Transportation Conditions Report

I-5 Interchanges 119/120

Douglas County, Oregon

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

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EXECUTIVE SUMMARY

This document comprises the Interchange Area Study for Interchanges 119 and 120 (Winston and Green). The interchanges are located less than one mile apart, approximately five miles south of Roseburg, and serve the unincorporated community of Green in Douglas County.

The Conditions Report project is intended as the first step in planning for long-range improvements. This initial step is needed to gain a better understanding of both the current and the future deficiencies of these two interchanges. In the future, an Interchange Area Management Plan will be drafted using information from this Conditions Report to determine a preferred build solution that will solve the transportation problems within this area. Both interchanges have structurally deficient bridges and traffic operations limitations. The goal of this report is to identify and document conditions, limitations, opportunities and needs so that subsequent planning can address all relevant issues and focus on those that are most important. At the same time, long-range options should not be precluded by short-range solutions to immediate problems.

The conditions report contains a review of relevant plans and policies, including the Statewide Planning Goals, 1999 Oregon Highway Plan, Oregon Administrative Rules, Douglas County Transportation System Plan, Green Urban Unincorporated Circulation Plan, Winston Transportation System Plan, Greater Roseburg Area Transportation Study, 2000 I-5 State of the Interstate Report, and various traffic impact studies.

Operational analyses at planning area intersections and freeway facilities under existing and year 2025 no-build conditions were conducted and summarized in the report. The analyses confirmed that several intersections are approaching or exceeding ODOT operations standards. The I-5 southbound ramp terminals at Old Highway 99 are currently well over capacity with long queue lengths. The intersection of OR 42 with Carnes Road marginally exceeds ODOT operations standards under existing traffic conditions and approaches capacity under year 2025 traffic conditions. Preliminary analysis showed the intersection of Old Highway 99 and Grant Smith Road to marginally exceed ODOT standards under existing conditions, but still well under capacity. However, due to an imbalanced distribution of vehicles on the eastbound approaches caused by the Interchange 119 configuration, actual operations are much worse. Further analysis was conducted to model the detrimental effects of lane imbalance on this approach, and resulted in longer queue lengths and poor overall operation.

An analysis of the freeway ramps was conducted to test the benefits of adding a northbound auxiliary (weave) lane between the two interchanges. Results of this analysis showed that an auxiliary lane would improve operations somewhat over existing conditions. However, adding a weaving section would increase turbulence and increase the number of potential conflicts due to the introduction of a new lane-change maneuver for northbound traffic exiting at Interchange 120.

The report also contains a safety analysis, a listing of planned and programmed projects in the area, an examination of existing and future land uses, and a review of environmental constraints. The report also identifies deficiencies and needs related to roadway geometry, structures, operations, safety and access management standards. Additionally, the report identifies freight movement patterns and needs.

This conditions report has been prepared with participation of Douglas County, the City of Winston, the Oregon Department of Transportation, and with input from a variety of stakeholders and the general public.

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1 INTRODUCTION

1.1 Project Study Area

Interstate 5 (I-5) Interchanges 119 and 120 are located approximately 5 miles south of Roseburg, serve the unincorporated community of Green in Douglas County and provide important connections to Roseburg and Winston. The two interchanges are located approximately 0.7 miles apart. Interchange 119 is a trumpet B form and generally exhibits good geometrics and operations. Interchange 120 is a modified partial cloverleaf, with constrained geometry, which results in poor operational characteristics, particularly at the southbound off-ramp. In addition, there is no northbound on-ramp to Interstate 5 at this location. Old Highway 99 South parallels Interstate 5 and crosses under the freeway just north of Interchange 120. The Coos Bay – Roseburg Highway (OR 42) enters Interstate 5 from the west at Interchange 119. Both Interstate 5 and Old Highway 99 experience peak hour commuter traffic between Green and Roseburg. Figure 1 shows the Interchange 119/120 planning area.

1.2 Project Description

The Interchanges 119 and 120 Conditions Report project is intended as the first step in planning for long-range improvements. This initial step is needed to gain a better understanding of both the current and the future operational deficiencies of these two interchanges. In the future, an Interchange Area Management Plan will be drafted using information from this conditions report to determine a preferred build solution that will solve the transportation problems within this area.

Both interchanges have structurally deficient bridges and traffic operations limitations. Additional planning is needed to ensure that long-range options are not precluded by short-range solutions to immediate problems. The goal of this initial step is to identify and document conditions, limitations, opportunities and needs so that subsequent planning can address all relevant issues and focus on those that are most important.

Planned local development will affect the operation of both interchanges. Recent zone changes have been approved by Douglas County in the study area that will likely lead to increased demand affecting both interchanges. Due to increased travel on I-5 and local growth in recent years, state and local officials, area businesses, and residents have developed a common understanding that both interchanges need to be evaluated and possibly improved to accommodate future travel demand.

The purpose of this initial planning effort is to evaluate the operation of Interchanges 119 and 120, assess the limitations and issues of concern, and, in general terms, assess the long-range needs attributable to planned development in the area. Because of the proximity of the interchanges to each other this work order is set up to evaluate how the interchanges perform independently as well as in combination as part of the Interstate 5 system serving the Green area. The work will also include a general assessment of the effect of the state and local highway system, within the study area, on the performance and traffic at the interchanges and on I-5.

One or more subsequent phases will be initiated after the completion of this work order to determine how best to improve the interchanges and the local transportation facilities that affect interchange operations.

This report was coordinated with the work to complete the I-5 Interchange 123 Interchange Area Management Plan.

1.3 Agency Participation

This conditions report has been prepared with participation of Douglas County, the City of Winston, the Oregon Department of Transportation, and with input from a variety of stakeholders and the general public. Contacts were made with stakeholders interested in or concerned about future modifications to the interchanges and the possible effects on existing land uses, access, and the local road system.

A Technical Advisory Committee (TAC) informed and guided the preparation of the work products developed for the report. The TAC met five times during the course of the project. TAC members included representatives from the Douglas County Planning and Road Departments, the City of Roseburg Public Works Department, the City of Winston, and the Cow Creek Tribe. ODOT TAC members included staff from Region 3 Planning, Preliminary Design, Transportation Analysis Unit, Traffic/Region Access Management Engineer, Right-of-Way, and the Bridge Package Consultant Project Manager. In addition, two public meetings took place during the course of the project. The first public meeting took place on September 9, 2004 during a meeting of the City of Roseburg Public Works Commission. The second public meeting took place on May 17, 2005 during a meeting of the Roseburg/Green Planning Advisory Committee.

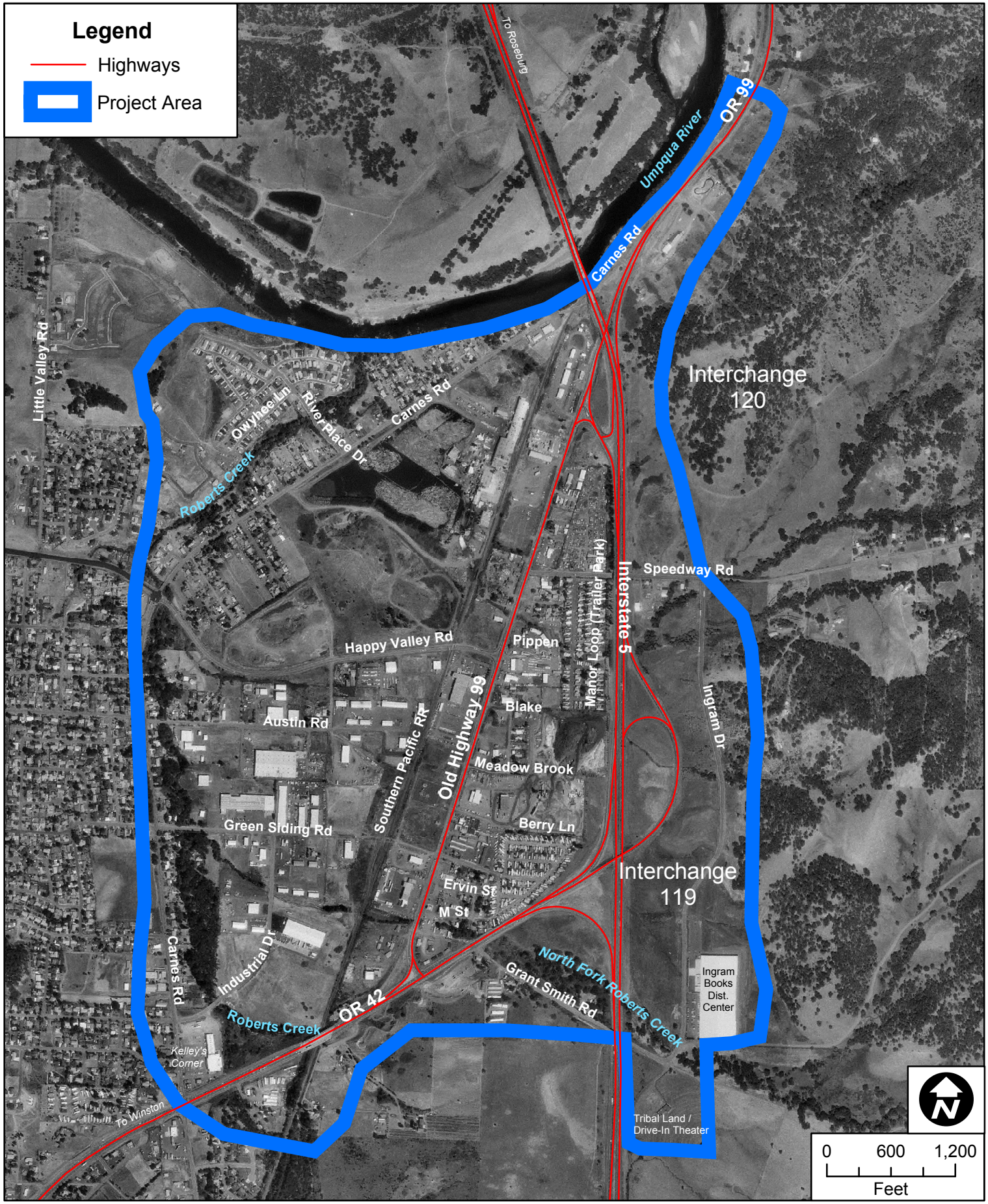
1.4 Interchange Function

Interchanges 119 and 120 are located inside the Urban Unincorporated Area of Green. The interchanges serve commuter traffic between Roseburg and the City of Winston as well as the unincorporated community of Green.

Interchange 119 connects I-5 with OR 42, classified by ODOT as a Statewide Highway and Expressway. Interchange 120 provides a partial connection with Old Highway 99 South, a County Arterial. The primary function of interstate freeways is to serve inter-regional and interstate passenger and freight traffic. The function of Statewide-level highways is to provide inter-regional and inter-urban mobility (connecting larger urban areas, ports and other locations that are not served by the Interstate system). The function of County Arterials is to provide through traffic movement between major communities in Douglas County, and distribute traffic between the State Highway system and the local streets network.

The intended function of Interchanges 119 and 120 is to safely and efficiently accommodate future traffic demands generated by population and employment growth in the region.

Figure 1
I-5 Interchanges 119 and 120 Project Area



n:/gis/odot0436/arcmap/interchanges_project_area_119_120_8x1_071805.mxd

2 STAKEHOLDER IDENTIFICATION AND INTERVIEWS

2.1 Background

A specific task identified for this project involved interviewing interested parties with knowledge of the interchanges. With the help of the project's Technical Advisory Committee, the consulting team identified individuals that potentially had valuable information and insight into transportation and land use planning-related issues at the interchanges. This initial list ultimately was narrowed down to a representative list of 13 individuals. The individuals included business property owners, homeowners, representatives of distribution and manufacturing interests, visitor or traveler service providers, and economic development representatives. These individuals were then interviewed via telephone during the last two weeks of June 2004 to identify issues associated with the 119/120 Interchange area. This section provides an overview of the stakeholder interviews. The complete summary report from the stakeholder interviews, including a list of the stakeholders interviewed and a complete list of the interview questions and responses can be found in Appendix A.

2.2 Interview Summary

There were some topics or themes that were common to most of the responses to the interview questions. Most respondents were generally pleased with present operations at the interchanges and did not have concerns regarding the interchanges' ability to handle current levels of traffic efficiently and safely. However, those interviewed did make a point of mentioning that the design of one or both of the interchanges was potentially dangerous. The majority of comments confirmed that current traffic conditions at the interchanges were not seen as having negative impacts to businesses or properties in the area. Words such as "workable," "acceptable," and "serves needs well" were used to describe current traffic conditions at the intersections, with one contrary comment pointedly saying that operations at Interchange 120 were unsatisfactory[1].

Several of those interviewed emphasized the growth in Roseburg, Winston and Coos Bay and noted that this growth will likely have negative impacts on the interchanges in the future. Most interviewees anticipated increased growth in the immediate vicinity of the interchanges as well, noting the amount and location of vacant and redevelopable land. Increases in light industrial and distribution-warehousing were anticipated for the Interchange 119/120 area. One individual interviewed predicted more residential growth in the Interchange 120 and Green area, citing the relative affordability of housing prices.

The interviews highlighted that most people view the interchanges' primary function to access property in the immediate area. In the case of the 119 exit, access to the coast and other tourist destinations (such as the Wildlife Safari in Winston), as well as access to the industrial park in Green, were also cited as a primary functions. Most of those interviewed expressed a vested interest in one particular interchange, typically the one closest physically to their property or place of business.

There were differing opinions regarding the function of Interchange 120; business representatives pointed to the necessity of the interchange for commercial uses and truck

[1] It was unclear if this comment was reacting to current construction at the Interchange, but the implication was that this Interchange doesn't work well under normal conditions.

movement, but another interviewee saw Interchange 120 serving predominantly residential traffic west of the freeway and in the Green area, with 119 being the major commercial exit.

The recent construction at Interchange 119 was cited the most as an improvement that had a positive effect on traffic movement in the area. There were few comments directed specifically at access issues, beyond concerns that current access be retained, both during and after any future construction at the interchanges.

3 PLAN AND POLICY REVIEW

This section summarizes the relevant plans and policies and identifies how they influence planning for Interchanges 119 and 120. The complete technical memorandum can be found in Appendix B.

This section reviews the following transportation and land use plans and regulations:

- Statewide Planning Goals 2 (Land Use Planning), 11 (Public Facilities Planning), and 12 (Transportation) , and 14 (Urbanization)
- 1999 Oregon Highway Plan (OHP);
- Oregon Administrative Rule (OAR) 734-051 (ODOT Division 51 Interchange Area Access Management Spacing Standards for Approaches);
- Douglas County Transportation System Plan (Adopted 2001);
- Green Urban Unincorporated Circulation Plan (adopted as part of the Douglas County TSP, 2001);
- City of Winston Transportation System Plan (2003);
- Greater Roseburg Area Transportation Study (GRATS) (Final Report 1996);
- 2000 I-5 State of the Interstate Report; and
- Traffic impact studies (developed as part of land use applications submitted to Douglas County).

3.1 Statewide Planning Goal 2 and OAR 660, Division 4

Goal 2, Land Use Planning, requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. Goal 2 is important because:

1) It requires planning coordination between ODOT and Douglas County to address future impacts to the area impacted by proposed interchange improvements, as well as the future operation of the interchanges;
2) It requires that land use decisions and actions be supported by "substantial evidence," and for that evidence to be found as adequate to support findings of fact; and
3) It requires that local/state/federal level plans and actions related to land use be "consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268."

3.2 Statewide Planning Goal 11 and OAR 660, Division 11.

Statewide Planning Goal 11. Public Facilities Planning, requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. The goal requires that urban and rural development be "guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served." The Unincorporated Urban Area of Green is growing and appropriate transportation facilities are needed to manage impacts from that growth.

3.3 Statewide Planning Goal 12 and OAR 660, Division 12.

Goal 12, Transportation, requires cities, counties, metropolitan planning organizations and ODOT to provide and encourage a safe, convenient and economic transportation system. This is accomplished through development of Transportation System Plans (TSPs) based on inventories of local, regional and state transportation needs. Goal 12 is implemented through OAR 660, Division 12, the Transportation Planning Rule (TPR). 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 access control measures, road operations standards, and coordinated review of future land use decisions affecting transportation facilities between local jurisdictions and ODOT. See also OAR 660-012-0060.

LCDC's rules implementing Goal 12 do not regulate access management. ODOT adopted OAR 734, Chapter 51 to address access management and it is expected that ODOT, as part of this project, will engage in access management consistent with its Access Management Rule.

3.4 Statewide Planning Goal 14, and OAR 660, Divisions 14 and 22

Goal 14, Urbanization, is important because it focuses development within relatively compact boundaries of Urban Growth Boundaries (UGBs) and to a lesser degree in unincorporated communities. This compact development helps contain the costs of public facilities such as transportation by reducing the need for facilities further out and helping jurisdictions better anticipate where growth will occur. The Interchange 119 and 120 Study Area includes land in the unincorporated community of Green. Goal 14 (OAR 660, Division 22) recognizes established development centers that were never incorporated yet have many qualities of a small city.

3.5 1999 Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) policies applicable to planning for interchanges 119 and 120 include four items under Goal 1 (System Definition). Policy 1B (Land Use and Transportation) recognizes the need for coordination between state and local jurisdictions. Policy 1C (State Highway Freight System) states the need to balance the movement of goods and services with other uses. Policy 1F (Highway Mobility Standards) 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. Policy 1G (Major Improvements) requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Under Goal 2: System Management, Policy 2B (Off–System Improvements) helps local jurisdictions adopt land use and access management policies. Policy 2F (Traffic Safety) improves the safety of the highway system. While an IAMP is not part of this project, future proposed improvements to the interchanges will require preparation of an IAMP and Access Management Plan that will address access management standards. One component of the IAMP will be an intergovernmental agreement between ODOT and the local jurisdiction(s) to implement access management solutions.

Under Goal 3: Access Management, Policy 3A (Classification and Spacing Standards) sets access spacing standards for driveways on, and approaches to, the state highway system. Policy 3C (Interchange Access Management Areas) sets policy for managing interchange areas by developing IAMPs. Policy 3D (Deviations) establishes general policies and procedures for deviations from adopted access management standards and policies.

This report compares access spacing with adopted access standards (existing physical features summary). Any future suggested improvements for the interchange would need to comply with this policy and improve any deficiencies identified. Future improvements to the interchange may affect the current configuration of approaches and access points.

3.6 Oregon Administrative Rule 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 access spacing standards and the purpose and components of an access management plan.

3.7 Green Transportation System Plan (Adopted August 2001) and Douglas County Transportation System Plan (Adopted 2001)

The Green Transportation System Plan (TSP) was adopted in 2001 to provide a detailed analysis of transportation facilities and levels of service for the Green Unincorporated Urban Area. The TSP inventories and analyzes the current transportation system and predicts conditions at buildout based on a buildable lands inventory and on population projections.

The TSP does not advocate any new projects directly impacting Interchanges 119 or 120. Key projects identified as solutions to Green's capacity, circulation, and safety issues include: improving traffic circulation by constructing multiple, local road connections; enhancing safety and circulation on and near OR 42 by closing some accesses and constructing a frontage road; and improving capacity and enhancing safety at Kelly's Corner by adding right-turn lanes on OR 42 in both directions, widening the local legs, moving the signal poles and highway signs away from the intersection, and re-phasing the signals.

The Green TSP was used as the basis of the Green Urban Area Circulation Plan that is part of the Douglas County TSP. The Douglas County Transportation System Plan (TSP) was adopted in 2001 and establishes a system of transportation facilities and level of service adequate to meet the county's transportation needs. This project is consistent with the goals and policies of the county's TSP, which includes goals to "provide and encourage a safe, convenient and

economical transportation system." The TSP does not list any projects related to interchanges 119 or 120.

3.7.1 Green Urban Unincorporated Circulation Plan (2001)

The purpose of the Green Urban Unincorporated Circulation Plan is to provide circulation policies and findings for the unincorporated urban areas and to address transportation issues within those unincorporated areas. The findings described in The Green Circulation Plan discuss previous transportation improvements within the community, including relocating the Carnes Road/Old Highway 99 intersection to improve intersection safety. The plan also proposes future improvements, including providing new roadways or increasing capacity of existing roadways within the planning area. Proposed new roadways near I-5 would serve future development of an industrial area between Carnes Road and the Central Oregon Pacific Railroad and a vacant industrial area on the east side of I-5. No new connection to I-5 is proposed in the Green Circulation Plan. Future interchange improvements, based on the 2025 Needs Summary Report to be developed as part of the Conditions Report, will need to consider accessibility from the proposed new roadways in the industrial areas, as adopted in the circulation plan.

3.8 City of Winston Transportation System Plan (2003)

The City of Winston is located west of interchanges 119 and 120, which are outside of the city's urban growth boundary (UGB). However, the Winston TSP may apply if improvements were to occur to Old Highway 99/OR 42 within the Winston UGB that connects with I-5 at interchange 120. This project's objectives are consistent with the goals and policies of the Winston TSP; but it is possible that none of the proposed improvements will be within the city's UGB. If no improvements are proposed within the UGB, the Winston TSP will not be applicable to this planning project.

3.9 Greater Roseburg Area Transportation Study (GRATS) (Final Report 1996)

The Greater Roseburg Area Transportation Study (GRATS) is a regional framework study that identifies multimodal strategies to manage growth and the communities' transportation needs. Several goals are described in the study and are relevant to the project; they include accessibility, mobility, affordability, safety, flexibility and connectivity. Although the GRATS provides some framework for planning in the region, it was not adopted. It was built on an older model and has subsequently been replaced by more current transportation system plans.

3.10 I-5 State of the Interstate Report

The I-5 State of the Interstate Report (2000) describes the existing and forecasted operating, geometric, safety, and physical conditions for the I-5 mainline and interchanges within Oregon. This Conditions Report incorporates and updates information from the I-5 State of the Interstate Report, most notably in the discussion of geometric deficiencies contained in Section 5.1.

Some of the information presented in the State of the Interstate Report is out of date, such as pavement conditions and crash history. Therefore, this Conditions Report provides crash analysis based on updated crash histories (Section 4.2) and an updated pavement conditions summary (Section 3.12).

3.11 Traffic Impact Studies

Three traffic impact studies (TISs) were reviewed as a part of this task. All are for land use proposals to rezone land within the Green Urban Unincorporated area. Of the three TISs, a potential area of concern where rezoning would cause congestion levels to worsen was identified as the unsignalized intersection at Old Highway 99 and the I-5 southbound ramps. Based on capacity analysis performed for the Speedway Industrial Rezone TIS, it was determined that this intersection warrants a signal. ODOT has indicated, however, that there are sight distance issues with the existing geometric configuration at the Old Highway 99/I-5 southbound ramps that would make locating a signal difficult.

3.12 2004 Pavement Condition Report

The Oregon State Highway System 2004 Pavement Conditions map for Region 3 (December 2004) shows the relevant segment as good. The 2004 report classifies the I-5 segment between MP 117.7 and 122.3 as having an overall index of 96.0 (good condition) for the northbound lanes and an overall index of 99.0 (very good condition) for the southbound lanes. The index ranges from 0 to 100, with 10.1 to 45.0 categorized as poor, 45.1 to 75.0 as fair, 75.1 to 98.0 as good, and 98.1 to 100.0 as very good. According to the Pavement Condition Report, a good rating describes generally stable pavement with minor cracking that is generally hairline and hard to detect. Minor patching and possibly some minor deformation may also be evident. Pavement with a good rating has very good riding qualities, with rutting of less than one half-inch. A very good rating describes stable pavement with no cracking patching or deformation. This pavement has excellent riding qualities and requires no improvements.

4 TRANSPORTATION FACILITIES

4.1 Traffic Operations Analysis

This section summarizes the methods, procedures, and data used in analyzing the traffic counts and developing 30th highest hour volumes and year 2025 design hour volumes. Also included is a summary of the traffic operations analyses at key intersections, ramp terminals and freeway entrance / exit ramps. Analysis was conducted under both existing year (2004) and future year (2025) traffic volume conditions. The summary information in this section is based on the technical memoranda compiled in Appendix C.

4.1.1 Planning Area Intersections, Ramps and Freeway Segments

Old Highway 99 at I-5 Southbound Ramps

This is a T-intersection. The westbound leg consists of the southbound on- and off-ramps to I-5, which has a shared through-left turn with a channelized right-turn lane. Old Highway 99 consists of a through lane and channelized right-turn lane on the northbound approach. The southbound approach contains a through lane and a left-turn lane.

Old Highway 99 at Speedway Road

This is a T-intersection, with the stop-controlled Speedway Road intersecting Old Highway 99 with a single-lane approach for both left- and right-turning vehicles. Old Highway 99 is a two-lane facility with shared lanes for both through and turning movements.

Old Highway 99 at Happy Valley Road
Happy Valley Road and Old Highway 99 is a signalized intersection with a driveway comprising the east approach. The northbound approach of Old Highway 99 has a shared through-right turn lane and a left-turn lane. The southbound approach consists of a channelized right turn lane with approximately 150 feet of vehicle storage, and a left turn lane. The eastbound approach of Happy Valley Road consists of a shared through-left turn lane with an exclusive right-turn lane.

Old Highway 99 at Beaver State Sand and Gravel Access
The east leg of this T-intersection provides access to Beaver State Sand and Gravel. This approach consists of a single lane for both left- and right-turning vehicles. Old Highway 99 is a two-lane facility with shared lanes for both through and turning movements.

Coos Bay–Roseburg Highway (OR 42) at Old Highway 99/Grant Smith Road
The intersection of Old Highway 99 and OR 42/Grant Smith Road is a signalized intersection located approximately 0.4 miles west of I-5. The westbound approach carries traffic from the north- and southbound off-ramps of Interchange 119 and has four lanes: a separate left-turn lane, two through lanes, and a separate right-turn lane. The eastbound approach consists of a left-turn lane, through lane, and a shared through-right turn lane. The southbound approach of Old Highway 99 has a channelized right-turn lane with separate through and left-turn lanes. The northbound approach from Grant Smith Road has a similar configuration with right-turn channelization and separate left-turn and through movements.

OR 42 at Carnes Road/Roberts Creek Road
This intersection is located approximately 0.5 miles southwest of OR 42's intersection with Old Highway 99. The westbound approach on OR 42 consists of a left-turn lane, two through lanes, and a right-turn lane. The eastbound approach has a left-turn lane, one through lane, and one shared through-right turn lane. Both Carnes Road and Roberts Creek Road have shared through-right turn lanes and left-turn lanes.

The lane configuration and traffic control at each of the six intersections is illustrated in Figure 2.

Interchanges 119 and 120
The OHP requires a minimum of one mile between the on-ramp of one interchange and the off-ramp of a downstream interchange in urban locations[2]. However, the southbound on-ramp at Interchange 120 is located about 2200 feet from the southbound off-ramp at Interchange 119, and the northbound on-ramp for Interchange 119 is located about 2500 feet from the off-ramp of Interchange 120.

The volume of vehicles entering I-5 northbound from Interchange 119 is significant, as it is approximately equal to the mainline volume. The acceleration lane for the northbound on-ramp at Interchange 119 is 300 feet short of ODOT standards. This configuration forces large volumes of vehicles to complete their merge maneuver over a substandard length. Freeway operations during peak operating hours are characterized by congestion between the northbound on- and off-ramps.

[2] The interchanges lie within the Urban Unincorporated Area of Green. Therefore, the OHP classifies the interchanges as urban.

4.1.2 Traffic Counts and Design Hour Development

Traffic Counts
ODOT conducted 3-hour, and 14-hour manual classification counts at planning area intersections between November 2003 and June 2004. Additionally, ODOT conducted 48-hour tube counts at the ramps of Interchange 119 and 120 in May 2002. The classification counts were used in the development of 30th highest hour and design hour volumes. Details regarding traffic counts can be found in Appendix C.

ODOT count data enabled the determination of peak hour volumes, peak hour factors and the percentage of heavy vehicles at each intersection. The common peak hour for the four intersections was found to occur between 4:00 and 5:00 PM. Heavy vehicles were determined to comprise between three and eight percent of overall traffic at area intersections.

30th Highest Hour Determination
The Transportation Planning Analysis Unit (TPAU) of ODOT has developed a procedure for calculating current year 30th highest hour traffic volumes. In an urban area the 30th highest hour typically occurs on a weekday during the peak month of the year, and in a rural area it typically occurs on a weekend day during the summer. The 30th highest hour is calculated by applying a seasonal factor to the recorded peak hour volumes. The seasonal factor is found by using the Automatic Traffic Recorder (ATR) closest to the location of interest with similar traffic flows, area type, and lane configuration. Traffic volumes are then multiplied by their appropriate seasonal factor to determine the 30th highest hour volumes.

The above procedure was applied to the Interchange 119/120 planning area to determine the 30th highest traffic volumes, which were then manually balanced between intersections and the two interchanges. These volumes are illustrated in Figure 3 and Figure 4.

Year 2025 Design Hour Development
EMME/2 model volumes were developed for years 2000 and 2025. Year 2004 model volumes were determined through linear interpolation between 2000 and 2025 model volumes. Using the method outlined in NCHRP 255[3], the difference between link volumes for the 2004 and 2025 model years was calculated and added to the 2004 30th highest hour volumes used for the traffic operations analysis for existing conditions. Volumes were then balanced between planning area intersections and the two interchanges. Figure 4 and Figure 5 show 2025 design hour volumes for the intersections and ramps within the Interchanges 119 and 120 planning area. See Appendix C for details regarding the model development process.

4.1.3 Traffic Operations Analysis Methods
Traffic operations analyses were performed at the six interchange area intersections and at the ramp merge and diverge points on Interstate 5 using the methodology outlined in the *2000 Highway Capacity Manual* (HCM). The Synchro software package was selected for performing the traffic operational analysis for non-freeway facilities. Synchro report output summarizes the

[3] National Cooperative Highway Research Program Report 255. "Highway Traffic Data for Urbanized Area Project Planning and Design." 1982.

calculated level of service (LOS), volume-to-capacity (v/c) Ratios, and the 95th percentile queue length by lane.

SimTraffic simulation modeling was used to supplement Synchro and HCM analysis for congested intersections and freeway ramp and weave segments. SimTraffic is not subject to the limitations inherent in HCM queuing analysis due to its ability to calculate the effects of traffic flow under saturated traffic conditions where traffic may spill out of left-turn storage bays or spill over from one intersection to another. SimTraffic also provides information on delay and average speed for freeway ramp and weaving segments. Appendix C contains further details and a discussion regarding traffic operations analysis methods.

4.1.4 Operational Criteria

Transportation engineers have established various descriptors for traffic operations of intersections. The most common descriptor is the level-of-service (LOS) as defined by the HCM. The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established ranging from LOS A, where traffic is relatively free flowing, to LOS F, where the street system is totally saturated with traffic and movement is very difficult.

At both signalized and unsignalized intersections, LOS is based on control delay. At two-way stop-controlled intersections, control delay is the total duration from the time a vehicle joins the back of the queue until it proceeds forward into the intersection from the first position at the stop sign.

On freeway ramp and weaving segments LOS is based on the density of passenger cars per mile per lane (pc/mi/ln). At LOS A, traffic moves at free-flow speeds, and vehicles experience no impedance to their ability to maneuver in the traffic stream. At the other end of the continuum is LOS F, in which demand exceeds capacity and operational breakdowns occur. LOS E represents the density at capacity.

A comparison of traffic volume demand to intersection capacity is another method of evaluating how well an intersection is operating. This comparison is presented as a volume-to-capacity (v/c) ratio. A v/c ratio of less than 1.0 indicates that the volume is less than capacity. When it is closer to 0.0, traffic conditions are generally good with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable with longer delays.

The OHP and the Douglas County Transportation System Plan (TSP) define mobility standards in terms of v/c ratios, which are dependent on the roadway classification and area type. According to the OHP, the mobility standard for OR 42, a rural Statewide Highway and Expressway, is 0.70. The mobility standard for the southbound I-5 ramp terminals at Old Highway 99 is 0.85. These mobility standards apply through the planning horizon year, which is 2025 in this case.

The OHP requires that a v/c ratio of 0.70 be met for interstate freeway segments in unincorporated communities. This mobility standard includes ramp and weaving segments.

4.1.5 Intersection Operations Analysis Results

This section presents the results of the operational analysis for 2004 and 2025 conditions at each intersection. The results are based on HCS reports generated by Synchro. Table 1 summarizes traffic operations analysis results for both 2004 and 2025 traffic volume conditions.

Table 1. Intersection Operations Analysis Summary

		2004			2025		
Intersection	**Approach**	**V/C Ratio**	**95th Percentile Queue**	**LOS**	**V/C Ratio**	**95th Percentile Queue**	**LOS**
Old Highway 99 at I-5 SB Ramps	Westbound L	60	475	F	1.95	5.75	F
Old Highway 99 at Speedway Road	Westbound L/R	0.33	50	D	0.50	75	F
	Northbound T/R	0.29	0	n/a†	0.34	0	n/a†
Old Highway 99 at Happy Valley Road	**Intersection**	**0.65**	**n/a**	**B**	**0.70**	**n/a**	**B**
	Southbound T	0.58	325	B	0.65	400	B
	Eastbound L/T	0.79	225	C	0.82	250	D
Old Highway 99 at Beaver State S&G	Westbound L/R	0.14	<25	C	0.17	<25	C
	Northbound T/R	0.18	0	n/a†	0.21	0	n/a†
	Southbound L/T	0.00	0	A	0.01	<25	A
OR 42 at Old Highway 99 / Grant Smith Road	**Intersection**	**0.74**	**n/a**	**C**	**0.77**	**n/a**	**C**
	Eastbound L	0.73	175	D	0.76	250	D
	Eastbound T/R	0.65	350	B	0.75	475	B
	Southbound L	0.84	325	D	0.86	325	D
	Westbound T	0.61	325	B	0.75	425	C
OR 42 at Carnes Road / Roberts Creek Road	**Intersection**	**0.72**	**n/a**	**C**	**0.92**	**n/a**	**D**
	Eastbound L	0.82	275	D	0.94	350	E
	Westbound T/R	0.73	350	C	0.91	500	D
	Southbound L	0.66	250	D	0.92	300	E

† Free vehicular movements

The network is expected to see significant increases in traffic volumes in the next 20 years. Consequently, intersection operations will be degraded to varying degrees. A discussion of intersection results follows.

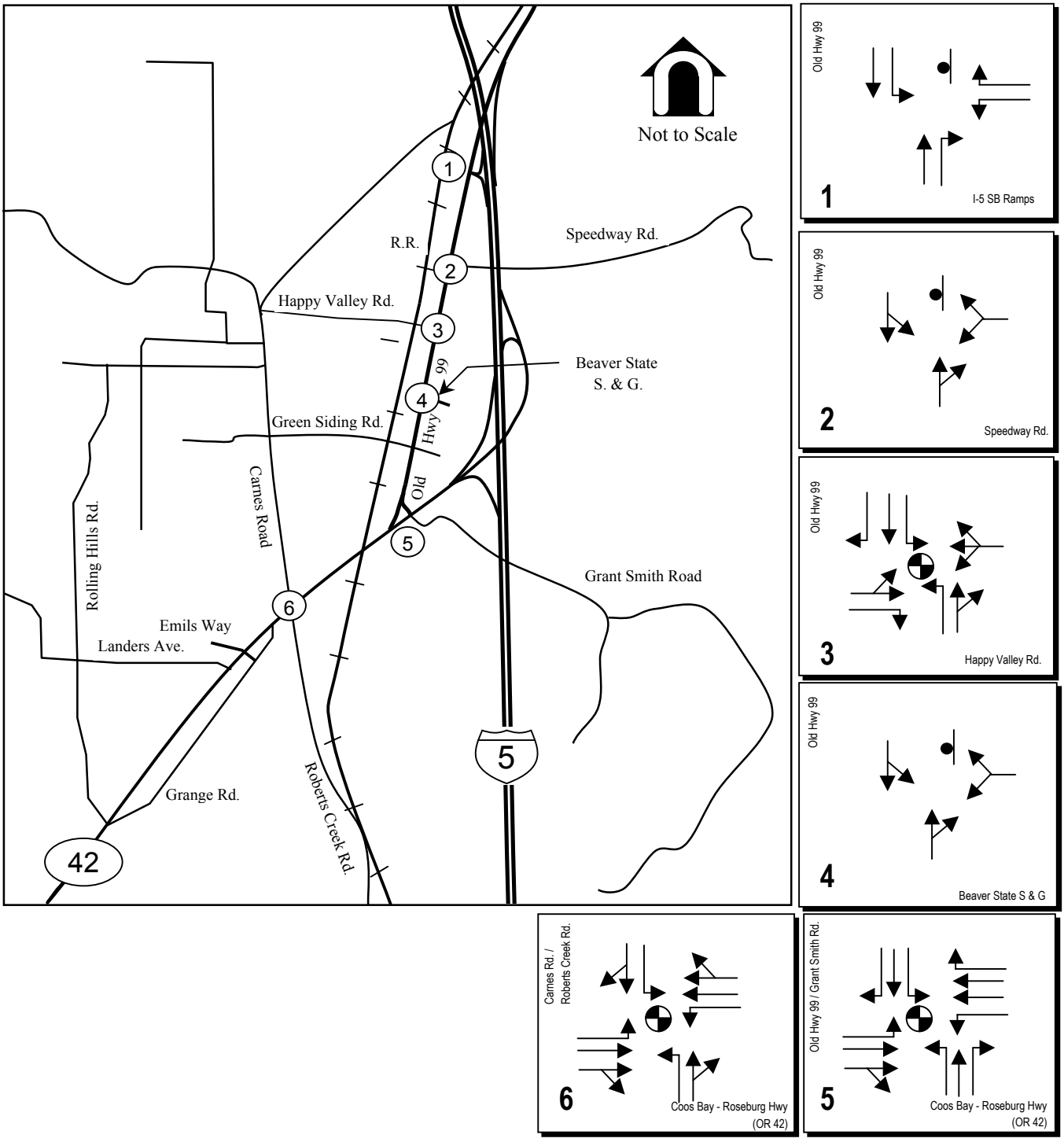
Old Highway 99 at I-5 SB Ramps

The westbound approach is currently well over capacity with a v/c of 1.60. The 95th percentile queue length is 475 feet. A queue of this length extends into the segment of the ramp needed for deceleration. Under 2025 volume conditions, intersection operations will further degrade with longer queues and more delay.

A preliminary signal warrant analysis has shown that this intersection meets the following MUTCD signal warrants under current traffic volume conditions: Warrant 1, Eight-Hour Vehicular Volume; Warrant 2, Four-Hour Vehicular Warrant; and Warrant 3, Peak-Hour.

