson County)
Bern Case (Jackson County)
Eric Heesacker (Rogue Valley Council of Government)
Peter Schuytema, (ODOT Transportation Planning and Analysis Unit)
Ron Hughes (ODOT Region 3 Traffic)
Lisa Cortez, (ODOT Region 3 Planning)
Jennifer Danziger, (David Evans and Associates, Inc.)
Shelly Alexander, (David Evans and Associates, Inc.)

Project Overview

Jennifer Danziger provided a brief overview of the Interchange 33 Area Management Plan (IAMP) concept, process, goals, objectives, and management tools. The group participated in a discussion regarding current capacity improvements as planned by the County. Specifically, the additional lanes to be added for traffic along East Pine Street between Peninger and the Northbound ramp terminal. Improvements include right-turn lanes in the eastbound (onto Peninger), westbound (onto I-5 northbound ramp), and southbound (from Peninger onto East Pine Street) directions. Additionally, the intersection of East Pine Street and Peninger will see signal improvements in the form of protected left-turn movements for Peninger (construction scheduled for summer/fall of 2011).

Existing Conditions Analysis

Shelly Alexander provided a brief overview of the Existing Conditions Analysis summarized in Tech Memo #2. The analysis assumes the existing year of 2010 for the entire study area. A note was made regarding the number of jurisdictions that have control over East Pine Street throughout the study area. The existing conditions memo will need to be modified to show that ODOT only has jurisdiction between the ramps and that Jackson County has jurisdiction between the northbound ramp and Peninger. (Note: Central Point's TSP shows ODOT jurisdiction for this segment.)

Tom Humphrey and others noted that the study area boundaries end at Table Rock Road (eastern most study area boundary). They expressed concern over where the line was drawn (down the center of the road or to either side) and the development potential of the industrial lands (City of Medford) to the east of the roadway. Jennifer noted that all of these lands are included in the land use forecasts for the regional model that are used to develop the future traffic volumes so the effects of the lands will be addressed regardless of where the study area limits are located. However, if management tools such as overlay zones, trip caps, or other measures are to be considered as part of the IAMP, this area should be addressed as well. Ultimately, the group suggested incorporating the "triangle" of land between Table Rock Road, Biddle Road, and Airport Road and including the City of Medford in the TAC.

Shelly then summarized the operational findings of the analysis. All intersections meet v/c ratio standards but the 7th/East Pine southbound approach would not meet the City's LOS standard. There are also several locations to keep an eye on: 7th/East Pine (southbound left), 10th/Freeman/East Pine (westbound left), Peninger/East Pine (northbound left/through), and Hamrick/East Pine (eastbound left). Six of the study area intersections show one or more movements with existing queues in excess of the available storage (10th/Freeman/East Pine, Jewett/East Pine, I-5 SB Ramps/East Pine, I-5 NB Ramps/East Pine, Peninger/East Pine, Hamrick/East Pine).

Tom noted that the post office (southbound left volumes at the 7th/East Pine intersection) traffic is always a problem. Tom and others also commented on the truck traffic east of the interchange, specifically for the Hamrick/East Pine intersection (eastbound left). There is a safety concern along Hamrick due to increasing residential development and a park located north of East Pine. Both the City and County would like to see Table Rock Road become the preferred route for trucks with a possible Truck Route designation. Ron Hughes added that the Regional Access Management Engineers (RAMEs) throughout Oregon have been keeping a close eye on the truck laws and standards which could come into play if the truck traffic is eventually relocated to Table Rock Road. Lastly, with regard to truck traffic Peter Schuytema requested that the analysis keep true to the number of trucks observed in the count data throughout the East Pine corridor.

Shelly also shared that the review of the traffic counts showed that I-5 peaks differently in the northbound and southbound directions. Traffic data shows northbound I-5 peaking during the PM peak hour, similar to East Pine, while the southbound direction peaks during the morning.

Jennifer discussed the crash history for the IAMP management area. The highest crash locations included the northbound ramp terminal, 10th/Freeman/East Pine intersection, the southbound ramp terminal, and Hamrick/East Pine intersection. Jennifer noted that the ODOT coding for crashes on the overpass (i.e., East Pine between the ramp terminals) does not specify location and the distribution of crashes were completed to the best of our ability. Segment crash rates for East Pine and I-5 mainline as well as Safety Priority Index System (SPIS) data was also reviewed. The segment crash rate for East Pine is above the rate for a similar facility, however, the I-5 mainline crash rates were below. The review of SPIS data showed no top 10% locations.

Next Steps in Analysis

DEA will complete baseline analysis for future year 2034 as well as a sensitivity analysis for the RPS scenario (assumed year 2050). The baseline analysis findings will be summarized in the next technical memorandum. This analysis will help guide the concept development and evaluation for the IAMP management area. Further consideration should be given to ideas including: Additional Ramp Improvements (Phase 2) as well as Local Street Network and Intersection improvements. Eventually, all potential concepts will be evaluated in a screening matrix. Ideas for projects and/or evaluations measures are encouraged for discussion at the next Technical Advisory Committee (TAC) meeting. DEA asked about the timeline for the 4-lane to 3-lane conversation project as it needs to be considered/included in the future conditions analysis.

Tom recommended having a conversation with Jim Hanks (JRH Transportation) to discuss previous work completed for East Pine St. (*East Pine Street Transportation Plan*) to determine the assumptions used. Tom mentioned that not much development, with the exception of FEDEx, has occurred since the study was completed.

Public Involvement

Project needs to move forward with a public presentation of the work completed. Group decided that a presentation or discussion with the Project Focus Group (PFG)-breakfast or lunch area good times- is needed as well as a public meeting. The recommended timing for the next meetings (TAC, PFG, and public open house) is January/February. The month of January will not work for Bern Case (Jackson County). Lisa will send out another “Doodle” when the meeting date nears to determine committee members availability.

Question was raised about City of Medford involvement. Should they be invited to the CAB meeting?

Actions:

- DEA will complete tech memo summarizing future baseline analysis.
- ODOT will investigate adding Table Rock Road intersection to study area and expanding study area to include the land between Table Rock/Biddle and the south study area boundary.
- City and ODOT will establish TAC, PFG, and public meeting dates for presenting the latest information.

Attachments:
Technical Memorandum 2:DRAFT Existing Conditions Analysis

DAVID EVANS AND ASSOCIATES INC.

JOB DESCRIPTION	JN.
CALCULATION FOR	BY ____ DATE ____
	SHEET ____ OF ____ SHEETS
	CHECKED BY ____ DATE ____

I-5 Interchange 33 IAMP

TAC Meeting #1
December 2, 2010

Name	Email
Jennifer Danziger	jed@deainc.com
Shelly Alexander	sma@deainc.com
ERIC HEESACKER	eheesacker@rvcog.org
TOM HUMPHREY	tom.humphrey@centralpointoregon.gov
BERN CASE	CASEBE@JACKSONCOUNTY.ORG
MIKE QUILTY	MIKE.QUILTY@CENTRALPOINTOREGON.GOV
JOHN VIAL	VIALJN@JACKSONCOUNTY.ORG
Phil Messina	phil.messina@centralpointoregon.gov
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Lisa Cortés	~~lisa~~ lisa.cortes@odot.state.or.us

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan (IAMP)

Technical Advisory Committee Meeting #1
December 2, 2010

Oregon Department of Transportation

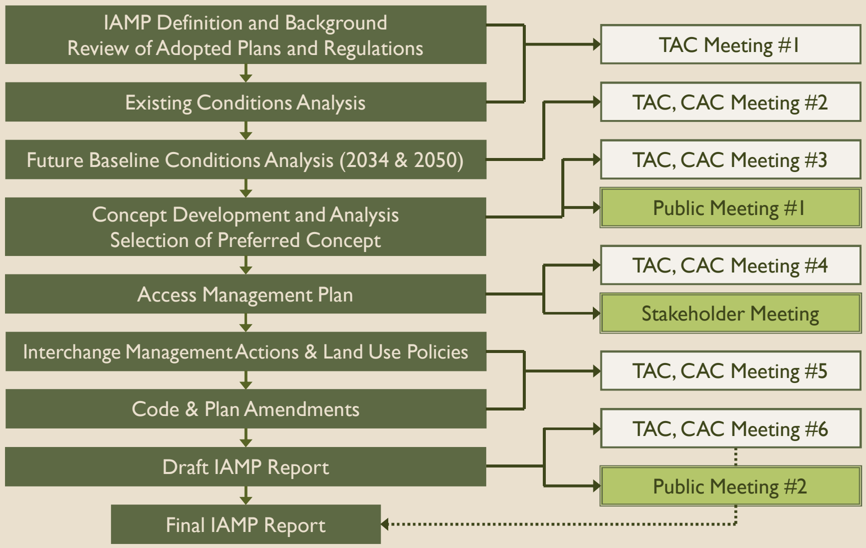
CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2034
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Jackson County, and Central Point

IAMP Planning Process



Why do an IAMP for Interchange 33?

- Increasing demand at the interchange
  - Population growth forecast of almost 60% over the next 20 years
  - Urban Reserve locations north and east of the project were identified in the Greater Bear Creek Valley Regional Plan
  - Potential fairgrounds expansion in future
- Interchange and roadway network characteristics
  - Substandard intersection spacing near ramp terminals
  - National Highway System intermodal connector from I-5 to OR 62
  - Downtown grid system to west
- Traffic Concerns
  - High truck volumes to and from the east
  - Queuing between closely spaced intersections
  - Weaving movements between nearby access roadways and ramp terminals

IAMP Goal

Develop a plan for improvements for Interchange 33 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Central Point and other Rogue Valley communities.

IAMP Objectives

- Protect the function of the interchange and East Pine Street as specified in the Oregon Highway Plan (OHP), RVMPO Regional Transportation Plan, City of Central Point Transportation System Plan (TSP), *and Jackson County TSP*.
- Develop concepts to improve safety and maximize operational efficiency of the freeway and interchange to address existing and future needs.
- Evaluate the need for capacity improvements based on the adopted comprehensive land use plans of Central Point and Jackson County.

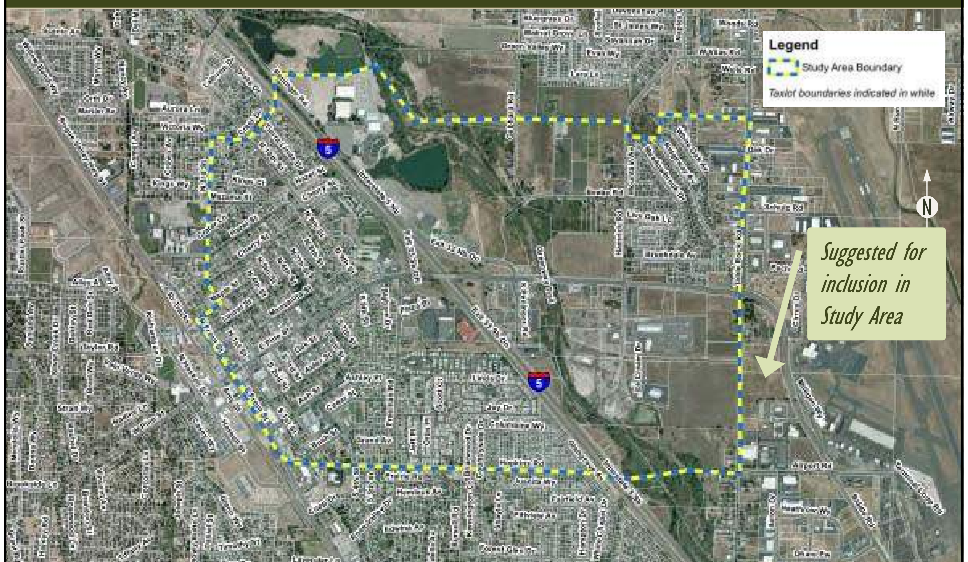
IAMP Objectives (continued)

- Develop an access management plan that provides for safe and acceptable operations on the transportation network and meets OHP requirements and the access spacing standards in Oregon Administrative Rule (OAR) 734-051
- Incorporate the Greater Bear Creek Valley Regional Plan into the design and management systems, including recommended strategies for land use control
- Incorporate the analysis of the City's Pine Street Four-Lane to Three-Lane Conversion Study *and recommendations from the I-5 Rogue Valley Corridor Plan.*

Potential IAMP Management Tools

- Transportation System Management
  traffic control, lane striping, signing, access management
- Transportation Demand Management
  transit service, multi-modal facilities
- Land Use Strategies
  overlay zones, modification of allowable uses, trip cap allocation ordinances, zone changes
- Capacity Improvements
  added travel or turning lanes, ramps

IAMP Planning Area



IAMP 33 - Technical Advisory Committee #1

Existing Condition Analysis

- Existing Transportation System Inventory
  - Traffic Volumes - 2010
  - Traffic Operations - Intersections & Freeway
  - Crash History – 2006 through 2008
- Land Use Summary
  - Characteristics, Constraints, Features, Resources
- Natural and Historic Resources
  - Natural – Floodplains, Wetlands/Waterways, Threatened/Endangered Species, Air Quality,
  - Hazardous Materials
  - Historic and Archaeological Resources

IAMP 33 - Technical Advisory Committee #1

East Pine Street Jurisdiction

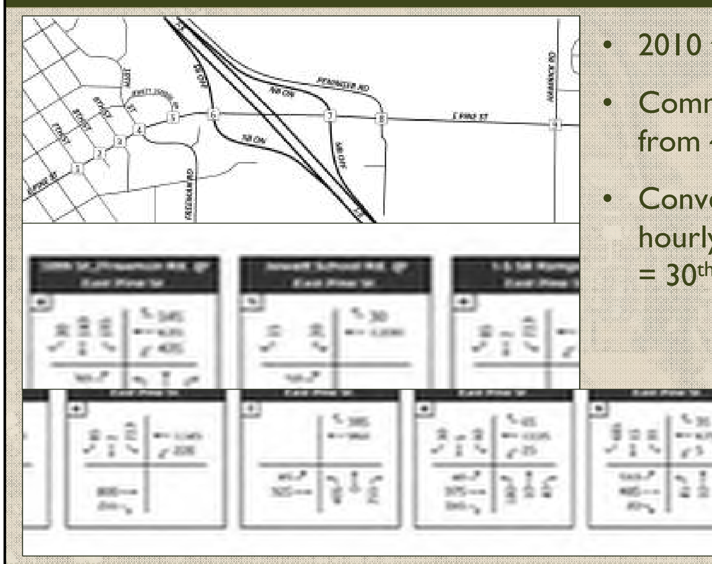
Management Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT/Federal Functional Classification	City/County Functional Classification	Posted Speed (mph)	No. of Lanes
Interstate 5					
Mainline	ODOT	Interstate, NHS, FR, TR[1]	-	65	4
Interchange 33 Ramps	ODOT	Interstate, NHS, FR, TR[1]	-	-	1-2
East Pine St.[2]					
West of 10th St.	Central Point	Minor Arterial	Minor Arterial	25-35	4-5
10th St. - SB Ramps	Jackson County	Minor Arterial	Principal Arterial	35	5
SB Ramps – *NB Ramps*	ODOT	Minor Arterial, NHS Intermodal Connector[1,]	Principal Arterial	35	5
NB Ramps to East	Jackson County	Minor Arterial, NHS Intermodal Connector[1,]	Intermodal Connector	35-45	5

Notes:

1. NHS: National Highway System; FR: State Freight Route; TR: Federally Designated Truck Route
2. The state functional classification maps denote East Pine Street as under state jurisdiction between the northbound and southbound ramp terminals, and under county jurisdiction outside of the ramp terminals.

Existing Traffic Volumes



- 2010 traffic counts
- Common peak hour from 4:30 to 5:30 PM
- Converted to design hourly volumes (DHV) = 30th highest hour

Freight Traffic

Truck Percentages on Management Area Roadways

Location	6:00 AM – 10:00 PM			4:30 PM – 5:30 PM		
	Single Unit	Tractor Trailer	Total	Single Unit	Tractor Trailer	Total
East Pine Street						
West of I-5 Southbound Ramps[1]	1.9%	1.4%	3.2%	0.5%	0.6%	1.1%
On I-5 Overpass[1]	2.2%	4.4%	6.6%	0.9%	2.9%	3.8%
East of I-5 Northbound Ramps[1]	2.5%	7.7%	10.2%	1.4%	5.2%	6.6%
East of Peninger Rd.[2]	-	-	-	2.5%	2.1%	4.6%
East of Hamrick Rd.[2]	-	-	-	1.8%	1.6%	3.5%
Interchange 33 Ramps						
I-5 Southbound Off-Ramp[1]	3.2%	13.9%	17.1%	2.6%	12.8%	15.5%
I-5 Southbound On-Ramp[1]	1.3%	7.0%	8.4%	0.9%	5.8%	6.7%
I-5 Northbound Off-Ramp[1]	1.8%	9.3%	11.1%	1.1%	5.3%	6.4%
I-5 Northbound On-Ramp[1]	2.7%	14.7%	17.5%	2.1%	9.2%	11.3%
I-5 Mainline						
Northbound[3]	2.7%	14.1%	16.8%	4.0%	19.3%	23.3%
Southbound[3]	2.4%	11.8%	14.2%	2.7%	19.0%	21.7%

Notes:
1. 16-hour (6:00-22:00), turning movement, classification collected on May 11, 2010
2. 4-hour (14:00-18:00), turning movement, classification collected on April 20, 2010
3. 16-hour (6:00-22:00), turning movement, classification collected on March 31, 2010

Source: Traffic counts collected March 31, April 20, and May 11, 2010.

Operations

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards
  - ODOT Standards
    - V/C ratio 0.80 on I-5 Mainline and 0.85 on I-5 Ramps
  - Central Point Standard
    - LOS D or better
  - Jackson County Standard
    - V/C ratio = 0.85

Existing Intersection Operations

- Findings reflect most recent ODOT signal timing plans
- All intersections meet v/c ratio standards
- Southbound 7th Street exceeds Central Point LOS standard

Existing Intersection Queuing

Existing (2010) 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked[1]
10th St./Freeman Rd. & East Pine St.	WB L	300	150[4]	41%
	WB T/R	450	350[2]	22%
	NB L	150	125[3]	3%
	SB L	225	100[3]	16%
Jewett School Rd. & East Pine St.	WB T/R	325	300[2]	7%
I-5 SB Ramps & East Pine St.	SB R	125	50[3]	6%
I-5 NB Ramps & East Pine St.	WB R	125	65[3]	2%
Peninger Rd. & East Pine St.	SB R	75	40[3]	7%
Hamrick Rd. & East Pine St.	EB L	425	400[4]	1%

Acronyms: For intersection approaches NB = northbound, SB = southbound, EB = eastbound, and WB = westbound. At the intersection approach L = left-turn movement, T = through movement, and R right-turn movement. Some approaches have shared lanes where two or more travel movements may be permitted as indicated with a slash.

Notes:
1. Percent time block reflects the percentage of time when the queue either extends out of a storage bay and interferes with the adjacent through travel lane or extends past the next upstream intersection.
2. Storage distance reflects spacing to the next public access point.
3. Storage distance reflects length of travel lane or turn bay.
4. Storage distance reflects length of turn bay but TWLTL allows additional storage space.

Source: Synchro HCM Intersection Analysis Report

Existing Freeway Operations

- Merge and Diverge Operations
  - Merge = Segment where traffic enters onto the highway
  - Diverge = Segment where traffic exits from the highway
- I-5 Northbound
  - PM Peak Hour is busiest time of day
  - V/C Ratio ranges from 0.45 south of Interchange 33 to 0.31 between the ramps
- I-5 Southbound
  - AM Peak Hour is busiest time of day
  - V/C Ratio ranges from 0.30 south of Interchange 33 to 0.14 where traffic exits the highway

Crash History

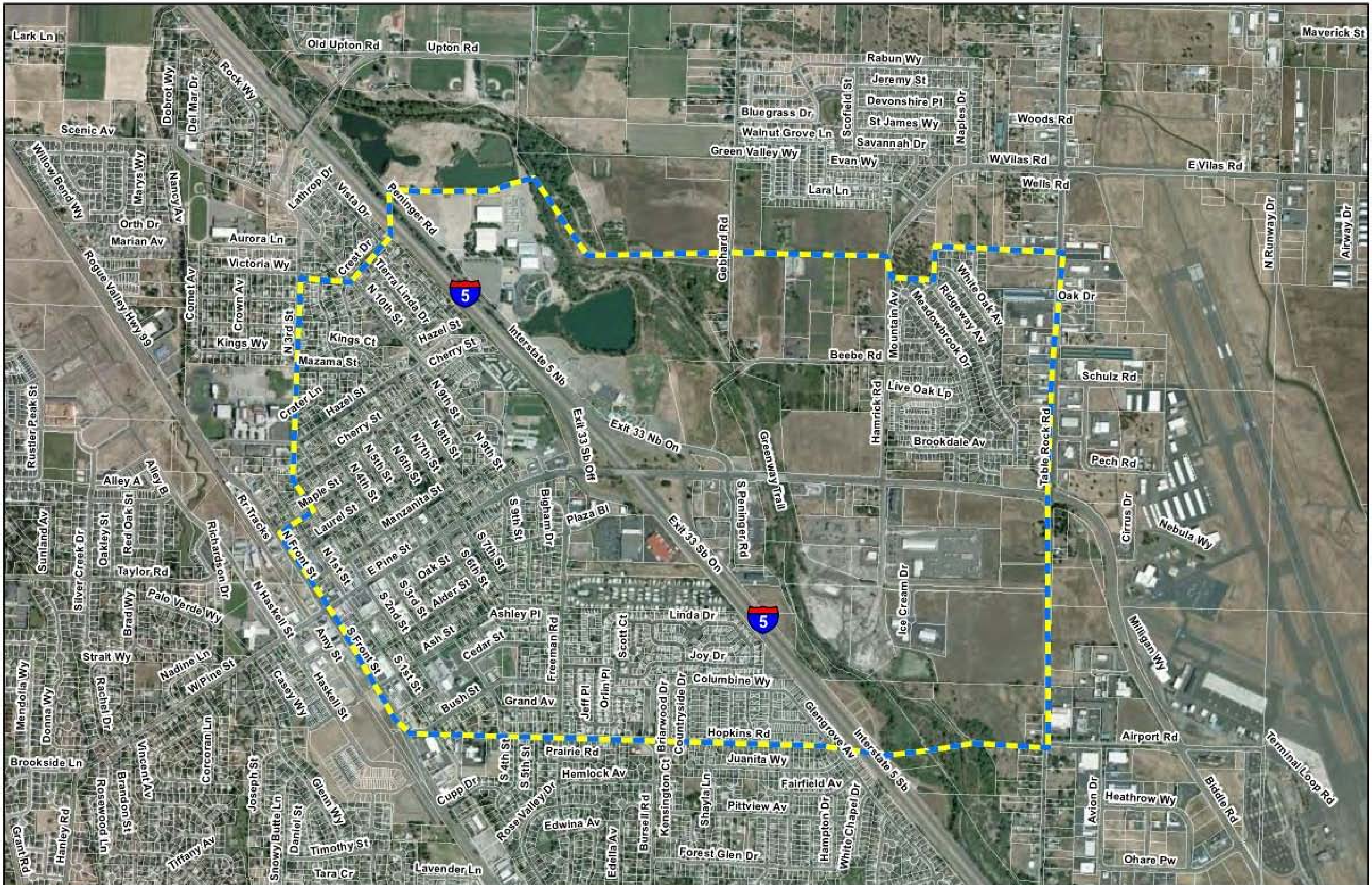
- Three Years of Data (2006 – 2008)
- 127 Crashes in Project Area
- Highest Crash Locations on East Pine Street
  - I-5 NB Ramps Intersection (30 crashes)
  - 10th Street/Freeman Road Intersection (29 crashes)
  - I-5 SB Ramps Intersection (19 crashes)
  - Hamrick Road Intersection (16 crashes)

Crash History (continued)

- East Pine Street Segment Crash Rate
  - 4.02 vs. 2.51 for similar facilities
  - May be attributable shorter segment length, 4 closely spaced signalized intersections, and freeway ramp terminals
- I-5 Mainline Segment Crash Rate
  - 0.30 vs. 0.54 for similar facilities
- Safety Priority Index System
  - No top 10% locations

Next Steps

- Future Conditions Analysis
  - 2034 Baseline Condition - Forecasting
  - 2050 RPS Land Use Scenario - Sensitivity
- Concept Development and Evaluation
  - Ideas *(Begin Discussion Today)*
    - Additional Ramp Improvements (Phase 2)
    - Local Street Network Improvements
    - Intersection Improvements
  - Evaluation
    - Baseline and RPS Scenarios
    - Screening Matrix



N
1,500 750 0 1,500 Feet

Source Data: ESRI, Jackson County, Microsoft (2001-09)

Legend

Study Area Boundary

Taxlot boundaries indicated in white

Figure 1-1

Project Vicinity and Study Area

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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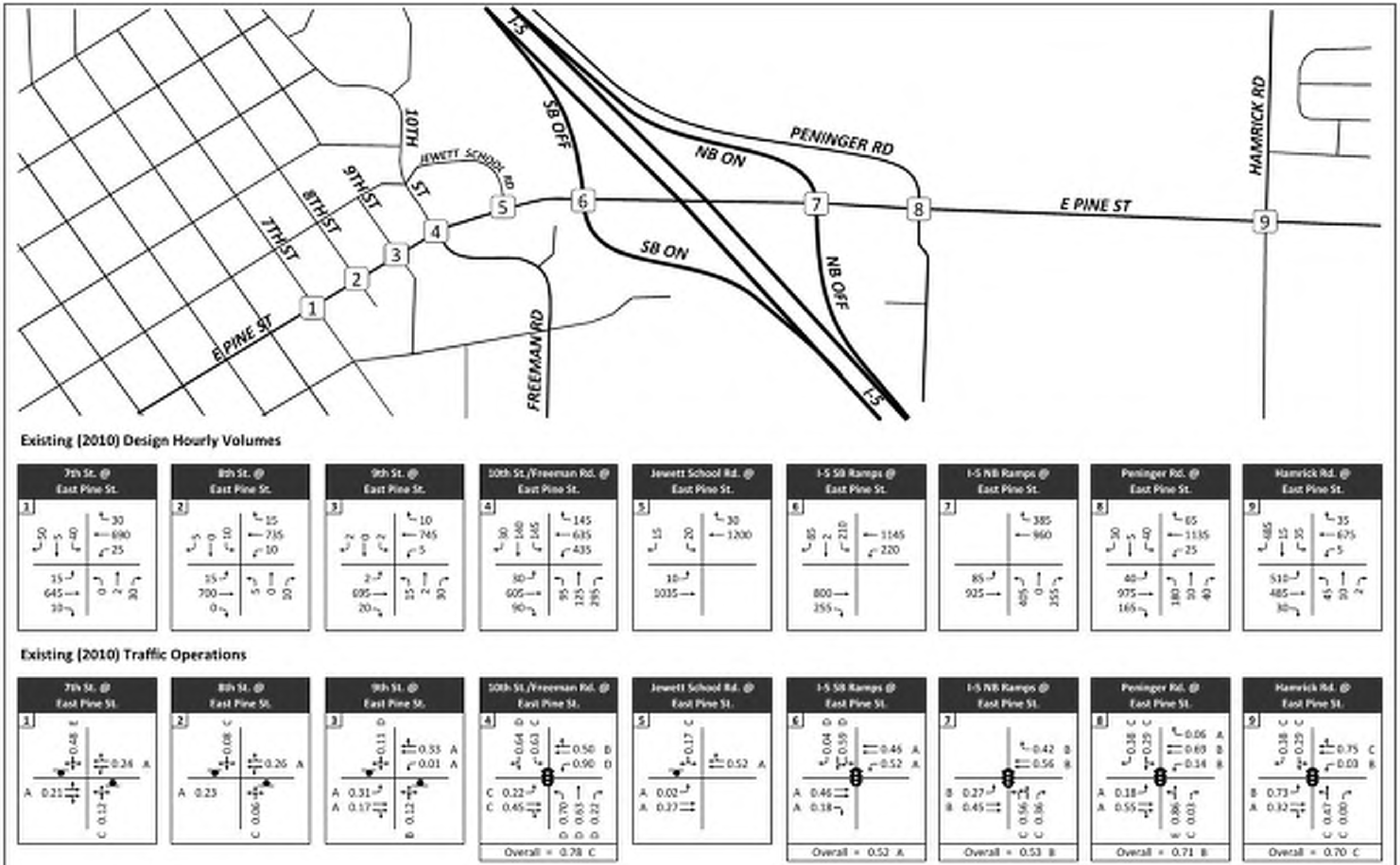


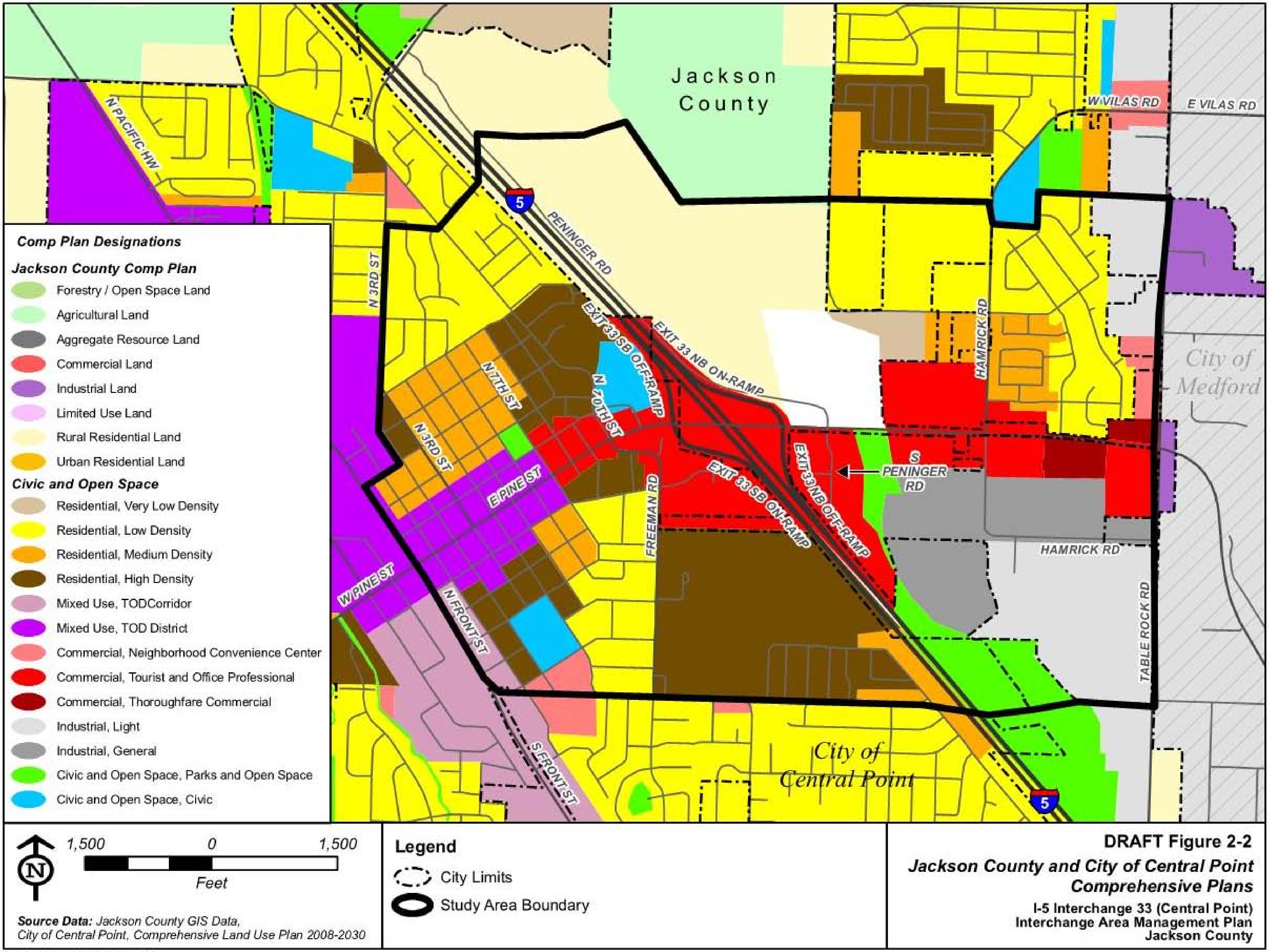
Legend

Turning Movement	Lane Group	Traffic Signal
00 Turning Movement Volume	0.00 Volume-to-Capacity (V/C) Ratio	STOP Sign
	A Level of Service (LOS)	

DRAFT Figure 2-1

Existing (2010) Design Hour Traffic Volumes and Operations

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County



DRAFT Figure 2-2

Jackson County and City of Central Point Comprehensive Plans

I-5 Interchange 33 (Central Point) Interchange Area Management Plan Jackson County

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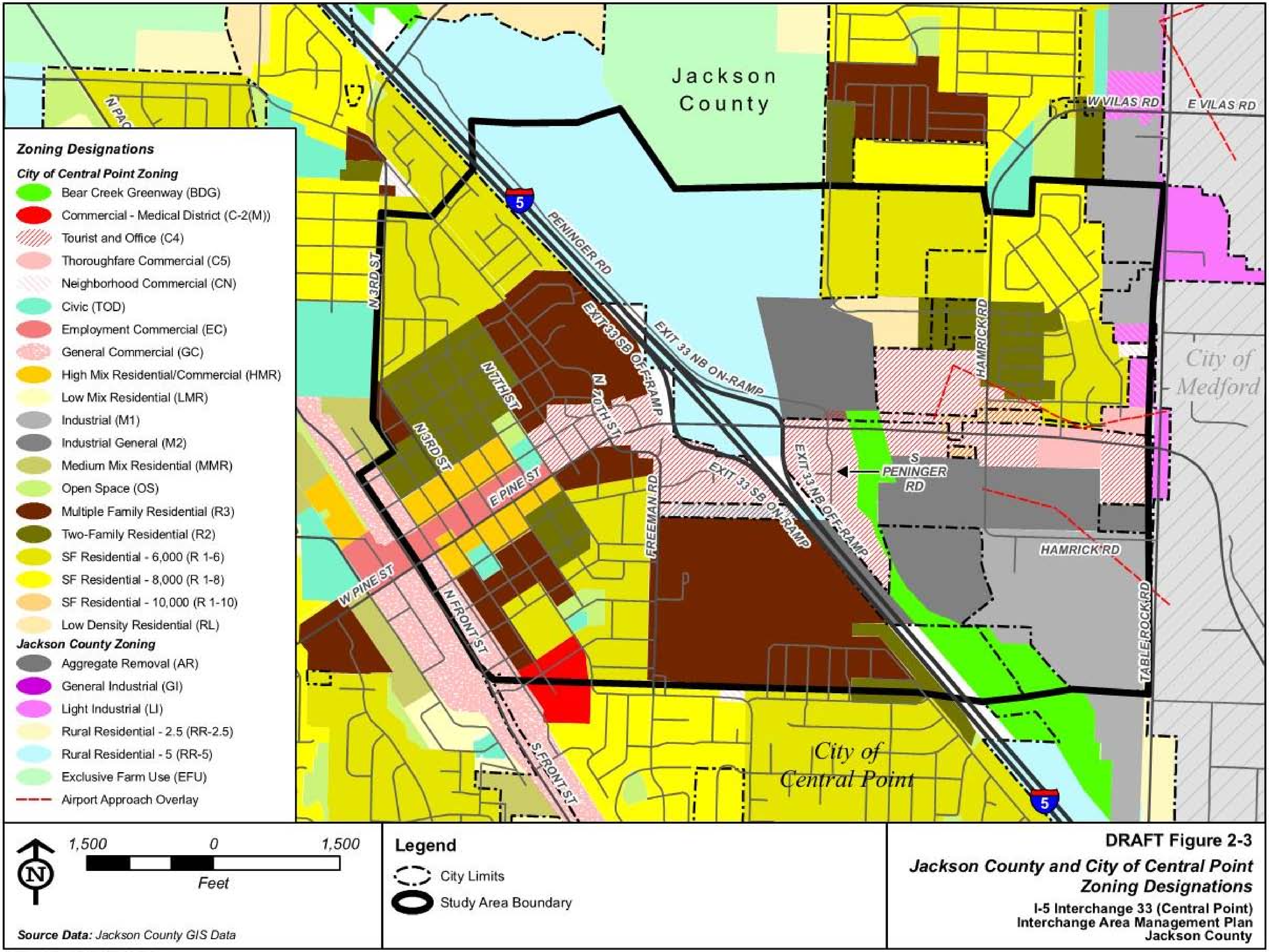

DRAFT Figure 2-3

Jackson County and City of Central Point Zoning Designations

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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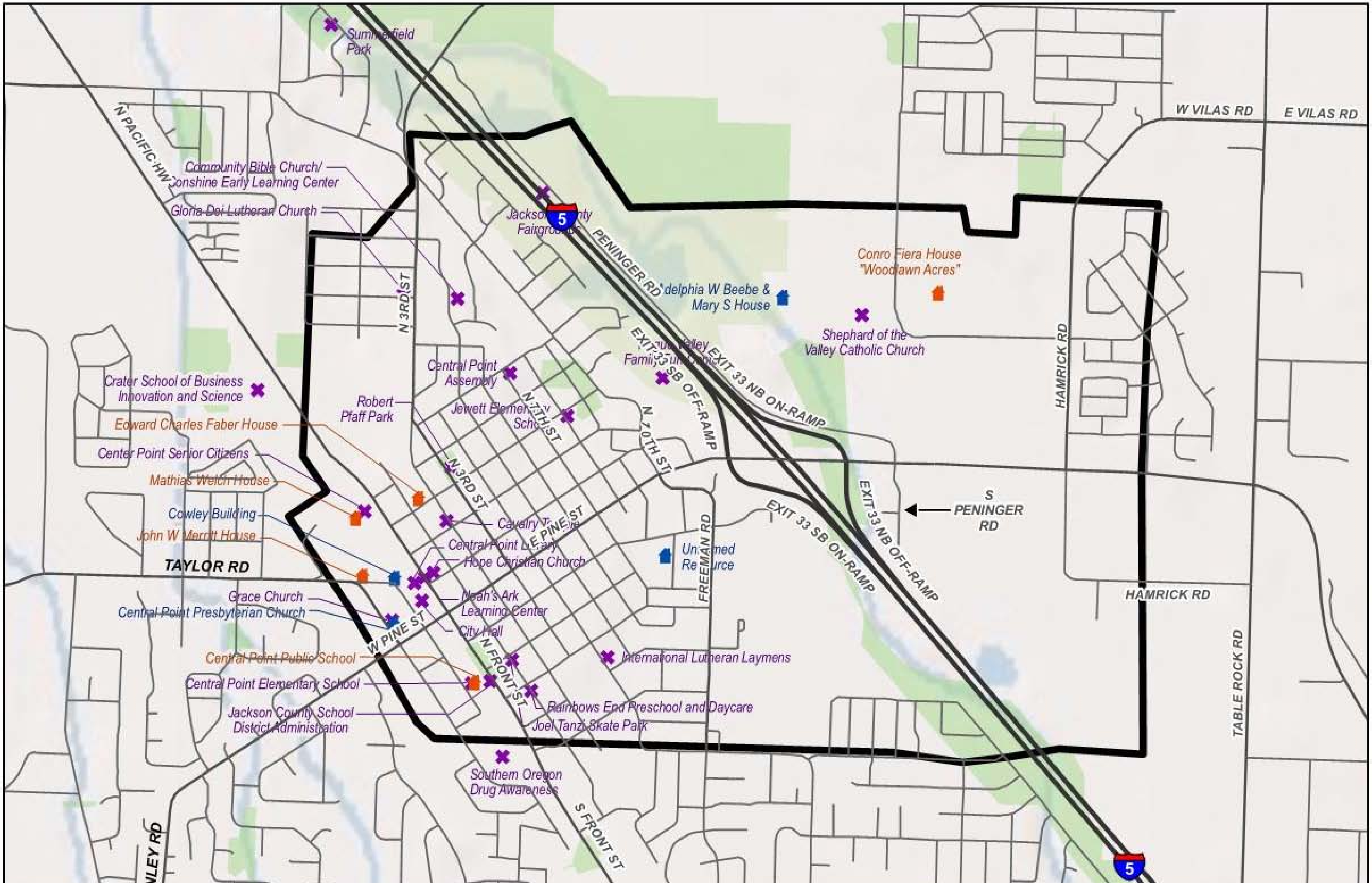

Source Data: ESRI, Jackson County GIS Data

Legend

- Study Area Boundary
- Community Resources
- Historic Resources
- Historic Resources (Undetermined or Eligible/Significant)

DRAFT Figure 2-4

Community and Historical Resources

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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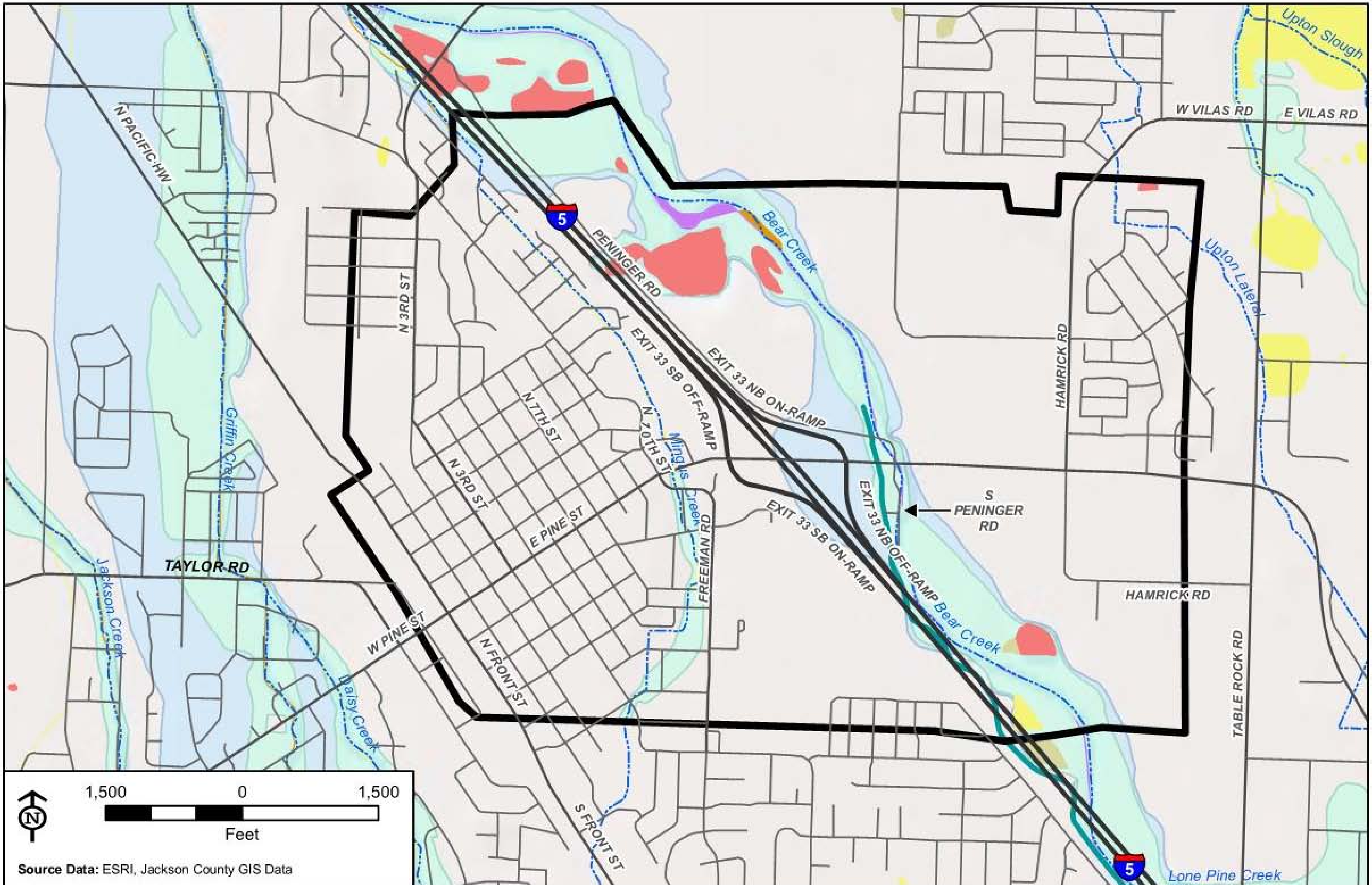

Source Data: ESRI, Jackson County GIS Data

Legend

- Study Area Boundary
- 100-Year Floodplain
- 500-Year Floodplain
- Rivers/Streams
- Bear Creek Greenway

Wetlands (Cowardin)

- Palustrine, Aquatic Bed
- Palustrine, Emergent
- Palustrine, Forest
- Palustrine, Scrub-Shrub
- Palustrine, Other
- Riverine, Upper Perennial
- Riverine, Intermittent

DRAFT Figure 2-5

Natural Resources

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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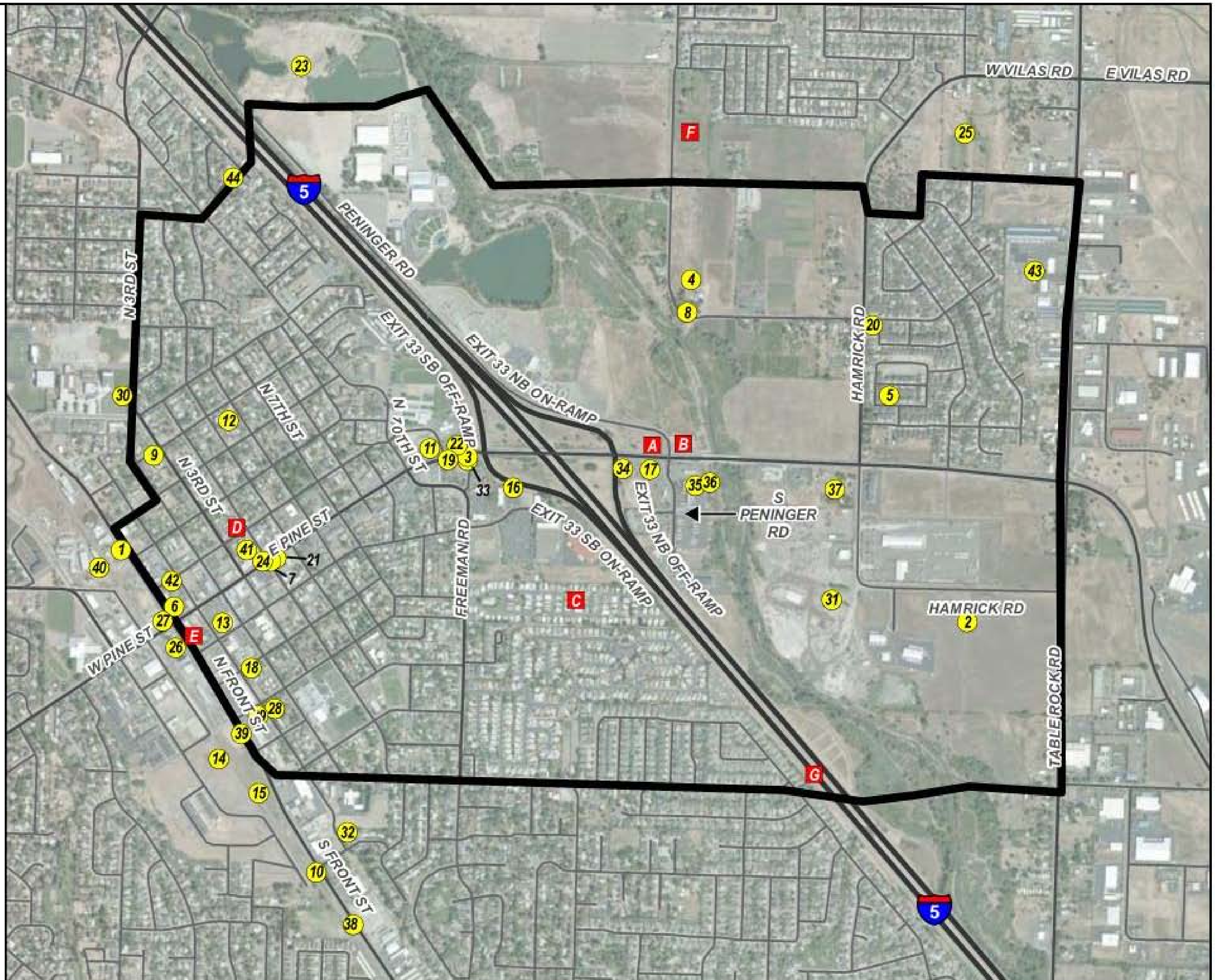
Filename: P:\O\ODOT00000680\0600INFO\GS\ArcMap\Tech Memo 2\Fig_2-5_NaturalResources_Sept2010.mxd

HAZARDOUS MATERIALS SITES

1. 234 FRONT STREET
2. AIRPORT ORCHARD
3. ARS-FRESNO LLC
4. BEEBE ROAD
5. BEEBEWOOD ESTATES
6. BI-MOR STATIONS #7
7. BROCK PROPERTY (B & R TAX SERVICE INC.)
8. BROOKSTONE RANCH PUD
9. BUS BARN
10. C & M WESTERN INC.
11. CENTRAL POINT BP
12. CENTRAL POINT CITY SHOP
13. CENTRAL POINT CLEANERS
14. CENTRAL POINT LUMBER
15. CENTRAL POINT LUMBER CO.
16. CENTRAL POINT TIGER MART #2774
17. CHEVRON USA INC SS 98337
18. COLVIN OIL CO. JEFFERSON STATE
19. COLVIN OIL COMPANY
20. DECARLO HOMES OIL RELEASE
21. EAST PINE STREET GROUNDWATER\
22. EQUILON ENTERPRISES LLC
23. EXPO PONDS
24. FORMER CENTRAL POINT POST OFFICE HOT
25. FOUR SEASON'S SUBDIVISION
26. GRANGE CO-OP
27. GRANGE CO-OP CARDTROL
28. GRANGE COOP HOT
29. GRANGE COOPERATIVE SUPPLY ASSOCIATION
30. HARRIS M HOT
31. LTM INCORPORATED
32. MARBLE DESIGNS INC.
33. PACIFIC NW BELL - CENTRAL POINT
34. PANOCO INC #27
35. PILOT TRAVEL CENTER #391
36. PILOT TRAVEL CENTERS LLC
37. PINE STREET DEMO
38. PROVIDENCE
39. ROGUE CREAMERY
40. TWIN CREEKS CROSSING/THE NORTH VILLAGE
41. U S WEST COMMUNICATIONS
42. UNION PACIFIC RAILROAD
43. VIKING FREIGHT INC
44. WYSS DOMESTIC UST

FIRE MARSHALL SITES

- A 1500 E PINE ST
- B 1550 E PINE ST
- C 301 FREEMAN RD
- D 347 MANZANITA ST
- E 43 N FRONT ST
- F 4922 GEBHARD RD
- G I-5 SB AT MP 32



1,500 0 1,500

Feet

Source Data: Jackson County GIS Data
Microsoft Aerial Photograph (2001-2009)

Legend

- Study Area Boundary
- Hazardous Material Sites
- Fire Marshall Sites

DRAFT Figure 2-6

Hazardous Materials Sites

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan
Jackson County

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INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #2

10:00 AM to 12:00 Noon

February 22, 2011

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Lisa Cortes, ODOT Tom Humphrey, Central Point
2. Work Completed • Future Baseline Conditions	Jennifer Danziger, DEA Shelly Alexander, DEA
3. Project Discussion • Concept Development	All
4. Project Update • Schedule • Upcoming meetings	Jennifer Danziger, DEA Lisa Cortes, ODOT
5. Next Steps	Jennifer Danziger, DEA

Attachments:
DRAFT Technical Memorandum #3 – Future Baseline Traffic Conditions

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #1 - February 22, 2011

Draft Meeting Notes

Attendees: Tom Humphrey (Central Point)
Don Burt (Central Point)
Mike Quilty (Central Point)
Matt Samitore (Central Point)
Alex Georgevitch (Medford)
John Vial (Jackson County)
Bern Case (Jackson County)
Eric Heesacker (Rogue Valley Council of Government)
Lisa Cortes, (ODOT Region 3 Planning)
Dave Warrick (ODOT roadway and bridge design)
Jennifer Danziger, (David Evans and Associates, Inc.)
Shelly Alexander, (David Evans and Associates, Inc.)

Work Completed-Future Baseline Conditions

Jennifer Danziger revisited two concerns from the first TAC meeting: expanding the study area boundary to the east and adding the Table Rock Road intersection into the traffic analysis. It was deemed that neither concern required a modification to the IAMP 33 study area at this time and thus were not included in the future baseline analysis.

Jennifer then summarized the forecasting scenarios for the future conditions baseline analysis which include the 2034 Regional Transportation Plan (RTP) as well as the Regional Problem Solving (RPS) Land Use Scenario. Don Burt commented that the official forecast year for the RPS scenario is now year 2060, not 2050. (*Note: DEA confirmed with City staff that the forecast year has changed but is not yet reflected in documents available on line.)* She then provided an overview of the assumptions used in both the 2034 RTP and 2050 RPS models including population and employment assumptions and resulting growth as a percentage as well as traffic volume. Both scenarios also include some of the OR 62 Expressway elements that reflect JTA funding. The RPS scenario also includes 6 urban reserve areas, totaling 1,136 acres, which would likely add traffic to Interchange 33.

Next, Shelly Alexander led the group through the operational highlights of the two scenarios. In summary, the 2034 RTP scenario would likely result in 5 intersections failing to meet operational standards: 7th Street/East Pine Street, 8th Street/East Pine Street, 10th Street/Freeman Road/East Pine Street, Peninger Road/East Pine Street, and Hamrick Road/East Pine Street. Two of these intersections would be nearing capacity: 10th Street/Freeman Road/East Pine Street (v/c ratio 0.94) and Hamrick Road/East Pine Street (v/c ratio 0.98), while

5 specific movements would be at or over capacity. In addition to future 2034 operational concerns, severe queuing (spilling out of turn bays or spilling into adjacent intersections) was also noted at various locations throughout the corridor; most notably in the westbound direction starting at 10th Street/Freeman Road and extending to the northbound ramp terminal, the northbound direction at the northbound off-ramp, and in the east and west directions at the Hamrick Road intersection.

2034 RTP freeway operations were also evaluated including merge and diverge points as well as mainline. All freeway operations in both directions would meet operational standards.

John Vial commented that the year 2034 is probably optimistic for the type of growth assumed to occur. Bern Case expressed concern regarding motorists' route choice for accessing the airport. He pointed out that the airport signs Interchange 30 (to the south) for access; however, some GPS units direct users to Interchange 33. Those that are directed to Interchange 33 are often confused as the airport is not well signed from this interchange. Alex Georgevitch suggested that an indication of signalized vs. unsignalized be included in the operations tables for both the 2034 RTP and RPS scenarios. He also mentioned that trigger points, rather than years, may be a great way to identify when new projects are needed. Jennifer indicated that triggers would probably be used to identify implementation needs rather than time periods.

Shelly then summarized the operational results for the RPS scenario. This scenario would experience one additional intersection (6 total) failing to meet operational standards, the I-5 NB ramp terminal. Under the RPS forecasting scenario, four intersections could be approaching (or over) capacity: 10th Street/Freeman Road/East Pine Street, I-5 NB ramp terminal, Peninger Road/East Pine Street, and Hamrick Road/East Pine Street. Ten individual movements are near (or over capacity). In addition to future RPS operational concerns, severe queuing (spilling out of turn bays or spilling into adjacent intersections) was also noted at various locations throughout the corridor; most notably in the westbound direction starting at 10th Street/Freeman Road and extending to the northbound ramp terminal, in the eastbound direction at the southbound ramp terminal, the northbound direction at the northbound off-ramp, the eastbound direction at Peninger Road, and in the eastbound and westbound directions at the Hamrick Road intersection.

Freeway operations under the RPS scenario would likely meet operations standards in both directions (mainline, merge, and diverge).

Jennifer and Shelly then presented the future safety concerns within the IAMP 33 study area which include:

- Inadequate mainline gaps (along East Pine Street) for sidestreet manuevers
- Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic.
- Long northbound off-ramp queues could cause more collisions as traffic existing the freeway would have less distance to stop and exiting drivers may also slow I the freeway lanes in anticipation of stopping on the ramp
- Inadequate access spacing

- Competition for two-way left-turn lanes could result in head-on collisions

Project Discussion-Concept Development

Jennifer provided an overview of projects identified in current planning documents including: the Rogue Valley Metropolitan Planning Organization (RVMPO) RTP, Jackson County Transportation System Plan (TSP), Central point TSP, and the East Pine Street Plan.

After discussing the relevant projects listed within the current planning documents the group decided that the East Pine Street (EPS) Plan projects should be evaluated as a "concept" at a minimum. If the improvements identified in the EPS Plan are insufficient to accommodate anticipated demand at the interchange other projects should be considered. It was acknowledged that improvements at the 10th Street/Freeman Road/East Pine Street intersection will need to be included as well as considering improvements to the interchange itself (diverging diamond, loop ramps).

Finally, Jennifer requested that the group be thinking about how to evaluate the concepts beyond operational measures. Any evaluation metric ideas are welcome. The next meeting will include operational results from various concepts as well as potential screening criteria in the form of a matrix. Project Update: Schedule and meetings

Next Steps in Analysis

DEA will evaluate the recommended East Pine Street Plan projects for the 2034 RTP and 2050 RPS scenarios. DEA will add projects as needed, likely to include (but not limited to) improvements to the 10th Street/Freeman Road/East Pine Street intersection, local street network options, and if needed interchange improvements. The concepts and operational findings will be included in the next draft technical memorandum and presented at the next TAC meeting for discussion. Additionally, a draft screening matrix will be presented comparing the concepts that were evaluated. Ideas for projects and/or evaluations measures are encouraged for discussion at the next Technical Advisory Committee (TAC) meeting.

Interest was expressed regarding a project website for the progress of the Interchange 33 AMP. The City volunteered to post materials on their website.

