Final Interchange Area Management Plan

Interstate 5 Interchanges 103 (Riddle), 106 (Weaver Road), and 108 (Myrtle Creek)

Douglas County, Oregon

Prepared for
Oregon Department of Transportation, Region 3

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List of Acronyms

ADT	average daily traffic
CORP	Central Oregon Pacific Railroad
EB	east bound
HDM	Highway Design Manual
I-5	Interstate 5
IAMP	Interchange Area Management Plan
LCDC	Land Conservation and Development Commission
LUDO	Land Use and Development Ordinance
MP	mile post
NB	north bound
NRHP	National Register of Historic Places
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
OTC	Oregon Transportation Commission
OTIA	Oregon Transportation Investment Act
PRC	Planning Research Corporation
SB	south bound
SHPO	State Historic Preservation Office
SPIS	Safety Priority Index System
TPAU	Transportation Planning Analysis Unit
TSP	Transportation System Plan
UGB	Urban Growth Boundary
V/C	volume to capacity ratio
VMS	variable message sign
WB	west bound

Table of Contents

List of Tables

List of Figures

List of Appendices

1.0 INTRODUCTION

The Southern Douglas County area has been promoted and targeted for new industrial growth by Douglas County and the State of Oregon. Interchanges 103, 106, and 108 are located along I-5 in Southern Douglas County. They provide important access between I-5 and the communities of Myrtle Creek, Tri City, and Riddle; the Myrtle Creek Airport; and the South Umpqua Industrial Park at Interchange 103. Because these interchanges are in close proximity and have inter-related operational issues, they are addressed together in this Interchange Area Management Plan (IAMP). (See Figure 1: Vicinity Map.) The IAMP includes an evaluation of existing and future conditions and the identification of future improvements and modifications to these I-5 Interchanges.

The three interchanges are deficient from a design and operational perspective. At Interchange 103, Pruner Road, the overpass bridge is functionally obsolete and driveways and access points are located closer to the ramp terminals than allowed by current standards. Interchange 106, Weaver Road, also has access points too close to the ramp terminals, and the bridge is both functionally obsolete and does not meet vertical clearance standards. In addition, the frontage road at Interchange 106 serving the Myrtle Creek Municipal Airport between I-5 and the South Umpqua River may need to be relocated, and is constrained by proximity to the river's floodway and floodplain. Interchange 108, Myrtle Creek, has tight curves at the entrance ramps and deficient acceleration lengths. Its overpass bridge is also functionally obsolete.

Multiple projects have been identified to address these deficiencies. The 2003 OTIA III legislation includes sufficient funding to pay for bridge replacement and perhaps limited modernization for the Interchange 103 Bridge. In addition, Douglas County has secured funding for the construction of the Weaver Road Bridge at Interchange 106, crossing the South Umpqua River and connecting Tri City to I-5. Funding for the Weaver Road Bridge was earmarked in the federal transportation bill passed by the U.S. Congress in August 2005. OTIA III funds had also been provided for two Interchange 108 projects, the Myrtle Creek Arch Bridge and the Myrtle Creek Curves project. Douglas County has created preliminary concepts for the arch bridge under a separate process from the IAMP study. At the same time, ODOT has recently decided not to move forward with the Myrtle Creek Curves project. This project was intended to straighten the Myrtle Creek curves on the I-5 mainline to improve safety. However, analysis of the geotechnical issues involved showed that the rock substrates would not have held up if cut to straighten the highway. This could lead to catastrophic failure of the cut slopes. The only other option would be an extremely expensive tunnel. Consequently, the project has been shelved.

This IAMP includes conceptual designs for Interchange 103, but not for Interchanges 106 or 108, because designs for these two interchanges will be developed to work with future planning efforts for the Weaver Road Bridge and any future improvements to I-5 near Interchange 108. The Interchange 108 concepts will integrate the planning for the Myrtle Creek Arch Bridge that Douglas County is working on.