Old Highway 99 at Speedway Road

The stop-controlled approaches are currently operating within County mobility standards and are expected to remain within an acceptable range through 2025. The westbound approach is



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LEGEND

=Lane

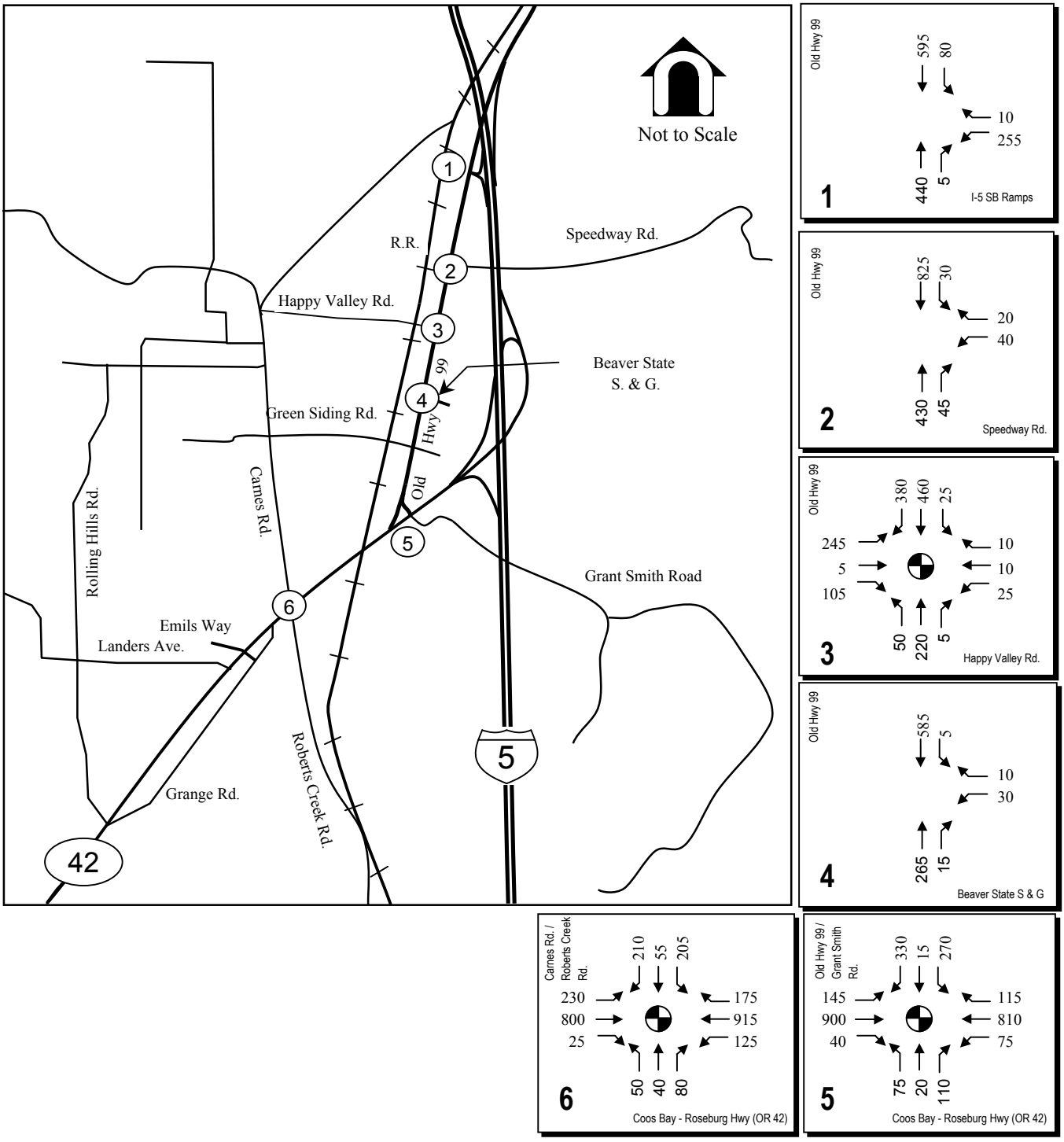
14 = Intersection Number

= Stop Sign

= Signalized Intersection

Figure 2 - Lane Configurations

Interchanges 119/120



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LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

(14) = Intersection Number

= Signalized Intersection

Figure 3

2004 30th Hour Volumes - Balanced

Planning Area Intersections

Interchanges 119/120

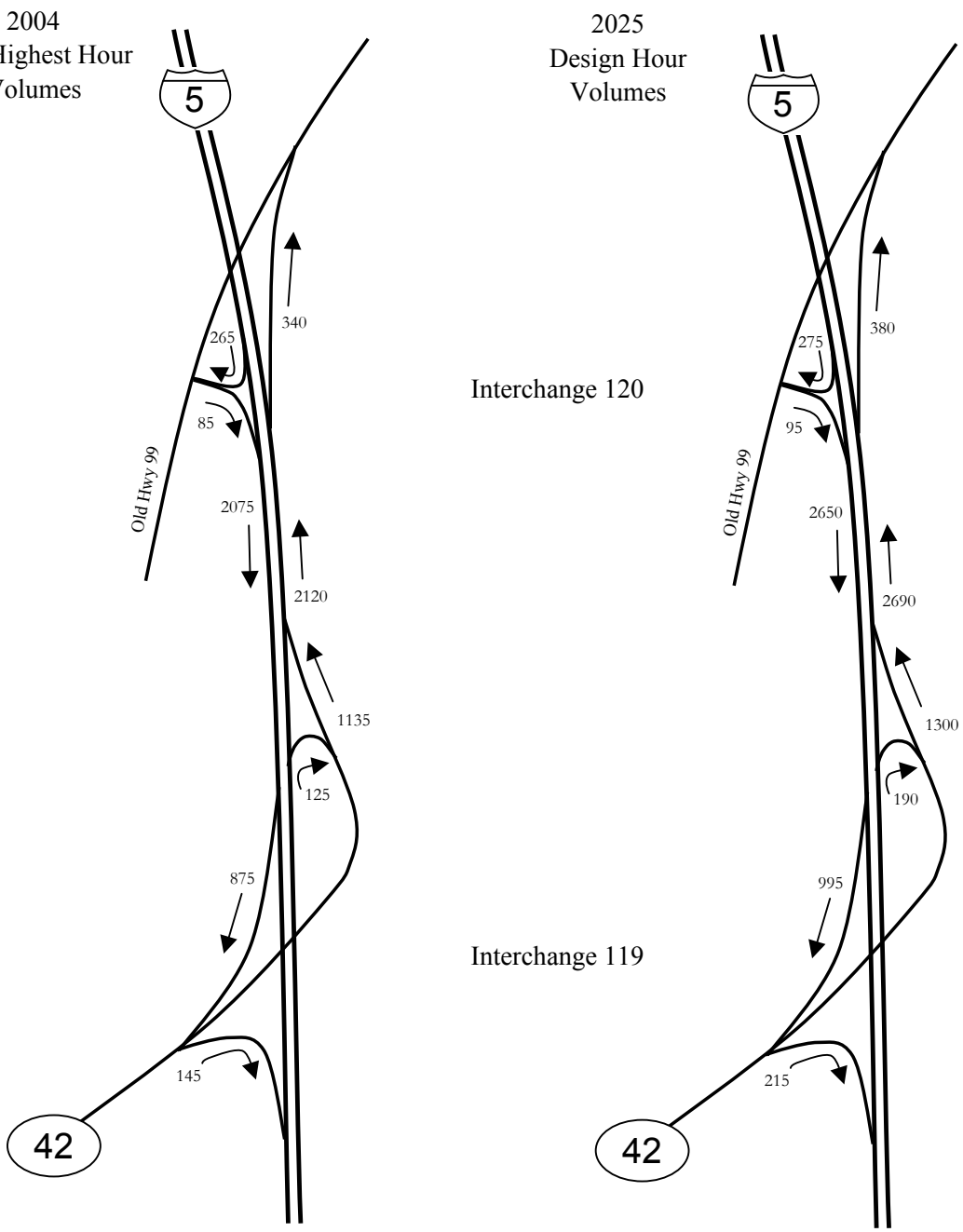

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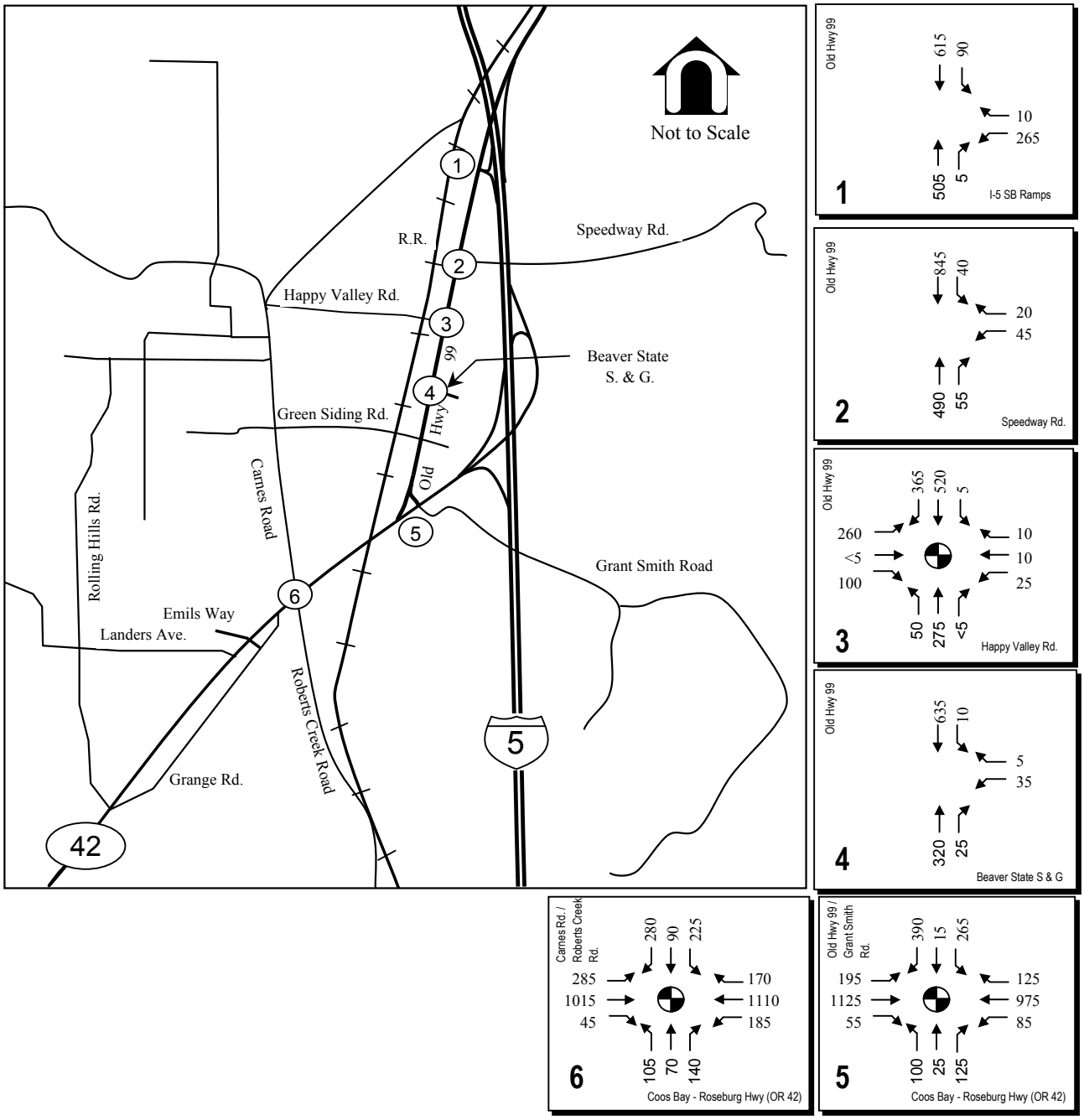
Figure 4

2004 30th Hour Volumes

2025 Design Hour Volumes

Interchanges 119/120



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LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

(14) = Intersection Number

= Signalized Intersection

Figure 5

2025 Design Hour Volumes

Planning Area Intersections

Interchanges 119/120

expected to be at LOS 'F' with delays of about 50 seconds. However, this is a relatively minor approach with low volumes. The overall intersection operation is expected to remain satisfactory.

Old Highway 99 at Happy Valley Road
This intersection is currently operating at a v/c of 0.65, with moderate queuing on the southbound and eastbound approaches. Under 2025 design hour volume conditions, the intersection is expected to meet the Douglas County mobility standard with a v/c of 0.70.

Old Highway 99 at Beaver State Sand and Gravel
This two-way stop-controlled intersection is operating well within the mobility standard under current and future traffic volume conditions.

OR 42 at Old Highway 99 / Grant Smith Road
The north- and southbound on-ramps for Interchange 119 diverge approximately 1000 feet to the east of this intersection, with the left lane going north and the right lane going south. About 85% of the eastbound vehicles leaving this intersection head north at the interchange. Most of those vehicles have already assumed their desired lanes on the eastbound approach to the intersection. This results in many more vehicles queuing in the left lane than in the right lane.

Preliminary analysis, as shown in Table 1, depicts the intersection operating with moderate queuing and overall v/c ratios of less than 1.00 for both existing and future year conditions. However, this analysis assumed a nearly equal distribution between the right and left lanes of the eastbound approach. Therefore, the values shown in Table 1 are likely underreporting overall v/c ratios and 95th percentile queue lengths on the eastbound approach due to lane imbalance that is occurring.

Supplemental analysis was conducted using Synchro and SimTraffic to more accurately reflect the queuing and v/c resulting from lane imbalances. Results confirmed that significant queuing of greater than 1000 feet results when the effects of lane imbalance are taken into account. A complete discussion of a Synchro HCM sensitivity analysis can be found in Appendix C. The sensitivity analysis tested the impacts of increasingly unbalanced lane use on the eastbound leg. Appendix C also contains a discussion of a SimTraffic simulation designed to test the impacts of lane imbalance.

OR 42 at Carnes Road
Currently this intersection marginally exceeds the mobility standard with a v/c of 0.75. Under future year traffic volume conditions, the intersection is expected to approach capacity with a v/c of 0.92. The eastbound left, westbound through/right, and southbound left-turn movements are all expected to exceed a v/c of 0.90 under future year traffic volume conditions.

4.1.6 Freeway Operations Analysis Results
A 1999 ODOT origin-destination study found that 20 percent of northbound vehicles entering at Interchange 119 subsequently exit at Interchange 120. It has been suggested that the addition of an auxiliary lane between the on- and off-ramps could improve operations. An auxiliary lane would create a weaving segment between the ramps. The following sections evaluate current and future year traffic operations under the existing interchange configuration (merge/diverge analysis) and with an auxiliary lane (weave analysis).

Due to the low volumes of ramp-to-ramp traffic in the southbound direction, a southbound auxiliary lane is not recommended. However, mainline freeway operations in the southbound

direction were examined and found to be operating at acceptable v/c ratios of 0.48 and 0.62 under 2004 and 2025 traffic volume conditions, respectively.

Merge / Diverge Analysis

Figure 4 shows 2004 and 2025 volumes for the Interchange 119 and 120 ramps, as well as the mainline. HCM Ramps and Ramp Junction methodology was used to determine LOS of the Interchange 119 ramps under 2025 design hour volume conditions. A v/c analysis was also conducted so that the merge and diverge segments could be compared to OHP mobility standards.

Table 2 summarizes results for 2004 and 2025 ramp junction analysis at Interchanges 119 and 120 under existing lane configurations. The northbound off-ramp terminal at Old Highway 99 is also provided. As the table shows, the ramp junctions are expected to experience increased traffic volumes, which will increase density and degrade v/c and LOS. However, even under 2025 traffic volume conditions, no ramps are expected to operate below a v/c of 0.60 and LOS C.

Table 2. Interchanges 119/120 Ramps Operations Analysis Summary

Direction of Travel	2004 Density (pc/mi/ln)	2004 v/c	2004 LOS	2025 Density (pc/mi/ln)	2025 v/c	2025 LOS
IC 119 Northbound On	18.4	0.52	B	23.3	0.65	C
IC 119 Northbound Off	12.7	0.25	B	17.2	0.35	B
IC 119 Southbound On	12.9	0.33	B	17.4	0.46	B
IC 119 Southbound Off	26.3	0.53	C	27.3	0.68	C
IC 120 Northbound Off	20.6	0.54	C	26.1	0.68	C
IC 120 Southbound Off	23.7	0.57	C	29.3	0.72	D
IC 120 Southbound On	19.8	0.51	B	24.7	0.65	C
IC 120 Northbound Off at Old 99	n/a†	0.54	A	n/a†	0.60	B

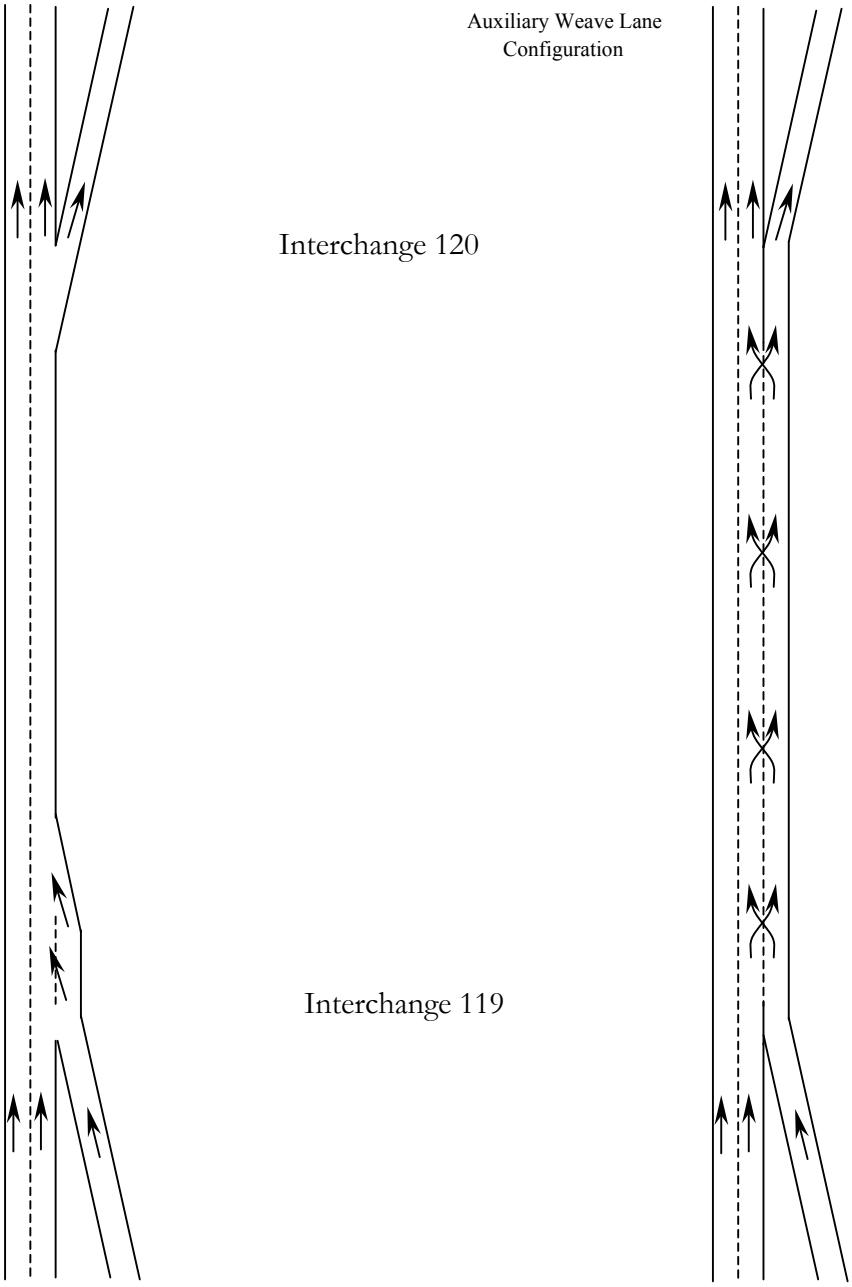
† HCM (density-based) merge methodology does not apply to two-way, two-lane facilities. Synchro ICU report results are shown for a yield controlled intersection.

Weave Analysis

A significant amount of northbound ramp-to-ramp traffic exists between the on-ramp at Interchange 119 and the off-ramp at Interchange 120. This section evaluates the effects of an auxiliary weave lane between the two interchanges. Figure 6 illustrates the merge and diverge movements for the current ramp configuration and the weave movements of a possible auxiliary lane between the two ramps. HCM Weaving methodology was used to determine LOS of an auxiliary lane scenario. A v/c analysis was also conducted so that the weave segment could be compared to OHP mobility standards. Analysis results are summarized in Table 3.

Merge / Diverge Configuration

Auxiliary Weave Lane Configuration



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Not to Scale

Figure 6

Merge / Diverge & Auxiliary Lane Interchange Configurations

Interchanges 119/120

Table 3. Interchange 119/120
Weaving Segment Summary

	2004	*2025*
Speed (mph)	51.0	50.2
Density (pc/mi/ln)	15.3	19.7
v/c	0.41	0.50
LOS	B	B

Analysis results for the weave segment show moderately improved operations compared to the merge/diverge configuration ("*Northbound On"* row from Table 2), with the weave segment improving v/c from 0.46 to 0.41 for current year conditions and from 0.58 to 0.50 for year 2025 conditions. The weave segment would be expected to maintain a LOS of B through 2025.

ODOT conducted a weaving analysis in 1999 to evaluate whether an auxiliary lane between the ramps would have any operational benefits over the current ramp configuration. The ODOT analysis draws a similar conclusion, showing improved operations with an auxiliary weave lane. A detailed discussion of the ODOT analysis can be found in Appendix C.

Simulation modeling using SimTraffic software was conducted to supplement HCM analysis results and construct a more complete picture of freeway operations under both merge/diverge and weaving scenarios. The results showed that an auxiliary lane would improve freeway operations. However, the model results show the ramps operating with lower speeds and more delay with an auxiliary lane in place. This decrease in operational performance may reflect the spillback from disruption caused by the weaving of entering vehicles from Interchange 119 and mainline vehicles exiting at Interchange 120. It should be noted that the facility is expected to perform adequately under either scenario. Details regarding the SimTraffic model results can be found in Appendix C

4.1.7 Auxiliary Lane Discussion

Generally weaving lanes cause significant turbulence and increase the number of potential conflicts. An auxiliary lane would remove the merge/diverge maneuver for ramp-to-ramp vehicles. This movement accounts for a full 20 percent of entering vehicles at Interchange 119, or 260 out of 1300 future year peak hour vehicles. However, an auxiliary lane would force a lane-change maneuver where one currently does not exist for mainline vehicles exiting at Interchange 120 (approximately 120 future year peak hour vehicles). An auxiliary lane would allow a greater distance for entering vehicles to complete their merge with mainline traffic, but it would also extend the length over which potential conflicts may occur, as well as create additional conflicts over the current configuration.

HCM ramp and weaving analysis results show moderately improved overall performance with an auxiliary lane than with the current merge/diverge configuration. A v/c analysis shows that, while an auxiliary lane would improve operations, OHP mobility standards would be met under future year traffic volume conditions even if an auxiliary lane is not constructed. SimTraffic modeling shows that an auxiliary lane does offer some level of improved operations over the

existing merge/diverge configuration for mainline through traffic. However, an auxiliary lane may not provide appreciable benefits to ramp operations.

4.2 Safety Analysis

This section summarizes the crash analysis that was conducted for the Planning Area roadway facilities. The safety analysis included a review of the ODOT supplied Planning Research Corporation (PRC) crash listings (2000 to 2002), ODOT Safety Priority Index System (SPIS) data, and a comparison of calculated crash rates with statewide averages. The procedures used to analyze this data are discussed in Appendix D.

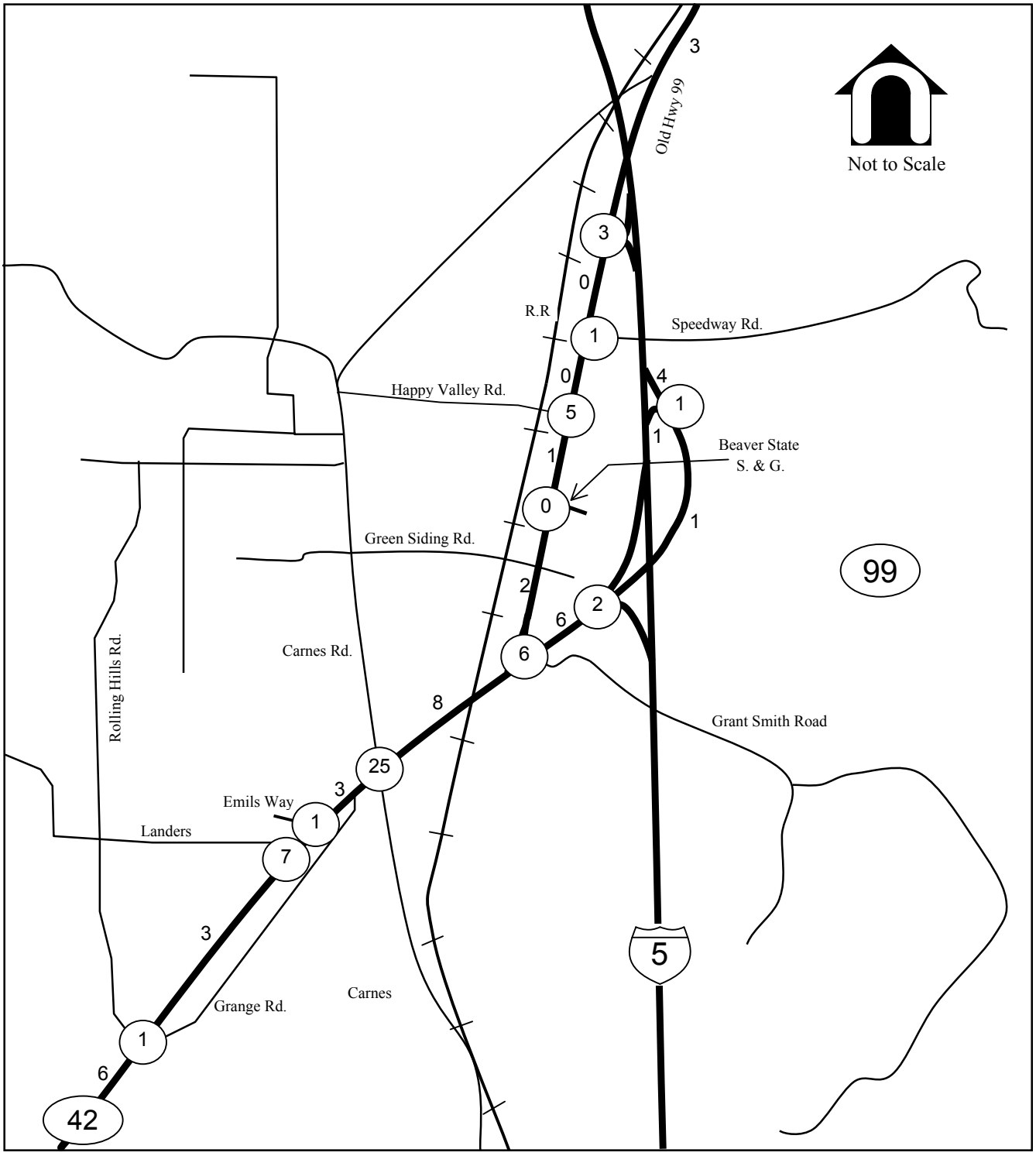
SPIS Data
The SPIS is a method developed by ODOT for prioritizing locations where funding for safety improvements can be spent most efficiently and effectively. Based on crash data, the SPIS score is influenced by three components: crash frequency, crash rate, and crash severity. Three years of crash data are analyzed for the SPIS score. A list of the sites with the top 10% SPIS scores is produced each year. There are two Top 10% SPIS locations within the Interchanges 119/120 Planning Area. The first is at the intersection of OR 42 and Carnes Road. The second from milepost 76.29 to 76.43 on OR 42, which is located to the east of the intersection of OR 42 with Old Highway 99/Grant Smith Road. This section had one fatal crash where a pedestrian was walking in the roadway.

4.2.1.1 Study Area Findings
Crashes were summarized by location for each of the six study intersections. Figure 7 shows the location and the number of crashes that occurred between 2000 and 2002. Intersection crash rates are summarized in Table 4.

Table 4. Study Area Intersection Crash Rates

Intersection	ADT	3-Year Crash Rate
Old Highway 99 at IC 120 SB On/Off Ramp	11,480	0.40
Old Highway 99 at Speedway Road	11,140	0.08
Old Highway 99 at Happy Valley Road	12,310	0.37
Old Highway 99 at Beaver State S & G	6,920	0.00
Old Highway 99 at OR 42	23,800	0.23
OR 42 at Carnes Road	23,610	1.04

The crash rate of 1.04 at the intersection of OR 42 with Carnes Road is high when compared to the surrounding intersections. This location had 27 crashes between 2000 and 2002 that occurred within 265 ft (0.05 mi.) of the intersection on both OR 42 and Carnes Road/Roberts Creek Road. Of the 27 crashes, 18 were rear end crashes. Fifteen (15) of the crashes resulted in injuries and 12 resulted in property damage only. There were no fatal crashes at this location during the study period. As noted above, this intersection is a Top 10% SPIS location.



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LEGEND

(#) = Number of Intersection Crashes

=Number of Segment Crashes

Figure 7 - Crash Summary

Interchanges 119/120

The crash rate on Old Highway 99 from OR 42 to the ramp terminal at interchange 120 is 1.04. This is comparable to the statewide crash rate for highways in the same class as the Old Highway 99, which is 0.99.

Crashes were also examined on I-5 between Interchanges 119 and 120. The segment of freeway examined included both the northbound and southbound lanes, as well as the merge and diverge areas for both interchanges. The I-5 segment crash rate was found to be 0.28, which is slightly higher than the comparable statewide average of 0.22. Table 5 summarizes the crashes on Interstate 5 in the vicinity of Interchanges 119 and 120.

Table 5. Freeway Crash Data

Location	2000	2001	2002	Total
Northbound				
IC 119 Off Ramp (MP 119.72)	1	0	0	1
IC 119 On Ramp (MP 119.99)	1	1	1	3
IC 119 On to IC 120 Off Ramps	2	1	4	7
IC 120 Off Ramp (MP 120.41)	1	1	2	4
IC 119 On and Off (OR 42)	1	1	2	4
Southbound				
IC 120 Off Ramp (MP 120.43)	0	1	0	1
IC 120 On Ramp(MP 120.13)	0	0	0	0
IC 120 On to IC 119 Off Ramps	0	4	0	4
IC 119 Off Ramp (MP 119.68)	0	0	0	0
IC 119 On Ramp (MP 119.68)	0	0	0	0

4.2.1.2 Safety Conclusions

The safety analysis showed that only one of the intersections in the study area, OR 42 at Carnes Road, has a crash rate greater than the surrounding area. This intersection had 25 crashes within the influence area between 2000 and 2002. The primary type of crash was rear-end, which are often caused by driver inattention and congestion at signalized intersections. Due to the nature of rear-end crashes, there is no specific mitigation that can be suggested. However, some general safety mitigations may help improve safety, including changes to signal timing such as increasing the clearance interval. Also, visibility of signals may be improved by re-aiming the signal heads or using a different luminaire.

4.3 Summary of Planned and Programmed Projects

Both Douglas County and ODOT were asked to provide any planned or programmed projects in the area surrounding Interchange 119 and 120. The following section provides a brief overview of any planned or programmed projects and a discussion of the likely impact on the transportation infrastructure, use, and operations.

OR 42: Winston to I-5 Resurfacing

This project is part of the 2004 to 2007 Statewide Transportation Improvement Program. This project has several objectives including placing a new road surface and improving the intersection geometry at Kelly's Corner. This project took place from milepost 73.20 to 77.20 on

OR 42 and has been completed. It is expected that this project will improve safety and operations on this stretch of roadway.

I-5 Overcrossing: South Umpqua River and Old Highway 99
The replacement project is in the approved 2004-2007 STIP. The I-5 northbound and southbound structures crossing over the South Umpqua River and Old Highway 99 will be replaced and widened. These Bridges are listed as an OTIA stage 1a project. As part of this project, the northbound off-ramp is being reconstructed, the mainline I-5 alignment is being shifted to the east, and the southbound off-ramp at Interchange 120 is being realigned to create a 25 mph curve, which will replace the existing 15 mph curve.

4.4 Land Use

4.4.1 Existing Land Uses

The 119/120 planning area is located primarily within the Green Unincorporated Urban Area (UUA) of Douglas County. Although Green is not a city, it is developed with higher densities than typical rural areas with industrial, commercial, and residential development. The dominant land uses surrounding the interchanges and both sides of Old Highway 99 are industrial in nature. Access to OR 42 and Old Highway 99 makes this area appropriate for distribution-related industries, such as UPS and FedEx on Old Highway 99. Other "medium heavy" industrial uses, the largest area of which is along Austin Road, Green Siding Road, and Industrial Drive, include recreational boat manufacturing, auto body shops, storage, and machinery parts manufacturing. Pacific Power on the corner of Old Highway 99 and Happy Valley Road is also zoned medium industrial. "Heavy" industrial uses include wood products processing (Roseburg Forest Products owns 93 acres), paving materials manufacturing, and salvage/automobile wrecking (allowed conditionally in heavy industrial zones). The dominant land uses in the light industrial-zoned areas within the study area are mobile home parks (on Old Highway 99 and west of I-5, south of Interchange 120 and east of Interchange 199).

Commercial uses in the study area are predominantly found at Kelley's Corner, the intersection of Carnes Road and OR 42, where there is a large grocery store, some strip commercial uses, and restaurants in "C-2," and off of Grant Smith Road, south of Interchange 119 (Loves Truck Stop, zoned "C-3"). Outside of the mobile home parks, the majority of residential developments within Green are located farther from I-5 in the northern and western portions of the study area. Figure 8 and Figure 9 show zoning and Comprehensive Plan designations, respectively, for the planning area.

4.4.2 Douglas County Comprehensive Plan and Development Code

The entire project area is located within Douglas County's planning jurisdiction, mostly within the Green Urban Unincorporated Area (UUA). The northernmost portion, along Old Highway 99 north of Interchange 120, is outside of the Green planning area. The predominant land use designations, per the Douglas County Comprehensive Plan (2003) are Industrial and General Commercial/Industrial (described as a designation intended for heavy retail service commercial uses or light industrial uses). There is also an area of Industrial Reserve directly east of Interchange 119. Residential designations are also found along Roberts Creek and Carnes Road, the western boundary of the study area. Residential lots east of Carnes Road are designated High

Density; moving northwest, from Carnes Road to the South Umpqua River, residential densities go from High to Medium Density.

Comprehensive Plan land use policies applicable to the study area include:

3. (Commercial) Future commercial development should be located along Carnes Road, at Kelley's Corner, and along Grange Road.

4. (Commercial/Industrial) A mix of light industrial and heavy commercial uses are encouraged in the designated portions of the area bounded by Carnes Road, OR 42, and I-5.

In addition, there are specific industrial policies that pertain to industrial development east of I-5 at Interchange 119. These policies address improvements to Grant Smith Road, screening and landscaping, and drainage plans.

Industrial zones cover most of the study area and are concentrated along I-5 and Old Highway 99. Industrial designations include Light Industrial (M-1), Medium Industrial (M-2), and Heavy Industrial (M-3), permitting a range of uses from Mobil Home Parks and some commercial uses, "clean" industry, manufacturing, and heavy industry. Medium and Heavy Industrial specify the necessity of being in proximity to good (or excellent) rail or highway access.

Consistent with the Comprehensive Plan Land Use Map, to the east of Interchange 119 is an Industrial Reserve designation (INR). The intent of the Industrial Reserve is to ensure that an adequate quantity of land suitable for industrial use is available in Douglas County. Areas with this designation in the study area are in the Green Urban Unincorporated Area, and over time development is expected to reach urban densities. All sites designated Industrial Reserve are considered potentially good industrial sites and are protected for the County's economic future.

Commercial zoning is concentrated on the west side of I-5 primarily at Kelley's Corner, near Grant Smith Road and OR 42 near the Interchange 119 on ramp, and interspersed with industrial zoned property along the eastside of Old Highway 99.

Residential zoning in the study area includes primarily Single-Family Residential (R-1, 6,500 square foot minimum lot area), with some Multiple Family Residential (R-2, 6,500 square foot minimum lot area for single family residence) interspersed along Carnes Road, bordering the western study area boundary. The northwest corner of the study area also encompasses a portion of R-2. Suburban Residential (RS) flanks the intersection of OR 42 and Carnes Road, and continues to be the dominant zoning along Carnes Road in the northern portion of the study area. The RS zone is intended for suburban residential development where limited agricultural activities, including raising livestock and nursery stock, may be pursued. Minimum lot size in this zone are 15,000 square feet, when served by a community water supply system or community sanitary sewer system, and one (1) acre or larger if not on a water or sewer system. The RS zoning designation is not consistent with the Douglas County Comprehensive Plan, which specifies only high density residential along Carnes Road, but is fairly consistent with the type of existing residential development in the area.

4.4.3 Future Land Uses

The Green District is the largest urban unincorporated area in Douglas County and has seen a great deal of commercial and industrial growth in the last five years, including the new Love's

Truck Stop and Ingram Book distribution center (approximately 6 acres and 500 employees) that lie within the study area. In addition, the Green District is the most populated urban unincorporated area in Douglas County and, with a growth rate of 2.2%, continues to attract residents, predominantly to new residential developments in the west portion of the District.[4] The 2000 census recorded the population of Green as 6,174. Development services related to the Green area account for a third of the planning activity at the County's Planning Department. According to a representative of the Umpqua Economic Development Partnership, warehousing/distribution and light industrial growth is expected around Interchange 119 due to the available land, services and comparatively affordable housing in the vicinity. Interviews with business and property interests in the vicinity of the I-5 interchanges consistently included comments regarding the potential for continued commercial, industrial and residential growth in the area. Douglas County maintains a current buildable lands inventory of vacant industrial land in the study area.

The Green District is within the Roberts Creek Enterprise Zone, a program to encourage businesses to make new or additional investments through property tax abatement. The majority of vacant industrial land is east of I-5, in the vicinity of, and north of Ingram Book Distribution Center. Much of the developable land is within the Oak Creek Industrial Park where approximately 30 acres is available. The land is owned by Douglas County, and an industrial board, Umpqua Economic Development Partnership, is responsible for marketing the site. The goal of the park (which is restricted to "clean" industrial development) is to enhance Douglas County's industrial base and create jobs. Moderate slopes and stands of oak characterize the area north of the Industrial Park.

Also, the Cow Creek Tribe has recently purchased a 15.29-acre site, formerly a drive-in theater, to the south of Grant Smith Road. While this property has a "Rural Commercial (CRE)" zone designation, which allows a variety of commercial uses, it is expected that this parcel will ultimately be placed in the Tribal Trust and future uses will be dictated by the Tribe.

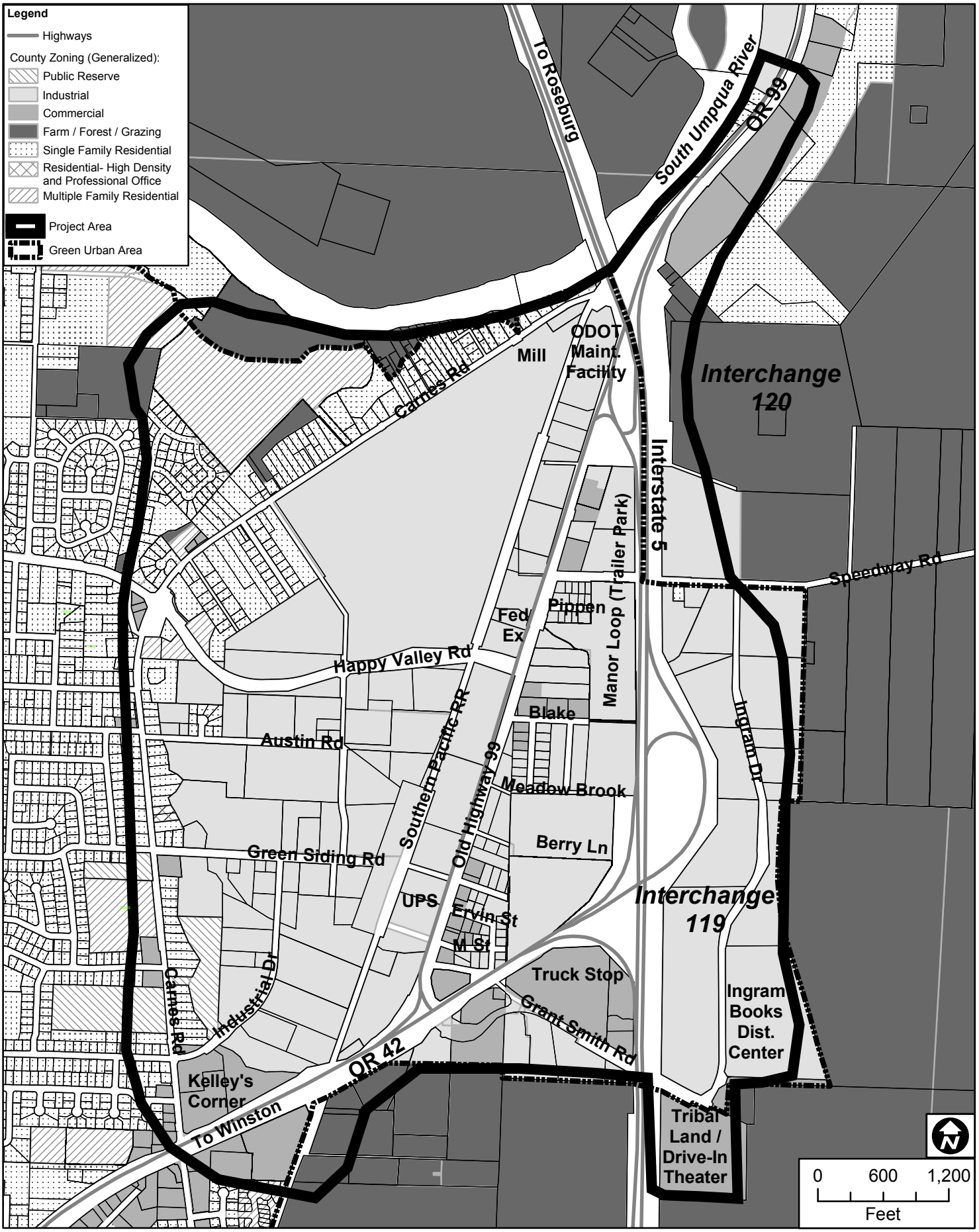
There are only a few vacant industrial areas west of I-5. The largest known redevelopment plan is at former Roseburg Forest Products site, which is currently undergoing an environmental permitting process to fill an existing 30-40 acre log pond (and nationally listed wetland). The company intends to drain the site, substantially increasing the buildable acreage on the property, in order to fulfill redevelopment plans for the site.

Residential areas close to I-5 are predominantly mobile home parks, with some pockets of "stick built" homes, and an occasional house associated with a business on Old Highway 99. Areas on "M-1," where mobile homes are allowed, appear to be built out. Numerous single-family residential developments have recently been built or are underway near Carnes Road, Happy Valley Road, and Little Valley Road.

The growth in the Winston-Dillard area, while outside of the study area, will also have an effect on the transportation system in the study area. The City of Winston, a community of roughly 5,000, has seen rapid residential growth in recent years and expects to see 520 homes built within the next 5-6 years. With very little commercial and no industrial uses in Winston, residents are dependent on OR 42 and Old Highway 99 to get to services and jobs. The Dillard area is being promoted as a prime industrial area. OR 42 is an important route for people and freight through

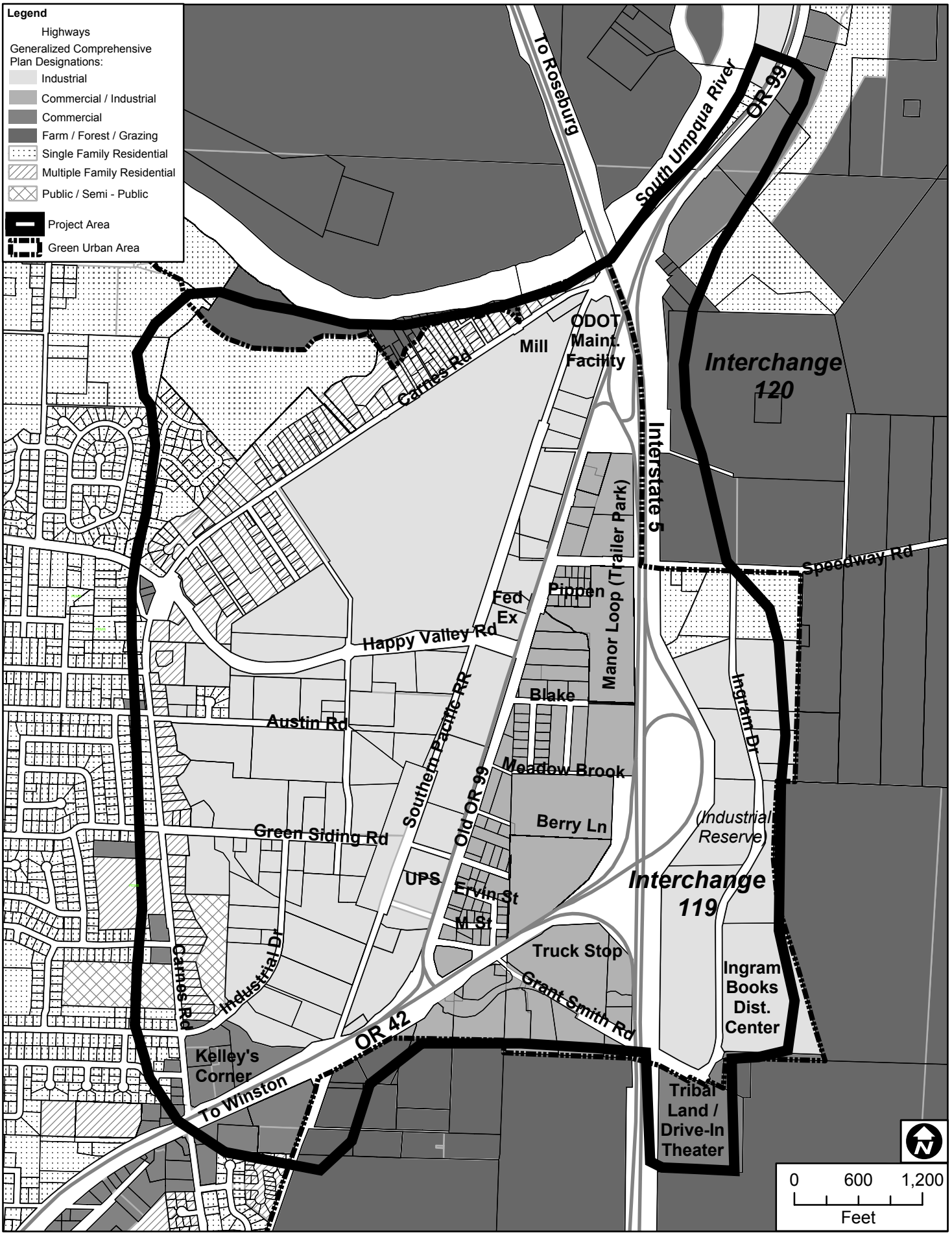
[4] The most recent demographic information for the Green District can be found in the Green Transportation System Plan, August 8, 2001, available at the Douglas County Planning Department.

Figure 8
I-5 Interchanges 119 and 120 Zoning and Existing Land Uses



n:/gis/odot0436/arcmap/i119_120_zoning_8x11_071805.mxd

Figure 9
I-5 Interchanges 119 and 120 Comprehensive Plan and Existing Land Uses



n:/gis/odot0436/arcmap/i119_120_comp_8x11_071805.mxd

Winston, Dillard and further west and is designated a Freight Route in the Oregon Highway Plan recognizing its significance in connecting Coos Bay and Roseburg.

4.5 Environmental Constraints

A review of existing natural and historic resources was conducted to identify sensitive natural and historic resources in the planning area that could result in potential constraints or barriers to future transportation facility improvements. The complete memorandum is contained in Appendix E In addition to analyzing two environmental baseline reports, the following information was reviewed:

- Goal 5 resources and the Douglas County Comprehensive Plan;
- Federal Emergency Management Agency (FEMA) floodplains;
- Known Threatened and Endangered (T&E) listed species;
- Wetlands and the presence of hydric soils;
- Hazardous materials databases and field surveys;
- Cultural and historic resources; and
- Agency Cultural Resource Specialist lists for potential archeology sites.

More detailed analysis will need to occur after improvement projects are identified, to determine precise impacts and the resulting permitting and mitigation actions required. Local, state, and federal agencies/jurisdictions regulate project impacts associated with improvements.

Interchange 119 may have issues regarding wildlife, environmental, and cultural resource concerns, due to the proximity or potential proximity to threatened and endangered species, water resources, hazardous materials, and cultural deposits in an area not previously surveyed. Threatened species that may potentially be located near Interchange 119 include the bald eagle, coho salmon (Oregon Coast) and Kincaid's lupine flower. Potential endangered species near Interchange 119 includes the rough popcorn flower. A review of hazardous materials databases and field surveys found four sites with recognized environmental concerns located near Interchange 119. Also, the North Fork Roberts Creek runs through the project area enhancing the possibility of encountering buried cultural deposits near Interchange 119.

The Douglas County Floodplain Overlay indicates a portion of North Fork Roberts Creek, an intermittent stream that joins the South Umpqua River downstream of the site, is located about a quarter mile south of Interchange 119. Therefore, it is unlikely that special floodplain considerations would apply to repairs or replacement of Interchange 119 bridges.