Actions:

- DEA to submit model request(s) to TPAU for improvements associated with the East Pine Street Plan study as the starting point for developing concepts.
- DEA will evaluate the improvement identified in the East Pine Street Plan and determine if any additional improvements are needed.
- Central Point will add IAMP 33 materials to their website for public access.

Attachments:
TAC PowerPoint Presentation Slides
Copy of Attendance Sheet

DAVID EVANS AND ASSOCIATES INC.

JOB DESCRIPTION TAC Mtg #2 2/22/11

CALCULATION FOR

JN.

BY DATE

SHEET OF SHEETS

CHECKED BY DATE

Name	Organization	Email
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I-5 Interchange 33 (Central Point)
Interchange Area Management Plan (IAMP)

Technical Advisory Committee Meeting #2
February 22, 2011

Oregon Department of Transportation

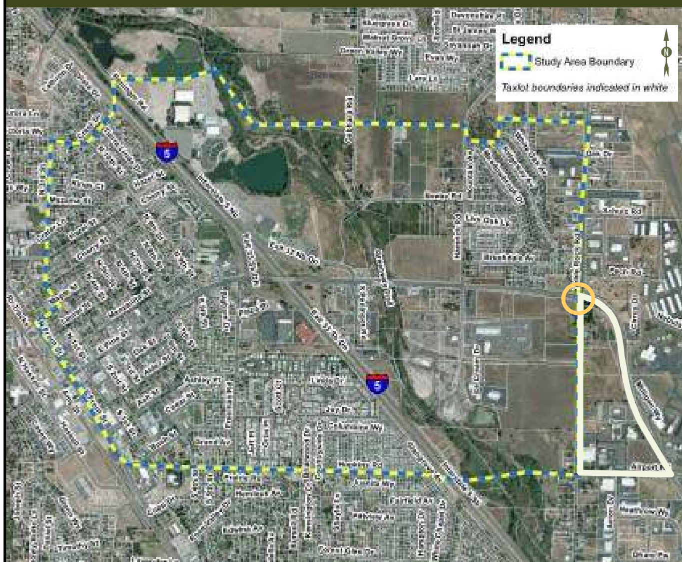
CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

Presentation Topics

1. Follow Up from Last Meeting
2. Future Conditions Analysis
3. Concept Development

IAMP Planning Area – Follow Up from Last Meeting



Expanded Study Area

Action: No Change

- Area can be addressed in management plan without changing boundary
- Include Medford in process

Table Rock Road Intersection

Action: No Change Now

- Monitor Hamrick Road operations under future conditions
- Reconsider action based on future analysis and potential concepts

Future Baseline Condition Analysis

- Forecasting Scenarios
  - 2034 Regional Transportation Plan (RTP)
  - 2050 Regional Problem Solving (RPS) Land Use
- Operational Analysis
  - Intersections
  - Freeway
- Future Safety Considerations

Future Traffic – 2034 RTP Scenario

- Serves as the future baseline condition for IAMP 33
- Based on Regional Travel Demand Model:

Regional	2009	2034
Population	172,665	248,324
Employment	115,430	150,666

Source: 2009-2034 Regional Transportation Plan

- Network used is the financially-constrained RTP network with some OR 62 Expressway elements added
- Network volume growth: (2010 to 2034)

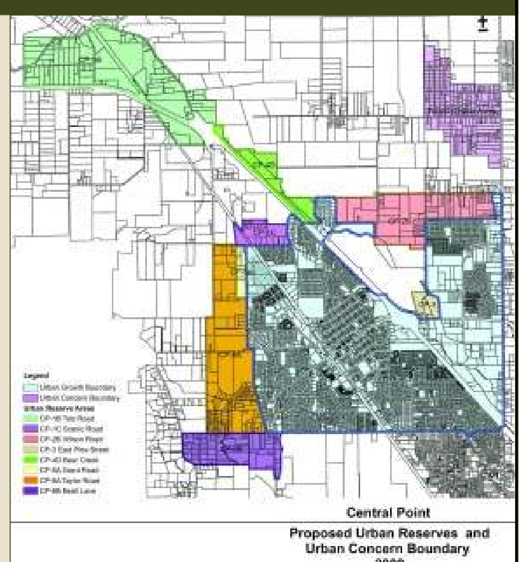
Location	% Growth	Volume Growth*
E Pine: 7th to SB Ramps	31 to 38%	215 to 450
E Pine: NB Ramps to Hamrick	29 to 47%	295 to 480
I-5 Northbound Ramps	45% off, 25% on	300 off, 115 on
I-5 Southbound Ramps	24% off, 34% on	70 off, 165 on
I-5 Mainline Northbound	46 to 53%	765 to 1,065
I-5 Mainline Southbound	54 to 65%	590 to 755

** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

Future Traffic – 2050 RPS Scenario

- Based on the Greater Bear Creek Valley Regional Problem Solving Project
- Examined long-term needs for additional lands for urban development to accommodate a doubling of the region's population
- Identified Urban Reserve Areas
  - 6 areas (1,136 acres) with potential to affect interchange

Zoning	Current	Proposed
Residential	42%	79%
Commercial	0%	5%
Institutional	0%	4%
Open Space/Parks	0%	12%
Resource	58%	0%



Future Traffic – 2050 RPS Scenario

- Provides a sensitivity analysis that considers potential areas for development beyond assumptions in the RTP model
- Because land use scenarios are developed differently from the RTP land use assumptions:
  - Volume distribution across network differs
  - Operational results can vary
- Network used is the same as the RTP scenario
- Network volume growth: (2034 to 2050)

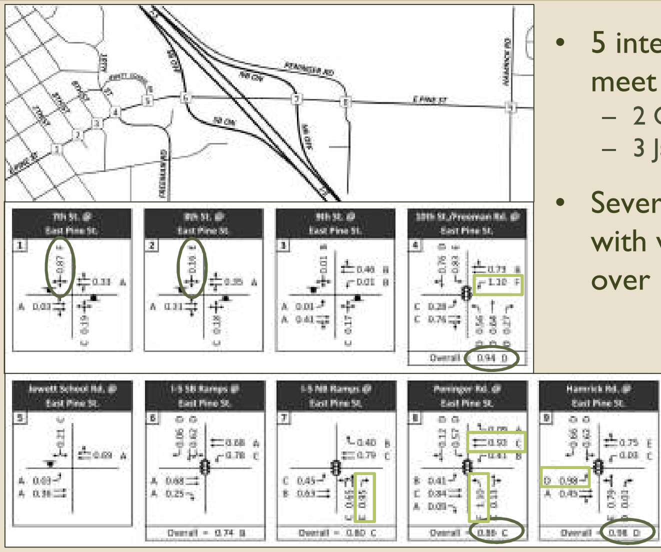
** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

Location	% Growth	Volume Growth*
E Pine: 7th to SB Ramps	0 to 7%	0 to 100
E Pine: NB Ramps to Hamrick	9 to 27%	120 to 395
I-5 Northbound Ramps	10% off, 33% on	95off, 195 on
I-5 Southbound Ramps	40% off, 16% on	145 off, 105 on
I-5 Mainline Northbound	14 to 20%	350 to 545
I-5 Mainline Southbound	19 to 24%	305 to 450

Operations

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards
  - ODOT Standards
    - V/C ratio 0.80 on I-5 Mainline and 0.85 on I-5 Ramps
  - Central Point Standard
    - LOS D or better
  - Jackson County Standard
    - V/C ratio = 0.85

2034 RTP Scenario – Intersection Operations



- 5 intersections don't meet standards
  - 2 Central Point
  - 3 Jackson County
- Several Movements with v/c ratios near or over 1.0

2034 RTP Scenario – Most Severe Queuing

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked
10th St./Freeman Rd. & East Pine St.	WB L	250	150	66%
	WB T/R	400	350	57%
Jewett School Rd. & East Pine St.	WB T/R	450	300	35%
I-5 SB Ramps & East Pine St.	WB T	1,625	1,150	16%
	SB R	175	50	23%
I-5 NB Ramps & East Pine St.	WB T	500	425	4%
	NB L/T	1,125	1,075	7%
	NB R	750	500	20%
Peninger Rd. & East Pine St.	NB L	300	150	73%
	NB T/R	500	450	54%
Hamrick Rd. & East Pine St.	EB L	600	400	32%
	EB T/R	1,475	600	-
	WB T/R	2,500	775	60%
	SB L/T	650	300	-
	SB R	575	300	25%

2034 RTP Scenario – Freeway Operations

- I-5 Northbound: (PM Peak Hour)

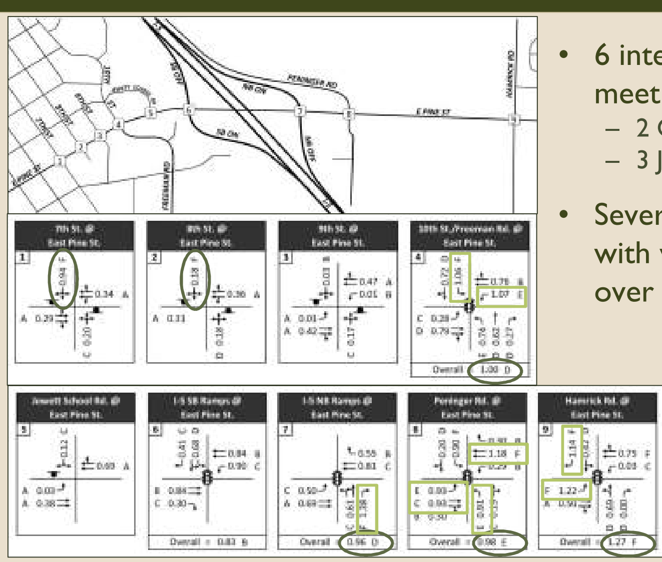
Location	V/C Ratio
Mainline South of IC 33	0.67
Diverge: IC 33 Northbound Off-Ramp	0.48
Mainline between Off and On-Ramps	0.47
Merge: IC 33 Northbound On-Ramp	0.61
Mainline North of IC 33	0.59

- I-5 Southbound: (PM Peak Hour)

Location	V/C Ratio
Mainline North of IC 33	0.40
Diverge: IC 33 Southbound Off-Ramp	0.17
Mainline between Off and On-Ramps	0.32
Merge: IC 33 Southbound On-Ramp	0.47
Mainline South of IC 33	0.46

IAMP 33 – Technical Advisory Committee #2

2050 RPS Scenario – Intersection Operations



- 6 intersections don't meet standards
  - 2 Central Point
  - 3 Jackson County
- Several Movements with v/c ratios near or over 1.0

IAMP 33 – Technical Advisory Committee #2

2050 RPS Scenario – Most Severe Queuing

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked
10th St./Freeman Rd. & East Pine St.	WB L	300	150	35%
	WB T/R	450	350	22%
Jewett School Rd. & East Pine St.	WB T/R	350	300	6%
I-5 SB Ramps & East Pine St.	EB T	375	275	5%
I-5 NB Ramps & East Pine St.	EB L	225	175	-
	NB L/T	1,275	1,075	42%
	NB R	700	500	74%
Peninger Rd. & East Pine St.	EB L	225	75	24%
	EB T	650	400	16%
	EBR	325	215	-
Hamrick Rd. & East Pine St.	EB L	625	400	57%
	EB T/R	2,350	600	-
	WB T/R	4,500	775	69%
	SB L/T	2,375	300	-
	SB R	500	300	71%

2050 RPS Scenario – Freeway Operations

- I-5 Northbound: (PM Peak Hour)

Location	V/C Ratio
Mainline South of IC 33	0.77
Diverge: IC 33 Northbound Off-Ramp	0.53
Mainline between Off and On-Ramps	0.54
Merge: IC 33 Northbound On-Ramp	0.72
Mainline North of IC 33	0.71

- I-5 Southbound: (PM Peak Hour)

Location	V/C Ratio
Mainline North of IC 33	0.49
Diverge: IC 33 Southbound Off-Ramp	0.24
Mainline between Off and On-Ramps	0.38
Merge: IC 33 Southbound On-Ramp	0.56
Mainline South of IC 33	0.54

Future Safety Concerns

- 7th, 8th, Jewett School
  - Inadequate mainline gaps could lead to riskier driver behaviors
- 10th/Freeman, SB Ramps, NB Ramps, Peninger, Hamrick
  - Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic
- NB Off-Ramp
  - Long ramp queues could cause more collisions as traffic exiting the freeway would have less distance to stop and exiting drivers may also slow in the freeway lanes in anticipation of stopping on the ramp
- 10th/Freeman, Jewett School, SB Ramps, NB Ramps, Peninger
  - Inadequate access spacing provides insufficient storage resulting in queue spillover and consequent safety issues listed above
  - Competition for 2-way left-turn lanes could result in head-on collisions

Next Steps

- Concept Development and Evaluation
  - Ideas *(Begin Discussion Today)*
    - Additional Ramp Improvements (Phase 2)
    - Local Street Network Improvements
    - Intersection Improvements
  - Evaluation
    - Baseline and RPS Scenarios
    - Screening Matrix

IAMP 33 – Technical Advisory Committee #2

Projects in Current Planning Documents

- RVMPO RTP
  - 2009 to 2034
    - East Pine/Peninger – Add right-turn lane w/ sidewalks (#852) *(also in Central Point TSP #226)*
    - East Pine: Bear Creek Bridge to Medford City Limits – Overlay, signals, striping (#851)
  - 2005 to 2030 (Superseded)
    - Full interchange reconfiguration (#3918 - long-term 2016-2030)
- Jackson County TSP (2005)
  - Table Rock: Biddle to Bear Creek – Widen to 3 lanes (Tier1)
  - Peninger: East Pine to Expo Park – Widen to 3 lanes (Tier2)

IAMP 33 – Technical Advisory Committee #2

Projects in Current Planning Documents

- Central Point TSP (2009)
  - Tier 1 Projects
    - East Pine/Hamrick – Add second EB Left (#216)
    - East Pine/Meadowbrook – Restrict to right-in/right-out (#210)
    - East Pine/Table Rock – Add second EB Left (#218)
  - Tier 2 Projects
    - East Pine: Bear Creek Bridge to Hamrick – Widen for acceleration/deceleration lanes, add bike/pedestrian facilities (#233)
    - East Pine: Bear Creek Bridge to Peninger – Widen for turn lanes, bike/pedestrian facilities, and third lane (#236)
    - New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick (#245)
    - East Pine: I-5 SB Ramp to Table Rock – widen to add third westbound through lane (#255)

IAMP 33 – Technical Advisory Committee #2

Projects in Current Planning Documents

- East Pine Street Plan (2004)
  - Interchange 33 – Replace left-turn lanes with loop ramps
  - Peninger – Remove signal and convert to right-in/right-out
  - East Pine: I-5 SB Ramp to Table Rock – Widen to add third westbound through lane (in CP TSP #255)
  - East Pine/Hamrick & East Pine/Table Rock – Major capacity enhancements
  - New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick (in CP TSP #245)
  - New north-south street connecting Beebe and new connection to south located between Peninger and Hamrick

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #3

10:00 AM to 12:00 Noon

January 25, 2012

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Allie Krull, ODOT Tom Humphrey, Central Point
2. Future Traffic Forecasting - Update • 2034 Baseline Conditions (RTP) – Recap • 2034 Alternative Land Use Scenario - Sensitivity	Jennifer Danziger, DEA Shelly Alexander, DEA
3. Interchange Area Improvement Concepts • Concept Development • Concept Analysis	Jennifer Danziger, DEA Shelly Alexander, DEA
4. Discussion • Ideas for modifications to concepts or additional concepts that could be evaluated • Input for selection of preferred concepts	All
5. Next Steps • Schedule • Upcoming meetings	Jennifer Danziger, DEA Allie Krull, ODOT

Attachments:
DRAFT Technical Memorandum #4 – Alternatives Analysis

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #3 - January 25, 2012

Draft Meeting Notes

Attendees: See Attached List

Introductions

Tom Humphrey (Central Point) welcomed the committee members and opened the meeting with introductions of attendees and turned the meeting over to Allie Krull (ODOT PM, taking over for Lisa Cortes). Allie provided an outline of the meeting topics and introduced the consultant team project manager Jennifer Danziger and transportation analysis leader Shelly Alexander.

Jennifer welcomed the group, indicated the meeting would include a PowerPoint presentation and acknowledged the need to coordinate the IAMP with an adjacent project along E. Pine Street, the 4-lane to 3-lane conversion. She invited Tom to provide an overview of the road diet concept and the status of the project. Tom provided a brief overview. He noted that, if the 3-lane conversion were to be implemented, the transition would likely occur near the 7th Street intersection, noting that Front Street is currently a 3-lane facility.

Future Traffic Forecasting-Update

Jennifer transitioned to the PowerPoint presentation initially discussing the forecast scenarios needed to complete the IAMP process. She reminded the group that two forecast scenarios are being done based on IAMP guidelines. The IAMP 33 project is using the Regional Transportation Plan Model (RTP) as the future baseline scenario and a future sensitivity scenario. The future sensitivity scenario originally presented, the Regional Problem Solving (RPS) model, has resulted in inconsistencies within the IAMP 33 project area prompting the team to reassess how to address a sensitivity scenario in the area. The team decided to move forward with an Alternative Land Use Scenario (ALUS) to consider potential areas for development beyond assumptions in the RTP model. The ALUS incorporates the “aggressive redevelopment scenario from the E. Pine Street Refinement Plan” on the east side of the interchanged in conjunction with a build out scenario for the west side of the interchange. The build out scenario is based on City of Central Point GIS mapping, comprehensive plan zoning, and zoning ordinances by land use type. The ALUS does not have a timeline (forecast year) associated with it.

Jennifer informed the group of the most recent changes to the mobility standards in the OHP. The only effect within the study area was along I-5, not the ramps or E. Pine Street. She also discussed projects that were assumed in the analysis area, specifically the modifications done between Peninger and the northbound ramp terminal in the westbound direction. See slides 3 through 9 of the attached presentation.

The City expressed interest in the forecast and asked to view and/or have input. Others questioned whether forecasts at the Interchange 35 and surrounding areas were considered when developing the IAMP 33 forecast. Jennifer informed the group that the two interchanges have individual forecasts. The RTP baseline scenarios are the same but the sensitivity options differ.

Alex informed the group that the City of Medford is currently updating their TSP. The current projected build out year is 2023 with densification happening by 2027, and ultimately expansion of the UGB needed. Impacts will likely affect Interchange 24 through Interchange 35.

Next, the operations for the two scenarios were discussed. Jennifer pointed out that the southbound ramp terminal peak period is actually during the morning (while the primary time period for this study is the afternoon). Under the RTP scenario two intersections would be near capacity (Hamrick and Table Rock), while six intersections would be near or over capacity for the ALUS scenario. Jennifer also provided intersections and areas of concern from a safety perspective, including queue spillback on both ramp terminal off ramps, and insufficient queue storage lengths at many study area intersections. See slide 10 through 11 of the attached presentation for more information.

Interchange Area Improvement Concepts

To address the operational and safety concerns four areas of concept development were presented. The concept development started with assuming many improvements from the E Pine Street Plan (referenced as the Enhanced Network) and progressed to conceptual improvements at specific intersections/locations. When describing the Enhanced Network, Jennifer confirmed which E Pine Street Plan projects were assumed and which were not included, and why. The resulting operations, after assuming the E Pine Street improvements, still would result in many intersections failing to meet mobility standards or operating at/over capacity. See slides 12 through 16 of the attached presentation.

Jennifer explained that the concept development process considers three improvement types: interchange, west side, and east side.

Shelly Alexander led the group through the interchange improvement concepts. They included two options for the northbound ramp terminal (Concepts I-1 and I-2) to address the queuing (safety) concern: dual northbound right turns, and dual northbound right-turns in conjunction with a northbound loop off-ramp with dual right turn lanes. The southbound ramp terminal improvements also had two options (Concepts I-3 and I-4) including: dual westbound left-turn lanes and a loop ramp for westbound traffic bound for southbound I-5. Interchange concepts I-5 through I-7 considered improvements to both ramp terminals in one of two ways: a diverging diamond (with or without bridge modification), or various combinations of the individual ramp terminal improvements. Preliminary costs, forecast operations, safety details, roadway geometry and ROW, and environmental and land use issues were also considered and can be found in the attached presentation (slides 17-24).

The addition of the northbound right-turn lane on the northbound off-ramp was generally supported as a concept. It was suggested that perhaps widening on the west side of the ramp could minimize right-of-way impacts. Jennifer noted that this is probably true but could require some realignment of the northbound on-ramp to allow for the through traffic movement.

Some concern was expressed about the geometry of both the northbound and southbound loop ramps. Jennifer noted that she would have the DEA designer talk directly to ODOT staff about the assumptions used in the layouts. The cost opinions for each of the loop ramp concepts are very high because substantial bridge modification is expected for multiple bents to create space for the respective loops. Combining the two loop ramp concepts could cost as much, or more, than replacing the bridge structure.

The City expressed interest in pursuing some more detail about the feasibility of the diverging diamond concepts. ODOT expressed concerns about Concept I-5, which would maintain the existing bridge structure. DEA design staff will contact ODOT staff to discuss the diverging diamond concepts, particularly if the bridge structure is ultimately replaced.

Jennifer then presented the west side concepts including four options (W-1 through W-4) for the 10th/Freeman intersection. Concept W-1 considers dual westbound left-turns paired with a reduction of eastbound through lanes to two in an effort to minimize widening impacts. Concept W-2 is similar to W-1; however, it maintains the three eastbound through lanes and assumes widening will be needed. Both of these concepts would require limiting turning movements to right-in/right-out between the 10th/Freeman intersection and the southbound ramps because of the dual left-turn lanes. City staff mentioned that there may be options to connect behind the parcels front E Pine Street to provide access to 10th Street.

The next two concepts (W-3 and W-4) focus on reducing traffic demand through the intersection by considering turn restrictions and rerouting to 7th. Preliminary costs, forecast operations, safety details, roadway geometry and ROW, and environmental and land use issues were also considered and can be found in the attached presentation (slides 25 through 28).

Next, the east side concepts were presented. Jennifer reminded the group of the operational and safety issues of the Hamrick and Table Rock intersections. The three concepts she presented address these issues in varying ways. Concept E-1 focuses on improvements at Hamrick, specifically dual eastbound left-turn lanes. Concept E-2 focuses on capacity improvements on three of the approaches of Table Rock. The final concept (E-3) looks at modifications at both intersections including traffic calming along Hamrick and addition capacity at Table Rock. Forecast operations, safety details, roadway geometry and ROW, and environmental and land use issues were also considered and can be found in the attached presentation (slides 29 through 31).

Discussion

Comments from the group included concern regarding the count date (2010 vs. 2011) for the Table Rock Road intersection, design (auto-turn for WB-67) of the loop ramps, creek impacts for the dual westbound left turns at the southbound terminal, and a possibly larger impact of the loop ramps. The group felt that W-1 and W-2 may be feasible along Freeman as the Oak intersection currently has a three lane southbound cross-section. W-3 and W-4 generated more concern from the group regarding concerns with the median barrier, large intersection impacts from middle and high school traffic, and already present congestion at the 7th St intersection (the Post Office is the current source of congestion and may be moving). The City mentioned that they may be able to improve circulation on once the Post Office relocates. On the east side the group agreed that increased demand at Table Rock is likely and should be considered. DEA will coordinate with the ODOT District office regarding the Table Rock count.

Jennifer asked if we wanted to present the full range of options to the Project Focus Group and at the Open House in February. The City supported presenting the full range of alternatives so that the citizens could understand that a variety of options had been considered even if there were significant impacts associated with a specific option.

Next Steps in Analysis

DEA will follow up on the action items listed below. The next meetings are scheduled on February 16 (Project Focus Group and Open House) and February 17 (Technical Advisory Committee). After the meetings the next step will be to select the preferred alternative.

Actions:

DEA will coordinate with the ODOT District office regarding the Table Rock count date and Dave Warrick (ODOT design) regarding the layouts.

Attachments:
TAC PowerPoint Presentation Slides
Copy of Attendance Sheet

City of Central Point
Public Meeting Sign in

Meeting: IAMP 33 TAC #3 Date: 1/25/12

Name	Address
BRIAN SHEADEL	100 ANTELOPE WHITE CITY
Roger Allemand	D.8 W.C. ODOT
Michael Wang	District ODOT
WILLIAM FITZGERALD	District 8 ODOT
ERVIN LANIER	ODOT
Shelly Alexander	DEA, CONSULTANT
Dick Converse	RVCOG
Jennifer Danziger	DEA
ALEX GEORGEVITCH	CITY OF MEDFORD
DON BURT	CITY OF CENTRAL POINT
TOM HUMPHREY	CITY OF CENTRAL POINT
MATT SAMITORE	CITY OF CENTRAL POINT
DAVE WARRICK	ODOT - BY PHONE
PETER SCHUYTEMA	TPAU - BY PHONE

I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

Technical Advisory Committee Meeting #3
January 25, 2012

Oregon Department of Transportation

CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

Presentation Topics

1. Future Traffic Forecasting - Update
   – 2034 Baseline Conditions (RTP) - Recap
   – 2034 Alternative Land Use Scenario - Sensitivity
2. Concept Development
3. Concept Analysis
4. Discussion
   – Ideas for modifications to concepts or additional concepts that could be evaluated
   – Input for selection of preferred concepts

Future Traffic Forecasting

- Forecasting Scenarios
  - 2034 Baseline Conditions (RTP)
  - Alternative Land Use Scenario – Sensitivity
  - *Regional Problem Solving (RPS) Land Use Scenario – Discarded because of irregularities in results*

Future Traffic – 2034 Baseline (RTP)

- Serves as the future baseline condition for IAMP 33
- Based on Regional Travel Demand Model:

Regional	2009	2034
Population	172,665	248,324
Employment	115,430	150,666

Source: 2009-2034 Regional Transportation Plan

- Network used is the financially-constrained RTP network with some OR 62 Expressway elements added
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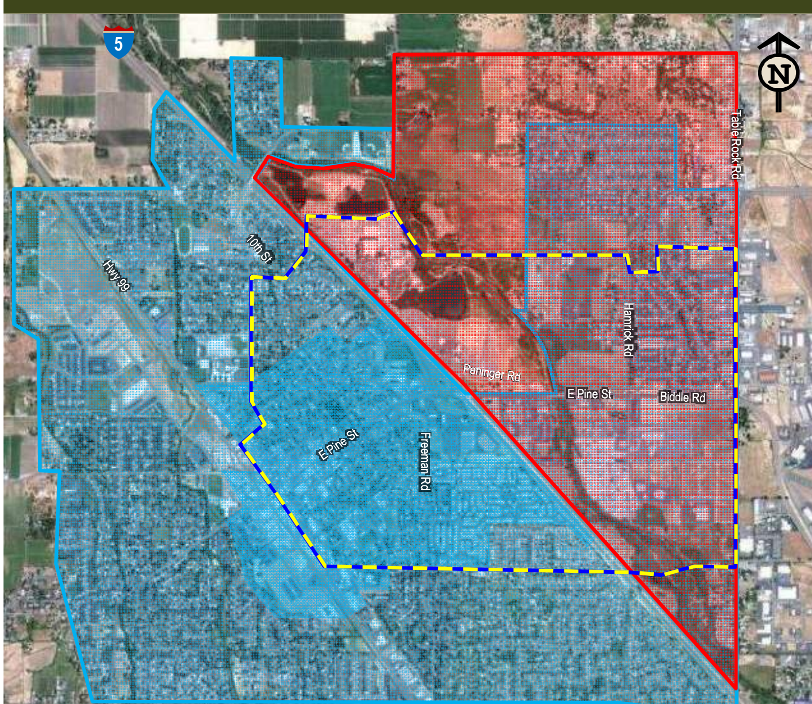
I-5 Mainline Northbound	46 to 53%	765 to 1,065
I-5 Mainline Southbound	54 to 65%	590 to 755

** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

Future Traffic – Alternative Land Use

- Replaces RPS Scenario
- Provides a sensitivity analysis that considers potential areas for development beyond assumptions in the RTP model
- Network used is the same as the RTP scenario
- Assumes build out in study area east of I-5 (see map on following slide)
- Builds on Aggressive Redevelopment Scenario from *East Pine Street Corridor Refinement Plan*

Alternative Land Use Scenario (ALUS)



Build Out Area

IAMP Study Area

E Pine St Corridor Refinement Plan Land Use Area

Note: Build out area extends beyond study area boundaries to conform to traffic analysis zone boundaries in the model

Future Traffic – ALUS

- Estimated Growth with Build Out of Area:

Area	2034 RTP	ALUS
Population	5,330	8,690
Housing	1,920	2,990
Employment	2,270	6,720

- Network volume growth (ALUS vs 2034 RTP):

** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

Location	% Growth	Volume Growth*
E Pine: 7th to SB Ramps	3% to 11%	30 to 145
E Pine: NB Ramps to Hamrick	19% to 46%	255 to 415
I-5 Northbound Ramps	12% off, 6% on	115 off, 35 on
I-5 Southbound Ramps	4% off, 24% on	15 off, 160 on
I-5 Mainline Northbound	-2% to 3%	-35 to 80
I-5 Mainline Southbound	-4% to 5%	-55 to 105

Operations

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards
  - ODOT Standards (Revised OHP)
    - V/C ratio 0.85 on I-5 Mainline and 0.85 on I-5 Ramps
  - Central Point Standard
    - LOS D or better
  - Jackson County Standard
    - V/C ratio = 0.95

Study Area Projects in Baseline Scenario

- E Pine/Peninger Improvements:
  - Add right-turn lane w/ sidewalks at Peninger
  - Extension of westbound right-turn lane at NB On-Ramp
  - Completed

2034 Operations - Baseline Scenario

Operations with 2034 RTP Forecasts (AM Peak Hour):			
I-5 SB Ramps:	V/C = 0.94	LOS C	Queuing – WB Left, SB
I-5 NB Ramps:	V/C = 0.60	LOS A	Queuing – None
Operations with 2034 RTP Forecasts (PM Peak Hour):			
10th/Freeman:	V/C = 0.88	LOS D	Queuing – WB Left, SB Left
I-5 SB Ramps:	V/C = 0.75	LOS A	Queuing – WB Left
I-5 NB Ramps:	V/C = 0.83	LOS B	Queuing – WB, NB
Peninger:	V/C = 0.94	LOS C	Queuing – NB
Hamrick:	V/C = 0.98	LOS D	Queuing – EB Left, SB
Table Rock:	V/C = 1.00	LOS E	Queuing – EB Left, SB Left
Operations with 2034 Sensitivity Analysis Forecasts (AM Peak Hour):			
I-5 SB Ramps:	V/C = 1.00	LOS D	Queuing – EB, WB Left, SB
I-5 NB Ramps:	V/C = 0.72	LOS B	Queuing – None
Operations with 2034 Sensitivity Analysis Forecasts (PM Peak Hour):			
10th/Freeman:	V/C = 0.93	LOS D	Queuing – EB, WB Left, NB, SB
I-5 SB Ramps:	V/C = 0.90	LOS C	Queuing – EB, WB Left
I-5 NB Ramps:	V/C = 1.06	LOS C	Queuing – WB, NB
Peninger:	V/C = 1.12	LOS E	Queuing – WB, NB
Hamrick:	V/C = 1.16	LOS E	Queuing – EB Left, WB, SB
Table Rock:	V/C = 1.10	LOS F	Queuing – WB, NB, SB Left

2034 Baseline Scenario – Safety Concerns

- 10th/Freeman, SB Ramps, NB Ramps, Peninger, Hamrick, Table Rock
  - Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic
- SB Off-Ramp, NB Off-Ramp
  - Long ramp queues could cause more collisions as traffic exiting the freeway would have inadequate stopping distance
  - Exiting drivers may also slow in the freeway lanes in anticipation of stopping on the ramp
- 10th/Freeman, Jewett School, SB Ramps, NB Ramps, Peninger
  - Inadequate access spacing provides insufficient storage resulting in queue spillover and consequent safety issues listed above
  - Competition for 2-way left-turn lanes could result in head-on collisions

Concept Development

- **Enhanced Network** – Evaluate scenario that incorporates the improvements identified in the E Pine Street Plan
- **Interchange Improvements** – Develop concepts that address deficiencies at the interchange ramps (build on E Pine Street Plan)
- **West Side Improvements** – Address deficiencies west of the interchange (build on 4-lane to 3-lane conversion)
  Note: Focus on area from ramps to 10th Street/Freeman Road
- **East Side Improvements** – Address deficiencies east of the interchange (build on E Pine Street Plan)

Enhanced Network Concept

Enhanced Network Concept (continued)

- Projects from E Pine Street Plan not included in network:
  - Interchange 33 – Replace left-turn lanes with loop ramps
  - East Pine: I-5 SB Ramp to I-5 NB Ramp – Widen to add third westbound through lane
  - East Pine/Hamrick – Dual eastbound left-turn lanes with second northbound receiving lane
  - No southern extension of Peninger

2034 Operations – Enhanced Network

Operations with 2034 RTP Forecasts (AM Peak Hour):			
I-5 SB Ramps:	V/C = 0.94	LOS C	Queuing – WB Left. SB
I-5 NB Ramps:	V/C = 0.61	LOS B	Queuing – None
Operations with 2034 RTP Forecasts (PM Peak Hour):			
10th/Freeman:	V/C = 0.86	LOS = D	Queuing – WB Left, SB Left
I-5 SB Ramps:	V/C = 0.78	LOC = B	Queuing – WB Left
I-5 NB Ramps:	V/C = 0.86	LOC = C	Queuing – NB
Hamrick:	V/C = 0.94	LOC = C	Queuing – EB Left, SB
Table Rock:	V/C = 0.88	LOS = D	Queuing – SB Left
Operations with 2034 Sensitivity Analysis Forecasts (AM Peak Hour):			
I-5 SB Ramps:	V/C = 0.95	LOS D	Queuing – EB, WB Left, SB
I-5 NB Ramps:	V/C = 0.71	LOS B	Queuing – None
Operations with 2034 Sensitivity Analysis Forecasts (PM Peak Hour):			
10th/Freeman:	V/C = 0.95	LOS = D	Queuing – EB, WB Left, SB Left
I-5 SB Ramps:	V/C = 0.90	LOC = B	Queuing – WB
I-5 NB Ramps:	V/C = 0.96	LOC = C	Queuing – NB
Hamrick:	V/C = 1.05	LOC = D	Queuing – EB Left, SB
Table Rock:	V/C = 1.05	LOS = E	Queuing – NB, SB Left

Enhanced Network Concept Evaluation

- Traffic volumes in the corridor would go up as capacity becomes available
- Operations would improve at some locations but still would not meet mobility standards
- Queuing would still be present on highway ramps – safety concerns remain
- Queuing between intersections would still be an issue with associated safety concerns

Concept I-1: I-5 Northbound Off-Ramp Add Lane

Purpose: Improve operations and reduce queuing

Traffic Operations:
- OHP and HDM mobility standards met (RTP)
- RTP Scenario – AM V/C = 0.56, PM V/C = 0.72
- ALUS – AM V/C = 0.62, PM V/C = 0.82

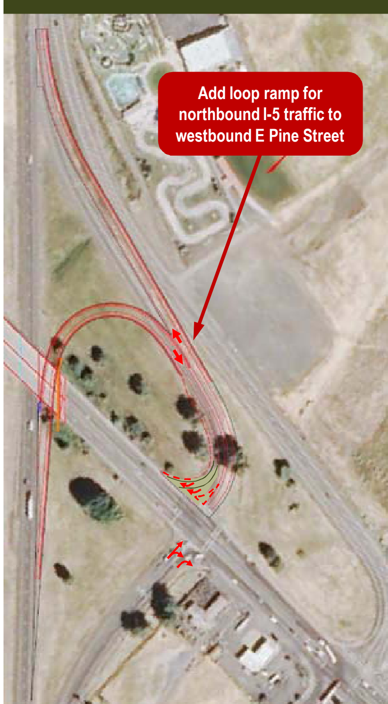
Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance
- No turn on red required

Basic Roadway Geometry & Right of Way (ROW):
- Additional storage lane of 350 feet
- Would likely result in some ROW impacts

Environmental & Land Use:
- Likely ROW impacts to adjacent property, especially corner
- Hazmat site near the intersection

Cost Opinion: $1.3 million

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp



Purpose: Improve operations and reduce queuing

Traffic Operations:
- OHP and HDM mobility standards met (RTP)
- RTP Scenario – AM V/C = 0.57, PM V/C = 0.71
- ALUS – AM V/C = 0.64, PM V/C = 0.82

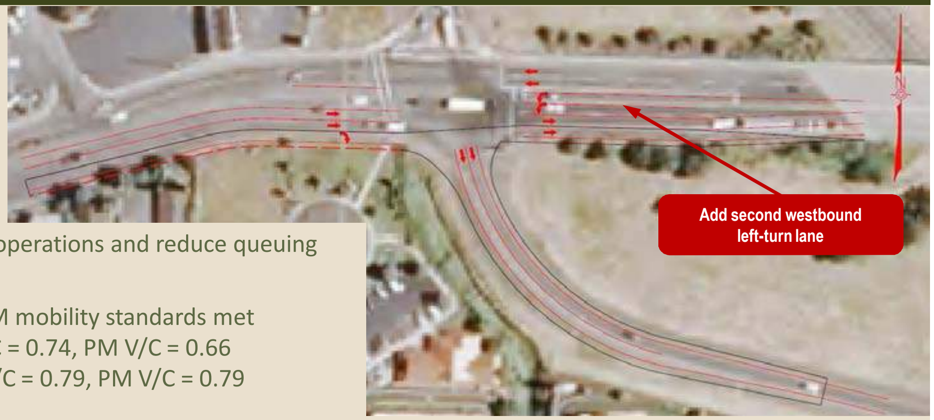
Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates addition pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):
- Northbound to westbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans to accommodate loop ramp
- Substantial retaining walls needed
- Realignment of existing ramp required

Environmental & Land Use:
- No substantial concerns

Cost Opinion: $9.7 million

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:
- OHP and HDM mobility standards met
- RTP – AM V/C = 0.74, PM V/C = 0.66
- ALUS – AM V/C = 0.79, PM V/C = 0.79

Safety:
- No queuing issues on ramps – adequate stopping distance

Basic Roadway Geometry & Right of Way (ROW):
- Storage lane of 150-200' between structure and intersection
- Modification would require design exception
- Some potential ROW on west side of intersection

Environmental & Land Use:
- Some potential ROW need west of intersection
- Hazardous materials site near the intersection

Cost Opinion: $1.7 million

Concept I-4: I-5 Southbound – Loop Ramp

Purpose: Improve operations and reduce queuing

Traffic Operations:
- OHP and HDM mobility standards met
- RTP – AM V/C = 0.53, PM V/C = 0.66
- ALUS – AM V/C = 0.58, PM V/C = 0.74

Safety:
- No queuing issues on ramps – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates addition pedestrian conflicts on north side

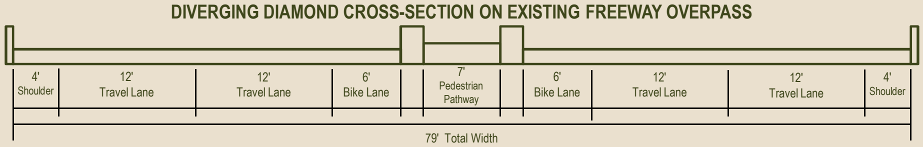
Basic Roadway Geometry & Right of Way (ROW):
- Westbound to southbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans over loop ramp
- Requires extending current ramp further south to maintain access spacing
- Would allow for sidewalk on south side of bridge
- Additional ROW needed

Environmental & Land Use:
- Substantial ROW impacts adjacent to existing ramp
- Hazardous materials site near the intersection

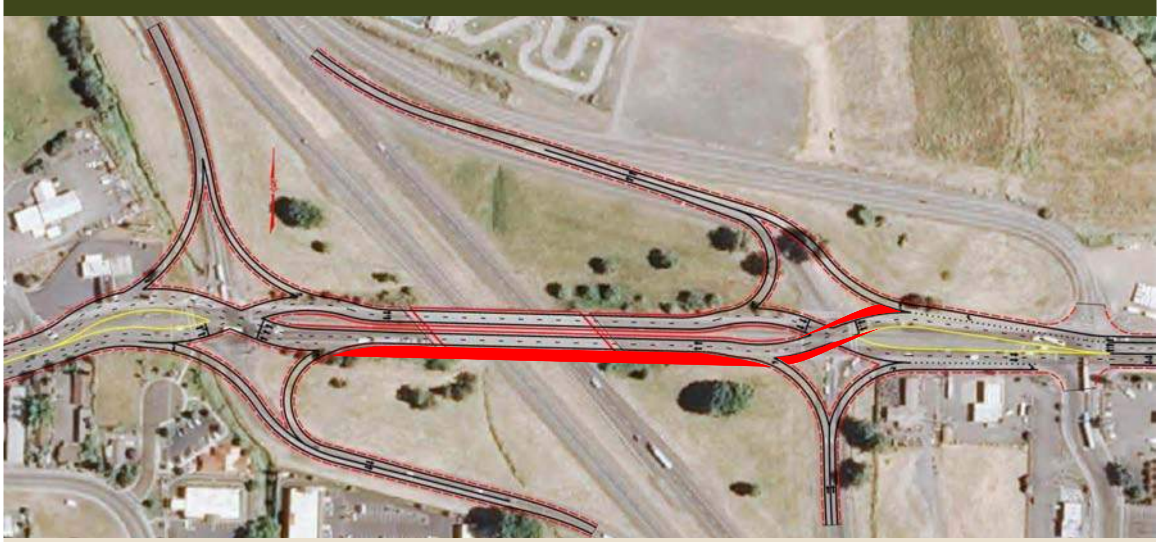
Cost Opinion: $11.0 million

Concept I-5: Diverging Diamond Interchange – No Widening

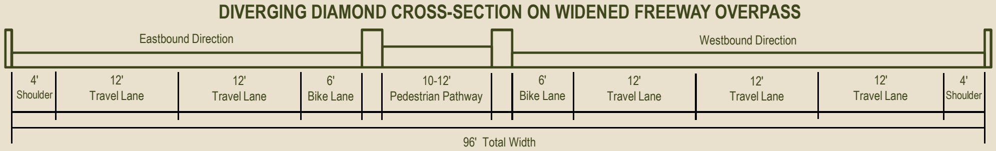
DIVERGING DIAMOND CROSS-SECTION ON EXISTING FREEWAY OVERPASS



Concept I-6: Diverging Diamond Interchange – Bridge Widening



DIVERGING DIAMOND CROSS-SECTION ON WIDENED FREEWAY OVERPASS



Concepts I-5 & I-6: Diverging Diamond Interchanges

I-5: Diverging Diamond – No Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Does not meet HDM standards
- RTP – AM West V/C = 0.56, East V/C = 0.88
- RTP – PM West V/C = 0.75, East V/C = 0.91
- ALUS – AM West V/C = 0.64, East V/C = 0.96
- ALUS – PM West V/C = 0.85, East V/C = 1.07

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Uses existing bridge
- Some realignment of ramps
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: $8.6 million

I-6: Diverging Diamond – Bridge Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets OHP and HDM standards (RTP)
- RTP – AM West V/C = 0.55, East V/C = 0.75
- RTP – PM West V/C = 0.74, East V/C = 0.76
- ALUS – AM West V/C = 0.63, East V/C = 0.81
- ALUS – PM West V/C = 0.81, East V/C = 0.89

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Widens existing bridge or replaces structure
- Some realignment of ramps but more flexibility with structure widening
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: To be determined

Concept I-7: Bridge (Overpass) Widening or Replacement

Interchange Concept Combination	Concept I-7 Improvements
Option 1: *I-1 – I-5 NB Off-Ramp – Dual NB Right-Turn Lanes* *I-3 – I-5 SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine Street • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 2: *I-2 – I-5 NB Off-Ramp – New Loop Ramp* *I-3 – I-5 SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine Street • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 3: *I-1 – I-5 NB Off-Ramp – Dual NB Right-Turn Lanes* *I-4 – I-5 SB On-Ramp – New Loop Ramp*	• Add sidewalk to south side of E Pine Street which may be accomplished without widening
Option 4: *I-2 – I-5 NB Off-Ramp – New Loop Ramp* *I-4 – I-5 SB On-Ramp – New Loop Ramp*	• Consider bridge replacement because combination of significant structural work at either end may require as much work as replacement • Add sidewalk to south side of E Pine Street which may be accomplished without any widening

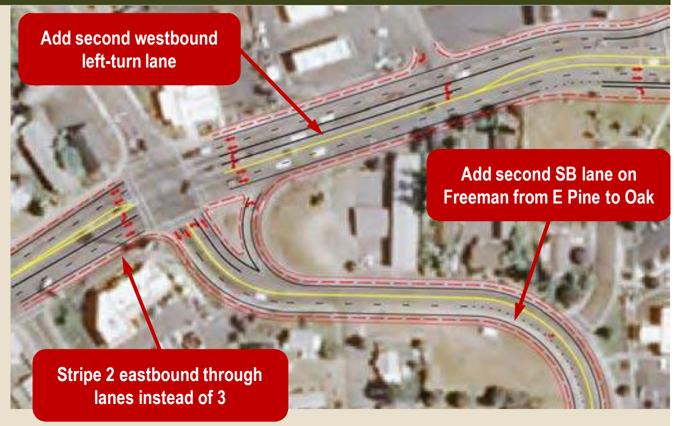
Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County mobility standards met (RTP)
- RTP – PM V/C = 0.85, Queuing EB, SB
- ALUS – PM V/C = 0.94, Queuing EB, SB

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane and reduce eastbound travel lanes to minimize widening
- Widen Freeman Road to 3 lanes which may require additional ROW
- Some ROW may be needed on E Pine



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman and E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.2 million

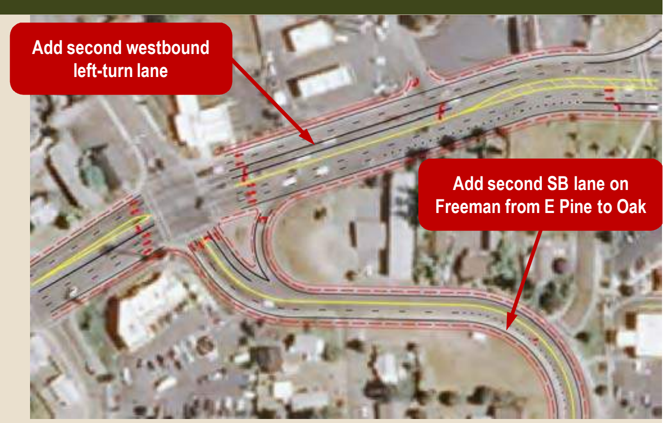
Concept W-2: 10th/Freeman – Dual Lefts with Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County mobility standards met
- RTP – PM V/C = 0.73, Queuing SB
- ALUS – PM V/C = 0.79, Queuing SB

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening
- Increased crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane
- Widen Freeman Road to 3 lanes which may require additional ROW
- Additional ROW needed on E Pine



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman
- ROW impacts on E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.6 million

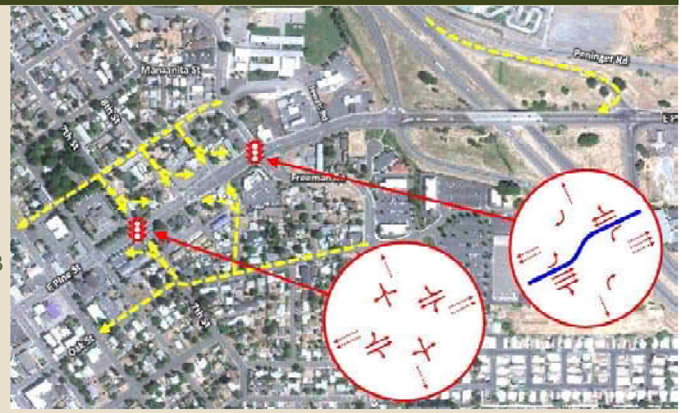
Concept W-3: 10^{th}/Freeman & 7^{th} – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County & City mobility standards met
- RTP – 10^{th} V/C = 0.67, Queuing WB
- RTP – 7^{th} V/C = 0.80, Queuing WB, SB
- ALUS – 10^{th} V/C = 0.73, Queuing WB
- ALUS – 7^{th} V/C = 0.80, Queuing WB, SB

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10^{th}
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10^{th} may require some widening
- Maintains 4 lanes on E Pine
- Traffic signal at 7^{th}



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Added traffic could affect businesses around 7^{th}

Cost Opinion: TBD

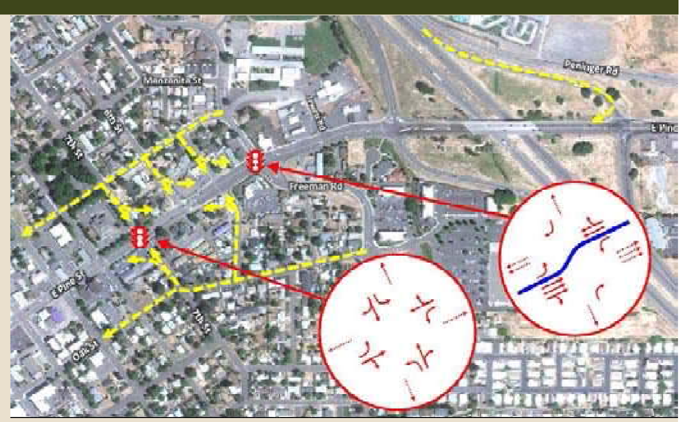
Concept W-4: 10^{th}/Freeman & 7^{th} – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County & City mobility standards met
- RTP – 10^{th} V/C = 0.67, Queuing WB
- RTP – 7^{th} V/C = 0.82, Queuing EB, WB
- ALUS – 10^{th} V/C = 0.73, Queuing WB
- ALUS – 7^{th} V/C = 0.93, Queuing All

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10^{th}
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10^{th} may require some widening
- Reduces E Pine to 3 lanes
- Widens 7^{th} to 3 lanes – more ROW
- Traffic signal at 7^{th}



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- ROW impacts to properties along 7^{th}
- Added traffic could affect businesses around 7^{th}

Cost Opinion: TBD

Concept E-1: Hamrick – Dual Left-Turn Lanes

Note: Basic road layout not prepared because enhanced network substantially changes the configuration of E Pine east of the freeway.

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County mobility standards met
- RTP Scenario – PM V/C = 0.65
- ALUS – PM V/C = 0.73

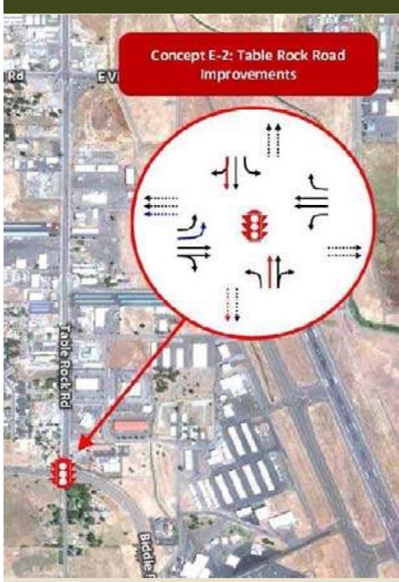
Safety:
- Reduced congestion and fewer queuing conflicts
- Will increase pedestrian crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Adds second EB left-turn lane on E Pine
- Adds second NB receiving lane on Hamrick (~700')
- ROW may be needed on E Pine
- ROW needed on Biddle
- ROW may be needed on Hamrick
- Realignment of existing ramp required

Environmental & Land Use:
- Some ROW impacts along E/Pine, Biddle and Hamrick

Cost Opinion: TBD

Concept E-2: Table Rock – Improvements



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County mobility standards met
- RTP Scenario – PM V/C = 0.75
- ALUS – PM V/C = 1.01

Safety:
- No safety evaluation was conducted

Basic Roadway Geometry & Right of Way (ROW):
- 5-lane cross-section on Table Rock south of Biddle
- ROW on Table Rock

Environmental & Land Use:
- Some ROW impacts along Table Rock

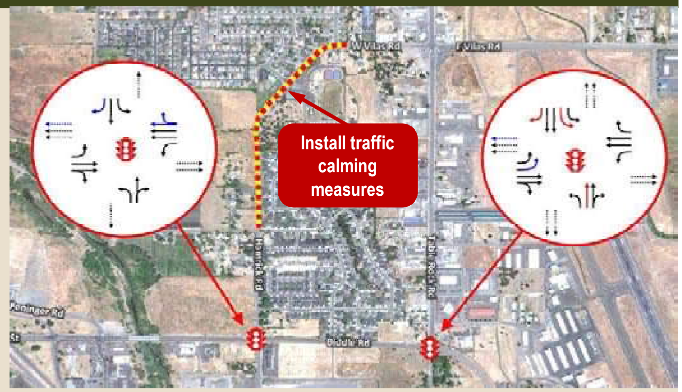
Cost Opinion: TBD

Concept E-3: Hamrick Diversions to Table Rock

Purpose: Improve operations and reduce queuing

Traffic Operations:
- County mobility standards met
- RTP – Hamrick V/C = 0.77
- RTP – Table Rock V/C = 0.75
- ALUS – Hamrick V/C = 0.91
- ALUS – Table Rock V/C = 0.97

Safety:
- Traffic calming and traffic diversions may improve conditions on Hamrick



Basic Roadway Geometry & Right of Way (ROW):
- No changes at Hamrick intersection
- Additional traffic calming on Hamrick
- Adds more turn lanes on Table Rock
- ROW needed on Table Rock north and south of Biddle

Environmental & Land Use:
- Reduced traffic demand in areas zoned for residential and open space uses
- Some ROW impacts along Table Rock – potential structure impact in northwest quadrant

Cost Opinion: TBD

Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Next Steps

- Analysis of modified or additional concepts
- Selection of preferred concepts
- Upcoming meeting dates (Tentative)
  - Project Focus Group – February 16
  - Open House – February 16
  - TAC – February 17

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #4

10:00 AM to 12:00 Noon

February 17, 2012

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Allie Krull, ODOT Tom Humphrey, Central Point
2. Summary of Outreach • Project Focus Group • Open House	Jennifer Danziger, DEA Shelly Alexander, DEA
3. Additional Discussion of Interchange Area Concepts • Additional comments • Input for selection of preferred concepts	All
4. Next Steps • Schedule • Upcoming meetings	Jennifer Danziger, DEA Allie Krull, ODOT

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INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #4 – February 17, 2012

Draft Meeting Notes

Attendees: See attached

Introductions

Tom Humphrey and Allie Krull welcomed everyone. After finishing the introductions, Tom invited Jennifer Danziger, the consultant project manager to start the presentation.

Summary of Comments/Input from Project Focus Group

Jennifer provided an overview of the project focus group meeting and the open house, both held the previous day. She indicated a wide range of representation between the two groups including adjacent business owners, real estate owners, RV Act, City Councilors, and Police. The attached presentation summarizes some of the attendees at the meetings and feedback we received.

One of the big questions out there for this IAMP is whether or not the unfunded elements of the city TSP (included in the enhanced network) will find funding, be built, and the potential timeline of the improvements. Beyond the enhanced network, Jennifer noted that the Project Focus Group expressed interest in the construction timeline associated with the IAMP improvements.

In general the project focus group and public supported the expanded network; though there were concerns about overall cost, impacts to businesses, and whether there would be restrictions at the fairgrounds.

When considering concepts I-1 and I-2 at the northbound ramp terminal, the Project Focus Group and the public were generally in support of I-1 over I-2. There was one suggestion that a second off-ramp further south be considered to separate some of the traffic destined for the industrial area to the east rather than E Pine Street.

For concepts I-3 and I-4 at the southbound ramp terminal, the Project Focus Group and public were generally supportive of I-3 over I-4. Some were considering I-3 as an interim improvement, if it is feasible.

The diverging diamond concepts (I-5 and I-6) received mixed support. In general attendees were concerned about overall impacts and the connection to Peninger Road. They didn't want to see businesses impacted. There was one comment received at the Open House in support of this concept stating that they'd driven through a diverging diamond in Utah and thought it worked great and was very intuitive to navigate.

If a diverging diamond is not selected at the preferred alternative the attendees supported a combination of improvements (I-1 and I-3) as well as adding sidewalk to the south side of the bridge. There were comments at the open house indicating that pedestrians use the bike lane on the south side of the bridge in the morning to cross over I-5 instead of crossing to the existing sidewalk on the north side.

On the west side, concepts W-1 and W-2 generated concern regarding right of way and access impacts while concepts W-3 and W-4 were not generally supported. We had several police officers attend the open house. When asked, some of the officers agreed that the area between 10th Street and the freeway ramps can be a problem now with lots of turning movements and vehicles queued in the center lane. The main reasons provided for lack of support for W-3 and W-4 included concerns about traffic in neighborhoods and out-of-direction travel as well as lack of support for the 3-lane cross section along E Pine Street west of the IAMP study area.

The east side concepts didn't generate any strong opinions, though some merit was seen in the application of traffic calming along Hamrick Road. One of the open house attendees commented that some traffic shifted to Table Rock Road when speeds were reduced on Hamrick Road. A comment card suggesting extending the speed reductions in the Hamrick Road corridor could be effective traffic calming.

After the recap of the Project Focus Group and Open House, Jennifer provided additional ideas and issues for consideration. One idea is to apply for an alternative mobility standard at the southbound ramp terminal to extend the life of the existing configuration. The signal timing could be modified to favor the off ramp and minimize queuing along the ramp, though the east-west movements would be impacted. She also reminded the group that regardless of the concept selected for the west side, access management will need to be pursued as well as network improvements to off-set restricted access points.

Additional Discussion of Concepts

TAC members commented on the awkward access that currently exists for the fairgrounds (Peninger) today.

There was general consensus to keep the diverging diamond (no widening) on the table and general support for concept W-1 (need to address details for McDonald's entrance). If concept W-1 is selected as part of the preferred concept the City will want to consider the future improvements on the current design work along Freeman Road between Oak and Hopkins. The TAC did not have support for concepts W-3 or W-4.