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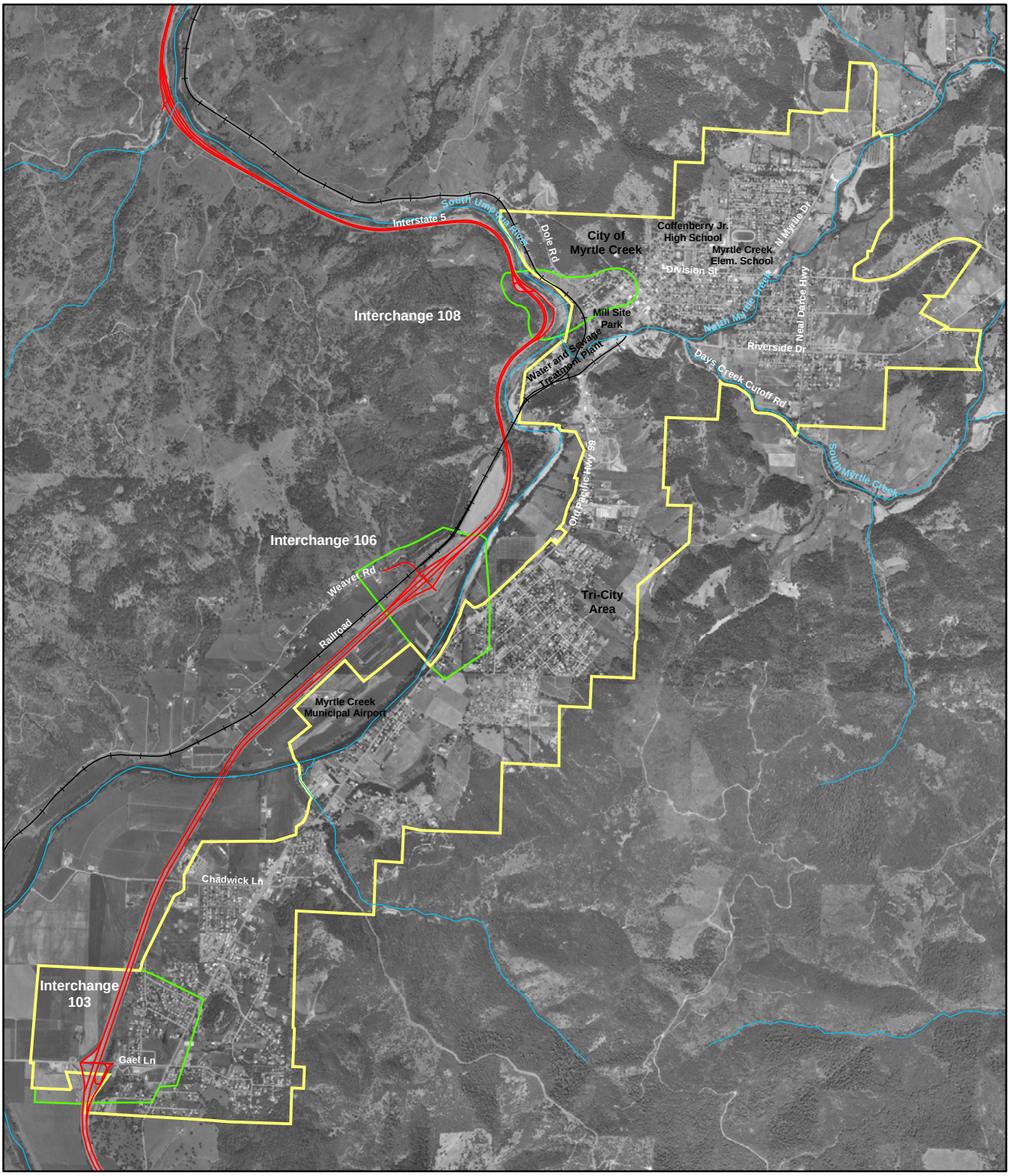
Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

- Highways
- Streams
- Railroads
- Myrtle Creek Urban Growth Boundary

N

0 0.5 1

Miles

Figure 1

I-5 Interchanges 103, 106, and 108
Interchange Area Management Plan
Vicinity Map

February 2006

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The Myrtle Creek Transportation System Plan (TSP) was developed concurrently with the Interchange Area Management Plan. The findings and recommendations of the IAMP process are integrated into the Myrtle Creek TSP. Because these planning efforts were concurrent, close coordination was employed to create cost efficiencies such as shared and parallel meetings, shared Technical Advisory Committee, and shared and coordinated traffic counts and inventory work.

1.1 IAMP Planning Area

The land use planning boundary for the IAMP includes three separate areas surrounding each interchange (see Figures 2, 3, and 4). The planning areas include the general area where the interchange improvements could potentially influence land use patterns or have land use impacts. At a minimum, the IAMP land use planning area includes all land uses and roadways located within approximately 1,320 feet of the existing interchange ramps. This distance corresponds to the spacing standard outlined in the OAR 734-051 Division 51 rules for interchange ramps.

The three interchanges serve the Myrtle Creek and Tri City Unincorporated Urban Area in Douglas County, as shown in Figures 1, 2, 3, and 4. The Interchange 108 study area encompasses urban and rural areas, with the eastern half within the Myrtle Creek city limits, and the western half outside the city limits and the Urban Growth Boundary (UGB). Interchange 106 is wholly outside of the UGB, with access from Weaver Road to the north and a frontage road, Aviation Drive, to the south. Interchange 103 primarily serves the Tri City area and is within the UGB. Old Pacific Highway ("Highway 99") crosses over I-5 at this interchange, providing access to urban areas to the east, and agricultural area to the west.