Areas of concern for Interchange 120 include possible floodplain, wildlife, wetland, environmental, and cultural constraints. Unlike Interchange 119, Interchange 120 is located relatively close to the South Umpqua River yet outside of the 100-year floodplain. Interchange 120 is also near an unnamed stream with a floodplain that is constrained by terraces. Surveys would need to be conducted at the bridge site to better ascertain any floodplain constraints related to improvements. Potential threatened and endangered species identified near Interchange 119 also apply to Interchange 120. Wetlands identified by NWI mapping and the area of mapped hydric soils along Unnamed Stream 1, were not investigated for the baseline report in the field because of access limitations. Site surveys would be necessary prior to construction. A

recognized environmental concern was identified through site reconnaissance located near Interchange 120. Prior to ground disturbance, an evaluation of potential hazardous materials and other sites of concern will need to be completed. In addition, the presence of an unnamed tributary and a prehistoric lithic scatter near the South Umpqua River highlights the potential for cultural resources near Interchange 120.

After project improvements are identified and construction envelopes delineated, potential impacts to natural and historic resources and necessary permitting can be determined. Any project impacts to wetlands or streams could require special permitting with the Oregon Department of Environmental Quality (DEQ), US Corps of Engineers (COE) and the Oregon Division of State Lands (DSL). These permits may require mitigation including one or more of the following: water quality swales, water quality detention ponds, construction of new wetlands, and/or enhancement of existing wetlands. Douglas County regulates impacts to floodplains and may require similar mitigation if impacts to the floodplains are anticipated.

Project impacts to threatened species or species of concern could require detailed consultation with the US Department of Fish and Wildlife and National Marine Fisheries Service (NOAA Fisheries). A Biological Assessment or similar biological evaluation may be required to determine project impacts to listed and proposed species. Based on the analysis, the agencies may require modified construction techniques and timing to minimize impacts on the species. If identified hazardous material sites will be disturbed during project construction activities, both testing for hazardous materials and proper disposal in an appropriate landfill will be required. DEQ is the overseeing agency for disposal of hazardous materials. Regarding cultural and historic resources, no resources have been identified, so special protective measures or mitigation are not necessary to implement prior to project area construction. However, if previously undetected cultural resources are encountered during the course of the project, all ground disturbing activities must cease and personnel at ODOT's Environmental Services Division must be notified immediately. Data recovery must be undertaken. This would likely result in construction delay and additional project costs to pay for the recovery.

5 NEEDS ASSESMENT

The following section identifies geometric, operational, safety, and freight movement deficiencies related to the existing interchange and roadway network configurations. The needs identified in this section will be used to inform the future Interchange Area Management Plan (IAMP). The IAMP will recommend specific long-term strategies to address existing deficiencies in the planning area.

5.1 Interchanges 119/120 Geometric Deficiencies

A review of geometric deficiencies for the I-5 interchanges 119 and 120 was conducted for this conditions report. The deficiencies described in this section are based upon a review of as-built drawings for the interchanges and information presented in the *I-5 State of the Interstate Report*. The existing conditions were compared against the ODOT design standards from the 2003 Highway Design Manual.

5.1.1 Interchange 119 Deficiencies

I-5 is a divided freeway in this section. There are only 4 foot wide inside shoulders when standard is 6 feet and the median width is only 30 feet when 64 feet is the standard. The Type 1 and earth mound guardrail terminals for this section are not to current standards. The spacing between the ramps of the Coos Bay-Roseburg interchange and the ramps of Interchange 120 do not meet the one-mile OHP standard spacing for urban interchanges[5].

The northbound entrance ramp has a design speed of 55 mph, which meets current design standards. However, the acceleration length is approximately 300 feet short of ODOT standards for vehicles merging onto I-5. In addition, the merge area of the ramp is on a spiral as opposed to a tangent section, which is not desirable.

The northbound exit ramp functions as a loop ramp with a speed of 30 mph, meeting current standards for speed. However, the deceleration length is approximately 270 feet short of ODOT standards for vehicles leaving I-5. In addition, there is no tangent or spiral section prior to the curve to aid in speed reduction and superelevation transitions.

The southbound entrance ramp has a design speed of 45 mph, which meets current design standards for speed. The acceleration length is approximately 470 feet short of ODOT standards for vehicles merging onto I-5. In addition, the ramp merges onto I-5 with a 45 mph horizontal curve, with no tangent or spiral section to aid in speed increase and superelevation transitions. The superelevation transition must occur completely on the curve itself before the merge with I-5.

The southbound exit ramp has a design speed of 65 mph, meeting current design standards for speed. However, the deceleration length is approximately 140 feet short of ODOT standards for vehicles leaving I-5. In addition to the short deceleration length, the exit ramp is a horizontal curve, with no tangent or spiral section before it to aid in speed reduction and superelevation transitions. The superelevation transition must occur completely on the curve itself.

5.1.2 Interchange 120 Deficiencies

I-5 is a divided freeway with a median barrier in this section. The median width is 16 feet, while the standard minimum width is 18 feet. The Type 1 and earth mound guardrail terminals for this section are not to current standards. The horizontal alignment contains spiral lengths of 400 feet, below the standard 600 feet required for a 4-lane section. This requires superelevation transitions to happen over a shorter distance. As noted in Section 5.1.1, the spacing between the ramps of this interchange and the ramps of Interchange 119 are substandard.

The northbound exit ramp has a design speed of 65 mph, meeting current design standards for speed. However, the deceleration length is approximately 70 feet short of ODOT standards for vehicles leaving I-5. The Type 1 and earth mound guardrail terminals on this ramp are not to current standards. Access should be controlled within 1320 feet of the ramp, however there are several private accesses on or within this distance on the crossroad. Also, 140 additional feet should be provided for acceleration from the ramp onto Old Highway 99. Note that this ramp will be reconstructed as part of the I-5 overcrossing project described in Section 4.4. This project will address many of the geometric deficiencies described above.

[5] The interchanges lie within the Urban Unincorporated Area of Green. Therefore, the OHP classifies the interchanges as urban.

The design speed for the southbound entrance ramp is 45 mph, meeting current design standards for speed. The spirals of the horizontal alignment could be lengthened by 50 feet to provide longer transitions for superelevation. For both this ramp and the southbound exit ramp, access should be controlled within 1320 feet of the ramp, however there are multiple private accesses within 1320 feet on the crossroad.

The southbound exit ramp has a design speed of 15 mph, which does not meet the standard of 25 mph minimum. The horizontal alignment contains a sharp, 72 foot radius curve with no spirals to aid in speed reduction and superelevation transitions. The following section contains additional discussion regarding the deficiencies of this ramp and measures to address them.

5.2 Traffic Operations and Safety Deficiencies

Section 4.1 contains a comprehensive discussion regarding traffic operations analysis results. The following discussion presents some strategies that may be considered to address the major operational and safety deficiencies found in the planning area. As noted above, the future IAMP effort will expand on these general concepts and will recommend specific actions to address the existing operational and safety deficiencies within the planning area.

Old Highway 99 at I-5 SB Ramps

The westbound left turn at the ramp terminal is currently operating over capacity at v/c of 2.05, and is forecast to reach a v/c of 2.51 in 2025. The ramp does not have adequate storage length to accommodate the queues that result, which often back up onto the freeway. Preliminary analysis has shown that several signal warrants are met for this intersection. A signal would improve operations and safety at the intersection by providing a protected left turn for southbound exiting vehicles, which would lower v/c and queue lengths.

However, signalization will not improve the operational problems related to geometric deficiencies. The southbound off-ramp contains a sharp, 15 mph curve with a 72-foot radius. In addition, the ramp terminal intersection with Old Highway 99 is too close to the freeway. Possible solutions include the relocation of Old Highway 99 further from the interstate to increase spacing and storage length, or the relocation of the ramp terminals further south on Old Highway 99. This would allow the curve on the southbound off-ramp to be designed with a larger-radius, and would also increase the storage length.

OR 42 at Old Highway 99 / Grant Smith Road

The eastbound approach lanes experience excessive queuing and delays due to lane imbalance on the approach. The Interchange 119 ramp split is located less than 1000 feet downstream. Most vehicles have already assumed their desired lanes on the approaches to the intersection. With 85 percent of vehicles subsequently heading to the northbound I-5 ramps from the left lane, most vehicles queue in the left approach lane at the intersection.

A possible improvement includes constructing a new overcrossing, currently carrying a two-lane, two-way roadway, with sufficient width to accommodate two eastbound lanes. This would allow vehicles heading north at the interchange to occupy both eastbound lanes. At the north- and southbound split, the roadway would consist of one exclusive northbound lane and one lane for both north- and southbound traffic. Allowing northbound interchange traffic to occupy both

lanes would reduce or eliminate the imbalance seen at the intersection of OR 42 at Old Highway 99 / Grant Smith Road.

OR 42 at Carnes Road / Roberts Creek Road
This intersection marginally exceeds the ODOT mobility standard under current year conditions, but approaches capacity (0.92) under 2025 conditions. Possible mitigation strategies include adding lanes on the approaches and signal timing modifications.

Other Operational Issues
Some stakeholders have identified as a deficiency the lack of northbound freeway access at Interchange 120. This places limitations on access to Roseburg and points north from the Green area. It also places additional demands on the intersection of OR 42 with Old Highway 99 / Grant Smith Road and Interchange 119, facilities that are already experiencing operational problems. One possible solution includes the construction of a full-movement interchange at this location that would provide a northbound entrance ramp. Another alternative might be to the replace interchanges 119 and 120 altogether with a single interchange. This could provide better access to the Green area, while removing several closely-spaced entrance and exit ramps.

As discussed in Section 4.1, the northbound merge at Interchange 119 experiences operational problems due to the high volumes of entering traffic followed by an exit ramp 2500 feet downstream at Interchange 120. An auxiliary lane may provide some operational benefits compared to the existing interchange configuration. This alternative will be thoroughly evaluated in the future IAMP effort.

Traffic Safety Deficiencies
As discussed in Section 4.2, intersection and segment crash rates for planning area facilities are generally consistent with statewide average crash rates. The intersection of OR 42 with Carnes Road has a higher crash rate, with a significant number of rear-end crashes.

5.3 Access Management Needs

Background
Access to the roads connecting to the interstate system is vital to the adjacent property owners who need access for their businesses and residences. However, it has been shown that a proliferation of driveways and minor street intersections on major roadways and near ramp terminals can drastically increase conflicts, causing operational problems, decreasing capacity, and generally degrading service for all system users.

One of the primary goals of the future IAMP will be to develop an access management strategy that helps preserve the functionality of planning area roadway facilities, protecting their ability to accommodate traffic volumes safely and efficiently into the future, while accommodating the needs of businesses and residences. This goal will be implemented by the development of a set of short, medium, and long-term strategies. The access management strategies will comply with the objectives outlined in OAR 734-051, the administrative rule pertaining to access management on State highway facilities.

Access Spacing Standards and Access Inventory

The access management spacing standards for roadways in the study area vary according to jurisdiction, classification and posted speed. The OHP spacing standard for OR 42, a Statewide Highway and Expressway within an urban area, is one-half mile. As previously noted, the minimum spacing between the on-ramps of one interchange and the off-ramps of the downstream interchange is one mile. Also, the OHP specifies that access should be controlled on interchange crossroads within 1320 feet (1/4 mile) of ramp terminals. However, several private approaches currently exist on Old Highway 99 within 1320 feet of the Interchange 120 southbound ramp terminals. Douglas County has control over access spacing requirements on the remainder of Old Highway 99.

An inventory of existing access points on roads within the study area was compiled based on aerial and tax lot maps, and a site visit. The access points are listed in Appendix F. The access inventory revealed that many access points do not currently comply with the applicable access spacing standards. The IAMP will develop access management strategies for roadways in the study area to address safety or operational problems concerning existing or proposed private and public access points, with the overall goal of balancing the mobility needs with the access needs of residences and businesses.

5.4 Freight Movement Patterns & Needs

This section identifies significant freight movement patterns and freight movement deficiencies related to Interchanges 119 and 120. OR 42 and I-5 are both Statewide Freight System Routes on the National Highway System. OR 42 helps move freight in both Coos and Douglas Counties, while I-5 serves local, county, statewide, and interstate freight traffic. An automatic traffic recorder just north of Roseburg shows that approximately 18% of I-5 traffic is heavy vehicles. On OR 42, just west of Brockaway, the automatic traffic recorder shows approximately 13% of the traffic is heavy vehicles.

The *Intermodal Management System* (March 1997) identified no intermodal facilities for freight within the planning area. However, there were two project needs that the report identified within the area of interchanges 119 and 120. The first is a project that would allow the use of triple-trailers on OR 42 between Coos Bay and Roseburg. The second is a project that would provide a better highway connection between Coos Bay and Roseburg. One project that would address those needs would consist be the creation of a new highway with four lanes and flatter curves facilitating high-speed truck travel between the two cities. Such a facility would make travel safer for long vehicles and speed truck freight movement through the corridor.

ODOT's Motor Carrier Transportation Division has imposed weight restrictions in the vicinity of Interchanges 119 and 120. These include the Shady River Bridge over the South Umpqua River at MP 120.57 and the I-5 Overcrossing at Interchange 119.

The 1999 ODOT report entitled *Freight Moves the Oregon Economy* does not contain any specific needs or projects for the 119 and 120 study area. It does address some general improvements that could be applied in the area such as: installing additional automatic traffic recorders to monitor truck traffic, continuing to develop the Intermodal Management System, and continuing to identify and develop Intelligent Transportation Systems (ITS) applications for freight movements.

Other possible constraints identified in the region relate to possible clearance issues and pavement conditions. The county has noted that the clearance under I-5 on Speedway Road could have a possible height restriction. Grant Smith Road has been realigned and a traffic signal installed to address past access and safety issues near interchange 119.

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Transportation Conditions Report
Technical Appendix

I-5 Interchanges 119/120

Douglas County, Oregon

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October 2005

LIST OF APPENDICES

APPENDIX A. STAKEHOLDER INTERVIEWS SUMMARY REPORT
APPENDIX B. REVIEW OF TRANSPORTATION AND LAND USE PLANS AND POLICIES
APPENDIX C. EXISTING AND FUTURE TRAFFIC OPERATIONS ANALYSIS, TRAVEL DEMAND MODEL DEVELOPMENT
APPENDIX D. SAFETY ANALYSIS
APPENDIX E. EXISTING SOILS, AGRICULTURE, AND NATURAL RESOURCES NARRATIVE
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Appendix A

Stakeholder Interviews Summary Report

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Stakeholder Interviews Summary Report – July 14, 2004

Interchanges 119 and 120 Transportation Conditions Report
Interchange 123 Interchange Area Management Plan

This report is intended to fulfill the deliverable under Task 2, Stakeholder Identification and Interviews, in the statement of work for the Interchanges 119 and 120 Transportation Conditions Report, and one part of the deliverables for Task 2, Local Agency Coordination, as specified in the statement of work for the Interchange 123 Interchange Area Management Plan planning process.

Introduction

A large part of the Oregon Department of Transportation (ODOT) planning studies being conducted for I-5 Interchanges 119 and 120 and Interchange 123 is finding out and documenting the current conditions at these interchanges. While the two planning projects are distinct - one will result in a Transportation Conditions Report for Interchanges 119 and 120 and the other an Interchange Area Management Plan for Interchange 123 - both are being conduced concurrently. A specific task identified for both projects involved interviewing interested parties with knowledge of the interchanges. ODOT has contracted with the engineering firm CH2M Hill for consulting work on these three interchanges; the planning firm Angelo Eaton & Associates is a subconsultant and is responsible for conducting and reporting on these "stakeholder interviews."

The Process

With the help of the two projects' Technical Advisory Committee, the consulting team identified individuals that potentially had valuable information and insight into transportation and land use planning-related issues at the interchanges. This initial list ultimately was narrowed down to a representative list of 13 individuals. On June 17, 2004, Michael Baker, Project Manager ODOT Region 3 Planning, sent a letter to this list that introduced the projects and invited the chosen interviewees to participate in the process (Attachment A). Staff from Angelo Eaton & Associates then conducted a series of telephone interviews with these individuals to identify issues associated with the 119/120 Interchange area and Interchange 123 during the last two weeks of June. Each person interviewed was contacted by phone. The interview typically lasted from 20-30 minutes.

The Participants

The participants were chosen because they, as individuals or as representatives of a group, had an interest in the operation of one, or all of the subject interchanges. Those interviewed included business property owners, homeowners, distribution and manufacturing interests, visitor or traveler service

providers, and economic development representatives. Of the 12 people contacted, four were primarily interested in just Interchange 123. Attachment B contains the list of the stakeholders interviewed. [1]

The Questions

A complete list of the interview questions is included in this report in Attachment C. The interview questions can be categorized in the following general topic areas:

- The effect current traffic conditions at the interchange(s) have on business/property owners/interest groups.
- Major transportation deficiencies at the interchange(s).
- Future growth in areas around the interchange(s).
- Ideas for improvements at the interchange(s).

The same set of questions were used for all of the interviewees, with some alternate questions used in the case of interviews that were only concerned with Interchange 123.

Interview Summary

There were some topics or themes that were common to most of the responses to the interview questions. Most respondents were generally pleased with present operations at all three interchanges and did not have concerns regarding the interchanges' ability to handle current levels of traffic efficiently and safely. However, those interviewed did make a point of mentioning that the design of one or more of the interchanges was potentially dangerous. The majority of comments confirmed that current traffic conditions at the interchanges was not seen as having negative impacts to businesses or properties in the area, with the notable exception of Interchange 123 on major event days at the Douglas County Fairground (see list of comments below). Words such as "workable," "acceptable," and "serves needs well" were used to describe current traffic conditions at the intersections, with one contrary comment pointedly saying that operations at Interchange 120 were unsatisfactory[2].

Several of those interviewed emphasized the growth in Roseburg, Winston and Coos Bay and noted that this growth will likely have negative impacts on the interchanges in the future. Most interviewees anticipated increased growth in the immediate vicinity of the interchanges as well, noting the amount and location of vacant and redevelopable land. Increases in light industrial and distribution-warehousing was anticipated for the Interchange 119/120 area. One individual interviewed predicted more residential growth in the Interchange 120 and Green area, citing the relative affordability of housing prices. Some residential and commercial opportunities west of Interchange 123 were mentioned, with development and redevelopment in the vicinity expected to increase if a new bridge was constructed at Portland Avenue.

The following is a list of paraphrased comments that were shared during the telephone interviews. The comments are organized under five general topic areas: Specific Concerns Regarding Interchanges 119

[1] Thirteen individuals were contacted to participate in the stakeholder interviews; twelve interviews ultimately were conducted and summarized as part of this report.
[2] It was unclear if this comment was reacting to current construction at the Interchange, but the implication was that this Interchange doesn't work well under normal conditions.

and 120; Specific Concerns Regarding Interchange 123; Growth in the Region Affecting Interchanges 119 and 120; Growth in the Region Affecting Interchanges 123; and Past Improvements/Suggestions for the Future. When there was more than one related comment this fact is noted in parentheses.

Specific Concerns Regarding Interchanges 119 and 120

- Geometry at 119 is convoluted and the on/off ramp movement is not intuitive and is dangerous.
- Design for 119 is dangerous, especially for southbound vehicles exiting and the merging traffic from the northbound off ramp. Southbound, the one lane coming off, then splitting into three lanes is confusing and the northbound traffic looping around comes into conflict with the traffic exiting. Southbound traffic has to change lanes to make a right turn. (Four interviewees had comments similar to this one).
- The major deficiency at 119 is the configuration and the conflicts it creates between trucks and passenger cars. (Two comments noted the potentially dangerous interaction between semi-trucks and passenger cars).
- Don't shut down Interchange 119 completely during future construction projects - it's very important for business and is one of the busiest interchanges in southern Oregon.
- Love's Truck Stop is bringing in more traffic (it has a strange access but one that currently doesn't seem to cause problems).
- It's important to keep Interchange 120, particularly for traffic heading north into Roseburg. The "new" Pacific Power access is better than the Old Highway 99 or Kelly's Corner access. The freeway bridge is the entrance into industrial land (plywood plant).
- Interchange 120 is important to commercial uses in the immediate area; it is the main "feeder" for the south part of Roseburg (most northbound traffic is going to Green; southbound is accessing commercial at the interchange or south Roseburg).
- The first stop sign on Old Highway 99, south through the Green district, is an important intersection.
- Because of the traffic movement necessary to access property to the west, there is a potential for accidents at Interchange 120, particularly conflicts between semi trucks and passenger cars.
- Interchange 120 doesn't work well.
- Interchange 120 isn't a very good intersection; if you want to go north off of Speedway Road you are locked into going into town.
- Coming off of Interchange 120 is "hairy"; the merge lane on to I-5 is not long enough.
- Improvements currently underway at Interchange 120, once completed, may actually create more traffic.
- Safety is a concern at Interchange 120, particularly to the retirement community in the area; the southbound exit is substandard.
- Regarding development projects, things seem to be "studied to death" and the bureaucracy slows down the execution of any real improvements.

Specific Concerns Regarding Interchange 123

- A new bridge at Portland Avenue is necessary to alleviate the "bottleneck" that occurs occasionally at 123; another exit would improve traffic congestion from south Roseburg.
- There are geometric and sight distance problems with the interchange (all four interviewees with an interest in this interchange mentioned that traffic movement under the overpass was challenging and

dangerous, citing lack of traffic controls at the off ramp and having to turn against traffic when accessing Portland Street).
- There seems to be a lot of accidents (off southbound exit).
- Any improvements will need to be well coordinated with operations of Old Highway 99 east of the river.
- The time of construction for future improvements is a concern (Douglas County Fair week is the first or second week of August; 80,000 visitors over 5 days cause back-ups on I-5).
- Residents should be able to access their homes during construction of any future improvements; the sooner improvements happen, the better.
- Even though event parking on Kendall is prohibited, people still park in front of residences and this area is not patrolled for violators in the "no parking" areas.
- The design of a future Portland Avenue bridge will be particularly important, as it will become an arterial roadway.
- The mill between Portland Avenue and Interchange 123 creates significant traffic on Old Highway 99 in this area; if the bridge is built, all this traffic will use that facility; if Interchange 120 is constructed as a four-way intersection, then the traffic in and out of the mill will use this intersection.
- Backups on I-5 southbound and the barrier that trains cause at the Highway 99 Harvard Exit are a detriment in emergency situations, particularly when trying to reach Mercy Hospital.

<u>Growth in the Region Affecting Interchanges 119 and 120</u>
- Woodproducts industry in the area is expected to grow. There has been a shift from rail to trucks for transportation needs. Employee traffic may stay flat or slightly decline, but truck traffic will increase.
- There are plans to drain and develop the 30-40 acre log pond at the Green Plywood Plant #3.
- A business will be expanding to include a new ready mix plant in the next year or two; more truck traffic is expected as a result.
- Interchange 119 is already densifying; lower intensity development will evolve into more intensive light industrial and commercial uses. Interchange 120 will likely follow a similar pattern if it is upgraded, serving as a gateway into South Roseburg.
- Commercial growth around Interchange 119 is happening and more is expected (two comments).
- Warehousing/distribution and light industrial growth is expected around Interchange 119. Land is available, services are available, and housing in the area is still affordable.
- There is room for light industrial growth near Ingram Book; there is a lot of developable land in the area around Interchange 119 (two comments).
- Interchange 119 is affected by seasonal traffic going to the beach and camping spots in the region.
- Generally there is lots of room for increased growth around Interchange 119 (two similar comments).
- Economic growth in Winston, which is "on the bounce" and has a large industrial site for sale (old Weyerhaeuser plant), will affect the interchange(s) and the fact that Coos Bay is a deep-water port may expand the export business.
- Prime industrial land in Green will increase traffic in the area.
- Green is one of the highest residential growth areas in Douglas County.

- The lots at Littlebrook Estate will likely be full by the end of 2005 (currently half of the 140 lots are occupied).
- Additional residential development west of Little Valley Road is taking advantage of a recently built sewer line.
- The county recently approved a zone change for a 9-hole, 3-par golf course at the end of Little Valley Road in the river bottom, but there are no immediate development plans.
- Three small subdivisions have recently been developed in the vicinity of Happy Valley Road and Little Valley Road.

Growth in the Region Affecting Interchange 123

- Improvements to Interchange 123 will affect the quality of development in its vicinity. A decent quality interchange and a new bridge will cause rural/heavy industrial uses to evolve into high density, quality commercial uses.
- If the interchange is upgraded, there will likely be a rapid shift from residential to commercial uses in the immediate vicinity.
- The Douglas County Fair has a "buy order" for houses along Portland Avenue and has a "first right of refusal" for the Driver Property near the water shed.
- The Douglas County Fair is currently in the process of replacing a 12,000 square foot conference center with a 25,000 square foot facility, scheduled for completion in Spring 2005.
- There isn't a lot of room for more residential growth along Kendall Street; there aren't plans for the couple of vacant lots to be developed or sold.
- Improvements could facilitate commercial (motel/restaurant) and residential growth west of the interchange.
- Roseburg is growing; there is definitely a need for a bridge at Portland Avenue.

Past Improvements/Suggestions for the Future

- Past improvements to Interchange 119 (extension of the southbound lane, widening turn lanes on Highway 42) has helped with traffic flow (five comments).
- The series of traffic lights on Highway 42 has helped with safety.
- ODOT handled Love's Truck Stop's move to the area well; did a good job planning and keeping traffic flowing.
- Most projects in the area of Interchange 119 and Interchange 120 seem to be cosmetic (preservation).
- Any improvements at the Interchanges 119 and 120 will help.
- Adding an eastbound access at Interchange 119 should be considered.
- Improvements at Interchange 120 will help; any road improvements are welcomed.
- The improvements and widening to Happy Valley Road west of Carnes Road and the extension of Happy Valley Road east of the Carnes Road intersection has improved traffic flow in the area.
- The way Interchange 120 feeds into Old Highway 99 needs to be improved; a separate lane is needed, as well as a longer merge with highway traffic.
- Eliminate Interchange 120 southbound on ramp and expand and reconfigure the exit ramp to smooth out the curve.
- Put in an on ramp going north at Interchange 120.

- Before working on Interchange 119 projects, improve Interchange 120 first so that it can handle on/off, north and southbound traffic.
- Working closely with ODOT, many of the Fairground traffic issues were eliminated last year; re-striping at the interchange has improved its functionality.
- While visibility has improved under the 123 bridge, it is still an uncontrolled intersection with nothing to slow down traffic; more needs to be done to address this issue with regards to the traffic volumes coming from the north to access the fairgrounds.
- Both Interchange 120 and 123 need to be made fully functional with sufficient area underneath for improvements (a four-way intersection).
- The traffic impacts on Interchange 123 would be significantly lessened if 120 was to become a four way interchange (instead of southbound on and off only).
- The fairgrounds need more parking area and more control over parking in prohibited areas would be helpful.
- Really need a new interchange at 123; a redesign should straighten out the alignment and widen the overpass to make that intersection more safe (three comments concerned the curve at this intersection, as it related to safety issues).
- A new Portland Avenue bridge would be the biggest improvement to improve traffic flow south of Roseburg (all interviewees with an interest in the Interchange 123 area shared a similar opinion).
- Another exit (new bridge crossing) in the area would disperse traffic, get congestion out of downtown Roseburg and alleviate log and semi-truck traffic on Old Highway 99 (Sunstuds Lumber Mill and Umqqua Dairy traffic mentioned).
- Adding another lane from Harvard into the Fairgrounds would help with traffic/access.
- There should be a northbound entrance to Interchange 120.

Conclusion

The interviews highlighted that most people view the three interchanges' primarily function to access property in the immediate area. In the case of the 119 exit, access to the coast and other tourist destinations (such as the Wildlife Safari in Winston), as well as access to the industrial park in Green, were also cited as a primary functions. Most of those interviewed expressed a vested interest in one particular interchange, typically the one closest physically to their property or place of business.

Existing conditions at the interchanges were viewed largely as satisfactory, with a smooth flow of traffic on and off the highway, even with the recent increase in passenger and truck traffic at Interchanges 119 and 120 and the large amount of visitors to the Douglas County Fairgrounds. Despite initial positive comments, participants were in agreement that expected future growth in the vicinity and region would worsen traffic conditions, causing congestion, exacerbating existing deficiencies, and increasing the possibility of accidents.

There were differing opinions regarding the function of Interchange 120; business representatives pointed to the necessity of the interchange for commercial uses and truck movement, but another interviewee saw Interchange 120 serving predominantly residential traffic west of the freeway and in the Green area, with 119 being the major commercial exit.

The recent construction at Interchange 119 was cited the most as an improvement that had a positive effect on traffic movement in the area. There were few comments directed specifically at access issues, beyond concerns that current access be retained, both during and after any future construction at the interchanges.

Attachment A

Oregon

Theodore R. Kulongoski, Governor

Oregon Department of Transportation
Region 3
3500 NW Stewart Parkway
Roseburg, OR 97470
Telephone (541) 957-3500
FAX (541) 957-3547

File Code:

[name]
[company]
[address]
Roseburg, OR 97470

Dear [name]:

The Oregon Department of Transportation (ODOT) is currently conducting planning studies for I-5 Interchanges 119 and 120 and Interchange 123. ODOT has contracted with the engineering firm David Evans and Associates (DEA) for consulting work on these three interchanges; the planning firm Angelo Eaton & Associates is a subconsultant for land use issues. Two projects, one resulting in a Transportation Conditions Report for Interchanges 119 and 120 and the other an Interchange Area Management Plan for Interchange 123, are happening concurrently. I am contacting you because you have been identified as a person, or as a representative of a group, who has an interest in the operation of one, or all of these interchanges. We would like to schedule 10-20 minutes of your time to discuss the information or concerns you have about the interchange(s).

Staff from Angelo Eaton & Associates will be conducting stakeholder interviews during the week of June 21-25. They will be contacting you via telephone during this week to either conduct a short interview, or schedule another time that is more convenient for you.

Some of the question topic areas will include:

- The affect current traffic conditions at the interchange(s) have on business/property owners/interest groups.
- Major transportation deficiencies at the interchange(s).
- Future growth in areas around the interchange(s).
- Ideas you may have for improvements at the interchange(s).

We hope that you, or an associate with similar knowledge, will be willing to spend some time contributing to the interchange planning projects by participating in a stakeholder interview. While this call will be relatively short and informal, your input is important to successfully identifying future solutions for these interchanges. If you have questions about the Interchanges 119 and 120 Conditions Report or the Interchange 123 Interchange Area Management Plan, please call me at 541-957-3658.

Sincerely,

Michael Baker
Project Manager
ODOT Region 3 - Planning

Attachment B

Interchanges 119/120 and 123
Stakeholder List

Name	Organization	Address
Interchanges 119/120		
Tonya Theiss*	Cow Creek Band of Umpqua Tribe of Indians	2371 NE Stephens, Ste 100 Roseburg, OR 97470
Tony Wright	UPS	4429 Old Highway 99 S., Roseburg, OR 97470
Helga Conrad	Umpqua Economic Development Partnership	744 SE Rose St., Roseburg, OR 97470
Allyn Ford	Roseburg Forest Products	P.O. Box 1088, Roseburg, OR 97470
Dave Gilbert	Lindyland (Lindy's Center?)	P.O. Box 909, Roseburg, OR 97470
Patty Carte	Love's Truck Stop	280 Grant Smith Rd., Roseburg, OR 97470
Mike Crennen	Roseburg Paving, a Division of LTM Inc.	P.O. Box 1427, Roseburg, OR 97470
Wes Melo	Ingram Books	201 Ingram Drive, Roseburg, OR 97470
Rod Johnson	Littlebrook Estate	200 Littlebrook Lane, Roseburg, OR 97470
Interchange 123		
Harold Philips	Douglas County - Fair Director	2110 SW Frear, Roseburg, OR 97470
Stephen James	Stephen James Construction	161 Heritage Way, Roseburg, OR 97470
Dave Leonard	Pinnacle Engineering	3329 NE Stephens, Roseburg, OR 97470
William Baker	Property Owner	1713 SW Kendall, Roseburg, OR 97470

* This stakeholder was contacted but did not have time to discuss the interchange planning projects within the timeframe for completion of this report. Tonya Theiss represents the interests of the Cow Creek Band of Umpqua Tribe of Indians as a member of the I-5 Interchanges 119/120 Technical Advisory Committee.

Attachment C

ANGELO EATON & Associates

620 SW Main, Suite 201
Tel: 503.224.6974
Fax: 503.227-3679
www.angeloeaton.com

Stakeholder Interviews for:
Interchanges 119 and 120 Transportation Conditions Report
Interchange 123 Interchange Area Management Plan

A reminder that the purpose of the interviews is to:

- Uncover underlying issues in the community;
- Establish a sense of confidence in the consultant team;
- Gather information and opinions that might not otherwise be available;
- Observe patterns of opinion from a range of diverse community leadership;
- Determine overall willingness to participate in the project.

The purpose of this process is to gain a better understanding of both the current and future deficiencies in how the 119 and 120 interchanges function. With the help of an advisory committee, the consultant team will identify and document conditions, limitations, and opportunities and needs, all of which will be captured in a Conditions Report.

The purpose of the Interchange 123 planning effort is to evaluate the operation of, assess the limitations and issues of concern, and identify possible future long-range needs attributable to planned development in the area. The project is to prepare an interchange area management plan, as required by State law, for the I-5 overcrossing bridge replacement and the potential new Portland Avenue bridge over the South Umpqua River.

To what extent are you familiar with the planning project(s)? *(Interviewer will distinguish these from the construction projects underway; questions will be referred to Chris Hunter, ODOT CPM, 541-957-3689)*

(1.) What concerns, if any, do you have about the purpose and process? What are your expectations?

(2.) What interchange is of particular interest to you? Why?

For property owners/tenant stakeholders:
What are the existing uses on the property?
Are the existing uses considered temporary, short-term, or long-term?
Do you have any short-term, medium-term, or long-term plans to change use, or develop on the property? If yes, would the change(s) involve a need to change access to the property?

(3.) How is your property/business/ constituency/members affected by current traffic conditions at the interchange(s)?

(4.) What do you see as the primary function of the interchange(s)? How do you think the interchange(s) and I-5 can balance serving local/regional access needs with interstate use (mobility) and function?

(5.) What do you believe are the major deficiencies at the (these) interchange(s) – e.g. congestion, access to properties, safety, design, etc.?

(6.) What are your ideas for improvements to the interchange(s)?

(7.) What do you envision for future growth in the region? Do you think the area needs – or is likely to see - more industrial growth, more commercial growth or more residential growth? What locations might this occur in the future?

(8.) Have past ODOT or County improvements or particular development projects helped or hindered traffic congestion and access issues in the vicinity of the interchange?

(9.) How would the construction of a new bridge across the South Umpqua River affect traffic movement or land uses in the area?

(10.) An access management plan will be a part of the interchange area management plan for Interchange 123. Do you have concerns specific to access management, such as related safety considerations or the location of future access points?

(11.)This process will continue through Fall of 2004, with several public input and information opportunities. What suggestions do you have for us about how we involve the public in this process? How would you like to stay involved? Are there other specific individuals and groups that we need to contact?

Appendix B

Review of Transportation and

Land Use Plans and Policies

DAVID EVANS
AND ASSOCIATES INC.

I-5 INTERCHANGES 119 AND 120 CONDITIONS REPORT
REVIEW OF TRANSPORTATION AND LAND USE PLANS AND POLICIES

TECHNICAL MEMORANDUM

Prepared for:
ODOT Region 3
3500 NW Stewart Parkway
Roseburg, Oregon

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

August 2004

DAVID EVANS AND ASSOCIATES INC.

This memorandum summarizes the relevant plans and policies (Task 4.1) and identifies how they influence planning for Interchanges 119 and 120. This memorandum reviews the following transportation and land use plans and regulations:

- Statewide Planning Goals 2 (Land Use Planning), 11 (Public Facilities Planning), and 12 (Transportation) , and 14 (Urbanization)
- 1999 Oregon Highway Plan (OHP);
- Oregon Administrative Rule (OAR) 734-051 (ODOT Division 51 Interchange Area Access Management Spacing Standards for Approaches);
- Douglas County Transportation System Plan (Adopted 2001);
- Green Urban Unincorporated Circulation Plan (adopted as part of the Douglas County TSP, 2001);
- City of Winston Transportation System Plan (2003);
- Greater Roseburg Area Transportation Study (GRATS) (Final Report 1996);
- 2000 I-5 State of the Interstate Report; and
- Traffic impact statements (developed as part of land use applications submitted to Douglas County).

Statewide Planning Goal 2 and OAR 660, Division 4

Goal 2, Land Use Planning, requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. This Goal is one of four statewide planning goals that play a key role in management planning for the Interchange 123 area. The other goals are Goals 11 (Public Facilities Planning), 12 (Transportation) and 14 (Urbanization).

Goal 2 is important for three reasons. First, Goal 2 requires planning coordination between those local governments and state agencies "which have programs, land ownerships, or responsibilities within the area included in the plan." Here, Goal 2 will require that ODOT coordinate with Douglas County which has planning authority over the area impacted by the proposed interchange improvements . Coordination is particularly important because development within the County, particularly in the Green Urban Unincorporated Area,will impact use of the interchanges, and land use decisions there could affect future use and operation of the interchanges.

A second important element of Goal 2 is its provision that land use decisions and actions be supported by an "adequate factual base." This requirement applies to both legislative and quasi-judicial land use actions and requires that such actions be supported by "substantial evidence." In essence, it requires that there be evidence

that a reasonable person would find to be adequate to support findings of fact that a land use action complies with the applicable review standards.

Third, Goal 2 requires that city, county, state and federal agency and special district plans and actions related to land use be "consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268." This provision is important because the conditions report will inform the county planning process and elements may ultimately be incorporated into the jurisdiction's transportation system plans (TSPs).

Statewide Planning Goal 11 and OAR 660, Division 11.

Statewide Planning Goal 11. Public Facilities Planning, requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. The goal requires that urban and rural development be "guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served."

Statewide Planning Goal 12 and OAR 660, Division 12.

Goal 12, Transportation, requires cities, counties, metropolitan planning organizations and ODOT to provide and encourage a safe, convenient and economic transportation system. This is accomplished through development of Transportation System Plans (TSPs) based on inventories of local, regional and state transportation needs.

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 in this report.

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 assuring 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.

LCDC's rules implementing Goal 12 do not regulate access management. ODOT adopted OAR 734, Chapter 51 to address access management and it is expected that ODOT, as part of this project, will engage in access management consistent with its Access Management Rule.

Statewide Planning Goal 14, and OAR 660, Divisions 14 and 22

Goal 14, Urbanization, requires an orderly and efficient transition from rural to urban land use. This is accomplished through the establishment of urban growth boundaries and unincorporated communities. Urban growth boundaries (UGBs) and unincorporated community boundaries separate urbanizable land from rural land. Land uses permitted within the urban areas is more urban in nature and higher intensity than in rural areas, which primarily include farm and forest uses.

Goal 14 is important because it focuses development within relatively compact boundaries of the UGB and to a lesser degree in unincorporated communities. This compact development helps contain the costs of public facilities such as transportation by reducing the need for facilities further out and helping jurisdictions better anticipate where growth will occur. The location, type, and intensity of development within study area will impact use of the interchanges and could affect future use and operation of the interchanges.

The Interchange 119 and 120 Study Area includes land in the unincorporated community of Green. Goal 14 (OAR 660, Division 22) recognizes established development centers that were never incorporated yet have many qualities of a small city. These areas are allowed to develop with more intensity than rural areas, but uses are generally restricted to those that appropriate considering available water, sewer, and transportation service. Uses that would tend to undermine the viability of nearby urban areas, such as Roseburg, are also restricted. There are many undeveloped areas in Green which could be urbanized. According to the Green TSP, and the existing infrastructure can support a population of around 9,000.

1999 Oregon Highway Plan

The 1999 Oregon Highway Plan (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 Oregon Transportation Plan. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The policies applicable to planning for interchanges 119 and 120 are described below, with impacts to interchange planning shown in italic.

Under Goal 1: System Definition, the following policies are applicable:

- 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 Interchanges 119 and 120 Conditions Report preparation through regular mailings and scheduled meetings. A Technical Advisory Committee (TAC) has been formed to inform the Interchange 123 Interchange Area Management Plan (IAMP) and this group will also serve as advisors to the 119 and 120 Conditions Report planning process. . Members include representatives from Douglas County, the Cow Creek Band of Umpqua Tribe of Indians, the City of Roseburg, and the City of Winston. The Interchange 123 IAMP TAC will receive information gathered about interchanges 119 and 120.

- Policy 1C (State Highway Freight System), which states the need to balance the movement of goods and services with other uses;
  Stakeholder interviews are being conducted as part of this existing conditions data gathering project. Stakeholders include representatives from freight/shipping interests, including UPS and Federal Express. One task of this existing conditions project is to identify existing significant freight movement patterns and deficiencies related to the interchanges that inhibit freight movement. I-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
  One task of this existing conditions project is to compare existing conditions with identified existing needs and the 2025 no-build conditions. This includes developing roadway alignment concepts to address operations and geometric deficiencies.

- Policy 1G (Major Improvements), which requires maintaining performance and improving safety by improving efficiency and management before adding capacity.
  The purpose of this existing conditions project is to model the 2025 no-build scenario in order to assess future needs. One task is to identify existing safety problems and develop -measures to address these problems.

Under Goal 2: System Management, the following policies are applicable:

- Policy 2B (Off–System Improvements), which helps local jurisdictions adopt land use and access management policies; and
  One task of this existing conditions project is to validate existing land use, zoning, and vacant land inventories. This planning process will result in documentation of existing conditions and an assessment of future needs based on a 2025 "no-build" forecast. While an IAMP is not part of this project, future proposed improvements to the interchanges will require preparation of an IAMP and Access Management Plan that will address access management standards. One component of the IAMP will be an intergovernmental agreement between ODOT and the local jurisdiction(s) to implement access management solutions.

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

One task of this existing conditions project is to identify existing crash patterns and rates and to develop strategies to address safety issues.

Under Goal 3: Access Management, the following policies are applicable:

- Policy 3A: (Classification and Spacing Standards), which sets access spacing standards for driveways on, and approaches to, the state highway system.
- 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
- Policy 3D (Deviations), which establishes general policies and procedures for deviations from adopted access management standards and policies.

One task of this existing conditions project is to compare access spacing with adopted access standards (existing physical features summary). Any future suggested improvements for the interchange would need to comply with this policy and improve any deficiencies identified in the Conditions Report. Future improvements to the interchange may affect the current configuration of approaches and access points. While not included in the scope of this project, future proposed improvements to the interchanges will require preparation of an IAMP and Access Management Plan that will address access management standards.

Oregon Administrative Rule 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. The Oregon Transportation Commission formally adopted the revisions to OAR 734-051 dated July 1, 2003 that became effective on March 1, 2004.

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; and
- Requirements regarding mitigation, modification and closure of existing approaches as part of project development.

Section 734-051-0125, Access Management Spacing Standards for Approaches in an Interchange Area, establishes interchange management area access spacing standards. It also 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. One task of this existing conditions project is to compare access spacing with adopted access standards. Before any proposed future improvements to the interchanges can be implemented, an IAMP and Access Management Plan will need to be prepared that addresses access management standards. If proposed future interchange improvements can not meet access spacing standards outlined in OAR 734-051-0125, the project would require deviation findings to interchange and roadway approach (public and private streets and driveways) access management spacing standards, as per OAR 734-051-0135.

Green Transportation System Plan (Adopted August 2001)

The Green Transportation System Plan (TSP) was adopted in 2001 to provide a detailed analysis of transportation facilities and levels of service for the Green Unincorporated Urban Area. The TSP inventories and analyzes the current transportation system and predicts conditions at buildout based on a buildable lands inventory and population projections.

The TSP contains roadway classifications and design standards for the roadways in Green. The roadway network analysis shows the how well each facility met the physical standards (paving, width, right-of-way) and service standards (volume/capacity) in 2000.

The TSP concludes that the transportation system (with some identified improvements) could support "urban and rural development by providing types and levels of transportation facilities and services appropriate to serve the land uses identified" in the adopted Douglas County Comprehensive Plan.

The TSP does not advocate any new projects directly impacting Interchanges 119 or 120. Key projects identified as solutions to capacity, circulation and safety issues in the community include: improving traffic circulation by constructing multiple, local road connections; enhancing safety and circulation on and near Highway 42 by closing some accesses and constructing a frontage road; and improving capacity and enhancing safety at Kelly's Corner by adding right-turn lanes on Highway 42 in both directions, widening the local legs, moving the signal poles and highway signs away from the intersection, and rephasing the signals.