On the east side, city staff supported reducing through traffic, particularly trucks, on Hamrick Road through implementation of measures, such as a roundabout at the Beebe/Hamrick intersection. A question was asked about the traffic impacts (and potential change in demand) if Gebhard Road were extended southwards from Beebe Road to E Pine Street. Jennifer noted that this link is included in the enhanced network alternative although demand on this link may be a little underestimated because it serves primarily undeveloped lands now. A TAC member asked if implementing traffic calming measures on Hamrick Road would reduce the demand for the dual eastbound left-turn lane on E Pine Street at Hamrick Road, an improvement that the City would prefer to avoid. The City has jurisdiction of Hamrick Road while the County has jurisdiction of Table Rock Road. The two jurisdictions will need to coordinate to work toward a common goal to maximize investment dollars.

The group discussed access management for the study area. They understood that access will ultimately need to be modified on the west side between the southbound ramp terminal and 10th St/Freeman Road and on the east side between the northbound ramp terminal and Peninger Road. On the west side, options to address circulation impacts from turn restrictions will need to be investigated behind the parcels that front E Pine Street. Additionally, alternative access options for the Pottery Outlet property and Chevron on the east side will need to be considered. The group noted that there is access to these two properties via Peninger Road and the cul-de-sac in the back.

The primary activity for the Reddaway trucking facility (east side) is during the evening, between 8 PM and midnight. The company sends triples to the north and doubles to the south on I-5. The next round of meetings will review the preferred alternative, access management, and other management measures, including the potential need for trip caps and/or budgets. During the discussion members expressed concern regarding how land use is considered when determining the thresholds for the budgets.

Finally, potential construction impacts were considered and discussed at a very high level. During construction there would be some short-term access closure/impacts associated with the diverging diamond (no widening), though the total construction could last less than one year.

Dave Warrick asked if the project team had consulted with FHWA regarding potential modifications to the interchange. The team has not. <u>Dave will make contact and relay the information back to the team.</u>

Next Steps

The meeting minutes will include a copy of the today's presentation. Comments/input on the concepts or on the Tech Memo describing the concepts are due to Allie Krull the ODOT PM by the end of the first week in March.

The next TAC meeting will review the refined preferred alternative and access management strategy.

Actions:

- TAC to provide comments on the concepts within two weeks of receiving the meeting minutes

- DEA will conduct additional analysis, as necessary, to evaluate commentsand suggestions from committee meetings and subsequent input received over the next few weeks.
- Dave will make contact with FHWA and relay the information back to the team.
- DEA to complete traffic analysis for preferred concept
- DEA to draft an access management strategy

Attachments:
TAC PowerPoint Presentation Slides
Copy of Attendance Sheet

TAC #4 February 17, 2012

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I-5 Interchange 33 (Central Point)
Interchange Area Management Plan (IAMP)

Technical Advisory Committee Meeting #4
February 17, 2012

Oregon Department of Transportation
CENTRAL POINT
DAVID EVANS AND ASSOCIATES INC.

Presentation Topics

1. Summary of Comments/Input from Project Focus Group and Open House
2. Additional Discussion of Concepts
3. Next Steps

Outreach Participation

- Project Focus Group (2/16 from 2-4 PM)
  - Representation from Chevron, Shell, Reddaway, Grange/Coop, People's Bank, Hotel, Real Estate, etc.
- Open House
  - 11 people signed in but more attended
  - RV Act, City Council, 76 Station, Pottery Outlet property, Police, Airport, Etc.

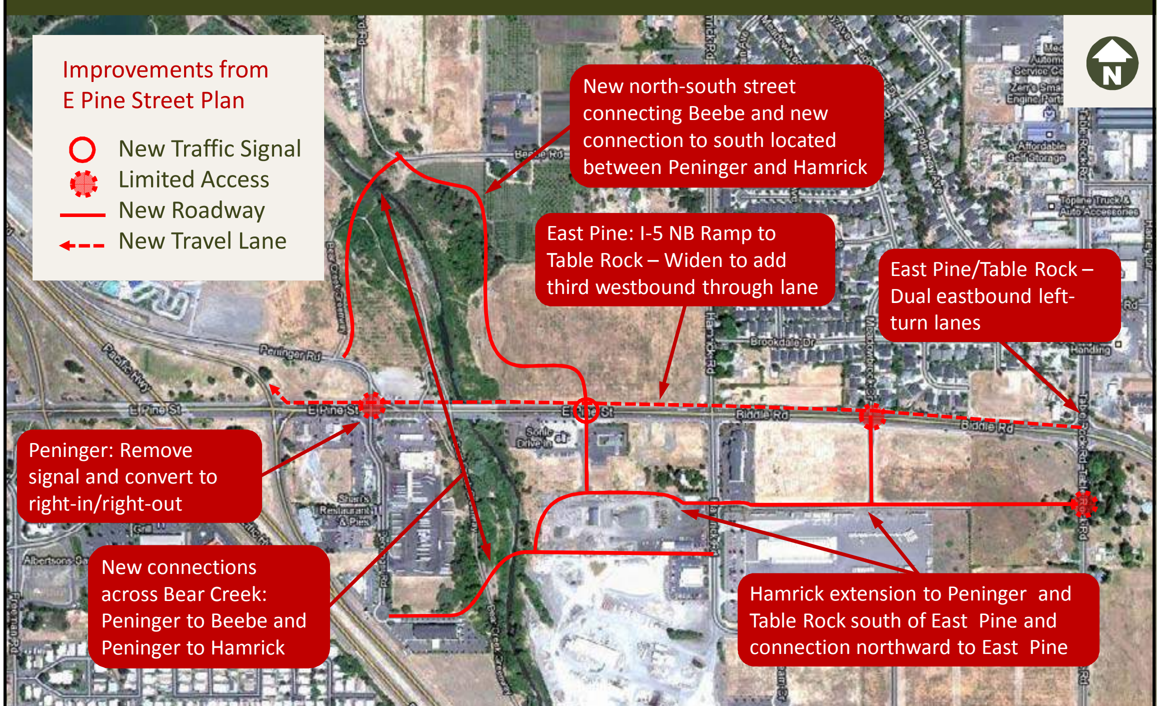
General Comments/Questions

- What happens if elements of the City TSP included in the enhanced network don't get constructed?
  - Peninger connections across Bear Creek
  - Peninger/E Pine intersection limitations
- When will projects get implemented?

Input/Comments by Concept

- Enhanced Network
  - General support for expanded network
  - Concern about cost
  - Concern about some impacts to businesses and fairgrounds for restrictions at Peninger

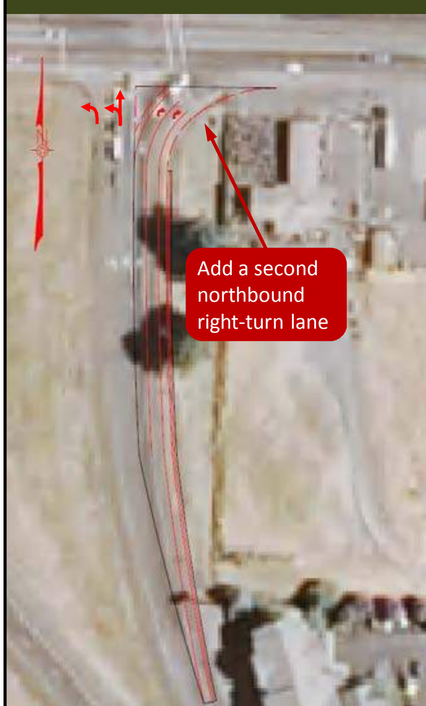
Enhanced Network Concept



Input/Comments by Concept (continued)

- I-1 – Northbound Off-Ramp – Second Lane
  - Generally supported
  - Generated suggestion of a second off-ramp further to the south to separate some of the traffic not destined for E Pine St
- I-2 – Northbound Off-Ramp - Loop
  - Not generally supported

Concept I-1: I-5 Northbound Off-Ramp Add Lane



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

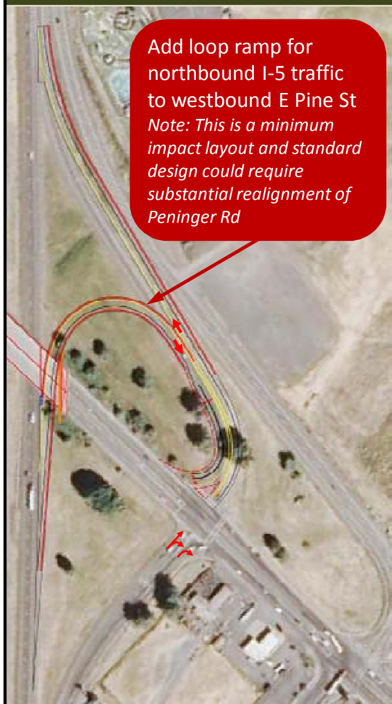
Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Additional storage lane of 350 feet
- Would likely result in some ROW impacts

Environmental & Land Use:
- Likely ROW impacts to adjacent property, especially corner
- Hazmat site near the intersection

Cost Opinion: $1.3 million

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates addition pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):
- Northbound to westbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans to accommodate loop ramp
- Substantial retaining walls needed
- Realignment of existing ramp required
- Non-standard design illustrated to minimize impacts

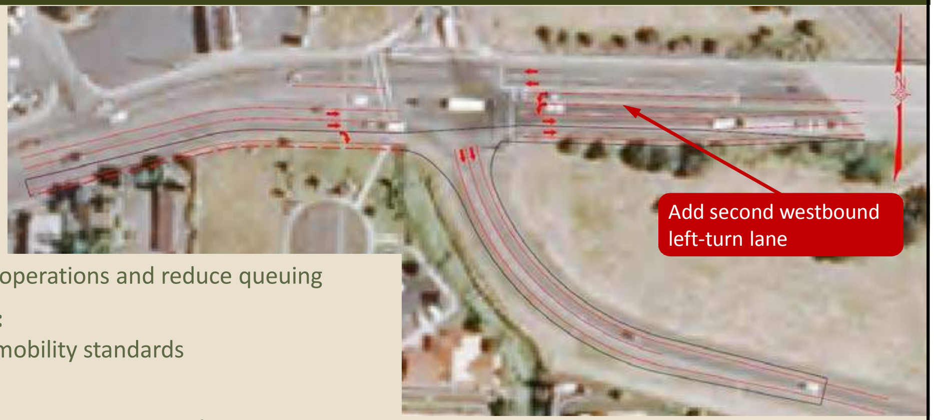
Environmental & Land Use:
- No substantial concerns

Cost Opinion: $9.7 million

Input/Comments by Concept (continued)

- I-3 – Southbound On-Ramp - Second Left-Turn Lane
  - Generally supported
  - Liked idea of interim improvement if feasible
- I-4 – Southbound On-Ramp - Loop
  - Not generally supported

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramps – adequate stopping distance

Basic Roadway Geometry & Right of Way (ROW):
- Storage lane of 150-200’ between structure and intersection (could be extended with bridge widening)
- Modification would require design exception
- Some potential ROW on west side of intersection

Environmental & Land Use:
- Some potential ROW needed west of intersection
- Could impact Mingus Creek
- Hazardous materials site near the intersection

Cost Opinion: $1.7 million (no bridge widening)

Concept I-4: I-5 Southbound – Loop Ramp

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramps – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates additional pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):
- Westbound to southbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans over loop ramp
- Requires extending current ramp further south to maintain access spacing
- Would allow for sidewalk on south side of bridge
- Additional ROW needed
- Non-standard design illustrated to minimize impacts

Environmental & Land Use:
- Substantial ROW impacts adjacent to existing ramp
- Hazardous materials site near the intersection

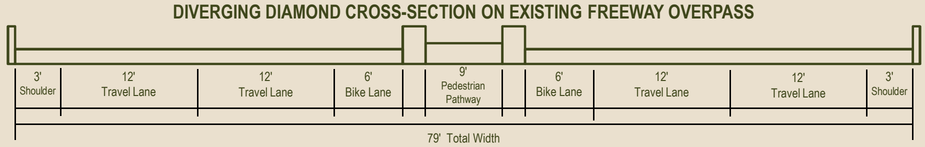
Cost Opinion: $11.0 million

Input/Comments by Concept (continued)

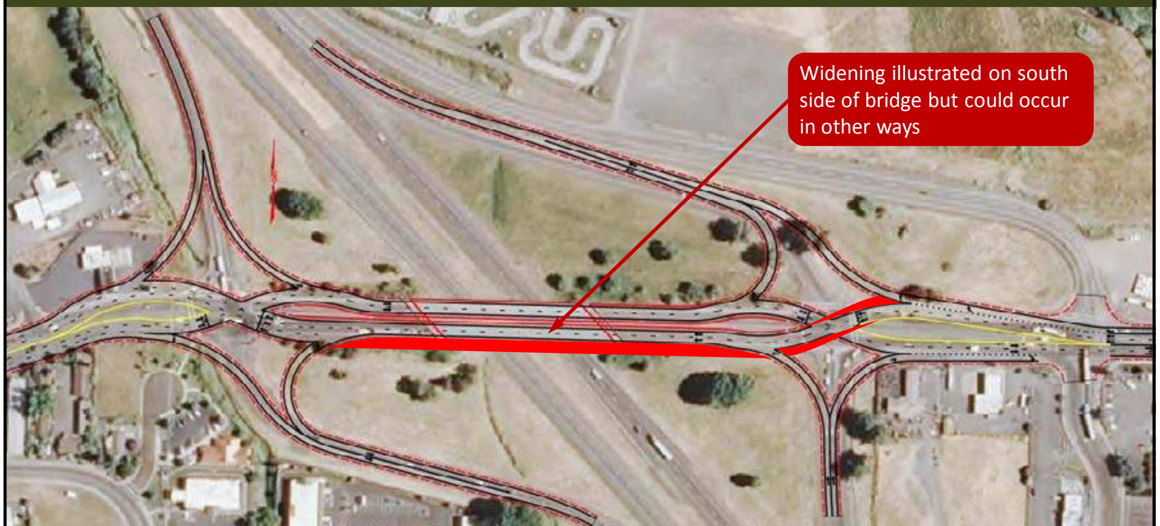
- I-5 – Diverging Diamond on Existing Bridge
  - Mixed support for idea
  - Concerned about impacts
  - Concerned about connection to Peninger
  - Don't want to see businesses impacted
  - One open house attendee has been to DDI in Utah and said it worked great – he supported idea
- I-6 – DDI on Widened Bridge
  - Same as I-5

Concept I-5: Diverging Diamond Interchange – No Widening

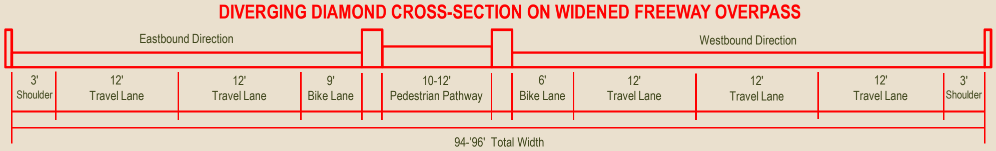
DIVERGING DIAMOND CROSS-SECTION ON EXISTING FREEWAY OVERPASS



Concept I-6: Diverging Diamond Interchange – Bridge Widening



DIVERGING DIAMOND CROSS-SECTION ON WIDENED FREEWAY OVERPASS



Concepts I-5 & I-6: Diverging Diamond Interchanges

I-5: Diverging Diamond – No Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at west crossover intersection
- Would eventually exceed state mobility standards at east crossover intersection

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Uses existing bridge
- Some realignment of ramps
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: $8.6 million

I-6: Diverging Diamond – Bridge Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at both intersections

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Widens existing bridge or replaces structure
- Some realignment of ramps but more flexibility with structure widening
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: To be determined

Input/Comments by Concept (continued)

- I-7 – Additional Improvements
  - Combination of I-1 & I-3 best supported
  - Liked idea of adding sidewalk – pedestrians use bike lane instead of crossing over

Concept I-7: Bridge (Overpass) Widening or Replacement

Combinations of ramp concepts with additional improvements that could be considered to address remaining deficiencies

Interchange Concept Combination	Concept I-7 Improvements
Option 1: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 2: *I-2: NB Off-Ramp – New Loop Ramp* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 3: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-4: SB On-Ramp – New Loop Ramp*	• Add sidewalk to south side of E Pine St which may be accomplished without widening
Option 4: *I-2: NB Off-Ramp – New Loop Ramp* *I-4: SB On-Ramp – New Loop Ramp*	• Consider bridge replacement because combination of significant structural work at either end may require as much work as replacement • Add sidewalk to south side of E Pine St which may be accomplished without any widening

Input/Comments by Concept (continued)

- W-1 – Dual Lefts to Freeman (no widening E Pine)
  - Concerned about access impacts
  - Police agreed that the area can be a problem now
    - Long queues in center turn lane
    - Lots of conflicting movements
- W-2 – Dual Lefts to Freeman (widening E Pine)
  - Concerned about greater ROW impacts

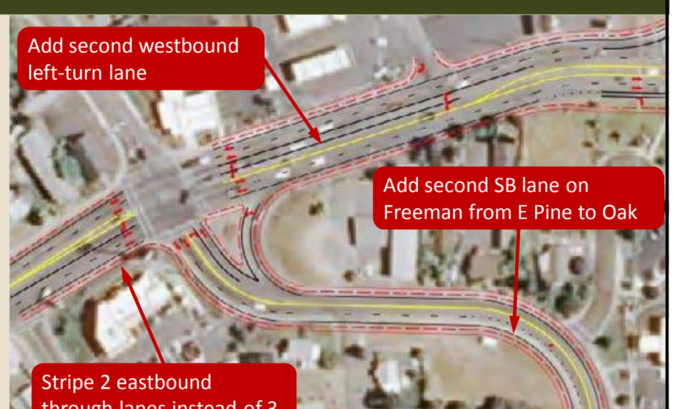
Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards
- Some queuing on north and west approaches

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane and reduce eastbound travel lanes to minimize widening
- Widen Freeman Road to 3 lanes which may require additional ROW
- Some ROW may be needed on E Pine



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman and E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.2 million

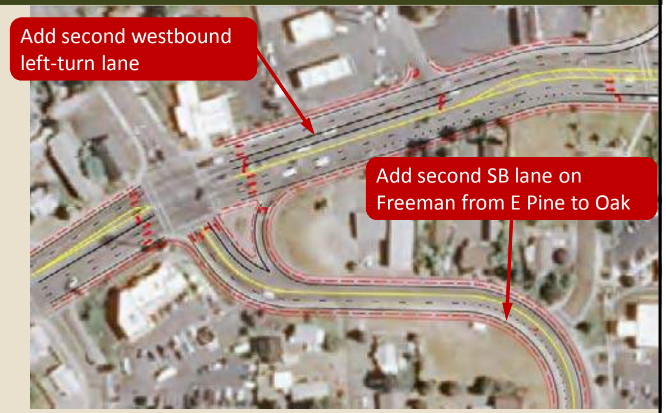
Concept W-2: 10th/Freeman – Dual Lefts with Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards
- Some queuing on north approach

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening
- Increased crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane
- Widen Freeman Road to 3 lanes which may require additional ROW
- Additional ROW needed on E Pine



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman
- ROW impacts on E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.6 million

Input/Comments by Concept (continued)

- W-3 – 10th/Freeman Turn Restrictions
  - Generally not supported
  - Concerned about traffic in neighborhoods and out-of-direction travel
- W-4 – 10th/Freeman Turn Restrictions
  - Same as W-3
  - Not much support for 3 lanes on E Pine downtown

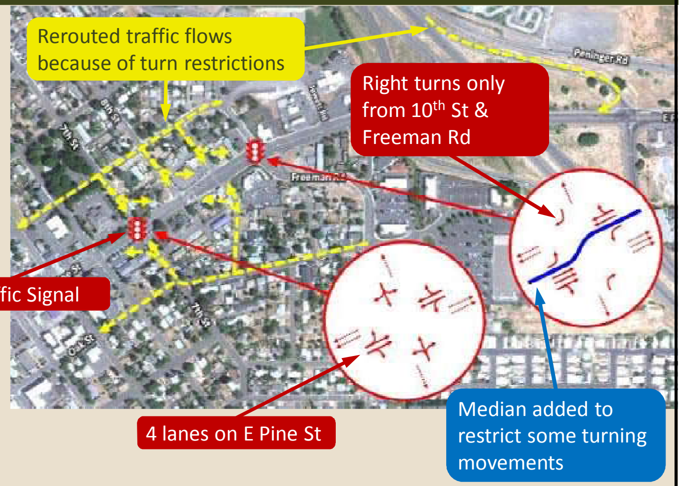
Concept W-3: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and north approaches at 7th Street

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10th may require some widening
- Maintains 4 lanes on E Pine
- Traffic signal at 7th



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

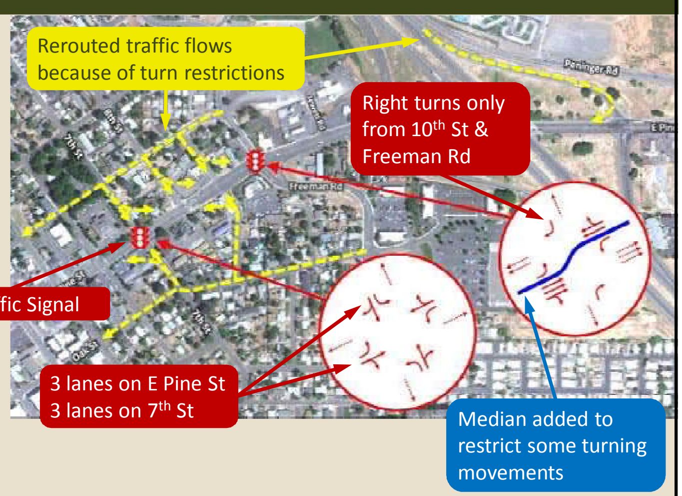
Concept W-4: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and west approaches at 7th Street

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10th may require some widening
- Reduces E Pine to 3 lanes
- Widens 7th to 3 lanes – more ROW
- Traffic signal at 7th



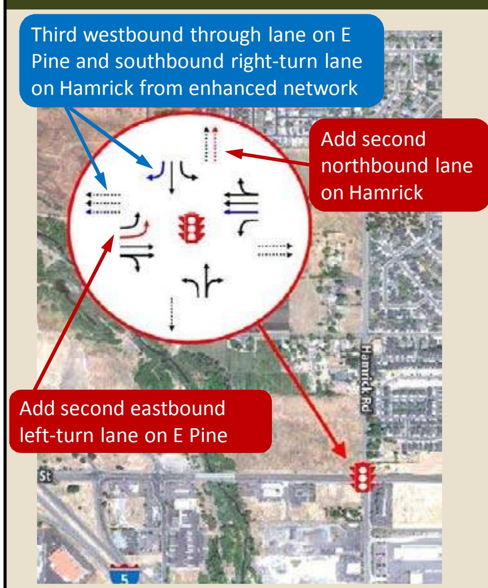
Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- ROW impacts to properties along 7th
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

Input/Comments by Concept (continued)

- E-1 – Second Eastbound Left at Hamrick
  - No strong opinions
- E-2 – Table Rock Improvements
  - No strong opinions
- E-3 – Hamrick Diversions to Table Rock
  - Some saw merits in traffic calming
  - Open house attendee commented that some traffic shifted to Table Rock when speeds were reduced on Hamrick

Concept E-1: Hamrick – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards

Safety:
- Reduced congestion and fewer queuing conflicts
- Will increase pedestrian crossing distance

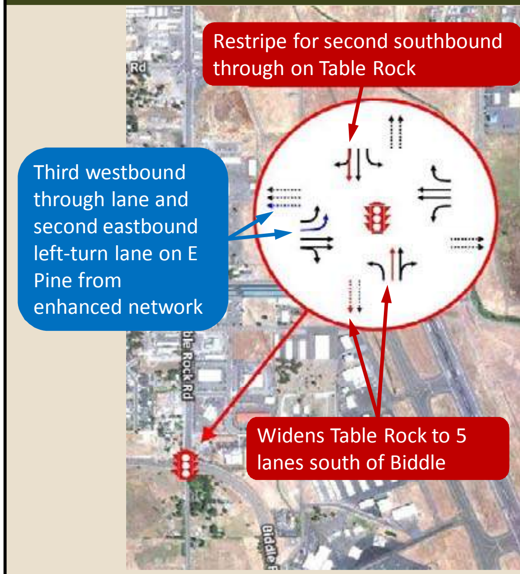
Basic Roadway Geometry & Right of Way (ROW):
- Adds second EB left-turn lane on E Pine
- Adds second NB receiving lane on Hamrick (~700')
- ROW may be needed on E Pine
- ROW needed on Biddle
- ROW may be needed on Hamrick

Environmental & Land Use:
- Some ROW impacts along E/Pine, Biddle and Hamrick

Cost Opinion: Not calculated

Note: Basic road layout not prepared because enhanced network substantially changes the configuration of E Pine east of the freeway.

Concept E-2: Table Rock – Improvements



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets county mobility standards

Safety:

- No safety evaluation was conducted

Basic Roadway Geometry & Right of Way (ROW):

- 5-lane cross-section on Table Rock south of Biddle
- ROW on Table Rock

Environmental & Land Use:

- Some ROW impacts along Table Rock

Cost Opinion: TBD

Concept E-3: Hamrick Diversions to Table Rock

Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets county mobility standards

Safety:

- Traffic calming and traffic diversions may improve conditions on Hamrick

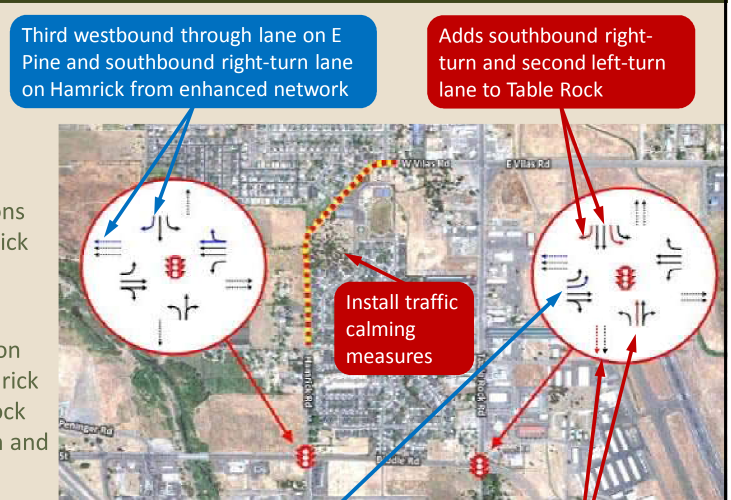
Basic Roadway Geometry & Right of Way (ROW):

- No changes at Hamrick intersection
- Additional traffic calming on Hamrick
- Adds more turn lanes on Table Rock
- ROW needed on Table Rock north and south of Biddle

Environmental & Land Use:

- Reduced traffic demand in areas zoned for residential and open space uses
- Some ROW impacts along Table Rock – potential structure impact in northwest quadrant

Cost Opinion: Not calculated



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Other Ideas/Issues

- Alternative Mobility Standards
  - Manage Southbound ramps for safety and allow more congestion on E Pine
- Access Management
  - Segment between Southbound Ramp and 10th will need specific attention even if no other improvements are pursued
  - Need to look at network improvements to off-set restricted access

Next Steps

- Analysis of modified or additional concepts
- Selection of preferred concepts
- Upcoming meeting dates

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Committee

Meeting #5

10:00 AM to 12:00 Noon

November 7, 2012

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Allie Krull, ODOT Tom Humphrey, Central Point
2. Summary of Outreach • Project Focus Group • Open House	Jennifer Danziger, DEA Shelly Alexander, DEA
3. Preferred Alternative • Concepts presented at last meeting • Additional concept considerations	Jennifer Danziger, DEA Shelly Alexander, DEA
4. How to protect the interchange • Access Management Plan • Potential Management Actions	Jennifer Danziger, DEA Shelly Alexander, DEA
5. Next Steps • Schedule-Draft Plan • Upcoming meetings	Jennifer Danziger, DEA Allie Krull, ODOT

INTERCHANGE 33 AREA MANAGEMENT PLAN

Technical Advisory Group

Meeting #5 - November 7, 2012

Draft Meeting Notes

Attendees: See attached

Introductions and Update on Project Status

Allie Krull (ODOT project manager) welcomed everyone and introduced the consultant team, Jennifer Danziger and Shelly Alexander. Technical advisory members went around the table/phone and introduced themselves including the section they represent. Jennifer gave a brief overview of the project focus group meeting which included two members and the open house which had 7 attendees.

Next Jennifer related that 3 technical memorandums have been drafted since our last meeting: The Preferred Alternative, Access Management Plan, and Management Actions. Comments on these 3 memorandums need to be provided to Allie by November 21. (See slides 1-3 of the attached presentation.)

Preferred Alternative

Jennifer provided a review of the enhanced network and concepts previously presented along with whether or not they were recommended for inclusion in the preferred alternative. Since the past meeting two additional concepts have been added to address bicycle and pedestrian deficiencies at/on the bridge. Concept A-1 considers replacement of the bridge railing to provide sufficient space for a sidewalk along the south side of the bridge. Concept A-2 considers installation of a bicycle signal at the southbound ramp terminal for eastbound cyclists.

Highlights for the overall operations include all intersections meeting mobility standards with the 2034 RTP forecasts and only two intersections exceeding standards for the ALUS forecasts. ALUS forecasts provide an assessment of sensitivity to more rapid development and are not anticipated to be an issue for the IAMP. (See slides 4-22)

Additionally, the analysis also answered two phasing questions and provided recommendations to related TSP project descriptions and timing:

1. What happens if the enhanced network improvements are not implemented within the 20-year planning horizon?
2. What transportation system management measures can be done before substantial capital investments must occur? (See slides 23-24.)

Protecting the interchange

Jennifer provided an overview of the access management goals and applicable standards specific to interchange 33. Goals have recently been updated and grandfather in approach in existence prior to January 1, 2012. In the case of private approaches three instances can trigger review of an approach: new approach road is requested, infill re/development, or a roadway project. Any of these occurrences will result in a department determination of desirable access spacing along the identified section of roadway. (See slides 25-28.)

Technical Memorandum #6 (Access Management) includes an inventory of existing approaches (both public and private) as well as assessing access spacing. Jennifer shared access management techniques with the group to address the large number of accesses near the interchange and identified potential implementation triggers that are found in the access plan. She tied the two elements (existing spacing deficiencies and techniques to move in the direction of the desired spacing) together with the Access Management Plan Actions graphic and descriptions. (See slides 29-35.)

Discussion

- Members expressed concern regarding the Expo assumptions used for the analysis. *Jennifer noted that limited growth was assumed at the Jackson County Expo for the analysis because not a lot of information was available. Depending on the type of use, peak traffic periods may or may not be affected by new development on the Expo property.*
- Signal timing at the southbound ramp terminal can be monitored to maintain safe queue lengths prior to construction of the recommended improvement.
- Discussion regarding the need for complete access control between 10th/Freeman and the southbound ramp terminal. Complete access control may be desirable. *Jennifer indicated that the improvement is probably 10-15 year down the road but access management may be needed sooner to maintain safe operations.*
- Tom mentioned that the City is planning for some transit-oriented development on the east side of the interchange. It could help reduce single-occupancy vehicle trips across the bridge.
- The City expressed desire to move truck trips from Hamrick Road to Table Rock Road. *They may seek to modify the TSP to address this desire.*
- The cross-section for the addition of sidewalk on the south side of the bridge does not include the dual left-turn storage/transition area and should be added (or noted as such). *DEA will include this change in the draft IAMP.*
- Access management needs for the City are not included in the City code language, rather in the public works specifications. Consultant should work with City to gain appropriate specifications. Consultant should work with Matt Samitore and Tom Humphrey regarding City specifications. County code should also be considered.

Next Steps

The meeting minutes will include a copy of the today's presentation. Comments/input on the concepts or on the Tech Memos are due to Allie Krull the ODOT PM by November 21. DEA will use the comments and data from the previous 7 technical memorandums to draft the IAMP 33 report. The draft report is anticipated by January 1, 2013.

We have the option to hold additional meetings to review the draft report if committee members think this is desirable. Comments will be solicited on the draft report and rolled into the final report to be delivered in the spring.

There will be the opportunity for additional public review during the adoption process.

Attachments:
PFG PowerPoint Presentation Slides
Copy of Attendance Sheet

Interchange 33 Area Management Plan (IAMP 33)

Technical Advisory Committee

Central Point City Hall
Council Chambers
140 S. Third Street
Central Point, OR

November 7, 2012
ATTENDANCE SHEET

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BERN CASE	AIRPORT	541-776-7222	CASEBE@JACKSON county.org
Brian Shrader	ODOT	541-774-6385	BRIAN.C.SHRADER@ ODOT.STATE.OR.US
TOM HUMPHREY	CENTRAL POINT	541-423-1025	ON FILE
Dick Converse	RVCOG	541-423-1373	dconverse@rvcog.org
Matt Samitore	City of CP	541-423-1017	matt.samitore@ centralpointoregon.gov

I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

Technical Advisory Committee Meeting #5
November 7, 2012

Oregon Department of Transportation

CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

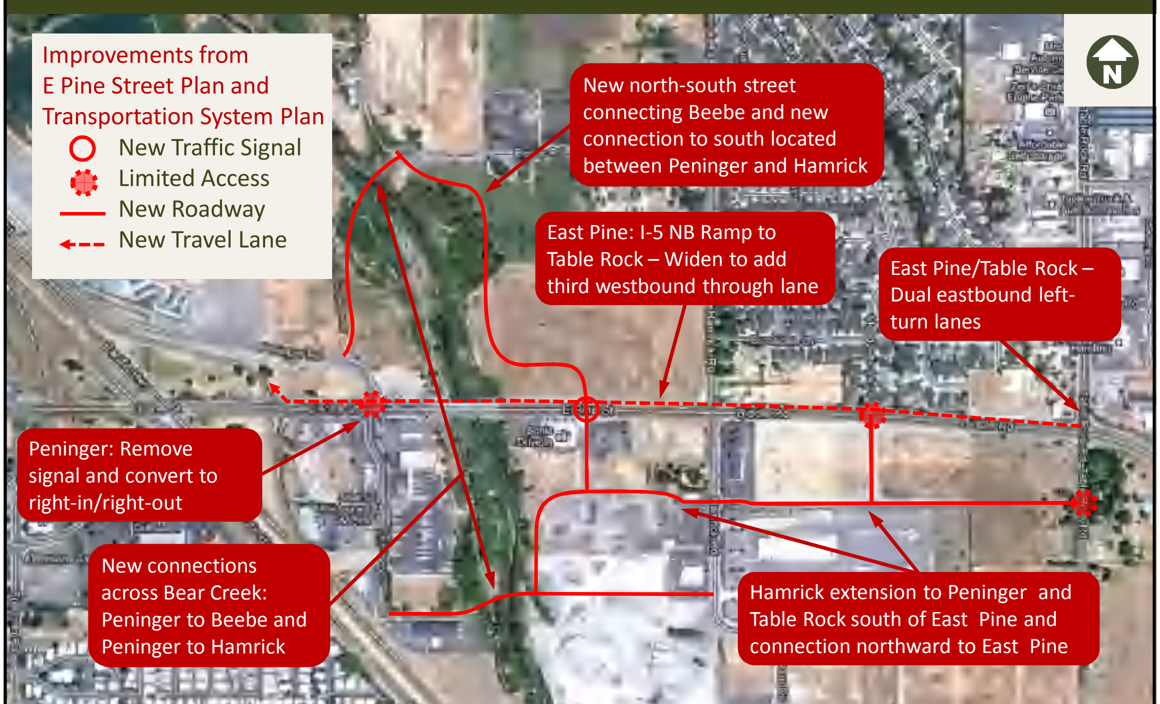
Presentation Topics

1. Project Update
2. Preferred Alternative
3. Protecting the Interchange
   - Access Management
   - Other Management Actions
4. Discussion

Other Meeting Feedback

- Project Focus Group
  - Only 2 representatives
- Open House
  - 7-8 attended

Enhanced Network Concept



Enhanced Network Concept Evaluation

Recommended: Yes

Highlights:

- Many of these projects are Tier 2 projects with no clear funding available
- Need to consider how the timing of project completion could affect other elements of the IAMP

Concept I-1: I-5 Northbound Off-Ramp Add Lane

Recommended: Yes

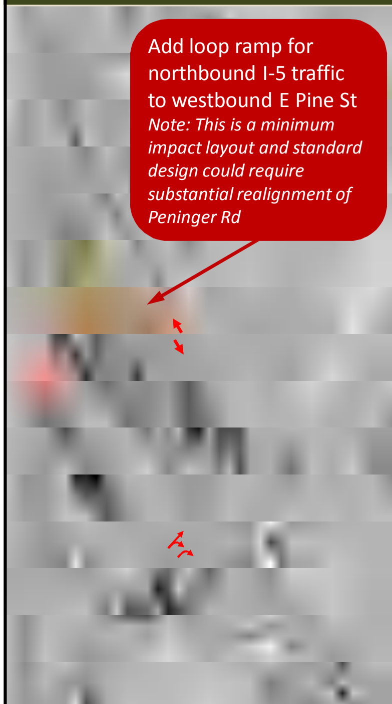
Highlights:

- Addresses queuing concerns to maintain safe operations on northbound off-ramp
- Provides additional capacity

Priority:

- Medium to low priority
- Manage ramp queues with signal timing until implemented

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp



Recommended: No

Highlights:

- Very expensive even with minimum impact layout
- Impacts could be greater with standard design
- Concept I-1 has greater safety benefits

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes

Recommended: Yes

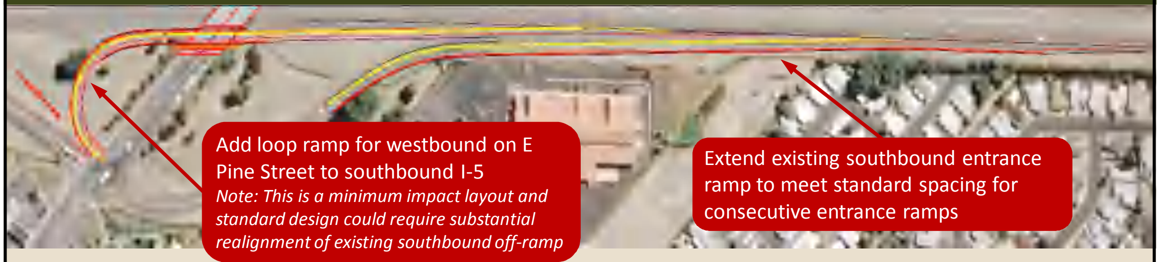
Highlights:

- Addresses queuing concerns to maintain safe operations on southbound off-ramp
- Provides additional capacity

Priority:

- Medium to low priority
- Manage ramp queues with signal timing until implemented

Concept I-4: I-5 Southbound – Loop Ramp



Recommended: No

Highlights:

- Very expensive even with minimum impact layout
- Impacts could be greater with standard design
- Concept I-3 has greater safety benefits

Concept I-5: Diverging Diamond Interchange – No Widening

Recommended: No

Highlights:

- Doesn’t meet operational needs
- Very expensive with high impacts

Concept I-6: Diverging Diamond Interchange – Bridge Widening

Recommended: No

Highlights:

- Doesn't meet operational needs
- Very expensive with high impacts

Concept I-7: Bridge (Overpass) Widening or Replacement

Combinations of ramp concepts with additional improvements that could be considered to address remaining deficiencies

Recommended: Pursue Concept I-1 & I-3 Combination

Highlights:

- See Concept A-1 under additional improvements

Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening

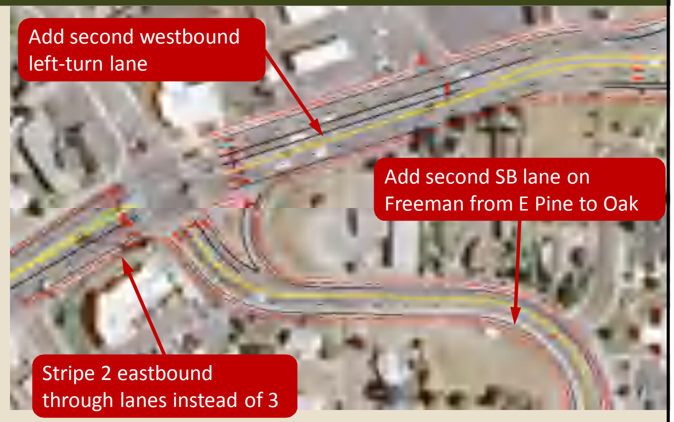
Recommended: Yes

Highlights:

- Addresses queuing concerns in westbound direction that could impact the I-5 southbound ramp terminal
- Adds capacity to intersection
- Will need to be combined with access management
- Fewer impacts than Concept W-2

Priority:

- Medium to low priority

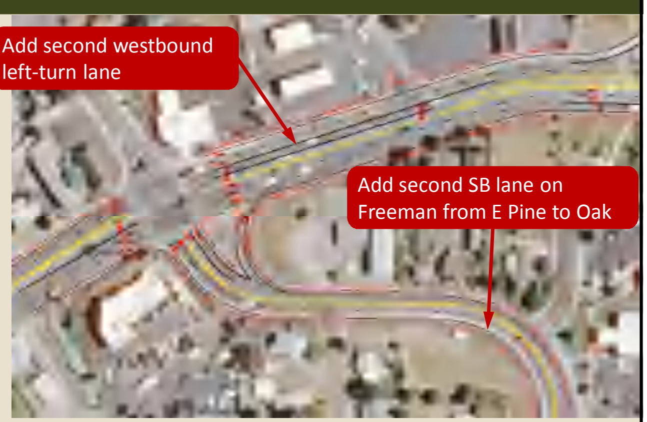


Concept W-2: 10th/Freeman – Dual Lefts with Widening

Recommended: No

Highlights:

- Addresses concerns but with greater impacts than Concept W-1

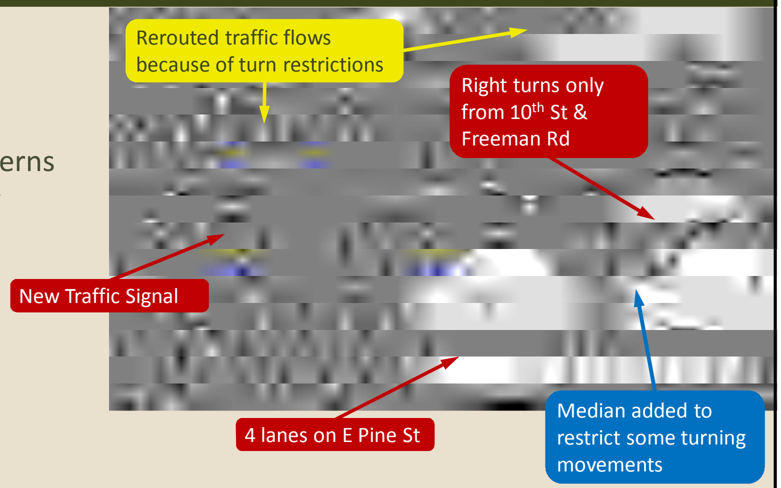


Concept W-3: 10th/Freeman & 7th – Turn Restrictions

Recommended: No

Highlights:

- Change in traffic patterns would have generally adverse impacts on neighborhoods and downtown

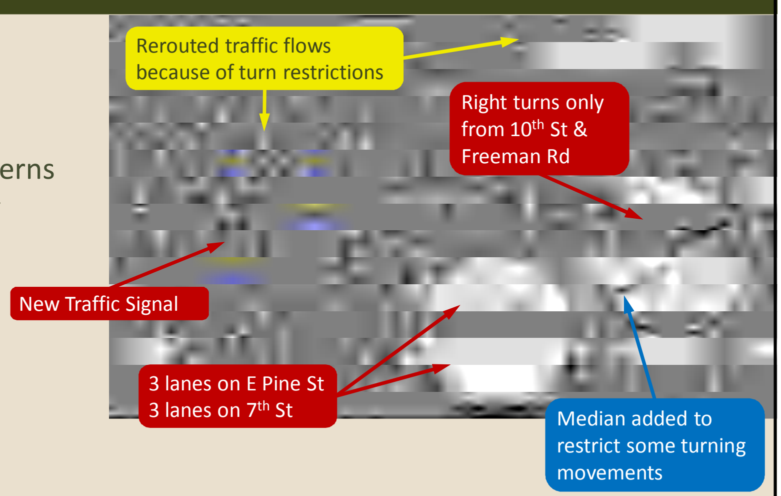


Concept W-4: 10th/Freeman & 7th – Turn Restrictions

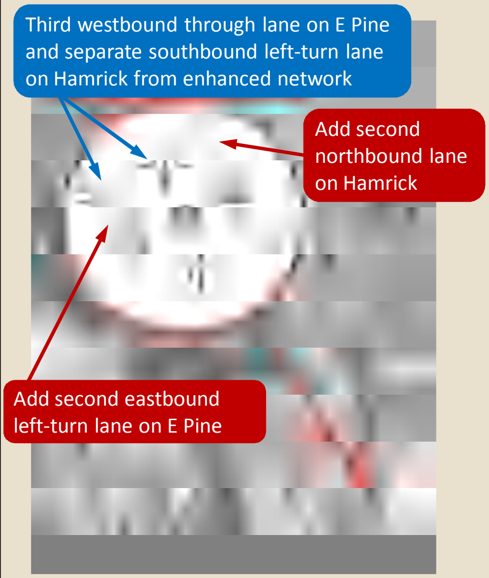
Recommended: No

Highlights:

- Change in traffic patterns would have generally adverse impacts on neighborhoods and downtown



Concept E-1: Hamrick – Dual Left-Turn Lanes

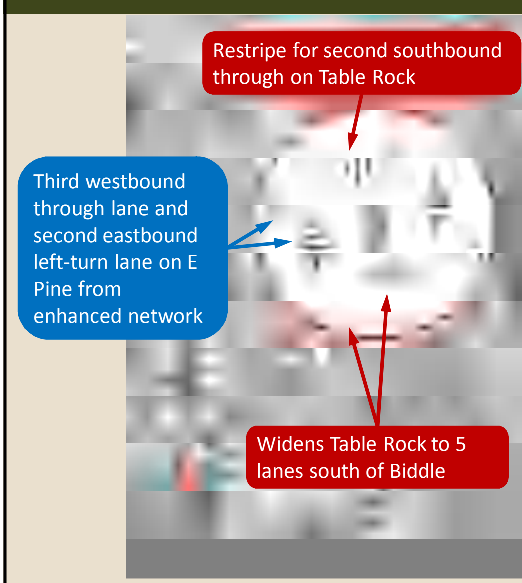


Recommended: Not as part of IAMP

Highlights:

- Dual eastbound left-turn is currently recommended in Central Point Transportation System Plan (TSP)

Concept E-2: Table Rock – Improvements



Recommended: Not as part of IAMP

Highlights:

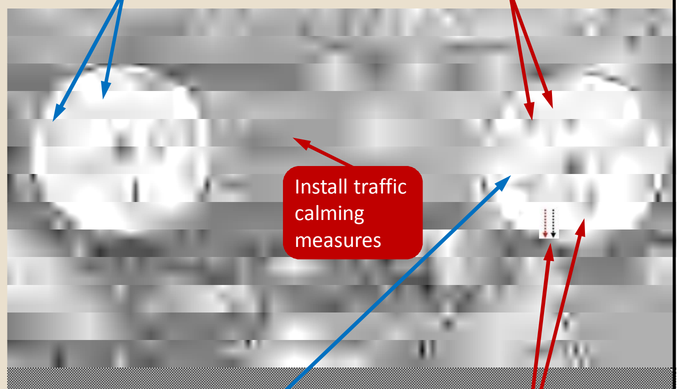
- Outside IAMP planning area
- Defer to local TSP process

Concept E-3: Hamrick Diversions to Table Rock

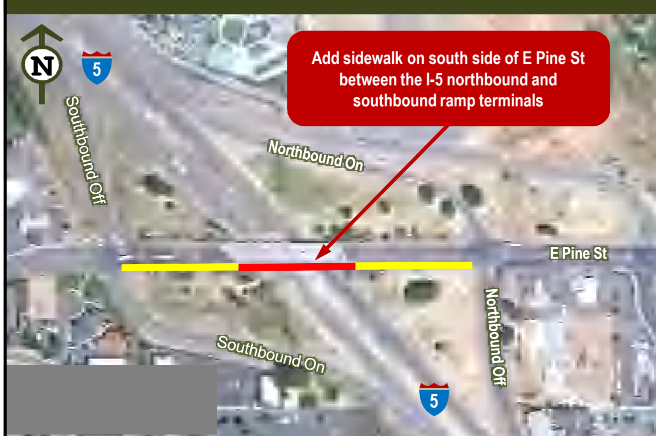
Recommended: Not as part of IAMP

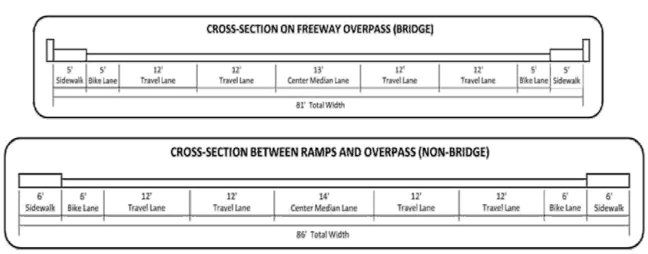
Highlights:

- Dual eastbound left-turn at Hamrick Rd is currently in Central Point TSP – would need to be removed with update
- Table Rock Rd is outside IAMP planning area
- Defer to local TSP process



Concept A-1: South Sidewalk





Description: Concept A-1 considers adding a sidewalk on the south side of E Pine Street between the northbound and southbound ramp terminals

Purpose: Address the existing pedestrian network deficiency

Evaluation: Bridge railing on south side can be replaced to allow for wider cross-section (81 feet vs. 79 feet) and 5-foot sidewalk can be added with some minor reductions in travel and bike lane widths at an estimated cost of $1.2 million

Recommended: Yes – High to medium priority

Concept A-2: Bike Lane Improvements

Existing Bicycle Signal in Portland

<u>Description</u>: Concept A-2 considers adding a bicycle signal at the I-5 southbound ramp intersection to address the conflict between vehicles and bicyclists in the eastbound direction

<u>Purpose</u>: Address the existing safety concern for bicyclists

<u>Evaluation</u>: Bike signal would create bicycle phase that stopped eastbound right turn when activated with sensors or pushbutton with minimal impact to traffic flow at an estimated cost of $25,000

<u>Recommended</u>: Yes – High priority

Future Operations with Improvements

Operations with recommended improvements

- All improved intersections would meet mobility standards with the 2034 RTP forecasts
- Two intersections would exceed mobility standards with the ALUS forecasts
  - ALUS forecasts are only intended to provide a sensitivity analysis to address more rapid development → this result is not anticipated to be an issue for the IAMP

Project Phasing

Two phasing questions need to be answered:

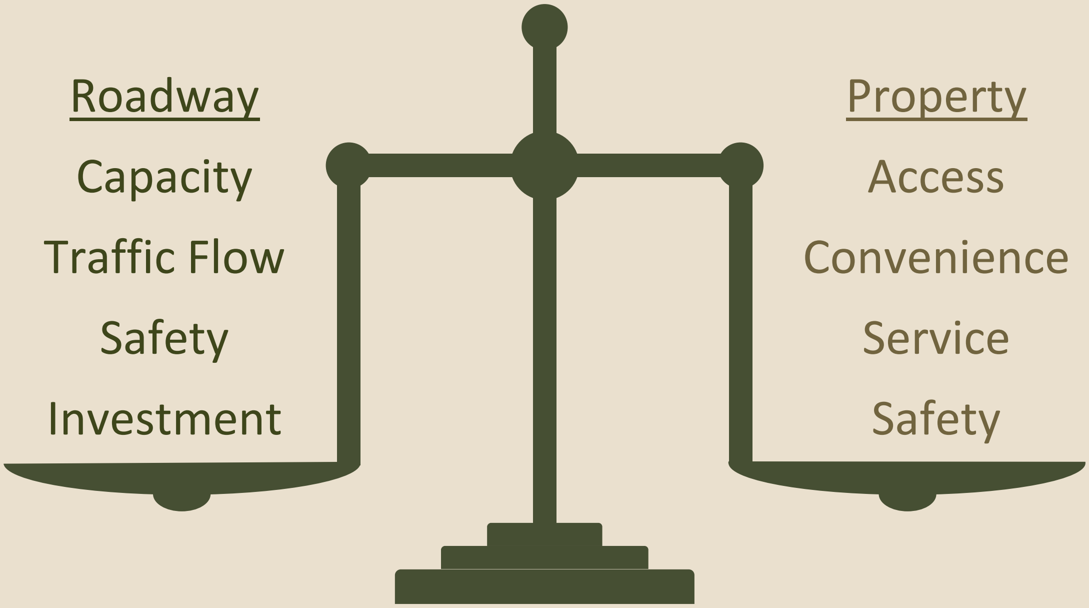
- What happens if the enhanced network improvements are not implemented within the 20-year planning horizon?
  - Intersections with the IAMP recommended improvements would meet mobility standards
  - Hamrick Rd intersection would have capacity and queuing issues without dual left-turn lane
  - Peninger Rd intersection would remain signalized and would meet the mobility standard but would have some long queues
- What transportation system management measures can be done before substantial capital investments must occur?
  - Manage signal timing at ramp terminals for safety
  - Modify signal timing and phasing to maximize safety
  - Restripe travel lanes
  - Restrict accesses to right-in/right-out movements only

Recommendations Related to TSP

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Comments and Recommendations
Tier 1 TSP Projects	
TSP #216 – E Pine St & Hamrick Rd	No changes recommended Project should be reconsidered with update to TSP but without this project, modified projects #236 and #233 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection
Tier 2 TSP Projects	
TSP #233 – E Pine Street: Hamrick Rd to Bear Creek Bridge	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented after modified #236 and prior to modified #255
TSP #234 – E-W Hamrick Rd extension (south of E Pine St)	No changes recommended
TSP #236 – E Pine Street: Bear Creek Bridge to Peninger Rd	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented prior to modified #233 and modified #255
TSP #240 - Peninger Rd Extension, South	No changes recommended
TSP #245 – Peninger Rd Project	No changes recommended Interim TSM measures could address operations until this project and project #240 are constructed
TSP #255 – E Pine St: I-5 to Table Rock Rd	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented after modified #233 and modified #236
TSP #916 – I-5 & E Pine St, SB Off-Ramp	Delete project and replace with IAMP project at I-5 southbound ramp terminal
TSP#917 – I-5 Central Point Interchange (Exit 33)	Delete project
TSP #918 – I-5 & E Pine St, NB Ramp	Delete project and replace with IAMP project at I-5 northbound ramp terminal

Access Management



Oregon Highway Plan and Division 51

- Oregon Highway Plan addresses access management in Goal 3
  - Supporting policies regarding classification and spacing standards, medians, interchanges, deviations, and appeals
  - Appendix C: Access Spacing Standards
  - Revised to address Senate Bill 264 which suggested revisions to Oregon's management of access on state facilities
- Oregon Administrative Rule (OAR) 734-051 (Division 51)
  - Detailed requirements, action definitions, and the access spacing standards for state facilities

Access Spacing Standards

Table 6-1. Access Spacing Standards

Segment Characteristic	Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
Distance from off-ramp to first approach on the right, right-turn movements only	750 feet[2]
Distance from off-ramp to first intersection where left turns are allowed	1320 feet[2]
Distance from last approach road to the start of the taper for the on-ramp	1320 feet[2]
Distance from last right in/right out approach road to the start of the taper for the on-ramp	750 feet[2]
Other Public/Private Access Points	
Central Point - Urban Business District (Speed: 25-35 mph)	350 feet[3]
Jackson County - Arterial (Minor and Major)	300 feet[4]

Notes:
1. Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the developable frontage area are developed at urban densities and many have driveways connecting to the crossroad. See definition in the Oregon Highway Plan.
2. Table 18 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads
3. City of Central Point Transportation System Plan.
4. Jackson County Transportation System Plan.

Private Approaches

OAR 734-051-4020, Standards and Criteria for Approval of Private Approaches:

(8)(c) The spacing standards in Tables 3 through 6 do not apply to approaches in existence prior to January 1, 2012, except when:

(A) A new approach road is requested or an existing approach permit is subject to change of use under ORS 374.312; and

(B) Where infill development or infill redevelopment occurs the approach road spacing standards will be a department determination; the department shall determine whether the approach road spacing or safety is improved by moving in the direction of the spacing standards in Tables 3 through 6; and

(C) Where a highway or interchange project occurs the approach road spacing standard will be a department determination; the department shall consider whether the approach road spacing or safety is improved by moving in the direction of the applicable spacing standards in Tables 3 through 6.

Existing Access Inventory

- Inventory
  - Public street intersections
  - Public/private approaches
  - 70 accesses from 7th Street to Table Rock Rd
    - 30 on the north side
    - 40 on the south side
- Access spacing along segments assessed
  - 30 accesses within 1,320 feet (1/4 mile) of interchange ramps
  - Few driveways meet Central Point or Jackson County spacing standards

Access Management Techniques

- Controlling Intersection Spacing
  - Improved flow, less congestion
- Managing Driveway Spacing
  - Fewer conflicts, more orderly traffic flow
- Adding Turn Lanes
  - Separates turning and through traffic
- Installing Median Treatments
  - Separates turning traffic, can restrict some movements
- Improving the Local Street Network
  - Alternative access and routes available

Access Management Implementation

Access management actions would be taken when one or more of the following triggers occurs:

- Applications for land use changes or development are submitted
  Example: *"Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street."*
- Future roadway improvements move into design and construction
  Example: *"Right-turn deceleration lanes should be considered when a new signalized intersection is constructed on E Pine (between Peninger and Hamrick)."*
- Safety and or operational problems arise
  Example: *"Consolidation or closure of driveways should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT Safety Priority Index System (SPIS) rating in the top 10 percent."*

Access Management Plan Actions

Access Management Plan Actions

E Pine St from 10th St to I-5 Southbound Ramp Terminal

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
2. Expand the local street network.

E Pine St from I-5 Northbound Ramp Terminal to Peninger Rd

3. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
4. Expand the local street network.
5. Evaluate traffic control, potential turn limitations, left-turn lane, and right-turn lane needs for the Peninger Road intersection.