The Central Oregon Pacific Railroad (CORP) runs through Myrtle Creek and crosses I-5 before Interchange 106, where it passes under Weaver Road and runs parallel to, and north of, I-5.

1.2 Public and Agency Participation

This IAMP has been prepared with the participation of Douglas County, the City of Myrtle Creek, and ODOT, and with input from a variety of stakeholders and the general public. Contacts were made with stakeholders interested in or concerned about the proposed interchange modifications and possible effects on existing land uses, access, and the local road system.

Public meetings were held jointly for this planning project and the concurrent Myrtle Creek Transportation System Plan planning process. The meetings included brief presentations and open house discussion to provide information and solicit public input. The meetings were held at Myrtle Creek City Hall on September 30, 2004, and on March 30, 2005, and in June 2006. Two newsletters were produced discussing both projects. The newsletters were distributed prior to the public meetings, posted on the City of Myrtle Creek's website, and posted at the Myrtle Creek City Hall. The public meetings were advertised in the Roseburg News-Review and Douglas County Mail, and news releases were sent to the local radio stations.

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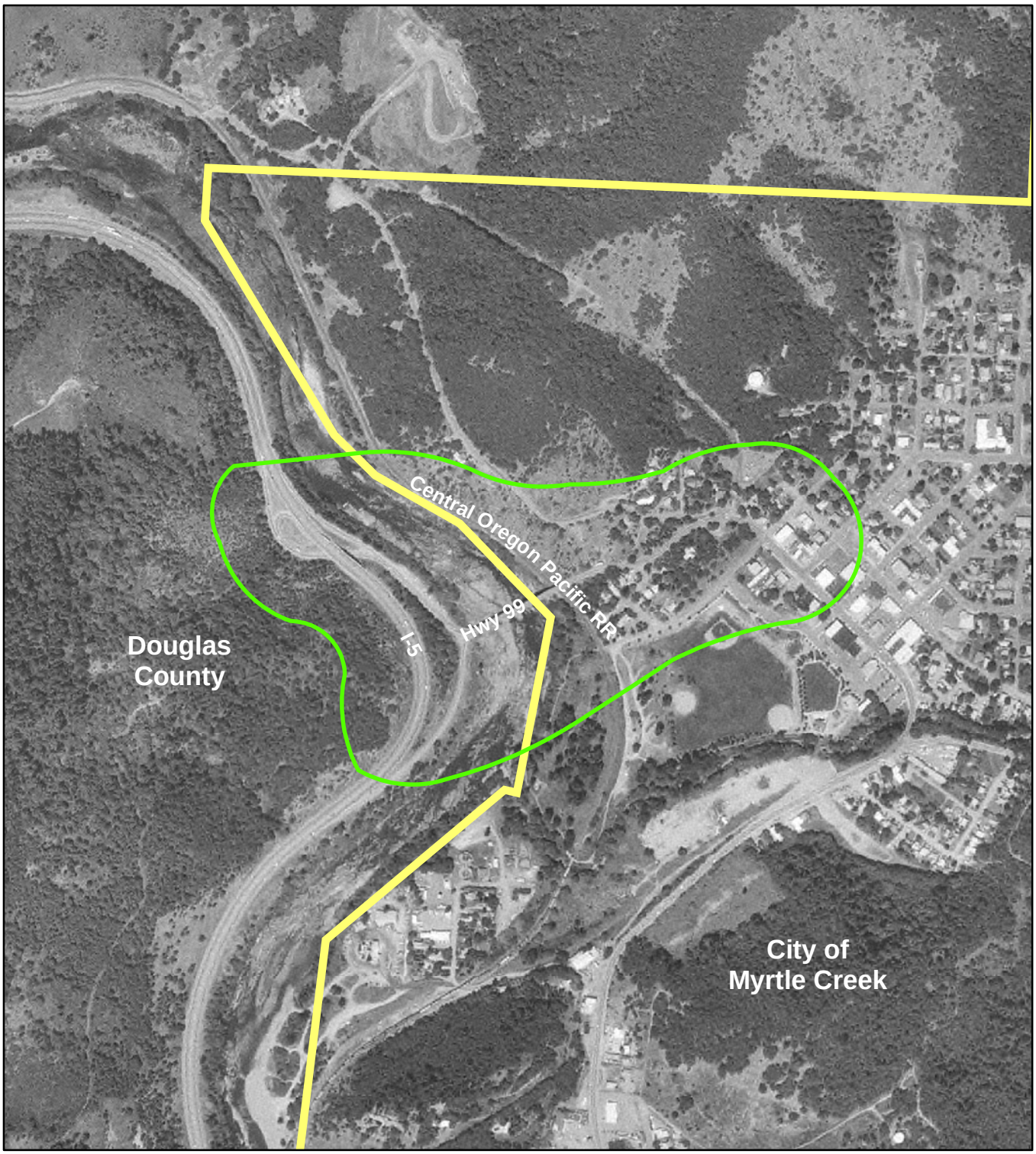
Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