The Green TSP was used as the basis of the Green Urban Area Circulation Plan that is part of the Douglas County TSP.

Douglas County Transportation System Plan (Adopted 2001)

The Douglas County Transportation System Plan (TSP) was adopted in 2001 and establishes a system of transportation facilities and level of service adequate to meet the county's transportation needs. The TSP includes a determination of future transportation needs for road, transit, bicycle, pedestrian, air, water, rail, and pipeline systems; policies and regulations for the implementation of the TSP; and a transportation funding program.

This project is consistent with the goals and policies of the county's TSP, which includes goals to "provide and encourage a safe, convenient and economical transportation system." The TSP does not list any projects related to interchanges 119 or 120.

Green Urban Unincorporated Circulation (2001)

The Green Urban Unincorporated Circulation Plan is one of three urban unincorporated circulation plans that are part of the Douglas County TSP. The other circulation plans, for Glide and Tri City, are not applicable to this project. The purpose of the circulation plans is to provide circulation policies and findings for the unincorporated urban areas and to address transportation issues within those unincorporated areas. The objectives of the circulation plans are the same for each community, although the specific findings are different. The five objectives used in development of the circulation plans are:

- To provide access to all existing and future residential, commercial, industrial, and public areas;
- To ensure the safety of vehicular movement;
- To keep through traffic out of the neighborhoods;
- To ensure that streets are economically planned; and
- To ensure adequate access of emergency vehicles to all dwellings.

The findings described in The Green Circulation Plan discuss previous transportation improvements within the community, including relocating the Carnes Road/Old OR 99 intersection to improve intersection safety. The plan also proposes future improvements, including providing new roadways or increasing capacity of existing roadways within the planning area. Proposed new roadways near I-5 would serve future development of an industrial area between Carnes Road and the Central Oregon Pacific Railroad and a vacant industrial area on the east side of I-5. The proposed circulation system would provide access to the industrial areas to accommodate the assumed 9,000 additional trips new industrial development could generate.

No new connection to I-5 is proposed in the Green Circulation Plan. Future interchange improvements, based on the 2025 Needs Summary Report to be developed as part of the Conditions Report, will need to consider accessibility from the proposed new roadways in the industrial areas, as adopted in the circulation plan.

City of Winston Transportation System Plan (2003)

The City of Winston is located west of interchanges 119 and 120, which are outside of the city's urban growth boundary (UGB). However, the Winston TSP may apply if improvements were to occur to Old OR 99/OR 42 within the Winston UGB that connects with I-5 at interchange 120. Potentially applicable transportation-related policies include an overall transportation goal to "provide a safe and efficient

transportation system for moving people and goods within/through the urban area." The TSP also requires the city to coordinate with ODOT, implement access management standards, reduce the transportation demand on the existing system, and improve bicycling along Highway 42.

This project's objectives are consistent with the goals and policies of the Winston TSP; but it is possible that none of the proposed improvements will be within the city's UGB. If no improvements are proposed within the UGB, the Winston TSP will not be applicable to this planning project.

Greater Roseburg Area Transportation Study (GRATS) (Final Report 1996)

The Greater Roseburg Area Transportation Study (GRATS) was completed in 1996 and was a joint venture between the Umpqua Regional Council of Governments, the City of Roseburg, the City of Winston, Douglas County, and the Oregon Department of Transportation. The GRATS was not adopted. The GRATS is a regional framework study that identifies multimodal strategies to manage growth and the communities' transportation needs. Several goals are described in the study and are relevant to the project. The transportation system should:

- Provide accessibility
- Provide mobility
- Be economical and affordable for the users and for the community to construct and maintain
- Be safe
- Provide flexibility through options
- Provide connectivity between transportation options and to locations outside the study area
- Provide a transportation system that attracts people to live and work in the area and supports and enhances the local economy, including the recreation and tourism industry
- Be supportive of, and integrated with, the land use system

This planning process will document current traffic conditions and land uses and will generally assess to what extent the goals listed above are being met. Although the GRATS provides some framework for planning in the region, the document was built on an older model and has subsequently been replaced by more current transportation system plans. Upon completion of the Conditions Report, a logical next step is the preparation of an IAMP and an Access Management Plan that will address providing enough capacity to accommodate projected industrial growth and access to existing uses with applicable transportation plans.

I-5 State of the Interstate Report

The I-5 State of the Interstate Report (2000) describes the existing and forecasted operating, geometric, safety, and physical conditions for the I-5 mainline and interchanges within Oregon. The following information within this report is relevant to interchanges 119 and 120. The State of the Interstate Report uses highway segments as a unit of analysis; the Conditions Report study area stretches from approximately mile point (MP) 119.24, at Grant Smith Road, to MP 120.62 at the South Umpqua River. The Conditions Report being prepared for interchanges 119 and 120 will incorporate information from the I-5 Report.

The Interstate Report references the 1997 Pavement Conditions Report. The information is outdated, as the 2003 Pavement Conditions Report is available. The Oregon State Highway System 2003 Pavement Conditions map for Region 3 (December 2003) shows the relevant segment as good. The 1997 report classifies the I-5 segment between MP 117.7 and 122.3 as having a 52.4 section index (fair condition) for the northbound lanes and a 43.0 (poor condition) section index for the southbound lanes. The index ranges from 0 to 100, with 11.0 to 45.0 categorized as poor and 46.0 to 75.0 as fair. A fair rating describes generally stable pavement with moderate cracking, minor areas of structural weakness and acceptable ride quality. Poor pavement conditions indicate a pavement with areas of instability, large crack patterns, heavy and numerous patches and acceptable to poor ride quality. Pavement in fair condition may require some maintenance to ensure the existing pavement does not fall below the fair category. Poor pavement quality requires action to meet ODOT's goal for ensuring pavement quality.

Interchange 119

Average daily traffic (ADT) in 2000 on I-5 south of the interchange was 27,800 cars per day, although north of the interchange ADT was higher at 40,800, due mainly from traffic generated from OR 42. ADT on OR 42 at I-5 was 18,000; ADT at Old OR 99 was 21,000. The 2000 ADT at the Old OR 99/OR 42 junction was 6,800.

Ramp operations were evaluated in the report, which found that on- and off ramps were free flowing to and from OR 42. All of the signalized intersections worked acceptably in 2000, with volume to capacity (v/c) ratios equal to or less than 0.76. Recently, ODOT redesignated Highway 42 to an Expressway, resulting in stricter v/c standards for the highway (less than 0.70). Furthermore, the report found by 2020 OR 42/Carnes Road intersection would operate under more congested conditions with a v/c ratio of 9.20. In 2000, the stop sign controlled left turn movement from Grant Smith Road to OR 42 had delays during the peak period with a v/c ratio of 2.97 and was projected to worsen without intersection improvements. Since that time, Grant Smith Road has been reconfigured to intersect with OR 42 at the intersection with Old OR 99. The new intersection is further from Interchange 119 and signalized.

Between MP 119 and MP 120.3, there were 18 accidents within a five-year period. Six crashes were sideswipes; five were with a fixed object (pole and protective barrier), likely caused by narrow shoulders and the center median; two were rear end; and the remaining five were classified as miscellaneous. Of the 18

crashes, 14 occurred in the southbound direction. There were no Safety Priority Index System (SPIS)[1] sites between these mileposts between 1995 and 1997.

Along Old OR 99, 13 collisions occurred between MP 76.2 and MP 77.2. Crashes included four from turning movements, four rear end collisions, two with fixed objects, two sidewsipes, and one non-collision. There was one fatality at the OR 42/Old OR 99 junction.

The ODOT bridge inspection program determined that the interchange's southern bridge (Grant Smith Road) had a 68.7 sufficiency rating, indicating that the bridge is eligible for rehabilitation. A bridge with a rating less than 80 means the bridge is eligible for rehabilitation; a bridge with a rating less than 50 is required to be considered for replacement. The southern bridge is also classified as functionally obsolete based on National Bridge Inventory inspection criteria due mainly to inadequate safety features. The southern bridge is identified as a high priority for improvements. .

Interchange 120

An evaluation of the interchange found that the current configuration has substandard horizontal curve elements on the mainline and ramps; inadequate ramp deceleration length; substandard sight distance; substandard vertical clearance; and substandard median and shoulder widths.

ADT in 2000 on I-5 near Old OR 99 was 38,400 car per day. Peak hour turning movements were conducted at two ramps. The stop controlled left-turn movement from the southbound off-ramp onto Old OR 99 had a v/c ratio of 2.38, indicating vehicles currently experience long delays, a situation that will slightly worsen by 2020.

Between MP 119.8 and MP 121.2, there were 24 accidents within a five-year period. Of the 24 crashes, 17 occurred in the northbound direction. Seven of the crashes were rear-end collisions and six crashes were sideswipes. Of the seven southbound collisions, three were rear end collisions. There were no SPIS sites between these mileposts between 1995 and 1997.

Along Old OR 99, 42 accidents have occurred, including 20 rear-end collisions and 15 due to turning movements, between MP 20.2 and MP 21.6. The high number of crashes in this area is attributed to inadequate access management and lack of a center left turn lane.

[1] The Safety Priority Index System (SPIS) is a method developed by the Oregon Department of Transportation (ODOT) for identifying hazardous locations on state highways. The SPIS score is based on three years of crash data and considers crash frequency, crash rate, and crash severity.

The ODOT bridge inspection program determined that the 1-5 bridge has a 44.3 sufficiency rating. With a rating less than 50, this bridge is required to be considered for replacement. The National Bridge Inventory inspection criteria classified the bridge as functionally obsolete due mainly to inadequate safety features. This bridge is identified as a immediate priority for improvements (which includes consideration for replacement).

Traffic Impact Statements

Three traffic impact statements (TISs) were reviewed as a part of this task. All are for land use proposals to rezone land within the Green Urban Unincorporated area.

Speedway Industrial Rezone Traffic Impact Study (December 1997)

In December 1997, a TIS was completed as part of an application to rezone 15 vacant acres previously used as a rock quarry to Industrial use. The site is located on the north side of Speedway Road at the north terminus of Ingram Road within the Green Urban Unincorporated Area. Due to topography constraints, approximately 10 of the 15 acres proposed for rezoning would be available for development. The TIS determined that rezoning the property would generate an additional 630 daily trips. Of those trips, approximately 101 would occur during the morning peak hour (83 entering the site, 18 exiting); the evening peak hour would result in 105 additional trips (83 entering the site, 22 exiting). Capacity analysis showed that the impact to the Old OR 99/OR 42 intersection would not change the level of service (LOS) (projected to be LOS D in 2015) during AM and PM peak hours.

However, the capacity analysis did find that the unsignalized intersection at Old OR 99 and the I-5 southbound ramps is operating at a LOS B during the AM peak hour, but at a LOS F during the PM peak hour. This LOS describes the left turn movement from the southbound I-5 off-ramp to southbound Old OR 99. The additional traffic generated by the zone change would reduce the AM peak hour to LOS C, while the PM peak hour would continue to be a LOS F, satisfying a warrant for a signal at this intersection. The TIS assumed that if the intersection were reconfigured as proposed in the GRATS (described above), the intersection would have enough capacity for the additional traffic the zone change would generate. Overall, the existing road system, with the exception of the Old OR 99/I-5 southbound off-ramp intersection that would require a signal, is adequate to accommodate the increased traffic generated from the proposed zone change.

Monteleone Subdivision Traffic Impact Study (March 1999)

In March 1999, a TIS was completed in the Green Urban Unincorporated Area for a requested zone change for 8.7 acres from Exclusive Farm Use – Grazing (FG) to Single-Family Residential (R-1) for a proposed subdivision (Monteleone). The TIS stated that approximately 40 single-family residential units planned for construction added 382 daily trips (half entering and half exiting the site). Of those trips, 31 would be generated during the morning peak hour (23 entering, 8 exiting the site). Forty-one trips would be generated in the evening peak hour (26 entering, 15 exiting the site). Approximately 90 percent of the trips were

assumed to be northbound toward Roseburg, either on Old OR 99 or I-5; the remainder was assigned to westbound OR 42. The TIS determined that additional trips generated as a result of the planned subdivision would utilize interchange 119 more than interchange 120 because interchange 120 is more congested. If, as proposed in the TIS for the Speedway rezone, a signal was added to the Highway 99 intersection adjacent to interchange 120, the proposed rezone would have little impact to interchange 120. Without a signal traffic would use interchange 119 to avoid existing congestion.

ODOT's response to the Monteleone TIS contradicted the findings, stating that the projected traffic increase as a result of the zone change request was low and that there are sight distance issues at the Old OR 99/I-5 southbound ramps that would make locating a signal difficult. Additional traffic at interchange 120 could slow traffic along I-5, potentially increasing the possibility of accidents.

Stella Street Zone Change Traffic Impact Study (June 2002)

In June 2002, a zone change request was submitted for changing 3.6 acres (Stella Street site) from Suburban Residential (RS) to Single Family Residential (R-1) within the Green Urban Unincorporated Area. If the zone change were permitted, eight single-family residences would be constructed on the property. The TIS used the same assumptions described above for the Monteleone subdivision. The proposed zone change would add 65 north-oriented trips: 43 to I-5 and 22 to OR 99. The 43 trips would be split evenly between inbound and outbound; none of the outbound trips would affect interchange 120. Approximately 2.2 inbound trips would occur during the evening peak hour, the majority using interchange 119. The TIS concludes that only one vehicle would use interchange 120 during the evening peak hour and would not result in a significant impact to interchange 120.

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Appendix C

Traffic Operations Analysis for

Existing and Future Year Conditions,

Travel Demand Model Development

Interchanges 119 and 120
Conditions Report

Existing Transportation Analysis

Prepared for

ODOT Region 3

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July 26, 2004

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1 INTRODUCTION

The Interchanges 119 and 120 conditions report is intended to be the first step in planning for long-range improvements to these two interchanges in the Green Area of Douglas County south of Roseburg. The conditions report will help gain a better understanding of the current conditions, limitations, opportunities and need for these interchanges. This report discusses the methods, procedures, and data used in analyzing the traffic counts and developing the 30th Highest Hour Volume. Traffic operations, merge, and weave analyses were performed for current traffic volumes on the existing road network. Those results are presented in this report.

Interchanges 119 and 120 on I-5 are located approximately five miles south of Roseburg and serve the Green Area. The two interchanges, which are approximately 0.7 miles apart, also provide connections to Roseburg and Winston. ORE 42 connects with I-5 at interchange 119. ORE 99 parallels I-5 and crosses under the freeway just north of interchange 120.

There are eight intersections of interest surrounding these two interchanges. Four of those intersections are on ORE 99 between ORE 42 and the undercrossing of I-5. The fifth intersection is at the junction of ORE 99, ORE 42 and Grant Smith Road. The last three intersections are on ORE 42, southwest of ORE 42's junction with ORE 99.

The southbound on- and off-ramps of Interchange 120 intersect ORE 99 approximately 0.15 miles southwest of the ORE 99 undercrossing. In addition to the ramps of Interchange 120, ODOT also has an entrance to a maintenance yard making this a two-way stop-controlled intersection. ORE 99 is the free movements with a shared through-left lane and channelized right-turn lane on the northbound approach. The southbound approach contains a shared through-right lane and a left-turn lane. The off-ramp from I-5 is a shared through-left turn with a channelized right-turn lane.

The intersection of Speedway Road with ORE 99 is approximately 0.25 miles south of the intersection of the southbound on/off-ramps of Interchange 120. This is a T-intersection that is stop-controlled on Speedway Road. Each of the three approaches has a single lane with shared turning movements.

Happy Valley Road and ORE 99 is a signalized intersection with a driveway located to the east. Both the northbound and southbound approaches of ORE 99 have shared through-right turn lanes with additional left-turn lanes. The eastbound approach of Happy Valley Road is a shared through-left turn lane with an exclusive right-turn lane.

The fourth intersection of interest is the entrance to Beaver State Sand and Gravel. This is a T-intersection that is stop-controlled on the approach from Beaver State Sand and Gravel. ORE 99 is a two-lane road. The exit from Beaver State Sand and Gravel is a single lane serving both left- and right-turn movements.

The intersection of ORE 99 and Grant Smith Road with ORE 42 is a signalized intersection located approximately 0.4 miles west of I-5. The westbound approach consists of the off-ramps from Interchange

119 northbound and southbound and has four lanes: a separate left-turn lane, two through lanes, and a separate right-turn lane. The eastbound approach has a left turn lane, through lane, and a shared through-right turn lane. The southbound approach of ORE 99 has a channelized right turn with separate through and left-turn movements. The northbound approach from Grant Smith Road has a similar configuration with right-turn channelization and separate left-turn and through movements.

Carnes Road and ORE 42 is the final signalized intersection of interest. This intersection is approximately 0.5 miles southwest of ORE 42's junction with ORE 99. Each approach on ORE 42 has a left-turn lane , a through lane, and a combined through-right turn lane. Carnes Road has shared through-right turn movements and a separate left-turn movement on both approaches.

The remaining two intersections of Emils Way and Rolling Hills Road with ORE 42 are both two-way stop-controlled intersections. ORE 42 is a four-lane road with either a two-way left-turn lane or a separate left-turn lane. The minor street approaches of Rolling Hills Road and Emils Way are single-lane approaches serving through, left-, and right-turn movements.

The lane configuration and traffic control at each of the eight intersections is illustrated in **Figure 1**.

2 TRAFFIC COUNTS

ODOT conducted both 14-hour manual classification counts and 48-hour tube counts. The 48-hour tube counts were performed at the ramps of Interchanges 119 and 120 from May 21, 2002 to May 23, 2002. The following table shows the location and date for each of the 14-hour classification counts.

Table 1. Location and Date for 14-hour Classification Counts

Location	Date
ORE 99 @ Interchange 120 SB Off-ramps	06/09/2004
ORE 99 @ Speedway Road	11/05/2003
ORE 99 @ Happy Valley Road	11/05/2003
ORE 99 @ Beaver State Sand and Gravel	11/06/2003
ORE 99 @ ORE 42	11/04/2003
ORE 42 @ Carnes Road	01/22/2004
ORE 42 @ Emils Way	11/10/2003
ORE 42 @ Rolling Hills Road	11/12/2003

The intersection of ORE 99 at ORE 42 also had a 3-hour classification count performed on April 28, 2004. The newer count has higher volumes than the November 4th count and was used in all calculations in the analysis.

A 14-hour classification count was conducted on Interstate 5 between interchanges 119 and 120 at milepost 119.70. In addition to the classification count, 48-hour tube counts were performed on each ramp at interchanges 119 and 120. The peak hour volumes for the ramps were determined using the 14-

hour classification counts from the intersection of the Coos Bay – Roseburg Highway with the Oakland Shady Highway and Grant Smith Road. The westbound traffic at the intersection of the Coos Bay – Roseburg Highway and the Oakland Shady Highway is either coming from northbound or southbound I-5. The traffic heading east from this intersection is getting onto I-5 heading either northbound or southbound.

To determine the percentages of traffic heading northbound and southbound, the 48-hour tube counts were used to calculate the percentages to/from north or southbound I-5. The following table shows the calculated percentages:

Table 2. Interchange 119 Ramp Volume Percentages

Ramp	48-Hour Count	Total	% of Total
Northbound Off	2,405	19,525	12.3
Southbound Off	17,120	19,525	87.7
Northbound On	23,715	26,730	88.7
Southbound On	3,015	26,730	11.3

Once the percentage was determined, the ramp volumes were calculated using the balanced 30th Highest Volumes from the count at the intersection of the Coos Bay – Roseburg Highway and the Oakland – Shady Highway. Table 3 shows the ramp volumes used in the weave/merge analysis on each of the ramps.

Table 3. Interchange 119 Ramp Volumes

Ramp	OR 42 @ OR 99 Approach	OR42 @ OR 99 30 HV	% of Total	Ramp Volume
Northbound Off	Entering from the East	1000	12.3	125
Southbound Off			87.7	875
Northbound On	Exiting to the East	1280	88.7	1135
Southbound On			11.3	145

The traffic count on I-5 was taken between interchanges 119 and 120. To obtain the volumes on the freeway before the northbound ramps, the on ramp volume was subtracted from the total and then the off ramp volume was added to the total. For the southbound direction, the volume before the off ramp was known. The volume before the on ramp was determined by subtracting the off ramp volume from the total volume.

The 14-hour manual classification counts were examined to determine the Peak Hour Volume, Peak Hour Factor, and Percent of Heavy Vehicles at each intersection. The common peak hour for the four intersections was found to occur between 4:00 and 5:00 PM. Existing peak hour volumes are illustrated in **Figure 2**. In addition to the hourly tabulations, the count data was available for 15-minute intervals and was also obtained at the following four intersections:

- ORE 99 at Beaver State Sand and Gravel
- ORE 99 at ORE 42
- ORE 42 at Emils Way
- ORE 42 at Rolling Hills Road

The availability of 15-minute counts within the peak hour allowed for the calculation of Peak Hour Factors. Peak Hour Factors were calculated for each of the four intersections above were determined and an average peak hour factor of 0.95 was applied to each of the eight intersections except for ORE 99 at Beaver State Sand and Gravel. A peak hour factor of 0.90 was calculated from the 15-minute counts at this location and was lower than the 0.96, 0.95, and 0.94 factors calculated for the other three intersections.

Heavy vehicle percentages were determined for each intersection from the counts provided. Heavy vehicles were considered to be any vehicle with three or more axles excluding buses. The following table summarizes the percent of heavy vehicles by intersection:

Table 4. Percent of Heavy Vehicles by Intersection

Location	% Heavy Vehicles
ORE 99 @ Interchange 120 SB Off-ramps	4
ORE 99 @ Speedway Road	2
ORE 99 @ Happy Valley Road	4
ORE 99 @ Beaver State Sand & Gravel	6
ORE 99 @ ORE 42	8
ORE 42 @ Carnes Road	4
ORE 42 @ Emils Way	3
ORE 42 @ Rolling Hills Road	4

3 DEVELOPING 30TH HOUR VOLUMES

The Transportation Planning Analysis Unit (TPAU) for ODOT has developed a procedure for calculating current year 30th highest hour traffic volumes. This procedure was applied to the area surrounding Interchanges 119 and 120.

The 30th highest hour traffic volumes are calculated by applying a seasonal factor to the peak hour volumes. The 30th Hour Volume usually occurs during the peak month of the year. The peak hour volume is multiplied by the seasonal factor to obtain the 30th Hour Volume.

The seasonal factor is found by using the Automatic Traffic Recorder (ATR) closest to the location of interest with similar traffic flows, area type, and lane configuration. For locations on ORE 99 and ORE 42, the nearest ATRs with similar characteristics were determined to be:

- 10-006 (OR 42 Coos Bay–Roseburg Highway, 1.2 miles west of Brockaway)
- 15-017 (OR 62–Crater Lake Highway, 0.1 mile northeast of Biddle Road overcrossing)
- 15-014 (OR 99–Rogue Valley Highway, 1.4 miles south of Talent)
- 18-018 (OR 39–Klamath Falls–Malin Highway, 0.46 miles south of Main Street)

Seasonal factors were determined for each ATR and then averaged to return the following values:

	11/05/2003	11/15/2003	01/22/2004	04/28/2004	06/09/2004
Seasonal Factor	1.11	1.14	1.18	1.06	1.03

The seasonal factors shown above were used on non-interstate facilities. A separate seasonal factor was calculated and used for freeways and ramps. ATR 10-005, located 3.40 miles north of Roseburg on I-5, was used to determine an appropriate seasonal factor. The following summarizes those values:

	11/05/2003	11/15/2003	01/22/2004	04/28/2004	06/09/2004
Seasonal Factor	1.19	1.19	1.34	1.19	1.09

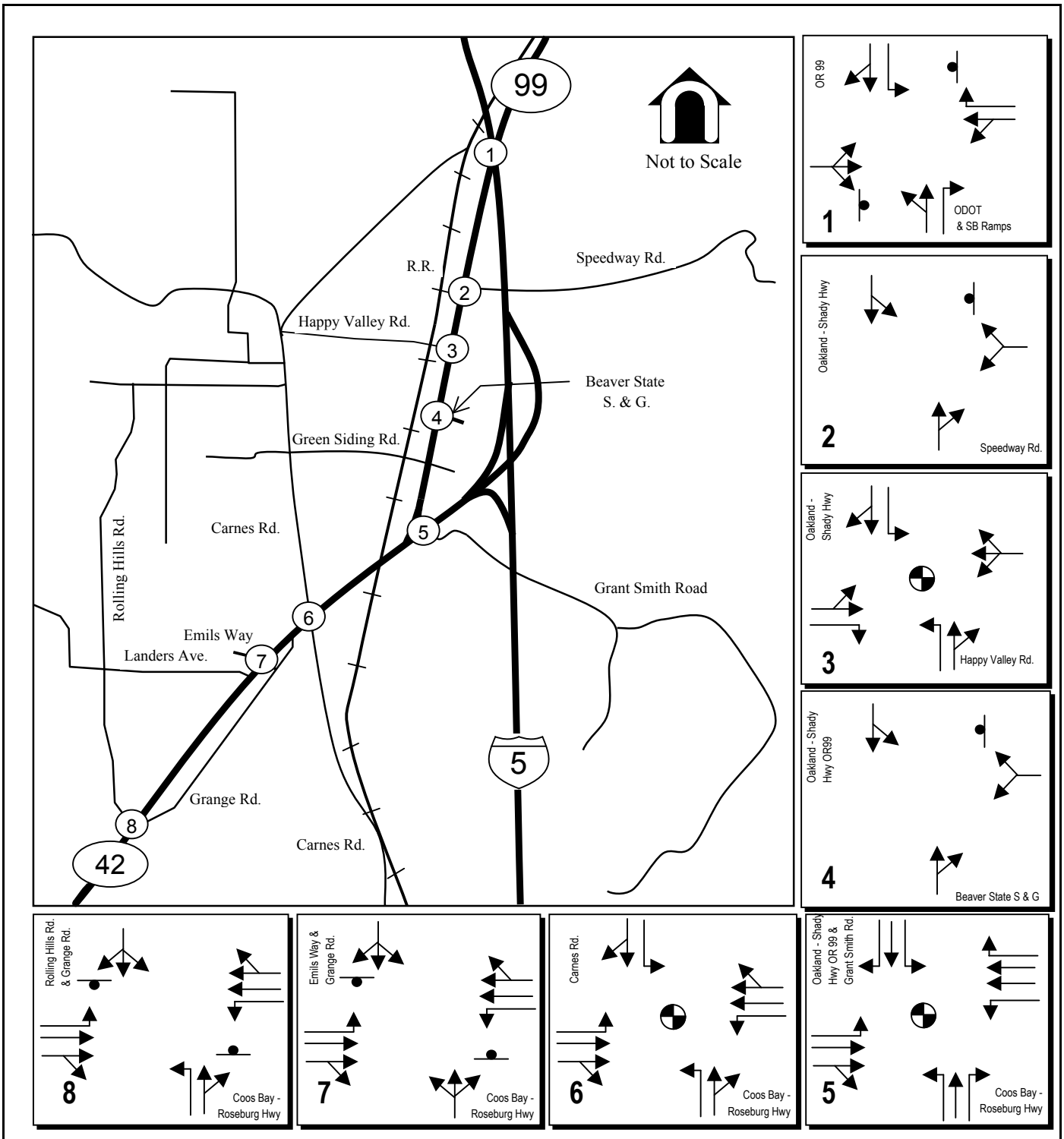
Traffic volumes were then multiplied by their appropriate seasonal factor to determine the 30th Hour Volumes. The traffic volumes were rounded to the nearest five vehicles and balanced using the larger volume. Unbalanced and balanced 30th Hour Volumes can be found in **Figure 3** and **Figure 4**, respectively.

4 TRAFFIC OPERATIONS ANALYSIS

Synchro was selected for performing the traffic operational analysis for non-freeway facilities. Three of the eight intersections in the study area are signalized and the remaining five are stop-controlled. The Level-of-Service report from Synchro on signalized intersections is based on Chapter 16 and the analysis of unsignalized intersections is based on Chapter 17 of the 2000 Highway Capacity Manual (HCM)[1]. The Synchro report summarizes the calculated Level of Service, Volume-to-Capacity Ratios, and the 95th Percentile Queue Length by lane and minor street approach for two-way stop-controlled intersections.

The merge and weaving analysis were performed using the Highway Capacity Software 2000 (HCS). The merge analysis is based on chapter 25 of the Highway Capacity Manual. The weave analysis is based on chapter 24 of the Highway Capacity Manual. The HCS report summarizes the calculations, density, and LOS.

[1] *Highway Capacity Manual, Transportation Research Board, Washington DC, 2000.*



DAVID EVANS AND ASSOCIATES INC.

LEGEND

=Lane

14 = Intersection Number

= Stop Sign

= Signalized Intersection

Figure 1 - Lane Configurations

Interchanges 119/120

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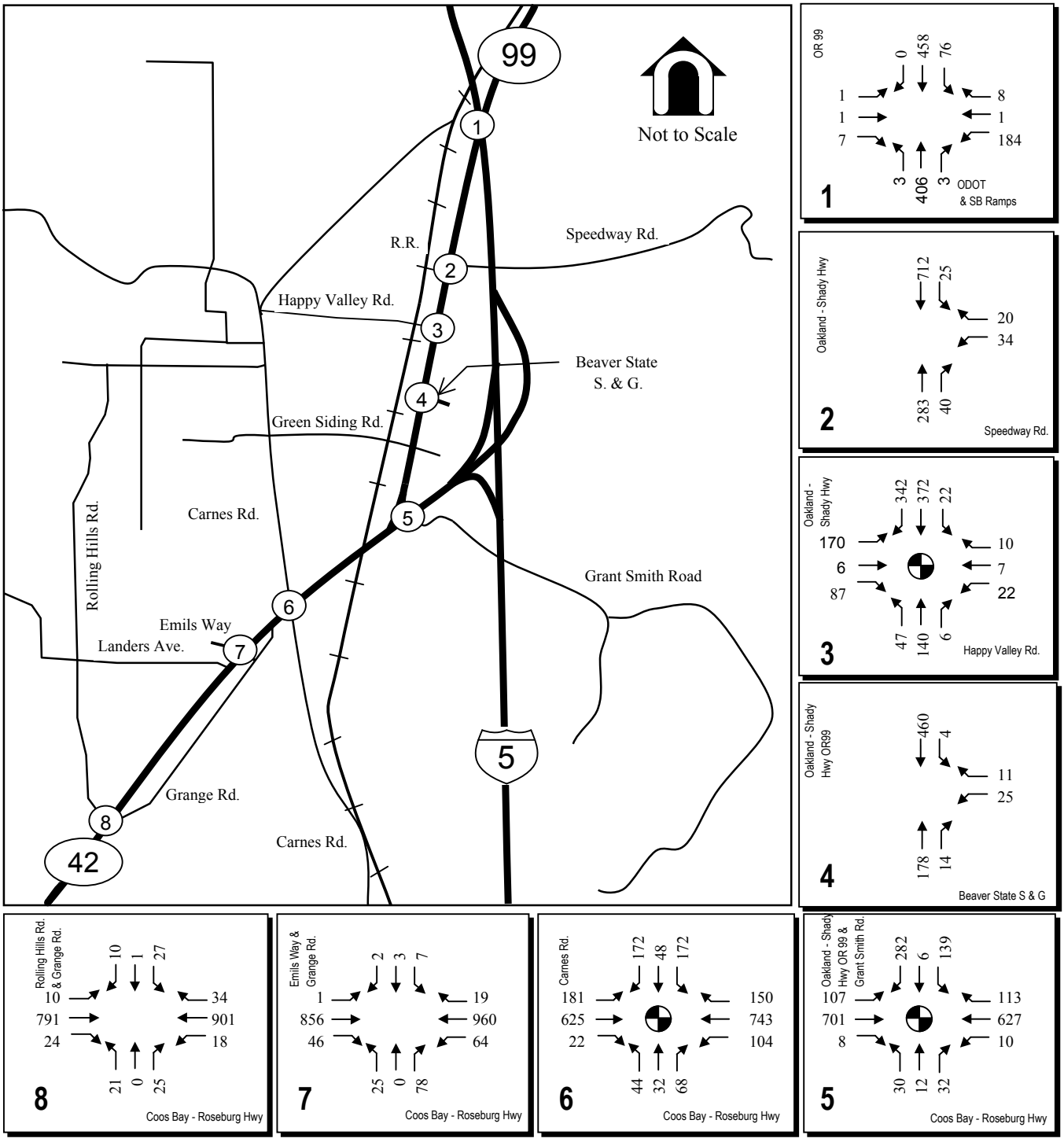


DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

(14) = Intersection Number

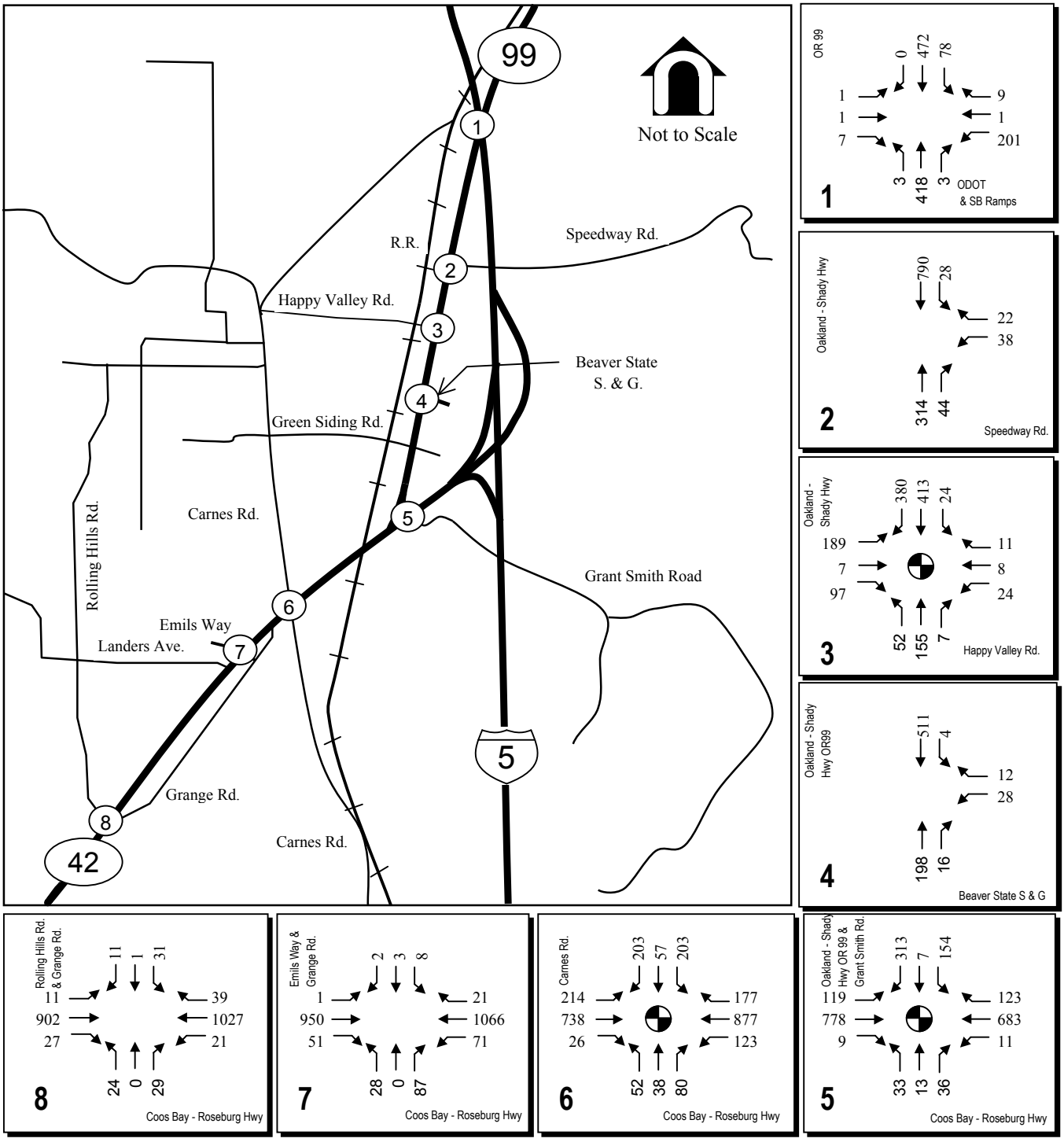
= Signalized Intersection

Figure 2 - Existing Traffic Volumes

Nov. 2003 to June 2004

4:00 to 5:00 PM

Interchanges 119/120



DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

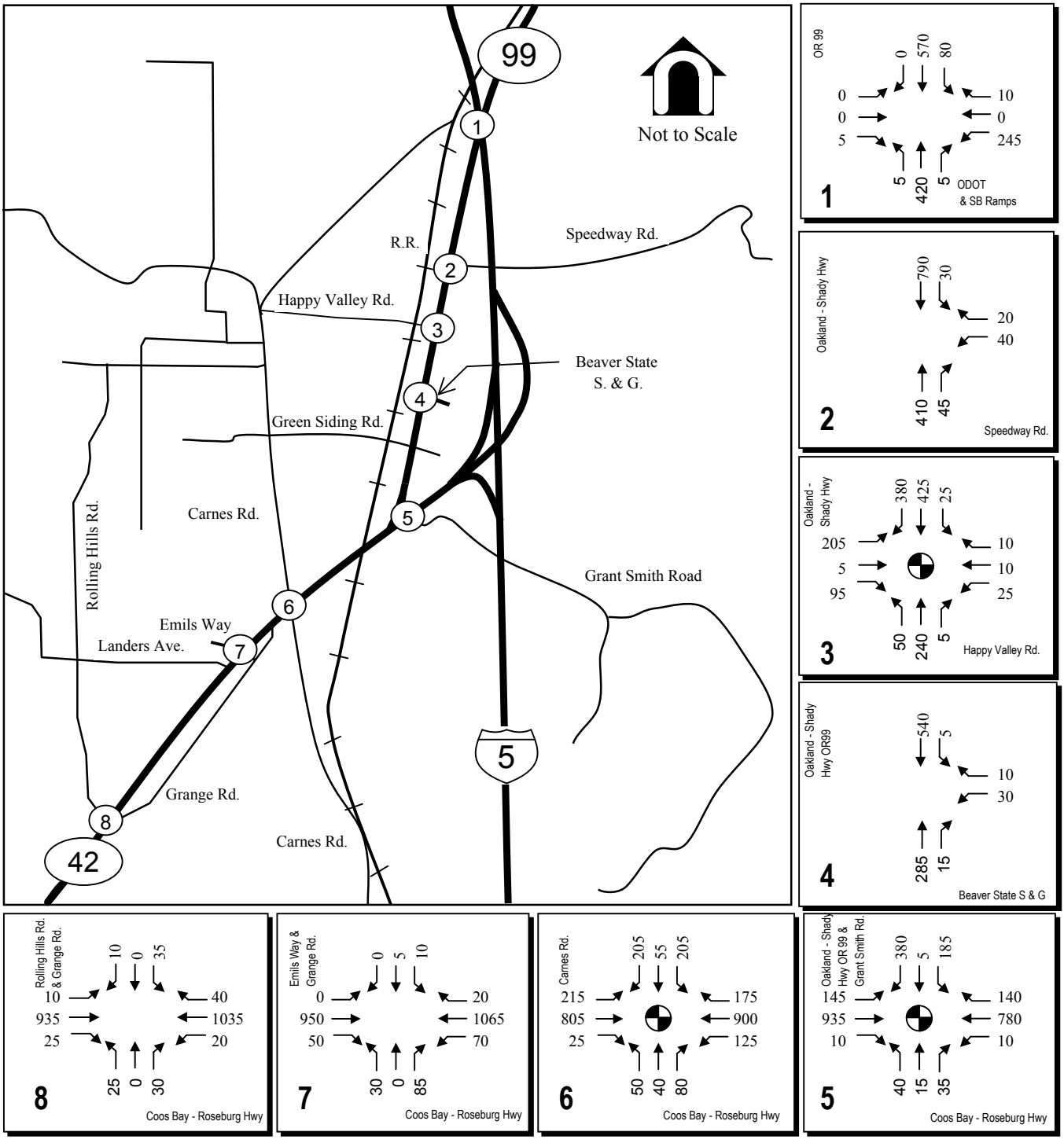
= Turning Movement

(14) = Intersection Number

= Signalized Intersection

Figure 3 - 30th Hour Volumes

Interchanges 119/120



DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

(14) = Intersection Number

= Signalized Intersection

Figure 4 - 30th Hour Volumes

Balanced

Interchanges 119/120

5 OPERATIONAL CRITERIA

Transportation engineers have established various descriptors for traffic operations of intersections. The most common descriptor is the Level-of-Service (LOS) as defined by the HCM. The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established ranging from LOS A, where traffic is relatively free flowing, to LOS F, where the street system is totally saturated with traffic and movement is very difficult. At both signalized and unsignalized intersections, LOS is based on control delay. At two-way stop controlled intersections, control delay is the total duration from the time a vehicle joins the back of the queue until it proceeds forward into the intersection from the first position at the stop sign. For freeway facilities, LOS is based on density in terms of passenger cars per mile per lane.

A comparison of traffic volume demand to intersection capacity is another method of evaluating how well an unsignalized intersection is operating. This comparison is presented as a Volume-to-Capacity (v/c) ratio. A v/c ratio of less than 1.0 indicates that the volume is less than capacity. When it is closer to 0.0, traffic conditions are generally good with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable with longer delays.

The 1999 Oregon Highway Plan[2] (OHP) sets standards for v/c ratios that are not to be exceeded for state highways. The standards show that ORE 42 must operate with a v/c ratio at or below 0.70. The Green Transportation System Plan[3] establishes standards for roads not under the state's jurisdiction. The Green Transportation System Plan, which lists ORE 99 as an arterial, specifies a v/c ratio of 0.85 for an urban arterial.

6 INTERSECTION RESULTS

The section that follows presents the analysis and results of the operational analysis for existing conditions at each intersection. The results are based on the Synchro/SimTraffic model. For each of the intersections, the peak hour factor and the percent heavy vehicles were based on the traffic counts collected by ODOT.

ORE 99 AT INTERCHANGE 120 SB ON/OFF-RAMPS

ORE 99 at the on/off-ramps for interchange 120 and the ODOT maintenance facility is a two-way stop-controlled intersection. A peak hour factor of 0.95 was used with 4% heavy vehicles. ORE 99 was assumed to be operating at a speed of 55 mph.

The following table shows the 2004 30th Hour Volume analysis results:

[2] *1999 Oregon Highway Plan, Oregon Department of Transportation, Salem, OR, 1999.*
[3] *Green Transportation System Plan, Douglas County, Roseburg, OR, 2001*

Table 5. 2004 30th Hour Volume Analysis (ORE 99 at Interchange 120)

Approach	V/C Ratio	95th Queue Length (feet)	LOS
Eastbound Left/Thru/Right	0.01	<20	B
Westbound Thru/Left	2.05	575	F
Northbound Thru/Left	0.01	0	A
Northbound Right	0.00	0	-
Southbound Left	0.08	<20	A
Southbound Thru/Right	0.37	0	-

Table 5 shows that three of the four approaches at this intersection are operating at an acceptable LOS. However, the westbound approach from the southbound off-ramp is currently failing with a LOS equal to F and a v/c ratio of 2.05. There is also a long queue length for vehicles trying to turn south onto ORE 99.

ORE 99 AT SPEEDWAY ROAD

This intersection is a T-intersection with stop-control on Speedway Road. A peak hour factor of 0.95 was used with 2% heavy vehicles. ORE 99 was assumed to be operating at a speed of 55 mph.

Table 6 shows the 2004 30th Hour Volume analysis results:

Table 6. 2004 30th Hour Volume Analysis (ORE 99 at Speedway Road)

Approach	V/C Ratio	95th Queue Length (feet)	LOS
Westbound Left/Right	0.33	50	D
Northbound Thru/Right	0.29	0	-
Southbound Left/Thru	0.03	<20	A

Table 6 shows that all approaches at this intersection are operating at an acceptable LOS. The westbound approach of Speedway Road is currently operating with a marginal, but acceptable, LOS of D and a v/c ratio of 0.33. The v/c ratio of 0.33 meets standards set in the Green TSP. The 95th percentile queue is currently just over one vehicle length.