E Pine St from Peninger Rd to Hamrick Rd

6. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
7. Expand the local street network.

Potential Management Actions

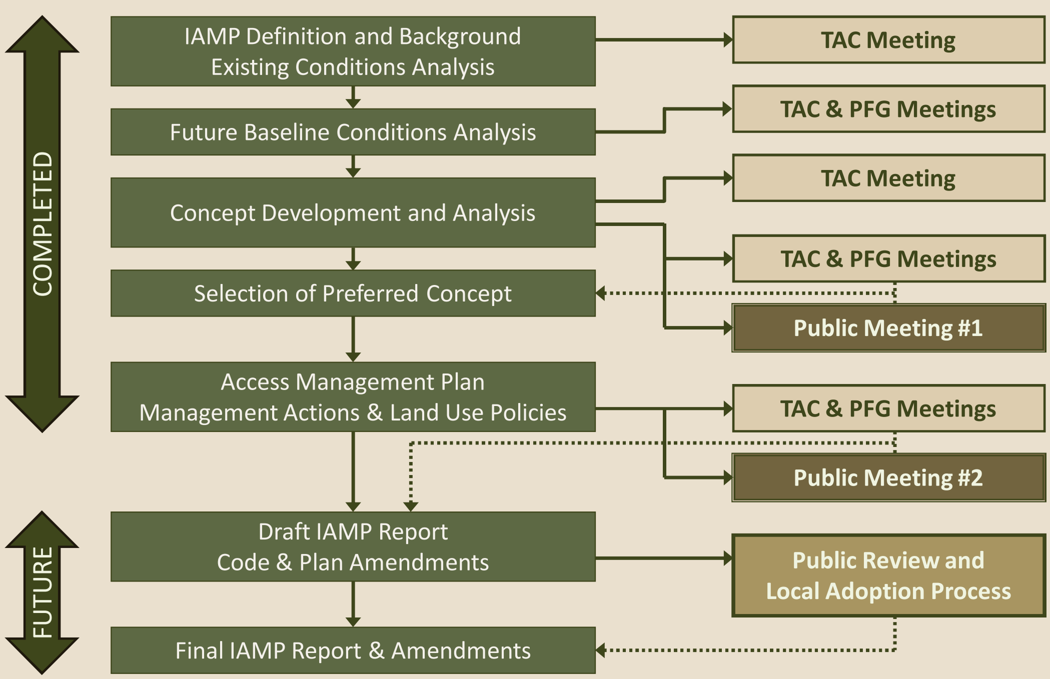
Management actions are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange
- **Transportation Demand Management Strategies** that provide travel options to reduce the number of trips or vehicles on the road
- **Transportation System Management Measures** that improve system efficiency and reduce delays
- **Land Use and Development Strategies** that guide land use development to result in fewer trips in the interchange area

Recommended Actions

- **ODOT and Central Point:** Enhance the local street network to support future development and address access in the vicinity of the interchange.
- **ODOT:** Adopt an Access Management Plan for the Interchange 33 area.
- **Jackson County and City of Central Point:** Implement Transportation Demand Management strategies in cooperation with other jurisdictions within the RVMPO.
- **ODOT:** Apply Transportation System Management measures when adding traffic signals to the system.
- **Jackson County and City of Central Point:** Retain, through adoption of the IAMP, current adopted Jackson County Comprehensive Plan and Land Development Ordinance designations and regulations

IAMP Planning Process



Next Steps

- Prepare Draft IAMP for I-5 Exit 33
  - End of 2012
  - Review period
  - Final round of meetings
- Finalize IAMP for I-5 Exit 33
  - Spring 2013
  - Additional agency coordination/outreach through ODOT

APPENDIX B.

Project Focus Group Meeting Materials

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #1

12:00 Noon – 2:00 PM

February 22, 2011

Central Point City Hall – Sun Room

AGENDA

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1. Introductions	Lisa Cortes, ODOT Tom Humphrey, Central Point
2. Project Overview	Jennifer Danziger, DEA
3. Work Completed • Existing Conditions Analysis • Future Baseline Conditions	Jennifer Danziger, DEA Shelly Alexander, DEA
4. Project Discussion • Concept Development	All
5. Project Update • Schedule • Upcoming meetings	Jennifer Danziger, DEA Lisa Cortes, ODOT
6. Next Steps	Jennifer Danziger, DEA

Attachments:
DRAFT Technical Memorandum #3 – Future Baseline Traffic Conditions

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #1 - February 22, 2011

Draft Meeting Notes

Attendees: Tom Humphrey (Central Point)
Mike Quilty (Central Point)
Ray Heysell (Land Owner)
Pat McShane (Innsight Hotel Management Group)
Dave Rainey (Reddaway)
Barry Robino (Grange Co-op)
Tammy Conn (Fairgrounds Chevron)
Rod Bell (Fairgrounds Chevron)
Cris Galpin (Land Owner)
Sam Gressett (Real Estate Broker)
Ken Trautman (People's Bank)
John Batzer (Land Owner)
Frank Pulver (Pulver and Leever Real Estate Company)
Dave Koellermeir (Jackson County Expo)
Lisa Cortes, (ODOT Region 3 Planning)
Jennifer Danziger, (David Evans and Associates, Inc.)
Shelly Alexander, (David Evans and Associates, Inc.)

Project Overview

Jennifer Danziger provided a brief overview of the Interchange 33 Area Management Plan (IAMP) concept, process, goals, objectives, and management tools. The group participated in a discussion regarding current capacity improvements as planned by the County. Specifically, the additional lanes to be added for traffic along East Pine Street between Peninger and the Northbound ramp terminal. Improvements include right-turn lanes in the eastbound (onto Peninger), westbound (onto I-5 northbound ramp), and southbound (from Peninger onto East Pine Street) directions. Additionally, the intersection of East Pine Street and Peninger will see signal improvements in the form of protected left-turn movements for Peninger (construction scheduled for summer/fall of 2011).

Ray Heysell requested that the goals and objectives be amended to include wording with regard to minimizing impacts to property owners.

Existing Conditions Analysis

Shelly Alexander provided a brief overview of the Existing Conditions Analysis summarized in Tech Memo #2. The analysis assumes the existing year of 2010 for the entire study area. A note was made regarding the number of jurisdictions that have control over East Pine Street throughout the study area.

Shelly then summarized the operational findings of the analysis. All intersections meet v/c ratio standards but the 7th/East Pine southbound approach would not meet the City's LOS standard. There are also several locations to keep an eye on: 7th/East Pine (southbound left), 10th/Freeman/East Pine (westbound left), Peninger/East Pine (northbound left/through), and Hamrick/East Pine (eastbound left). Six of the study area intersections show one or more movements with existing queues that sometimes exceed available storage (10th/Freeman/East Pine, Jewett/East Pine, I-5 SB Ramps/East Pine, I-5 NB Ramps/East Pine, Peninger/East Pine, Hamrick/East Pine).

Tom noted that the post office (southbound left volumes at the 7th/East Pine intersection) traffic is always a problem. Tom and others also commented on the truck traffic east of the interchange, specifically for the Hamrick/East Pine intersection (eastbound left).

Shelly also shared that the review of the traffic counts showed that I-5 peaks differently in the northbound and southbound directions. Traffic data shows northbound I-5 peaking during the PM peak hour, similar to East Pine, while the southbound direction peaks during the morning.

Jennifer discussed the crash history for the IAMP management area. The highest crash locations included the northbound ramp terminal, 10th/Freeman/East Pine intersection, the southbound ramp terminal, and Hamrick/East Pine intersection. Jennifer noted that the ODOT coding for crashes on the overpass (i.e., East Pine between the ramp terminals) does not specify location and the distribution of crashes were completed to the best of our ability. Segment crash rates for East Pine and I-5 mainline as well as Safety Priority Index System (SPIS) data was also reviewed. The segment crash rate for East Pine is above the rate for a similar facility, however, the I-5 mainline crash rates were below. The review of SPIS data showed no top 10% locations.

John Batzer questioned how the safety (crash frequency and severity) of Interchange 33 compares to other interchanges throughout the state. Jennifer responded that every interchange is different (access spacing, ramp configuration, traffic volumes) but overall the crash patterns that were identified for Interchange 33 are consistent with those seen at ramp terminals throughout the state.

Dave Rainey commented on the camber of the bridge over I-5, specifically a safety concern for southbound truck traffic exiting I-5 and turning left (eastbound). Many truck drivers perceive this maneuver as difficult and some have reported seeing rolled trucks at this location. Tom Humphrey confirmed that there have been rollover incidents in the past.

Future Baseline Conditions

Jennifer summarized the forecasting scenarios for the future conditions baseline analysis, which include the 2034 Regional Transportation Plan (RTP) as well as the Regional Problem Solving (RPS) Land Use Scenario.

Next, Shelly Alexander led the group through the operational highlights of the two scenarios. In summary, the 2034 RTP scenario would likely result in 5 intersections failing to meet operational standards: 7th Street/East Pine Street, 8th Street/East Pine Street, 10th Street/Freeman Road/East Pine Street, Peninger Road/East Pine Street, and Hamrick Road/East Pine Street. Two of these intersections would be nearing capacity: 10th Street/Freeman Road/East Pine Street (v/c ratio 0.94) and Hamrick Road/East Pine Street (v/c ratio 0.98), while 5 specific movements would be at or over capacity. In addition to future 2034 operational concerns, severe queuing (spilling out of turn bays or spilling into adjacent intersections) was also noted at various locations throughout the corridor; most notably in the westbound direction starting at 10th Street/Freeman Road and extending to the northbound ramp terminal, the northbound direction at the northbound off-ramp, and in the east and west directions at the Hamrick Road intersection.

2034 RTP freeway operations were also evaluated including merge and diverge points as well as mainline. All freeway operations in both directions are anticipated to meet operational standards.

Shelly then summarized the operational results for the RPS scenario. This scenario would experience one additional intersection (6 total) failing to meet operational standards, the I-5 NB ramp terminal. Under the RPS forecasting scenario, four intersections could be approaching (or over) capacity: 10th Street/Freeman Road/East Pine Street, I-5 NB ramp terminal, Peninger Road/East Pine Street, and Hamrick Road/East Pine Street. Ten individual movements could be near (or over capacity). In addition to future 2050 operational concerns, severe queuing (spilling out of turn bays or spilling into adjacent intersections) was also noted at various locations throughout the corridor; most notably in the westbound direction starting at 10th Street/Freeman Road and extending to the northbound ramp terminal, in the eastbound direction at the southbound ramp terminal, the northbound direction at the northbound off-ramp, the eastbound direction at Peninger Road, and in the eastbound and westbound directions at the Hamrick Road intersection.

Freeway operations under the RPS scenario would likely meet operations standards in both directions (mainline, merge, and diverge).

Jennifer and Shelly then presented the future safety concerns within the IAMP 33 study area which include:

- Inadequate mainline gaps (along East Pine Street) for side street maneuvers
- Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic.
- Long northbound off-ramp queues could cause more collisions as traffic existing the freeway would have less distance to stop and exiting drivers may also slow I the freeway lanes in anticipation of stopping on the ramp
- Inadequate access spacing
- Competition for two-way left-turn lanes could result in head-on collisions

Project Discussion-Concept Development

Jennifer provided an overview of projects identified in current planning documents including: the Rogue Valley Metropolitan Planning Organization (RVMPO) RTP, Jackson County Transportation System Plan (TSP), Central point TSP, and the East Pine Street Plan.

After discussing the relevant projects listed within the current planning documents Jennifer relayed that the TAC has recommended using the East Pine Street (EPS) Plan projects as a starting point for developing concepts. If the improvements identified in the EPS Plan are insufficient to accommodate anticipated demand at the interchange, other projects should be considered. It was acknowledged that improvements at the 10^{th} Street/Freeman Road/East Pine Street intersection will need to be included as well as considering improvements to the interchange itself (diverging diamond, loop ramps).

Next Steps in Analysis

DEA will evaluate the recommended East Pine Street Plan projects for the 2034 RTP and RPS scenarios. DEA will add projects as needed, likely to include (but not limited to) improvements to the 10^{th} Street/Freeman Road/East Pine Street intersection, local street network options, and if needed interchange improvements. The concepts and operational findings will be included in the next draft technical memorandum and presented at the next TAC meeting for discussion. Additionally, a draft screening matrix will be presented comparing the concepts that were evaluated. Ideas for projects and/or evaluations measures are encouraged for discussion at the next Technical Advisory Committee (TAC) meeting.

Interest was expressed regarding a project website for the progress of IAMP 33. The City volunteered to post materials on their website.

Actions:

- DEA to add a goal/objective relating to minimizing impacts to property owners adjacent to East Pine Street
- DEA to submit model request(s) to TPAU for improvements associated with the East Pine Street Plan study as baseline improvements
- DEA will evaluate the improvement identified in the East Pine Street Plan and determine if any additional improvements are needed.
- Central Point will add IAMP 33 materials to their website for public access.

Attachments:
PFG PowerPoint Presentation Slides
Copy of Attendance Sheet

DAVID EVANS AND ASSOCIATES INC.

JOB DESCRIPTION PFG #1 2/22/11

CALCULATION FOR

JN.

BY DATE

SHEET OF SHEETS

CHECKED BY DATE

NAME	ORGANIZATION	EMAIL
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John Batzer	Property owner	Judy@Batzer inc com
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Dave Koellermeier	Jackson Co ETPO	Koelledh@jacksoncounty.org.

I-5 Interchange 33 (Central Point)
Interchange Area Management Plan (IAMP)

Project Focus Group Meeting #1
February 22, 2011

Oregon Department of Transportation

CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

Presentation Topics

1. Project Overview
   – Purpose
   – Process
   – Goals & Objectives
2. Work Completed
   – Existing Conditions Analysis
   – Future Conditions Analysis
3. Concept Development

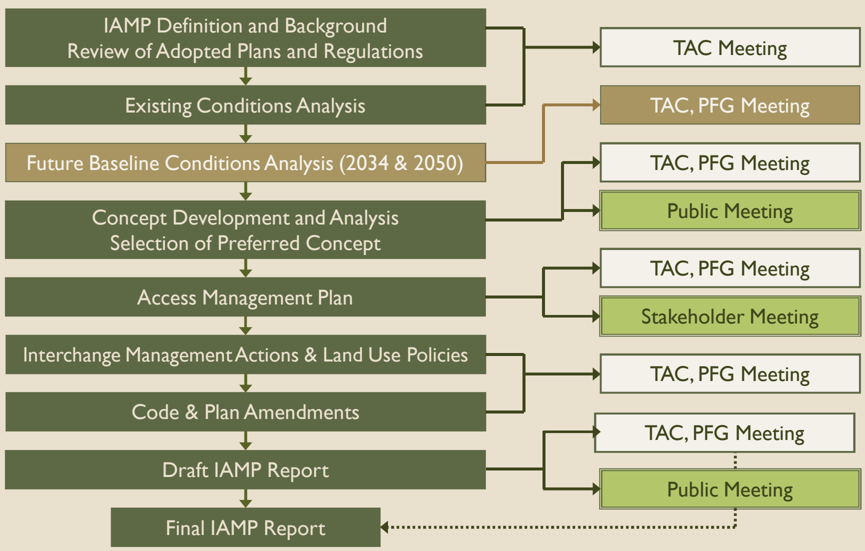
What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2034
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Jackson County, and Central Point

Why do an IAMP for Interchange 33?

- Increasing demand at the interchange
  - Population growth forecast of almost 60% over the next 20 years
  - Urban Reserve locations north and east of the project were identified in the Greater Bear Creek Valley Regional Plan
  - Potential fairgrounds expansion in future
- Interchange and roadway network characteristics
  - Substandard intersection spacing near ramp terminals
  - National Highway System intermodal connector from I-5 to OR 62
  - Downtown grid system to west
- Traffic Concerns
  - High truck volumes to and from the east
  - Queuing between closely spaced intersections
  - Weaving movements between nearby access roadways and ramp terminals

IAMP Planning Process



IAMP Goal

Develop a plan for improvements for Interchange 33 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Central Point and other Rogue Valley communities.

IAMP Objectives

- Protect the function of the interchange and East Pine Street as specified in the Oregon Highway Plan (OHP), RVMPO Regional Transportation Plan, City of Central Point Transportation System Plan (TSP), and Jackson County TSP.
- Develop concepts to improve safety and maximize operational efficiency of the freeway and interchange to address existing and future needs.
- Evaluate the need for capacity improvements based on the adopted comprehensive land use plans of Central Point and Jackson County.

IAMP 33 – Project Focus Group #1

IAMP Objectives (continued)

- Develop an access management plan that provides for safe and acceptable operations on the transportation network and meets OHP requirements and the access spacing standards in Oregon Administrative Rule (OAR) 734-051
- Incorporate the Greater Bear Creek Valley Regional Plan into the design and management systems, including recommended strategies for land use control
- Incorporate the analysis of the City's Pine Street Four-Lane to Three-Lane Conversion Study and recommendations from the I-5 Rogue Valley Corridor Plan.

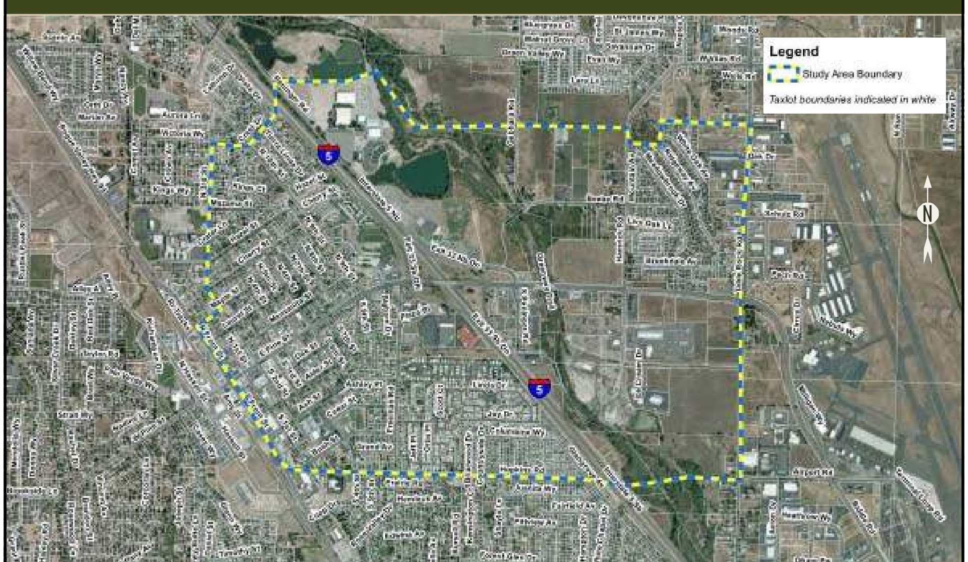
IAMP 33 – Project Focus Group #1

Potential IAMP Management Tools

- Transportation System Management
  traffic control, lane striping, signing, access management
- Transportation Demand Management
  transit service, multi-modal facilities
- Land Use Strategies
  overlay zones, modification of allowable uses, trip cap allocation ordinances, zone changes
- Capacity Improvements
  added travel or turning lanes, ramps

IAMP 33 – Project Focus Group #1

IAMP Planning Area



IAMP 33 – Project Focus Group #1

Existing Condition Analysis

- Existing Transportation System Inventory
  - Traffic Volumes - 2010
  - Traffic Operations - Intersections & Freeway
  - Crash History – 2006 through 2008
- Land Use Summary
  - Characteristics, Constraints, Features, Resources
- Natural and Historic Resources
  - Natural – Floodplains, Wetlands/Waterways, Threatened/Endangered Species, Air Quality,
  - Hazardous Materials
  - Historic and Archaeological Resources

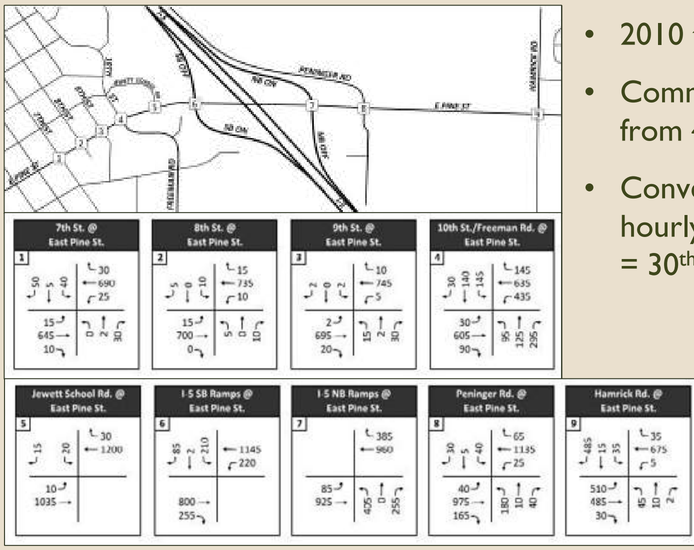
East Pine Street Jurisdiction

Management Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT/Federal Functional Classification	City/County Functional Classification	Posted Speed (mph)	No. of Lanes
Interstate 5					
Mainline	ODOT	Interstate, NHS, FR, TR	-	65	4
Interchange 33 Ramps	ODOT	Interstate, NHS, FR, TR	-	-	1-2
East Pine St.					
West of 10th St.	Central Point	Minor Arterial	Minor Arterial	25-35	4-5
10th St. - SB Ramps	Jackson County	Minor Arterial	Principal Arterial	35	5
SB Ramps – NB Ramps	ODOT	Minor Arterial, NHS Intermodal Connector	Principal Arterial	35	5
NB Ramps to East	Jackson County	Minor Arterial, NHS Intermodal Connector	Intermodal Connector	35-45	5

Acronyms: NHS: National Highway System; FR: State Freight Route; TR: Federally Designated Truck Route

Existing Traffic Volumes



- 2010 traffic counts
- Common peak hour from 4:30 to 5:30 PM
- Converted to design hourly volumes (DHV) = 30th highest hour

Freight Traffic

Truck Percentages on Management Area Roadways

	6:00 AM – 10:00 PM			4:30 PM – 5:30 PM		
Location	**Single Unit**	**Tractor Trailer**	**Total**	**Single Unit**	**Tractor Trailer**	**Total**
East Pine Street						
West of I-5 Southbound Ramps[1]	1.9%	1.4%	3.2%	0.5%	0.6%	1.1%
On I-5 Overpass[1]	2.2%	4.4%	6.6%	0.9%	2.9%	3.8%
East of I-5 Northbound Ramps[1]	2.5%	7.7%	10.2%	1.4%	5.2%	6.6%
East of Peninger Rd.[2]	-	-	-	2.5%	2.1%	4.6%
East of Hamrick Rd.[2]	-	-	-	1.8%	1.6%	3.5%
Interchange 33 Ramps						
I-5 Southbound Off-Ramp[1]	3.2%	13.9%	17.1%	2.6%	12.8%	15.5%
I-5 Southbound On-Ramp[1]	1.3%	7.0%	8.4%	0.9%	5.8%	6.7%
I-5 Northbound Off-Ramp[1]	1.8%	9.3%	11.1%	1.1%	5.3%	6.4%
I-5 Northbound On-Ramp[1]	2.7%	14.7%	17.5%	2.1%	9.2%	11.3%
I-5 Mainline						
Northbound[3]	2.7%	14.1%	16.8%	4.0%	19.3%	23.3%
Southbound[3]	2.4%	11.8%	14.2%	2.7%	19.0%	21.7%

Notes:
1. 16-hour (6:00-22:00), turning movement, classification collected on May 11, 2010
2. 4-hour (14:00-18:00), turning movement, classification collected on April 20, 2010
3. 16-hour (6:00-22:00), turning movement, classification collected on March 31, 2010

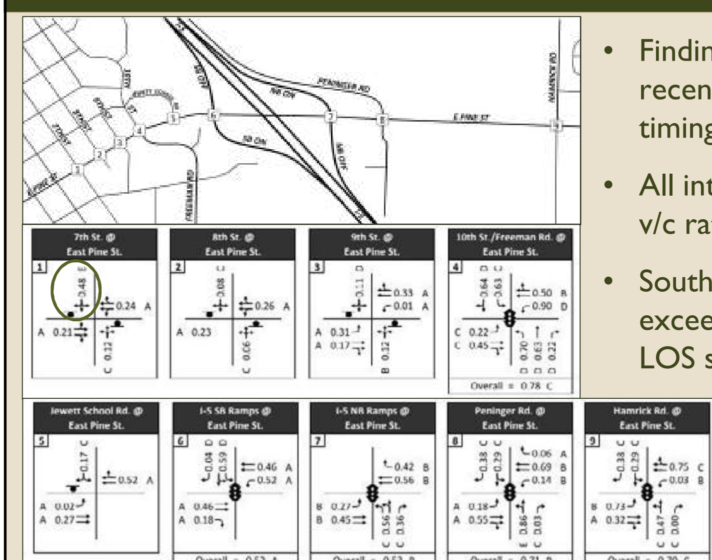
Source: Traffic counts collected March 31, April 20, and May 11, 2010.

IAMP 33 – Project Focus Group #1

Operations

- Performance Measures
  - Volume/Capacity Ratio
    - *Volume = Traffic Demand*
    - *Capacity = Maximum Throughput*
  - Level of Service A through F based on delay
  - 95th Percentile Queues
- Performance Standards
  - ODOT Standards
    - V/C ratio 0.80 on I-5 Mainline and 0.85 on I-5 Ramps
  - Central Point Standard
    - LOS D or better
  - Jackson County Standard
    - V/C ratio = 0.85

Existing Intersection Operations



- Findings reflect most recent ODOT signal timing plans
- All intersections meet v/c ratio standards
- Southbound 7th Street exceeds Central Point LOS standard

Existing Intersection Queuing

Existing (2010) 95th Percentile Queues Exceeding Available Storage

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked
10th St./Freeman Rd. & East Pine St.	WB L	300	150	41%
	WB T/R	450	350	22%
	NB L	150	125	3%
	SB L	225	100	16%
Jewett School Rd. & East Pine St.	WB T/R	325	300	7%
I-5 SB Ramps & East Pine St.	SB R	125	50	6%
I-5 NB Ramps & East Pine St.	WB R	125	65	2%
Peninger Rd. & East Pine St.	SB R	75	40	7%
Hamrick Rd. & East Pine St.	EB L	425	400	1%

Note: Available storage reflects the length of a turn bay or the distance to the next upstream intersection.

IAMP 33 – Project Focus Group #1

Existing Freeway Operations

- Merge and Diverge Operations
  - Merge = Segment where traffic enters onto the highway
  - Diverge = Segment where traffic exits from the highway
- I-5 Northbound: (PM Peak Hour is busiest time of day)

Location	PM V/C
Mainline South of IC 33	0.45
Diverge: IC 33 Northbound Off-Ramp	0.33
Mainline between Off and On-Ramps	0.31
Merge: IC 33 Northbound On-Ramp	0.41
Mainline North of IC 33	0.41

- I-5 Southbound: (AM Peak Hour is busiest time of day)

Location	PM V/C	AM V/C
Mainline North of IC 33	0.26	0.33
Diverge: IC 33 Southbound Off-Ramp	0.14	0.17
Mainline between Off and On-Ramps	0.19	0.25
Merge: IC 33 Southbound On-Ramp	0.30	0.42
Mainline South of IC 33	0.30	0.41

IAMP 33 – Project Focus Group #1

Crash History

- Three Years of Data (2006 – 2008)
- 127 Crashes in Project Area
- Highest Crash Locations on East Pine Street
  - I-5 NB Ramps Intersection (30 crashes)
  - 10th Street/Freeman Road Intersection (29 crashes)
  - I-5 SB Ramps Intersection (19 crashes)
  - Hamrick Road Intersection (16 crashes)

Crash History (continued)

- East Pine Street Segment Crash Rate
  - 4.02 vs. 2.51 for similar facilities
  - May be attributable shorter segment length, 4 closely spaced signalized intersections, and freeway ramp terminals
- I-5 Mainline Segment Crash Rate
  - 0.30 vs. 0.54 for similar facilities
- Safety Priority Index System
  - No top 10% locations

Future Baseline Condition Analysis

- Forecasting Scenarios
  - 2034 Regional Transportation Plan (RTP)
  - 2050 Regional Problem Solving (RPS) Land Use
- Operational Analysis
  - Intersections
  - Freeway
- Future Safety Considerations

Future Traffic – 2034 RTP Scenario

- Serves as the future baseline condition for IAMP 33
- Based on Regional Travel Demand Model:

Regional	2009	2034
Population	172,665	248,324
Employment	115,430	150,666

Source: 2009-2034 Regional Transportation Plan

- Network used is the financially-constrained RTP network with some OR 62 Expressway elements added
- Network volume growth: (2010 to 2034)

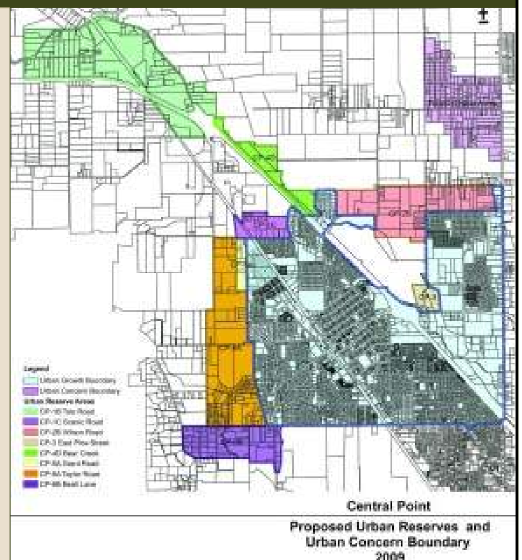
Location	% Growth	Volume Growth*
E Pine: 7th to SB Ramps	31 to 38%	215 to 450
E Pine: NB Ramps to Hamrick	29 to 47%	295 to 480
I-5 Northbound Ramps	45% off, 25% on	300 off, 115 on
I-5 Southbound Ramps	24% off, 34% on	70 off, 165 on
I-5 Mainline Northbound	46 to 53%	765 to 1,065
I-5 Mainline Southbound	54 to 65%	590 to 755

** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

Future Traffic – 2050 RPS Scenario

- Based on the Greater Bear Creek Valley Regional Problem Solving Project
- Examined long-term needs for additional lands for urban development to accommodate a doubling of the region's population
- Identified Urban Reserve Areas
  – 6 areas (1,136 acres) with potential to affect interchange

Zoning	Current	Proposed
Residential	42%	79%
Commercial	0%	5%
Institutional	0%	4%
Open Space/Parks	0%	12%
Resource	58%	0%



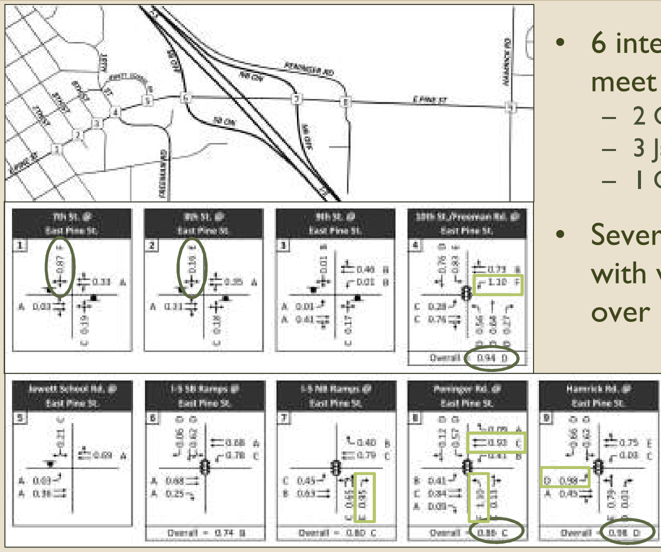
Future Traffic – 2050 RPS Scenario

- Provides a sensitivity analysis that considers potential areas for development beyond assumptions in the RTP model
- Because land use scenarios are developed differently from the RTP land use assumptions:
  – Volume distribution across network differs
  – Operational results can vary
- Network used is the same as the RTP scenario
- Network volume growth: (2034 to 2050)

Location	% Growth	Volume Growth*
E Pine: 7th to SB Ramps	0 to 7%	0 to 100
E Pine: NB Ramps to Hamrick	9 to 27%	120 to 395
I-5 Northbound Ramps	10% off, 33% on	95off, 195 on
I-5 Southbound Ramps	40% off, 16% on	145 off, 105 on
I-5 Mainline Northbound	14 to 20%	350 to 545
I-5 Mainline Southbound	19 to 24%	305 to 450

** The minimum and maximum volume growth does not necessarily correspond with the minimum and maximum % growth*

2034 RTP Scenario – Intersection Operations



- 6 intersections don't meet standards
  - 2 Central Point
  - 3 Jackson County
  - 1 ODOT
- Several Movements with v/c ratios near or over 1.0

2034 RTP Scenario – Most Severe Queuing

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked
10th St./Freeman Rd. & East Pine St.	WB L	250	150	66%
	WB T/R	400	350	57%
Jewett School Rd. & East Pine St.	WB T/R	450	300	35%
I-5 SB Ramps & East Pine St.	WB T	1,625	1,150	16%
	SB R	175	50	23%
I-5 NB Ramps & East Pine St.	WB T	500	425	4%
	NB L/T	1,125	1,075	7%
	NB R	750	500	20%
Peninger Rd. & East Pine St.	NB L	300	150	73%
	NB T/R	500	450	54%
Hamrick Rd. & East Pine St.	EB L	600	400	32%
	EB T/R	1,475	600	-
	WB T/R	2,500	775	60%
	SB L/T	650	300	-
	SB R	575	300	25%

2034 RTP Scenario – Freeway Operations

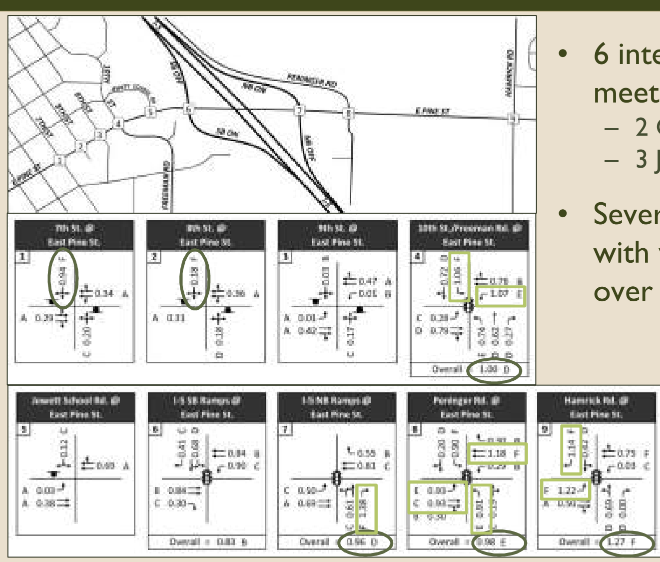
- I-5 Northbound: (PM Peak Hour)

Location	V/C Ratio
Mainline South of IC 33	0.67
Diverge: IC 33 Northbound Off-Ramp	0.48
Mainline between Off and On-Ramps	0.47
Merge: IC 33 Northbound On-Ramp	0.61
Mainline North of IC 33	0.59

- I-5 Southbound: (PM Peak Hour)

Location	V/C Ratio
Mainline North of IC 33	0.40
Diverge: IC 33 Southbound Off-Ramp	0.17
Mainline between Off and On-Ramps	0.32
Merge: IC 33 Southbound On-Ramp	0.47
Mainline South of IC 33	0.46

2050 RPS Scenario – Intersection Operations



- 6 intersections don't meet standards
  - 2 Central Point
  - 3 Jackson County
- Several Movements with v/c ratios near or over 1.0

2050 RPS Scenario – Most Severe Queuing

Intersection	Approach & Movement	95th Percentile Queue (ft.)	Available Storage	Percent Time Blocked
10th St./Freeman Rd. & East Pine St.	WB L	300	150	35%
	WB T/R	450	350	22%
Jewett School Rd. & East Pine St.	WB T/R	350	300	6%
I-5 SB Ramps & East Pine St.	EB T	375	275	5%
I-5 NB Ramps & East Pine St.	EB L	225	175	-
	NB L/T	1,275	1,075	42%
	NB R	700	500	74%
Peninger Rd. & East Pine St.	EB L	225	75	24%
	EB T	650	400	16%
	EBR	325	215	-
Hamrick Rd. & East Pine St.	EB L	625	400	57%
	EB T/R	2,350	600	-
	WB T/R	4,500	775	69%
	SB L/T	2,375	300	-
	SB R	500	300	71%

2050 RPS Scenario – Freeway Operations

- I-5 Northbound: (PM Peak Hour)

Location	V/C Ratio
Mainline South of IC 33	0.77
Diverge: IC 33 Northbound Off-Ramp	0.53
Mainline between Off and On-Ramps	0.54
Merge: IC 33 Northbound On-Ramp	0.72
Mainline North of IC 33	0.71

- I-5 Southbound: (PM Peak Hour)

Location	V/C Ratio
Mainline North of IC 33	0.49
Diverge: IC 33 Southbound Off-Ramp	0.24
Mainline between Off and On-Ramps	0.38
Merge: IC 33 Southbound On-Ramp	0.56
Mainline South of IC 33	0.54

Future Safety Concerns

- 7th, 8th, Jewett School
  - Inadequate mainline gaps could lead to riskier driver behaviors
- 10th/Freeman, SB Ramps, NB Ramps, Peninger, Hamrick
  - Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic
- NB Off-Ramp
  - Long ramp queues could cause more collisions as traffic exiting the freeway would have less distance to stop and exiting drivers may also slow in the freeway lanes in anticipation of stopping on the ramp
- 10th/Freeman, Jewett School, SB Ramps, NB Ramps, Peninger
  - Inadequate access spacing provides insufficient storage resulting in queue spillover and consequent safety issues listed above
  - Competition for 2-way left-turn lanes could result in head-on collisions

Next Steps

- Concept Development and Evaluation
  - Ideas *(Begin Discussion Today)*
    - Additional Ramp Improvements (Phase 2)
    - Local Street Network Improvements
    - Intersection Improvements
  - Evaluation
    - Baseline and RPS Scenarios
    - Screening Matrix

Projects in Current Planning Documents

- RVMPO RTP
  - 2009 to 2034
    - East Pine/Peninger – Add right-turn lane w/ sidewalks (#852) *(also in Central Point TSP #226)*
    - East Pine: Bear Creek Bridge to Medford City Limits – Overlay, signals, striping (#851)
  - 2005 to 2030 (Superseded)
    - Full interchange reconfiguration (#3918 - long-term 2016-2030)
- Jackson County TSP (2005)
  - Table Rock: Biddle to Bear Creek – Widen to 3 lanes (Tier1)
  - Peninger: East Pine to Expo Park – Widen to 3 lanes (Tier2)

Projects in Current Planning Documents

- Central Point TSP (2009)
  - Tier 1 Projects
    - East Pine/Hamrick – Add second EB Left (#216)
    - East Pine/Meadowbrook – Restrict to right-in/right-out (#210)
    - East Pine/Table Rock – Add second EB Left (#218)
  - Tier 2 Projects
    - East Pine: Bear Creek Bridge to Hamrick – Widen for acceleration/deceleration lanes, add bike/pedestrian facilities (#233)
    - East Pine: Bear Creek Bridge to Peninger – Widen for turn lanes, bike/pedestrian facilities, and third lane (#236)
    - New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick (#245)
    - East Pine: I-5 SB Ramp to Table Rock – widen to add third westbound through lane (#255)

Projects in Current Planning Documents

- East Pine Street Plan (2004)
  - Interchange 33 – Replace left-turn lanes with loop ramps
  - Peninger – Remove signal and convert to right-in/right-out
  - East Pine: I-5 SB Ramp to Table Rock – Widen to add third westbound through lane (in CP TSP #255)
  - East Pine/Hamrick & East Pine/Table Rock – Major capacity enhancements
  - New connections across Bear Creek: Peninger to Beebe and Peninger to Hamrick (in CP TSP #245)
  - New north-south street connecting Beebe and new connection to south located between Peninger and Hamrick

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #2

2:00 PM to 4:00 PM

February 16, 2012

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Allie Krull, ODOT Tom Humphrey, Central Point
2. Update on Project Status • Overview of Process • Current Status	Jennifer Danziger, DEA
3. Interchange Area Improvement Concepts • Concept Development • Concept Analysis	Jennifer Danziger, DEA Shelly Alexander, DEA
4. Discussion • Ideas for modifications to concepts or additional concepts that could be evaluated • Input for selection of preferred concepts	All
5. Next Steps • Schedule • Upcoming meetings	Jennifer Danziger, DEA Allie Krull, ODOT

Attachments:
DRAFT Technical Memorandum #4 – Alternatives Analysis

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #2 - February 16, 2012

Draft Meeting Notes

Attendees: See attached

Introductions and Update on Project Status

Tom welcomed everyone and introduced Allie Krull, the new ODOT project manager, who took over the Project Management duties for Lisa Cortes. Then, he introduced the focus group members and affiliations as well as the consultant team, Jennifer Danziger and Shelly Alexander. Additionally, he reviewed the function of the focus group and the need for them to serve as a sounding board for the project. After finishing the introductions, Tom invited Jennifer to start the presentation.

Jennifer provided an update on the project status including the planning area and process, work to-date, why the hiatus since last year and what work has been done recently. The hiatus stemmed from concerns with the Regional Problem Solving (RPS) model forecasts, specifically within the Central Point area, which builds on the Regional Transportation Plan (RTP) assumptions and is supposed to provide an assessment of population doubling within the area in the future. The problem with the RPS model resulted in no volume growth or decreases in volumes at some intersections within the study area. A new method for testing the sensitivity of interchange improvements was created in the Alternative Land Use Scenario (ALUS).

One PFG member asked about schedule for construction of road improvement that might come out of this work. The draft Interchange Area Management (IAMP) plan is anticipated in June 2012. Although the plan will include recommendations and priorities for improvements, timing of the improvements will likely be linked to volume and safety triggers rather that specific timelines. This allows for changes in growth, either more rapid or slower than assumed in the analysis to factor in to the planning of projects. No near-term construction timeline is anticipated to be part of the plan.

Focus Group members were interested in how the RPS doubling was applied as well as the assumptions for the ALUS. Jennifer shared that the RPS scenario was developed through a regional process designed to examine how long-term growth in the region could be accommodated. The current RPS timeline uses the year 2060 for the analysis. When this information was used to generate traffic volumes, a single assumption about development was not used. Instead, an average of about 20 variations was created, which has produced good forecasts in some areas and forecasts that are not consistent with either existing or future land use patterns, in other areas.

The ALUS scenario builds on the west side land use assumptions identified in the East Pine Street Refinement Plan (a concurrent project) and applies full build-out for land in the study area on the east side of the freeway.

Each scenario was applied to the baseline network (the existing network with funded RTP projects). Neither scenario would meet mobility standards at all study area intersections within the 20 year planning horizon. Both scenarios would result in safety concerns at multiple intersections. (see slides 3-8 of the attached presentation)

Interchange Area Improvement Concepts

Jennifer then introduced the most recent analysis work: improvement concepts. The improvement concepts were done in two phases. The initial phase evaluated the two growth scenarios, RTP and ALUS, with an enhanced network defined as the baseline network with some of the improvements identified in the E Pine Street Plan prepared by JRH Transportation Engineers (2004) and currently included in the City's Transportation System Plan (TSP). The second phase identifies additional improvements beyond those assumed in the enhanced network, to address operational and safety issues. The additional improvements of the second phase are distinguished as one of the following: interchange, west side, or east side improvements.

Enhanced network concept evaluation criteria and future operations are shown in the attached presentation, slides 9-12. Jennifer noted that while these improvements may be included in the City TSP, they are not funded at this time. The IAMP will need to consider what happens if, for example, the bridges from Peninger Road across Bear Creek are not constructed and Peninger Road remains signalized.

Next, Jennifer presented the improvement concepts developed in the second phase. Most improvements were presented with a lower cost option and a full build option (generally including more right-of-way impacts). For the interchange concepts (I-1 through I-6) Jennifer discussed two improvement concepts for each of the northbound and southbound ramp terminals, as well as a diverging diamond concept which would address operational and safety issues at both ramp terminals. More details regarding layout schematics, traffic operations, safety, basic roadway geometry & right of way, environmental and land use, and cost opinions see slides 13-19 of the attached presentation. Slide 20 (provides pairings of the northbound and southbound ramp terminal improvement concepts that as a package would also address the issues at both terminals. Jennifer pointed out that pairs of certain improvements as presented in concept I-7 would cost more than simply replacing the bridge structure and starting from scratch.

The west side concepts were presented next and focus on the 10th Street/Freeman Road intersection. Here, Jennifer presented improvements focusing on increasing capacity or changing demand to address the operational and safety issues. There were four concepts in total; all would result in access management to some degree. More details regarding layout schematics, traffic operations, safety, basic roadway geometry & right of way, environmental and land use, and cost opinions see slides 21-24 of the attached presentation.

Lastly, the east side concepts were presented. Jennifer discussed the three improvement concepts that focused on the Hamrick Road, Table Rock Road, or both. These improvements, and additional details, are shown on slides 25 through 27.

Discussion

The group discussed all of the concepts and associated impacts to businesses. There was significant discussion regarding impacts around the interchange and access modifications. Questions were raised about additional ramp connections or modifications to improve access to areas off E Pine Street. There was also suggestion that consideration be given to adding another interchange to I-5 between Exit 33 and Exit 30.

For the west side improvements there was interest in how the concepts would transition into/out of the roadway to the west which is currently considering converting from 4 travel lanes to 3. Jennifer assured the group that this possibility has been considered and is reflected in concepts W-3 (existing 4 lane cross section) and W-4 (potential 3 lane cross section). Some comments were made about the impacts to the neighborhoods if traffic was diverted from 10th Street and Freeman Road to other local streets.

On the east side (concept E-3) it was suggested that the traffic calming measures include speed reduction as this type of modification has worked in the past to reduce traffic volumes along Hamrick Road.

Next Steps

DEA will present these concepts at the public open house on February 16, 2012 and follow-up with a TAC meeting on February 17, 2012.

The meeting minutes will include a copy of the today's presentation. Comments/input on the concepts or on the Tech Memo describing the concepts are due to Allie Krull the ODOT PM by the first week in March.

Next, a preferred alternative will be identified. The preferred alternative analysis will be prepared and access management strategy developed. The next project focus group meeting will review preferred alternative and access management strategy.

Actions:

- Project Focus Group to provide comments on the concepts by the end of the first week in March.
- DEA to conduct additional traffic analysis, as necessary, to evaluate comments/suggestions from committee meetings
- DEA to complete traffic analysis for preferred concept
- DEA to draft an access management strategy

Attachments:
PFG PowerPoint Presentation Slides
Copy of Attendance Sheet

City of Central Point
Public Meeting Sign in

IAMP 33
Meeting: FOCUS GROUP Date: 2-16-17

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I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

Project Focus Group Meeting #2
February 16, 2012

Oregon Department of Transportation

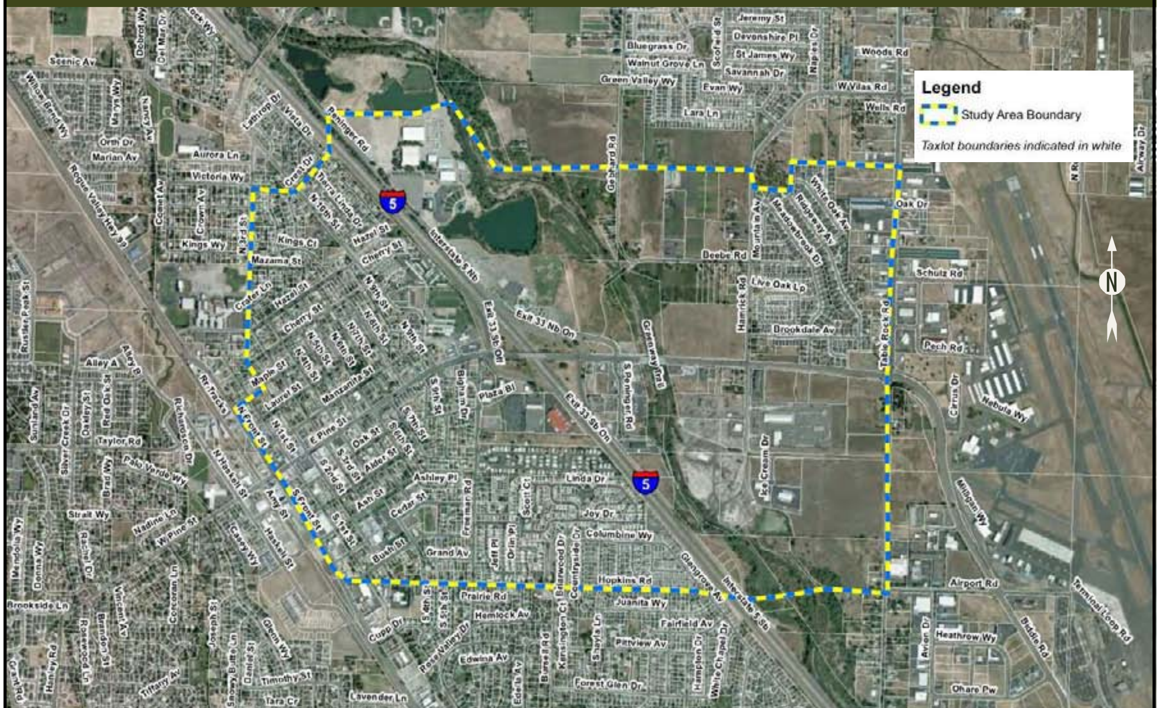
CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

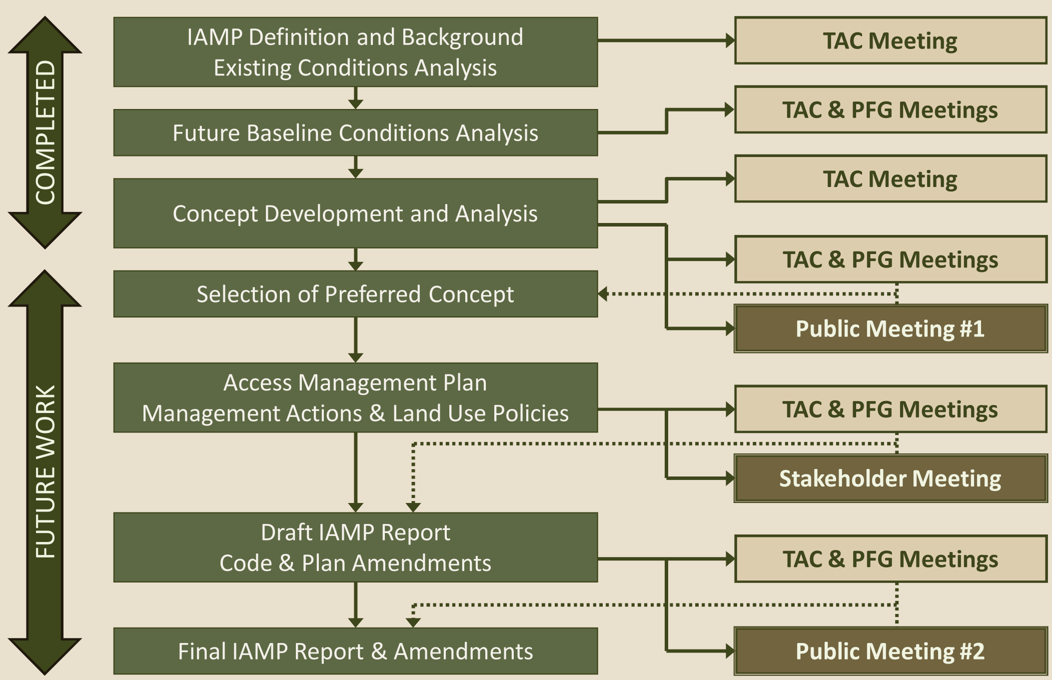
Presentation Topics

1. Project Update
2. Concept Development
3. Concept Analysis
4. Discussion
   - Ideas for modifications to concepts or additional concepts that could be evaluated
   - Input for selection of preferred concepts

IAMP Planning Area



IAMP Planning Process



Traffic Analysis

- Existing Conditions
  - 2010 Traffic Volumes
  - Crash History – 2006 through 2008
- Forecasting Scenarios
  - 2034 Baseline Conditions (RTP)
  - Alternative Land Use Scenario – Sensitivity
    - *Regional Problem Solving (RPS) Land Use Scenario – Discarded because of irregularities in results*
    - *Full build out of lands in the study area*

Future Traffic

- 2034 Future Baseline Condition
  - Based on Regional Travel Demand Model
  - Uses Transportation Network Assumptions from the Regional Transportation Plan

Regional	2009	2034
Population	172,665	248,324
Employment	115,430	150,666

Source: 2009-2034 Regional Transportation Plan

- Alternative Land Use Scenario
  - Assumes build out in study area east of I-5
  - Provides a sensitivity analysis that considers potential areas for development beyond assumptions in the RTP model

Area	2034 RTP	ALUS
Population	5,330	8,690
Housing	1,920	2,990
Employment	2,270	6,720

Future Operations - Baseline Scenario

Scenario	2034 RTP Forecasts	Sensitivity Analysis Forecasts
AM Peak Hour:		
I-5 SB Ramps:	🔴	🔴
I-5 NB Ramps:	🟢	🟢
PM Peak Hour:		
10^{th}/Freeman:	🟡	🟡
I-5 SB Ramps:	🟢	🔴
I-5 NB Ramps:	🟡	🔴
Peninger:	🟡	🔴
Hamrick:	🔴	🔴
Table Rock:	🔴	🔴

🔴 = Expected to Exceed Mobility Standards
🟡 = Expected to be near Mobility Standard Thresholds
🟢 = Expected to meet Mobility Standards

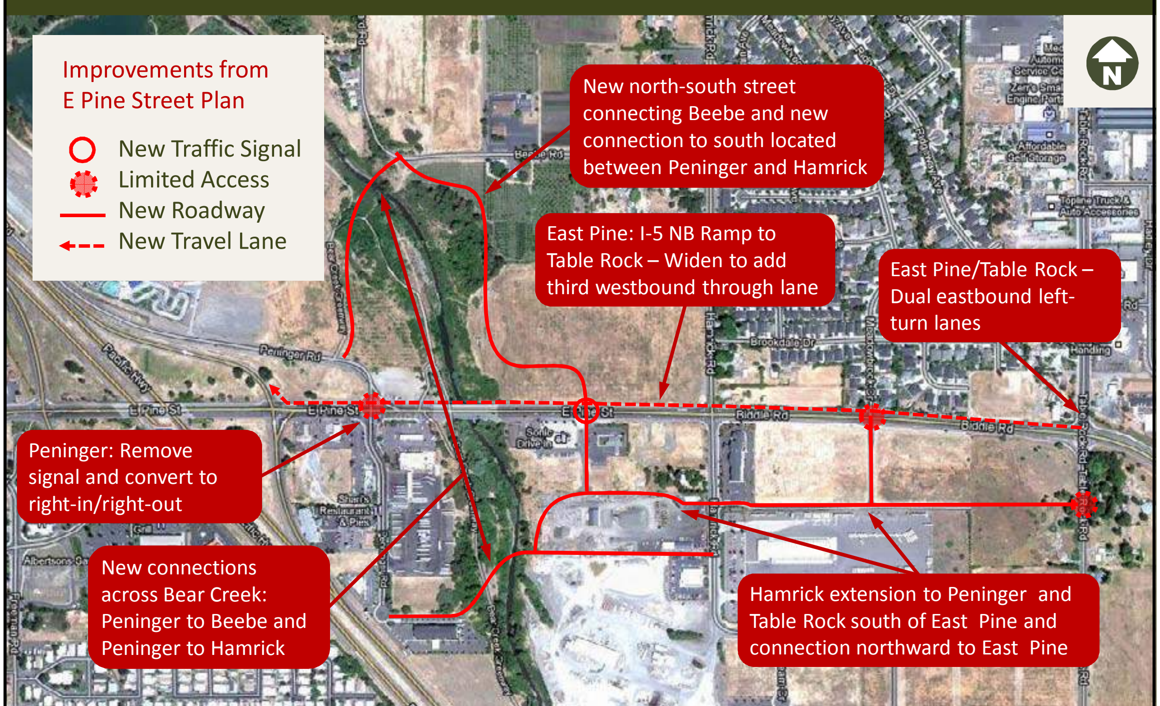
2034 Baseline Scenario – Safety Concerns

- 10^{th}/Freeman, SB Ramps, NB Ramps, Peninger, Hamrick, Table Rock
  - Queue spillover and spillback could result in an increase in collisions especially as drivers encounter stopped traffic or change lanes to avoid stopped traffic
- SB Off-Ramp, NB Off-Ramp
  - Long ramp queues could cause more collisions as traffic exiting the freeway would have inadequate stopping distance
  - Exiting drivers may also slow in the freeway lanes in anticipation of stopping on the ramp
- 10^{th}/Freeman, Jewett School, SB Ramps, NB Ramps, Peninger
  - Inadequate access spacing provides insufficient storage resulting in queue spillover and consequent safety issues listed above
  - Competition for 2-way left-turn lanes could result in head-on collisions

Concept Development

- **Enhanced Network** – Evaluate scenario that incorporates the improvements identified in the E Pine Street Plan
- **Interchange Improvements** – Develop concepts that address deficiencies at the interchange ramps (build on E Pine Street Plan)
- **West Side Improvements** – Address deficiencies west of the interchange (build on 4-lane to 3-lane conversion)
  Note: Focus on area from ramps to 10th Street/Freeman Road
- **East Side Improvements** – Address deficiencies east of the interchange (build on E Pine Street Plan)