IAMP Study Area Boundary

Myrtle Creek Urban Growth Boundary

0 500 1,000

Feet

Figure 2

I-5 Interchange 108
IAMP Study Area Boundary

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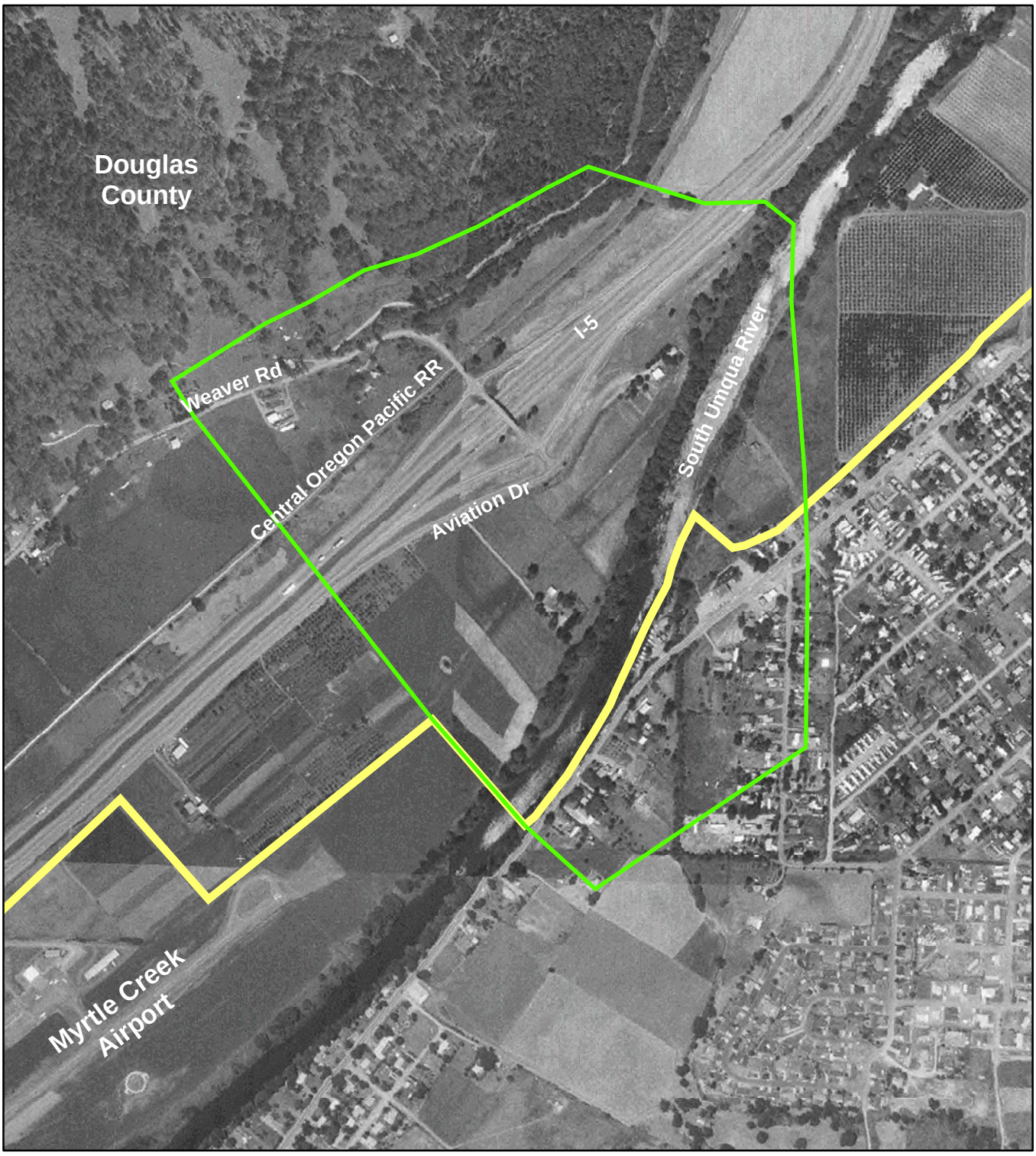
Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