ORE 99 AT HAPPY VALLEY ROAD

ORE 99 at Happy Valley Road is a signalized intersection that operates in the fully-actuated mode. Both left turns from ORE 99 are protected while the left turns from the minor street approaches are permitted. Signal timing plans were obtained from ODOT Region 3. The approach from the west is a driveway. A peak hour factor of 0.95 was used with 4% heavy vehicles. ORE 99 was assumed to be operating at a speed of 55 mph with Happy Valley Road operating at 45 mph.

Table 7 shows the 2004 30th Hour Volume v/c ratios, 95th percentile queue length, and the LOS for the critical movements at the intersection of ORE 99 with Happy Valley Road:

Table 7. 2004 30th Hour Volume (ORE 99 at Happy Valley Road)

Approach	V/C Ratio	95th % Queue	LOS
Overall Intersection	***0.87***	***-***	***C***
Northbound Left	0.61	75	D
Southbound Thru/Right	0.91	850[1]	C
Eastbound Left/Thru	0.85	225	D

[1] 95th percentile volume exceeds capacity, queue may be longer

Table 7 shows the eastbound through/left and the northbound left operate at a marginal, but acceptable, LOS. Overall, the intersection is operating at an acceptable LOS of C, but has a v/c ratio of 0.87, which is above the limit established in the Green TSP of 0.85.

ORE 99 AT BEAVER STATE SAND & GRAVEL

The intersection of ORE 99 at Beaver State Sand and Gravel is a T-intersection with stop control on Speedway Road. A peak hour factor of 0.90 was used with 6% heavy vehicles. ORE 99 was assumed to be operating at a speed of 55 mph.

Table 8 shows the 2004 30th Hour Volume analysis results:

Table 8. 2004 30th Hour Volume (ORE 99 at Beaver State Sand & Gravel)

Approach	V/C Ratio	95th Queue Length (feet)	LOS
Westbound Left/Right	0.14	<20	C
Northbound Thru/Right	0.18	0	-
Southbound Left/Thru	0.00	0	A

Table 8 shows that all three approaches are operating at an acceptable LOS. Each approach is also below the Green TSP standard v/c ratio of 0.85.

ORE 99 AT ORE 42

ORE 99 at ORE 42 is a signalized intersection that operates fully actuated. Both left turns from ORE 42 are protected while the left turns from the approaches of ORE 99 are permitted. Signal timing plans were obtained from ODOT Region 3. A peak hour factor of 0.95 was used with 8% heavy vehicles. ORE 99 was assumed to be operating at a speed of 55 mph with ORE 42 operating at 50 mph.

Table 9 shows the 2004 30th Hour Volume v/c ratios, 95th percentile queue length, and the LOS for the critical movements:

Table 9. 2004 30th Hour Volume (ORE 99 at ORE 42)

Approach	V/C Ratio	95Th % Queue	LOS
Overall Intersection	***0.66***	***-***	***C***
Eastbound Left	0.71	175	D
Eastbound Thru/Right	0.58	325	B
Southbound Left	0.84	300[1]	D

[1] 95th percentile volume exceeds capacity, queue may be longer

Table 9 shows that the intersection is operating at an acceptable LOS of C and a v/c ratio of 0.66, which is within the limits established in the OHP.

ORE 42 AT CARNES ROAD

This intersection is a signalized intersection. Both left turns from ORE 42 are protected with left-turn lanes. The left turns from the approaches of Carnes Road are permitted with left-turn lanes. Signal timing plans were obtained from ODOT Region 3. A peak hour factor of 0.95 was used with 4% heavy vehicles. ORE 42 is operating at a speed of 50 mph with Carnes Road operating at 40 mph.

Table 10 shows the 2004 30th Hour v/c ratios, 95th percentile queue length, and the LOS for the critical movements:

Table 10. 2004 30th Hour Volume (ORE 42 at Carnes Road)

Approach	V/C Ratio	95th % Queue	LOS
Overall Intersection	***0.75***	***-***	***C***
Eastbound Left	0.80	250[1]	D
Westbound Thru/Right	0.81	425	C
Southbound Left	0.63	250[1]	D

[1] 95th percentile volume exceeds capacity, queue may be longer

Table 10 shows the critical movements and the v/c ratio associated with that movement. Both the eastbound and southbound left turns are operating with a low LOS. It can also be seen that the intersection is near capacity with a LOS of C and a v/c ratio of 0.75.

ORE 42 AT EMILS WAY/GRANGE ROAD

ORE 42 at Emils Way is a two-way stop controlled intersection. A peak hour factor of 0.95 was used with 3% heavy vehicles. ORE 42 is operating at a speed of 50 mph. Emils Way and Grange Road are both local streets that were assumed to be operating at speeds of 25 mph. There is a two-way, left-turn lane for vehicles turning onto ORE 42 from Grange Road. Vehicles from Emils way must make a one-stage turn as there is a left-turn lane for vehicles turning onto Grange road from westbound traffic on ORE 42.

Table 11 shows the 2004 30th Hour Volume analysis results:

Table 11. 2004 30th Hour Volume (ORE 42 at Emils Way/Grange Road)

Approach	V/C Ratio	95th Queue Length (feet)	LOS
ORE 42 (northeast left)	0.00	0	-
ORE 42 (northeast thru)	0.40	0	-
ORE 42 (northeast thru/right)	0.23	0	-
ORE 42 (southwest left)	0.11	<20	B
ORE 42 (southwest thru)	0.45	0	-
ORE 42 (southwest thru/right)	0.24	0	-
Emils Way (eastbound left/thru/right)	0.71	50	F
Grange Road (westbound left/thru/right)	0.38	50	C

Table 11 shows that the approaches on ORE 42 at this intersection are operating at an acceptable LOS. However, the minor street approach from Emils Way is currently operating at a low LOS equal to F. The v/c ratio for movements on the highway meet the standards set by ODOT.

ORE 42 AT ROLLING HILLS ROAD

This intersection is a two-way, stop controlled intersection. A peak hour factor of 0.95 was used with 4% heavy vehicles. ORE 42 is operating at a speed of 55 mph. Both approaches on ORE 42 are two lanes with an additional left-turn lane. The minor street approaches of Rolling Hills Road and Grange Road are single lanes serving all movements.

Table 12 shows the 2004 30th Hour Volume analysis results:

Table 12. 2004 30th Hour Volume Analysis (ORE 42 at Rolling Hills Road)

Approach	V/C Ratio	95th Queue Length (feet)	LOS
ORE 42 (eastbound left)	0.02	<20	B
ORE 42 (eastbound thru)	0.39	0	-
ORE 42 (eastbound thru/right)	0.21	0	-
ORE 42 (westbound left)	0.03	<20	B
ORE 42 (westbound thru)	0.44	0	-
ORE 42 (westbound thru/right)	0.24	0	-
Rolling Hills (southbound left/thru/right)	0.75	100	F
Grange Road (northbound left)	0.43	50	F
Grange Road (northbound thru/right)	0.06	<20	B

Table 12 shows that the approaches on ORE 42 at this intersection are operating at an acceptable LOS. However, the minor street approaches are currently operating at a low LOS equal to F. The v/c ratio for the highway meet the standard of 0.70 set by ODOT.

7 MERGE ANALYSIS

Each of the 4 ramps was analyzed using the Ramps and Ramp Junction methodology in HCS 2000. For each analysis, the following information is required: peak hour factor, truck percentage, recreational vehicle percentage, freeway speed, ramp speed, and the terrain. The following table summarizes the data that was used in the analysis:

Table 13. Ramp Analysis Data

Ramp/Freeway	PHF	Truck %	RV %	Speed	Terrain
Northbound	0.95	12	2	65	Grade
Northbound Off	0.95	6	2	30	Level
Northbound On	0.95	6	2	45	Grade
Southbound	0.95	10	2	65	Level
Southbound Off	0.95	6	2	45	Grade
Southbound On	0.95	6	2	45	Level

The peak hour factor and the truck perecentages used in the analysis are based on the traffic counts taken surrounding interchanges 119 and 120. 15 minute counts were not provided for the freeway classification count.

The classification counts do not distinguish between trucks and recreational vehicles. It was therefore assumed, that the recreational vehicle percentage was equal to 2% and the percent trucks was then

reduced by 2%. The terrain was determined using the Vertical Grade Report from ODOTs States Highway Inventroy Reports. Each ramp junction is at least 1,500 feet apart.

The table below shows the density and LOS for each of the ramps:

Table 14. Ramp Analysis

Ramp	Density	LOS (pc/mi/ln)
Northbound Off	12.7	B
Southbound Off	21.8	C
Northbound On	18.4	B
Southbound On	12.9	B

The results of the operational analysis show that all of the ramps are operating at an acceptable Level of Service under existing traffic conditions.

8 WEAVE ANALYSIS

An additional analysis was performed to examine the LOS if an auxiliary lane was added between the northbound ramps of interchanges 119 and 120. The peak hour factor, percent heavy vehicles, and the percent of recreational vehicles remained the same as in the merge analysis.

Volumes were not provided for the northbound off ramp at interchange 120. A percentage of the mainline volume from Interstate 5 was determined from the 48-hour tube counts and used for a ramp volume. It was assumed that 20% of the vehicles getting on I-5 were getting off at interchange 120. This percentage is based off of a license plate survey conducted by ODOT in 1999 during the peak hour. The results of the analysis show that if an auxiliary lane was added, it would currently be operating at a level of service of C with a density of 23 passenger cars per mile per lane.

9 CONCLUSIONS

Of the eight intersections of interest surrounding interchanges 119 and 120, the three signalized intersections are currently operating at an acceptable LOS and within the v/c parameters established by the agency with jurisdiction for the facility. Four of the five stop-controlled intersections have one or both of the minor street approaches operating at a low LOS with long delays, especially for left-turn movements or all movements where separate left-turn lanes are not provided. The unsignalized intersection of ORE 99 with Beaver State Sand and Gravel operates at a relatively good LOS and shorter delays than the other stop-controlled intersections.

The merge and diverge analysis conducted on the freeway ramps shows that the ramps are currently operating at an acceptable level of service. The possibility of installing an auxiliary lane was also

checked using HCM methodology and the results showed that under existing traffic levels the weaving section would operate at a LOS of C.

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DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE:	September 14, 2004
TO:	Doug Norval, ODOT TPAU
FROM:	Cameron Grile
SUBJECT:	**Roseburg Model**
PROJECT:	Interchanges 119 and 120 AMP
PROJECT NO:	ODOT0000-0436
COPIES:	Mike Baker, ODOT Region 3
	John Stutesman, DEA
	John Replinger, DEA

Base year and 2025 traffic volumes were received from the request sent August 11, 2004. The volumes and data associated with the road network and Transportation Analysis Zones were examined. Upon further analysis of the TAZs used in the Roseburg Model, we identified the following problems in the Green area:

TAZ 112: This zone appears to have no growth between the base year condition and 2025. This does not reflect the availability of existing industrial zoned land. We would suggest the following to account for the availability of industrial land:

1. Expand TAZ 112 north to include the industrial zoned land.
2. Expand the network to include Speedway Road and all of Ingram Drive
3. Create a 2004 model that includes Ingram Books.
4. Account for the likely hood of additional industrial businesses in the future. (See also discussion under TAZ 113 below.)

We feel that these suggestions are important for the analysis of this area.

TAZ 113: This TAZ is composed of general commercial, community commercial, light industrial, and exclusive farm use – grazing zoning. There are 28 jobs in the base year and 1128 in the future year. This is a large increase in employment between 2000 and 2025. There is approximately 35 acres of commercially zoned land creating 2 base year and 615 future year retail and service related jobs. There is approximately 13 acres of industrial zoned land creating no base year and 201 future year industrial related jobs. If industrial land produced 2 jobs/acre and commercial land produced 10 jobs per acre in the future year it would create approximately 375 jobs. This is less than half of the jobs indicated in the future year model inputs for this TAZ.

To avoid a regional imbalance, we would suggest the following:

1. For RETL, SERV, and OTHR employment in the future year, 65% remain in TAZ 113 and 35% be moved to TAZ 112.
2. For INDY in the future year, 25% remain in TAZ 113 and 75% of employment be moved to TAZ 112.

The majority of the industrial land in the area is surrounding Ingram Books in the area of TAZ 112.

It also appears that the majority of the traffic coming from this area should load onto Grant Smith Road. There is one access road (Art Mill Lane) onto the Coos Bay – Roseburg Highway within TAZ 113 that only provides access to Rainbow Homes. We would like to have the centroid connector for TAZ 113 load onto Grant Smith Road.

These are our suggestions/recommendations. We are open to any suggestions you might have to the problems discussed above.

Attachments/Enclosures: 0

Initials: CMG

File Name: o:\project\o\odot0000-0436\!docs\6000 transportation\6040 modeling\roseburg_model\roseburgmodel_memo.doc

Project Number: ODOT0000-0436

Decision Data & Solutions

Memorandum

To: Sam Ayash, ODOT

From: Susan Hendricks

CC: Bob Schulte, DKS

Date: 09/22/2004

Re: Development of Forecast Socioeconomic Model Inputs for Roseburg

---

This memorandum describes the evaluation of the household and employment growth projections provided by Parametrics, and the recommended adjustments to implement in preparation of 2020 and 2025 model data sets.

2025 Household Projections

The **(2000-2020)** household growth (for City of Roseburg only) projected by Parametrix is 90% of the 2000-2025 growth projected by the State of Oregon's Office of Economic Analysis for Douglas County as a whole, while the Roseburg/Winston study area accounts for less than half of Douglas County's 2000 households. Of the projected Roseburg/Winston household growth, 1400 (16%) is outside the urban growth boundary of Winston (although most of it is within the city limit). Removing this portion would bring the Roseburg/Winston growth down to 75% of the county's total household growth, and would allow for growth occurring elsewhere in the county. Table 1 summarizes the county and study area projections.

2020 Household Projections

The (2000-2020) household growth projected by Parametrix exceeds the 2000-2020 growth projected by the State of Oregon's Office of Economic Analysis for Douglas County by 20%. The majority of this projected growth is at the edge of the urban growth boundary, as can be seen in Figure 1. Nearly two-thirds of the growth results in more than doubling the existing households over the twenty-year period. Table 2 summarizes the 2000 and projected households by relative growth ranges corresponding to average annual growth.

Summary of Recommendations

The implementation of the recommended changes is detailed by affected TAZ in Table 3. The TAZs not in the table (summarized under "Remaining TAZs" in Table 3) remain unchanged from the Parametrix household projections.

The summary of the recommended changes are:

- For TAZs outside of UGB, no growth by 2020 or 2025.
- For "high growth" TAZs inside of UGB, growth originally estimated by Parametrix to occur by 2020 will now occur by 2025. One-half of growth by 2025 will occur by 2020, with other half occurring between 2020 and 2025.
- For remaining TAZs, growth originally estimated by Parametrix to occur by 2020 will still occur by 2020, with no further growth by 2025.

Table 1: 2000-2025 Household Projections

	Douglas County Population [a]	Roseburg/Winston Study Area		Study Area % of County Population
		Households	Population	
2000	102,344	17,546 [b]	48,410 [b]	47%
2025	125,893	26,571 [c]	69,645 [d]	55%
2000-2025	23,549	9,025 [c]	21,235 [d]	90%
2000-2025 Outside UGA		1,401 [e]	3,670	16%
2000-2025 Inside UGA		7,624	17,565	75%
2025 with Growth Inside UGA		25,170	65,975	52%

a. Oregon State Office of Economic Analysis website: http://www.oea.das.state.or.us/demographic/longterm/co_pop.htm
b. 2000 Census
c. 2000-2020 growth from Parametrix within original study area (8789 of the 9025 household growth); extended study area growth based on nearby TAZ growth (average of 15% growth, adding 236 households)
d. Population estimated using 95% of 2000 household size (average household size decreases 1% every 5 years; from 2.76 to 2.62 over 25 year period)
e. Household growth in TAZs 119, 127, 130, 131, 189-191, and 197

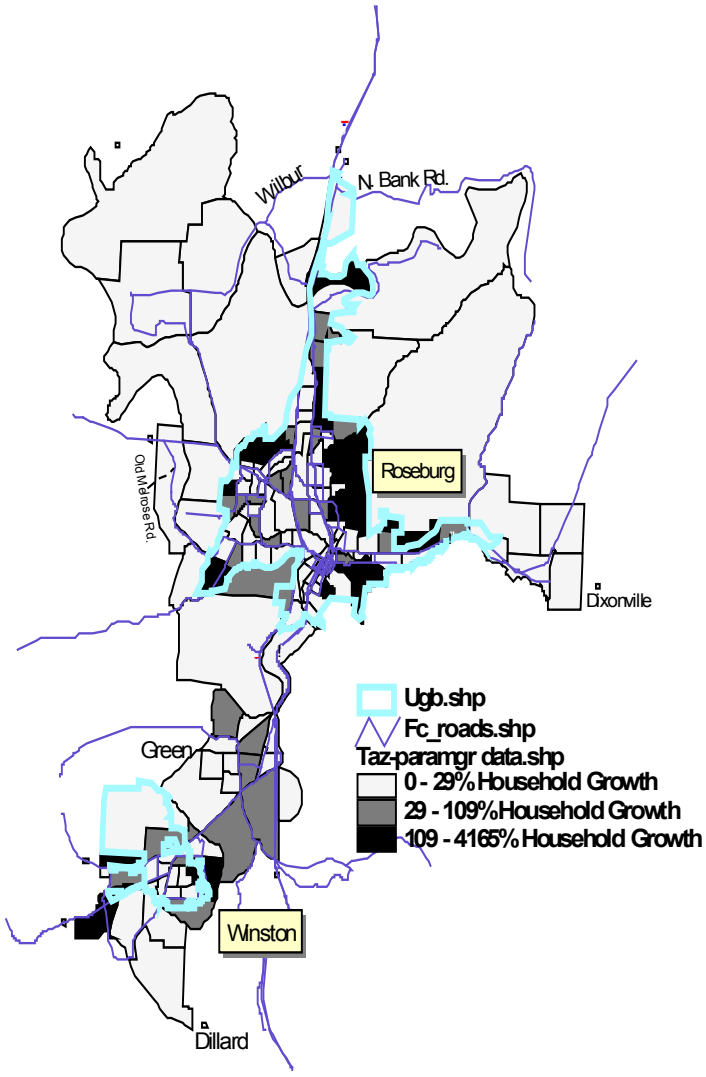
Table 2: 2000-2020 Household Projections

% Growth Range (average annual growth rate)	Number of TAZs	2000 Households [a]	2020 Households [b]	2000-2020 Growth	% of Growth
<29% (<1%aa)	115	13,036	14,508	1,472	16%
29%-109% (1-3%aa)	30	3,399	5,135	1,736	19%
>109% (>3%aa) Inside UGA	17	1,071	5,487	4,416	49%
>109% (>3%aa) Outside UGA	8	40	1,441	1,401	16%
Total Study Area	170	17,546	26,571	9,025 (+51.4%)	
Study Area Population		48,410	70,377 [c]	21,968 (+45.4%)	
Douglas County Population [d]		102,344	120,671	18,327	
Study Area % of County		47%	58%	120%	
Recommended Study Area Households[e]			22,962	5,416 (+30.9%)	
Recommended Study Area Population			60,821	14,348 (+25.6%)	
Recommended Study Area % of County Population			50%	78%	

a. 2000 Census
b. 2000-2020 growth from Parametrix within original study area (8789 of the 9025 household growth); extended study area growth based on nearby TAZ growth (average of 15% growth, adding 236 households)
c. Population estimated using 95% of 2000 household size (average household size decreases 1% every 5 years; from 2.76 to 2.62 over 25 year period)
d. Oregon State Office of Economic Analysis website: http://www.oea.das.state.or.us/demographic/longterm/co_pop.htm
e. The recommended growth removes one-half of the original growth in TAZs within the UGA that increase by >109% and eliminates growth outside UGA

Figure 1

Roseburg Projected Growth by TAZ



Source: Projected Growth provided by Parametrix within original study area; extended study area growth based on nearby TAZ growth (average of 15% growth)

The employment growth is focused around corridors and existing employment sites. It is not recommended that the distribution of the employment growth be adjusted, but the overall total will need to be adjusted to correlate with the adjusted households, retaining the same jobs-to-housing ratio as the original forecast.

Table 3: Recommended 2020 and 2025 Growth by TAZ

	Households			Recommended Change			
TAZ	**HHBASE**	**Original 2020**	**Growth**	**2000-2025**	**2000-2020**	**2025**	**2020**
Outside UGA							
197	10	70	60	0	0	10	10
119	22	161	139	0	0	22	22
127	8	167	159	0	0	8	8
130	0	342	342	0	0	0	0
131	0	392	392	0	0	0	0
189	0	141	141	0	0	0	0
190	0	56	56	0	0	0	0
191	0	112	112	0	0	0	0
Subtotal Outside UGA	**40**	**1441**	**1401**	**0**	**0**	**40**	**40**
Inside UGA							
49	99	221	122	122	61	221	160
90	50	113	63	63	32	113	82
99	88	210	122	122	61	210	149
91	196	477	281	281	140	477	336
26	60	152	92	92	46	152	106
28	75	245	170	170	85	245	160
159	48	218	170	170	85	218	133
75	114	537	423	423	212	537	326
31	162	793	631	631	316	793	478
178	19	156	137	137	68	156	88
35	52	454	402	402	201	454	253
36	65	700	635	635	318	700	382
78	1	11	10	10	5	11	6
173	15	246	231	231	116	246	130
145	10	219	209	209	104	219	114
54	17	725	708	708	354	725	371
30	0	10	10	10	5	10	5
Subtotal Inside UGA	**1,071**	**5,487**	**4,416**	**4,416**	**2,208**	**5,487**	**3,279**
Subtotal High Growth TAZs	**1,111**	**6,928**	**5,817**	**4,416**	**2,208**	**5,527**	**3,319**
Remaining TAZs	**16,435**	**19,643**	**3,208**	**3,208**	**3,208**	**19,643**	**19,643**
Total All TAZs	**17,546**	**26,571**	**9,025**	**7,624**	**5,416**	**25,170**	**22,962**

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: September 23, 2004
TO: John Replinger
FROM: Cameron Grile
SUBJECT: **Review of Roseburg Model Documentation**
PROJECT: Interchanges 119 and 120
PROJECT NO: ODOT0000-0436
COPIES:

This memorandum summarizes the documentation and correspondance that was provided to David Evans and Associates by Doug Norval of the Transportation Planning Analysis Unit following a meeting in Salem. The following will briefely describe each of the documents provided in chronological order.

Roseburg-Winston Model Development
This document, dated Novemenber 13, 2003 provides an overview of the base year model development, structure, and the model zone system and network. An overview of survey data and model input data is also discussed along with the validation of the model. The model was developed by calibrating and validating the Oregon Small Urban Model for the Roseburg – Winston area. The household activity survey data was collected from 3,200 households in eight rural counties around Oregon as part of the Joint Estimation Model project conducted by ODOT and Portland Metro.

Decision Data & Solutions Memorandum
This memorandum sent to Sam Ayash on December 2, 2003 discusses the evaluation of the numbers developed by Paramatrix on household and employment growth and the changes that Decision Data & Solutions (DDS) recommends. The memo states that 90% of the 2000-2025 growth projected by the State of Oregon's Office of Economic Analysis (OEA) for Douglas County was projected by Parametrix to occur between 2000 and 2020, while the Roseburg/Winston study area accounts for less than half of Douglas County's 2000 households. This leaves little room for growth elsewhere in the county. DDS recommends removing the portion of the household growth that occurs outside of the UGB of Winston bringing the Roseburg/Winston Growth down to 75% of the total for the County. The 2000 to 2020 growth projected by Paramterix exceeds the growth projected by OEA by 20% for the same time period. DDS states that the majority of the growth during this time is occuring arround the edge of the urban growth boundary.

TPAU and Parametrix Correspondance
This email sent from Howard Roll at Parametrix, Inc. (Dated 12/12/2003) to John Boyd at Douglas County and TPAU states "TPAU has to comply with the court-ordered settlement following the LUBA appeal by the County over County land use projections." Howard also attached a copy of the LUBA decision to the email. The LUBA decision seems to require the use of a County Population of 145,335 for 2020 which is 20%

above the values recommended by TPAU. Parametrix is concerened that the household and employments numbers are 20% low throughout the model as a result of their starting population being low.

General TPAU Correspondance

In an email dated January 21, 2004 from Susan Hendricks at DDS to Bob Schulte of DKS and Sam Ayash of TPAU, she states that they should accept the original Parametrix forecast for 2020. Susan then recommends seeing if Parametrix has buildout estimates to 2025 and the county have a 2025 projection. If not, then extrapolate the 2000 to 2020 out to 2025 and assume there is available capacity, which probably is not the case.

Attachments/Enclosures: 0

Initials: cmg

File Name: o:\project\o\odot0000-0436\!docs\6000 transportation\6040 modeling\roseburg_model\memo_roseburgmodel_doc_summary.doc

Project Number: ODOT0000-0436

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: October 13, 2004
TO: John Replinger
FROM: Cameron Grile
SUBJECT: **Roseburg Model Growth Allocation**
PROJECT: Interchange 119 and 120
PROJECT NO: ODOT0000-0436
COPIES:

This memorandum summarizes the Buildout Estimates by TAZ and the growth allocation performed by Parametrix for the Roseburg/Winston Model. Susan Hendricks of Decision Data & Solutions (DDS) provided the documentation. Parametrix performed the allocation within the Roseburg/Winston UGBs. DDS extrapolated data for areas just outside of the UGB.

Roseburg/Winston Draft Buildout Estimates by TAZ

This memorandum outlines the procedure used to determine buildout estimates by TAZ for the City of Roseburg by Parametrix. Parametrix generated a spatial database using information from Douglas County, ODOT, the SSGIS website, Umpqua Regional Council of Governments, City of Roseburg, and the Oregon Spatial Data Clearinghouse. The following process was used to develop the buildout estimates:

1. Assign each Parcel to a TAZ: a TAZ number was assigned to each parcel that did not have a majority of their area extending outside the TAZ.
2. Determine Vacant Parcels and Developed Parcels: Vacant parcels were identified by property assessment information from the County. Parametrix assumed that vacant parcels were those with no improvement value on the property records.
3. Assign Zoning Classification: Zoning classification was assigned to each parcel based on information from the city and county. The Oregon Spatial Data Clearinghouse was used for zoning around in the unincorporated areas around Winston.
4. Estimate Environmentally Constrained Areas: Environmentally constrained areas were assumed to be areas with steep slopes and areas within the 100-year flood plain.
5. Subtract Land for Streets and Future Public Facilities: this step estimated the land needed for future streets and public facilities and then removed it from vacant buildable residential areas.
6. Apply Residential Density Estimates: Densities are assigned with respect to each parcel's local zoning designation and densities from local codes and reported in units per acre.
7. Estimate Units lost from Residential Underbuild: Parametrix assumed a 20% underbuild factor for all residential densities.
8. Estimate Dwelling Units Occurring from Possible Redevelopment: Parametrix assumed that redevelopment would occur in areas of non-vacant, non tax-exempt parcels with a building to land value ratio under 0.5, and a total parcel area greater than 2 acres.

9. Apply Employment Density Estimate: Density estimates were expressed as employees per acre and defined by employment zones.
10. Estimate Employment Occurring in Nonresidential Areas with Redevelopment Potential: Non-residential parcels were multiplied by the employee/acre estimates to determine a total number of employees. The current number of employees was then subtracted to obtain the net increase. Parametrix assumed that half of the total employment capacity on a parcel with redevelopment potential is already occurring and the estimates were reduced by one-half.
11. Estimate Additional Employment Occurring in Residential Areas: Parametrix assumed that there were about 0.4 employees per residential acre.
12. Estimate Additional Jobs and Dwelling Units Occurring in Mixed Use Areas: Parametrix assumed that parcels over two acres would develop for non-residential uses and parcels less than two acres would develop as residential uses.

A table in the back of the Parametrix memorandum shows the number of new dwelling units and new employees by TAZ number.

Growth Allocation

Parametrix used four basic steps to allocate the growth in the Roseburg/Winston Area. The steps were as follows:

1. Convert 2000-2020 Population Forecast to Households and Jobs: 2000 census data was used in combination with the City's established population forecast number to determine household growth. These numbers returned an estimated increase of 11,175 households in Roseburg and 748 households in Winston. Job estimates were from the 2000 Geocode and an estimated jobs-to-housing ratio of 1.96 jobs per household. This returned an estimated 23,336 jobs.
2. Calculate Current Buildout by Zoning: This was done using the procedure documented above. Parametrix made a few modification returning a total number of households of 6,569 and 14,476 jobs by allocating additional jobs to the PR zone to reflect the likelihood of employment in that area. Parametrix noted that the growth estimate exceeded the build out potential, but it did not concern them at that time as the allocation was being done according to the distribution of build out potential. The documentation gave the city three alternatives if the city wished to address the problem differently. They were:
   - Have the forecast numbers controlled by the build out estimates.
   - Modify the build out estimates to increase expected capacity in certain areas – such as agricultural zones.
   - Modify the forecast numbers calculated in Step 1.
3. Translate Buildout Estimates in to Job an Household Types: These assignements were made by ODOTs zoning categories. The distribuitions are included in a table at the end of the documentation by ODOT categories and distribuition of jobs.
4. Allocate 2000 – 2020 Households and Jobs to TAZ and Job/Household Types: The job and household buildout estimates were cross-tabulated by ODOTs classifcation type and TAZ. The buildout distribuition is used to allocate the 2000-2020 forecasted groth. The allocation is included in a table at the end of the document by TAZ.

Attachments/Enclosures: 0

Initials: CMG

File Name: o:\project\o\odot0000-0436\!docs\6000 transportation\6040 modeling\roseburg_model\memo_allocation.doc

Project Number: ODOT0000-0436

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: November 8, 2004

TO: Mike Baker, ODOT Region 3 Planning
Sam Ayash, ODOT TPAU

FROM: John Replinger

SUBJECT: **Roseburg Traffic Forecasting Model**

PROJECT: Interchanges 119 and 120

PROJECT NO: ODOT0000-0436

COPIES:

David Evans and Associates, Inc. (DEA) has reviewed the documentation of the Roseburg Model provided by ODOT's Transportation Planning and Analysis Unit (TPAU) and Susan Hendricks of Decision Data & Solutions (DDS). In addition to reviewing the provided documentation, several of the land use assumptions where checked. Of particular interest is whether or not Ingram Books was included in the model. This memorandum will summarize the findings of our review.

Roseburg Model Documentation

Doug Norval of TPAU provided documentation of the development of the Roseburg model. This included documents relating to the base year model development, a memorandum from Decision Data & Solutions, and general correspondence between Parametrix, DDS, and TPAU. The documents revealed that Parametrix used an estimated Douglas County Population of 145,335 for 2020, which is 20% above the population originally recommended by TPAU. The higher population number was used in response to a ruling by the Land Use Board of Appeals. DDS noted that the majority of the growth was occurring around the edges of the urban growth boundaries.

Parametrix noted in the description of their allocation methodology that the anticipated year 2025 population exceeded the buildout capacity of the residentially designated land. Households were allocated to outlying zones in proportion to their buildout potential. This resulted in an over-allocation of population to outlying zones relative to what the zones can actually accommodate. This was not addressed at the time. To address the problem Parametrix recommended the following options: have the buildout estimates control the forecast population and household numbers; modify the buildout estimates to increase expected capacity; or modify the forecast numbers.

Detailed TAZ Review

A detailed analysis was performed on 6 transportation analysis zones (TAZ) near interchanges 119 and 120. The analysis included examining the available land, the base year employment, and future year employment assumptions in each TAZ. Figure 1 shows the road network and the transportation analysis zones in the vicinity of interchanges 119 and 120.

The available land within each of the 6 TAZs was calculated for three categories: commercial, industrial, and other. For the commercial and industrial categories, the number of acres was estimated from zoning maps and county assessor maps. We calculated the acres available for other employment by subtracting the industrial and commercial area from the total area of the TAZ.

TPAU provided the employment for the base year (2000) and the future year (2025). Rather than using each individual employment category as provided by TPAU, we aggregated employment into three categories: service and retail; industrial; and non-commercial/non-industrial employment. This last category consists of agriculture, education, government, and other employment sectors.

Though there can be some mixing of employment type by land use category, we assumed that retail and service employment occurs on commercially zoned land and that industrial employment occurs on industrially zoned land. We also assumed that non-commercial/non-industrial employment occurs on land zoned for neither commercial nor industrial use. Using the employment numbers provided by TPAU and the estimates of available land by category for each zone, we calculated employment density in terms of employees per acre.

The last part of the analysis for each of the 6 TAZ's was to calculate number of employees who could be employed in each zone assuming buildout for the commercial and industrial lands. We based our theoretical buildout capacity on assumed employment densities of 20 employees per acre for commercial and 12 employees per acre of industrial. These density assumptions are the same as those used by Parametrix and are consistent with other studies including estimates from Metro's 1999 Employment Density Study urban and non-urban areas. The buildout employment was not calculated for the non-commercial/non-industrial category due to the mix of job types.

The following sections summarize the results of the analysis for each land use category.

Commercial Land

Commercial land was estimated using county assessor and zoning maps. Commercial land is a small percentage of the total land available making up less than 10% in each TAZ. The commercial area in acres for each TAZ is presented in Table 1 below.

Table 1 also presents the service/retail employment for the base and future years and the employment densities for both years. Finally, Table 1 includes the buildout employment potential for the commercially designated lands by zone.

Table 1: Summary of Commercially Zoned Land by TAZ

TAZ	Commercially Zoned Land (acres)	Year 2000 Retail & Service Employment	Forecast Year 2025 Retail & Service Employment	Calculated Employment Density (employees/acre)		Assumed Buildout Employment Density	Buildout Capacity (service and retail employees)
				Year 2000	Year 2025		
107	4	44	57	11	14	20	80
181	10	135	167	14	18	20	190
112	16	0	0	0	0	20	310
113	34	2	615	0	18	20	680
108	0	16	50	N/A	N/A	20	0
180	12	45	79	4	7	20	232

For each TAZ, the calculated employment density (for both 2000 and 2025) is below the assumed buildout employment density. Zones 181 and 113 are expected to be close to their commercial buildout capacities in the year 2025. Though it had no service and retail employment in year 2000, TAZ 113 is estimated to have a significant growth in service and retail employment prior to 2025. With the forecast employment, it would reach 18 employees per acre, which is close to the buildout employment capacity. Though it does not have any commercially zoned land, Zone 108 has a modest amount of retail and service employment that is probably now on industrially designated land.

Industrial Land

A large portion of the land surrounding interchanges 119 and 120 is industrially zoned land. The number of acres of industrial land for each TAZ can be found in Table 2. Table 2 also shows 55 acres of industrial land that comprises the north part of the industrial park between the Ingram Books distribution facility and Speedway Road.

Table 2 also summarizes the base and future year industrial employment and the employment densities for both years. Finally, Table 2 shows the industrial buildout capacity for each zone.

Table 2: Summary of Industrially Zoned Land by TAZ

TAZ	Industrially Zoned Land (acres)	Year 2000 Industrial Employment	Forecast Year 2025 Industrial Employment	Calculated Employment Density (employees/acre)		Assumed Buildout Employment Density	Buildout Capacity (industrial employees)
				Year 2000	Year 2025		
107	53	0	4	0	0	12	636
181	86	50	61	1	1	12	1032
112	62	0	0	0	0	12	738
113	20	0	201	0	10	12	234
108	142	246	258	2	2	12	1699
180	106	71	83	1	1	12	1268
Unaccounted	55	0	0	0	0	12	660
Total excluding Unaccounted	467	367	607	1	1	12	5607
Total with Unaccounted	522	367	607	1	1	12	6267
Roseburg Model Totals	2941	3639	7856	1	3	12	35293

The most significant problem illustrated in Table 2 is the absence of any existing industrial employment in TAZ 112, the site of the Ingram Books distribution facility since the mid-1990's. Ingram Books employs approximately 450 people and would be categorized as industrial use. By failing to include Ingram Books in both the base and future years, the traffic forecasts are low in both the base year and future year versions of the traffic forecasting model.

As shown in Table 2, the calculated industrial employee density is very low in all zones in year 2000. In year 2025, Zone 113, with 201 forecast industrial employees, is approaching buildout capacity. There is no obvious reason why TAZ 113, which currently has no industrial employment, should be the only TAZ in the study ara to gain significant industrial employment between 2000 and 2025.

Another obvious problem is the failure to include an existing industrial site in any TAZ. The model does not include the north portion of the industrial park in which Ingram Books and which measures approximately 55 acres. At 55 acres, this area, lablel "unaccounted" in Table 2 could accommodate approximately 660 industrial employees at buildout. It is also worth noting that this unaccounted for area would add trips to the road network via Grant Smith Road or via Speedway Road. The later is not even included in the street network.

The bottom line in Table 2 shows the totals for the entire Roseburg area. It indicates industrial employment is expected to double between 2000 and 2025. The Interchange 119 and 120 study area industrial employment is expected to grow at a somewhat lesser rate.

Non-Commercial, Non-Industrial Land

The non-commercial and non-industrial land includes that zoned for residential, exclusive farm use, or public reserve. Most of the land in TAZ 112 and 113 is zoned for exclusive farm use and is in the southern portion of the Interchange 119 and 120 study area.

Table 3 summarizes the non-commercial and non-industrial land and the employment in the categories excluding the service, retail and industrial sectors.

Table 3: Non-Commercial and Non-Industrial Land by TAZ

TAZ	Land Zoned for non-Commercial and non-Industrial Use (acres)	Year 2000 Non-Retail, Non-Service, Non-Industrial Employment	Year 2025 Non-Retail, Non-Service, Non-Industrial Employment
107	70	26	30
181	36	278	289
112	215	1	1
113	617	26	312
108	63	34	46
180	56	32	44

As shown in Table 3, only TAZ 113 is predicted to have any substantial growth, picking up almost 300 jobs. Most of the employment growth in this zone is in the agricultural sector (85 jobs) and in the "other" sector (201 jobs).

It is probable that some of the employment shown in TAZ 181 in Table 3 is actually occuring on commercial or industrial land. As shown in Table 3, TAZ 181 had 278 employees outside the retail, service and industrial sectors. This contrasts with a relatively small amount of land and Zone 181 not zoned for commercial and industrial use, leading to the conclusion that some of this employment is on industrial and commercially designated land.

Conclusions

After reviewing input for the Roseburg Model, we believe there are serious flaws in the this model. For both the base and future years, the exclusion of Ingram Books and more than 400 employees is an obvious problem. Only TAZ 113 is predicted to have substantial employment growth and is predicted to be near buildout capacity. Zone 181 is expected to gain a modest amount of serice/retail employment while the other zones are predicted to have little employment growth. Finally, the detailed analysis also revealed that approximately 55 acres of industrial land just to the north of the Ingram Books distribution center were not included in the model.

Attachments/Enclosures: 1

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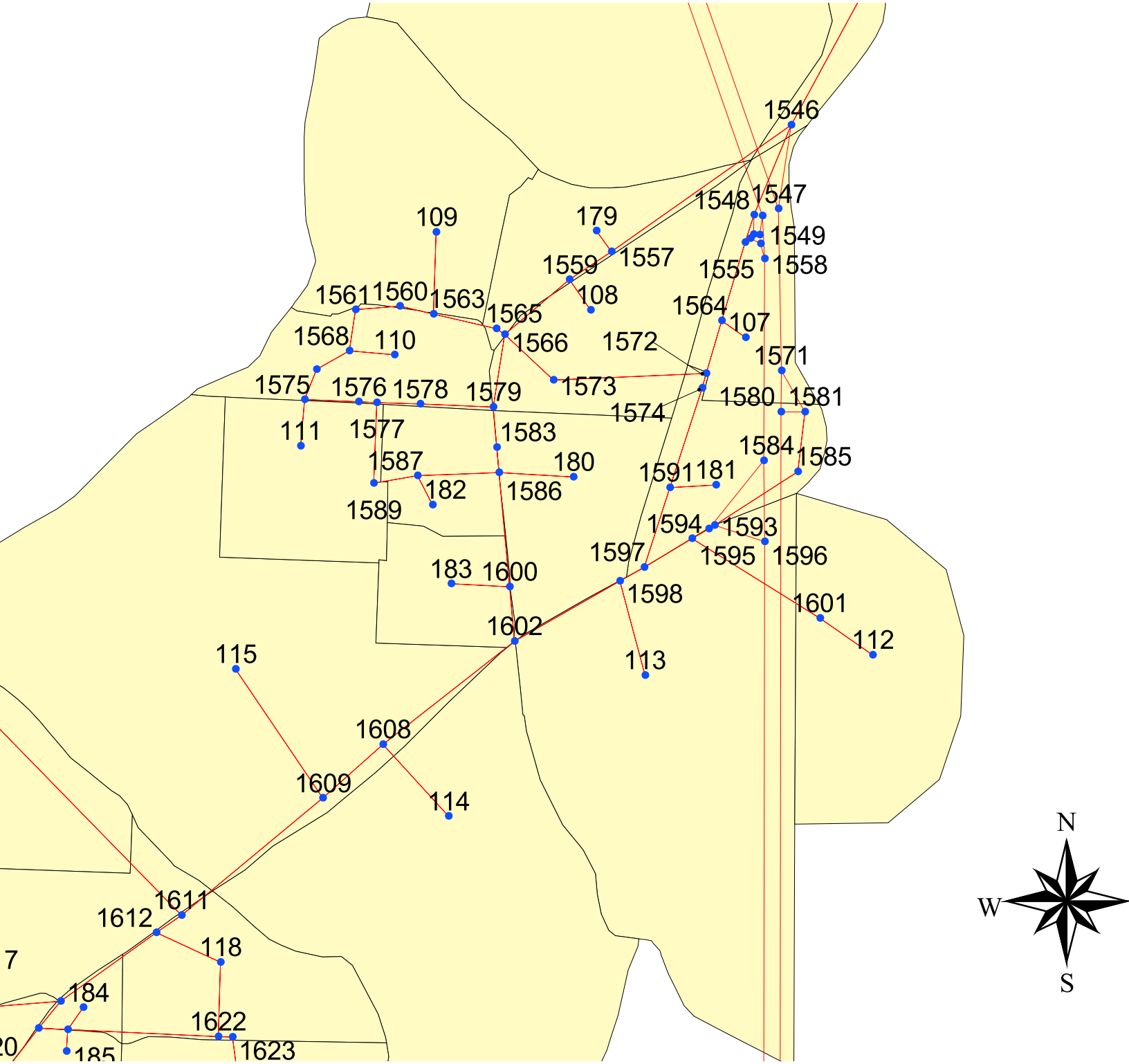
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Memorandum

To: John Replinger, David Evans and Associates
Bob Schulte, DKS Associates

From: Susan Hendricks

Date: March 25, 2005

Re: DEA ODOT Region 3 Planning and Transportation Engineering Services
Roseburg Interchange 119/120 Modeling

This memorandum describes the changes made to the Roseburg/Winston traffic model to reflect corrections identified in the base year and forecast socioeconomic data.

Base Year Socioeconomic Data

For the 2000 socioeconomic data set we added 450 industrial employment for the Ingram Books distribution facility to TAZ 112. This major employer site was not included in the 2000 ES202 data and did not appear on the aerial photos used to validate the data in the model development stage. The facility was built in the mid-1990's. DDS reviewed the other employment in the study area compared to more recent aerial photos for reasonability, and did not identify any other changes. The revised base year employment is presented in Table 1.

Table 1: 2000 Base Year Employment

TAZ	Agriculture	Industrial	Retail	Service	Education	Government	Other
107	0	0	25	19	0	0	26
181	0	50	54	81	0	0	278
112	0	450	0	0	0	0	0
113	12	0	2	0	0	0	14
108	7	246	7	9	0	10	17
180	0	71	43	2	0	0	32

Future Year Socioeconomic Data

For the forecast allocation, the growth between 2000 and 2025 was apportioned using estimated land available for commercial and industrial development. The total commercial and industrial land by TAZ was provided by DEA (Tables 2 and 3 of DEA's November 8th memorandum on the Roseburg Traffic Forecasting Model). DDS estimated the percentage of land by zoning that was already developed from aerials and zoning maps. This allowed us to estimate the land available for future commercial and industrial development. We also referenced topological maps to see if significant slopes inhibited future development, but it did not appear that it was a factor for the commercial and industrial zoned areas within these TAZs. We assumed that the overall growth for the six TAZs was reasonable, and used the estimated available acres to allocate the overall growth. Retail and Service employment growth were allocated using commercial zoned land, industrial employment was allocated using industrial zoned land, agriculture employment was kept the same as the model data (which used agricultural zoned land), and other employment was allocated using the sum of commercial and industrial land. Tables 2 through 4 present the allocation inputs and results. Table 5 summarized the 2025 forecast employment data for the model.