Enhanced Network Concept



Enhanced Network Concept Evaluation

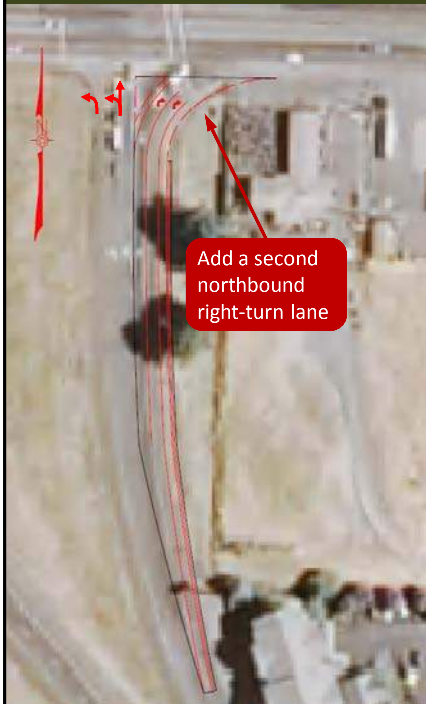
- Traffic volumes in the corridor would go up as capacity becomes available
- Operations would improve at some locations but still would not meet mobility standards
- Queuing would still be present on highway ramps – safety concerns remain
- Queuing between intersections would still be an issue with associated safety concerns

Future Operations – Enhanced Network

Scenario	2034 RTP Forecasts	Sensitivity Analysis Forecasts
AM Peak Hour:		
I-5 SB Ramps:	🔴	🔴
I-5 NB Ramps:	🟢	🟢
PM Peak Hour:		
10th/Freeman:	🔴	🔴
I-5 SB Ramps:	🟢	🔴
I-5 NB Ramps:	🔴	🔴
Hamrick:	🔴	🔴
Table Rock:	🔴	🔴

🔴 = Expected to Exceed Mobility Standards
🟡 = Expected to be near Mobility Standard Thresholds
🟢 = Expected to meet Mobility Standards

Concept I-1: I-5 Northbound Off-Ramp Add Lane



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

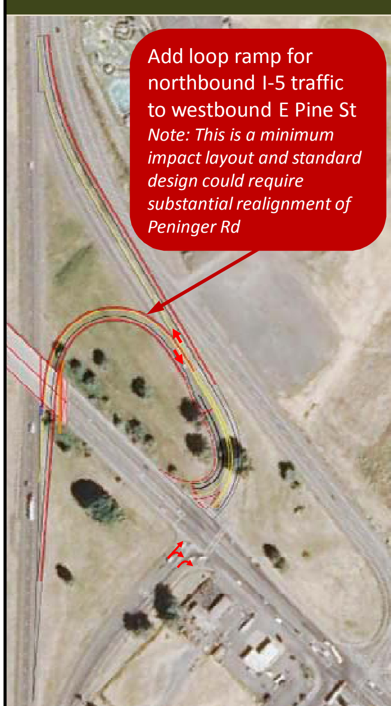
Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Additional storage lane of 350 feet
- Would likely result in some ROW impacts

Environmental & Land Use:
- Likely ROW impacts to adjacent property, especially corner
- Hazmat site near the intersection

Cost Opinion: $1.3 million

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates addition pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):
- Northbound to westbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans to accommodate loop ramp
- Substantial retaining walls needed
- Realignment of existing ramp required
- Non-standard design illustrated to minimize impacts

Environmental & Land Use:
- No substantial concerns

Cost Opinion: $9.7 million

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramps – adequate stopping distance

Basic Roadway Geometry & Right of Way (ROW):
- Storage lane of 150-200' between structure and intersection (could be extended with bridge widening)
- Modification would require design exception
- Some potential ROW on west side of intersection

Environmental & Land Use:
- Some potential ROW needed west of intersection
- Could impact Mingus Creek
- Hazardous materials site near the intersection

Cost Opinion: $1.7 million (no bridge widening)

Concept I-4: I-5 Southbound – Loop Ramp

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramps – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates additional pedestrian conflicts on north side

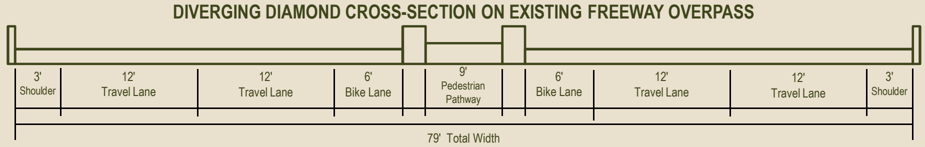
Basic Roadway Geometry & Right of Way (ROW):
- Westbound to southbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans over loop ramp
- Requires extending current ramp further south to maintain access spacing
- Would allow for sidewalk on south side of bridge
- Additional ROW needed
- Non-standard design illustrated to minimize impacts

Environmental & Land Use:
- Substantial ROW impacts adjacent to existing ramp
- Hazardous materials site near the intersection

Cost Opinion: $11.0 million

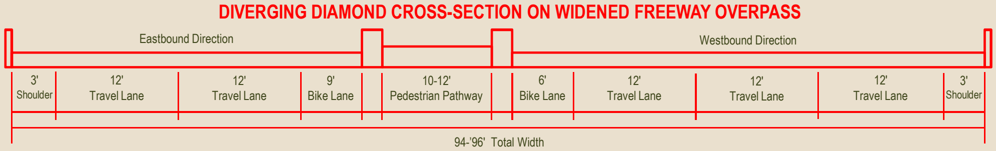
Concept I-5: Diverging Diamond Interchange – No Widening

DIVERGING DIAMOND CROSS-SECTION ON EXISTING FREEWAY OVERPASS



Concept I-6: Diverging Diamond Interchange – Bridge Widening

DIVERGING DIAMOND CROSS-SECTION ON WIDENED FREEWAY OVERPASS



Concepts I-5 & I-6: Diverging Diamond Interchanges

I-5: Diverging Diamond – No Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at west crossover intersection
- Would eventually exceed state mobility standards at east crossover intersection

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Uses existing bridge
- Some realignment of ramps
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: $8.6 million

I-6: Diverging Diamond – Bridge Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at both intersections

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Widens existing bridge or replaces structure
- Some realignment of ramps but more flexibility with structure widening
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: To be determined

Concept I-7: Bridge (Overpass) Widening or Replacement

Combinations of ramp concepts with additional improvements that could be considered to address remaining deficiencies

Interchange Concept Combination	Concept I-7 Improvements
Option 1: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 2: *I-2: NB Off-Ramp – New Loop Ramp* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 3: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-4: SB On-Ramp – New Loop Ramp*	• Add sidewalk to south side of E Pine St which may be accomplished without widening
Option 4: *I-2: NB Off-Ramp – New Loop Ramp* *I-4: SB On-Ramp – New Loop Ramp*	• Consider bridge replacement because combination of significant structural work at either end may require as much work as replacement • Add sidewalk to south side of E Pine St which may be accomplished without any widening

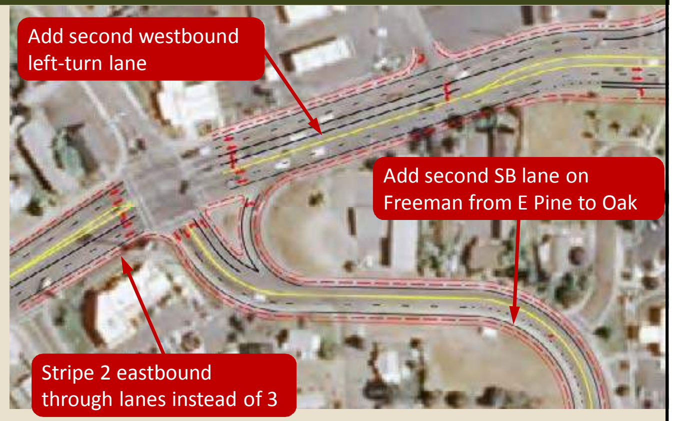
Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards
- Some queuing on north and west approaches

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane and reduce eastbound travel lanes to minimize widening
- Widen Freeman Road to 3 lanes which may require additional ROW
- Some ROW may be needed on E Pine



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman and E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.2 million

Concept W-2: 10th/Freeman – Dual Lefts with Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards
- Some queuing on north approach

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening
- Increased crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane
- Widen Freeman Road to 3 lanes which may require additional ROW
- Additional ROW needed on E Pine

Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman
- ROW impacts on E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.6 million

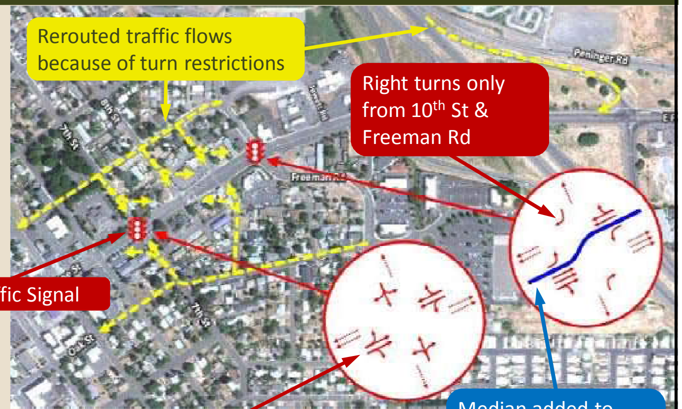
Concept W-3: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and north approaches at 7th Street

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10th may require some widening
- Maintains 4 lanes on E Pine
- Traffic signal at 7th



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

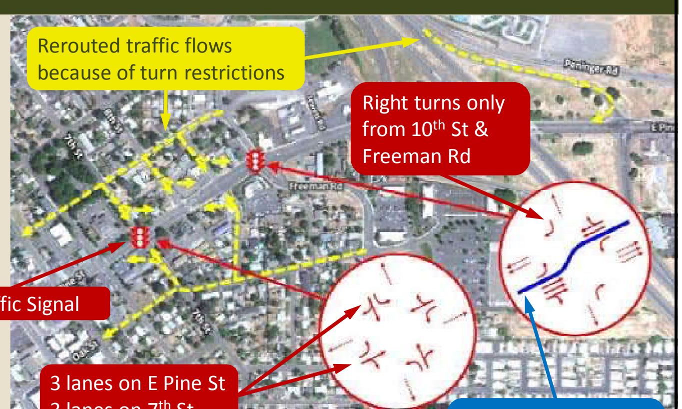
Concept W-4: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and west approaches at 7th Street

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

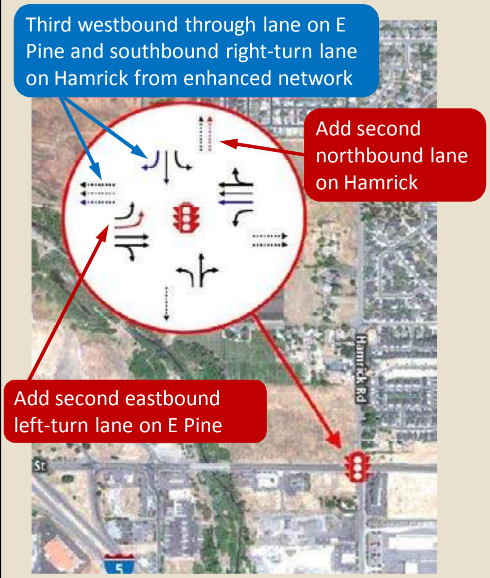
Basic Roadway Geometry & Right of Way (ROW):
- Median installation on E Pine at 10th may require some widening
- Reduces E Pine to 3 lanes
- Widens 7th to 3 lanes – more ROW
- Traffic signal at 7th



Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- ROW impacts to properties along 7th
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

Concept E-1: Hamrick – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards

Safety:
- Reduced congestion and fewer queuing conflicts
- Will increase pedestrian crossing distance

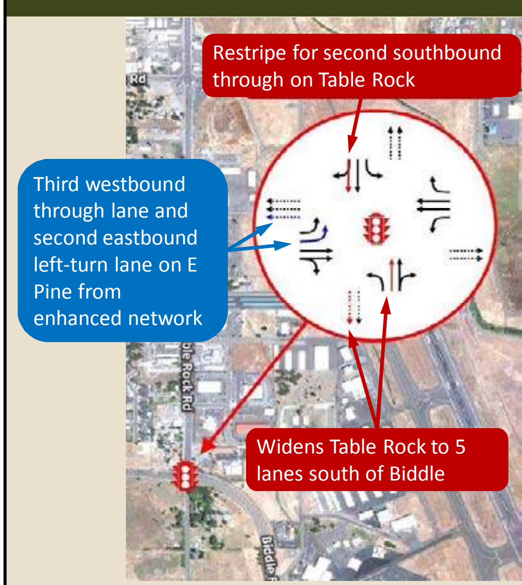
Basic Roadway Geometry & Right of Way (ROW):
- Adds second EB left-turn lane on E Pine
- Adds second NB receiving lane on Hamrick (~700')
- ROW may be needed on E Pine
- ROW needed on Biddle
- ROW may be needed on Hamrick

Environmental & Land Use:
- Some ROW impacts along E/Pine, Biddle and Hamrick

Cost Opinion: Not calculated

Note: Basic road layout not prepared because enhanced network substantially changes the configuration of E Pine east of the freeway.

Concept E-2: Table Rock – Improvements



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards

Safety:
- No safety evaluation was conducted

Basic Roadway Geometry & Right of Way (ROW):
- 5-lane cross-section on Table Rock south of Biddle
- ROW on Table Rock

Environmental & Land Use:
- Some ROW impacts along Table Rock

Cost Opinion: TBD

Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Concept E-3: Hamrick Diversions to Table Rock

Purpose: Improve operations and reduce queuing

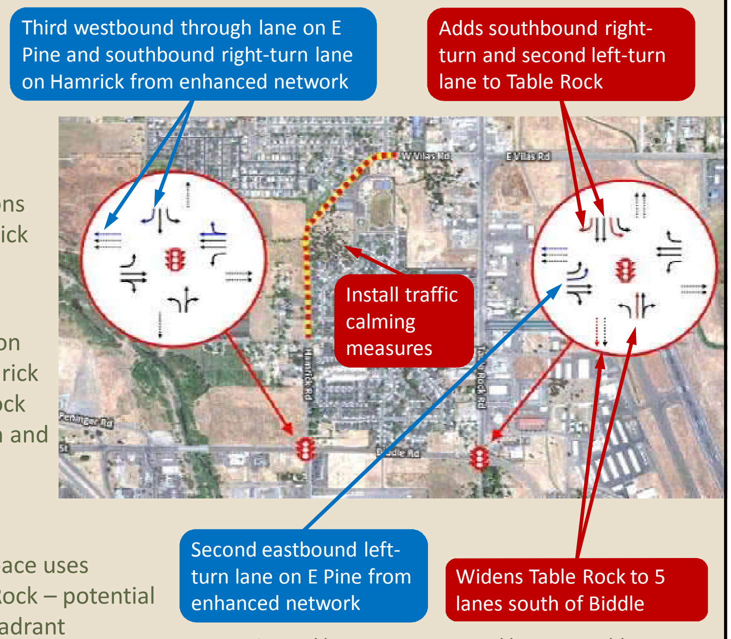
Traffic Operations:
- Meets county mobility standards

Safety:
- Traffic calming and traffic diversions may improve conditions on Hamrick

Basic Roadway Geometry & Right of Way (ROW):
- No changes at Hamrick intersection
- Additional traffic calming on Hamrick
- Adds more turn lanes on Table Rock
- ROW needed on Table Rock north and south of Biddle

Environmental & Land Use:
- Reduced traffic demand in areas zoned for residential and open space uses
- Some ROW impacts along Table Rock – potential structure impact in northwest quadrant

Cost Opinion: Not calculated



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Next Steps

- Analysis of modified or additional concepts
- Selection of preferred concepts
- Access management

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #3

2:00 PM to 4:00 PM

November 6, 2012

Central Point City Hall – City Council Chambers

AGENDA

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1. Introductions	Allie Krull, ODOT Tom Humphrey, Central Point
2. Update on Project Status • Overview of Process • Current Status	Jennifer Danziger, DEA Shelly Alexander, DEA
3. Preferred Alternative • Concepts presented at last meeting • Additional concept considerations	Jennifer Danziger, DEA Shelly Alexander, DEA
4. Protecting the interchange • Access Management Plan • Potential Management Actions	Jennifer Danziger, DEA Shelly Alexander, DEA
5. Next Steps • Schedule-Draft Plan • Upcoming meetings	Jennifer Danziger, DEA Allie Krull, ODOT

INTERCHANGE 33 AREA MANAGEMENT PLAN

Project Focus Group

Meeting #3 - November 6, 2012

Draft Meeting Notes

Attendees: See attached

Introductions and Update on Project Status

Allie Krull (ODOT project manager) welcomed everyone and introduced the consultant team, Jennifer Danziger and Shelly Alexander. Focus group members went around the table and introduced themselves including their affiliation.

Jennifer related that 3 technical memorandums have been drafted since our last meeting: The Preferred Alternative, Access Management Plan, and Management Actions. Comments on these 3 memorandums need to be provided to Allie by November 21. (See slides 1-3 of the attached presentation.)

Preferred Alternative

Jennifer provided a review of the enhanced network and concepts previously presented along with whether or not they were recommended for inclusion in the preferred alternative. Since the past meeting two additional concepts have been added to address bicycle and pedestrian deficiencies at/on the bridge. Concept A-1 considers replacement of the bridge railing to provide sufficient space for a sidewalk along the south side of the bridge. Concept A-2 considers installation of a bicycle signal at the southbound ramp terminal for eastbound cyclists.

Highlights for the overall operations include all intersections meeting mobility standards with the 2034 RTP forecasts and only two intersections exceeding standards for the ALUS forecasts. ALUS forecasts provide an assessment of sensitivity to more rapid development and are not anticipated to be an issue for the IAMP. (See slides 4-22.)

Additionally, the analysis also answered two phasing questions and provided recommendations to related TSP project descriptions and timing:

1. What happens if the enhanced network improvements are not implemented within the 20-year planning horizon?
2. What transportation system management measures can be done before substantial capital investments must occur? (See slides 23-24.)

Protecting the interchange

Jennifer provided an overview of the access management goals and applicable standards specific to interchange 33. Goals have recently been updated and grandfather in approach in existence prior to January 1, 2012. In the case of private approaches three instances can trigger review of an approach: new approach road is requested, infill re/development, or a roadway project. Any of these occurrences will result in a department determination of desirable access spacing along the identified section of roadway. (See slides 25-28.)

Technical Memorandum #6 (Access Management) includes an inventory of existing approaches (both public and private) as well as assessing access spacing. Jennifer shared access management techniques with the group to address the large number of accesses near the interchange and identified potential implementation triggers that are found in the access plan. She tied the two elements (existing spacing deficiencies and techniques to move in the direction of the desired spacing) together with the Access Management Plan Actions graphic and descriptions. (See slides 29-35.)

Discussion

- Liquefied natural gas (LNG) now available on the south side of Peninger. Development included ½ street improvements.
- Enhanced improvements (assumed in the baseline network) do not have identified funding.
- How long will the interchange improvements last? *Jennifer indicated that the improvements should last 20-40 years (which includes consideration of the ALUS projections).*
- When will the 10th/Freeman intersection improvements be needed? *Jennifer indicated that the improvement is probably 10-15 year down the road.*
- Tom mentioned that the Hamrick Road improvements are identified in the 2008 City Plan, but that may not be what's best for the community. Jennifer noted that the current signage to I-5 on Vilas Road directs traffic along Vilas/Hamrick, not Table Rock.
- Members questioned the effect of traffic calming versus limiting the timing on the left-turn phase. *Jennifer noted that restricting timing will redirect some traffic to other intersections because people will only wait so long at a signal.*
- Members expressed interest in the sidewalk improvements and liked the opportunity to incorporate aesthetic improvements (e.g., flags, banners) to represent the City and Fairgrounds exit.
- Members noted that if/when Peninger becomes right-in/right-out thought should be given to the length of the reroute and financial (gas) cost to trucks and others destined to the west.
- Is there a list of recommended projects? *Shelly indicated that TM 5 includes the recommended projects.*
- How did the improvements (and associated costs) that are recommended as part of the preferred alternative compare to what we originally thought might be needed? *Jennifer responded that the recommended projects and associated costs are less than we expected. The project list is "doable", which is good.*

- Limited growth was assumed at the Jackson County EXPO for the analysis because not a lot of information was available. *Jennifer noted that depending on the type of use, peak traffic periods may or may not be affected.*
- The group inquired if the number of users is known for both IC 33 and IC 30. More specifically, they are interested if IC 33 has seen an increase in volume since the IC 30 improvements. Jennifer and Tom both indicated that this type of information is not known and there is no easy way to collect it. Members asked if an airport survey could help.
- Sidewalk provision along the south side of the bridge could provide an opportunity to partner with the City to create “personality” for the interchange.

Next Steps

DEA will present these concepts at the public open house on November 6, 2012 and follow-up with a TAC meeting on November 7, 2012.

The meeting minutes will include a copy of the today’s presentation. Comments/input on the concepts or on the Tech Memos are due to Allie Krull the ODOT PM by November 21. DEA will use the comments and data from the previous 7 technical memorandums to draft the IAMP 33 report. The draft report is anticipated by January 1, 2013.

We have the option to hold additional meetings to review the draft report if committee members think this is desirable. Comments will be solicited on the draft report and rolled into the final report to be delivered in the spring.

There will be the opportunity for additional public review during the adoption process.

Attachments:
PFG PowerPoint Presentation Slides
Copy of Attendance Sheet

Interchange 33 Area Management Plan (IAMP 33)

Project Focus Group

Central Point City Hall
Council Chambers
140 S. Third Street
Central Point, OR

November 6, 2012
ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Allie Krull	ODOT	541.957.3635	allie.krull@odot.state.or.us
Barry Robino	Grange Co-op	541-664-1261	barry@grangecoop.com
Tammy Conn	Fairground Chevron	541 664 4218	FairChev@qwestoffice.net
Rod Bell	Same as above		
DAVE RAINEY	ROADWAY	541-821-1706	DAVE.RAINEY@USFC.COM
TOM HUMPHREY	CITY OF CENTRAL POINT	541-423-1025	tom.humphrey@centralpointoregon.gov

I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

Project Focus Group Meeting #3
November 6, 2012

Oregon Department of Transportation

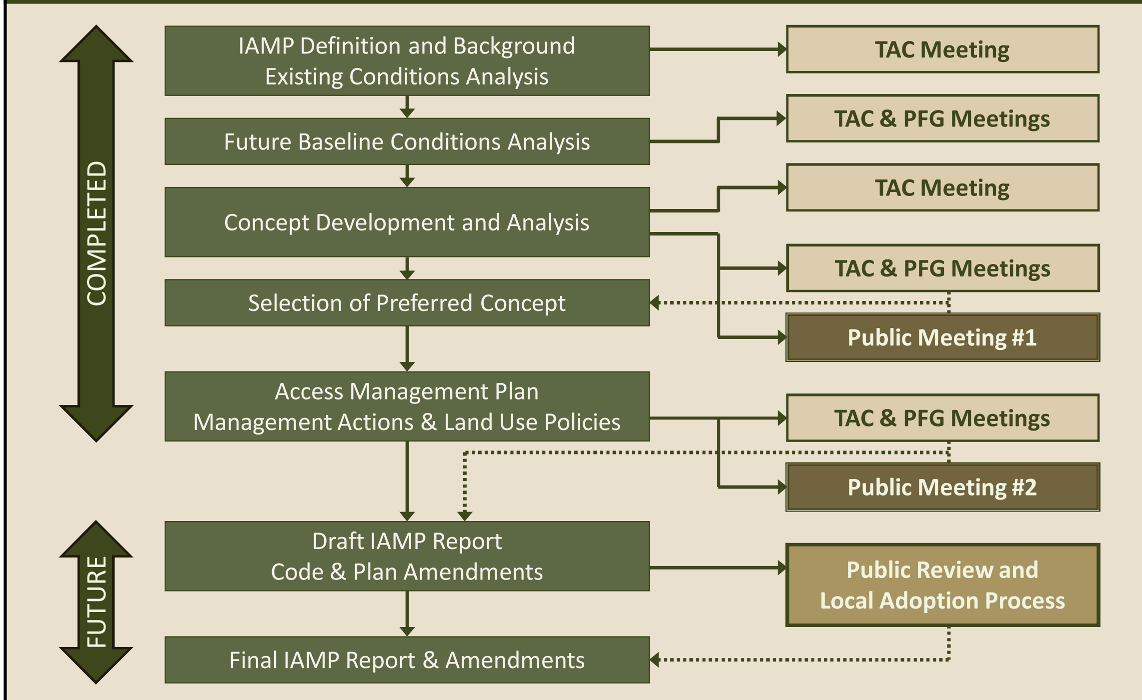
CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

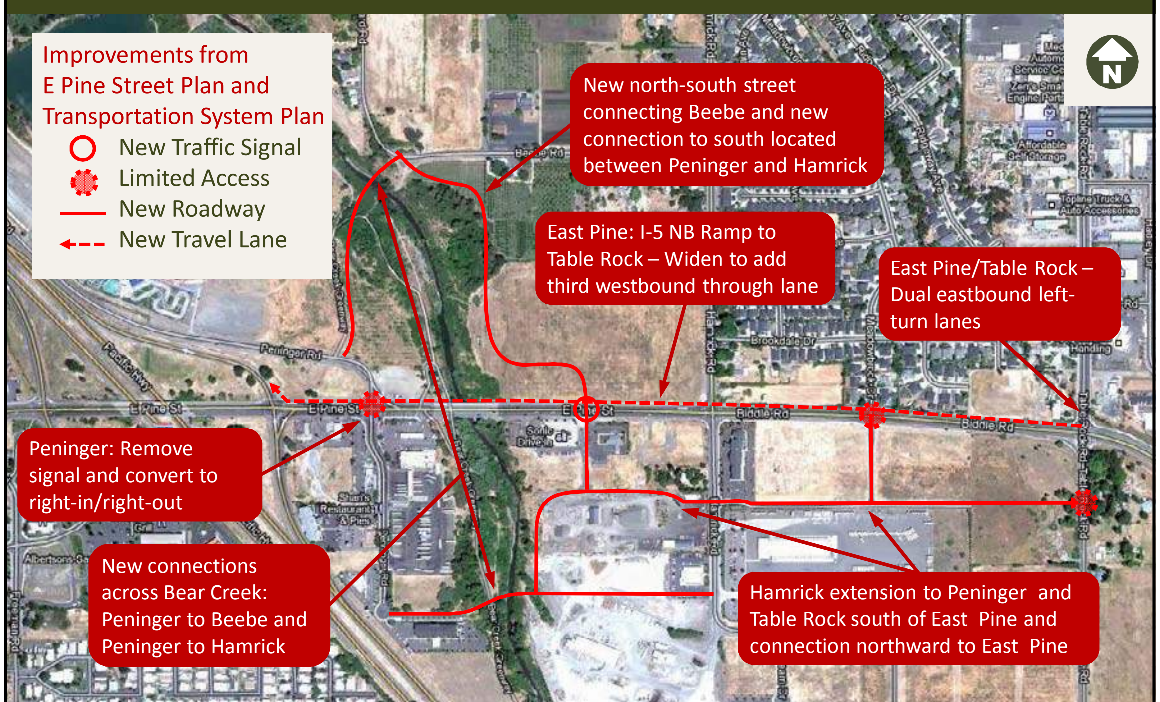
Presentation Topics

1. Project Update
2. Preferred Alternative
3. Protecting the Interchange
   – Access Management
   – Other Management Actions
4. Discussion

IAMP Planning Process



Enhanced Network Concept



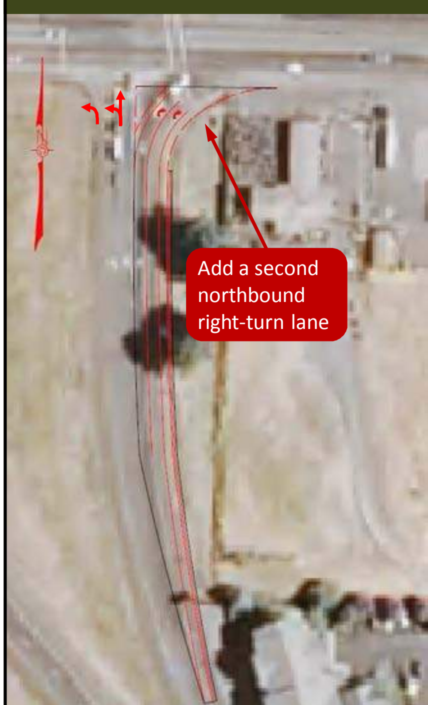
Enhanced Network Concept Evaluation

Recommended: Yes

Highlights:

- Many of these projects are Tier 2 projects with no clear funding available
- Need to consider how the timing of project completion could affect other elements of the IAMP

Concept I-1: I-5 Northbound Off-Ramp Add Lane



Recommended: Yes

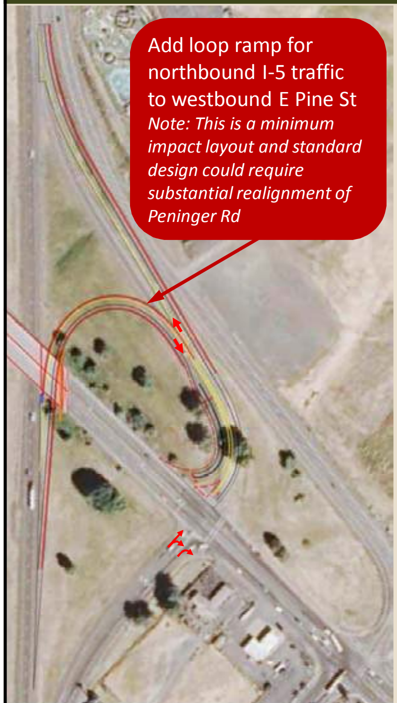
Highlights:

- Addresses queuing concerns to maintain safe operations on northbound off-ramp
- Provides additional capacity

Priority:

- Medium to low priority
- Manage ramp queues with signal timing until implemented

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp

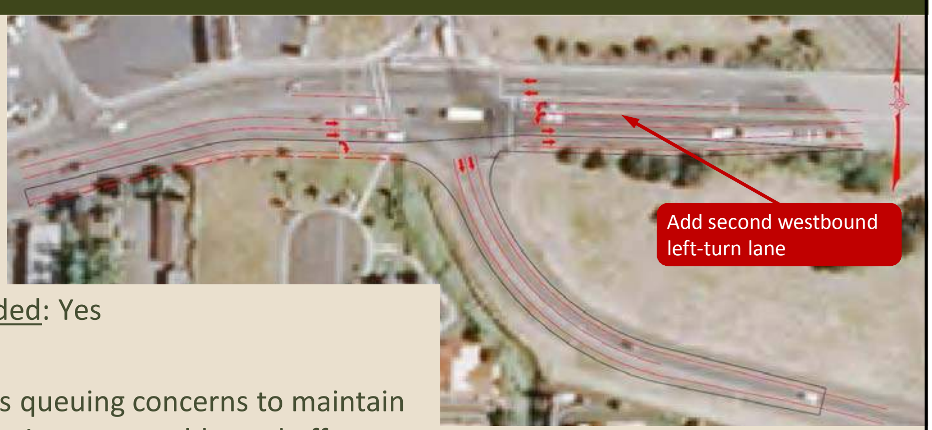


Recommended: No

Highlights:

- Very expensive even with minimum impact layout
- Impacts could be greater with standard design
- Concept I-1 has greater safety benefits

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes



Recommended: Yes

Highlights:

- Addresses queuing concerns to maintain safe operations on southbound off-ramp
- Provides additional capacity

Priority:

- Medium to low priority
- Manage ramp queues with signal timing until implemented

Concept I-4: I-5 Southbound – Loop Ramp

Recommended: No

Highlights:

- Very expensive even with minimum impact layout
- Impacts could be greater with standard design
- Concept I-3 has greater safety benefits

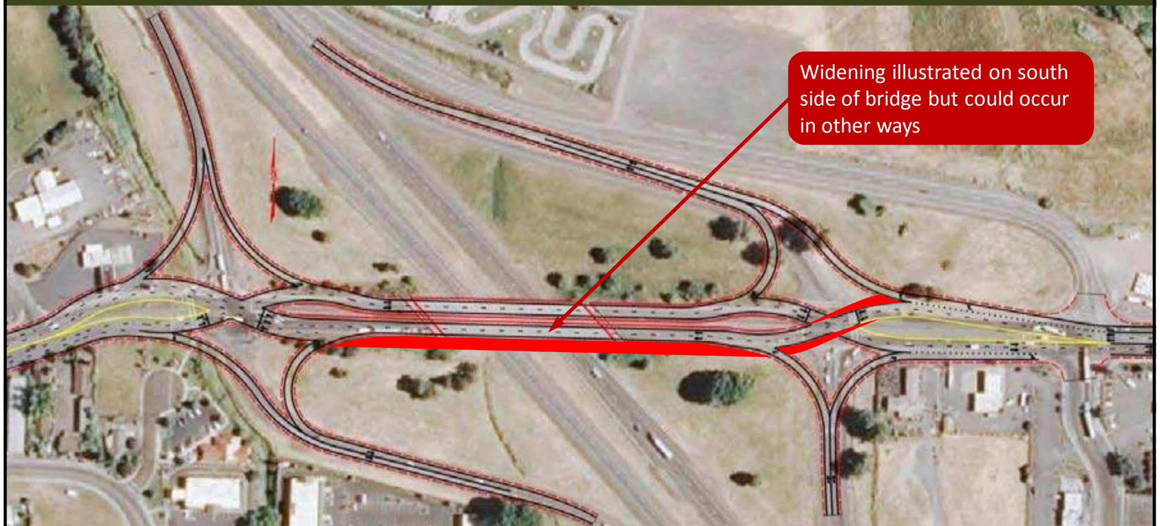
Concept I-5: Diverging Diamond Interchange – No Widening

Recommended: No

Highlights:

- Doesn’t meet operational needs
- Very expensive with high impacts

Concept I-6: Diverging Diamond Interchange – Bridge Widening



Recommended: No

Highlights:

- Doesn't meet operational needs
- Very expensive with high impacts

Concept I-7: Bridge (Overpass) Widening or Replacement

Combinations of ramp concepts with additional improvements that could be considered to address remaining deficiencies

Recommended: Pursue Concept I-1 & I-3 Combination

Highlights:

- See Concept A-1 under additional improvements

Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening

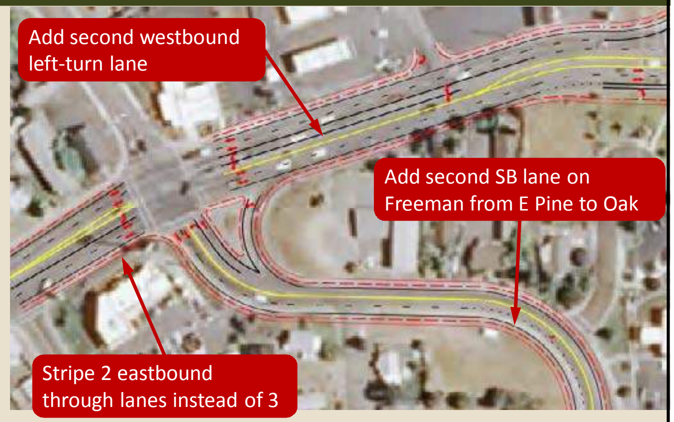
Recommended: Yes

Highlights:

- Addresses queuing concerns in westbound direction that could impact the I-5 southbound ramp terminal
- Adds capacity to intersection
- Will need to be combined with access management
- Fewer impacts than Concept W-2

Priority:

- Medium to low priority

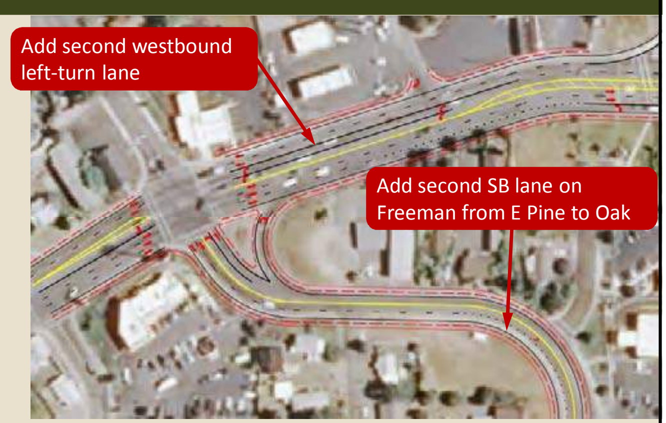


Concept W-2: 10th/Freeman – Dual Lefts with Widening

Recommended: No

Highlights:

- Addresses concerns but with greater impacts than Concept W-1

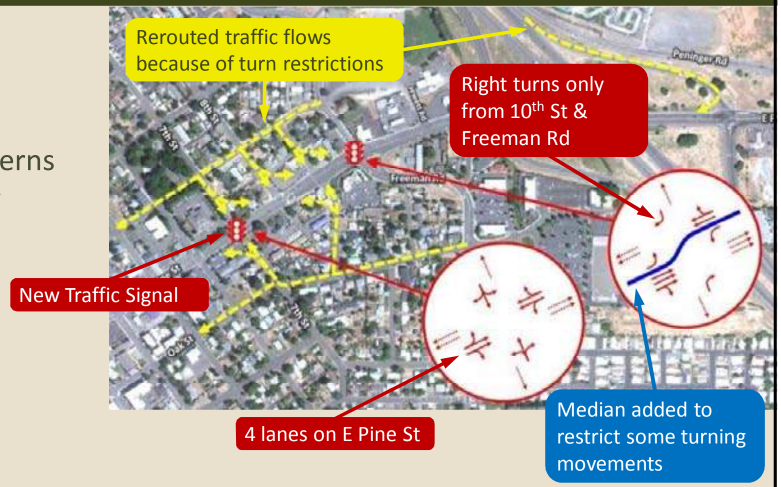


Concept W-3: 10th/Freeman & 7th – Turn Restrictions

Recommended: No

Highlights:

- Change in traffic patterns would have generally adverse impacts on neighborhoods and downtown

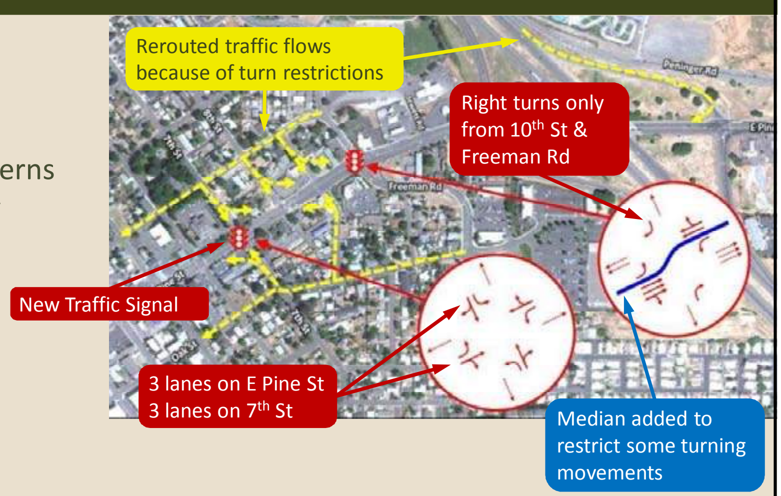


Concept W-4: 10th/Freeman & 7th – Turn Restrictions

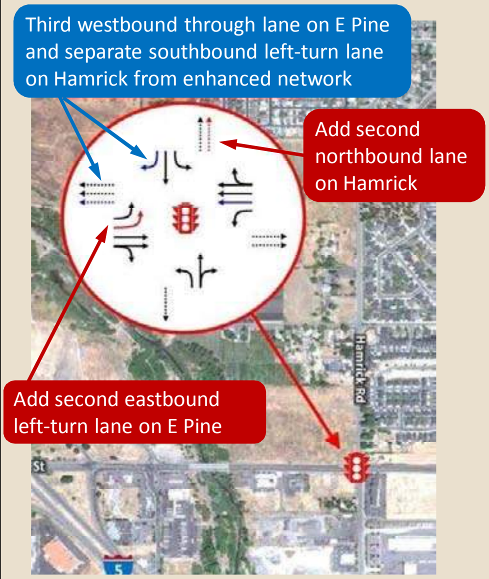
Recommended: No

Highlights:

- Change in traffic patterns would have generally adverse impacts on neighborhoods and downtown



Concept E-1: Hamrick – Dual Left-Turn Lanes

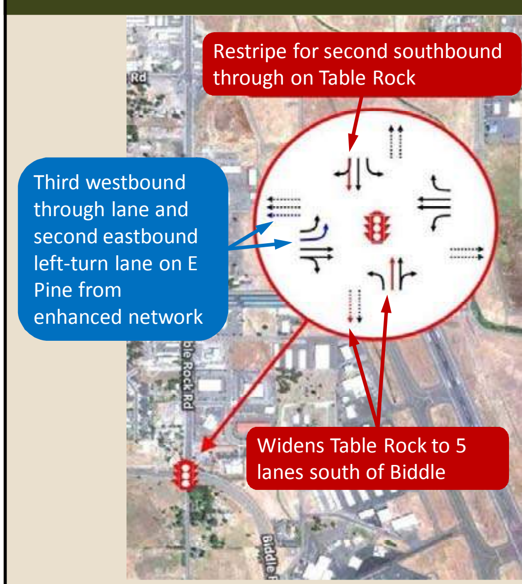


Recommended: Not as part of IAMP

Highlights:

- Dual eastbound left-turn is currently recommended in Central Point Transportation System Plan (TSP)

Concept E-2: Table Rock – Improvements



Recommended: Not as part of IAMP

Highlights:

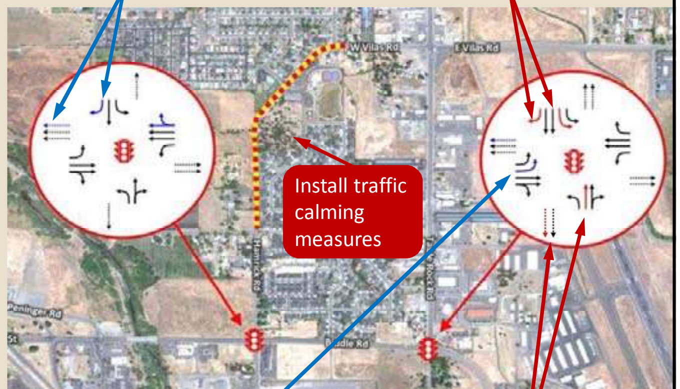
- Outside IAMP planning area
- Defer to local TSP process

Concept E-3: Hamrick Diversions to Table Rock

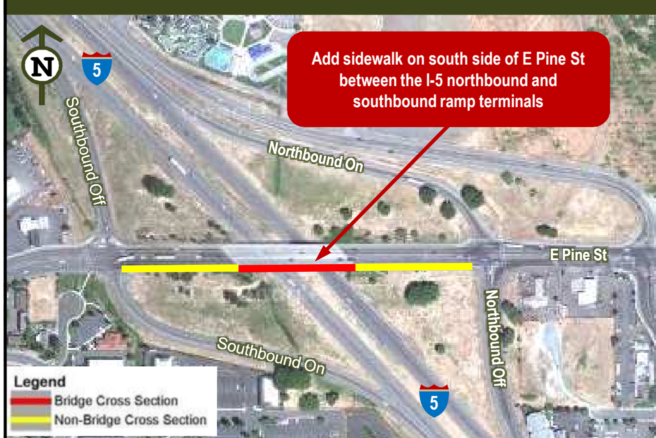
Recommended: Not as part of IAMP

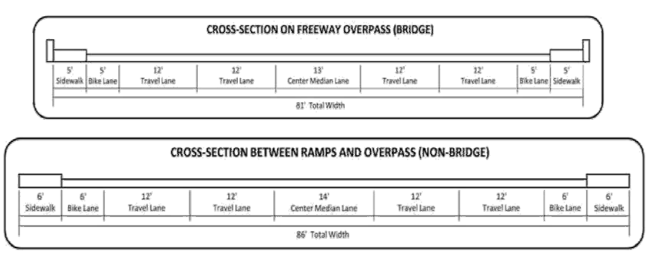
Highlights:

- Dual eastbound left-turn at Hamrick Rd is currently in Central Point TSP – would need to be removed with update
- Table Rock Rd is outside IAMP planning area
- Defer to local TSP process



Concept A-1: South Sidewalk





Description: Concept A-1 considers adding a sidewalk on the south side of E Pine Street between the northbound and southbound ramp terminals

Purpose: Address the existing pedestrian network deficiency

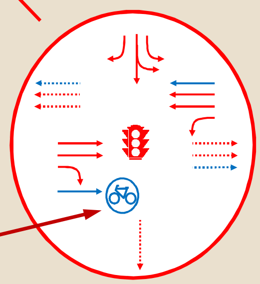
Evaluation: Bridge railing on south side can be replaced to allow for wider cross-section (81 feet vs. 79 feet) and 5-foot sidewalk can be added with some minor reductions in travel and bike lane widths at an estimated cost of $1.2 million

Recommended: Yes – High to medium priority

Concept A-2: Bike Lane Improvements

Existing Bicycle Signal in Portland

Install a bicycle signal on the eastbound approach to reduce conflict between bicycles and right-turning vehicles



Description: Concept A-2 considers adding a bicycle signal at the I-5 southbound ramp intersection to address the conflict between vehicles and bicyclists in the eastbound direction

Purpose: Address the existing safety concern for bicyclists

Evaluation: Bike signal would create bicycle phase that stopped eastbound right turn when activated with sensors or pushbutton with minimal impact to traffic flow at an estimated cost of $25,000

Recommended: Yes – High priority

Future Operations with Improvements

Operations with recommended improvements

- All improved intersections would meet mobility standards with the 2034 RTP forecasts
- Two intersections would exceed mobility standards with the ALUS forecasts
  - ALUS forecasts are only intended to provide a sensitivity analysis to address more rapid development → this result is not anticipated to be an issue for the IAMP

Project Phasing

Two phasing questions need to be answered:

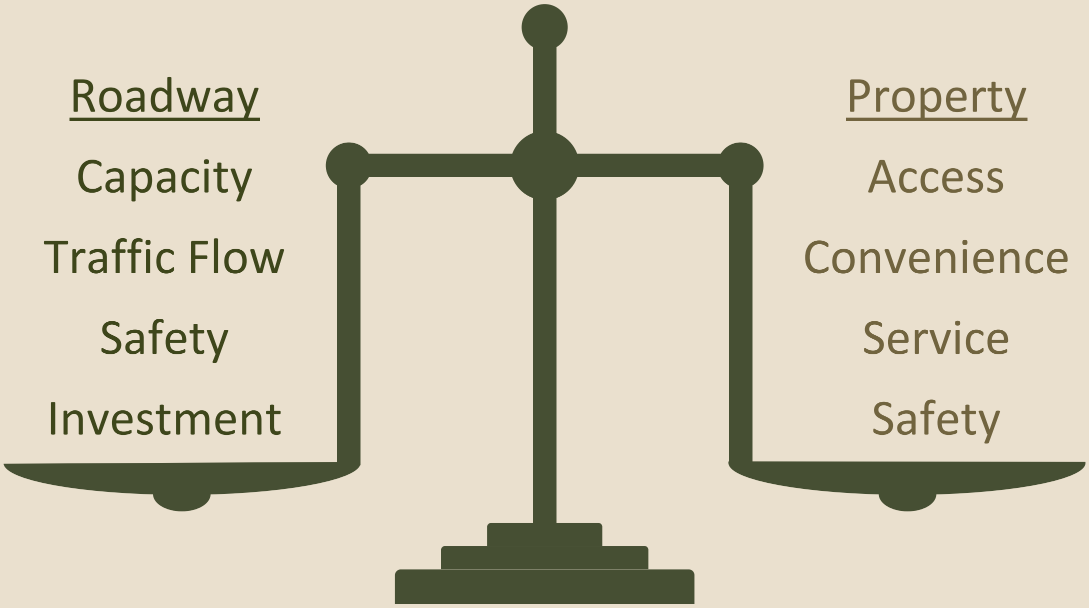
- What happens if the enhanced network improvements are not implemented within the 20-year planning horizon?
  - Intersections with the IAMP recommended improvements would meet mobility standards
  - Hamrick Rd intersection would have capacity and queuing issues without dual left-turn lane
  - Peninger Rd intersection would remain signalized and would meet the mobility standard but would have some long queues
- What transportation system management measures can be done before substantial capital investments must occur?
  - Manage signal timing at ramp terminals for safety
  - Modify signal timing and phasing to maximize safety
  - Restripe travel lanes
  - Restrict accesses to right-in/right-out movements only

Recommendations Related to TSP

Table 5-4. Summary of Related Central Point TSP Projects

Central Point TSP Project	Comments and Recommendations
Tier 1 TSP Projects	
TSP #216 – E Pine St & Hamrick Rd	No changes recommended Project should be reconsidered with update to TSP but without this project, modified projects #236 and #233 may be necessary to meet mobility standards at the E Pine St/Hamrick Rd intersection
Tier 2 TSP Projects	
TSP #233 – E Pine Street: Hamrick Rd to Bear Creek Bridge	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented after modified #236 and prior to modified #255
TSP #234 – E-W Hamrick Rd extension (south of E Pine St)	No changes recommended
TSP #236 – E Pine Street: Bear Creek Bridge to Peninger Rd	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented prior to modified #233 and modified #255
TSP #240 - Peninger Rd Extension, South	No changes recommended
TSP #245 – Peninger Rd Project	No changes recommended Interim TSM measures could address operations until this project and project #240 are constructed
TSP #255 – E Pine St: I-5 to Table Rock Rd	Modifications to project description are recommended (see Tech Memo #5) Project should be implemented after modified #233 and modified #236
TSP #916 – I-5 & E Pine St, SB Off-Ramp	Delete project and replace with IAMP project at I-5 southbound ramp terminal
TSP#917 – I-5 Central Point Interchange (Exit 33)	Delete project
TSP #918 – I-5 & E Pine St, NB Ramp	Delete project and replace with IAMP project at I-5 northbound ramp terminal

Access Management



Oregon Highway Plan and Division 51

- Oregon Highway Plan addresses access management in Goal 3
  - Supporting policies regarding classification and spacing standards, medians, interchanges, deviations, and appeals
  - Appendix C: Access Spacing Standards
  - Revised to address Senate Bill 264 which suggested revisions to Oregon's management of access on state facilities
- Oregon Administrative Rule (OAR) 734-051 (Division 51)
  - Detailed requirements, action definitions, and the access spacing standards for state facilities

Access Spacing Standards

Table 6-1. Access Spacing Standards

Segment Characteristic	Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
Distance from off-ramp to first approach on the right, right-turn movements only	750 feet[2]
Distance from off-ramp to first intersection where left turns are allowed	1320 feet[2]
Distance from last approach road to the start of the taper for the on-ramp	1320 feet[2]
Distance from last right in/right out approach road to the start of the taper for the on-ramp	750 feet[2]
Other Public/Private Access Points	
Central Point - Urban Business District (Speed: 25-35 mph)	350 feet[3]
Jackson County - Arterial (Minor and Major)	300 feet[4]

Notes:

1. Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the developable frontage area are developed at urban densities and many have driveways connecting to the crossroad. See definition in the Oregon Highway Plan.
2. Table 18 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads
3. City of Central Point Transportation System Plan.
4. Jackson County Transportation System Plan.

Private Approaches

OAR 734-051-4020, Standards and Criteria for Approval of Private Approaches:

(8)(c) The spacing standards in Tables 3 through 6 do not apply to approaches in existence prior to January 1, 2012, except when:

(A) A new approach road is requested or an existing approach permit is subject to change of use under ORS 374.312; and

(B) Where infill development or infill redevelopment occurs the approach road spacing standards will be a department determination; the department shall determine whether the approach road spacing or safety is improved by moving in the direction of the spacing standards in Tables 3 through 6; and

(C) Where a highway or interchange project occurs the approach road spacing standard will be a department determination; the department shall consider whether the approach road spacing or safety is improved by moving in the direction of the applicable spacing standards in Tables 3 through 6.

Existing Access Inventory

- Inventory
  - Public street intersections
  - Public/private approaches
  - 70 accesses from 7th Street to Table Rock Rd
    - 30 on the north side
    - 40 on the south side
- Access spacing along segments assessed
  - 30 accesses within 1,320 feet (1/4 mile) of interchange ramps
  - Few driveways meet Central Point or Jackson County spacing standards

Access Management Techniques

- Controlling Intersection Spacing
  - Improved flow, less congestion
- Managing Driveway Spacing
  - Fewer conflicts, more orderly traffic flow
- Adding Turn Lanes
  - Separates turning and through traffic
- Installing Median Treatments
  - Separates turning traffic, can restrict some movements
- Improving the Local Street Network
  - Alternative access and routes available

Access Management Implementation

Access management actions would be taken when one or more of the following triggers occurs:

- Applications for land use changes or development are submitted
  - Example: *"Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street."*
- Future roadway improvements move into design and construction
  - Example: *"Right-turn deceleration lanes should be considered when a new signalized intersection is constructed on E Pine (between Peninger and Hamrick)."*
- Safety and or operational problems arise
  - Example: *"Consolidation or closure of driveways should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT Safety Priority Index System (SPIS) rating in the top 10 percent."*

Access Management Plan Actions

Access Management Plan Actions

E Pine St from 10th St to I-5 Southbound Ramp Terminal

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
2. Expand the local street network.

E Pine St from I-5 Northbound Ramp Terminal to Peninger Rd

3. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
4. Expand the local street network.
5. Evaluate traffic control, potential turn limitations, left-turn lane, and right-turn lane needs for the Peninger Road intersection.

E Pine St from Peninger Rd to Hamrick Rd

6. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
7. Expand the local street network.

Potential Management Actions

Management actions are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange
- **Transportation Demand Management Strategies** that provide travel options to reduce the number of trips or vehicles on the road
- **Transportation System Management Measures** that improve system efficiency and reduce delays
- **Land Use and Development Strategies** that guide land use development to result in fewer trips in the interchange area

Recommended Actions

- **ODOT and Central Point:** Enhance the local street network to support future development and address access in the vicinity of the interchange.
- **ODOT:** Adopt an Access Management Plan for the Interchange 33 area.
- **Jackson County and City of Central Point:** Implement Transportation Demand Management strategies in cooperation with other jurisdictions within the RVMPO.
- **ODOT:** Apply Transportation System Management measures when adding traffic signals to the system.
- **Jackson County and City of Central Point:** Retain, through adoption of the IAMP, current adopted Jackson County Comprehensive Plan and Land Development Ordinance designations and regulations

Next Steps

- Prepare Draft IAMP for I-5 Exit 33
  - End of 2012
  - Review period
  - Final round of meetings
- Finalize IAMP for I-5 Exit 33
  - Spring 2013
  - Additional agency coordination/outreach through ODOT

APPENDIX C.

Public Open House Meeting Materials

Interchange 33 Area Management Plan (IAMP 33) Open House

Central Point City Hall
Council Chambers
140 S. Third Street
Central Point, OR

FEBRUARY 16, 2012
ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Joe Thomas	Self	665-4878	tomus4488@msn.com
Mike Duncan	Duncan Development	941-8990	mikeduncan@me.com
Jim McKee	Cornitius LLC	5417739995	mckee113@msn.com
Greg Hayes	Colvin Oil	541-660-0786	
Bob Doggett	Resident C.P.	541)664 6119	bbdoggett@MSN.com
Jason Richmond	City of CP	541 664 3321	
Bern Case	Airport	776-7222	On file
Earl Wood	Jackson At Large	541 840 2447	—
Don Pfaff	Self	541-941-4288	DRSLPfaff@charter.net
John [illegible]	Self	664-3518	—
Kay Harrison	City	621-0176	
Tom Humphrey	City	541-423-1025	On file

I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

WELCOME

Open House – February 16, 2012

Oregon Department of Transportation

CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2034
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Jackson County, and Central Point

Why do an IAMP for Interchange 33?