IAMP Study Area Boundary

Myrtle Creek Urban Growth Boundary

Figure 3

I-5 Interchange 106
IAMP Study Area Boundary

0 500 1,000
Feet

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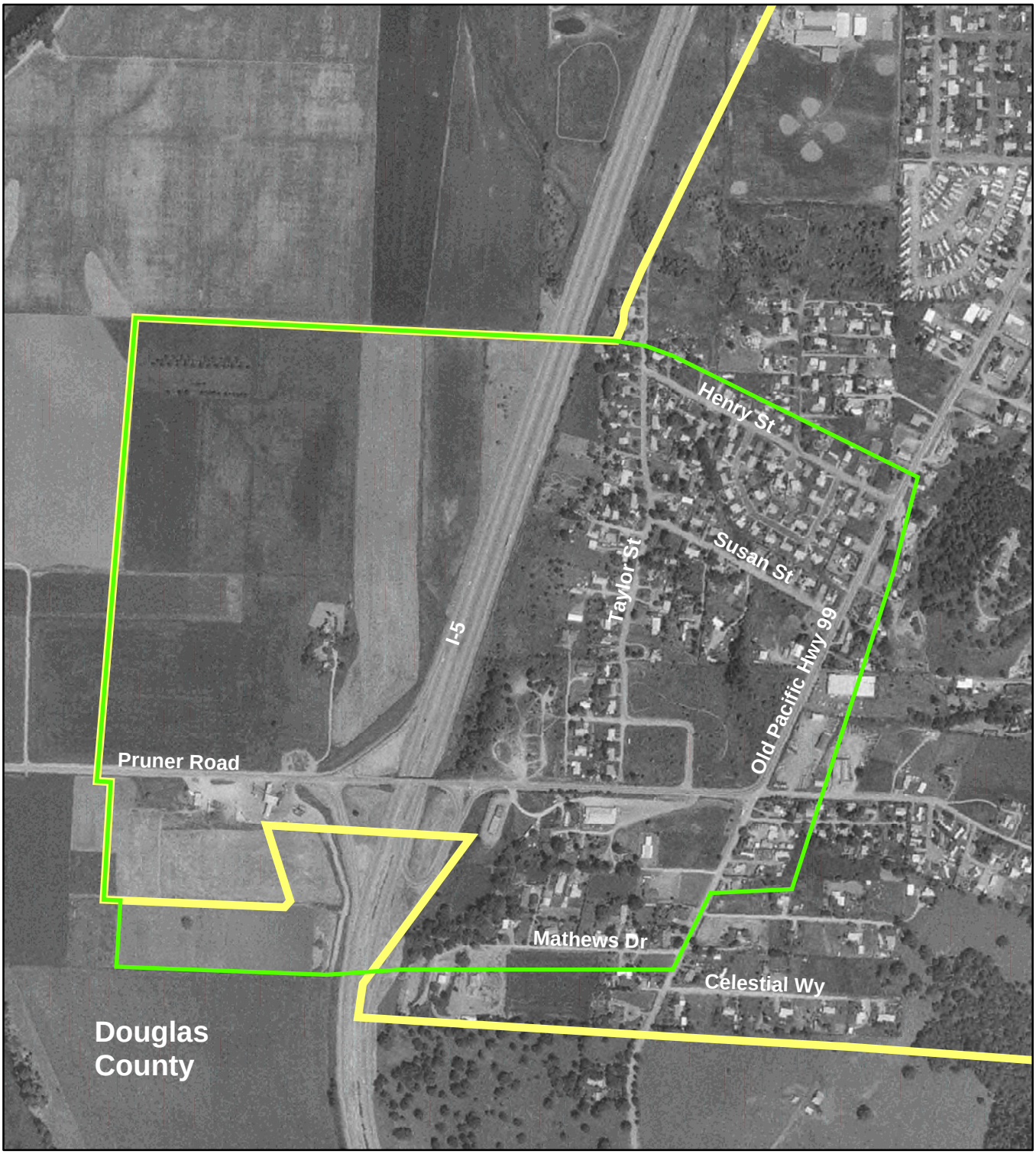

Legend

IAMP Study Area Boundary

Myrtle Creek Urban Growth Boundary

0 500 1,000

Feet

Figure 4

I-5 Interchange 103
IAMP Study Area Boundary

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An access management workshop was held on July 18, 2005 to discuss ODOT standards and access to individual properties. Representatives from ODOT, Douglas County, and Myrtle Creek participated. Additional meetings were held by ODOT staff to discuss access management actions with local property owners in June 2006.