Table 2: Commercial Land and Employment

				Retail and Service Employment					
	Commercially Zoned Land			Year 2000		2000-2025 Growth		2025 Forecast	
TAZ	Acres	% Developed*	Available Acres	Retail	Service	Retail	Service	Retail	Service
107	4	75	1	25	19	7	7	32	26
181	10	50	5	54	81	33	34	87	115
112	16	0	16	0	0	106	109	106	109
113	34	25	26	2	0	173	177	175	177
108	0	0	0	7	9	0	0	7	9
180	12	50	6	43	2	40	41	83	43

* estimated from aerials and zoning maps

Table 3: Industrial Land and Employment

	Industrial Zoned Land			Industrial Employment		
TAZ	Acres	% Developed	Available Acres	2000	Growth	2025
107	53	90	5	0	5	5
181	86	90	9	50	9	59
112	117*	25	88	450	86	536
113	20	0	20	0	19	19
108	142	50	71	246	69	315
180	106	50	53	71	52	123

* Including 55 acres previously not accounted in the Parametrix Data

Table 4: Other Employment

	Available Commercial & Industrial Acres			Other Employment		
TAZ	Commercial	Industrial	Commercial+ Industrial	2000	Growth	2025
107	1	5	6	26	5	31
181	5	9	14	278	11	289
112	16	88	104	0	83	83
113	26	20	46	14	37	51
108	0	71	71	17	57	74
180	6	53	59	32	47	79

Table 5: 2025 Employment

TAZ	Agriculture	Industrial	Retail	Service	Education	Government	Other
107	0	5	32	26	0	0	31
181	0	59	87	115	0	0	289
112	0	536	106	109	0	0	83
113	97	19	175	177	0	0	51
108	7	315	7	9	0	10	74
180	0	123	83	43	0	0	79

Model Validation

The model was applied using the revised base year data and compared to counts that were used in the original calibration, as well as counts provided by DEA. DEA provided counts for both daily and a 4-5pm peak hour. The original peak hour calibration was done using a 5-6 hour peak, but counts were also available for the 4-5pm peak hour. The performance of the model was assessed and some model adjustments to peak hour factors, assignment parameters, and network coding were implemented to match these counts more closely. Some performance measures for the daily and peak hour models are summarized in Table 6 and 7 below.

Table 6: Daily Model vs. Estimated Volumes

Count Range	Observed Volume	Model Estimated Volume	Estimated/ Observed	Number of Counted Links	Root Mean Square Error (RMSE)
<2000	42,677	33,559	0.79	34	49.2%
2000-4999	150,073	141,465	0.94	43	26.9%
5000-8000	235,399	218,650	0.93	37	21.0%
>8000	967,779	951,973	0.98	80	13.0%
Total	1,395,928	1,345,647	0.96	194	17.9%

Table 7: Peak (4-5PM) Model vs. Estimated Volumes

Count Range	Observed Volume	Model Estimated Volume	Estimated/ Observed	Number of Counted Links	RMSE
<200	4,211	3,240	0.77	36	54.5%
200-499	15,190	14,807	0.97	40	30.7%
500-800	29,366	29,383	1.00	45	24.9%
>800	64,586	57,951	0.90	64	24.5%
Total	113,353	105,381	0.93	185	28.2%

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: April 7, 2005

TO: Mike Baker, ODOT Region 3

FROM: John Replinger

SUBJECT: **Interchange 119/120 Modeling**

PROJECT: Interchange 119/120 Conditions Report

PROJECT NO: ODOT0000-0436

COPIES: Sam Ayash, ODOT TPAU

This memorandum is a follow up to the technical memorandum dated November 8, 2004 discussing the Roseburg Traffic Foecasting Model and the flaws that were discovered. As explained in the memo, it was discovered that Ingram Books, which has approximately 450 employees, was left out of the Roseburg traffic model. In addition, the Transporation Analysis Zones (TAZ) in the study area had widely inconsistent growth rates. Finally, 55 acres of industrial land just to the north of Ingram Books was unaccouonted for even though it is in an established industrial park.

As a result of the flaws we found, an agreement was made with DKS Associates and their sub-consultant Decision Data & Solutions (DDS) to adjust the population, employment, and TAZ data. The 55 acres of industrial land was added to TAZ 112 and the employment numbers were adjusted to account for Ingram Books. DDS also reallocated the growth in the Green area between 2000 and 2025 based on estimated land available for commercial and industrial development. The memorandum dated March 25, 2005 from DDS details the methodology and adjustments made to the Roseburg model.

Once DDS completed the model adjustments, the model was run for the base year of 2000 and the future year of 2025. A comparison was made between the trips generated using the DDS and the ODOT TPAU models. The comparison revealed that the numbers from the DDS model were more representative of what one might expect in the Green area.

The traffic analysis for the Interchange 119 and 120 Conditions Report has moved forward using the traffic volumes generated in the DDS model. These volumes were post processed using NCHRP 255 methodology and used to develop 2025 traffic volume estimates for the traffic operations analysis.

It is our recommendation that TPAU adjust the Roseburg traffic model to reflect the changes made by DDS. If TPAU has not received a copy of the adjusted base year and future data, please let us know. Please contact us with any questions

Attachments/Enclosures: 2

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DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: May 10, 2005

TO: Technical Advisory Committee

FROM: John Replinger

SUBJECT: **Interchange 119/120 Modeling**

PROJECT: Interchange 119/120 Conditions Report

PROJECT NO: ODOT0000-0436

COPIES: Sam Ayash, ODOT TPAU

This memorandum presents a summary revisions made to the Roseburg transportation model and the recommended action that should be taken.

Initial review of the Roseburg traffic model found that Ingram Books, which has approximately 450 employees, was left out of the base year for the Roseburg traffic model.

For the future, the Transportation Analysis Zones (TAZ) in the study area had widely inconsistent growth rates. Essentially, all of the anticipated employment growth in the entire Green Area was forecast to occur in one zone – TAZ 113. Finally, 55 acres of industrial land just to the north of Ingram Books was not accounted for even though it is in an established industrial park.

Roseburg Model Revisions

As a result of the flaws we found, DEA enlisted the help of DKS Associates and their sub-consultant Decision Data & Solutions (DDS) to adjust the population, employment, and TAZ data. The 55 acres of industrial land was added to TAZ 112 and the base year employment numbers were adjusted to account for Ingram Books.

For the future 2025 analysis, DDS reallocated the growth in the Green area between 2000 and 2025 based on estimated land available for commercial and industrial development. The memorandum dated March 25, 2005 from DDS (attached) details the methodology and adjustments made to the Roseburg model.

Once DDS completed the model adjustments, the model was run for the base year of 2000 and the future year of 2025. A comparison was made between the trips generated using the DDS and the ODOT TPAU models. The comparison revealed that the numbers from the DDS model were more representative of what one might expect in the Green Area.

The traffic analysis for the Interchange 119 and 120 Conditions Report has moved forward using the traffic volumes generated in the DDS model and used to develop 2025 traffic volume estimates for the traffic operations analysis.

Recommended Action

We recommend that City of Roseburg and Douglas County review the changes made by DDS and adopt them as the *Official* Base year and Future year models for the Roseburg area. By adopting these changes as the Official Base year and Future year models, TPAU will use these for future analysis done in the area.

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I-5 Interchanges 119/120
Conditions Report

Traffic Operations Analysis
Year 2025 No-Build Scenario

Prepared for:
Oregon Department of Transportation
Region 3

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

June 27, 2005

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1 INTRODUCTION

This technical memorandum summarizes the traffic operations analysis for 2025 design hour volume conditions at key intersections and ramp terminals within the Interchange 119 and 120 project area.

INTERCHANGES 119 AND 120

Interchanges 119 and 120 on Interstate 5 (I-5) are located approximately five miles south of Roseburg and serve the unincorporated community of Green. The two interchanges, which are approximately 0.7 miles apart, also provide connections to Roseburg and Winston. The Coos Bay–Roseburg Highway (OR 42) connects with I-5 at interchange 119, which provides full access for entering and exiting traffic. Old Highway 99 South parallels I-5 and crosses under the freeway just north of interchange 120. This interchange does not include a northbound on-ramp, but does provide access for all other movements.

PLANNING AREA INTERSECTIONS

Old Highway 99 at I-5 Southbound Ramps

This is a T-intersection. The westbound leg consists of the southbound on- and off-ramps to I-5, which has a shared through-left turn with a channelized right-turn lane. Old Highway 99 consists of a through lane and channelized right-turn lane on the northbound approach. The southbound approach contains a through lane and a left-turn lane.

Old Highway 99 at Speedway Road

This is a T-intersection, with the stop-controlled Speedway Road intersecting Old Highway 99 with a single-lane approach for both left- and right-turning vehicles. Old Highway 99 is a two-lane facility with shared lanes for both through and turning movements.

Old Highway 99 at Happy Valley Road

Happy Valley Road and Old Highway 99 is a signalized intersection with a driveway comprising the east approach. The northbound approach of Old Highway 99 has a shared through-right turn lane and a left-turn lane. The southbound approach consists of a channelized right turn lane with approximately 150 feet of vehicle storage, and a left turn lane. The eastbound approach of Happy Valley Road consists of a shared through-left turn lane with an exclusive right-turn lane.

Old Highway 99 at Beaver State Sand and Gravel Access

The east leg of this T-intersection provides access to Beaver State Sand and Gravel. This approach consists of a single lane for both left- and right-turning vehicles. Old Highway 99 is a two-lane facility with shared lanes for both through and turning movements.

Coos Bay–Roseburg Highway (OR 42) at Old Highway 99/Grant Smith Road

The intersection of Old Highway 99 and OR 42/Grant Smith Road is a signalized intersection located approximately 0.4 miles west of I-5. The westbound approach carries traffic from the north- and

southbound off-ramps of Interchange 119 and has four lanes: a separate left-turn lane, two through lanes, and a separate right-turn lane. The eastbound approach consists of a left-turn lane, through lane, and a shared through-right turn lane. The southbound approach of Old Highway 99 has a channelized right-turn lane with separate through and left-turn lanes. The northbound approach from Grant Smith Road has a similar configuration with right-turn channelization and separate left-turn and through movements.

OR 42 at Carnes Road/Roberts Creek Road

This intersection is located approximately 0.5 miles southwest of OR 42's intersection with Old Highway 99. The westbound approach on OR 42 consists of a left-turn lane, two through lanes, and a right-turn lane. The eastbound approach has a left-turn lane, one through lane, and one shared through-right turn lane. Both Carnes Road and Roberts Creek Road have shared through-right turn lanes and left-turn lanes.

The lane configuration and traffic control at each of the six intersections is illustrated in **Figure 1**.

2 FUTURE VOLUME DEVELOPMENT

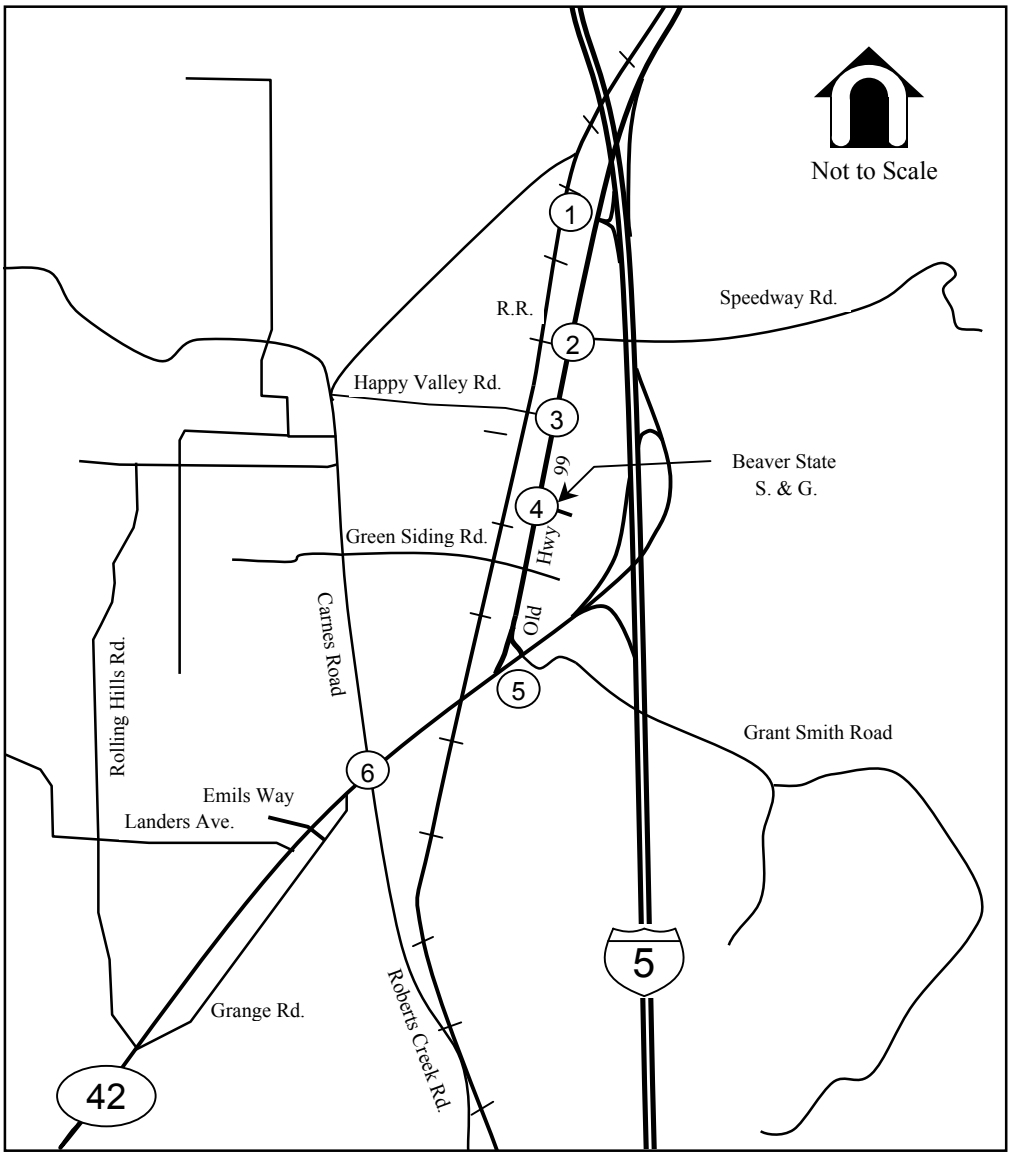
EMME/2 model volumes were developed by Decision Data and Solutions for years 2000 and 2025. Year 2004 model volumes were determined through linear interpolation between 2000 and 2025 model volumes. Using the method outlined in NCHRP 255[1], the difference between link volumes for the 2004 and 2025 model years was calculated and added to the 2004 30th highest hour volumes used for the traffic operations analysis for existing conditions. Volumes were then balanced between planning area intersections and interchanges. Year 2004 30th highest hour volumes and 2025 design hour volumes are shown in **Figure 2** and **Figure 3**, respectively. **Figure 4** shows 2004 30th highest hour and 2025 design hour volumes for Interchanges 119 and 120.

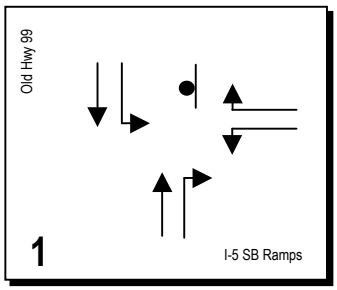
3 TRAFFIC OPERATIONS ANALYSIS

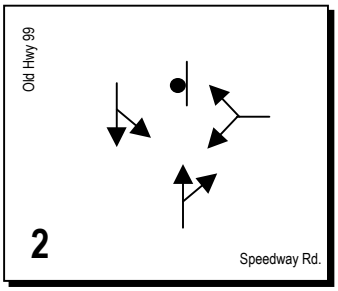
Synchro was selected for performing the traffic operational analysis for non-freeway facilities. Three of the six intersections in the study area are signalized and the remaining three are stop-controlled. The Level-of-Service report from Synchro on signalized intersections is based on Chapter 16 and the analysis of unsignalized intersections is based on Chapter 17 of the 2000 Highway Capacity Manual (HCM)[2]. The Synchro report summarizes the calculated LOS, Volume-to-Capacity Ratios, and the 95th Percentile Queue Length by lane and minor street approach for two-way stop-controlled intersections.

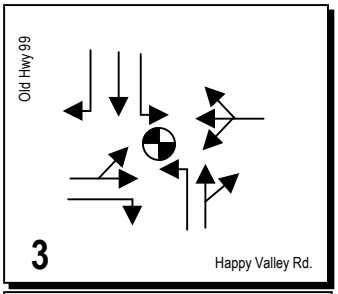
Merge and weaving segment analyses were performed using Highway Capacity Software 2000 (HCS). The merge analysis is based on chapter 25 of the Highway Capacity Manual (HCM), and the

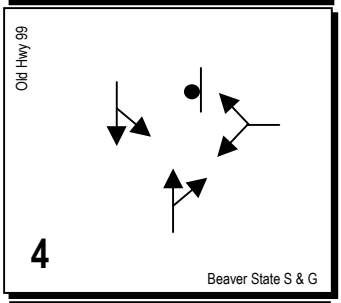
[1] *National Cooperative Highway Research Program Report 255. "Highway Traffic Data for Urbanized Area Project Planning and Design." 1982.*
[2] *Highway Capacity Manual, Transportation Research Board, Washington DC, 2000.*

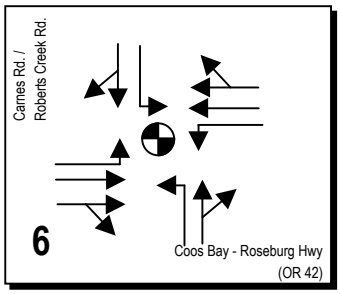


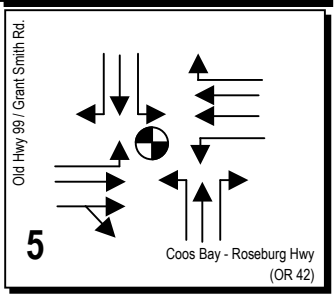












DAVID EVANS AND ASSOCIATES INC.

LEGEND

=Lane

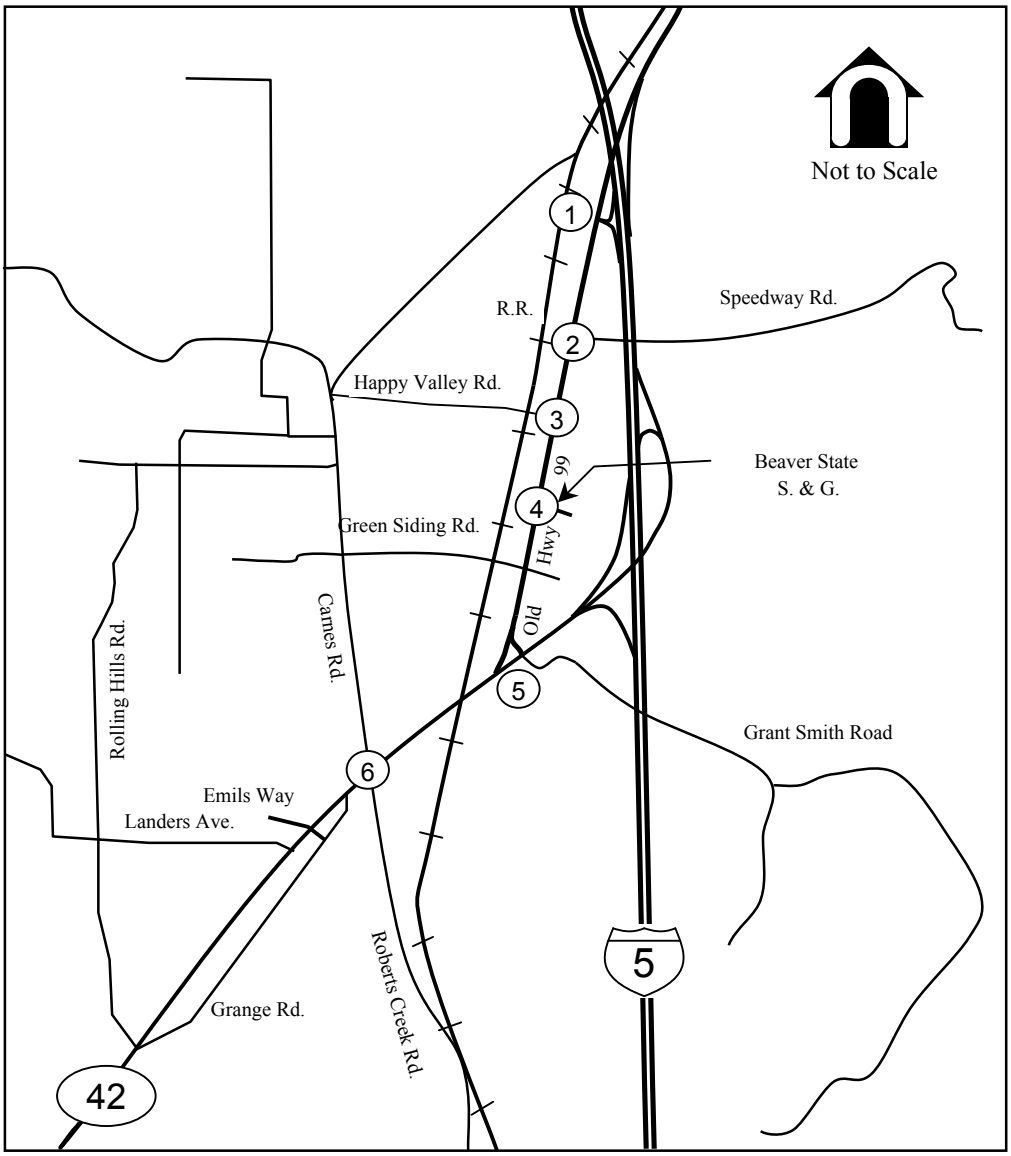
14 = Intersection Number

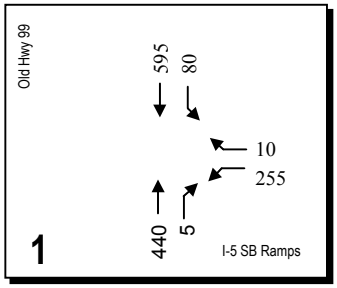
= Stop Sign

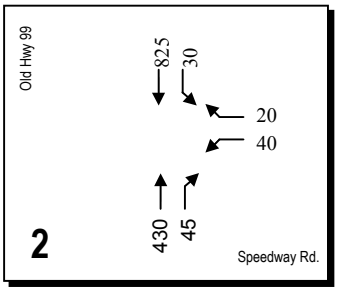
= Signalized Intersection

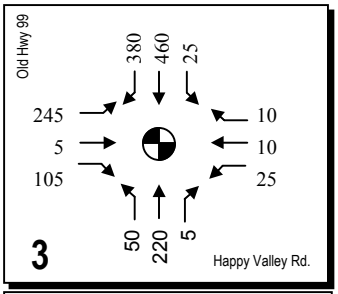
Figure 1 - Lane Configurations

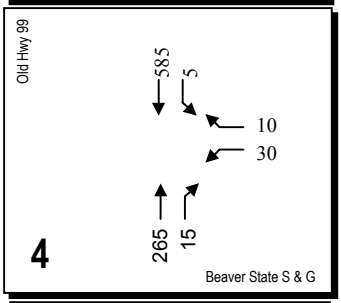
Interchanges 119/120

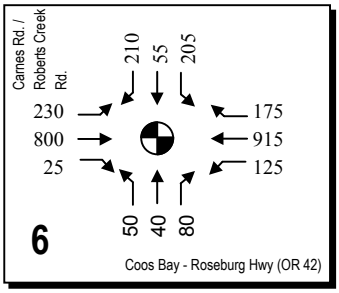


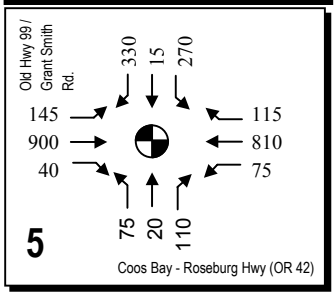












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LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

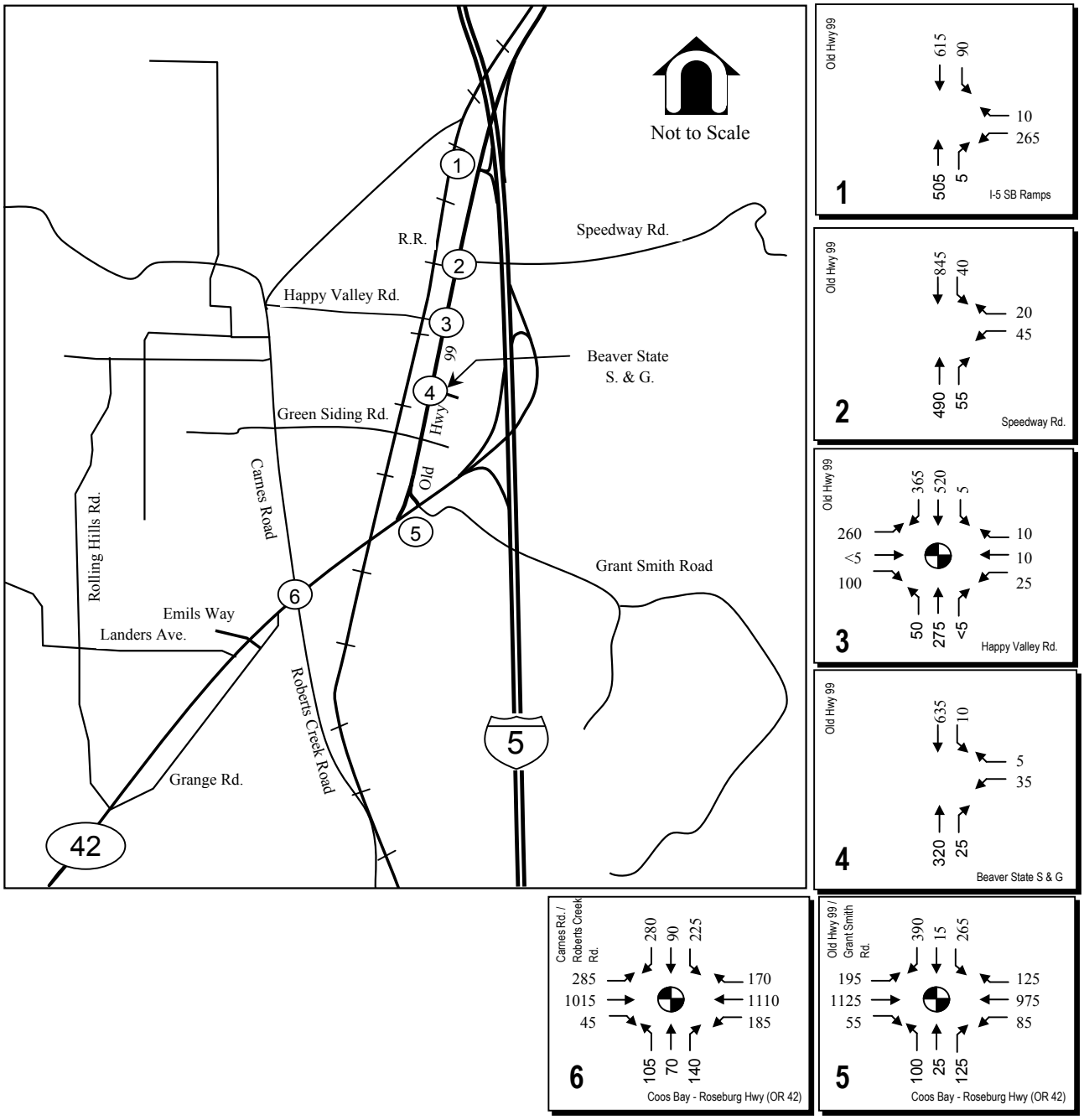
(14) = Intersection Number

= Signalized Intersection

Figure 2 - 2004 30th Hour Volumes

Balanced

Interchanges 119/120



DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

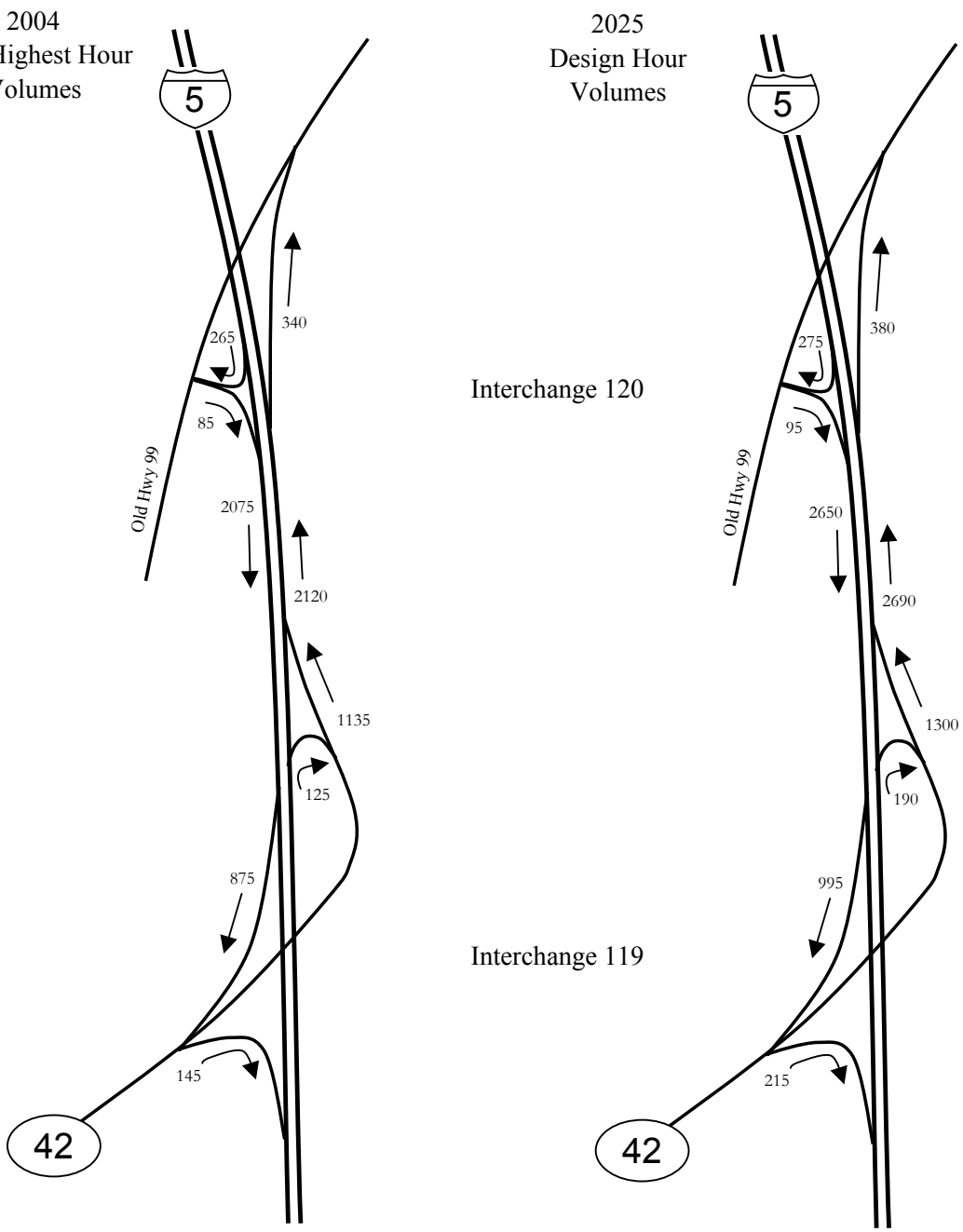
(14) = Intersection Number

= Signalized Intersection

Figure 3

2025 Design Hour Volumes

Interchanges 119/120



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Not to Scale

Figure 4

2004 30th Hour Volumes

2025 Design Hour Volumes

Interchanges 119/120

weave analysis is based on chapter 24 of the HCM. The HCS report summarizes the calculations, density, and LOS.

4 OPERATIONAL CRITERIA

INTERSECTION ANALYSIS

Transportation engineers have established various descriptors for traffic operations of intersections. The most common descriptor is the Level-of-Service (LOS) as defined by the HCM. The LOS concept requires consideration of factors that include travel speed, delay, frequency of interruptions in traffic flow, relative freedom for traffic maneuvers, driving comfort, convenience, and operating cost. Six standards have been established ranging from LOS A, where traffic is relatively free flowing, to LOS F, where the street system is totally saturated with traffic and movement is very difficult. At both signalized and unsignalized intersections, LOS is based on control delay. At two-way stop-controlled intersections, control delay is the total duration from the time a vehicle joins the back of the queue until it proceeds forward into the intersection from the first position at the stop sign.

A comparison of traffic volume demand to intersection capacity is another method of evaluating how well an intersection is operating. This comparison is presented as a Volume-to-Capacity (v/c) ratio. A v/c ratio of less than 1.0 indicates that the volume is less than capacity. When it is closer to 0.0, traffic conditions are generally good with little congestion and low delays for most intersection movements. As the v/c ratio approaches 1.0, traffic becomes more congested and unstable with longer delays.

The 1999 Oregon Highway Plan[3] (OHP) and the Douglas County TSP define mobility standards in terms of v/c ratios, which are dependent on the roadway classification and area type. According to the OHP, the mobility standard for OR 42, a rural Statewide Highway and Expressway, is 0.70. The controlling mobility standard for ramp terminals is the lower of 0.85 or that of the crossroad. Old Highway 99, the Interchange 120 crossroad, is a Rural Arterial according to the Douglas County TSP. As such, it has a mobility standard of 0.80. These mobility standards apply through the planning horizon year, which is 2025 in this case.

RAMP AND WEAVE SEGMENT ANALYSIS

The HCM defines LOS as the primary operational measure for freeway facilities. LOS is based on the density of passenger cars per mile per lane (pc/mi/ln). At LOS A, traffic moves at free-flow speeds, and vehicles experience no impedance to their ability to maneuver in the traffic stream. At the other end of the continuum is LOS F, in which demand exceeds capacity and operational breakdowns occur. LOS E represents the density at capacity.

[3] *1999 Oregon Highway Plan, Oregon Department of Transportation, Salem, OR, 1999.*

For ramp segments, chapter 25 of the HCM applies. LOS is based on the density in the merge influence area, which consists of the acceleration lane and the two right-hand freeway lanes for a distance of 1500 feet downstream from where the ramp meets the mainline.

For weaving segments, chapter 24 of the HCM applies. LOS is based on the density within the weaving segment, which consists of the mainline and auxiliary lanes over the entire length of the weaving segment. The HCM weaving methodology applies only to weaving segments of 2500 feet or less. A potential weaving segment between interchanges 119 and 120 would be approximately 2500 feet.

The OHP requires that a v/c ratio of 0.70 be met for rural interstate freeway segments. This mobility standard includes ramp and weaving segments. The HCM provides methodologies for determining the capacity of ramps and weaving segments, from which a v/c ratio can be determined.

5 INTERSECTION OPERATIONS

This section presents the results of the operational analysis for 2004 and 2025 conditions at each intersection. The results are based on HCS reports generated by Synchro. As directed by ODOT[4], peak hour factors for future year analysis were as follows: 0.85 for local and collector street approaches; 0.90 for minor arterial approaches; and 0.95 for major arterial approaches. Signalized intersections were optimized within Synchro and percent heavy vehicles were unchanged from the year 2004 analysis. **Table 1** summarizes traffic operations analysis results for both 2004 and 2025 traffic volume conditions.

Table 1. Intersection Operations Analysis Summary

		2004			2025		
Intersection	**Approach**	**V/C Ratio**	**95th Percentile Queue**	**LOS**	**V/C Ratio**	**95th Percentile Queue**	**LOS**
Old Highway 99 at I-5 SB Ramps	Westbound L	60	475	F	1.95	5.75	F
Old Highway 99 at Speedway Road	Westbound L/R	0.33	50	D	0.50	75	F
	Northbound T/R	0.29	0	n/a†	0.34	0	n/a†
Old Highway 99 at Happy Valley Road	**Intersection**	**0.65**	**n/a**	**B**	**0.70**	**n/a**	**B**
	Southbound T	0.58	325	B	0.65	400	B
	Eastbound L/T	0.79	225	C	0.82	250	D
Old Highway 99 at Beaver State S&G	Westbound L/R	0.14	<25	C	0.17	<25	C
	Northbound T/R	0.18	0	n/a†	0.21	0	n/a†
	Southbound L/T	0.00	0	A	0.01	<25	A
OR 42 at Old Highway 99 / Grant Smith Road	**Intersection**	**0.74**	**n/a**	**C**	**0.77**	**n/a**	**C**
	Eastbound L	0.73	175	D	0.76	250	D

[4] *Application of Oregon Highway Plan Mobility Standards. October 2004*

	Eastbound T/R	0.65	350	B	0.75	475	B
	Southbound L	0.84	325	D	0.86	325	D
	Westbound T	0.61	325	B	0.75	425	C
	Intersection	**0.72**	**n/a**	**C**	**0.92**	**n/a**	**D**
OR 42 at Carnes Road /	Eastbound L	0.82	275	D	0.94	350	E
Roberts Creek Road	Westbound T/R	0.73	350	C	0.91	500	D
	Southbound L	0.66	250	D	0.92	300	E

† Free vehicular movements

The network is expected to see significant increases in traffic volumes in the next 20 years. Consequently, intersection operations will be degraded to varying degrees. A discussion of intersection results follows.

Old Highway 99 at I-5 SB Ramps

The westbound approach is currently well over capacity with a v/c of 1.60. The 95th percentile queue length is 475 feet. A queue of this length extends into the segment of the ramp needed for deceleration. Under 2025 volume conditions, intersection operations will further degrade with longer queues and more delay.

A preliminary signal warrant analysis has shown that this intersection meets the following MUTCD signal warrants under current traffic volume conditions: Warrant 1, Eight-Hour Vehicular Volume; Warrant 2, Four-Hour Vehicular Warrant; and Warrant 3, Peak-Hour.

Old Highway 99 at Speedway Road

The stop-controlled approaches are currently operating within County mobility standards and are expected to remain within an acceptable range through 2025. The westbound approach is expected to be at LOS 'F' with delays of about 50 seconds. However, this is a relatively minor approach with low volumes. The overall intersection operation is expected to remain satisfactory.

Old Highway 99 at Happy Valley Road

This intersection is currently operating at a v/c of 0.65, with moderate queuing on the southbound and eastbound approaches. Under 2025 design hour volume conditions, the intersection is expected to meet the Douglas County mobility standard with a v/c of 0.70.

Old Highway 99 at Beaver State Sand and Gravel

This two-way stop-controlled intersection is operating well within the mobility standard under current and future traffic volume conditions.

OR 42 at Old Highway 99 / Grant Smith Road

The north- and southbound on-ramps for Interchange 119 diverge approximately 1000 feet to the east of this intersection, with the left lane going north and the right lane going south. About 85% of the eastbound vehicles leaving this intersection head north at the interchange. Most of those vehicles

have already assumed their desired lanes on the eastbound approach to the intersection. This results in many more vehicles queuing in the left lane than in the right lane.

Preliminary analysis, as shown in Table 1, depicts the intersection operating with moderate queuing and overall v/c ratios of less than 1.00 for both existing and future year conditions. However, this analysis assumed a nearly equal distribution between the right and left lanes of the eastbound approach. Therefore, the values shown in Table 1 are likely underreporting overall v/c ratios and 95th percentile queue lengths on the eastbound approach due to lane imbalance that is occurring.

Supplemental analysis was conducted using Synchro and SimTraffic to more accurately reflect the queuing and v/c resulting from lane imbalances. **Table 2** shows the results of a Synchro HCM sensitivity analysis testing the impacts of increasingly unbalanced lane use ratios on the eastbound leg. The table presents the 95th percentile queue and v/c ratio with lane imbalances from the Synchro default (nearly 50/50) to an extreme of 90/10. Not surprisingly, the table shows that 95th percentile queues and v/c ratios increase as the lane imbalance becomes more pronounced. The Synchro HCM queuing reports are not reliable beyond a certain volume threshold, since Synchro records queues after only two cycle lengths. HCM queuing methodology also does not take into account the impacts of turn-lane overflow on through traffic, or the effects of downstream congestion. Table 2 shows queues well above 500 feet and v/c ratios approaching or exceeding capacity under most lane use ratios. However, given the limitations of the methodology, actual queues may be longer than those shown.

Table 2. Queuing Sensitivity Analysis; Eastbound Leg - OR 42 at Old Highway 99/Grant Smith Road

Lane Use Ratio	*2004 95% Queue (ft)*	*2004 v/c*	*2025 95% Queue (ft)*	*2025 v/c*
Default	350	0.65	475	0.75
60/40	425	0.72	650†	0.84
70/30	625†	0.82	850†	0.95
75/25	675†	0.87	950†	1.00
80/20	750†	0.92	1050†	1.07
85/15	850†	0.98	1175†	1.14
90/10	925†	1.04	1250†	1.20

† 95th percentile queue exceeds capacity, queue may be longer
Queues shown are maximum after two cycles.

SimTraffic was also used to simulate current and future year volume conditions at the intersection. SimTraffic is not subject to the limitations inherent in HCM queuing analysis due to its ability to calculate the effects of traffic flow under saturated traffic conditions where traffic may spill out of left-turn storage bays or spill over from one intersection to another. Therefore, SimTraffic generally returns more reliable queuing results for heavily congested facilities. Model parameters were set such that all vehicles heading south at the interchange would be in the right lane and all vehicles heading north would be in the left lane at the intersection approach. This distribution imbalance can be expected to return conservative results due to the assumption of zero lane changes downstream of

the intersection. Five simulation model runs were recorded and queue lengths were averaged for both current and future year volume scenarios. Based on these model runs, the maximum observed queue for the eastbound approach is approximately 1000 feet for current year and 1500 feet for year 2025 volume conditions.

OR 42 at Carnes Road

Currently this intersection marginally exceeds the mobility standard with a v/c of 0.75. Under future year traffic volume conditions, the intersection is expected to approach capacity with a v/c of 0.92. The eastbound left, westbound through/right, and southbound left-turn movements are all expected to exceed a v/c of 0.90 under future year traffic volume conditions.

6 FREEWAY OPERATIONS

The OHP spacing standard requires two miles between the on-ramp of one interchange and the off-ramp of a downstream interchange in rural locations. However, the southbound on-ramp at Interchange 120 is located about 2200 feet from the southbound off-ramp at Interchange 119, and the northbound on-ramp for Interchange 119 is located about 2500 feet from the off-ramp of Interchange 120.

The volume of vehicles entering I-5 northbound from Interchange 119 is significant, as it is approximately equal to the mainline volume. According to an October 18, 2004 CH2M Hill, Inc. memo, the acceleration lane for the northbound on-ramp at Interchange 119 is 300 feet short of ODOT standards. This configuration forces large volumes of vehicles to complete their merge maneuver over a substandard length. Freeway operations during peak operating hours are characterized by congestion and a general degradation of LOS between the on- and off-ramps.

A 1999 ODOT origin-destination study found that 20 percent of northbound vehicles entering at Interchange 119 subsequently exit at Interchange 120. It has been suggested that the addition of an auxiliary lane between the on- and off-ramps could improve operations. An auxiliary lane would create a weaving segment between the ramps. The following sections evaluate current and future year traffic operations under the existing interchange configuration (merge/diverge analysis) and with an auxiliary lane (weave analysis).