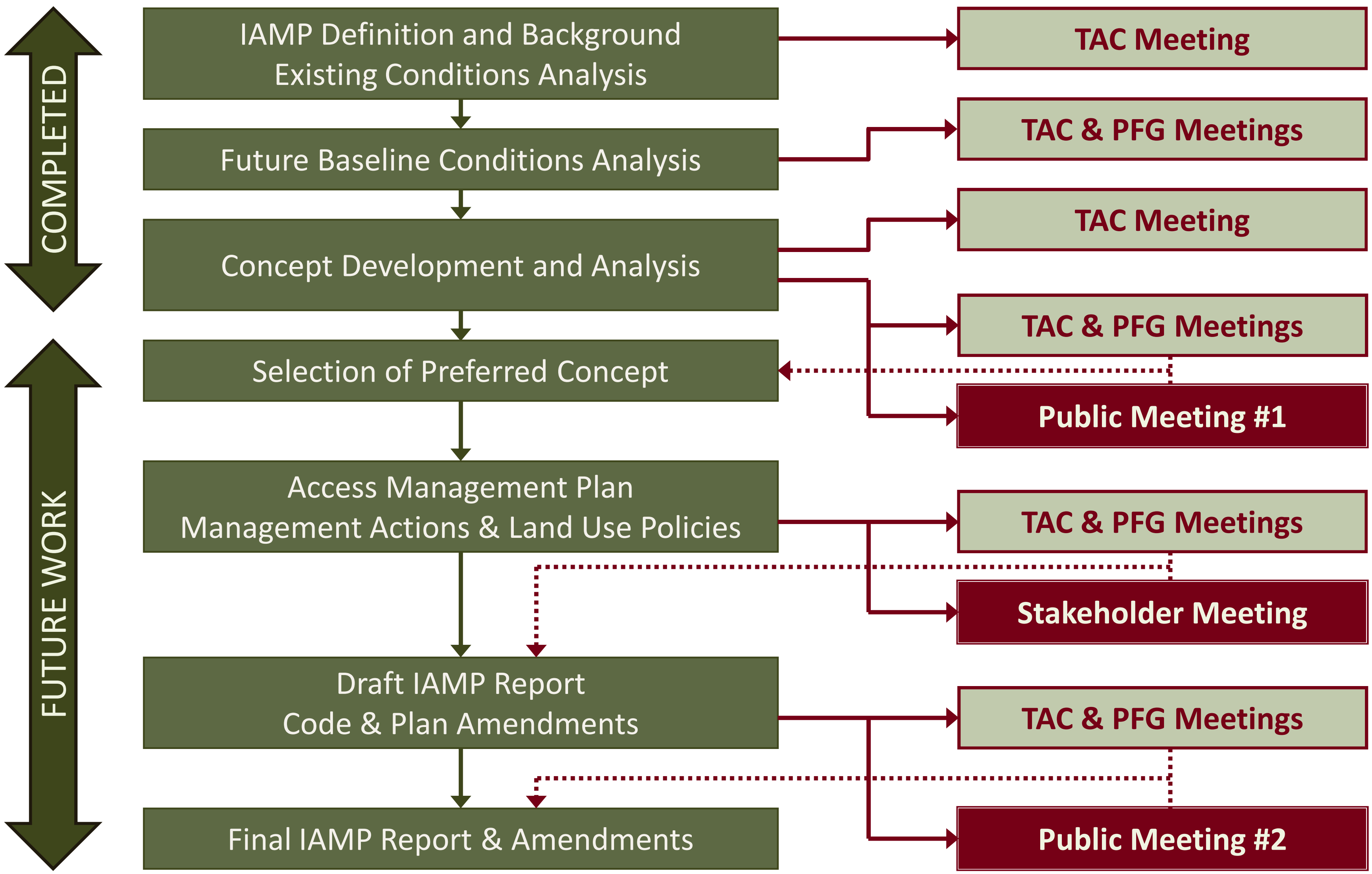
- Increasing demand at the interchange
  - Population growth forecast of almost 60% over the next 20 years
  - Urban Reserve locations north and east of the project were identified in the Greater Bear Creek Valley Regional Plan
- Interchange and roadway network characteristics
  - Substandard intersection spacing near ramp terminals
  - National Highway System intermodal connector from I-5 to OR 62
  - Downtown grid system to west
- Traffic Concerns
  - High truck volumes to and from the east
  - Cars and trucks queuing between closely spaced intersections
  - Weaving movements between nearby access roadways and ramps
  - Safety on ramps and at other locations

IAMP Goal & Objectives

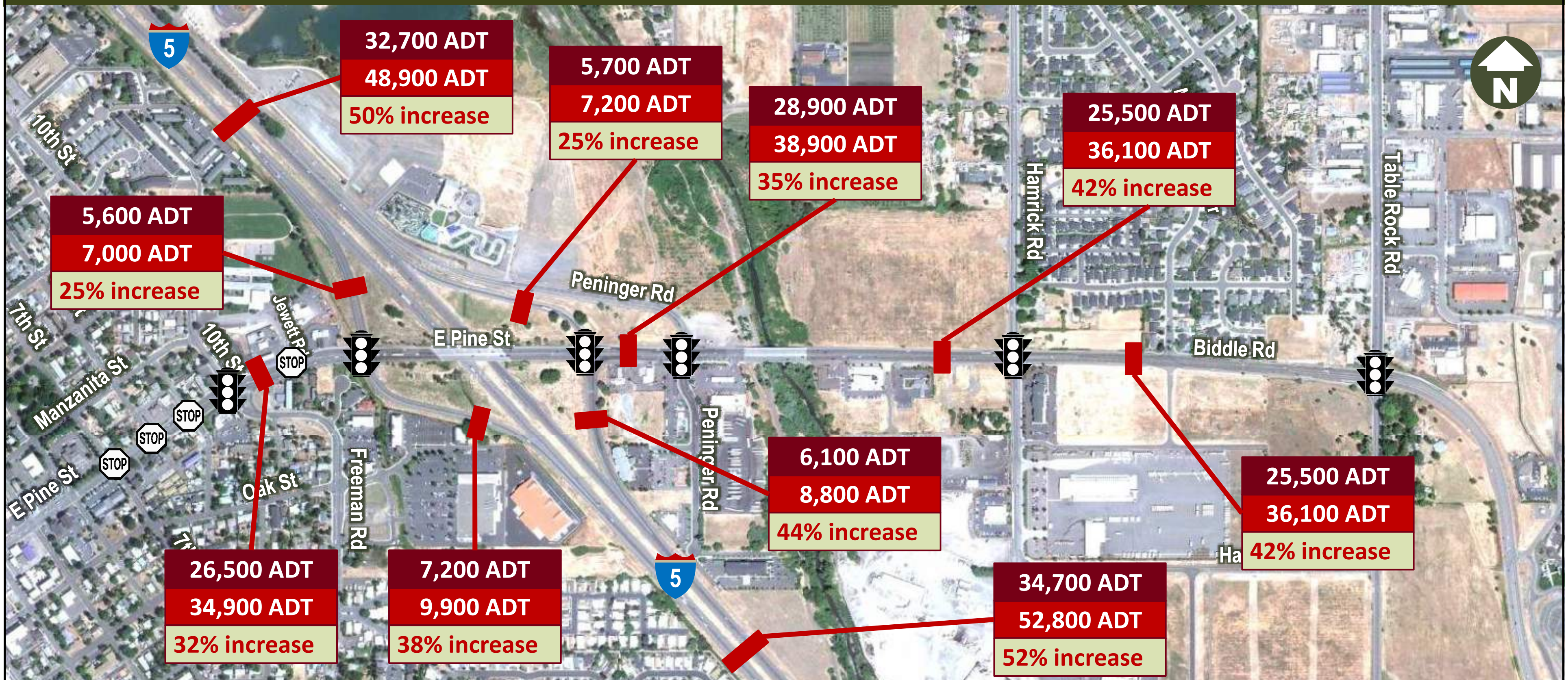
Develop a plan for improvements for Interchange 33 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of Central Point and other Rogue Valley communities.

- Protect the function of the interchange and East Pine Street
- Develop concepts to improve safety and maximize efficiency
- Base improvements on adopted land use plans of Central Point and Jackson County
- Develop an access management plan for safe and acceptable operations

IAMP Planning Process



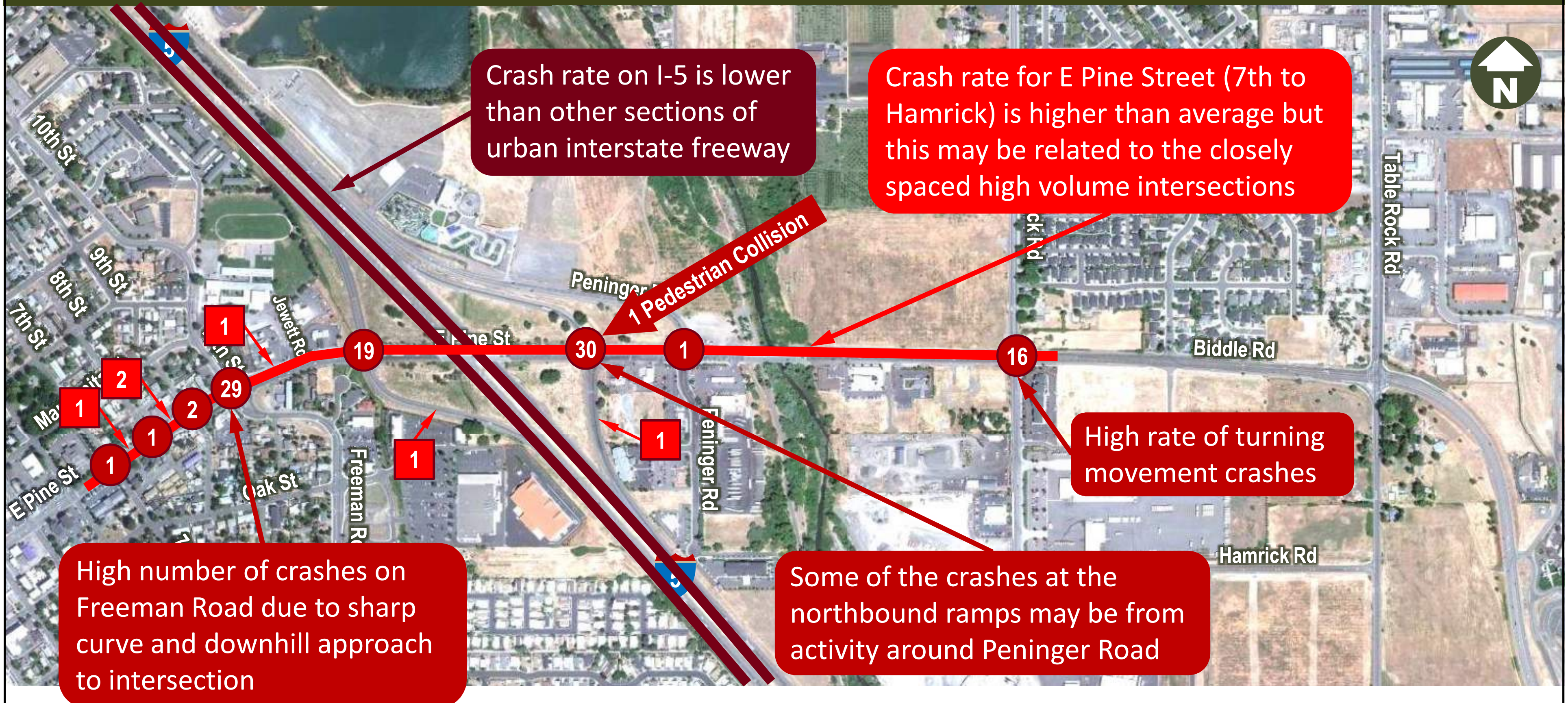
Average Daily Traffic Volumes



LEGEND

2009 or 2010 Existing Volume
2034 Future Volume
% Increase In Volumes

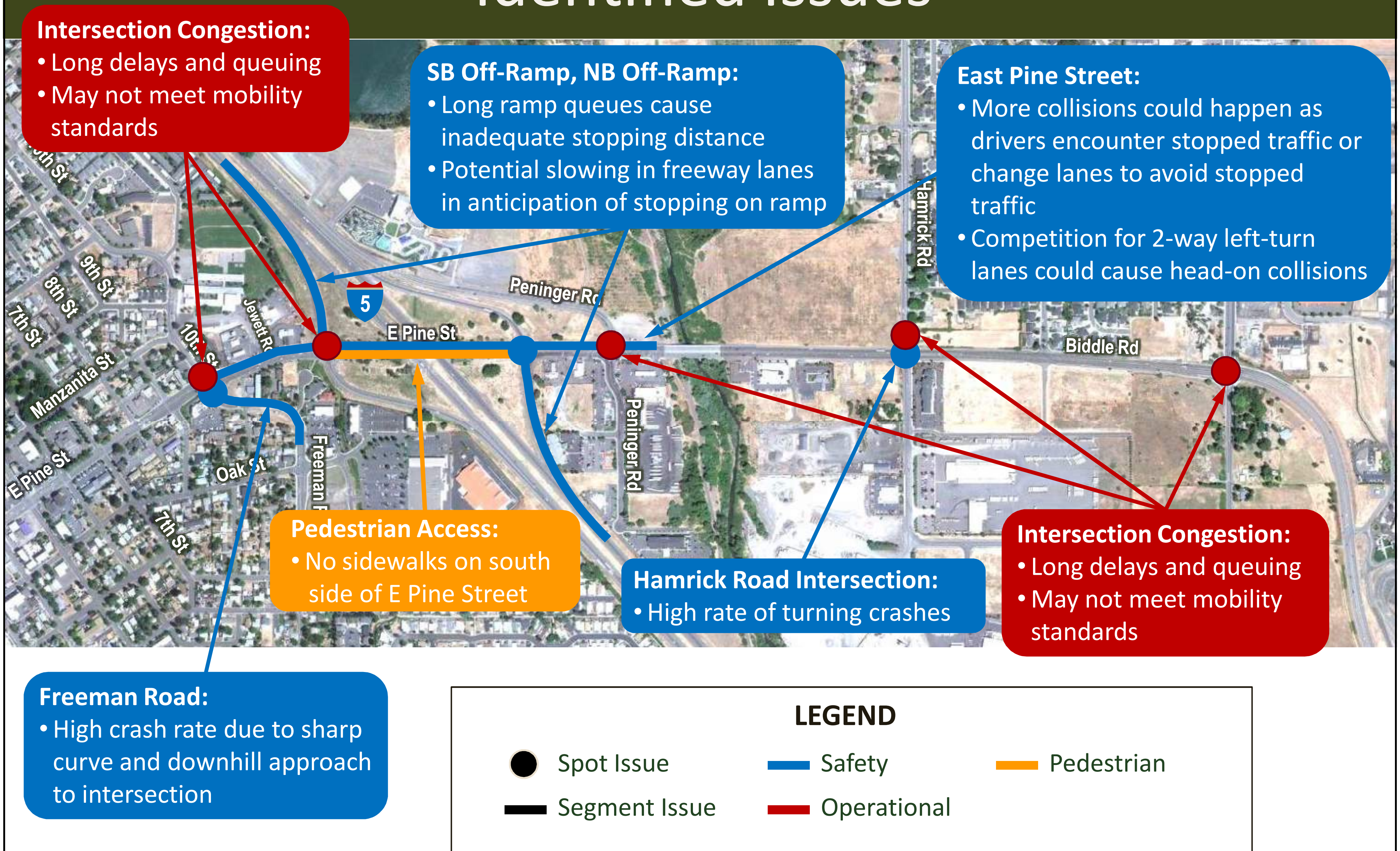
Crash History (2006-2008)



LEGEND

- # Intersection Crashes
- # Segment Crashes

Identified Issues



Concept Development

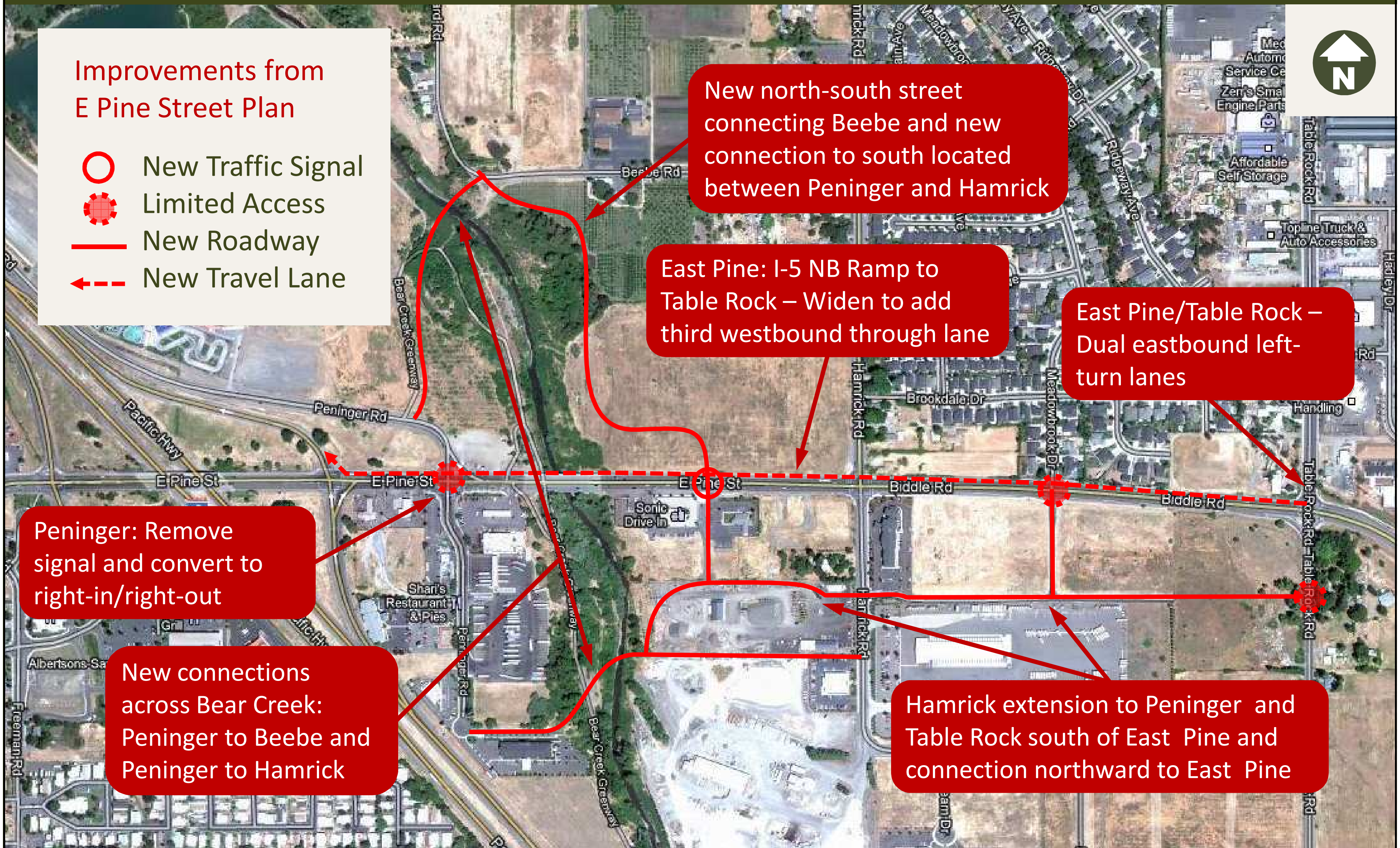
- **Concepts**
  - Address deficiencies around Interchange 33 as identified through existing and future baseline analysis

- **Type of Improvements**
  - Enhanced Network – Evaluate a scenario that incorporates the improvements identified in the East Pine Street Plan and City Transportation System Plan
  - Interchange Improvements – Develop concepts that address deficiencies at the interchange ramps (build on East Pine Street Plan)
  - West Side Improvements – Address deficiencies west of the interchange (build on Downtown East Pine Street Refinement Plan-in progress)
    Note: Focus on area from ramps to 10th Street/Freeman Road
  - East Side Improvements – Address deficiencies east of the interchange (build on East Pine Street Plan)

Concept Evaluation Criteria

- Traffic Operations and Safety
  - Does the improvement address identified operational or safety concerns?
  - Will it cause additional concerns?
- Basic Roadway Geometry and Right of Way
  - How might the improvement look?
  - Would it require additional right of way?
  - Are there design issues that will need to be addressed?
- Environmental and Land Use
  - Would the improvement have any potential impact to land uses or environmental resources?
- Cost Opinion
  - How much would it cost?

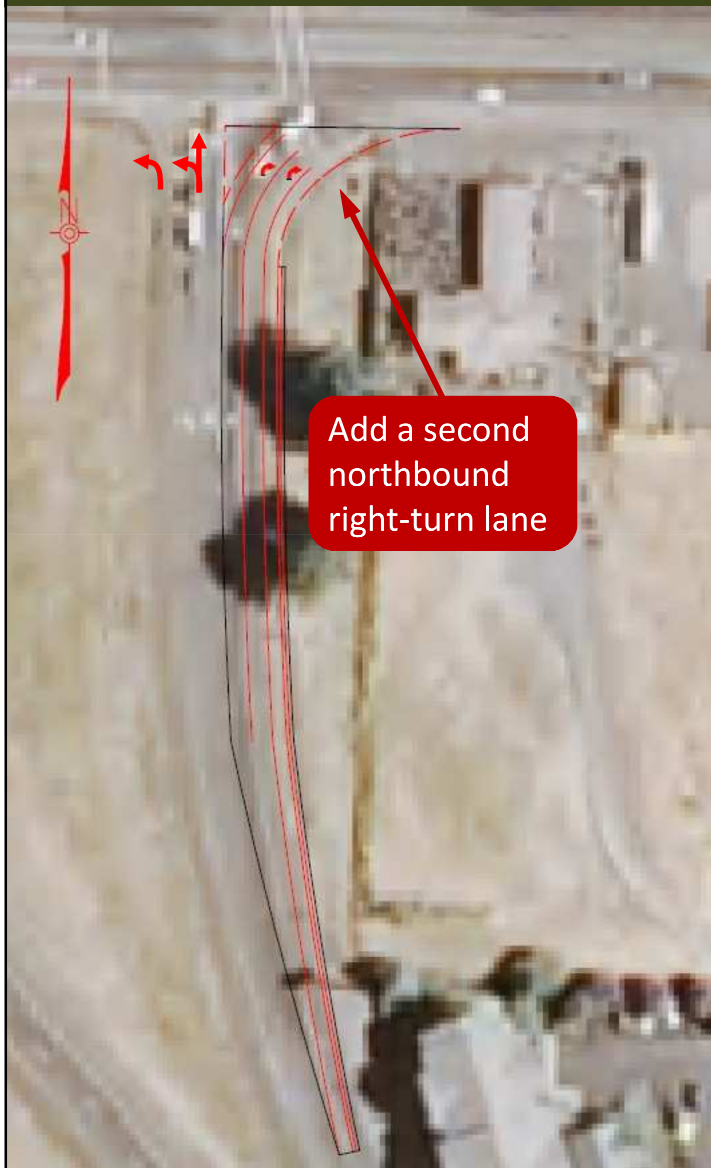
Enhanced Network Concept



Enhanced Network Concept Evaluation

- Traffic volumes in the corridor would go up as capacity becomes available
- Operations would improve at some locations but still would not meet mobility standards
- Queuing would still be present on highway ramps – safety concerns remain
- Queuing between intersections would still be an issue with associated safety concerns

Concept I-1: I-5 Northbound Off-Ramp Add Lane



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

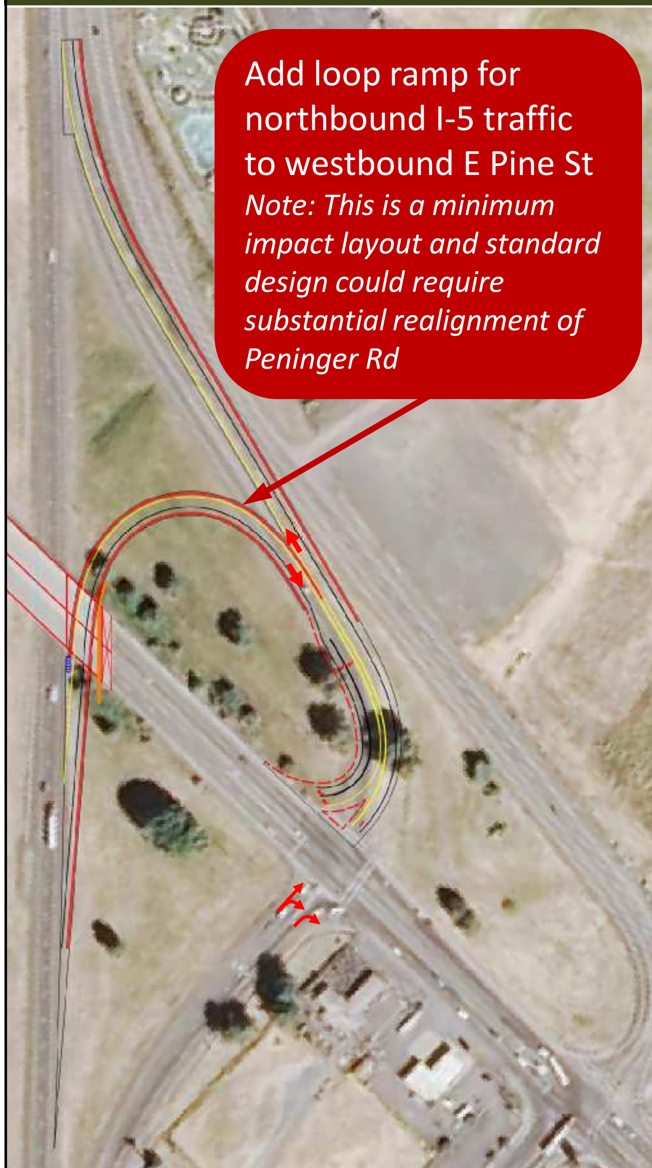
Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance

Basic Roadway Geometry & Right of Way (ROW):
- Additional storage lane of 350 feet
- Would likely result in some ROW impacts

Environmental & Land Use:
- Likely ROW impacts to adjacent property, especially corner
- Hazmat site near the intersection

Cost Opinion: $1.3 million

Concept I-2: I-5 Northbound Off-Ramp – Loop Ramp



Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets state mobility standards

Safety:

- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates addition pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):

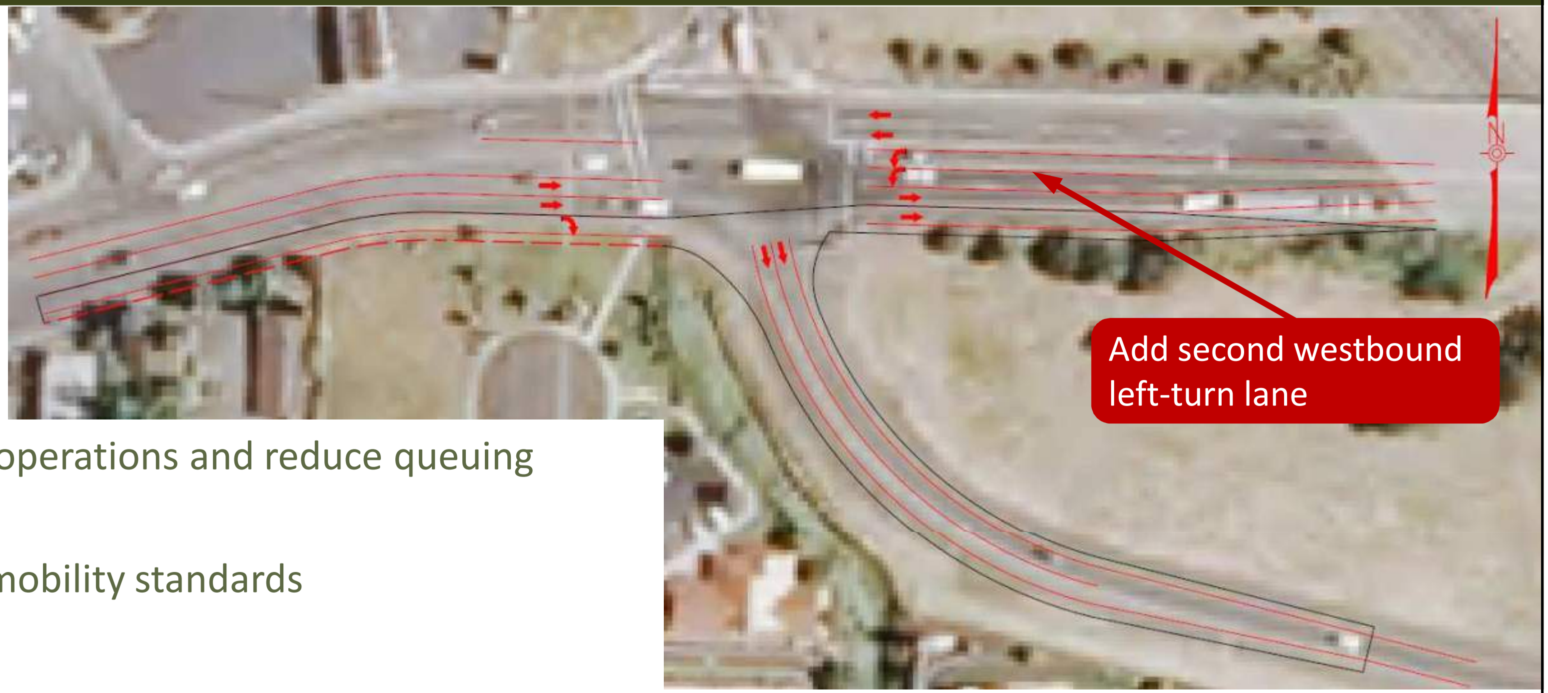
- Northbound to westbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans to accommodate loop ramp
- Substantial retaining walls needed
- Realignment of existing ramp required
- Non-standard design illustrated to minimize impacts

Environmental & Land Use:

- No substantial concerns

Cost Opinion: $9.7 million

Concept I-3: I-5 Southbound – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

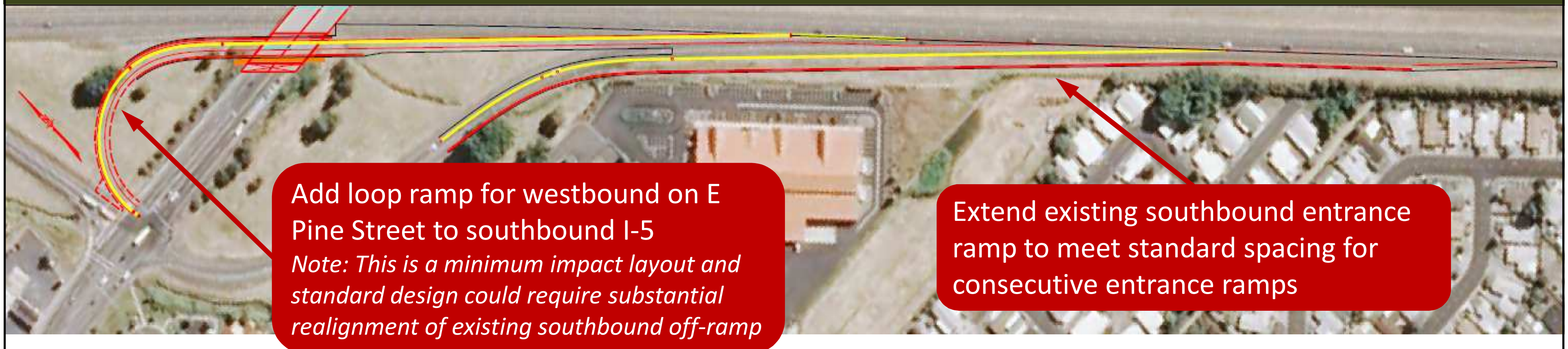
Safety:
- No queuing issues on ramps – adequate stopping distance

Basic Roadway Geometry & Right of Way (ROW):
- Storage lane of 150-200’ between structure and intersection (could be extended with bridge widening)
- Modification would require design exception
- Some potential ROW on west side of intersection

Environmental & Land Use:
- Some potential ROW needed west of intersection
- Could impact Mingus Creek
- Hazardous materials site near the intersection

Cost Opinion: $1.7 million (no bridge widening)

Concept I-4: I-5 Southbound – Loop Ramp



Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets state mobility standards

Safety:

- No queuing issues on ramps – adequate stopping distance
- Will increase pedestrian crossing distance
- Creates additional pedestrian conflicts on north side

Basic Roadway Geometry & Right of Way (ROW):

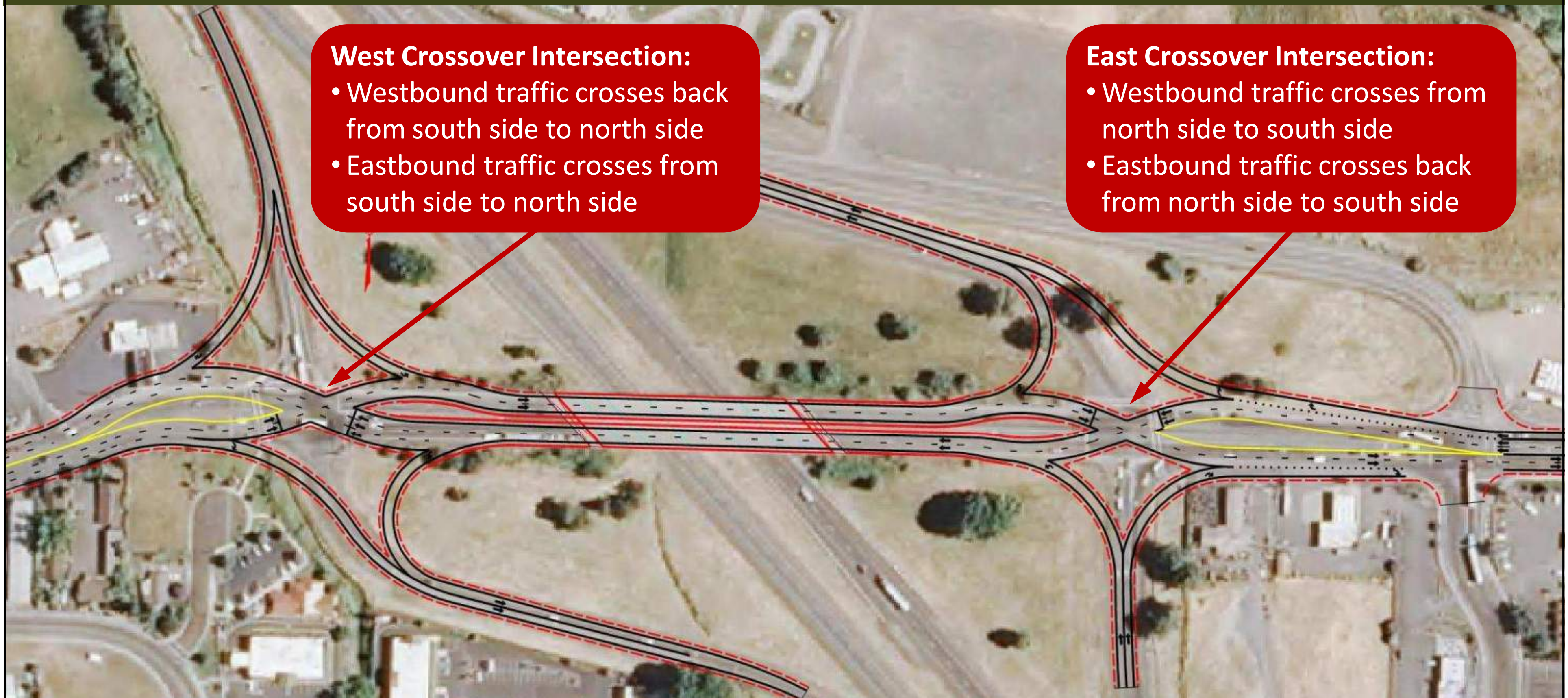
- Westbound to southbound loop ramp added
- Requires reconstruction of bridge to combine two structural spans over loop ramp
- Requires extending current ramp further south to maintain access spacing
- Would allow for sidewalk on south side of bridge
- Additional ROW needed
- Non-standard design illustrated to minimize impacts

Environmental & Land Use:

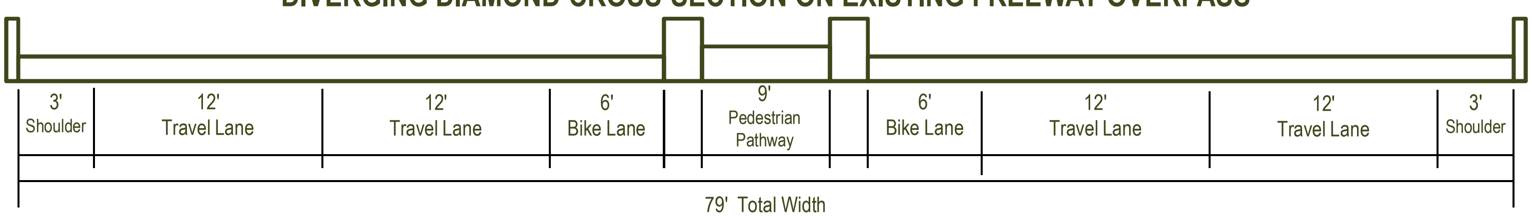
- Substantial ROW impacts adjacent to existing ramp
- Hazardous materials site near the intersection

Cost Opinion: $11.0 million

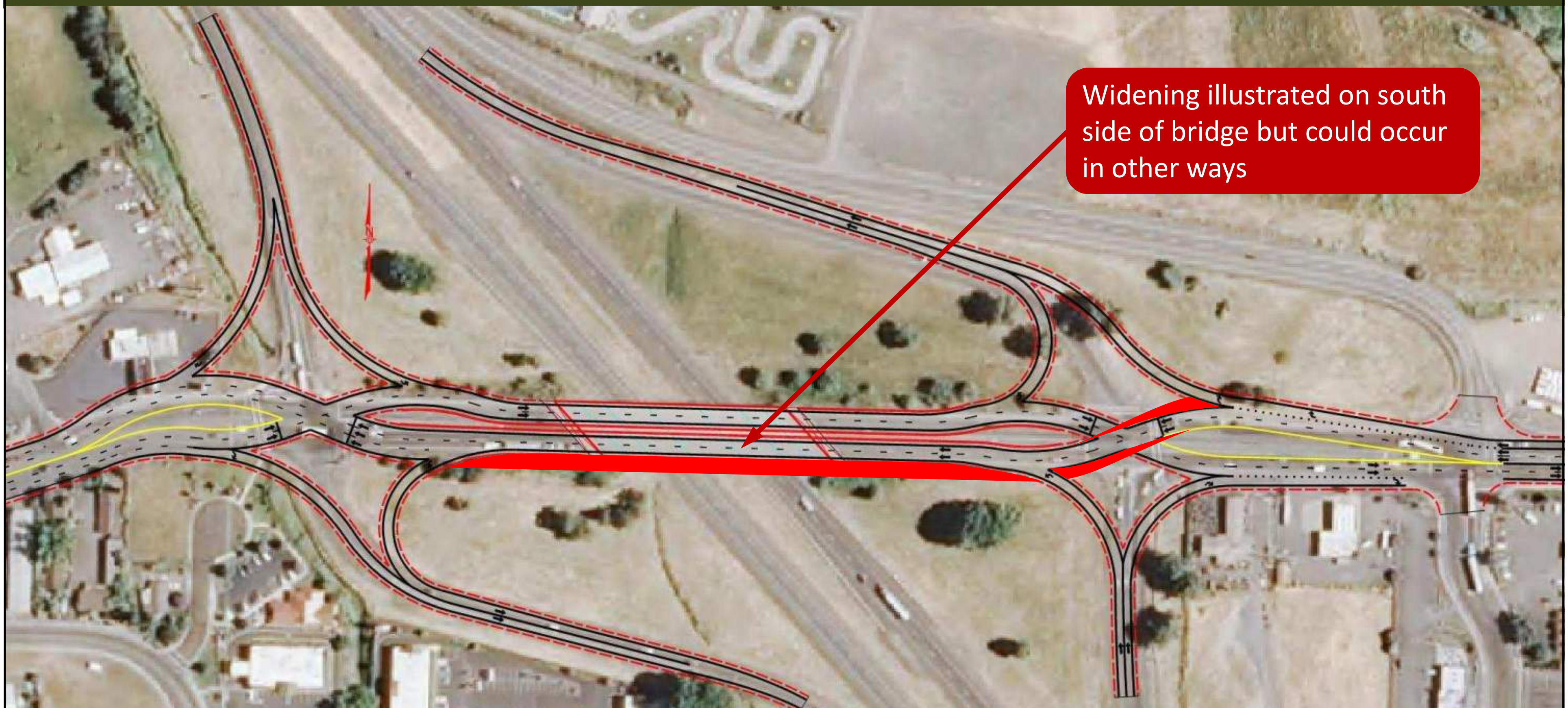
Concept I-5: Diverging Diamond Interchange – No Widening

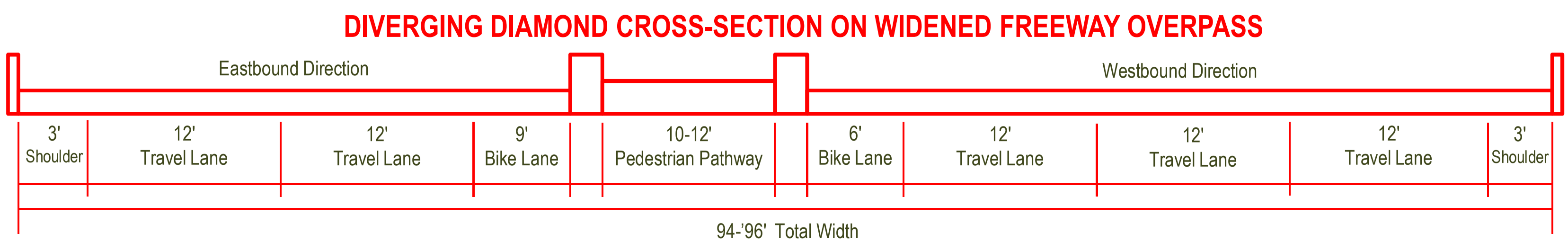


DIVERGING DIAMOND CROSS-SECTION ON EXISTING FREEWAY OVERPASS



Concept I-6: Diverging Diamond Interchange – Bridge Widening





Concepts I-5 & I-6: Diverging Diamond Interchanges

I-5: Diverging Diamond – No Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at west crossover intersection
- Would eventually exceed state mobility standards at east crossover intersection

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Uses existing bridge
- Some realignment of ramps
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

Cost Opinion: $8.6 million

I-6: Diverging Diamond – Bridge Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards at both intersections

Safety:
- Reduces number of conflict points

Basic Roadway Geometry & Right of Way (ROW):
- Widens existing bridge or replaces structure
- Some realignment of ramps but more flexibility with structure widening
- Accommodates bikes & pedestrians
- Additional ROW needed east & west sides

Environmental & Land Use:
- Impacts to adjacent businesses
- Hazardous materials sites around interchange

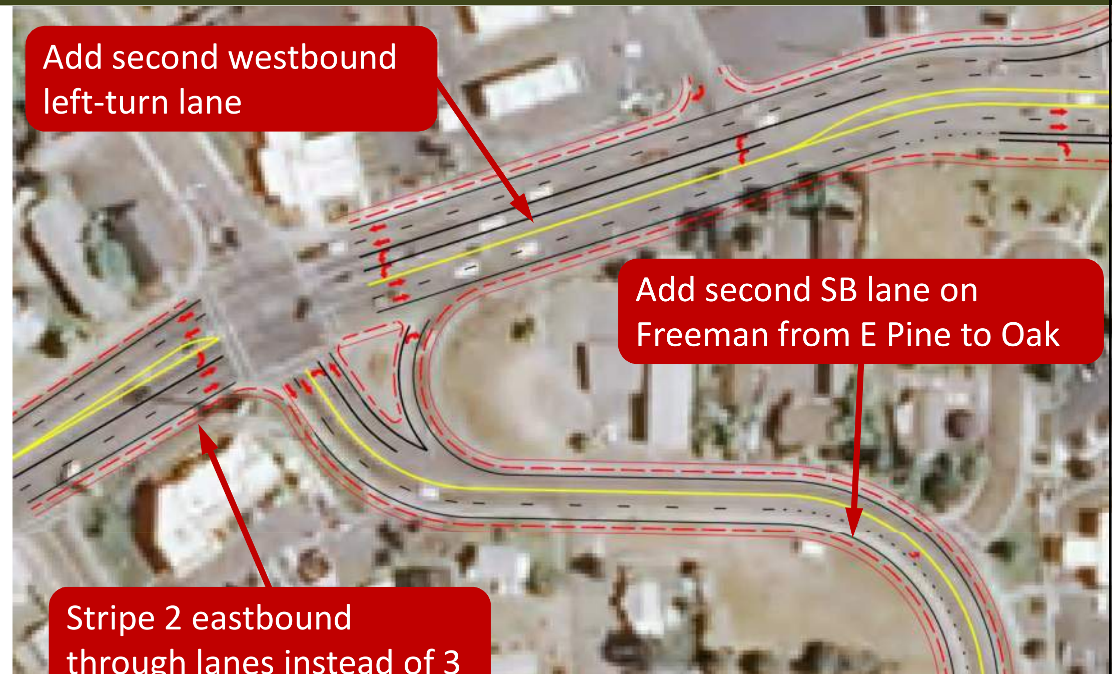
Cost Opinion: To be determined

Concept I-7: Bridge (Overpass) Widening or Replacement

Combinations of ramp concepts with additional improvements that could be considered to address remaining deficiencies

Interchange Concept Combination	Concept I-7 Improvements
Option 1: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 2: *I-2: NB Off-Ramp – New Loop Ramp* *I-3: SB On-Ramp – Dual WB Left-Turn Lanes*	• Widen bridge to add sidewalk to south side of E Pine St • Potentially widen more extensively to extend second WB left-turn to provide greater storage distance
Option 3: *I-1: NB Off-Ramp – Dual NB Right-Turn Lanes* *I-4: SB On-Ramp – New Loop Ramp*	• Add sidewalk to south side of E Pine St which may be accomplished without widening
Option 4: *I-2: NB Off-Ramp – New Loop Ramp* *I-4: SB On-Ramp – New Loop Ramp*	• Consider bridge replacement because combination of significant structural work at either end may require as much work as replacement • Add sidewalk to south side of E Pine St which may be accomplished without any widening

Concept W-1: 10th/Freeman – Dual Lefts, Minimize Widening



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets county mobility standards
- Some queuing on north and west approaches

Safety:
- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening

Basic Roadway Geometry & Right of Way (ROW):
- Add second westbound left-turn lane and reduce eastbound travel lanes to minimize widening
- Widen Freeman Road to 3 lanes which may require additional ROW
- Some ROW may be needed on E Pine

Environmental & Land Use:
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman and E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.2 million

Concept W-2: 10th/Freeman – Dual Lefts with Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:

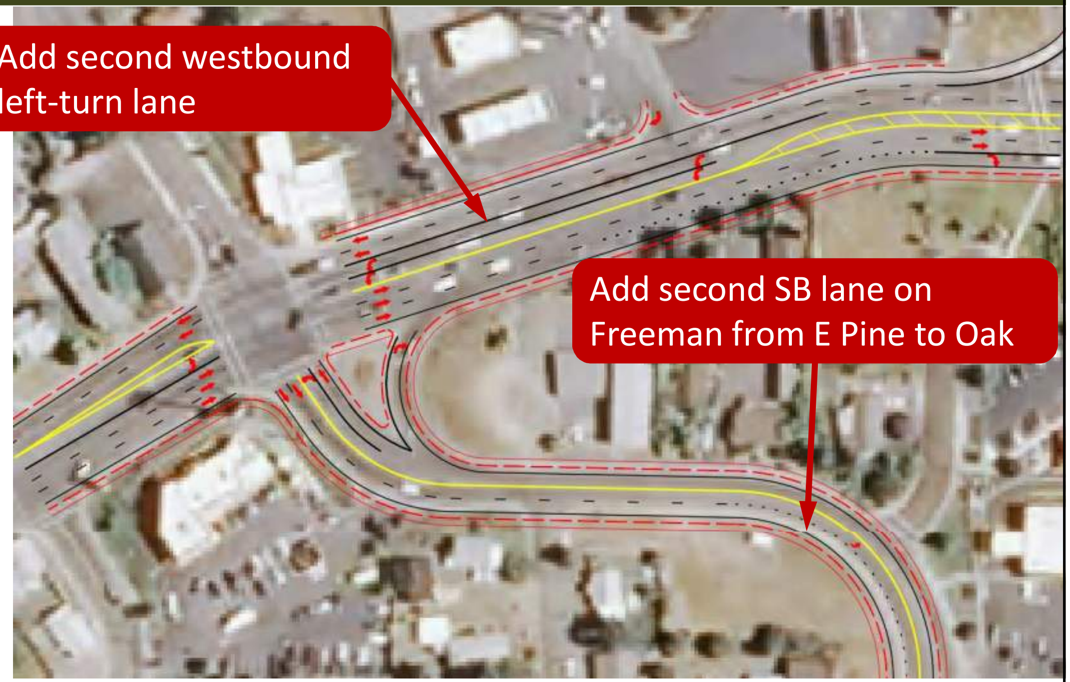
- Meets county mobility standards
- Some queuing on north approach

Safety:

- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening
- Increased crossing distance

Basic Roadway Geometry & Right of Way (ROW):

- Add second westbound left-turn lane
- Widen Freeman Road to 3 lanes which may require additional ROW
- Additional ROW needed on E Pine



Environmental & Land Use:

- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman
- ROW impacts on E Pine
- Hazardous materials site near the intersection

Cost Opinion: $2.6 million

Concept W-3: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:

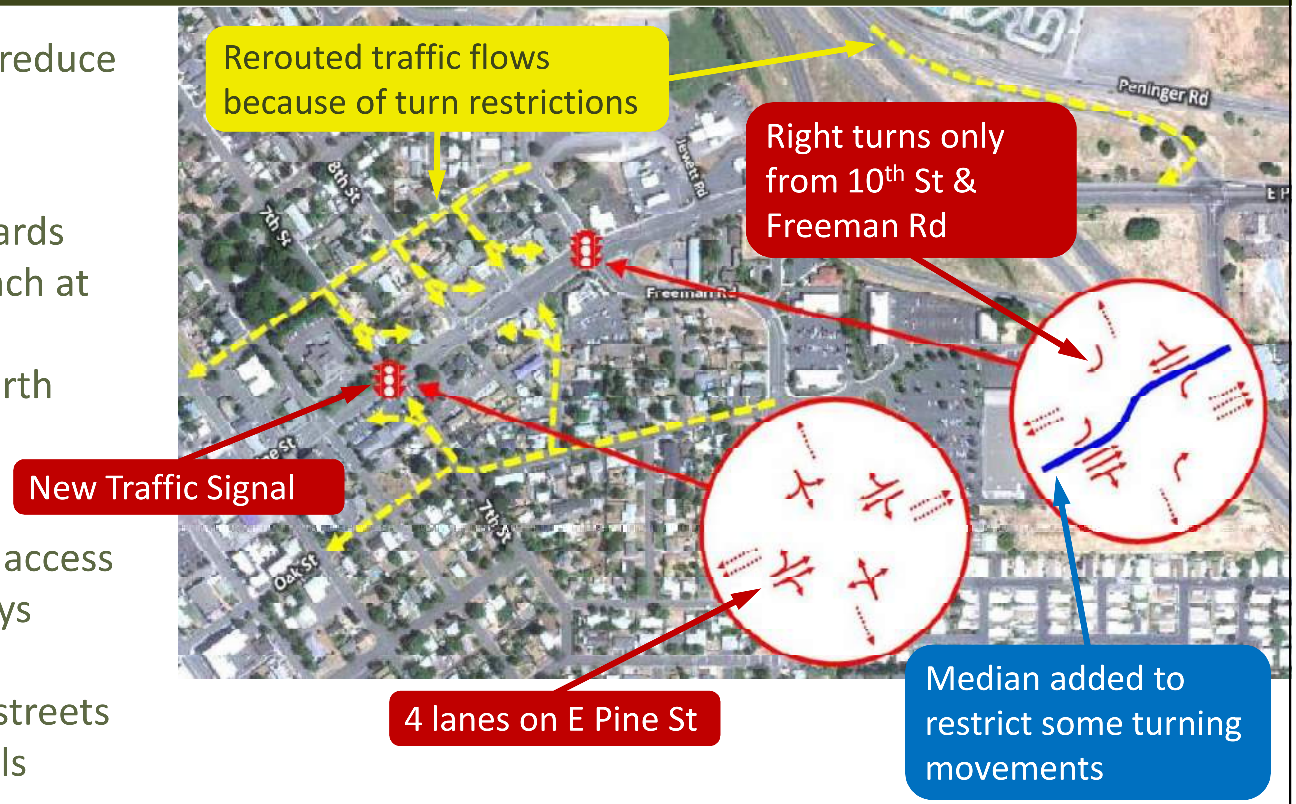
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and north approaches at 7th Street

Safety:

- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):

- Median installation on E Pine at 10th may require some widening
- Maintains 4 lanes on E Pine
- Traffic signal at 7th



Environmental & Land Use:

- Turn movement restrictions could affect businesses
- Potential connection through school property
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

Concept W-4: 10th/Freeman & 7th – Turn Restrictions

Purpose: Improve operations and reduce queuing

Traffic Operations:

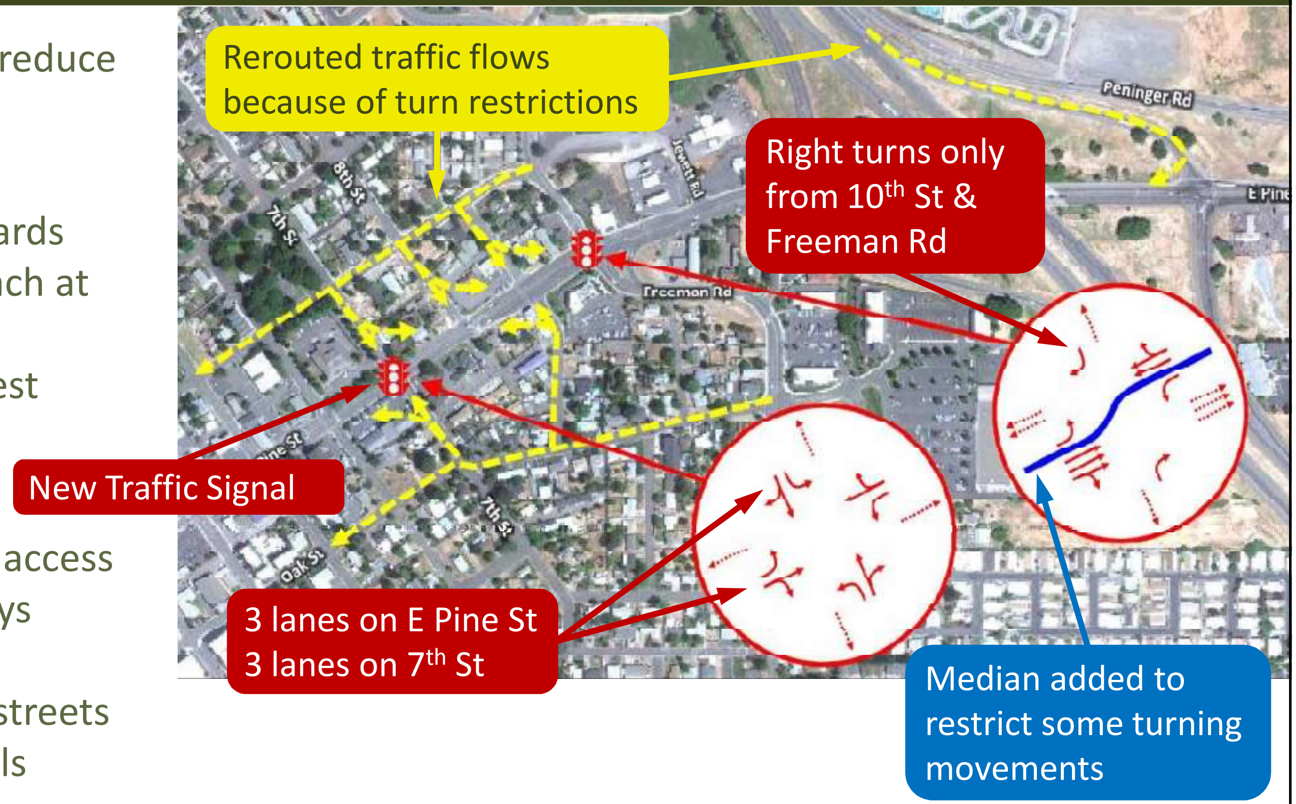
- Meets city and county standards
- Some queues on east approach at 10th Street
- Some queues on east and west approaches at 7th Street

Safety:

- Reduced conflict points with access changes at Jewett & driveways
- Reduced conflicts at 10th
- Increased demand on other streets
- Higher crash rates with signals

Basic Roadway Geometry & Right of Way (ROW):

- Median installation on E Pine at 10th may require some widening
- Reduces E Pine to 3 lanes
- Widens 7th to 3 lanes – more ROW
- Traffic signal at 7th

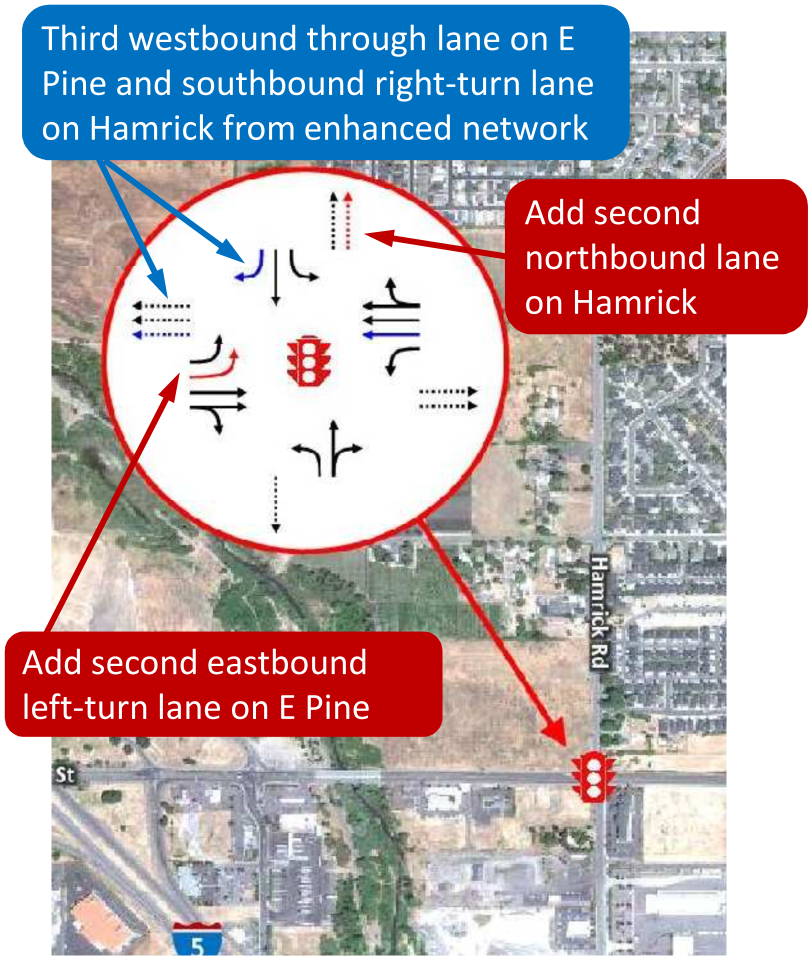


Environmental & Land Use:

- Turn movement restrictions could affect businesses
- Potential connection through school property
- ROW impacts to properties along 7th
- Added traffic could affect businesses around 7th

Cost Opinion: Not calculated

Concept E-1: Hamrick – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets county mobility standards

Safety:

- Reduced congestion and fewer queuing conflicts
- Will increase pedestrian crossing distance

Basic Roadway Geometry & Right of Way (ROW):

- Adds second EB left-turn lane on E Pine
- Adds second NB receiving lane on Hamrick (~700')
- ROW may be needed on E Pine
- ROW needed on Biddle
- ROW may be needed on Hamrick

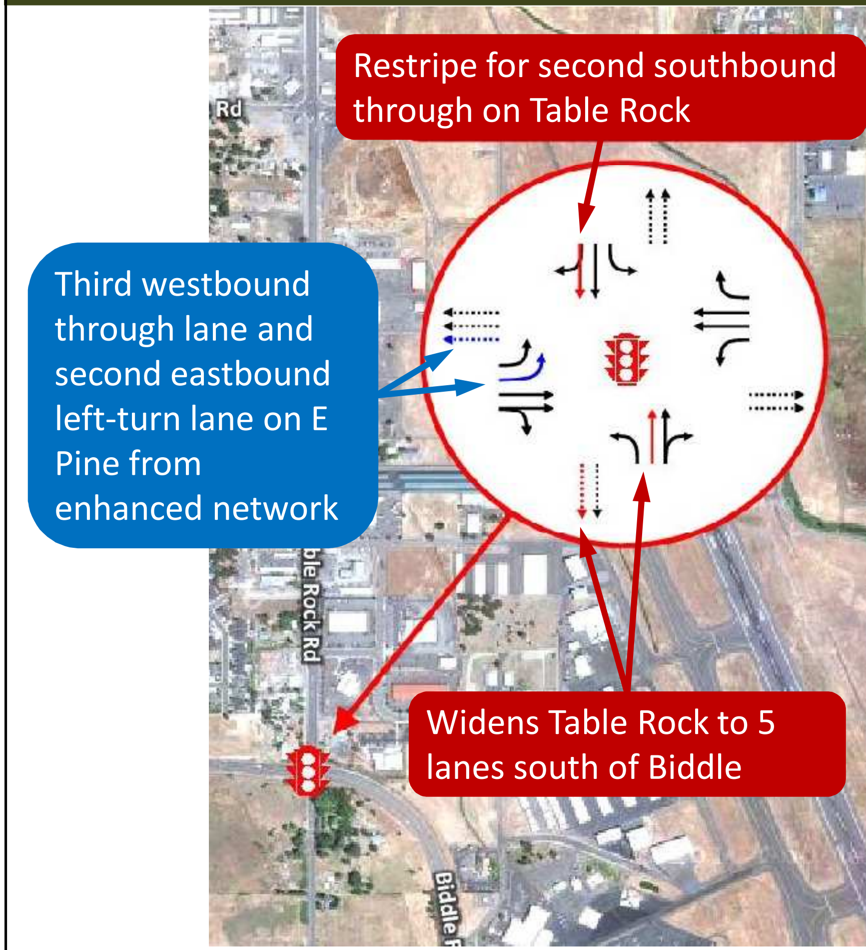
Environmental & Land Use:

- Some ROW impacts along E/Pine, Biddle and Hamrick

Cost Opinion: Not calculated

Note: Basic road layout not prepared because enhanced network substantially changes the configuration of E Pine east of the freeway.