2.0 PROJECT DESCRIPTION, PURPOSE, AND GOALS AND OBJECTIVES

2.1 Project Description

The IAMP provides documentation of current conditions at the three interchanges (traffic and travel patterns, access issues, land use, and geometric deficiencies.) As mentioned in Section 1.0, this IAMP is not proposing conceptual designs for interchanges 106 or 108 since those designs will occur as part of future planning processes. The IAMP does provide an analysis of the existing and future conditions that will provide context for future interchange designs. The plan documents current and forecast conditions, limitations, and needs for the three interchanges. It also provides access management actions to protect the future functioning of the interchanges regardless of the design implemented. In addition, the analysis considers land use and transportation implications of a new bridge connecting Interchange 106 to the Myrtle Creek and Tri City communities and proposes access management strategies for all three interchange areas.

The project calls for a redesign of the existing I-5 Interchange 103 Pruner Road/Riddle Bypass. (The crossroad at Interchange 103 is referred to as both Pruner Road and Riddle Bypass. In this document, we will refer to it as Pruner Road.) The existing interchange configuration is a standard diamond for southbound traffic and a folded diamond for northbound traffic. Replacement of the "cracked bridge" that carries the Pruner Road over I-5 is planned to alleviate the detours required now by some large trucks. Four different design options have been developed that would improve this interchange in conjunction with the replacement of the bridge. All improvement options include the following elements:

- The replacement bridge will accommodate three lanes of traffic (the current overpass accommodates only two lanes of traffic.
- The replacement bridge will be long enough that the I-5 mainline can be widened to accommodate three northbound and three southbound lanes (a future expansion of the current two lanes in each direction).
- All of the potential configurations studied could satisfy travel demands in the future.
- Traffic operations of the potential configurations are similar and will be an improvement over the current situation due to the expansion of the bridge to three lanes, allowing separation of left turns from through movements at the ramp terminals.

Section 4.0 discusses four proposed design configurations for Interchange 103 and the potential advantages of each. The analysis shows the traffic implications of each alternative and recommends that Interchange 103 be redesigned to contain a northbound on ramp in the northeast

quadrant. A determination to whether or not the northbound on ramp should be combined with either the existing loop ramp or a new loop ramp northbound will be decided after a separate analysis of geometric, geological, and cost implications is completed.

In addition, the project calls for the following short-term access management strategies for Interchange 103[1]:

- ODOT will acquire jurisdiction and may acquire access control of the interchange crossroad, Pruner Road, within the immediate interchange area.
- Reservations of access will be issued for existing approaches within the access control area on Pruner Road for properties with no alternative access.
- Some access points will be narrowed or closed, either through ODOT acquiring the parcel, consolidation of access points, or cross-access agreements between property owners.
- Two access points will be restricted to right-in, right-out traffic movements.

The Access Management Plan included in this IAMP (see Appendix J) is comprised of medium- to long-term actions that will be taken at all three interchanges as improvements are made to the transportation system and when change of use applications for parcels in the vicinity of the interchanges are reviewed and approved. Actions related to specific parcels and access points include[2]:

- Restricting traffic accessing sites to right-in, right-out movements.
- Realigning or relocating access points.
- ODOT acquisition of access control and jurisdiction over some roadways.
- Reducing access width.
- Consolidating access points.

2.2 Purpose of IAMP

The Oregon Department of Transportation (ODOT), Douglas County, and the City of Myrtle Creek have determined that the Interstate 5 (I-5) interchanges 103, 106, and 108 are in need of modifications and improvements to allow the interchanges to function more safely and efficiently.

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[1] See Appendix J, Access Management Plan.

[2] The following list is not exhaustive, nor does it distinguish medium-term from long-term actions. For a more detailed explanation of both the Access Management Strategy and Access Management Plan for interchanges 103, 106, and 108, please refer to Section 7.0 of the IAMP and Appendix J.

Pursuant to direction of the Oregon Transportation Commission (OTC), an IAMP is required for these interchange projects. This IAMP will assist the County, City and ODOT with the long-term transportation system management in the area around the interchanges including affected segments of the state highways.

The IAMP evaluates the operation of the interchanges, assesses limitations, identifies future long-range needs, and identifies recommended improvements in order to ensure consistency with mobility standards. The IAMP assesses interchange improvements that may be needed to accommodate the replacement of the structurally deficient Interchange 103. In the case of Interchange 103, the IAMP will need to be completed before funding will be released for the interchange reconstruction project.

Specifically, the purpose of this planning effort is to evaluate the existing and future conditions of Interchange 103, 106, and 108, identify possible future long-range needs attributable to planned development in the area and a new Weaver Road bridge, and propose improvements, modifications, and strategies for meeting those needs. IAMP solutions are intended to provide safe and efficient operations and to protect the transportation function of the interchanges.