Due to the low volumes of ramp-to-ramp traffic in the southbound direction, a southbound auxiliary lane is not recommended. However, mainline freeway operations in the southbound direction were examined and found to be operating at acceptable v/c ratios of 0.48 and 0.62 under 2004 and 2025 traffic volume conditions, respectively.

MERGE DIVERGE ANALYSIS

Figure 4 shows 2004 and 2025 volumes for the Interchange 119 and 120 ramps, as well as the mainline. HCM Ramps and Ramp Junction methodology was used to determine LOS of the Interchange 119 ramps under 2025 design hour volume conditions.

A v/c analysis was also conducted so that the merge and diverge segments could be compared to OHP mobility standards. According to the HCM, a merge area on a two-lane freeway has a desirable capacity of 4600 passenger cars per hour (pc/hr), and a diverge area has a desirable capacity of 4400 pc/hr. The sum of the ramp and mainline design hour volumes (adjusted for heavy vehicles and peak 15-minute volume conditions) were divided by the desirable capacity to determine v/c ratios.

Table 3 summarizes results for 2004 and 2025 ramp junction analysis at Interchanges 119 and 120 under existing lane configurations. The northbound off-ramp terminal at Old Highway 99 is also provided. As the table shows, the ramp junctions are expected to experience increased traffic volumes, which will increase density and degrade v/c and LOS. However, even under 2025 traffic volume conditions, no ramps are expected to operate below a v/c of 0.60 and LOS C.

Table 3. Interchanges 119/120 Ramps Operations Analysis Summary

Direction of Travel	2004 Density (pc/mi/ln)	2004 v/c	2004 LOS	2025 Density (pc/mi/ln)	2025 v/c	2025 LOS
IC 119 Northbound On	18.4	0.52	B	23.3	0.65	C
IC 119 Northbound Off	12.7	0.25	B	17.2	0.35	B
IC 119 Southbound On	12.9	0.33	B	17.4	0.46	B
IC 119 Southbound Off	26.3	0.53	C	27.3	0.68	C
IC 120 Northbound Off	20.6	0.54	C	26.1	0.68	C
IC 120 Southbound Off	23.7	0.57	C	29.3	0.72	D
IC 120 Southbound On	19.8	0.51	B	24.7	0.65	C
IC 120 Northbound Off at Old 99	n/a†	0.54	A	n/a†	0.60	B

† HCM (density-based) merge methodology does not apply to two-way, two-lane facilities. Synchro ICU report results are shown for a yield controlled intersection.

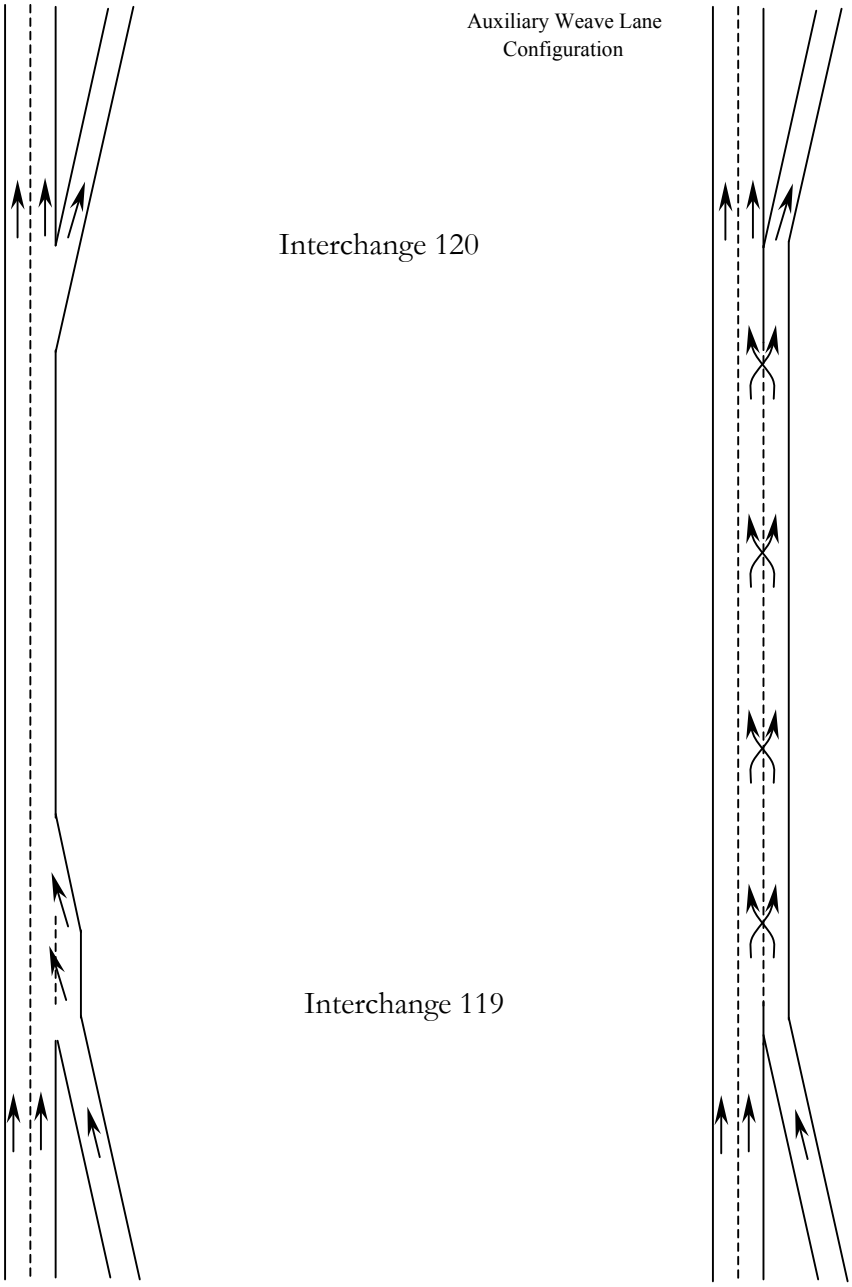
WEAVE ANALYSIS

A significant amount of northbound ramp-to-ramp traffic exists between the on-ramp at Interchange 119 and the off-ramp at Interchange 120. One proposal to improve operations on the freeway segment between the ramps and at the ramp junctions is the addition of an auxiliary lane that would run between the two interchanges. The addition of a third lane would create a weave segment. **Figure 5** illustrates the merge and diverge movements for the current ramp configuration and the weave movements of a possible auxiliary lane between the two ramps. HCM Weaving methodology was used to determine LOS of an auxiliary lane scenario.

A v/c analysis was also conducted so that the weave segment could be compared to OHP mobility standards. Weave lane capacity can be calculated from Exhibit 24-8 of the HCM. Capacities for weaving segments vary according to several factors, including number of lanes, free-flow speed, length of weaving segment, type of weave configuration, and ratio of weaving vehicles to all vehicles. A three-lane weaving segment on this segment of freeway would have a theoretical capacity of 5200 pc/hr under 2004 volume conditions, and 5430 pc/hr under 2025 volume conditions. Design hour volumes were divided by the calculated capacity to determine v/c ratios.

Merge / Diverge Configuration

Auxiliary Weave Lane Configuration



DAVID EVANS AND ASSOCIATES INC.

Not to Scale

Figure 5

Merge / Diverge & Auxiliary Lane Interchange Configurations

Interchanges 119/120

Analysis results are summarized in **Table 4.**

Table 4. Interchange 119/120 Weaving Segment Summary

	2004	*2025*
Speed (mph)	51.0	50.2
Density (pc/mi/ln)	15.3	19.7
v/c	0.41	0.50
LOS	B	B

Analysis results for the weave segment show moderately improved operations compared to the merge/diverge configuration (*Northbound On* row from Table 3), with the weave segment improving v/c from 0.46 to 0.41 for current year conditions and from 0.58 to 0.50 for year 2025 conditions. The weave segment would be expected to maintain a LOS of B through 2025.

1999 ODOT WEAVING ANALYSIS

ODOT conducted a weaving analysis in 1999 to evaluate whether an auxiliary lane between the ramps would have any operational benefits over the current ramp configuration. This analysis was based on 1994 HCM methodology as well as the Leisch method under 1999 and 2020 traffic volume conditions. The ODOT report does not state the traffic volumes used.

The analysis compared merge LOS with weave LOS, and determined that, under 2020 traffic volume conditions, a weave lane would operate at LOS B, with a density of 19.7. The merge analysis results showed a LOS of D, with a density of 29.3. Results are summarized in **Table 5.**

Table 5. 1999 ODOT Auxiliary Lane Analysis Results (1994 HCM Methodology)

	1999		**2020**	
	Existing Conditions	**With Auxiliary Lane**	**Existing Conditions**	**With Auxiliary Lane**
Density	17.4	14.7	29.3	19.7
LOS	B	B	D	B

The ODOT weave analysis draws a similar conclusion to that of the present analysis with decreased vehicular densities resulting in improved LOS with the addition of an auxiliary lane. However, the ODOT analysis shows a more pronounced improvement over current operations. It should be noted that only summary data from the ODOT analysis was available.

SIMTRAFFIC SIMULATION MODELING

Simulation modeling using SimTraffic software was conducted to supplement HCM analysis results and construct a more complete picture of freeway operations under both scenarios. Simulation

performance results are based on observed vehicle operations and therefore can provide a more realistic reproduction of actual traffic operations. The SimTraffic performance measures selected for analysis were delay per vehicle and average speed. SimTraffic model output does not provide v/c or LOS. **Table 6** shows a comparison of these measures for merge/diverge and weaving segments under 2004 and 2025 traffic volume conditions.

Table 6. SimTraffic Merge/Diverge and Weaving Simulation Summary

		2004		2025	
		119 On-Ramp	I-5 Mainline	119 On-Ramp	I-5 Mainline
Merge/Diverge	Delay/vehicle (s)	4.9	8.2	8.1	18.2
	Avg Speed (mph)	43	52	39	45
Auxiliary Lane	Delay/vehicle (s)	7.0	5.2	14.4	9.0
	Avg Speed (mph)	40	55	32	52

The results show that an auxiliary lane would improve freeway operations. However, the model results show the ramps operating with lower speeds and more delay with an auxiliary lane in place. This decrease in operational performance may reflect the spillback from disruption caused by the weaving of entering vehicles from Interchange 119 and mainline vehicles exiting at Interchange 120. It should be noted that the facility is expected to perform adequately under either scenario.

CONCLUSIONS AND RECOMMENDATIONS

Generally weaving lanes cause significant turbulence and increase the number of potential conflicts. An auxiliary lane would remove the merge/diverge maneuver for ramp-to-ramp vehicles. This movement accounts for a full 20 percent of entering vehicles at Interchange 119, or 260 out of 1300 future year peak hour vehicles. However, an auxiliary lane would force a lane-change maneuver where one currently does not exist for mainline vehicles exiting at Interchange 120 (approximately 120 future year peak hour vehicles). An auxiliary lane would allow a greater distance for entering vehicles to complete their merge with mainline traffic, but it would also extend the length over which potential conflicts may occur, as well as create additional conflicts over the current configuration.

HCM ramp and weaving analysis results show moderately improved overall performance with an auxiliary lane than with the current merge/diverge configuration. A v/c analysis shows that, while an auxiliary lane would improve operations, OHP mobility standards would be met under future year traffic volume conditions even if an auxiliary lane is not constructed. SimTraffic modeling is useful to gain a more complete understanding of the impacts an auxiliary lane would have on freeway and ramp operations. This methodology shows that an auxiliary lane does offer some level of improved operations over the existing merge/diverge configuration for mainline through traffic. However, an auxiliary lane may not provide appreciable benefits to ramp operations.

Reports have indicated that platooned vehicles being released by the signal at OR 42 and Old Hwy 99 create surges that may have a more significant impact on ramp junction operations than the analysis methods would indicate. An auxiliary lane would do nothing to meter the volume surge, but it would reduce the number of merging movements onto the freeway and spread them out over a

greater distance. Ramp metering could control the volume surge, but would also generate significant queuing that could impact the operation of the upstream intersection of OR 42 at Old Highway 99, which is already approaching mobility standard limits. For this reason, ramp metering is not recommended.

Despite peak hour congestion at the Interchange 119 ramp junction, analysis shows that the ramp and mainline facilities are generally operating at acceptable LOS and v/c. If operations were more constrained, or if a larger percentage of ramp-to-ramp vehicles were present, then an auxiliary lane may be more beneficial. However, given the existing and forecast volumes on the ramp and freeway facilities, an auxiliary lane may not provide substantial operational benefits.

Appendix D

Safety Analysis

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: September 7, 2004
TO: Technical Advisory Committee
FROM: David Evans and Associates, Inc.
SUBJECT: **Safety Analysis**
PROJECT: Interchange 119 and 120
PROJECT NO: ODOT0000-0436
COPIES:

The Interchanges 119 and 120 safety analysis report is intended to summarize and evaluate crashes in the project area that is located in the Green Unincorporated Urban Area of Douglas County south of Roseburg. Interchanges 119 and 120 on I-5 are located approximately five miles south of Roseburg and serve the Green Area. The two interchanges, which are approximately 0.7 miles apart, also provide connections to Roseburg and Winston. ORE 42 connects with I-5 at interchange 119. ORE 99 parallels I-5 and crosses under the freeway just north of interchange 120.

The safety analysis included a review of the ODOT supplied Planning Research Corporation (PRC) crash listings (2000 to 2002), Oregon Department of Transportation's (ODOT) Safety Priority Index System (SPIS) data, and a comparison of calculated crash rates with statewide averages. The procedures used to analyze this data are described in the following sections.

The process for analyzing the safety data provided was to determine the location and frequency of crashes occurring in the study area. Crashes were totaled by segment and by intersection. After being summarized and placed into the appropriate segment, intersection crash rates were calculated and compared to statewide averages.

PRC REPORTS

Planning Research Corporation (PRC) reports are generated by ODOT personnel in the Crash Analysis and Reporting Unit from statewide crash databases. The PRC crash listings were obtained from ODOT for the most recent three complete years of reported crashes. It should be noted that the crashes listed are only the crashes reported.

CRASH RATES

The crash rates were calculated from the PRC crash reports. Crash information collected represents crashes that occurred within 265 feet of the intersection and only those crashes that were reported. In Oregon, legally

reportable crashes are those involving death, bodily injury or damage to any one person's property in excess of $1,000 as of August 31, 1997.

Intersection crash rates were calculated using the following equations.

$$rate_{\text{int}} = \frac{(Crashes \cdot 1{,}000{,}000)}{(365 \cdot Years \cdot ADT)} \quad \text{and} \quad rate_{segment} = \frac{(Crashes \cdot 1{,}000{,}000)}{(365 \cdot Years \cdot Length \cdot ADT)}, \text{ where}$$

$Rate_{int}$ = Crash rate per Million Entering Vehicles (MEV)

$Rate_{segment}$ = Crash rate per Million Vehicle Miles Traveled (MVMT)

Crashes = Number of crashes during the time segment

Years = Number of years being studied

ADT = Average Daily Traffic volumes

Length = Length of roadway segment being studied (for segment rates).

The number of crashes was determined from the PRC reports. The ADT for each intersection was determined using 10 times the PM Peak Hour Volume. The Transportation Volume tables contain volumes for the highway, but do not include the minor street volumes. The ADT for segment Crash Rates was determine using the ODOT Volume Tables. Crash rates were then calculated for the entire three-year study period.

SPIS DATA

The Safety Priority Index System (SPIS) is a method developed by ODOT for prioritizing locations where funding for safety improvements can be spent most efficiently and effectively. Based on crash data, the SPIS score is influenced by three components: crash frequency, crash rate, and crash severity. Three years of crash data are analyzed for the SPIS score. SPIS locations meet one of two criteria during the previous three years: three or more crashes at the same location, or one or more fatal crashes at the same location. A list of the sites with the top 10% SPIS scores is produced each year. For the year 2003, which includes crash data for 2000, 2001, and 2002, the SPIS scores at or above 45.07 are in the top 10%.

There are two Top 10% SPIS locations surrounding interchanges 119 and 120. The first is the area surrounding the intersection of Carnes Road from milepost 75.63 to 75.79 on the Coos Bay – Roseburg Highway (ORE 42). The second location is from milepost 76.29 to 76.43 on the Coos Bay-Roseburg Highway. This section has one fatal crash where a pedestrian was walking in the roadway.

STUDY AREA FINDINGS

Crashes were summarized by location for each of the eight study intersections and Landers Avenue at the Coos Bay – Roseburg Highway. **Figure 1** shows the location and the number of crashes that occurred between 2000 and 2002. The figure shows that all of the segments have less than 10 crashes in the last three years.

Once crashes where sorted by location, it was then possible to calculate intersection crash rates. Table 1 shows the ADT that was determined for each intersection and the calculated crash rates.

Table 1 . Study Area Intersection Crash Rates

Intersection	ADT	3 Year Crash Rate
Oakland-Shady Highway at IC 120 SB On/Off Ramp	11,480	0.40
Oakland-Shady Highway at Speedway Road	11,140	0.08
Oakland-Shady Highway at Happy Valley Road	12,310	0.37
Oakland-Shady Highway at Beaver State S & G	6,920	0.00
Oakland-Shady Hwy at Coos Bay-Roseburg Hwy	23,800	0.23
Coos Bay-Roseburg Highway at Carnes Road	23,610	1.04
Coos Bay-Roseburg Highway at Emils Way	20,610	0.04
Coos Bay-Roseburg Highway at Landers Avenue	19,615	0.33
Coos Bay-Roseburg Highway at Rolling Hills Road	18,620	0.05

The crash rate of 1.04 at the intersection of the Coos Bay-Roseburg Highway at Carnes Road is high when compared to the surrounding intersections. It should be noted that all of the crash data at this intersection occurred prior to the intersection improvements completed in 2003. This location had 27 crashes that occurred at or within 265 ft of the intersection between 2000 and 2002. The crashes included are from the Coos Bay-Roseburg Highway and Carnes Road. Of the 27 crashes, 18 were rear end crashes. This intersection is a Top 10% SPIS location. There were no fatal crashes at this location. There were 15 injury-related crashes and 12 property damage only crashes.

The segment crash rate for the Coos Bay-Roseburg Highway is 1.44 between Rolling Hills Road and the interchange 119 ramp terminals. The comparable statewide crash rate for intersections on highways in the same class as the Coos Bay-Roseburg Highway is 0.80. The high crash rate is due to the large number of crashes at the intersection of the Coos Bay-Roseburg Highway and Carnes Road.

The Oakland-Shady Highway from the Coos Bay-Roseburg Highway to the ramp terminal at interchange 120 is 1.04. The comparable statewide crash rate for highways in the same class as the Oakland-Shady highway is 0.99.

Crashes were also examined on the freeway near interchanges 119 and 120. The crashes were examined from interchange 119 northbound on ramp (MP 119.72) to interchange 120 northbound off ramp (MP 120.41) and interchange 120 southbound off ramp (MP 120.43) to interchange 119 southbound on ramp (MP 119.31). Table 2 below summarizes the crashes on Interstate 5 near interchanges 119 and 120:

Table 2 . Freeway Crash Data

Location	2000	2001	2002	Total
Northbound				
IC 119 Off Ramp (MP 119.72)	1	0	0	1
IC 119 On Ramp (MP 119.99)	1	1	1	3
IC 119 On to IC 120 Off Ramps	2	1	4	7
IC 120 Off Ramp (MP 120.41)	1	1	2	4
IC 119 On and Off (ORE 42)	1	1	2	4
Southbound				
IC 120 Off Ramp (MP 120.43)	0	1	0	1
IC 120 On Ramp(MP 120.13)	0	0	0	0
IC 120 On to IC 119 Off Ramps	0	4	0	4
IC 119 Off Ramp (MP 119.68)	0	0	0	0
IC 119 On Ramp (MP 119.68)	0	0	0	0

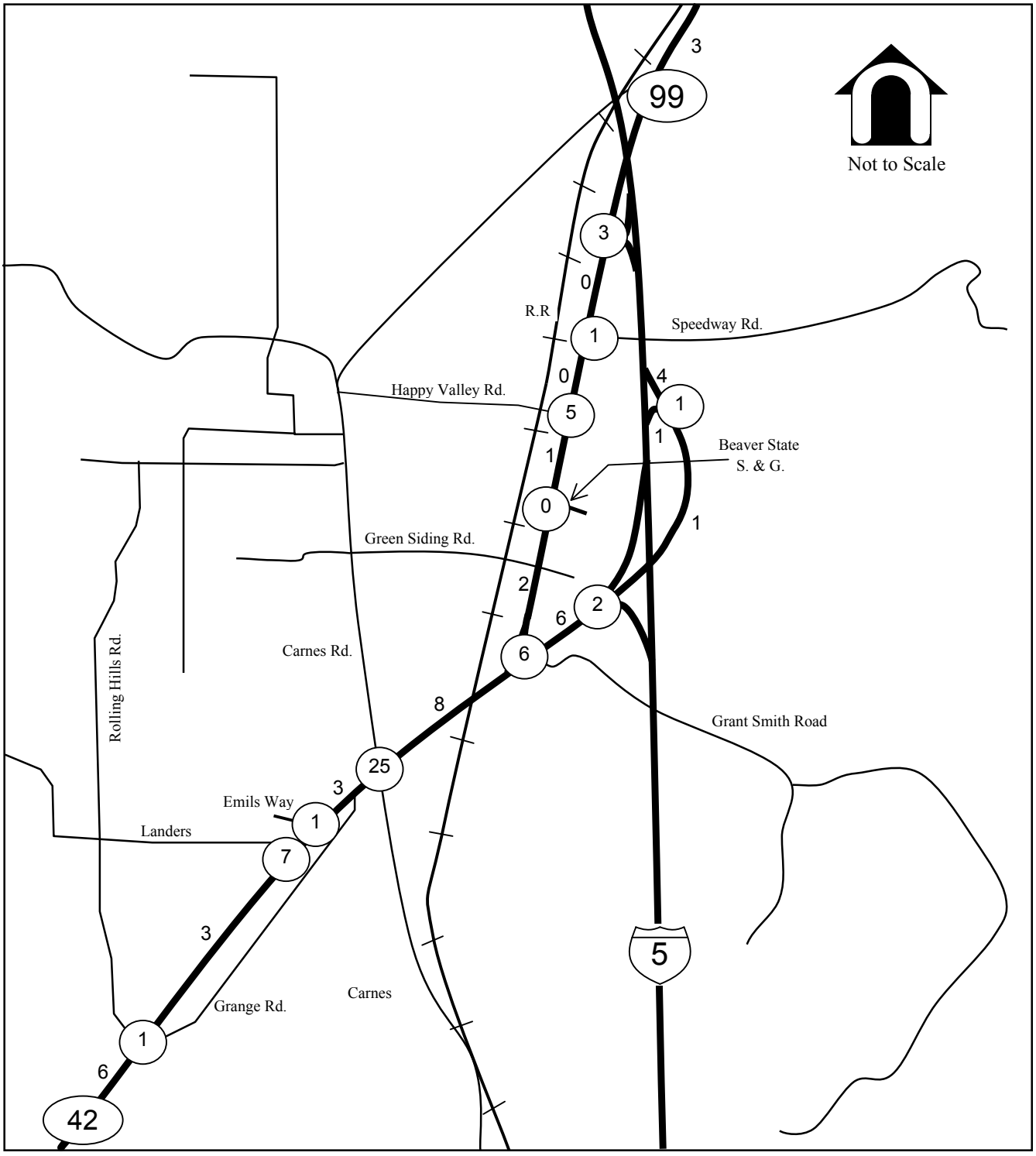
As can be seen from the table above, there were 7 crashes between the northbound on ramp at interchange 119 and the off ramp at interchange 120. In the southbound direction, 4 crashes occurred between the on ramp of interchange 120 and the off ramp of interchange 119. The segment crash rate for northbound and southbound I-5 from the off-ramp at interchange 120 to the on-ramp at interchange 119 is 0.28. The comparable statewide average is 0.22. Neither northbound or southbound directions have SPIS scores high enough to be in the Top 10%.

CONCLUSIONS

The safety analysis conducted showed that one of the intersections in the study area has a crash rate greater than the surrounding area. The intersection of the Coos Bay – Roseburg Highway and Carnes Road had 25 crashes within the influence area between 2000 and 2002. This Top 10% SPIS site had primarily rear-end type crashes. Due to the nature of rear-end crashes, there is no specific mitigation that can be suggested. Rear-end crashes are often caused by driver inattention.

However, there are some general suggestions that can be made. One option that might improve safety would be to increase the clearance interval. Ocassionally, signal heads can also be difficult to see. This can be due to the time of day and the way the sun shines on the head or it could be due to the orientation of the signal head. Re-aiming the signal head or using a different type of luminare could improve the visibility of the traffic signal.

Attachments/Enclosures: 1



DAVID EVANS AND ASSOCIATES INC.

LEGEND

(#) = Number of Intersection Crashes

=Number of Segment Crashes

Figure 1 - Crash Summary

Interchanges 119/120

Appendix E

Existing Soils, Agriculture

and Natural Resources Narrative

DAVID EVANS
AND ASSOCIATES INC.

I-5 INTERCHANGES 119 AND 120
INTERCHANGE AREA CONDITIONS REPORT

EXISTING SOILS, AGRICULTURE, AND NATURAL RESOURCES, NARRATIVE

Prepared for:

ODOT Region 3
3500 NW Stewart Parkway
Roseburg, Oregon

Prepared by:

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

June 15, 2005

DAVID EVANS AND ASSOCIATES INC.

INTRODUCTION

This memorandum documents the existing natural and historic resources within conditions report study area. Sensitive natural and historic resources in the planning area are identified as well as potential constraints that could pose challenges or barriers to future transportation facility improvements. The following information was reviewed:

- Goal 5 resources;
- Federal Emergency Management Agency (FEMA) floodplains;
- Known Threatened and Endangered (T&E) listed species;
- Wetlands and the presence of hydric soils;
- Cultural and historic resources; and
- Agency Cultural Resource Specialist lists for potential archeology sites.

GOAL 5 RESOURCES

Both interchanges are located within the Middle South Umpqua River watershed within the South Umpqua subbasin. The Douglas County Comprehensive Plan (1997) identifies Goal 5 resources within the entire County and establishes goals and policies for the protection of those resources. None of the maps included in the Comprehensive Plan identify any Goal 5 resources within the vicinity of the interchanges. The South Umpqua River was not identified as a Goal 5 resource.

As a part of the *I-5 State of the Interstate Report (2000)*, the US Fish and Wildlife Service evaluated natural resources within ¼ mile of each side of I-5 corridor to identify any significant natural resources to determine the most suitable locations for future interchange improvements. Interchanges 119 and 120 are located within Corridor Segments 6 to 8. No significant natural resources were identified, although the South Umpqua River was identified as having severe water quality impacts and is on the Oregon Department of Water Quality (DEQ) list of water quality limited streams. Because the river is designated a water quality limited stream, the regulating agencies may require that special construction guidelines be followed to treat water runoff. These may include special water quality swales or detention ponds.

FLOODPLAIN

Floodplains are the dynamic areas along the boundaries of surface waters that provide the transition from open waters to uplands. Floodplains provide important benefits including flood control and water quality protection. They also provide important habitat for plants, animals, and other organisms.

FEMA Floodplain maps identify 100-year and 500-year flood zones near the two interchange areas (See Overview Map – 01103783.25r – Parametrix, Inc.). Applicable map panels are shown in **Table 1**. The South Umpqua River floodplain is located closer to Interchange 120 than to Interchange 119. The 100-year floodplain is generally located to the northwest of both interchanges. Interchange 120 appears to be more constrained of the two interchanges because the 100-year floodplain is located on both sides of I-5.

OVERVIEW MAP - 01103783.25r - Parametrix, Inc.

- Target Property
- Sites at elevations higher than or equal to the target property
- Sites at elevations lower than the target property
- Coal Gasification Sites
- National Priority List Sites
- Landfill Sites
- Dept. Defense Sites
- Power transmission lines
- Oil & Gas pipelines
- 100-year flood zone
- 500-year flood zone
- Federal Wetlands
- Areas of Concern

0 1/4 1/2 1 Miles

N

TARGET PROPERTY:	07804N	CUSTOMER:	Parametrix, Inc.
ADDRESS:	07804N	CONTACT:	Michael Marshall
CITY/STATE/ZIP:	Roseburg OR 97470	INQUIRY #:	01103783.25r
LAT/LONG:	43.1606 / 123.3657	DATE:	December 23, 2003 2:13 pm

Table 1. Floodplain Map Panel Numbers

Interchange	FEMA Floodplain map panel number
119	41005909 30A
120	41005909 30A

Interchange 119

Interchange 119 is located approximately one mile from the South Umpqua River and its associated FEMA floodplain. The Douglas County Floodplain Overlay indicates a portion of North Fork Roberts Creek, an intermittent stream that joins the South Umpqua River downstream of the site, is located about a quarter mile south of Interchange 119 (See Figure 3.2-9 100-Year Floodplain Map). Although the interchange is near the North Fork Roberts Creek, a preliminary review indicates that the bridge is outside of the floodplain. Therefore, no special floodplain considerations would be expected during repair or replacement of Interchange 119 (Parametrix, 2004).

Interchange 120

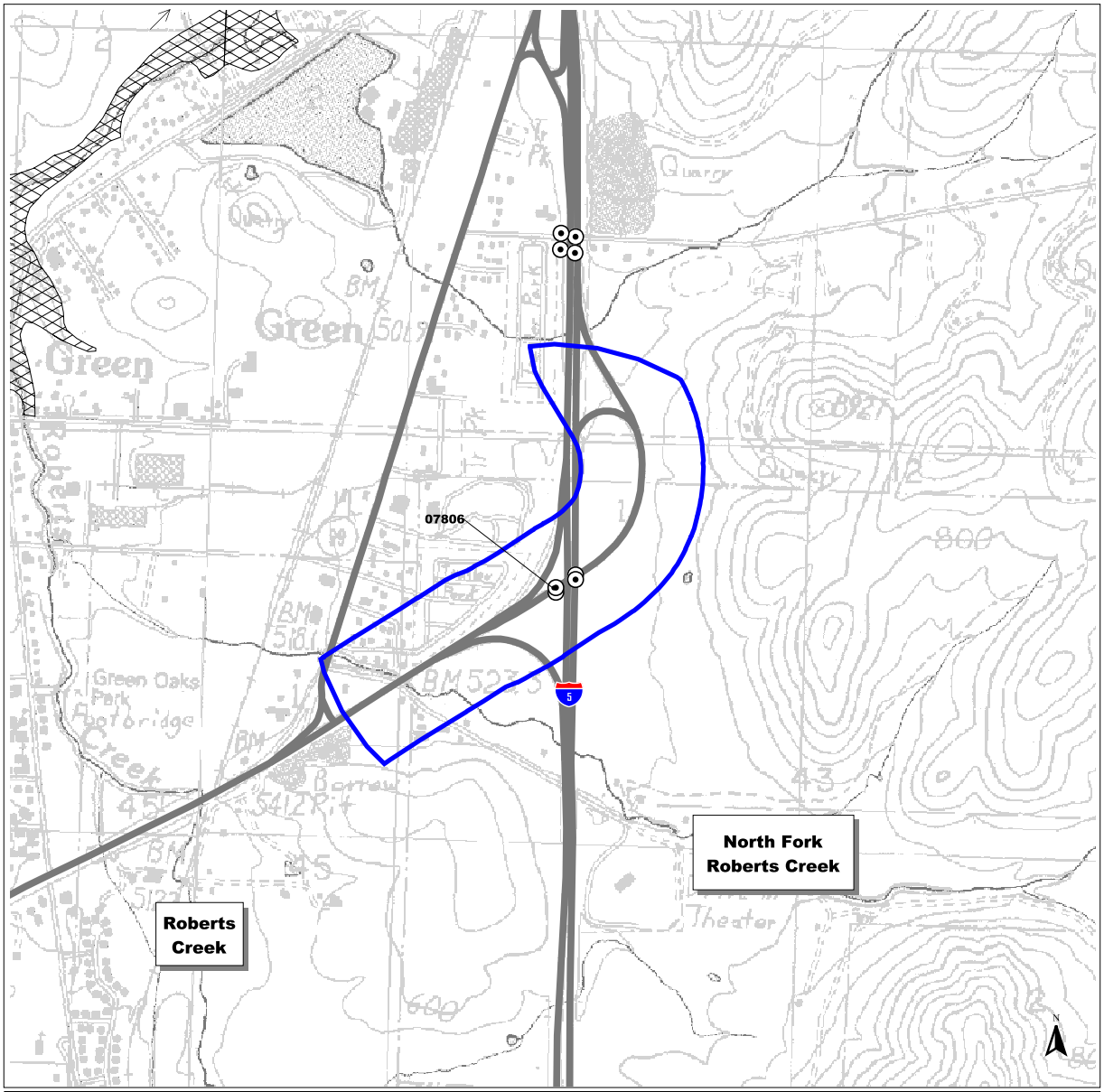
Unlike Interchange 119, Interchange 120 is located relatively close to the South Umpqua River yet outside of the 100-year floodplain. Also, a detailed analysis of Speedway Road Bridge, located a quarter mile south of Interchange 120, identified an Unnamed Stream 1 in the environmental baseline report. (See Figure 3.1-9 100-Year Floodplain Map). This stream has a floodplain that is constrained by terraces.

Site surveys would need to be conducted at this bridge to better ascertain any floodplain constraints for improvements to Interchange 120. Douglas County regulates project area floodplain impacts. To mitigate for impacts, the County may require water quality treatment such as bioswales and water detention ponds.

ENDANGERED SPECIES

The Endangered Species Act of 1973 was enacted to help protect threatened and endangered species and the environment in which they live. In order to meet this requirement, any projects planned in the area must determine the impact on threatened and endangered species in the area. Based on the types of species identified in the project area, consultation with regulatory agencies (US Fish and Wildlife Service and National Marine Fisheries [NOAA Fisheries]) may be required. In addition, construction techniques and timing may be constrained to minimize impacts on the species. For example, if large terrestrial species were present, the construction window could be restricted to late summer and fall.

The Fish and Wildlife Service of the US Fish and Wildlife Service was contacted and asked to provide a list of threatened or endangered species that may occur in the project study area. The complete list is shown in **Table 2**. Threatened species, including the bald eagle, coho salmon (Oregon Coast) and Kincaid's lupine flower are potentially located in the area surrounding interchanges 119 and 120. Potential endangered species near the two interchanges includes the rough popcorn flower.



Bridge points and highway lines from ODOT. Points with significant offsets have been adjusted based on recorded bridge corners. Areas of Potential Impact (APIs) have been generated by Parametrix following ODOT specifications

Features are shown on 1:24,000-scale georeferenced USGS digital raster graphic (DRG) images obtained through the Oregon Spatial Data Clearinghouse. They are based on original USGS maps, whose production dates vary.

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

Secondary API (Area of Potential Impact)
Direction of Flow
Field Recorded Bridge Corners
FEMA 100-year Floodplain
Source: Q3 Flood Data, 1998
Highways

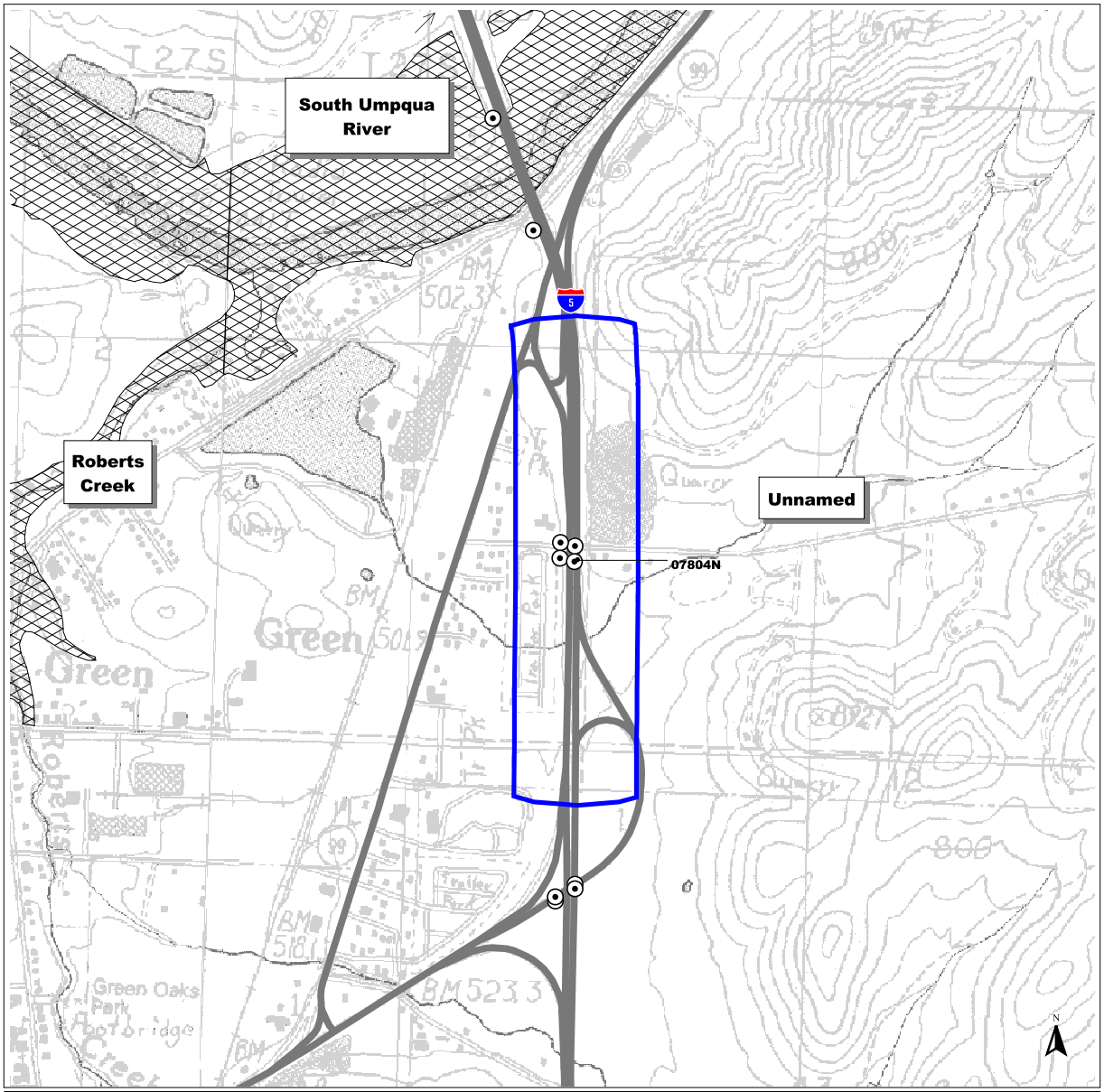
1000 0 1000 Feet

Map date: 09/15/03. Map by Vigil-Agrimis.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.2-9
100-Year Floodplain Map

Oregon Highway 42 over Interstate 5, Bridge 07806



Bridge points and highway lines from ODOT. Points with significant offsets have been adjusted based on recorded bridge corners. Areas of Potential Impact (APIs) have been generated by Parametrix following ODOT specifications

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- Secondary API (Area of Potential Impact)
- Direction of Flow
- Field Recorded Bridge Corners
- FEMA 100-year Floodplain
  Source: Q3 Flood Data, 1998
- Highways

1000 0 1000 Feet

Map date: 09/15/03. Map by Vigil-Agrimis.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.1-9
100-Year Floodplain Map

Interstate 5 over Speedway Rd, Bridge 07804N

Table 2. Threatened, Endangered, and Species of Concern

Common Name	Scientific Name
Threatened Species	
Bald eagle	*Haliaeetus leucocephalus*
Coho salmon (Oregon coast)	*Oncorhynchus kisutch*
Kincaid's lupine	*Lupinus sulphureus var. kincaidii*
Rough popcorn flower	*Plagiobothrys hirtus*
Candidate Species	
Streaked horned lark	*Eremophila alpestris strigata*
Steelhead (Oregon coast)	*Oncorhynchus mykiss*
Species of Concern	
Pallid bat	*Antrozous pallidus pacificus*
White-footed vole	*Arborimus albipes*
Red tree vole	*Arborimus longicaudus*
Pacific western big eared bat	*Corynorhinus townsendii townsendii*
Silver-haired bat	*Lasionycteris noctivagans*
Long-eared myotis	*Myotis evotis*
Fringed myotis	*Myotis thysanodes*
Long-legged myotis	*Myotis volans*
Yuma myotis	*Myotis yumanensis*
Band-tailed pigeon	*Columba fasciata*
Olive-sided flycatcher	*Contopus cooperi borealis*
Yellow-breasted chat	*Icteria virens*
Acorn woodpecker	*Melanerpes formicivorus*
Lewis's woodpecker	*Melanerpes lewis*
Oregon vesper sparrow	*Pooecetes gramineus affinis*
Purple martin	*Progne subis*
Northwestern pond turtle	*Emys marmorata marmorata*
Common kingsnake	*Lampropeltis getula*
Northern red legged frog	*Rana aurora aurora*
Foothill yellow-legged frog	*Rana boylii*
Pacific lamprey	*Lampetra tridentata*
Coastal cutthroat trout (Oregon Coast)	*Oncorhynchus clarki clarki*
Umpqua chub	*Oregonichthys kalawatseti*
Franklin's bumblebee	*Bombus franklini*
Koehler's rockress	*Arabis koehleri* var. *koehleri*
Wayside aster	*Aster vialis*
Shaggy horkelia	*Horkelia congesta ssp. Congesta*
Red-root yampah	*Perideridia erythrorhiza*

Common Name	Scientific Name
Hitchchock's blue-eyed grass	*Sisyrinchium hitchcockii*

Source: US Fish and Wildlife Service: Oregon Fish and Wildlife Office, 2004

WETLANDS

There are wetlands identified on the U.S. Fish and Wildlife Service National Wetlands Inventory map near both interchanges. Although, Douglas County has not officially adopted the National Wetland Inventory (NWI), impacts to these wetlands are still regulated. Douglas County Comprehensive Plan shows several wetlands identified on the NWI map both east and west of I-5. The largest site is on the Roseburg Forest Products site, which is currently undergoing environmental review for a fill permit.

Once improvements are designed for the interchanges, a wetland delineation at the sites will need to be conducted to determine if the designs would impact any wetlands. If impacts are expected, permitting and mitigation would be required by one or more of three agencies: the Oregon Department of Environmental Quality (DEQ), the US Corps of Engineers (COE) and the Oregon Division of State Lands (DSL). Mitigation usually involves creating new wetlands or enhancing existing wetlands elsewhere, preferably within the project area watershed.