Concept E-2: Table Rock – Improvements



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets county mobility standards

Safety:

- No safety evaluation was conducted

Basic Roadway Geometry & Right of Way (ROW):

- 5-lane cross-section on Table Rock south of Biddle
- ROW on Table Rock

Environmental & Land Use:

- Some ROW impacts along Table Rock

Cost Opinion: TBD

Concept E-3: Hamrick Diversions to Table Rock

Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets county mobility standards

Safety:

- Traffic calming and traffic diversions may improve conditions on Hamrick

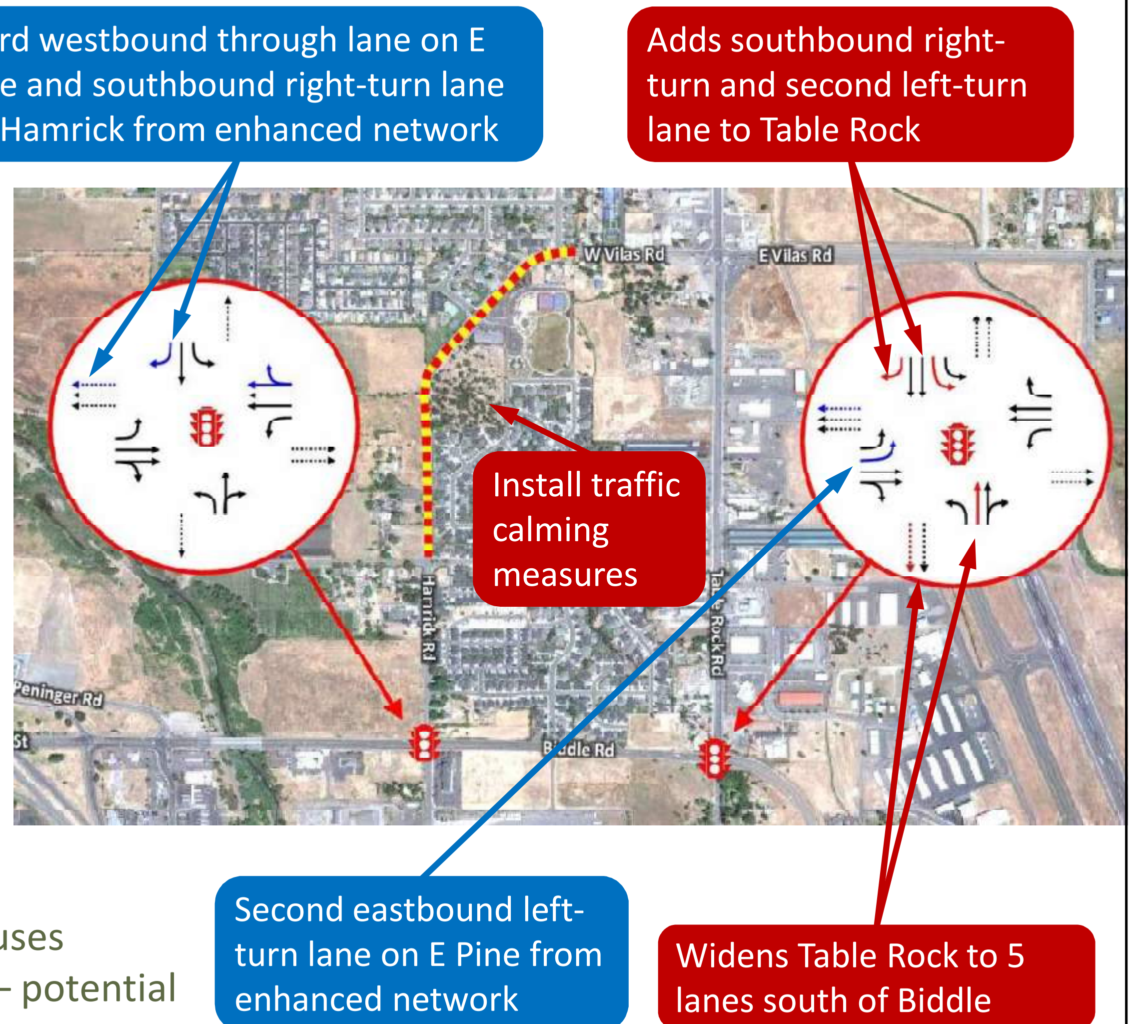
Basic Roadway Geometry & Right of Way (ROW):

- No changes at Hamrick intersection
- Additional traffic calming on Hamrick
- Adds more turn lanes on Table Rock
- ROW needed on Table Rock north and south of Biddle

Environmental & Land Use:

- Reduced traffic demand in areas zoned for residential and open space uses
- Some ROW impacts along Table Rock – potential structure impact in northwest quadrant

Cost Opinion: Not calculated



Note: Basic road layout not prepared because Table Rock is not currently included in study area network

COMMENT CARD: I-5 Interchange 33 Interchange Area Management Plan
Open House, February 16, 2012

OPTIONAL

Name:

Company/Affiliation (if applicable): SELF

Address:

Phone: Email:

Do you (check all that apply):

- ☒ Own property in the project area?
- ☒ Live in the project area?
- ☐ Have a business in the project area?

If other than your address, where?

☐ **Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?**

Please put your comments about this project on the <u>REVERSE</u> of this card.

COMMENTS

I think a speed reduction on Hamrick Rd should be tried <u>before</u> spending money on a round-about. During the center island const for the park, the speed was reduced to 25 MPH and lots to traffic took another route.

I am in favor of the divarging diamond intarchange w/o widening the I-5 structure. You can "google earth" the one in American Fork, Utah and see how well it works. I have driven through that one in Utah.

Interchange Area Management Plan 33

Open House 1

February 16, 2012

Interchange 33 Area Management Plan (IAMP 33) Open House

Central Point City Hall
Council Chambers
140 S. Third Street
Central Point, OR

November 6, 2012
ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Lisa Shipley		541-734-5845	tatoter777@Yahoo
DON KENNEDY	Albertsons	541-665-3761	Don.Kennedy@Albertsons.com
Ivan Velasquez	Central Point Chamber	541 261 8026	BFhorse52@yahoo.com
Farber Surveying -	Central Point CAC	Herb Farber	
Kay Harrison			
Connie Clune	City of Central Point		connie.clune@gmail.com
GREG HAYES	COLVIN OIL CO	541-479-5343	GREG@COLVINOIL.COM

Interchange 33 Area Management Plan (IAMP 33) Open House

Central Point City Hall
Council Chambers
140 S. Third Street
Central Point, OR

November 6, 2012
ATTENDANCE SHEET

Name	Agency/Organization	Phone #	Email
Samantha Steele	Cent. Pt. SD 6	541.494.6241	samantha.steele @district6.org

I-5 Interchange 33 (Central Point)

Interchange Area Management Plan (IAMP)

WELCOME

Open House – November 6, 2012

Oregon Department of Transportation

CENTRAL POINT

DAVID EVANS AND ASSOCIATES INC.

What is an IAMP?

- A plan for managing the interchange and surrounding areas through the year 2034
- A plan to protect the function and capacity of the interchange and cross streets
- A plan expressing the management objectives of ODOT, Jackson County, and Central Point

Why do an IAMP for Interchange 33?

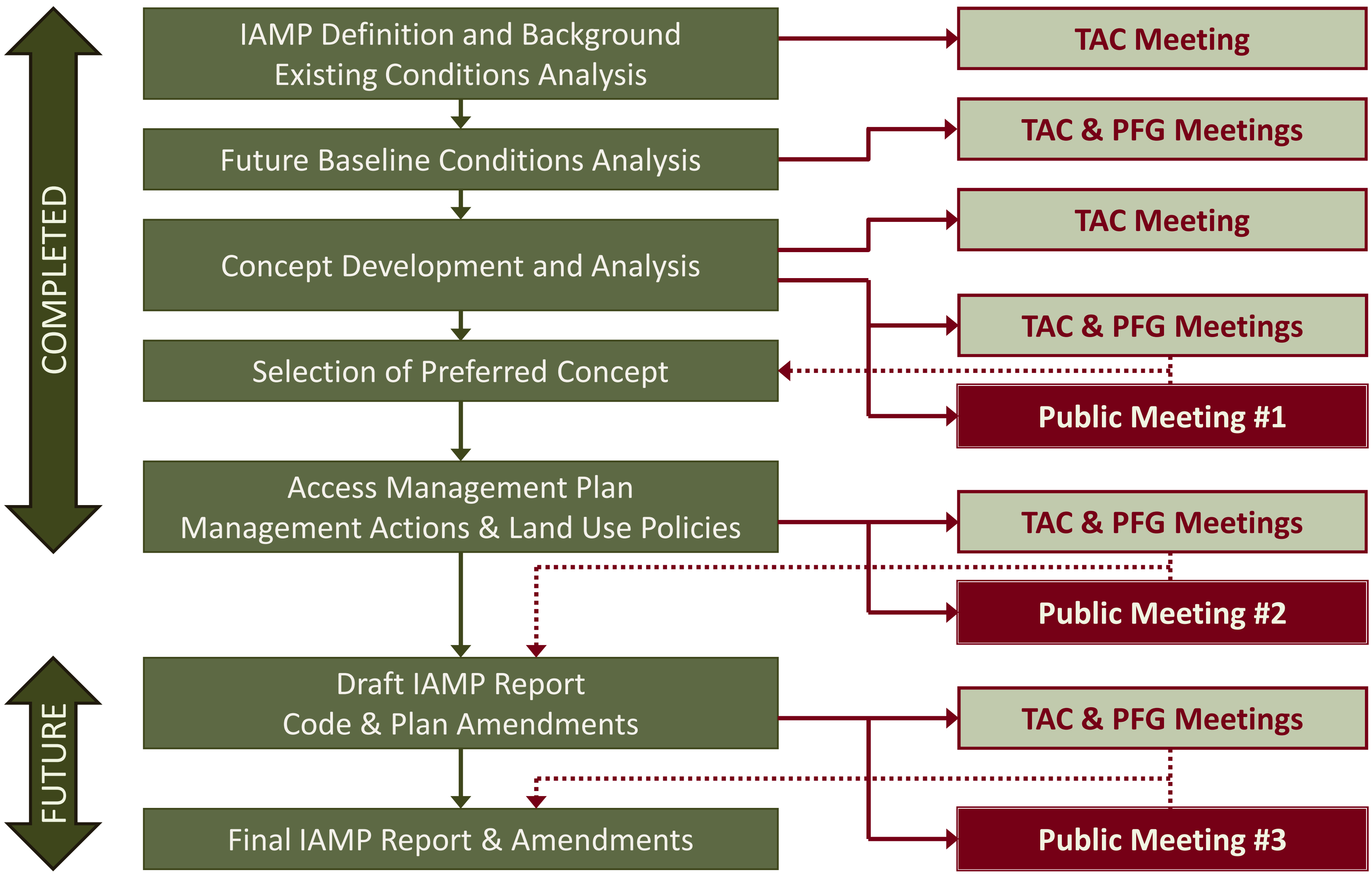
- Increasing demand at the interchange
  - Population growth forecast of almost 60% over the next 20 years
  - Urban Reserve locations north and east of the project were identified in the Greater Bear Creek Valley Regional Plan
- Interchange and roadway network characteristics
  - Substandard intersection spacing near ramp terminals
  - National Highway System intermodal connector from I-5 to OR 62
  - Downtown grid system to west
- Traffic Concerns
  - High truck volumes to and from the east
  - Cars and trucks queuing between closely spaced intersections
  - Weaving movements between nearby access roadways and ramps
  - Safety on ramps and at other locations

IAMP Goal & Objectives

Develop a plan for improvements for Interchange 33 that can be <u>implemented over time</u> to <u>maximize the function</u> of the existing interchange and address the <u>long-term needs</u> of Central Point and other Rogue Valley communities.

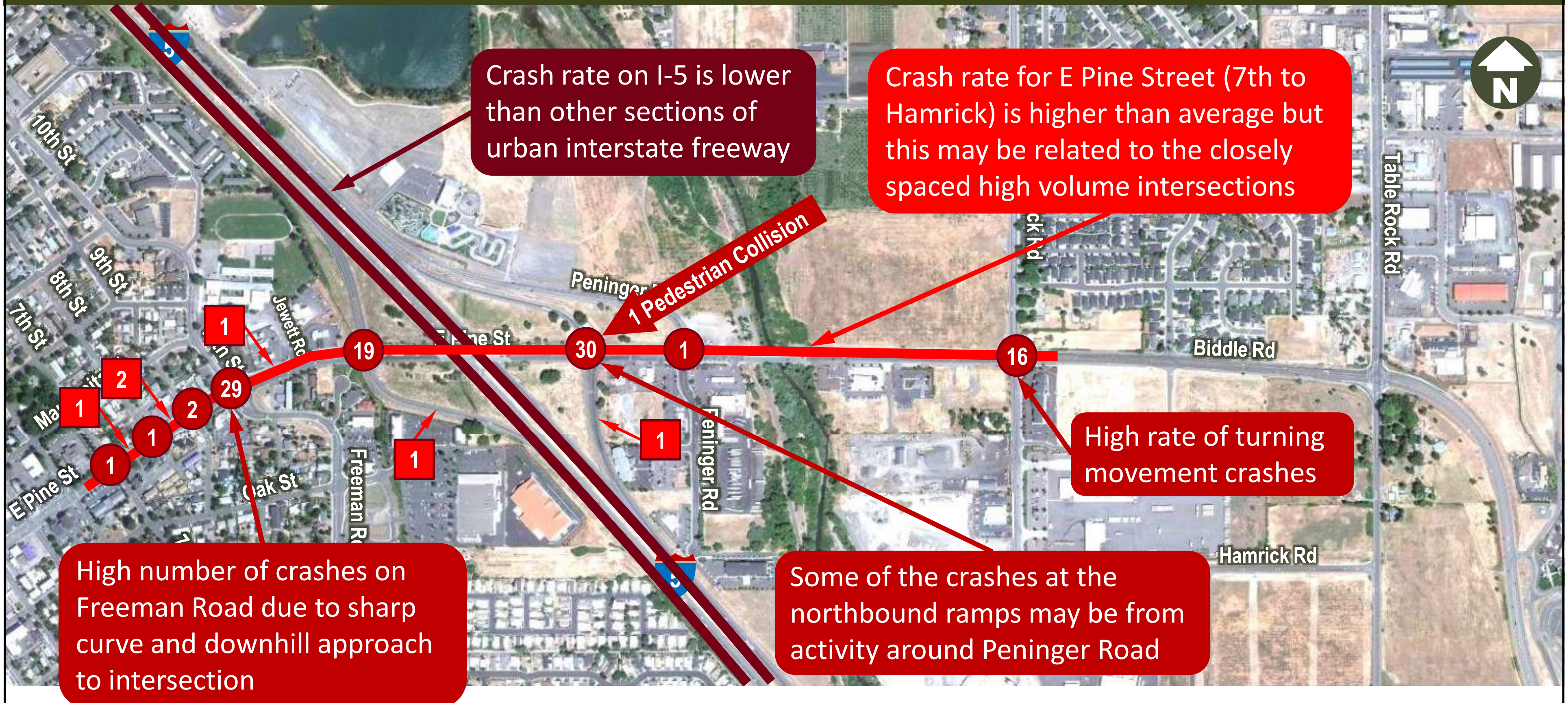
- Protect the function of the interchange and East Pine Street
- Develop concepts to improve safety and maximize efficiency
- Base improvements on adopted land use plans of Central Point and Jackson County
- Develop an access management plan for safe and acceptable operations

IAMP Planning Process



Average Daily Traffic Volumes

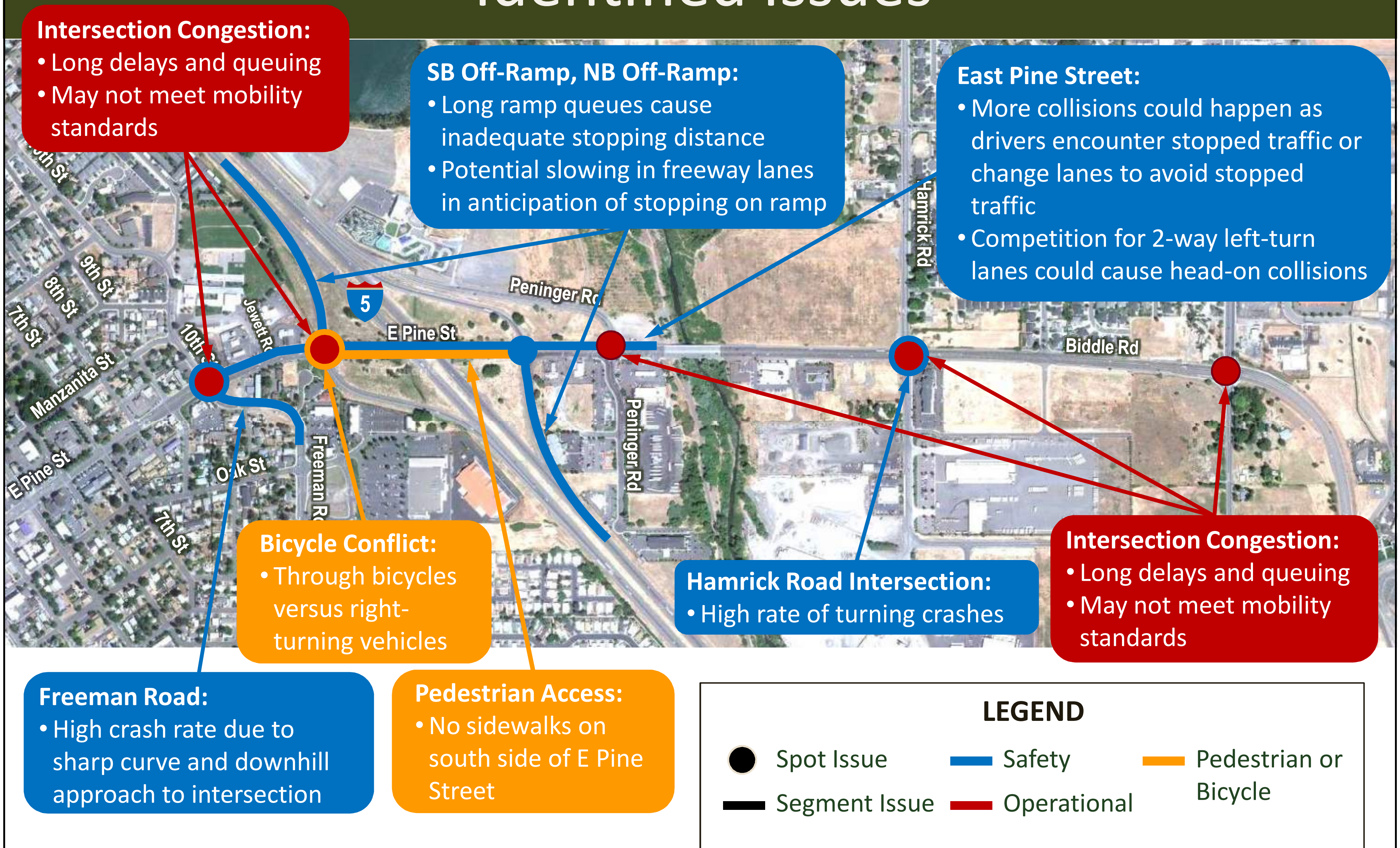
Crash History (2006-2008)



LEGEND

- Intersection Crashes
- Segment Crashes

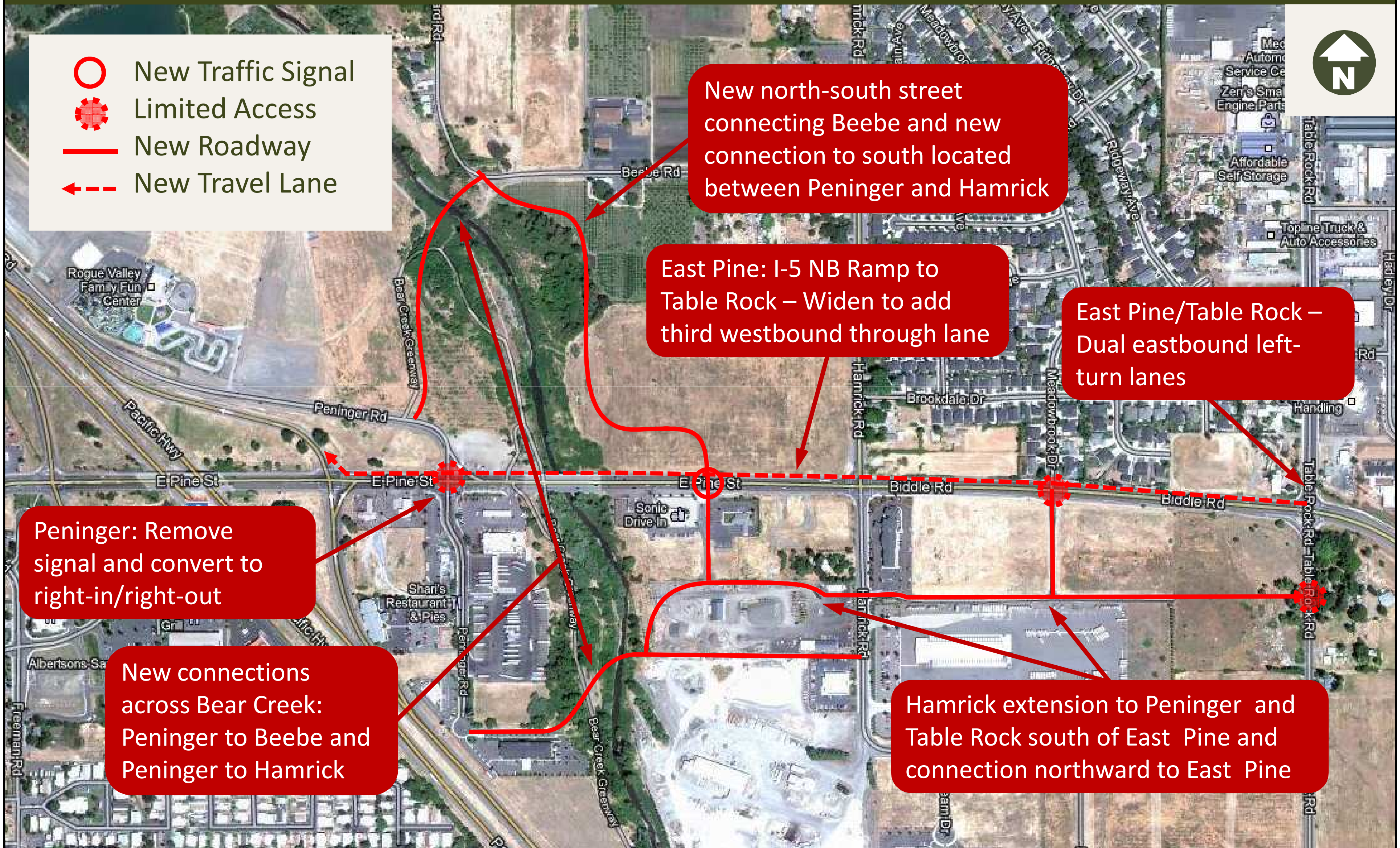
Identified Issues



Recommended Plan Elements

- Recommended IAMP Improvements
  - Transportation system management measures such as signal timing changes, lane striping, access control
  - Capital improvements for vehicles, bicycles, and pedestrians
- Recommended changes to the Central Point Transportation System Plan
- Recommended Access Management Plan

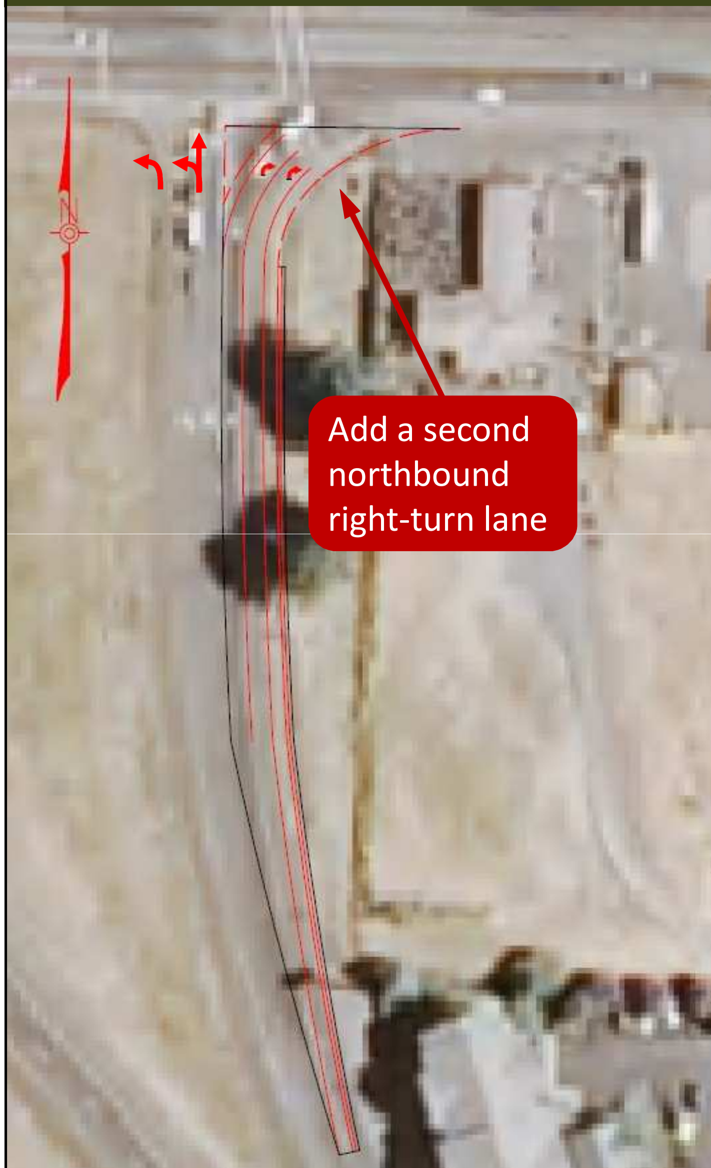
Improvements from Other Plans



Improvements from Other Plans

- All of these projects enhance the transportation network by expanding local network options and increasing overall capacity
  - Many of these projects are Tier 2 projects in the Central Point Transportation System Plan (TSP) with no funding identified
  - Some would be constructed with development and are not in the TSP
- Need to consider how the timing of project completion could affect other elements of the IAMP

Improvement: I-5 Northbound Off-Ramp Add Lane



Purpose: Improve operations and reduce queuing

Traffic Operations:
- Meets state mobility standards

Safety:
- No queuing issues on ramp – adequate stopping distance
- Will increase pedestrian crossing distance

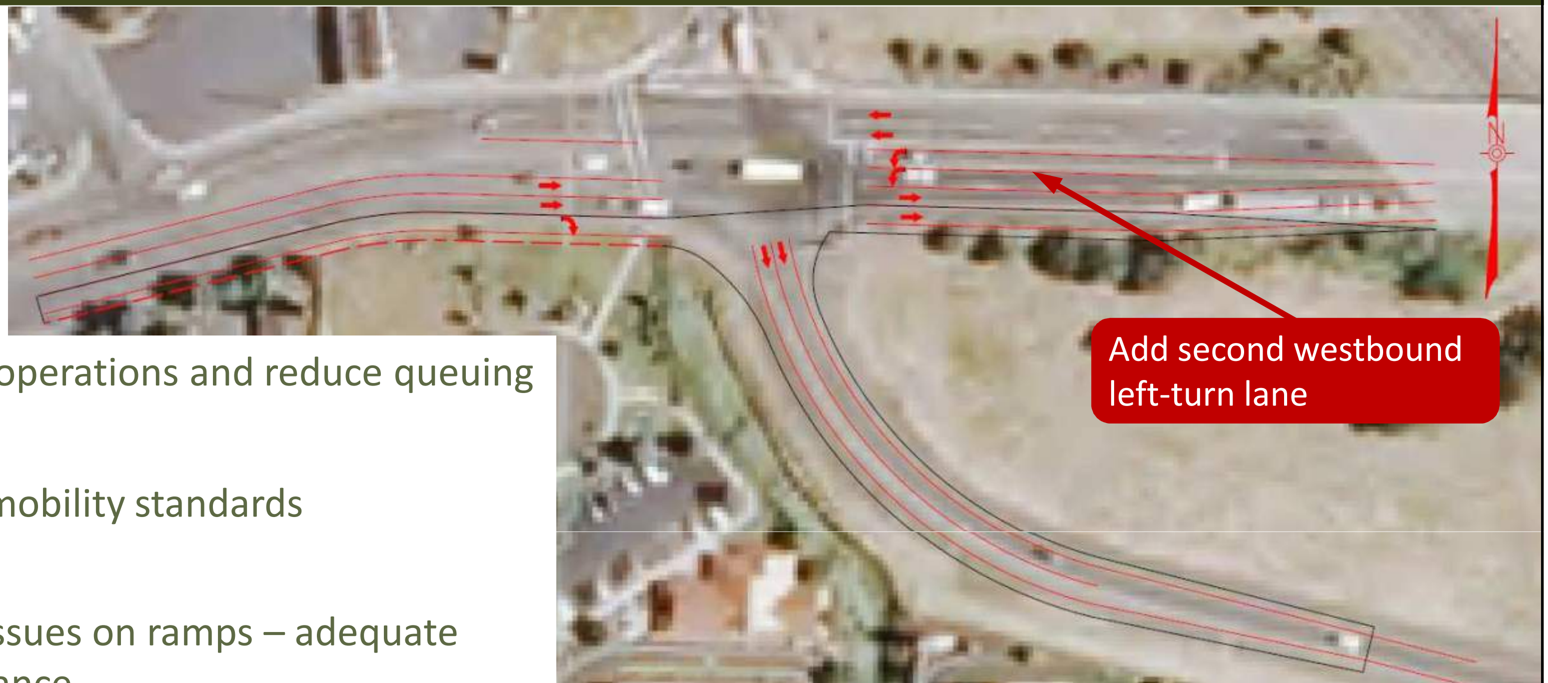
Basic Roadway Geometry & Right of Way (ROW):
- Additional storage lane of 350 feet
- Would likely result in some ROW impacts

Environmental & Land Use:
- Likely ROW impacts to adjacent property, especially corner
- Hazmat site near the intersection

Cost Opinion: $1.3 million

Priority:
- Medium to low
- Manage ramp queues with signal timing prior to installation

Improvement: I-5 Southbound – Dual Left-Turn Lanes



Purpose: Improve operations and reduce queuing

Traffic Operations:

- Meets state mobility standards

Safety:

- No queuing issues on ramps – adequate stopping distance

Basic Roadway Geometry & Right of Way (ROW):

- Storage lane of 150-200’ between structure and intersection (could be extended with bridge widening)
- Modification would require design exception
- Some potential ROW on west side of intersection

Environmental & Land Use:

- Some potential ROW needed west of intersection
- Could impact Mingus Creek
- Hazardous materials site near the intersection

Cost Opinion: $1.7 million (no bridge widening)

Priority:

- Medium to low
- Manage ramp queues with signal timing

Improvement: 10^{th}/Freeman – Dual Lefts, Minimize Widening

Purpose: Improve operations and reduce queuing

Traffic Operations:

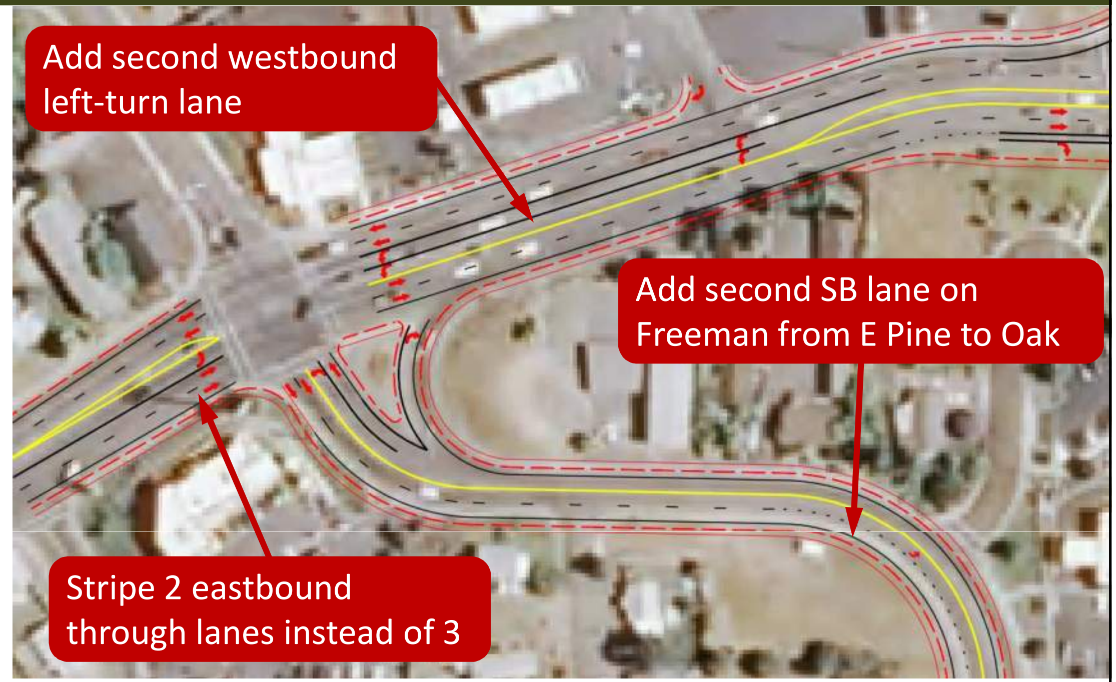
- Meets county mobility standards
- Some queuing on north and west approaches

Safety:

- Reduced conflict points with access changes at Jewett & driveways
- Additional storage
- Potentially address sight distance on Freeman with widening

Basic Roadway Geometry & Right of Way (ROW):

- Add second westbound left-turn lane and reduce eastbound travel lanes to minimize widening
- Widen Freeman Road to 3 lanes which may require additional ROW
- Some ROW may be needed on E Pine



Environmental & Land Use:

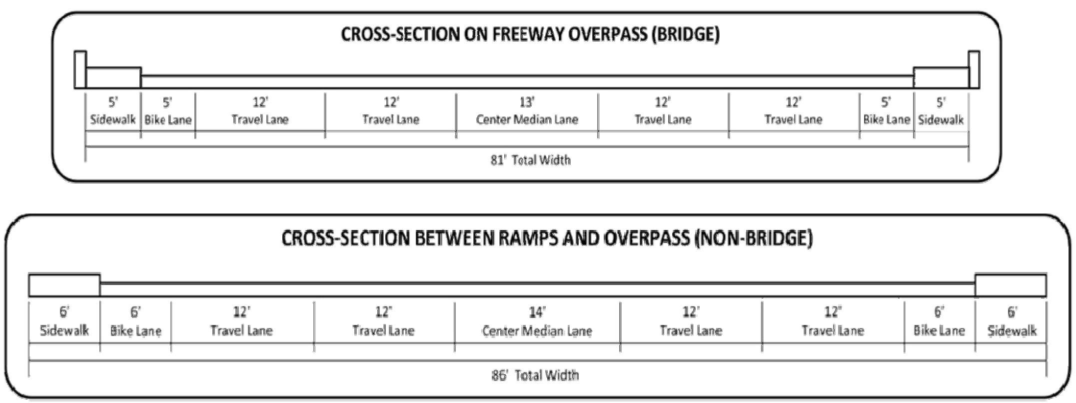
- Turn movement restrictions could affect businesses
- Potential connection through school property
- Potential ROW impacts on Freeman and E Pine
- Hazardous materials site near the intersection

Cost Opinion: \$2.2 million

Priority:

- Medium to low

Improvement: South Sidewalk



Description: Concept A-1 considers adding a sidewalk on the south side of E Pine Street between the northbound and southbound ramp terminals

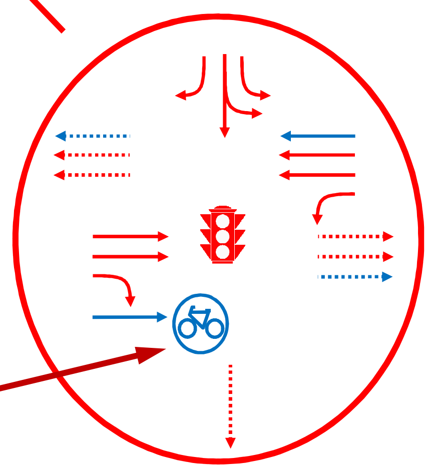
Purpose: Address the existing pedestrian network deficiency

Evaluation: Bridge railing on south side can be replaced to allow for wider cross-section (81 feet vs. 79 feet) and 5-foot sidewalk can be added with some minor reductions in travel and bike lane widths at an estimated cost of $1.2 million

Recommended: Yes – High to medium priority

Improvement: Bike Signal

Existing Bicycle Signal in Portland



Install a bicycle signal on the eastbound approach to reduce conflict between bicycles and right-turning vehicles

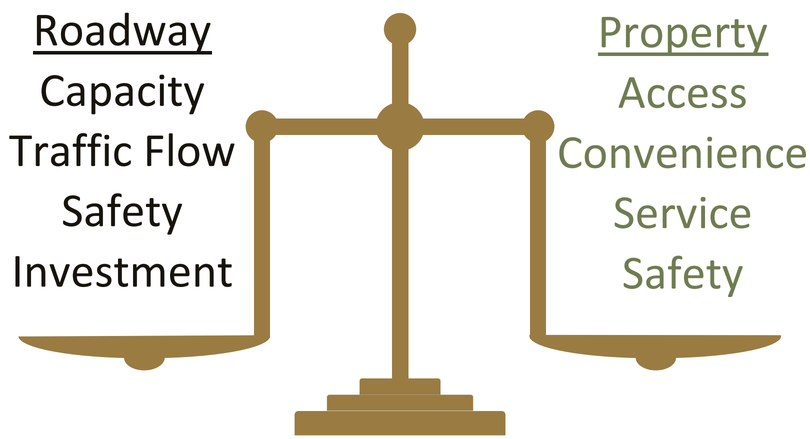
Description: Concept A-2 considers adding a bicycle signal at the I-5 southbound ramp intersection to address the conflict between vehicles and bicyclists in the eastbound direction

Purpose: Address the existing safety concern for bicyclists

Evaluation: Bike signal would create bicycle phase that stopped eastbound right turn when activated with sensors or pushbutton with minimal impact to traffic flow at an estimated cost of $25,000

Recommended: Yes – High priority

Access Management Plan (AMP)



- Access Management Standards
  - Standards in plan will be adopted by the Oregon Transportation Commission
- Access Management Actions
  - Access management would happen when:
    - Applications for land use changes or development are submitted
    - Future highway improvement projects move into design and construction
    - Safety and/or operational problems arise

Private Approaches

- Standards do not apply to driveways in existence prior to January 1, 2012 except when one of the following happens:
  - A new driveway is requested or an existing driveway use is changed based on certain criteria
  - Infill development or infill redevelopment occurs
  - Where a highway or interchange project occurs
- If one of these things happen the Oregon Department of Transportation shall determine whether the approach road spacing or safety is improved by moving in the direction of the appropriate spacing standards

Reference: Oregon Administrative Rule 734-051-4020, Standards and Criteria for Approval of Private Approaches

Access Spacing Standards

Table 6-1. Access Spacing Standards

Segment Characteristic	Spacing Standard
ODOT – Interchange Ramp Terminals - Fully Developed Urban[1]	
Distance from off-ramp to first approach on the right, right-turn movements only	750 feet[2]
Distance from off-ramp to first intersection where left turns are allowed	1320 feet[2]
Distance from last approach road to the start of the taper for the on-ramp	1320 feet[2]
Distance from last right in/right out approach road to the start of the taper for the on-ramp	750 feet[2]
Other Public/Private Access Points	
Central Point - Urban Business District (Speed: 25-35 mph)	350 feet[3]
Jackson County - Arterial (Minor and Major)	300 feet[4]

Notes:

1. Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the developable frontage area are developed at urban densities and many have driveways connecting to the crossroad. See definition in the Oregon Highway Plan.
2. Table 18 in the revised OHP-Effective January 1, 2012 Amended May 3, 2012 : Access Management Spacing Standards for Freeway Interchanges with Multi-Lane Crossroads
3. City of Central Point Transportation System Plan.
4. Jackson County Transportation System Plan.

Access Management Implementation

Access management actions would be taken when one or more of the following triggers occurs:

- Applications for land use changes or development are submitted

  Example: *"Consolidation or closure of driveways should be considered when properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street."*

- Future roadway improvements move into design and construction

  Example: *"Right-turn deceleration lanes should be considered when a new signalized intersection is constructed on E Pine (between Peninger and Hamrick)."*

- Safety and or operational problems arise

  Example: *"Consolidation or closure of driveways should be considered when the annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT Safety Priority Index System (SPIS) rating in the top 10 percent."*

Access Management Plan Actions

Interchange Area Management Plan 33

Legend

- Access Consolidation / Turn Restriction / Closure
- IAMP Recommended Improvement Project
- City of Central Point Transportation System Plan Project
- Potential new public connection or easement

DRAFT Figure 6-2

Access Management Plan Actions

Access Management Plan Actions

E Pine St from 10th St to I-5 Southbound Ramp Terminal

1. Consolidate/close driveways in an effort to move towards achieving applicable access spacing standards.
2. Expand the local street network.

E Pine St from I-5 Northbound Ramp Terminal to Peninger Rd

3. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
4. Expand the local street network.
5. Evaluate traffic control, potential turn limitations, left-turn lane, and right-turn lane needs for the Peninger Road intersection.

E Pine St from Peninger Rd to Hamrick Rd

6. Consolidate/close driveways and/or restrict access in an effort to move towards achieving applicable access spacing standards.
7. Expand the local street network.

Potential Management Actions

Management actions are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching elements:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange
- **Transportation Demand Management Strategies** that provide travel options to reduce the number of trips or vehicles on the road
- **Transportation System Management Measures** that improve system efficiency and reduce delays
- **Land Use and Development Strategies** that guide land use development to result in fewer trips in the interchange area

COMMENT CARD: I-5 Interchange 33 Interchange Area Management Plan
Open House, November 6, 2012

OPTIONAL

Name:______________________________

Company/Affiliation (if applicable):____________________

Address:______________________________

Phone:__________________ Email:__________________

No Comments Received

Do you (check all that apply):

☐ Own property in the project area?

☐ Live in the project area?

☐ Have a business in the project area?

If other than your address, where?________________________

☐ **Do you have any special concerns/thoughts regarding these projects? Any specific safety concerns? Traffic concerns? Ideas?**

Please put your comments about this project on the REVERSE of this card.

COMMENTS

Open House 2

November 6, 2012

I-5 Exit 33 (Central Point):
Interchange Area Management Plan
Jackson County

Technical Memorandum #9
Recommended Code and Plan Amendments

Prepared for

Oregon Department of Transportation, Region 3
3500 NW Stewart Parkway
Roseburg, Oregon 97470

Prepared by

David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon

June 2015

Table of Contents

9. RECOMMENDED CODE AND PLAN AMENDMENTS

This Plan and Ordinance Memorandum recommends changes to the City of Central Point Land Development Code (LDO) and Transportation System Plan and the Jackson County Land Development Ordinance in order to comply with the provisions of the Oregon Transportation Planning Rule (TPR) as codified in OAR 660-012-045, Division 51 and to implement and accompany the Interchange Area Management Plan (IAMP) for I-5 Exit 33 (Central Point).

In summary, the revisions provide additional standards to:

- Protect the safety and capacity of the roadway;
- Provide notification to ODOT regarding any potential affects to the state transportation system throughout the development review cycle;
- Provide additional access management standards;
- Protect the function of the interchange and East Pine Street as specified in the Oregon Highway Plan (OHP), RVMPO Regional Transportation Plan, and City of Central Point Transportation System Plan; and
- Improve safety and maximize operational efficiency of the freeway and interchange to address existing and future needs.

The following amendments are recommended to implement applicable state policies and make the City of Central Point LDO and TSP and Jackson County LDO and TSP consistent with the IAMP. The purpose of the amendment is boxed. Additions are shown underlined and deletions in ~~strikethrough~~.

9.1. City of Central Point Zoning Code (Chapter 17)

To implement OAR 734-051-7010 and protect the function of the facility

17.05.600 General provisions--One-hundred-twenty-day rule -Time computation--Pre-application conferences--Acceptance and review--Planning official's duties--Amended applications--Resubmittal.

D. Acceptance and Review of Applications.

I. In accordance with Oregon Administrative Rules for *Highway Approaches, Access Control, Spacing Standards and Medians*, adopted Access Management Plans and Interchange Area Management Plans:

(a) Must be used to evaluate development proposals; and

(b) May be used to determine mitigation for development proposals.

9.2. City of Central Point Transportation System Plan

To implement OAR 734-051-7010 and protect the function of the facility.

5.4. Access Management (AM)

5.4.1. Access Management Planning:

IAMP for I-5 Exit 33 (Central Point). The plan was prepared in 2015 to identify improvements for I-5 Exit 33 that can be implemented over time to maximize the function of the existing interchange and address the long-term needs of the Central Point and Rogue Valley communities. The IAMP includes an Access Management Plan that includes access management techniques and objectives for the IAMP study area. The findings and recommendations of the Access Management Plan for IAMP 33 are incorporated into this TSP by reference.

To implement OAR 734-051-7010 and protect the function of the facility.

5.6. Transportation Management Goals, Objectives, and Policies

GOAL 5.2: TO EMPLOY ACCESS MANAGEMENT STRATEGIES TO ENSURE SAFE AND EFFICIENT ROADWAYS CONSISTENT WITH THEIR DESIGNATED FUNCTION.

Policy 5.2.2. The City shall implement the access management strategies presented in the Access Management Plan for Front Street (Highway 99)/Pine Street, ~~and~~ the Central Point Highway 99 Corridor Plan, and I-5 Exit 33 IAMP.

To implement the TPR and the IAMP.

5.6. Transportation Management Goals, Objectives, and Policies

GOAL 5.1: TO MAXIMIZE, THROUGH TRANSPORTATION SYSTEM MANAGEMENT TECHNIQUES, **THE EFFICIENCY, SAFETY, AND CAPACITY OF THE CITY'S EXISTING TRANSPORTATION** FACILITIES AND SERVICES.

Policy 5.1.3. The City shall implement the TSM strategies presented in the IAMP for I-5 Exit 33 (Central Point).

To implement the IAMP and be consistent with the TSP.

Table 7.4. Transportation Projects, 2008-2030

Ref. No.	Project Location	Improv. Category	Project Description
236	E. Pine St.: Bear Creek Bridge to Peninger Rd.	~~Pb~~minor	~~Widen for turn lanes, bike lanes, add sidewalks. And third lane~~Widen to accommodate a third westbound through travel lane that will feed into the existing right-turn lane at I-5 northbound on ramp. Add sidewalks where missing.
256	E. Pine St. between 9th Street and I-5 Southbound Ramp Terminal	b	Restripe eastbound travel lanes to improve bike lane transitions

Table 7.6. City of Central Point Transportation Projects, 2008-2030

Ref. No.	Project Location	Improv. Category	Project Description
916	I-5 & E. Pine St., ~~SB Off-Ramp~~ Southbound Ramp Terminal.	major	~~Extend and channelize southbound off ramp~~ Add second westbound left-turn lane on E. Pine St. and a second receiving lane on the southbound on ramp.
~~917~~	~~I-5 Central Point Interchange (Exit 33)~~	~~Major~~	~~Interchange reconfiguration.~~
917~~8~~	I-5 & E. Pine St. ~~NB~~ Northbound Ramp Terminal	~~major~~major	Northbound off-ramp ~~& eastbound~~ capacity improvements.
918	E Pine St., south side between ramp terminals	p	Add 5- to 6-ft. sidewalk.

To implement the OHP and protect the function of the facility.

7.4. Street System Goals, Objectives and Policies

GOAL 7.1: PROVIDE A COMPREHENSIVE STREET SYSTEM THAT SERVES THE PRESENT AND FUTURE MOBILITY AND TRAVEL NEEDS OF THE CENTRAL POINT URBAN AREA, INCLUDING PROVISIONS FOR BICYCLE AND PEDESTRIAN FACILITIES.

Policy 7.1.17. The City shall provide a minimum maintenance level for those street improvements that have received state financial assistance to assure the continued benefit of the street improvements to the state highway system and maximize the longevity of the capital investments.

9.3. Jackson County Land Development Ordinance

To Implement the TPR and protect the function of the state facility.

CHAPTER 2. REVIEW AND DECISION-MAKING

2.7 STANDARD REVIEW PROCEDURES

2.7.3 Notice of Application

B) Notice of Application Requirements

3)The County shall send notice to the Oregon Department of Transportation when a land use action or land development proposal may affect a state transportation facility or facility plan, such as an interchange area management plan or corridor plan. If a proposal may affect a state transportation facility, the Oregon Department of Transportation comments will be incorporated into the conditions of approval for the proposal.

2.7.4 Planning Staff Decision/Recommendation

B) Description

1) Following certification of the application as complete, the Planning Staff will review the application and refer it to the appropriate review agencies, including the Oregon Department of Transportation.

To implement OAR 734-051-7010 and protect the function of the facility.

CHAPTER 9. GENERAL DEVELOPMENT REGULATIONS

9.5 ACCESS DESIGN STANDARDS

9.5.1 Applicability

G) In accordance with Oregon Administrative Rules for *Highway Approaches, Access Control, Spacing Standards, and Medians*, where adopted, Access Management and Interchange Area Management Plans:

1) Must be used to evaluate development proposals; and

2) May be used to determine mitigation for development proposals.

9.7 DEDICATION AND IMPROVEMENT REQUIREMENTS

It is the purpose of this section to ensure that an appropriate portion of right-of-way and improvement costs are provided for by abutting properties without general public cost when the development of the abutting property, due to the size or type of use, necessitates the need for additional expansion or construction of existing or planned transportation facilities if the necessary improvements have not been identified in the STIP or CIP.

(a) When development is proposed, the County may require improvements necessary to meet the applicable road design and capacity standards. Improvements shall be designed according to standards identified in the TSP and the specifications of the County Public Works Engineering Division.

(b). When development is proposed and consistent with the State Transportation Planning Rule, the following standards apply for when a proposal must be reviewed for potential traffic impacts; when a traffic impact analysis must be submitted with a development application in order to determine whether conditions are needed to minimize impacts to and protect transportation facilities; what must be in a traffic impact analysis; and who is qualified to prepare the study.

(1). If the application includes residential development, a TIA shall be required when the land use application involves one or more of the following actions:

a. A change in zoning or a plan amendment;

b. An increase in site traffic volume generation by two hundred fifty average daily trips or more;

c. An increase in peak hour volume of a particular movement to and from the State highway by twenty percent or more; or

d. An increase in use of adjacent streets by vehicles exceeding the twenty thousand pounds gross vehicle weights by ten vehicles or more per day;

(2). If the application does not include residential development, a TIA shall be required when a land use application involves one or more of the following actions:

a. A change in zoning or a plan amendment designation;

b. Any proposed development or land use action that a road authority, including Jackson County, incorporated or unincorporated cities or ODOT, states may have operational or safety concerns along its facility(ies);

c. An increase in site traffic volume generation by two hundred fifty average daily trips (ADT) or more;

d. An increase in peak hour volume of a particular movement to and from the State highway by twenty percent or more;

e. An increase in use of adjacent streets by vehicles exceeding twenty thousand pounds gross vehicle weight by ten vehicles or more per day;

f. The location of the access driveway does not meet minimum sight distance requirements, as determined by the county engineer, or is located where vehicles entering or leaving the property are restricted, or such vehicles queue or hesitate on the state highway, creating a safety hazard in the discretion; or

g. A change in internal traffic patterns that, in the discretion of the planning commission, may cause safety problems, such as back-up onto a street or greater potential for traffic accidents.

(3) Traffic Impact Analysis Preparation. A traffic impact analysis shall be:

a. Be approved as to scope prior to proceeding with the analysis,

b. Be prepared by an Oregon-certified engineer with expertise in traffic and road construction engineering;

c. Document compliance with:

(i)The Transportation Planning Rule;

(ii) The specifications of the County Public Works Engineering Division; and

(iii) The requirements specified in section 9.05 Jackson County Development Code;

(iv)The goals, policies and standards of the applicable transportation system plan(s); and

(v) If the road authority is ODOT, consult ODOT's regional development review planner and in accordance with Oregon Administrative Rules for Highway Approaches, Access Control, spacing standards, and medians.

(4) The traffic impact analysis shall demonstrate the following:

a. that the performance standards specified in the TSP and OHP for the affected road(s) will be achieved immediately and for the next five years.

(5) If the performance standard cannot be achieved or maintained as specified, the analysis shall propose one or more of the following:

a. Reconfigure roadway and side-street accesses to minimize traffic conflicts at intersections;

b. Road dedications, improvements including intersection improvements for capacity increases;

c. Other mitigation measures.

9.4. Jackson County Transportation System Plan

The Jackson County TSP is currently being updated. Modifications to the 2005 TSP that could be incorporated into the update include the following changes.

To implement the OHP and protect the function of the facility.

4.2 MODAL COMPONENTS

Modal Components Goal: To plan an integrated transportation system that maintains existing facilities and responds to the changing needs of Jackson County by providing effective multi-modal transportation options.

4.2.1 Vehicular System Policies

Minimum Maintenance Level

4.2.1.V Jackson County will provide a minimum maintenance level for those street improvements that have received state financial assistance to assure the continued benefit of the street improvements to the state highway system and maximize the longevity of the capital investments.

GEBHARD ROAD INTERSECTION

TRAFFIC IMPACT ANALYSIS

CITY OF CENTRAL POINT, Oregon

JUNE 4, 2015

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4765 VILLAGE PLAZA LOOP SUITE 201 EUGENE OREGON 97401

Traffic impact analysis

GEBHARD ROAD INTERSECTION

CENTRAL POINT, OREGON

Project principal: jim hanks Pe

Project no. 2409

June 4, 2015

Jrh transportation engineering
4765 village plaza loop, suite 201, Eugene, Oregon 97401 541.687.1081 FAX 541.345.6599 jrh@jrhweb.com

EXECUTIVE Summary

The information in this report confirms that construction of the Gebhard Road – East Pine Street intersection will not adversely affect traffic along East Pine Street between Hamrick Road and the Interstate 5 Ramps. Based on this confirmation, we recommend that the Gebhard – East Pine Street Intersection be added to the "Interstate -5, Interchange 33 (East Pine Street) Interchange Area Management Plan (IAMP).

The Oregon Department of Transportation (ODOT) is completing the IAMP for Interchange 33 in the City of Central Point. The early iterations of the draft IAMP do not include the planned intersection of Gebhard Road with East Pine Street. The draft IAMPS assume that financing of the intersection would not be available until after the end of the IAMP planning horizon. Recent improvement of the Rogue Valley economy makes it likely that developer financed construction of Gebhard Road itself and its intersection with East Pine Street will occur. Including the intersection to the IAMP at this time will facilitate the construction of Gebhard Road and the accompanying development of the property using it to access the City's arterial road system.

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The City of Central Point is currently conducting a location study for Gebhard Road. Although the City has not selected a preferred alignment, all alternatives connect to existing Gebhard Road at the north end and directly opposite an existing Gebhard Road right-of-way on the south side of East Pine Street, immediately east of the Sonic Drive-in. Because both ends of the Gebhard Extension are set and the traffic volumes at the proposed intersection alternatives are projected to be identical, the precise alignment to the north and south does not affect on the analysis contained in this letter.

The proposed extension of Gebhard Road would run through Transit Oriented Development (TOD) and Commercial property. Developers representing substantial portions of both land uses have approached the City regarding development. The City has requested ODOT to include Gebhard Road in their recommendation for the Intersection Area Management Plan. The IAMP will become effective when it is adopted as part of the City of Central Point's Transportation System Plan.