The IAMP provides transportation management planning for the interchange areas providing conceptual designs to address deficiencies at Interchange 103, and access management strategies for all three interchanges. The plan will help ODOT, Douglas County, and Myrtle Creek to maintain the integrity of interchange operations while providing appropriate access to the immediate areas and greater connections from I-5 to the nearby communities.

Preparation of the IAMP for the three interchanges occurred in conjunction with the preparation of the City of Myrtle Creek Transportation System Plan (TSP). The Myrtle Creek Planning Commission recommended approval of the TSP to the Myrtle Creek City Council on December 19, 2005. The City Council is expected to adopt the TSP by June 2006.

2.3 IAMP Goals and Objectives

The goal of this IAMP is to maintain the function of the three interchanges in order to preserve the investment in the transportation facilities. The objectives of this IAMP are defined by OAR 734-051-0010 et seq. As noted in Section 3.0, Regulatory Framework and Appendix A, the review of applicable plans and policies, this IAMP addresses OAR 734-051.

The objectives of the IAMP are to:

- Protect the function of the interchanges as specified in the Oregon Highway Plan (OHP) and Douglas County TSP.
- Protect the safe and efficient operation of the interchanges between connecting roadways and minimize the need for major improvements at existing intersections (4th and Main Street/Myrtle Creek Highway/Old Pacific Highway, in particular).

- Provide safe and efficient operations on I-5 and OR 99 (Old Pacific Highway, "Highway 99") as specified in the OHP and Douglas County TSP.
- Provide for safe and efficient connection to the surrounding urban areas and transportation routes.
- Not preclude a future bridge over the South Umpqua River connecting OR 99 to Weaver Road.
- Coordinate planning for Interchange 108 with any I-5 safety improvements.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network, and meets OHP requirements, and access spacing standards in Oregon Administrative Rule (OAR) 734-051.
- Identify future land uses that would be inconsistent with the operation and safety of the interchanges and develop strategies for recommended land use controls (particularly near the South Umpqua Valley Industrial Park).
- Ensure ODOT is involved in future land use decisions that could affect the function of the interchanges.

2.4 Interchange Function

The three interchanges provide access to the City of Myrtle Creek, the unincorporated community of Tri City, and the City of Riddle. There is significant pressure to develop land surrounding the interchanges, and the Interchange 103 area has been targeted to attract more industrial, and possibly commercial development by Douglas County. Due to their close proximity, inter-related issues, and similar conditions, the Pruner Road/Riddle Bypass (103), Weaver Road (106), and Myrtle Creek (108) interchanges in the South Umpqua Segment of I-5 are analyzed as a unit.

I-5 is a principal arterial- interstate and freight route through the 103/106/108 area. The primary function of interstate freeways is to serve inter-regional and interstate passenger and freight traffic.

Interchange 103 connects I-5 with Pruner Road (Riddle Bypass) to the west and Oregon Highway 99 (OR 99), a district-level highway, to the east. District-level facilities have county-wide importance and serve trips between small urbanized areas, rural centers and urban hubs. Oregon Highway 99 serves the Tri City area to the east. Pruner Road is the crossroad and provides access to the South Umpqua Industrial Park, some commercial development (gas station and restaurants), residences in Tri City, and Cow Creek Tribal land in the direct vicinity of the interchange. Further out, it connects to the community of Riddle roughly four miles south of the interchange.

Interchange 106 is a rural interchange providing access to agricultural uses and rural residences off of Weaver Road (a minor collector). Minor collectors in rural areas provide a connection between resource areas having high economic impact on the community and the markets for

these products. This interchange also provides the primary access to the Myrtle Creek Airport via a frontage road (Aviation Drive).

Interchange 108 is the principal interchange for the City of Myrtle Creek crossing the South Umpqua River and connecting just north of the historic downtown. This interchange provides access not only to downtown, but OR 99, and residential areas to the east.

The intended function of interchanges 103, 106, and 108 is to safely and efficiently accommodate future traffic demands associated with current rural and, in the case of 103 and 108, urban land uses. The interchange improvements outlined in this IAMP are not intended to facilitate major commercial or residential development in rural areas surrounding the interchanges.

3.0 REGULATORY FRAMEWORK

The Oregon Transportation Commission approved Oregon Transportation Investment Act (OTIA) funding for improvements to interchanges along I-5 at its January 16, 2002 meeting, subject to conditions. Principally, the Commission required that IAMPs be developed and submitted for their review and approval before funds for construction are released on specified projects. These conditions apply to future improvements on I-5 interchanges in the Myrtle Creek/Tri City area.