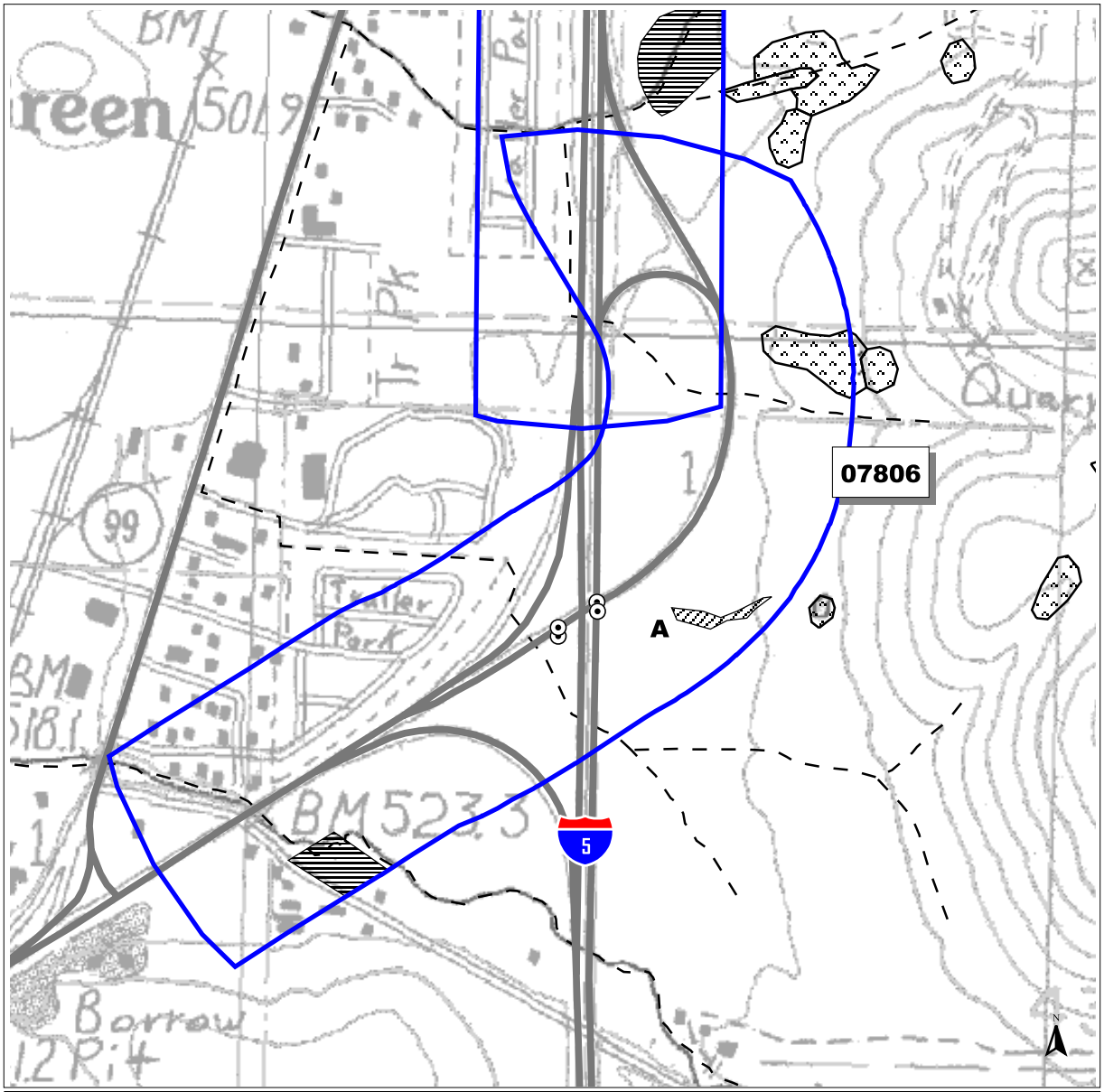
Interchange 119

NWI maps identified a palustrine, emergent, saturated wetland (PEMB) in the NE quadrant of Interchange 119, (See Figure 3.2-3 General Wetlands Map). The area contains unoccupied rural uses and vacant land intended for industrial uses. The Douglas County Area soil survey identified an area of Bashaw clay (map unit 15A), a hydric soil, along Unnamed Stream 1 that flows about half a mile north of Interchange 119. Curtin clay, 3-12 percent slopes (map unit 48C) contains hydric inclusions and is located throughout the project vicinity (Parametrix, 2004).

On-site observation identified one wetland (Wetland A) in the NE quadrant, south of the wetland mapped on the NWI. The wetland was not delineated because the field team did not have landowner permission to dig on the site. The wetland is palustrine emergent (PEM), with a dominant plant community of *Juncuseffusus* and *Scirpus spp.* The site was saturated at the July 19, 2003 site visit (Parametrix, 2004).

Interchange 120

NWI maps identified two wetlands in the NE quadrant of Interchange 120, which is characterized by unoccupied rural uses, (See Figure 3.1-3 General Wetlands Map). The wetlands include a palustrine emergent, saturated (PEMB) and a wetland as palustrine scrub-shrub, seasonally flooded, diked/impounded (PSSCh). The Douglas County Area soil survey identified an area of Bashaw clay, (map unit 15A), a hydric soil, along Unnamed Stream 1 that flows from east to west across the SE and SW quadrants. The following soils were mapped with hydric inclusions: Curtin clay, 3-12 percent slopes (map unit 48C) is located throughout the API; and Philomath-Dixonville complex, 3-30 percent slopes (map unit 189E) found north of the Speedway Road Bridge (Parametrix, 2004).



Highway centerline from ODOT.
Areas of Potential Impact (APIs) have been generated by Parametrix following ODOT specifications. This map shows secondary APIs. See Appendix for more information.

SRSAM = Salmon Resource Sensitive Area Mapping Data. Developed for ODOT by MB&G. As of August 2003, datasets cover ODOT Regions 1, 2, 4 and 5 only.

Features are shown on 1:24,000-scale georeferenced USGS digital raster graphic (DRG) images obtained through the Oregon Spatial Data Clearinghouse. They are based on original USGS maps, whose production dates vary.

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

- Secondary API (Area of Potential Impact)
- Field Recorded Bridge Corners
- Areas Not Inspected
- Field Delineated Wetlands
- Field Observed Wetlands
- NWI Wetlands
- SRSAM Wetlands
- Field Recorded Ditches
- Possible Drainages. Source: BLM 1997.
- Highways

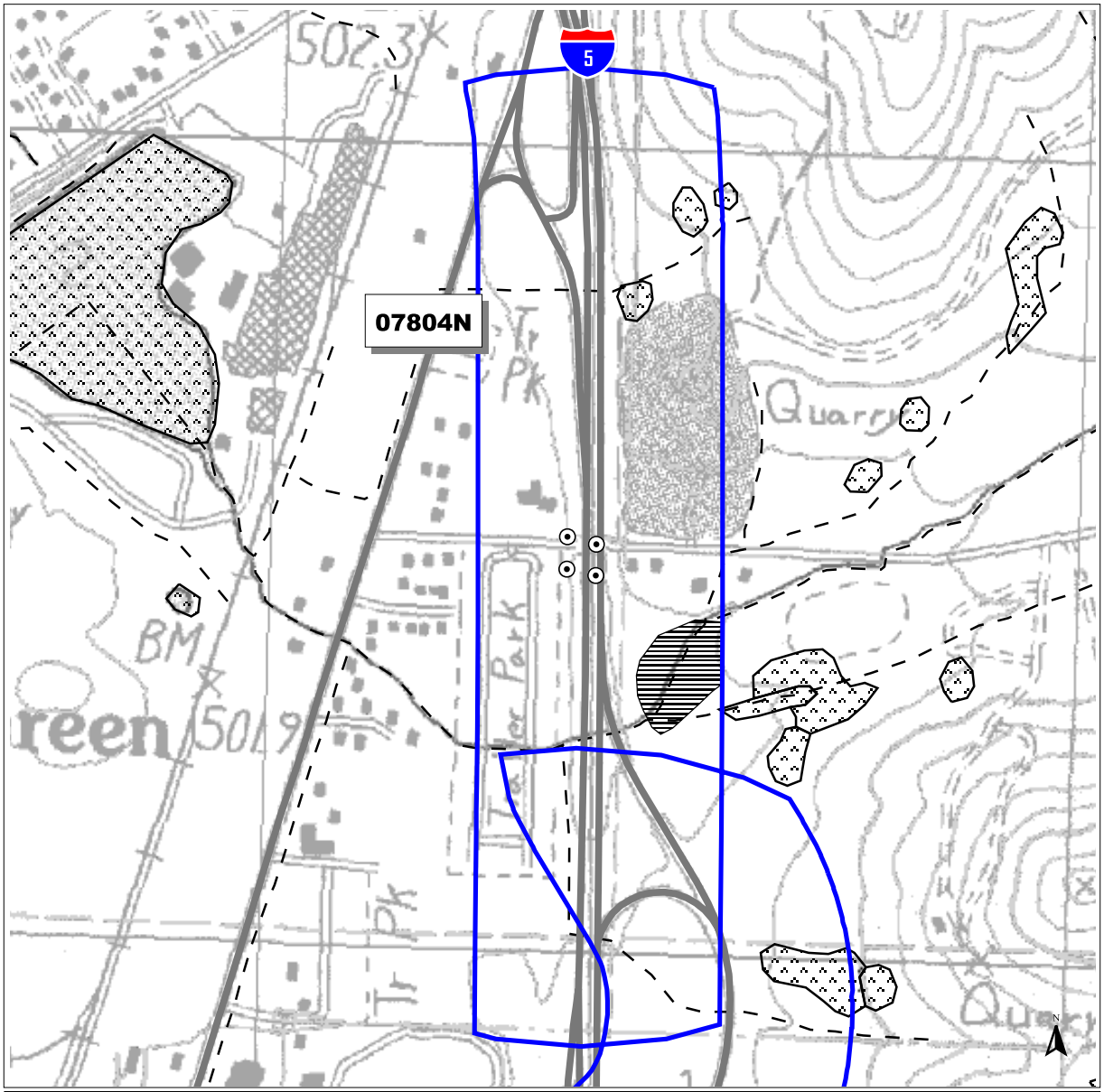
500 0 500 Feet

Map date: 09/29/03. Map by Parametrix.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.2-3
General Wetlands Map

Oregon Highway 42 over Interstate 5, Bridge 07806



Highway centerline from ODOT.
Areas of Potential Impact (APIs) have been generated by Parametrix following ODOT specifications. This map shows secondary APIs. See Appendix for more information.

SRSAM = Salmon Resource Sensitive Area Mapping Data. Developed for ODOT by MB&G. As of August 2003, datasets cover ODOT Regions 1, 2, 4 and 5 only.

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- Secondary API (Area of Potential Impact)
- Field Recorded Bridge Corners
- Areas Not Inspected
- Field Delineated Wetlands
- Field Observed Wetlands
- NWI Wetlands
- SRSAM Wetlands
- Field Recorded Ditches
- Possible Drainages. Source: BLM 1997.
- Highways

500 0 500 Feet

Map date: 09/29/03. Map by Parametrix.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.1-3
General Wetlands Map

Interstate 5 over Speedway Rd, Bridge 07804N

On-site observation identified one wetland in the NE quadrant. The wetland was not delineated because the field team did not have landowner permission to dig on the site. The wetland is palustrine emergent (PEM), with a dominant plant community of *Juncus effusus* (FACW) and *Daucus carota* (NOL). The potential wetlands identified by NWI mapping and the area of mapped hydric soils along Unnamed Stream 1, were not investigated in the field because of access limitations (Parametrix, 2004).

HAZARDOUS MATERIALS

An evaluation of the regulatory status of sites within a 2,000-foot radius of each interchange was performed through a review of reasonably available state and federal public agency computer databases to help identify recognized environmental conditions. Databases reviewed include those at the Department of Environmental Quality (DEQ) and Environmental Protection Agency. The database searches were performed by Environmental Data Resources, Inc. This review was limited to computer databases, historical topographic maps, and historical photographs or historical Sanborn maps. It did not include a review of archived files. In addition, a drive-by reconnaissance of the area surrounding each interchange was performed in order to evaluate the potential for recognized environmental conditions.

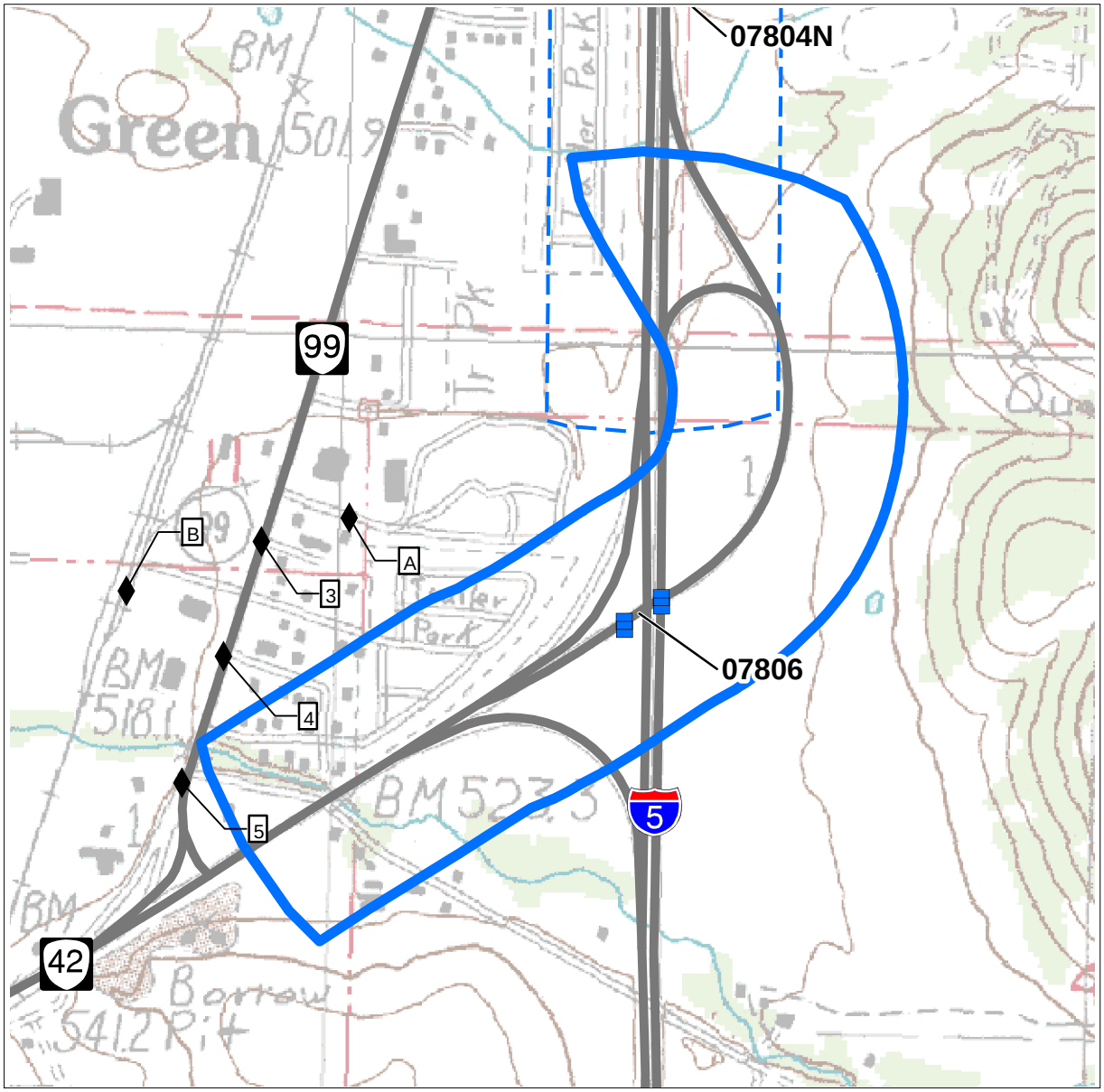
Prior to ground disturbance, an evaluation of potential hazardous materials sites and other sites of concern will need to be completed. If identified sites will be disturbed during project construction activities, proper disposal of hazardous materials in an appropriate landfill will be required. DEQ is the overseeing agency for disposal of hazardous materials.

Interchange 119

A review of hazardous materials databases and field surveys found four sites located near Interchange 119. There are three sites listed on the underground storage tank (UST) and one site listed on the leaking UST (LUST) databases. One of the UST sites was identified during site reconnaissance. All four sites are recognized as environmental concerns. If right-of-way, or easement acquisition or construction activities (e.g., subsurface excavation for utility work) are anticipated at or near these properties, environmental assessment work may be required. These additional assessments may include more detailed research on property-specific issues and/or sampling to confirm the presence or absence of contamination. Surface soil samples should be collected in the agricultural land area only if excavation is required at that location.

Three of the four sites include Harrington Petroleum Incorporated, Love's Travel Stop and a Texaco gas station, which were identified through reconnaissance. The fourth site includes three separate companies located on-site. These companies include Roseburg Paving Company, Teeco Corporation, and Beaver State Ready Mix (See location A in Figure 3.2-4 EDR Database Search Results).

Harrington Petroleum Inc. is located at 144 M Street, approximately 1,550 feet west-southwest of Interchange 119. The site is included in the HSIS and UST databases. Five active USTs are listed for the site. Chemicals reportedly used or stored on-site include diesel and unleaded gasoline. Parametrix did not discover any other information regarding this site during the 2004 supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.



Highway centerline from ODOT. Areas of Potential Impact (APIs) have been generated by Parametrix following ODOT specifications. This map shows secondary APIs. See Appendix for more information.

Features are shown on 1:24,000-scale georeferenced USGS digital raster graphic (DRG) images obtained through the Oregon Geospatial Data Clearinghouse. They are based on original USGS maps whose production dates vary.

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- Site Included in EDR Database
- Field Recorded Bridge Corners
- Secondary API
- Other Adjacent APIs
- Highways

N

500 0 500 Feet

Map date: 3/11/04. Map by Parametrix.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.2-4

EDR Database Search Results

Oregon Highway 42 over Interstate 5, Bridge 07806

Love's Travel Stop #312 is located at 280 Grant Smith Rd., approximately 1,270 feet southwest of Interchange 119. The DEQ database lists the site as a UST site. Six active USTs are listed for the site. No information regarding this site was discovered during a supplemental DEQ database search. However, this site is still recognized as an environmental concern.

Texaco gas station was identified through reconnaissance and is located at 4446 Old Highway 99. The facility is equipped with USTs. Parametrix did not discover any additional information regarding this site during the 2004 supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

Roseburg Paving Company is a division of LTM Inc., and is located at 186 Beaver State Road, approximately 1,100 feet west-northwest of Interchange 119. However, according to site reconnaissance observations, a portion of this facility is within the project vicinity. This facility is included in the RCRIS-SQG, FINDS, HSIS, LUST, UST, and AST databases. Three decommissioned USTs and four active USTs are listed for the site. The LUST cleanup began in December 1998 and was completed in January 1999; closure was obtained in March 1999. In 2004, Parametrix encountered no additional information from a supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

Teeco Corporation is also located at 186 Beaver State Road, approximately 1,100 feet west-northwest of Interchange 119. The facility is included in the HSIS and AST databases. In 2004, Parametrix encountered no additional information regarding the site during the supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

Beaver State Ready Mix is also located at 186 Beaver State Road, approximately 1,100 feet west-northwest of Interchange 119. Likewise, a portion of this facility is within the project vicinity. The site is included in the AST database. In 2004, Parametrix encountered no additional information regarding the site during the supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

Agricultural land was identified during the aerial photograph review and site reconnaissance. Agricultural operations typically use petroleum products to operate farm equipment and pesticides and herbicides to protect crops. No evidence of petroleum was noted during the field surveys. Pesticides and herbicides are often odorless and invisible, thus, these chemicals could be present in soil. Surface soil samples should be collected in the agricultural land area only if excavation is required at that location.

Treated utility poles, transformers, and treated guardrail posts were noted near the interchange. If bridge repair or replacement activities require the removal of the poles, transformers, and/or posts, they may require the collection of samples for laboratory analysis to determine the appropriate handling and/or disposal practices.

Interchange 120

Interchange 120 was not mapped for hazardous materials as a part of the baseline report, although the interchange is located within the half-mile radius of the Speedway Road Bridge where hazardous sites of concern were evaluated. There are two sites located near Interchange 120. One site was identified during the May 2003 EDR database search and the other during a drive-by reconnaissance of the area surrounding the bridge.

Bargain Lumber was listed in the EDR database as being located at 3495 Old Highway 99 S, approximately 1,660 feet north-northwest of the Speedway Road Bridge, which is approximately a quarter mile south of Interchange 120. Site reconnaissance indicates the site is actually located west of Old Highway 99 S. Therefore, this site is not located close enough to Interchange 120 to be a recognized environmental concern.

Site reconnaissance indicates that an automobile recycler identified in the historical aerial photographs is located at 220 and 224 Speedway Road, which is approximately a quarter mile south of Interchange 120. This facility (currently Roseburg Auto Parts and Recyclers) is still in operation. Facilities of this nature (auto wrecking) commonly spill vehicle fluids (e.g., oil, gas, ethylene glycol). Parametrix did not discover any additional information regarding this site during the 2004 supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

CULTURAL AND HISTORIC RESOURCES

Archaeological Record

The Oregon State Museum of Anthropology conducted surface surveys near the two interchanges. The state museum conducted an investigation of background records and literature to determine if there were any previously recorded sites. The field survey also included a review and assessment of the following:

- Tribal information (if appropriate)
- Historic/ethnographic/past research
- Cultural and historic context
- Geologic/geographic setting
- Current and past ecological environment
- Setting, including vegetation, visibility, soils, topography, and water (type, direction, and aspect)

Historic Resources

A literature review was conducted at the State Historic Preservation Office (SHPO) to identify previously documented sites located near the interchanges. This literature search included National Register of Historic Places (NRHP) listed sites, sites listed in the local County Historic Resource Inventory (where applicable), and sites documented through the Section 106 process.

The data category for NRHP status was divided into six categories, as follows:

- Properties that have been previously listed in the NRHP
- Properties that may be potentially eligible with further research
- Properties that are not eligible because they have not achieved sufficient age (generally 50 years of age or older)
- Properties that are not eligible because they lack distinction
- Properties that are not eligible in their current state
- Properties that are not eligible due to an irretrievable integrity loss

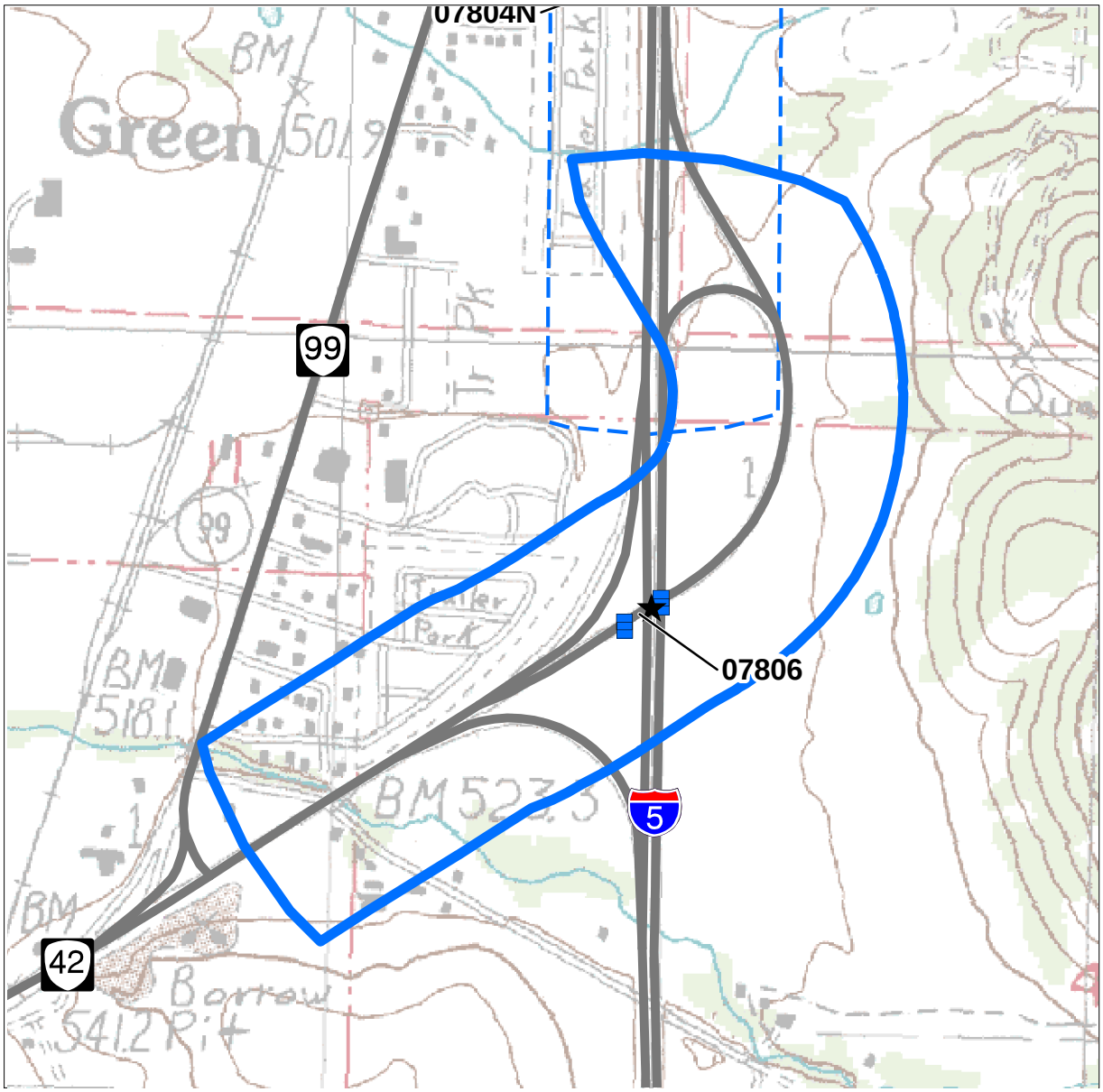
There are no mapped National Historic Register sites or Douglas County historical sites in the study area. A search through the SHPO archaeological statewide database reveals there are no reported sites in the proposed project area (Personal Communication with SHPO, 2004). The Cultural and Historic Resource Inventory for Douglas County was updated in 2002. Kelly's Corner is regionally known as a historic area of commerce, but is not a listed historic site (Angelo Eaton and Associates, 2005). This property is located at the intersection of Highway 42 and Carnes Road.

A cultural survey should be conducted to determine the likelihood of cultural resources in the project area prior to construction. If previously undetected cultural resources are encountered during the course of the project, all ground disturbing activities must cease and personnel at ODOT's Environmental Services Division must be notified immediately. Data recovery must be undertaken. This would likely result in construction delay and additional project costs to pay for the recovery.

Interchange 119

No archaeological sites were identified during a surface examination that was conducted in July 2003. The project area is characterized by residential and commercial development in the western half. Agricultural and pastureland comprises the majority of the eastern half. North Fork Roberts Creek, tributary to Bear Creek, transects the southern half of the project area from east to west. The presence of the creek within the project vicinity enhances the possibility of encountering buried cultural deposits (Parametrix, 2004).

A survey of the project area was conducted on June 11, 2003 to identify properties near Interchange 119 that may meet NRHP criteria. During the field survey, properties that are 45 years of age or older were photographed and their addresses were recorded. The existing bridge is the only resource within the project area that meets the age criteria (See Figure 3.2-5 Historic Resource Locations). However, this structure does not appear to be eligible for inclusion in the NRHP. No further research is necessary for historic properties near the interchange.



Secondary APIs, shown in this map, generally extend 500 feet from either side of the centerline and 2,000 feet in either direction along the roadway. The size and configurations of APIs vary depending on roadway alignments.

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

Highway centerline from ODOT. Features are shown on 1:24,000-scale georeferenced USGS digital raster graphic (DRG) images obtained through the Oregon Geospatial Data Clearinghouse. They are based on original USGS maps whose production dates vary. Please see Appendix for more details on GIS data sources.

- ★ Historic Resource Locations
- ■ Field Recorded Bridge Corners
- Secondary API
- Other Adjacent APIs
- Highways

N

500 0 500 Feet

Map date: 3/31/04. Map by Parametrix.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.2-5

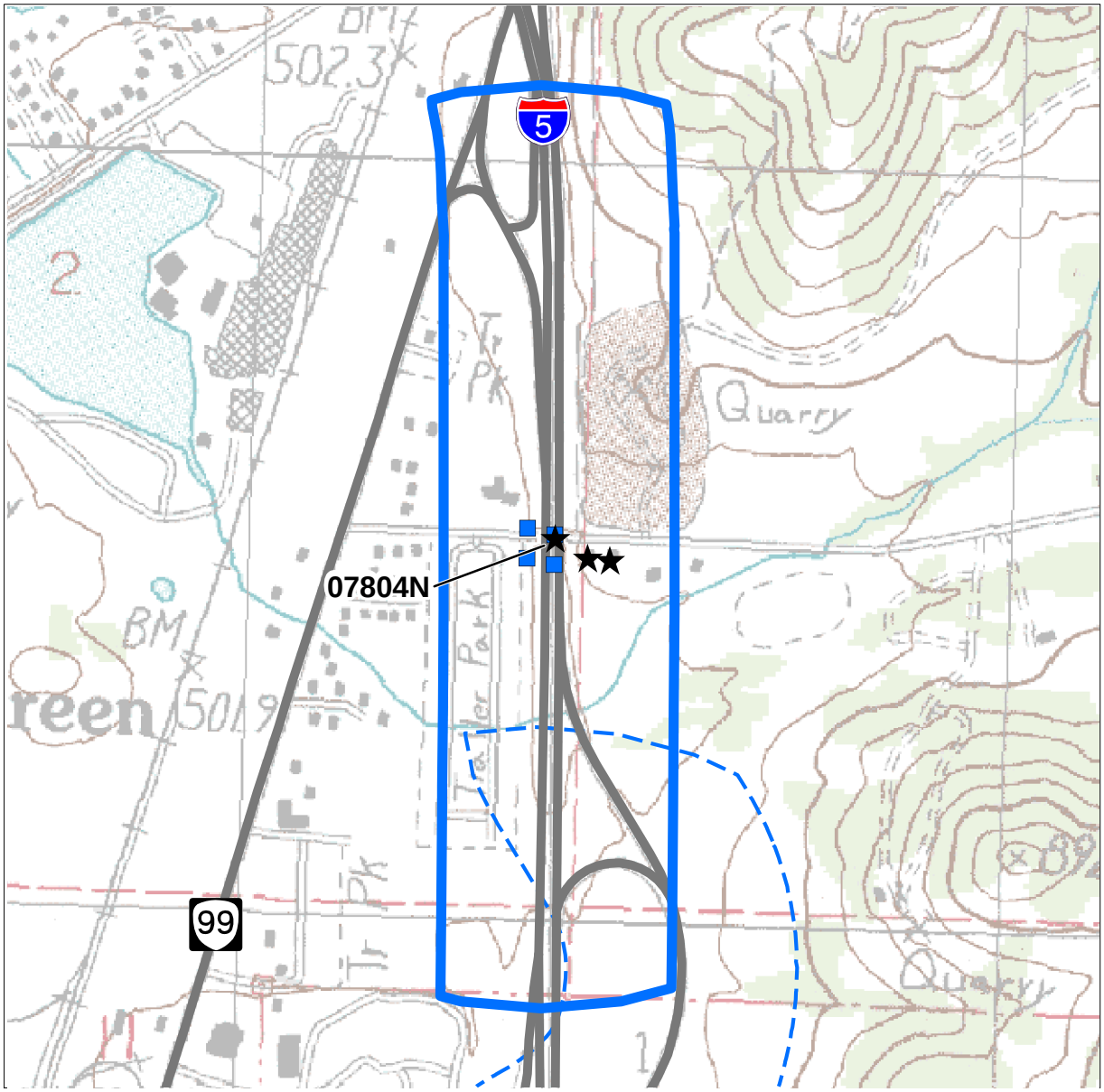
Historic Resource Locations

Oregon Highway 42 over Interstate 5, Bridge 07806

Interchange 120

No archaeological sites were identified during a surface examination that was conducted in July 2003. The project area is occupied by residential and commercial development in the western half, whereas mixed forest and few agricultural lots and pasturelands dominate the eastern half. A large quarry was noted in the NE quadrant. An unnamed tributary with a well-defined terrace transects the southern half of the project area. The presence of such a watercourse enhances the possibility of buried cultural deposits. Additionally, a dense prehistoric lithic scatter located to the north of the project area, along the south side of the Umpqua River, highlights the potential for cultural resources in this region (Parametrix, 2004).

A survey of the project area was conducted on June 11, 2003 to identify properties near Interchange 120 that may meet NRHP criteria. During a survey of properties 45 years of age or older, three historic resources were identified, including the existing bridge and two residential buildings (See Figure 3.1-5 Historic Resource Locations). None of these structures appear eligible for the inclusion in the NRHP. No further research is necessary for historic resources near Interchange 120 (Parametrix, 2004).



Secondary APIs, shown in this map, generally extend 500 feet from either side of the centerline and 2,000 feet in either direction along the roadway. The size and configurations of APIs vary depending on roadway alignments.

This product is for informational purposes and may not have been prepared for legal, engineering or surveying purposes. Users of this information should review or consult the primary data and information source to ascertain the usability of this information.

Highway centerline from ODOT. Features are shown on 1:24,000-scale georeferenced USGS digital raster graphic (DRG) images obtained through the Oregon Geospatial Data Clearinghouse. They are based on original USGS maps whose production dates vary. Please see Appendix for more details on GIS data sources.

- ★ Historic Resource Locations
- ■ Field Recorded Bridge Corners
- Secondary API
- Other Adjacent APIs
- Highways

N

500 0 500 Feet

Map date: 3/31/04. Map by Parametrix.

OTIA III STATEWIDE BRIDGE ASSESSMENT

Figure 3.1-5

Historic Resource Locations

Interstate 5 over Speedway Rd, Bridge 07804N

DAVID EVANS AND ASSOCIATES INC.

REFERENCES

Angelo Eaton and Associates. 2005. Existing Land Use Analysis Report for Interchanges 119 and 120.

Douglas County. 1997. Douglas County Comprehensive Plan.

Parametrix. 2004 (April). Oregon Department of Transportation OTIA III Statewide Bridge Delivery Program, Douglas County, ODOT Region 3 Baseline Report. Bridge Numbers: 07804N, 07806, 07835, 07835A, 07839, 07900A, 07931N, 07931S, 07950, 07952A, 08024, Southern Oregon Coastal Basin, Interstate 5.

Personal Contacts

Oregon Department of Parks and Recreation, Heritage Conservation Division. October 18,2004. SHPO Database Search (Letter).

United States Fish and Wildlife Service, Oregon Fish and Wildlife Office. September 9, 2004. Federally Listed and Proposed Endangered and Threatened Species, Candidate Species and Species of Concern. (Letter).

O:\PROJECT\O\Odot0000-0436\!docs\916a Environmental Constraints (5.1)\119-120 Natural and Historic Resources Memo_6_15_tn.doc

Oregon
Theodore R. Kulongoski, Governor

Parks and Recreation Department
Heritage Conservation Division
725 Summer St. NE, Suite C
Salem, OR 97301-1271
(503) 986-0707
FAX (503) 986-0793
www.hcd.state.or.us

October 14, 2004

Mr. Michael Baker
ODOT Region 3
350 NW Stewart Prkwy
Roseburg, OR 97470

RE: SHPO Case No. 04-2379
I-5 Interchanges 119, 120 and 123 ODOT Project
Interchange area management plan
ODOT/FHWA
28S 5W 1, 2, 11, 12 and 30S 5W 24, 25, Roseburg/Green vicinity, Douglas County

Dear Mr. Baker:

A search through the SHPO archaeological statewide database has revealed that there are no reported sites in your proposed project area, however, there have been no previous cultural surveys. Future ground disturbing activities may reveal the presence of buried cultural resources.

Under state law (ORS 358.905-955) it is a Class B misdemeanor to impact an archaeological site on public or private land in Oregon. Impacts to Native American graves and cultural items are considered a Class C felony (ORS 97.740-760). Please be aware that if during development activities you or your staff encounter any cultural material (e.g., prehistoric stone tools or flaking debris, human remains, historic material caches), all activities should cease and a professional archaeologist needs to be contacted to evaluate the discovery. If you have any questions regarding such a discovery, feel free to contact the SHPO office at your convenience.

Dennis Griffin

Dennis Griffin, Ph.D., RPA
SHPO Lead Archaeologist
(503) 986-0674
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Oregon Fish and Wildlife Office
2600 SE 98th Avenue, Suite 100
Portland, Oregon 97266
Phone: (503) 231-6179 FAX: (503) 231-6195

Reply To: 8330.05081 (04)
File Name: Sp0508.wpd
TS Number: 04-3601

Elizabeth Mros-O'Hara
David Evans and Associates, Inc.
2100 SW River Parkway
Portland, OR 97201

SEP 0 9 2004

Subject: I-5 Interchange Management Plan Project IC 123
USFWS Reference # 1-7-04-SP-0508

Dear Ms. Mros-O'Hara:

This is in response to your Species List Request Form, dated July 27, 2004, requesting information on listed and proposed endangered and threatened species that may be present within the area of the I-5 Interchange Management Plan Project in Douglas County. The Fish and Wildlife Service (Service) received your correspondence on July 26, 2004.

We have attached a list (Enclosure A) of threatened and endangered species that may occur within the area of the I-5 Interchange Management Plan Project. The list fulfills the requirement of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Oregon Department of Transportation (ODOT) requirements under the Act are outlined in Enclosure B.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems on which they depend may be conserved. Under section 7(a)(1) and 7(a)(2) of the Act and pursuant to 50 CFR 402 *et seq.*, ODOT is required to utilize their authorities to carry out programs which further species conservation and to determine whether projects may affect threatened and endangered species, and/or critical habitat. A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) which are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (NEPA) (42 U.S.C. 4332 (2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to the Biological Assessment be prepared to determine whether they may affect listed and proposed species. Recommended contents of a Biological Assessment are described in Enclosure B, as well as 50 CFR 402.12.

If ODOT determines, based on the Biological Assessment or evaluation, that threatened and endangered species and/or critical habitat may be affected by the project, ODOT is required to consult with the Service following the requirements of 50 CFR 402 which implement the Act.

Enclosure A includes a list of candidate species under review for listing. The list reflects changes to the candidate species list published May 4, 2004, in the Federal Register (Vol. 69, No. 86, 24876) and the addition of "species of concern." Candidate species have no protection under the Act but are included for consideration as it is possible candidates could be listed prior to project completion. Species of concern are those taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed.

If a proposed project may affect only candidate species or species of concern, ODOT is not required to perform a Biological Assessment or evaluation or consult with the Service. However, the Service recommends addressing potential impacts to these species in order to prevent future conflicts. Therefore, if early evaluation of the project indicates that it is likely to adversely impact a candidate species or species of concern, ODOT may wish to request technical assistance from this office.

Your interest in endangered species is appreciated. The Service encourages ODOT to investigate opportunities for incorporating conservation of threatened and endangered species into project planning processes as a means of complying with the Act. If you have questions regarding your responsibilities under the Act, please contact Kevin Maurice at (503) 231-6179. All correspondence should include the above referenced file number. For questions regarding salmon and steelhead trout, please contact NOAA Fisheries Service, 525 NE Oregon Street, Suite 500, Portland, Oregon 97232, (503) 230-5400.

Sincerely,

KJ Maurice

for Kemper M. McMaster
State Supervisor

Enclosures
1-7-04-SP-0508

cc:
Nongame, Oregon Department of Fish and Wildlife, Salem, Oregon.

Enclosure A

FEDERALLY LISTED AND PROPOSED ENDANGERED AND THREATENED SPECIES, CANDIDATE SPECIES AND SPECIES OF CONCERN THAT MAY OCCUR WITHIN THE AREA OF THE I-5 INTERCHANGE MANAGEMENT PLAN PROJECT 1-7-04-SP-0508

LISTED SPECIES[1/]

Birds		
Bald eagle[5/]	*Haliaeetus leucocephalus*	T
Fish		
Coho salmon (Oregon Coast)[8/]	*Oncorhynchus kisutch*	**T
Plants		
Kincaid's lupine[12/]	*Lupinus sulphureus* var. *kincaidii*	T
Rough popcorn flower[13/]	*Plagiobothrys hirtus*	E

PROPOSED SPECIES

None

CANDIDATE SPECIES

Birds		
Streaked horned lark[15/]	*Eremophila alpestris strigata*	
Fish		
Steelhead (Oregon Coast)[16/]	*Oncorhynchus mykiss*	**CF

SPECIES OF CONCERN

Mammals	
Pallid bat	*Antrozous pallidus pacificus*
Pacific western big-eared bat	*Corynorhinus (=Plecotus) townsendii townsendii*
Silver-haired bat	*Lasionycteris noctivagans*
Long-eared myotis (bat)	*Myotis evotis*
Fringed myotis (bat)	*Myotis thysanodes*
Long-legged myotis (bat)	*Myotis volans*
Yuma myotis (bat)	*Myotis yumanensis*
Birds	
Band-tailed pigeon	*Columba fasciata*
Olive-sided flycatcher	*Contopus cooperi (=borealis)*
Yellow-breasted chat	*Icteria virens*
Acorn woodpecker	*Melanerpes formicivorus*
Lewis's woodpecker	*Melanerpes lewis*
Oregon vesper sparrow	*Pooecetes gramineus affinis*

Purple martin	*Progne subis*
Amphibians and Reptiles	
Northwestern pond turtle	*Emys (=Clemmys) marmorata marmorata*
Common kingsnake	*Lampropeltis getula*
Northern red-legged frog	*Rana aurora aurora*
Foothill yellow-legged frog	*Rana boylii*
Fish	
Pacific lamprey	*Lampetra tridentata*
Coastal cutthroat trout (Oregon Coast)	*Oncorhynchus clarki clarki*
Umpqua chub	*Oregonichthys kalawatseti*
Invertebrates	
Franklin's bumblebee	*Bombus franklini*
Plants	
Koehler's rockcress	*Arabis koehleri* var. *koehleri*
Wayside aster	*Aster vialis*
Shaggy horkelia	*Horkelia congesta* ssp. *congesta*
Red-root yampah	*Perideridia erythrorhiza*
Hitchcock's blue-eyed grass	*Sisyrinchium hitchcockii*

(E) - Listed Endangered *(T) - Listed Threatened* *(CH) - Critical Habitat has been designated for this species*
(PE) - Proposed Endangered *(PT) - Proposed Threatened* *(PCH) - Critical Habitat has been proposed for this species*
(S) - Suspected *(D) - Documented*

Species of Concern - Taxa whose conservation status is of concern to the Service (many previously known as Category 2 candidates), but for which further information is still needed.

(CF) - Candidate: National Marine Fisheries Service designation for any species being considered by the Secretary for listing for endangered or threatened species, but not yet the subject of a proposed rule.

** *Consultation with National Marine Fisheries Service may be required.*

1/ *U. S. Department of Interior, Fish and Wildlife Service, October 31, 2000, Endangered and Threatened Wildlife and Plants, 50 CFR 17.11 and 17.12*

5/ *Federal Register Vol. 60, No. 133, July 12, 1995 - Final Rule - Bald Eagle*

9/ *Federal Register Vol. 63, No. 153, August 10, 1998, Final Rule-Oregon Coast Coho Salmon*

12/ *Federal Register Vol. 65, No. 16, January 25, 2000, Final Rule-Erigeron decumbens var. decumbens, Lupinus sulphureus ssp. kincaidii and Fender's blue butterfly*

13/ *Federal Register Vol. 65, No. 16, January 25 , 2000, Final Rule-Plagiobothrys hirtus*

14/

15/ *Federal Register Vol. 69, No. 86, May 4, 2004, Notice of Review - Candidate or Proposed Animals and Plants*

16/ *Federal Register Vol. 63, No. 53, March 19, 1998, Final Rule-West Coast Steelhead*

ENCLOSURE B

FEDERAL AGENCIES RESPONSIBILITIES UNDER SECTION 7(a) and (c)
OF THE ENDANGERED SPECIES ACT

SECTION 7(a)-Consultation/Conference

Requires:

1) Federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species;

2) Consultation with FWS when a Federal action may affect a listed endangered or threatened species to insure that any action authorized, funded or carried out by a Federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of Critical Habitat. The process is initiated by the Federal agency after they have determined if their action may affect (adversely or beneficially) a listed species; and

3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed Critical Habitat.

SECTION 7(c)-Biological Assessment for Major Construction Projects[1]

Requires Federal agencies or their designees to prepare a Biological Assessment (BA) for construction projects only. The purpose of the BA is to identify proposed and/or listed species which are/is likely to be affected by a construction project. The process is initiated by a Federal agency in requesting a list of proposed and listed threatened and endangered species (list attached). The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the species list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may be taken; however, no construction may begin.

To complete the BA, your agency or its designee should: (1) conduct an on-site inspection of the area to be affected by the proposal which may include a detailed survey of the area to determine if the species is present and whether suitable habitat exists for either expanding the existing population or for potential reintroduction of the species; (2) review literature and scientific data to determine species distribution, habitat needs, and other biological requirements; (3) interview experts including those within FWS, National Marine Fisheries Service, State conservation departments, universities, and others who may have data not yet published in scientific literature; (4) review and analyze the effects of the proposal on the species in terms of individuals and populations, including consideration of cumulative effects of the proposal on the species and its habitat; (5) analyze alternative actions that may provide conservation measures and (6) prepare a report documenting the results, including a discussion of study methods used, any problems encountered, and other relevant information. The BA should conclude whether or not a listed species will be affected. Upon completion, the report should be forwarded to our Portland Office.

---

[1]A construction project (or other undertaking having similar physical impacts) which is a major Federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332. (2)c). On projects other that construction, it is suggested that a biological evaluation similar to the biological assessment be undertaken to conserve species influenced by the Endangered Species Act.