In concept, ODOT planners agree with the construction of Gebhard Road and its intersection with East Pine Street; however, to ensure compliance with the goals of the IAMP, they have requested the City to provide analysis confirming that the following standards are met through the planning horizon year of 2038:

1) The new intersection must meet the mobility standards adopted for the corridor.

2) The new intersection must not cause any ODOT intersection to exceed a mobility standard adopted for the corridor. The City of Central Point has the authority to adopt local performance standards so ODOT is neutral on non-ODOT intersections.

3) The new intersection must not increase congestion between the Intersetate-5 northbound ramps and Penninger Road to the extent that it results in a backup on to the freeway, and

4) Traffic progression along East Pine Street can be maintained if the Gebhard Road intersection is completed and controlled by a traffic signal.

The remainder of this report explains the process used to determine that each of these tests is met.

The land use and trip generation information used to evaluate these criteria is found in the RVCOG "Year 2038 Alternative Land Use Scenario (ALUS) on Regional Transportation Plan (RTP) (Req 45a) - build-out east of I-5. This plan assumed completion of the 2038 RVMPO v3.1 roadway system. In short, this model assumes build out of Central Point's urban reserve east of I-5; it also assumes that Gebhard Road will **not** intersect with East Pine Street.

David Evans and Associates (DEA) provided JRH with a copy of their SYNCHRO traffic analysis model prepared for the scenario described in the previous paragraph. DEA is ODOT's consultant for the development of the Interchange 33 IAMP. The DEA model, and our analysis assumes that all of the land in the study area is completely developed, and that the total traffic generated in the study area will not change when the intersection is developed.

Although the total traffic volume will not change, traffic patterns will change with the completion of the new intersection. The new intersection will divert traffic that would have used Hamrick Road before its completion, to connect with East Pine Street at the new intersection at Gebhard Road – East Pine Street. Because the total traffic from the area is unchanged, traffic volumes on Pine Street west of Gebhard Road and East of Hamrick Road are virtually the same with or without the signal.

The extension of Gebhard Road falls within RVCOG Transportation Analysis Zone (TAZ) 217. The land use designation is TOD in the north and commercial to the south. The 2038 ALUS model described above, adjusted for the addition of an intersection at Gebhard and East Pine Street, calculates 289 PM peak-hour trips on Gebhard approaching East Pine from the north and 245 heading north from East Pine onto Gebhard. In the JRH SYNCHRO analysis, these trips are rerouted away from Hamrick and added to Gebhard. (See the appendix for an excerpt of the model output).

To assure that model differences do not affect our results, the JRH modeling used the same defaults, assumptions, and even the same version of the SYNCHRO model, as the DEA model. The only changes were to the adjust traffic volumes affected by the new intersection and the addition of the intersection itself.

The geometry of the evaluated intersections follows the recommended improvements contained in the May 2014 “Revised Draft I-5 Exit 33 (Central Point) Interchange Area Management Plan, Volume 1” prepared by David Evans and Associates, Inc. The improvements are:

- I-5 Northbound Ramp Terminal – dual right-turn lanes, and
- I-5 Southbound Ramp Terminal – dual westbound left-turn lanes

The remainder of this analysis applies directly to the standards set by ODOT for their approval. The attached appendices provide detailed documentation of the calculations and modeling leading to the information summarized below.

Criteria 1: The new intersection must meet the mobility standards adopted for the corridor.
The intersection of Gebhard Road and East Pine Street is projected operate at level-of-service (LOS) C and a volume-to-capacity ratio (v/c) of 0.81. This meets the Jackson County standard of v/c of 0.95 and LOS D and the City of Central Point standard of LOS D,

Criteria 2: The new intersection must not cause any ODOT intersection to exceed a mobility standard adopted for the corridor.

Table 1 shows that all intersections in the corridor will meet the adopted performance standard with the addition of the Gebhard Road – East Pine Street intersection. The Penninger Road – East Pine Street intersection shows a minor reduction in v/c ratio with the addition of the new intersection, probably because of a metering effect of a nearby signal. The Hamrick Road – East Pine Street Intersection will improve in both LOS and V/C. The primary reason is that the Gebhard Road intersection will attract vehicles that would have otherwise used Hamrick.

Table 1 Intersection Performance

Intersection	Standard	2038 Without Gebhard Rd	2038 With Gebhard Rd E
E. Pine Street at SB Off-Ramp	0.85/D	0.65/B	0.65/B
E. Pine Street at NB On-Ramp	0.85/D	0.76/B	0.76/B
E. Pine Street at Penninger Rd	0.95/D	0.94/C	0.93/C
E. Pine Street at Gebhard Rd	0.95/D	N/A	0.81/C
E. Pine Street at Hamrick Rd	0.95/D	0.92/C	0.79/B

Criteria 3: The new intersection must not increase congestion between the Intersetate-5 northbound ramps and Penninger Road to the extent that it results in a backup on to the freeway.

Table 2 shows the projected 2038 queue lengths for the NB I -5 ramps at East Pine Street and Penninger Road at East Pine Street intersections both with and without the Gebhard Road intersection. For reasons stated above, the intersection traffic volumes for each movement are the same for both scenarios.

In spite of the identical volumes, there are minor differences in the calculated queue lengths. One reason is that the metering effect of the Gebhard signal can produce tighter traffic platoons approaching the two intersections. Another, probably more important reason, is that the SimTraffic model used to calculate the queue lengths feeds the projected traffic volumes into the system randomly, similar to actual day-to-day traffic flow. Each simulation using SimTraffic is slightly different. In accordance with ODOT standards, each simulation is run five times and averaged.

Table 2: Queue Length

INTERSECTION	MOVEMENT	AVAILABLE STORAGE (feet)	2038 NO-BUILD QUEUING (FEET)		2038 BUILD QUEUING (FEET)	
			AVG.	95TH Percentile	AVG.	95TH Percentile
E. Pine Street and Peninger Rd	EB Left	300	150	225	250	425
	EB Right	225	125	**375**	125	**325**
	WB Left	150	50	100	50	75
	NB Left	150	**250**	**300**	**250**	**300**
E. Pine Street and NB Ramps	EB Left	400	125	326	75	200
	WB Right	275	75	175	75	125
	NB Left	500	150	300	200	375
	NB Right	500	325	**631**	275	**550**
	NB Right	500	178	370	250	492

Three locations show 95th percentile queue lengths that exceed the available storage length, the eastbound right turn and the northbound left turn at the East Pine and Penninger Road intersection and the northbound right turn at the I-5 northbound right turn at East Pine Street. All three of these locations are projected to exceed the available storage length at an equal or greater level without the Gebhard Intersection so it can be concluded that the new intersection would have no impact on queuing on the freeway ramps.

Criteria 4: Traffic progression along East Pine Street can be maintained if the Gebhard Road intersection is completed and controlled by a traffic signal,

The Part 10 of ODOT "Analysis Procedures Manual" outlines the process to determine if arterial progression can be maintained with the installation of a new traffic signal. Using the ODOT methodology it was shown that during the PM peak hour, traffic progression will be maintained. The critical I-5 Northbound Ramp intersection with East Pine Street requires 60 seconds westbound and 70 seconds eastbound of green and yellow signal time per cycle to maintain progression. With the Gebhard intersection, 60 seconds westbound and 58 seconds eastbound will be provided.

A signal should not be provided until it is warranted or it can be shown that it will meet signal warrants within a short time after it is installed.

Summary and Conclusion: The analysis contained in this report shows that the proposed Gebhard Road intersection with East Pine Streets meets all the established criteria set by ODOT for inclusion in the Interchange 33 IAMP. It is my recommendation that this be done.

JRH

EXHIBIT A

EAST PINE STREET
WITHOUT GEBHARD EXTENSION

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰↰	↑↑					↰	↰↑	↱
Volume (vph)	0	1065	315	375	1560	0	0	0	0	275	2	80
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		0.95	1.00	0.97	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.98	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
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1458	2854	3292					1327	1334	1488
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1458	2854	3292					1327	1334	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)	0	1121	332	395	1642	0	0	0	0	289	2	84
RTOR Reduction (vph)	0	0	155	0	0	0	0	0	0	0	0	37
Lane Group Flow (vph)	0	1121	177	395	1642	0	0	0	0	144	147	47
Confl. Peds. (#/hr)			4									2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	Prot						Perm		Prot
Protected Phases		2		1	6						4	4
Permitted Phases			2							4		
Actuated Green, G (s)		63.3	63.3	24.5	92.3					18.7	18.7	18.7
Effective Green, g (s)		63.8	63.8	25.0	92.8					19.2	19.2	19.2
Actuated g/C Ratio		0.53	0.53	0.21	0.77					0.16	0.16	0.16
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1750	775	595	2546					212	213	238
v/s Ratio Prot		0.34		0.14	c0.50							0.03
v/s Ratio Perm			0.12							0.11	0.11	
v/c Ratio		0.64	0.23	0.66	0.64					0.68	0.69	0.20
Uniform Delay, d1		20.0	15.0	43.6	6.1					47.5	47.6	43.7
Progression Factor		0.59	0.66	0.84	0.65					1.00	1.00	1.00
Incremental Delay, d2		1.4	0.5	1.7	0.9					7.6	8.5	0.3
Delay (s)		13.1	10.4	38.3	4.9					55.1	56.1	44.0
Level of Service		B	B	D	A					E	E	D
Approach Delay (s)		12.5			11.3			0.0			53.0	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	15.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.1%	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)	55	1285	0	0	1460	485	475	0	540	0	0	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	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	2338			
Flt Permitted	0.09	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	157	3197			3228	1299	1564	1564	2338			
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)	57	1339	0	0	1521	505	495	0	562	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	204	0	0	93	0	0	0
Lane Group Flow (vph)	57	1339	0	0	1521	301	247	248	469	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2					6	8					
Actuated Green, G (s)	78.5	78.5			70.4	70.4	32.5	32.5	32.5			
Effective Green, g (s)	79.0	79.0			70.9	70.9	33.0	33.0	33.0			
Actuated g/C Ratio	0.66	0.66			0.59	0.59	0.28	0.28	0.28			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	155	2105			1907	767	430	430	643			
v/s Ratio Prot	0.01	c0.42			c0.47				c0.20			
v/s Ratio Perm	0.23					0.23	0.16	0.16				
v/c Ratio	0.37	0.64			0.80	0.39	0.57	0.58	0.73			
Uniform Delay, d1	30.0	12.1			19.0	13.1	37.5	37.5	39.5			
Progression Factor	0.28	0.23			0.38	0.02	1.00	1.00	1.00			
Incremental Delay, d2	0.9	1.2			2.1	0.9	1.9	1.9	4.2			
Delay (s)	9.3	3.9			9.4	1.2	39.3	39.4	43.6			
Level of Service	A	A			A	A	D	D	D			
Approach Delay (s)		4.1			7.3			41.6			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	14.4	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.1%	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)	185	1420	220	30	1530	255	250	45	50	215	20	165
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	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3260	1102	1471	4596		1309	1485		1662	1516	
Flt Permitted	0.07	1.00	1.00	0.07	1.00		0.29	1.00		0.68	1.00	
Satd. Flow (perm)	118	3260	1102	110	4596		405	1485		1188	1516	
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)	195	1495	232	32	1611	268	263	47	53	226	21	174
RTOR Reduction (vph)	0	0	65	0	16	0	0	39	0	0	156	0
Lane Group Flow (vph)	195	1495	167	32	1863	0	263	61	0	226	39	0
Heavy Vehicles (%)	0%	2%	35%	13%	2%	0%	27%	0%	16%	0%	0%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	73.5	73.5	73.5	63.6	63.6		27.6	13.6		23.6	11.6	
Effective Green, g (s)	74.0	74.0	74.0	64.1	64.1		27.6	14.1		23.6	12.1	
Actuated g/C Ratio	0.62	0.62	0.62	0.53	0.53		0.23	0.12		0.20	0.10	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.5	1.0	1.0	2.5	1.0		2.5	2.5		2.5	4.0	
Lane Grp Cap (vph)	250	2010	680	103	2455		199	174		281	153	
v/s Ratio Prot	0.09	c0.46		0.01	c0.41		c0.15	0.04		0.08	0.03	
v/s Ratio Perm	c0.39		0.15	0.16			c0.15			0.08		
v/c Ratio	0.78	0.74	0.25	0.31	0.76		1.32	0.35		0.80	0.25	
Uniform Delay, d1	33.3	16.3	10.4	19.3	21.9		43.7	48.7		45.0	49.8	
Progression Factor	0.80	0.58	0.50	0.75	0.61		1.00	1.00		1.00	1.00	
Incremental Delay, d2	10.7	1.9	0.6	0.5	0.9		175.4	0.9		14.9	1.2	
Delay (s)	37.2	11.3	5.9	15.1	14.2		219.1	49.6		59.8	51.0	
Level of Service	D	B	A	B	B		F	D		E	D	
Approach Delay (s)		13.3			14.2			172.4			55.7	
Approach LOS		B			B			F			E	

Intersection Summary			
HCM Average Control Delay	30.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.94		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	90.0%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
9: E Pine St & Hamrick Rd

5/27/2015

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	735	925	25	10	1180	85	50	15	5	75	15	585
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	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3131	3110		1662	3202			1378	1488		1639	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.71	1.00
Satd. Flow (perm)	3131	3110		1662	3202			941	1488		1207	1458
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)	774	974	26	11	1242	89	53	16	5	79	16	616
RTOR Reduction (vph)	0	1	0	0	4	0	0	0	4	0	0	9
Lane Group Flow (vph)	774	999	0	11	1327	0	0	69	1	0	95	607
Heavy Vehicles (%)	3%	5%	62%	0%	3%	0%	29%	0%	0%	0%	15%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8		8	4		4
Actuated Green, G (s)	41.0	91.2		0.7	50.0			15.1	15.1		14.8	55.8
Effective Green, g (s)	41.0	92.2		0.7	51.4			15.6	15.6		15.6	55.8
Actuated g/C Ratio	0.34	0.77		0.01	0.43			0.13	0.13		0.13	0.46
Clearance Time (s)	4.0	5.0		3.5	5.4			4.5	4.5		4.8	4.0
Vehicle Extension (s)	3.0	1.0		3.0	1.0			2.5	2.5		1.0	3.0
Lane Grp Cap (vph)	1070	2390		10	1372			122	193		157	678
v/s Ratio Prot	0.25	0.32		0.01	c0.41							c0.31
v/s Ratio Perm								0.07	0.00		0.08	0.11
v/c Ratio	0.72	0.42		1.10	0.97			0.57	0.00		0.61	0.90
Uniform Delay, d1	34.5	4.7		59.6	33.5			49.0	45.4		49.3	29.4
Progression Factor	0.69	0.51		0.54	0.24			1.00	1.00		1.00	1.00
Incremental Delay, d2	1.7	0.4		204.8	8.9			4.8	0.0		4.5	14.4
Delay (s)	25.4	2.8		236.9	16.7			53.8	45.4		53.7	43.8
Level of Service	C	A		F	B			D	D		D	D
Approach Delay (s)		12.7			18.6			53.3			45.2	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	21.4	HCM Level of Service	C
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	91.8%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	WB	B24	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	T	L	LT	R
Maximum Queue (ft)	362	398	335	248	306	330	368	7	227	249	135
Average Queue (ft)	226	206	77	131	145	145	170	0	127	140	58
95th Queue (ft)	412	386	228	212	238	266	302	5	207	232	142
Link Distance (ft)	344	344			796	796	796	387		1208	
Upstream Blk Time (%)	5	3	0								
Queuing Penalty (veh)	36	21	0								
Storage Bay Dist (ft)			250	150					400		35
Storage Blk Time (%)		6		4	7					63	14
Queuing Penalty (veh)		20		8	12					138	40

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	B24	B24	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	379	478	490	783	781	374	344	262	311	586	465	426
Average Queue (ft)	107	308	276	334	302	147	126	61	140	383	321	178
95th Queue (ft)	326	621	593	879	837	281	258	173	288	985	631	370
Link Distance (ft)		387	387	796	796	460	460	460		1031		
Upstream Blk Time (%)	0	29	17	4	3		0	0		22		
Queuing Penalty (veh)	0	197	116	28	22		1	0		0		
Storage Bay Dist (ft)	400								500		500	500
Storage Blk Time (%)	0	29							0	9	24	
Queuing Penalty (veh)	1	16							0	65	111	

Intersection: 8: E Pine St & Peninger Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	TR	L	TR	L	TR
Maximum Queue (ft)	175	545	531	390	170	394	372	354	250	386	413	329
Average Queue (ft)	146	501	362	115	31	212	226	194	233	281	180	93
95th Queue (ft)	215	614	643	352	92	338	348	316	290	485	334	206
Link Distance (ft)		460	460			432	432	432		334	778	
Upstream Blk Time (%)		22	12			0	0	0		38		
Queuing Penalty (veh)		203	106			0	0	0		0		
Storage Bay Dist (ft)	75			215	100				150			300
Storage Blk Time (%)	48	31	17	0	0	30			62	3	3	
Queuing Penalty (veh)	341	58	37	0	0	9			59	7	5	

Arterial Level of Service: EB E Pine St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hamrick Rd	III	35	43.1	3.1	46.2	0.36	28.0	B
Total	III		43.1	3.1	46.2	0.36	28.0	B

Arterial Level of Service: WB E Pine St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hamrick Rd	II	45	35.8	20.3	56.1	0.38	24.4	C
Total	II		35.8	20.3	56.1	0.38	24.4	C

Project Information	
Analyst:	JYC
Agency/Company:	JRH Transportation Engineering
Date:	5/27/2015
Project Name:	Gebhard Road Ext
Section:	
Analysis Time Period:	PM Peak
Jurisdiction:	
Year/Alternative:	2038 No Gebhard Ext

Parameter	Value[2]	
Inputs		
Cycle Length (sec)	120	
Posted Speed of Arterial (mph)	35	35
Progression Speed (mph)	28	24.4
Direction of Flow	Westbound	Eastbound
Lane Group Flow (vph)	1460	1285
Saturation Flow Rate (veh per hour of green)	3500	3500
Progression bandwidth provided	68	70
Calculations[3]		
1. No. of Cycles per hour	30	
2. G/C, hours of green required per hour	0.417	0.367
3. Minimum seconds of green per hour	1502	1322
4. Minimum seconds of green per cycle	50.1	44.1
Generic Yellow Time	4	4
Results		
Minimum Progression Bandwidth = Minimum Green + Yellow Time	**54.1**	**48.1**

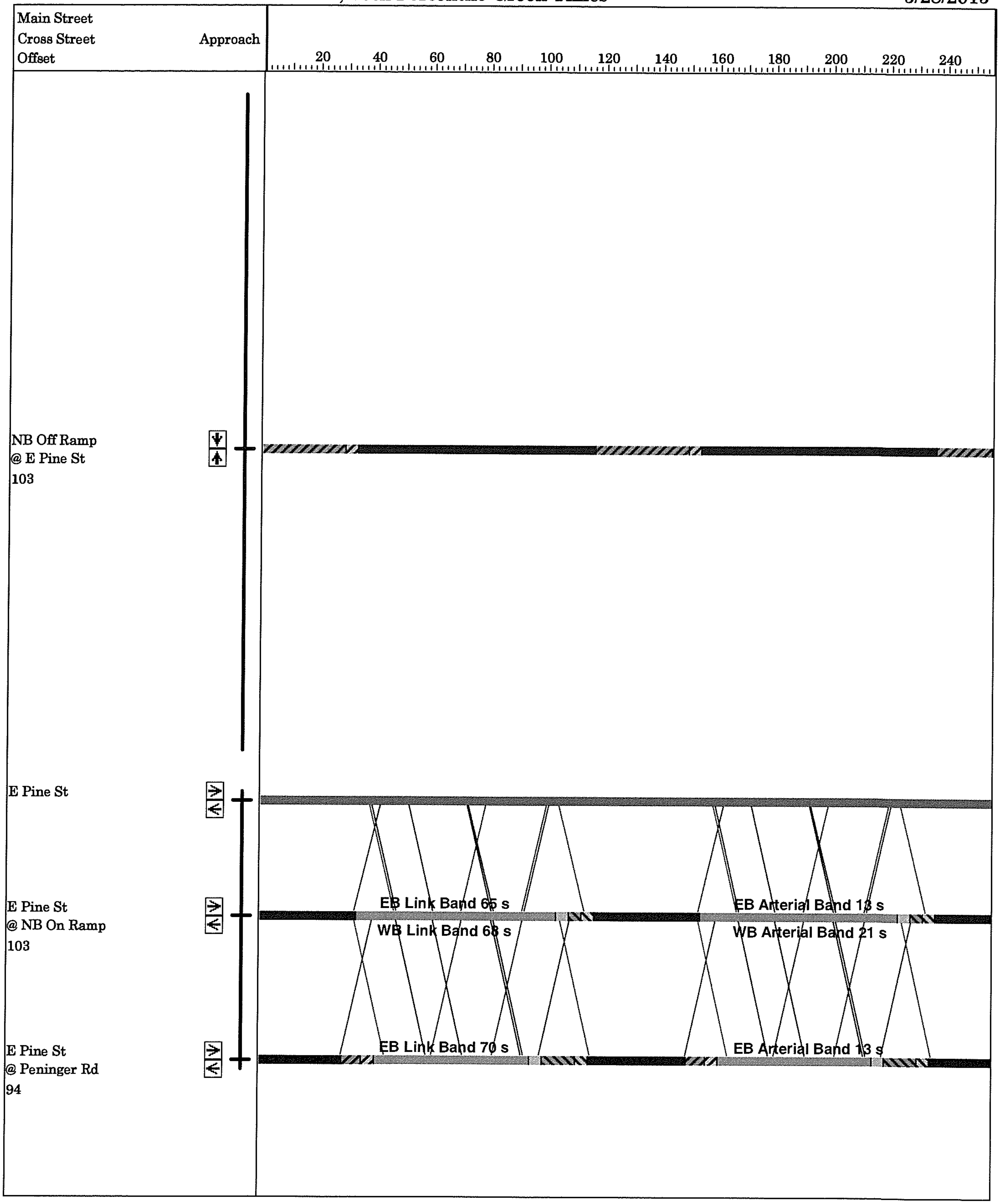
[1] This calculator is to be applied at the most critical intersection in a progressed signal system. At the critical intersection, the arterial approach volume and saturation flow rate are used to set the minimum required progression bandwidth

[2] See Notes tab for instructions.

[3] See Manual Calculation tab for description of steps.

Timing Plan: 1

Arterial and Link-Link Bandwidths, 70th Percentile Green Times 5/28/2015



IAMP 33

2038 ALUS PM Preferred Alt with Delayed TSP (Baseline Vols)

EXHIBIT b

EAST PINE STREET WITH GEBHARD ROAD EXTENSION

VOICE 541.687.1081 FAX 541.345.6599 WEB JRHWEB.COM
4765 VILLAGE PLAZA LOOP SUITE 201 EUGENE OREGON 97401

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑	↱	↰↰	↑↑					↰	↰↑	↱
Volume (vph)	0	1065	315	375	1560	0	0	0	0	275	2	80
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		0.95	1.00	0.97	0.95					0.95	0.95	1.00
Frpb, ped/bikes		1.00	0.98	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
Frt		1.00	0.85	1.00	1.00					1.00	1.00	0.85
Flt Protected		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (prot)		3292	1458	2854	3292					1327	1334	1488
Flt Permitted		1.00	1.00	0.95	1.00					0.95	0.95	1.00
Satd. Flow (perm)		3292	1458	2854	3292					1327	1334	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)	0	1121	332	395	1642	0	0	0	0	289	2	84
RTOR Reduction (vph)	0	0	155	0	0	0	0	0	0	0	0	37
Lane Group Flow (vph)	0	1121	177	395	1642	0	0	0	0	144	147	47
Confl. Peds. (#/hr)			4									2
Heavy Vehicles (%)	0%	1%	0%	13%	1%	0%	0%	0%	0%	19%	0%	0%
Turn Type			Perm	Prot						Perm		Prot
Protected Phases		2		1	6						4	4
Permitted Phases			2							4		
Actuated Green, G (s)		63.3	63.3	24.5	92.3					18.7	18.7	18.7
Effective Green, g (s)		63.8	63.8	25.0	92.8					19.2	19.2	19.2
Actuated g/C Ratio		0.53	0.53	0.21	0.77					0.16	0.16	0.16
Clearance Time (s)		4.5	4.5	4.5	4.5					4.5	4.5	4.5
Vehicle Extension (s)		4.6	4.6	2.5	4.6					2.5	2.5	2.5
Lane Grp Cap (vph)		1750	775	595	2546					212	213	238
v/s Ratio Prot		0.34		0.14	c0.50							0.03
v/s Ratio Perm			0.12							0.11	0.11	
v/c Ratio		0.64	0.23	0.66	0.64					0.68	0.69	0.20
Uniform Delay, d1		20.0	15.0	43.6	6.1					47.5	47.6	43.7
Progression Factor		0.59	0.66	0.81	0.57					1.00	1.00	1.00
Incremental Delay, d2		1.4	0.5	1.7	0.9					7.6	8.5	0.3
Delay (s)		13.1	10.4	37.1	4.4					55.1	56.1	44.0
Level of Service		B	B	D	A					E	E	D
Approach Delay (s)		12.5			10.7			0.0			53.0	
Approach LOS		B			B			A			D	

Intersection Summary			
HCM Average Control Delay	15.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.1%	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)	55	1285	0	0	1460	485	475	0	540	0	0	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	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00	0.95	0.95	0.88			
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	1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (prot)	1662	3197			3228	1299	1564	1564	2338			
Flt Permitted	0.09	1.00			1.00	1.00	0.95	0.95	1.00			
Satd. Flow (perm)	157	3197			3228	1299	1564	1564	2338			
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)	57	1339	0	0	1521	505	495	0	562	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	204	0	0	93	0	0	0
Lane Group Flow (vph)	57	1339	0	0	1521	301	247	248	469	0	0	0
Confl. Peds. (#/hr)	1					1			2			
Heavy Vehicles (%)	0%	4%	0%	2%	3%	12%	1%	0%	12%	0%	0%	0%
Turn Type	pm+pt					Perm	Perm		Prot			
Protected Phases	5	2			6			8	8			
Permitted Phases	2					6	8					
Actuated Green, G (s)	78.5	78.5			70.4	70.4	32.5	32.5	32.5			
Effective Green, g (s)	79.0	79.0			70.9	70.9	33.0	33.0	33.0			
Actuated g/C Ratio	0.66	0.66			0.59	0.59	0.28	0.28	0.28			
Clearance Time (s)	4.5	4.5			4.5	4.5	4.5	4.5	4.5			
Vehicle Extension (s)	2.5	4.6			4.6	4.6	3.0	3.0	3.0			
Lane Grp Cap (vph)	155	2105			1907	767	430	430	643			
v/s Ratio Prot	0.01	c0.42			c0.47				c0.20			
v/s Ratio Perm	0.23					0.23	0.16	0.16				
v/c Ratio	0.37	0.64			0.80	0.39	0.57	0.58	0.73			
Uniform Delay, d1	30.0	12.1			19.0	13.1	37.5	37.5	39.5			
Progression Factor	0.25	0.16			0.35	0.01	1.00	1.00	1.00			
Incremental Delay, d2	0.9	1.2			2.1	0.9	1.9	1.9	4.2			
Delay (s)	8.3	3.1			8.7	0.9	39.3	39.4	43.6			
Level of Service	A	A			A	A	D	D	D			
Approach Delay (s)		3.4			6.8			41.6			0.0	
Approach LOS		A			A			D			A	

Intersection Summary			
HCM Average Control Delay	13.9	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	72.1%	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)	185	1420	220	30	1530	255	250	45	50	215	20	165
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	0.91		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.92		1.00	0.87	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1662	3260	1102	1471	4596		1309	1485		1662	1516	
Flt Permitted	0.06	1.00	1.00	0.09	1.00		0.26	1.00		0.69	1.00	
Satd. Flow (perm)	104	3260	1102	132	4596		365	1485		1212	1516	
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)	195	1495	232	32	1611	268	263	47	53	226	21	174
RTOR Reduction (vph)	0	0	69	0	16	0	0	38	0	0	125	0
Lane Group Flow (vph)	195	1495	163	32	1863	0	263	62	0	226	70	0
Heavy Vehicles (%)	0%	2%	35%	13%	2%	0%	27%	0%	16%	0%	0%	0%
Turn Type	pm+pt		Perm	pm+pt			pm+pt			pm+pt		
Protected Phases	5	2		1	6		7	4		3	8	
Permitted Phases	2		2	6			4			8		
Actuated Green, G (s)	79.9	73.0	73.0	64.9	62.5		29.5	15.1		24.7	12.7	
Effective Green, g (s)	80.4	73.5	73.5	65.9	63.0		29.5	15.6		24.7	13.2	
Actuated g/C Ratio	0.67	0.61	0.61	0.55	0.52		0.25	0.13		0.21	0.11	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5		4.0	4.5		4.0	4.5	
Vehicle Extension (s)	2.5	1.0	1.0	2.5	1.0		2.5	2.5		2.5	4.0	
Lane Grp Cap (vph)	244	1997	675	105	2413		203	193		294	167	
v/s Ratio Prot	c0.09	c0.46		0.01	0.41		c0.16	0.04		0.08	0.05	
v/s Ratio Perm	c0.44		0.15	0.16			c0.16			0.08		
v/c Ratio	0.80	0.75	0.24	0.30	0.77		1.30	0.32		0.77	0.42	
Uniform Delay, d1	34.4	16.6	10.6	35.1	22.8		42.3	47.4		43.9	49.8	
Progression Factor	0.82	0.65	0.69	0.40	0.36		1.00	1.00		1.00	1.00	
Incremental Delay, d2	12.3	1.9	0.6	0.6	1.2		164.4	0.7		11.0	2.3	
Delay (s)	40.5	12.8	8.0	14.6	9.5		206.7	48.1		54.9	52.2	
Level of Service	D	B	A	B	A		F	D		D	D	
Approach Delay (s)		15.0			9.6			163.0			53.6	
Approach LOS		B			A			F			D	

Intersection Summary			
HCM Average Control Delay	27.9	HCM Level of Service	C
HCM Volume to Capacity ratio	0.93		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
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)	632	925	25	10	1180	85	50	15	5	75	15	417
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	4.0			4.0	4.0		4.0	4.0
Lane Util. Factor	0.97	0.95		1.00	0.95			1.00	1.00		1.00	1.00
Frt	1.00	1.00		1.00	0.99			1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.96	1.00		0.96	1.00
Satd. Flow (prot)	3131	3110		1662	3202			1378	1488		1639	1458
Flt Permitted	0.95	1.00		0.95	1.00			0.66	1.00		0.71	1.00
Satd. Flow (perm)	3131	3110		1662	3202			941	1488		1207	1458
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)	665	974	26	11	1242	89	53	16	5	79	16	439
RTOR Reduction (vph)	0	1	0	0	3	0	0	0	4	0	0	12
Lane Group Flow (vph)	665	999	0	11	1328	0	0	69	1	0	95	427
Heavy Vehicles (%)	3%	5%	62%	0%	3%	0%	29%	0%	0%	0%	15%	2%
Turn Type	Prot			Prot			Perm		Perm	Perm		pm+ov
Protected Phases	5	2		1	6			8			4	5
Permitted Phases							8		8	4		4
Actuated Green, G (s)	30.0	91.2		0.7	61.0			15.1	15.1		14.8	44.8
Effective Green, g (s)	30.0	92.2		0.7	62.4			15.6	15.6		15.6	44.8
Actuated g/C Ratio	0.25	0.77		0.01	0.52			0.13	0.13		0.13	0.37
Clearance Time (s)	4.0	5.0		3.5	5.4			4.5	4.5		4.8	4.0
Vehicle Extension (s)	3.0	1.0		3.0	1.0			2.5	2.5		1.0	3.0
Lane Grp Cap (vph)	783	2390		10	1665			122	193		157	593
v/s Ratio Prot	c0.21	0.32		0.01	c0.41							c0.18
v/s Ratio Perm								0.07	0.00		0.08	0.11
v/c Ratio	0.85	0.42		1.10	0.80			0.57	0.00		0.61	0.72
Uniform Delay, d1	42.8	4.7		59.6	23.6			49.0	45.4		49.3	32.2
Progression Factor	0.85	0.42		0.98	0.26			1.00	1.00		1.00	1.00
Incremental Delay, d2	6.7	0.4		204.8	1.5			4.8	0.0		4.5	4.3
Delay (s)	43.1	2.4		263.3	7.7			53.8	45.4		53.7	36.5
Level of Service	D	A		F	A			D	D		D	D
Approach Delay (s)		18.7			9.8			53.3			39.6	
Approach LOS		B			A			D			D	

Intersection Summary			
HCM Average Control Delay	19.2	HCM Level of Service	B
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
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)	170	1505	10	10	1572	65	41	10	5	72	15	202
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
Lane Util. Factor	1.00	0.95		1.00	0.95		1.00	1.00		1.00	1.00	1.00
Frt	1.00	1.00		1.00	0.99		1.00	0.95		1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)	1630	3257		1630	3240		1630	1635		1630	1716	1458
Flt Permitted	0.95	1.00		0.95	1.00		0.75	1.00		0.75	1.00	1.00
Satd. Flow (perm)	1630	3257		1630	3240		1282	1635		1282	1716	1458
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)	185	1636	11	11	1709	71	45	11	5	78	16	220
RTOR Reduction (vph)	0	0	0	0	2	0	0	4	0	0	0	167
Lane Group Flow (vph)	185	1647	0	11	1778	0	45	12	0	78	16	53
Turn Type	Prot			Prot			Perm			Perm		Perm
Protected Phases	5	2		1	6			8			4	
Permitted Phases							8			4		4
Actuated Green, G (s)	16.5	89.2		0.8	73.5		18.0	18.0		18.0	18.0	18.0
Effective Green, g (s)	16.0	88.7		0.3	73.0		17.5	17.5		17.5	17.5	17.5
Actuated g/C Ratio	0.13	0.74		0.00	0.61		0.15	0.15		0.15	0.15	0.15
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	2.5		2.5	2.5		2.5	2.5		2.5	2.5	2.5
Lane Grp Cap (vph)	217	2407		4	1971		187	238		187	250	213
v/s Ratio Prot	c0.11	0.51		0.01	c0.55			0.01			0.01	
v/s Ratio Perm							0.04			c0.06		0.04
v/c Ratio	0.85	0.68		2.75	0.90		0.24	0.05		0.42	0.06	0.25
Uniform Delay, d1	50.8	8.3		59.9	20.4		45.4	44.1		46.6	44.2	45.4
Progression Factor	0.77	1.76		0.95	0.52		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2	19.6	1.1		1122.0	5.1		3.0	0.4		1.1	0.1	0.4
Delay (s)	58.8	15.7		1179.2	15.8		48.4	44.5		47.7	44.3	45.9
Level of Service	E	B		F	B		D	D		D	D	D
Approach Delay (s)		20.0			22.9			47.4			46.2	
Approach LOS		C			C			D			D	

Intersection Summary			
HCM Average Control Delay	23.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	13.5
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			

Intersection: 6: E Pine St & SB Off Ramp

Movement	EB	EB	EB	WB	WB	WB	WB	B24	SB	SB	SB
Directions Served	T	T	R	L	L	T	T	T	L	LT	R
Maximum Queue (ft)	356	366	334	246	307	361	423	4	271	341	135
Average Queue (ft)	241	204	76	130	146	158	186	0	125	144	57
95th Queue (ft)	399	372	236	218	240	293	341	3	221	263	146
Link Distance (ft)	344	344			796	796	796	387		1208	
Upstream Blk Time (%)	8	7	0								
Queuing Penalty (veh)	57	49	0								
Storage Bay Dist (ft)			250	150					400		35
Storage Blk Time (%)		11	0	5	8					65	12
Queuing Penalty (veh)		33	0	9	14					142	34

Intersection: 7: E Pine St & NB On Ramp

Movement	EB	EB	EB	B24	B24	WB	WB	WB	NB	NB	NB	NB
Directions Served	L	T	T	T	T	T	T	R	L	LT	R	R
Maximum Queue (ft)	322	431	434	654	656	319	287	122	463	756	535	498
Average Queue (ft)	62	174	154	180	172	137	114	57	194	283	262	247
95th Queue (ft)	197	491	474	708	693	242	215	103	367	750	536	492
Link Distance (ft)		387	387	796	796	460	460	460		1042		
Upstream Blk Time (%)	0	18	15	7	6		0			5		
Queuing Penalty (veh)	0	122	96	49	39		0			0		
Storage Bay Dist (ft)	400								500		500	500
Storage Blk Time (%)	0	18							0	1	10	6
Queuing Penalty (veh)	0	10							0	9	47	27

Intersection: 8: E Pine St & Peninger Rd

Movement	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	T	TR	L	TR	L	TR
Maximum Queue (ft)	384	544	534	396	84	372	354	330	250	405	574	361
Average Queue (ft)	233	379	337	110	25	178	185	158	231	293	250	119
95th Queue (ft)	422	607	579	325	63	309	302	287	295	490	525	293
Link Distance (ft)		460	460			433	433	433		334	778	
Upstream Blk Time (%)		20	14			0				42	0	
Queuing Penalty (veh)		183	129			0				0	0	
Storage Bay Dist (ft)	300			225	150				150			300
Storage Blk Time (%)	5	26	20			9			61	2	12	0
Queuing Penalty (veh)	33	48	44			3			58	5	23	0

Arterial Level of Service: EB E Pine St

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Gebhard Road	III	35	25.4	10.7	36.1	0.21	21.1	C
Hamrick Rd	III	35	18.9	2.2	21.1	0.15	25.2	B
Total	III		44.3	12.9	57.2	0.36	22.6	C

Arterial Level of Service: WB E Pine St

With Gebhard Rd.

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Hamrick Rd	III	35	45.7	12.0	57.7	0.38	23.8	C
Gebhard Rd.	III	35	18.9	17.4	36.3	0.15	14.7	D
Total	III		64.6	29.4	94.0	0.53	20.3	C

Project Information	
Analyst:	JYC
Agency/Company:	JRH Transportation Engineering
Date:	5/27/2015
Project Name:	Gebhard Road Ext
Section:	
Analysis Time Period:	PM Peak
Jurisdiction:	
Year/Alternative:	2038 With Gebhard Ext

Parameter	Value[2]	
Inputs		
Cycle Length (sec)	120	
Posted Speed of Arterial (mph)	35	35
Progression Speed (mph)	23.8	21.6
Direction of Flow	Westbound	Eastbound
Lane Group Flow (vph)	1460	1285
Saturation Flow Rate (veh per hour of green)	3500	3500
Progression bandwidth provided	60	58
Calculations[3]		
1. No. of Cycles per hour	30	
2. G/C, hours of green required per hour	0.417	0.367
3. Minimum seconds of green per hour	1502	1322
4. Minimum seconds of green per cycle	50.1	44.1
Generic Yellow Time	4	4
Results		
Minimum Progression Bandwidth = Minimum Green + Yellow Time	**54.1**	**48.1**

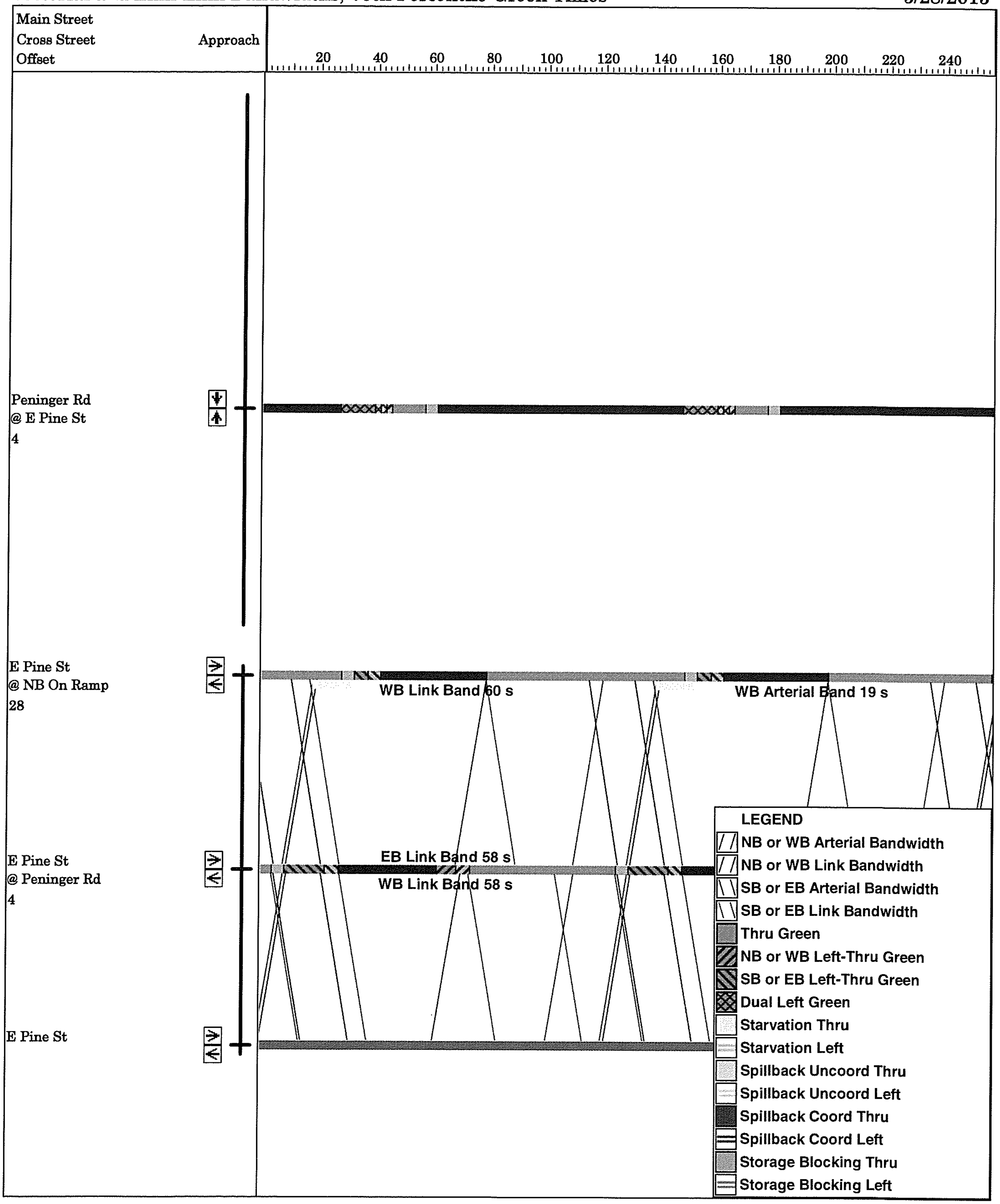
[1] This calculator is to be applied at the most critical intersection in a progressed signal system. At the critical intersection, the arterial approach volume and saturation flow rate are used to set the minimum required progression bandwidth

[2] See Notes tab for instructions.

[3] See Manual Calculation tab for description of steps.

Timing Plan: 1

Arterial and Link-Link Bandwidths, 70th Percentile Green Times 5/28/2015



IAMP 33

2038 ALUS PM Preferred Alt with Delayed TSP Add Gebhart Road

JRH Transportation Engineering
www.jrhweb.com

EUGENE
4765 Village Plaza Loop, Suite 201
Eugene, Oregon 97401
541-687-1081

Jennifer E. Danziger

From: GUEVARA Thomas <Thomas.GUEVARA@odot.state.or.us>
Sent: Tuesday, June 23, 2015 3:42 PM
To: Jennifer E. Danziger
Subject: FW: IAMP 33 (Central Point) Technical Advisory Committee

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From: BURFORD James P
Sent: Wednesday, June 10, 2015 10:19 AM
To: GUEVARA Thomas
Subject: RE: IAMP 33 (Central Point) Technical Advisory Committee

Page 33, Project 6 south sidewalk between ramp terminals – under additional considerations, last line should read, "Would require design exceptions for new center turn lane width, bike lane widths, and sidewalk width". This is generally acceptable.
Page 35, same issue. Lane widths are ok, it is the center turn lane that requires the design exception. This is generally acceptable.
Page 43, proposed shared use path on north side of bridge - would also require exceptions for shy distance, bike lane, sidewalk and multiuse path widths. This is generally acceptable.

That is all I have.

James

From: GUEVARA Thomas
Sent: Wednesday, May 27, 2015 3:29 PM
To: HUGHES Ronald H * Ron; SHEADEL Brian R; BURFORD James P; THOMAS Joseph R * ODOT; JORDAN Christy A; OBERY Gary R; matt.samitore@centralpointoregon.gov; don.burt@centralpointoregon.gov; tom.humphrey@centralpointoregon.gov; vialjn@jacksoncounty.org; dconverse@rvcog.org; alex.georgevitch@ci.medford.or.us; caseBE@jacksoncounty.org; mike.quilty@centralpointoregon.gov; SCHUYTEMA Peter L; WARRICK David D; GRUBBS Robert E; HENSON Anna * ODOT; WANG Wei * Michael; StankeJS@jacksoncounty.org; ALLEMAND Roger B; SMITH David R
Cc: Jennifer E. Danziger; 'Shelly Alexander'
Subject: IAMP 33 (Central Point) Technical Advisory Committee
Importance: High

Please find attached the Final Draft IAMP 33. Please review and send me final comments by Wednesday, 6/10/15. I will then send one (1) set of consolidated comments to the Consultant for preparation of the Final IAMP 33. You may contact me if you have any questions or require additional information. Thanks

<< File: IC 33 FDraft IAMP 052615.pdf >>

Thomas Guevara Jr. | ODOT Planning & Finance Section
Region 3 | 3500 NW Stewart Parkway | Roseburg, OR 97470
Phone: 541-957-3692 | Fax: 541-672-6148 | Thomas.Guevara@odot.state.or.us

IAMP 33

Final Draft IAMP - May 2015

Comment resolved

Comment in process

Comment not addressed

Comment No.	Document	Date	Contributor	Comment	Response
1	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 12 - 2.4.2 Existing Access Inventory. Can you provide one electronic copy of the existing access inventory data to ODOT?	Will do.
2	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 16 - Existing Intersection Operations. Please provide the related Synchro files for all the operation analysis (Existing, Future, Future with improvement etc..) to ODOT for review.	Files were provided to ODOT for review in February 2014 for the IAMP improvements proposed.
3	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 25 - Table 8 Please add "TSM" into project #1 to #5 Improvement Column.	Added TSM after each location.
4	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 41 - Project 10 Implementation: "All proposed development within the IMSA should be required...." change to " All proposed development within the IMSA may be required..."	Done.
5	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 46 - 4.1.2 Access Management Plan Policy 1 "access spacing standards over time" change to "access spacing and sight distance standards over time"	Done.
6	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 46 - 4.1.2 Access Management Plan Policy 2 "Properties develop or redevelop and when reasonable access can be provided with a single access point or via a local street." Change to "properties develop or redevelop or related land use applications"	Done.
7	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 46 - 4.1.2 Access Management Plan Policy 3 "The annual crash rate is 20 percent greater than..." Change to "Safety or operation issues. The annual crash rate is 20 percent greater than..."	Done.
8	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 46 - 4.1.2 Access Management Plan Policy 3 Add "Properties develop or redevelop or related land use applications" to Policy 3.	Done.
9	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 46 - 4.1.2 Access Management Plan Policy 4: "Balance access with the economic development of the adjoining parcels while ensuring travel on the highway occurs in a safe and efficient manner."	Done.
10	Final Draft IAMP	6/1/2015	Michael Wang	Pg. 47 - 4.1.2 Access Management Action 2: "Closure of driveways on the north-side of the street between penniger Road and Bear Creek." Change to "Closure of driveways on the north-side of the street between Peniger Road and Bear Creek. Closure of existing driveways on state highway system maybe qualified for a remedy."	Done.
11	Final Draft IAMP	6/2/2015	Peter Schuytema	No comments	No response required.
12	Final Draft IAMP	6/5/2015	John Vial	Pg. 35 - Roadway Characteristics "Posted speed is 25 MPH, not 35 MPH"	Corrected.
13	Final Draft IAMP	6/5/2015	John Vial	Pg. 43 - Implementation "Why can no funds come form ODOT's enhance program?"	Edited implementation per direction from ODOT.
14	Final Draft IAMP	6/9/2015	David Smith	I have reviewed the IAMP 33 documents and have determined that your western project limits (N 7th St - only for the optional MUP on north side of Pine St) are ~1,600' from the nearest highway rail crossing (E Pine St, Crossing C-445.70/756050T). After reviewing the 11 proposed projects (and an optional MUP) there are no improvements identified at/near rail facilities, nor is it anticipated that there would be a significant impact to rail facilities resulting from any particular proposed project improvement in the Draft IAMP 33.	No response required.
15	Final Draft IAMP	6/10/2015	James Burford	Page 33, Project 6 south sidewalk between ramp terminals – under additional considerations, last line should read, "Would require design exceptions for new center turn lane width, bike lane widths, and sidewalk width". This is generally acceptable.	Revised.
16	Final Draft IAMP	6/10/2015	James Burford	Page 35, same issue. Lane widths are ok, it is the center turn lane that requires the design exception. This is generally acceptable.	Revised.

IAMP 33

Final Draft IAMP - May 2015

Comment resolved
Comment in process
Comment not addressed

Comment No.	Document	Date	Contributor	Comment	Response
17	Final Draft IAMP	6/10/2015	James Burford	Page 43, proposed shared use path on north side of bridge - would also require exceptions for shy distance, bike lane, sidewalk and multiuse path widths. This is generally acceptable.	Revised.
18	Final Draft IAMP	6/10/2015	Rodger Gutierrez	Project 6 (south sidewalk between ramp terminals): The minimum ADA sidewalk width is 5' and the minimum confined width of a pedestrian access route is 48 inches (4') for a maximum distance of 200' – where the width must then be at least 5' to allow passing. The proposed width of the sidewalk on the overpass is 5', and no additional width is given for the curb. Thus, if the sidewalk is monolithic, a standard design exception will be required (not an ADA exception), but if it has a standard curb, the sidewalk would actually be 4.5' and the exception would be elevated to an ADA exception. Alternatively, to prioritize sidewalks over bikes, a 5' sidewalk, 6" curb and 4.5' shoulder could be considered to ensure that the design exception does not infringe on ADA standards. (The existing sidewalk on the north side appears to be monolithic over the center of the structure, but has a standard curb with the same sidewalk width as the sidewalk continues).	Noted. There are a number of minor variations on widths that could be made to ensure that the ADA standard is met.
19	Final Draft IAMP	6/10/2015	Rodger Gutierrez	Project 7 (Bike Lane Improvements): I don't have any issue with this concept Design Exception. I wonder if the hatch markings would be as effective as concrete, but that's not related to the Design Exception.	Concrete could also be pursued as a long term option but it would increase project cost.
20	Final Draft IAMP	6/10/2015	Rodger Gutierrez	Project 8 (SB On-Ramp Dual Left Turns): I don't have any issue with this concept Design Exception.	No response required.
21	Final Draft IAMP	6/10/2015	Rodger Gutierrez	Proposed Shared Use Path: Planning level assumptions about including 'bollard or other protective structure' on the side of the path are insufficient to determine whether this delineation could affect the safe operation of bikes and vehicles. • Where the path is not constrained on the structure, it is not clear whether there are other constraints that preclude acquisition of space for the standard cross section (10' path width with 2' shy and 5' separation from traffic). While this shared use path serves as the westbound bike lane, it is likely that some bicycles will use it to travel in both directions, especially if the length of the shared facility extends several blocks from 7th to the Bear Creek Greenway. There are concerns with two-way bike travel on one side of the street, especially at intersections where permissive or uncontrolled turns conflict with through bikes traveling in the unconventional direction. Intersection design treatments will affect the feasibility and appropriateness to mitigate for the nonstandard pathway elements, where exceptions are being requested.	Noted. This is a proposed city project.
22	Final Draft IAMP	6/17/2015	Anna Henson	No comments	No response required.
23	Final Draft IAMP	6/17/2015	Tom Humphrey	1.1 Interchange Function – connects to North Medford via Front Street (Highway 99) not Hanley Road.	Corrected.
24	Final Draft IAMP	6/17/2015	Tom Humphrey	1.2 Problem Statement Current Population is 17,375 not 16,500	Revised.
25	Final Draft IAMP	6/17/2015	Tom Humphrey	1.2 Problem Statement Geometric deficiency assessment is limited to bicycle weave maneuver and is incomplete.	These are deficiencies identified by the I-5 State of the Interstate report, not the IAMP evaluation.

IAMP 33

Final Draft IAMP - May 2015

Comment resolved
Comment in process
Comment not addressed

Comment No.	Document	Date	Contributor	Comment	Response
26	Final Draft IAMP	6/17/2015	Tom Humphrey	1.3 IAMP Study Area Typo to start second sentence	Corrected.
27	Final Draft IAMP	6/17/2015	Tom Humphrey	1.4 IAMP Goals and Objectives Last objective is a moot point now.	Deleted.
28	Final Draft IAMP	6/17/2015	Tom Humphrey	1.5 Planning Process Implementation Step didn't necessarily invite public input	Noted.
29	Final Draft IAMP	6/17/2015	Tom Humphrey	2.2.1 West of Interstate 5 Typo, 'denser development than east side	Corrected.
30	Final Draft IAMP	6/17/2015	Tom Humphrey	Figures 2 and 3 have been mapped incorrectly Missing East Side TOD Incorrect land use and zoning for CP-3 and Industrial land north of Pine/Biddle (shown as Commercial Neighborhood)	Updated.
31	Final Draft IAMP	6/17/2015	Tom Humphrey	2.2.2 East of Interstate 5 - Last paragraph is not well written and geographically confusing	Revised paragraph.
32	Final Draft IAMP	6/17/2015	Tom Humphrey	2.2.3 Potential Design Constraints - No specific design constraints are discussed, not examples given.	This paragraph was intended to highlight land use zoning that could need to be addressed with project implementation.
33	Final Draft IAMP	6/17/2015	Tom Humphrey	2.4.1 Roadway Inventory - Typo, 'Table 3 presents an inventory of roadways.	Revised.
34	Final Draft IAMP	6/17/2015	Tom Humphrey	2.4.1 Roadway Inventory - Clarify, 'from I-5 eastward (where it becomes Biddle Road) and southward to OR 62.	Revised.
35	Final Draft IAMP	6/17/2015	Tom Humphrey	Table 3. IAMP 33 Roadway Inventory: Freeman Road (3-Lanes); Hamrick Road to north (3-Lanes).	Freeman is 2 lanes with turn lanes but Hamrick is 3 lanes and has been corrected.
36	Final Draft IAMP	6/17/2015	Tom Humphrey	2.4.2 Existing Access Inventory - First sentence is incomplete.	Corrected.
37	Final Draft IAMP	6/17/2015	Tom Humphrey	2.6.1 Future Land Use - It appears that land use forecast addresses CP-3 and Fairgrounds but not CP-2B on Gebhard Road.	CP-2B is outside of IMSA. When Central Point provided build-out forecasts for the project, it did not include anything more than what is included in the regional model.
38	Final Draft IAMP	6/17/2015	Tom Humphrey	2.6.2 Future Transportation Network - TSP Tier 1 Project #216 is only one called out specifically in the Study Area. What aren't Project #s 209, 211, 213, 218, or 220 called out?	Revised paragraph to provide a better explanation of what was included in the model. Project 216 is no longer called out as different from others since none of these projects would affect model coding.
39	Final Draft IAMP	6/17/2015	Tom Humphrey	2.6.2 Future Transportation Network - Improvements at Hamrick and Beebe may make #216 less effective and force more improvements at Table Rock.	The forecasting model doesn't consider traffic signals in the speed calculation. Furthermore, it shows that forecast demand is well below capacity on Hamrick. Unless speeds are significantly altered in this corridor, it will still be appealing to many drivers.
40	Final Draft IAMP	6/17/2015	Tom Humphrey	2.6.2 Future Transportation Network - Gebhard Road discussion in this section is intended to facilitate the UGB expansion and development of CP-2B.	Added reference to Traffic Impact Study for Gebhard Road Intersection.

IAMP 33

Final Draft IAMP - May 2015

Comment resolved
Comment in process
Comment not addressed

Comment No.	Document	Date	Contributor	Comment	Response
41	Final Draft IAMP	6/17/2015	Tom Humphrey	2.6.2 Future Transportation Network - UGB expansion into CP-3 and Fairgrounds may conflict with TSP Project improvements for CP-2B.	Land use assumptions for the Fairgrounds and CP-3 were included in the analysis. No assumptions were provided for CP-2B. The city would need to address impacts of UGB expansion for CP-2B.
42	Final Draft IAMP	6/17/2015	Tom Humphrey	3.1 Alternatives Evaluation Process - Final Draft Alternatives were not all presented to Project Focus Group or Advisory Committee due to the extended duration of this project. We may want to reword this to state that these alternatives will proceed through the City's Citizen's Advisory Committee (CAC) and Planning Commission to legitimize this process?	Added sentence.
43	Final Draft IAMP	6/17/2015	Tom Humphrey	3.2 IAMP Improvements - Bicycle and Pedestrian Infrastructure projects are an example of late discussions that didn't get any input from PFG or Advisory Committee so they will be considered by the City's CAC and PC.	Noted.
44	Final Draft IAMP	6/17/2015	Tom Humphrey	I still think that Hamrick and Beebe signalization and a potential Gebhard Road connection to Pine Street will lessen the significance of Project #216 at the Hamrick/Pine Street intersection.	If project is not needed, it won't be implemented.
45	Final Draft IAMP	6/17/2015	Tom Humphrey	Project #218 is in the study area and may need to be revisited.	Project 218 will likely be needed but Table Rock Road is not one of the analysis intersections and no improvements are identified in the IAMP
46	Final Draft IAMP	6/17/2015	Tom Humphrey	4.1.2 Access Management Plan - Policies are fine and Actions are acceptable to the City. However, my comments on Project #216 stand. Perhaps we can discuss substitution as we head into our final review.	Noted. Project 216 would only be implemented if traffic conditions warrant the additional turn lane. There is no timeline for project but need is shown with future demand.