A number of different rules and regulations govern land use decision-making in the vicinity of I-5 Interchanges 103, 106 and 108. Appendix A provides a comprehensive review of the principal regulations applicable to planning for the interchanges and a working understanding of how these rules are likely to affect land use and development in the vicinity of the interchanges. Improvements to Interchanges 103, 106 and 108 are eligible for funding through the Oregon Transportation Investment Act (OTIA). Before construction funds can be released for any necessary future improvements, ODOT, Douglas County and the City of Myrtle Creek must agree on an acceptable Interchange Area Management Plan. Amendments to local plans to incorporate modifications to the function and design of the interchanges must be consistent with the regulatory requirements of the state and local governments as described in Sections 3.2, 3.3, and 3.4 and Appendix A.

3.1 Interchange Study Area Descriptions

The land use study area for each interchange (see Figures 2, 3 and 4) defines the general area where the interchange improvements could potentially influence land use patterns or have land use impacts. At a minimum, the IAMP land use study area includes all land uses and roadways located within approximately 1,320 feet of the existing interchanges. This distance corresponds to the spacing standard outlined in the OAR 734-051 Division 51 rules for interchange ramps.

The three interchanges serve the Myrtle Creek and Tri City Unincorporated Urban Area in Douglas County. Half of Interchange 108, to the east of I-5, lies within the Myrtle Creek city

limits. The western half of Interchange 108 is outside the Urban Growth Boundary (UGB). Interchange 106 is wholly outside of the UGB, with access from Weaver Road to the north and a frontage road, Aviation Drive, to the south. Interchange 103 primarily serves the Tri City area and is within the Myrtle Creek UGB and the City of Riddle approximately four miles to the southwest. Old Pacific Highway ("Highway 99") crosses over I-5 at this interchange, providing access to urban areas to the east, and agricultural areas to the west.

Douglas County has land use planning jurisdiction for most of the IAMP project, including the Tri City Unincorporated Urban Area, and the areas outside of the Myrtle Creek UGB. The Douglas County Comprehensive Plan (2003) contains land use designations in these areas, and. Chapter 3 of the Douglas County Land Use and Development Ordinance contains the County's zoning classifications. For the areas within the Myrtle Creek city limits and UGB (excluding Tri City), Myrtle Creek has planning jurisdiction. The Myrtle Creek Comprehensive Plan (1991) and the Myrtle Creek Zoning Ordinance 2004 provide land use designations and land use zoning, respectively.

3.2 State Regulatory Context for Interchange Area Management Planning

Land use decision-making in the vicinity of the I-5 Interchanges 103, 106 and 108 is governed by a number of different state and local rules and regulations. Appendix A identifies the principal regulations and provides an overview of them in sufficient detail to provide a working understanding of how these rules are likely to affect land conservation and development in the vicinity of the interchange. Regulations include Statewide Planning Goals, Oregon Administrative Rules, and Oregon Revised Statutes related to land use planning, preservation of agricultural land, public facilities planning, transportation planning, access management and urbanization. Also governing the development of IAMPs are the State's Highway Design Manual and the adopted transportation plans of Douglas County and Myrtle Creek.

Amendments to local plans to incorporate modifications to the function and design of the interchanges must be consistent with the applicable regulatory requirements. The allowed land uses in the vicinity of the interchanges will also have an affect on the operation of the transportation facilities. The traffic generation potential of allowed and future land uses, both in the County and in the City, were examined as part of the development to of the IAMP to assess the combined affect on how the interchanges function.

The plans and policies technical memorandum singles out Statewide Planning Goal 2 as particularly important in planning for interchange areas. 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." ODOT must coordinate with Douglas County and with the City Myrtle Creek, both of which have planning authority over the areas impacted by any proposed interchange improvements. Coordination is particularly important because development within both the City and the County will impact use of the proposed interchange, and land use decisions in that area could affect future use and operation of the

interchange.[3] Goal 2 also 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 elements of an IAMP developed for these interchanges will need to be adopted by both the City and County and elements will need to be incorporated into the jurisdictions' transportation system plans (TSPs)[4].

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

The IAMP for Interchange 103, 106 and 108 will need to be found in compliance with the provisions of the TPR before it can be adopted by the City and the County. 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, is engaging in access management consistent with its Access Management Rule. (See Section 7.0 Access Management.)

The 1999 Oregon Highway Plan (OHP) outlines the policies and strategies to guide the Highway Division's operating and fiscal activities. 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. Policy 3C calls for developing interchange area management plans to protect the function of the interchange to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges. Access management

[3] The Transportation Planning Rule also requires coordination among affected local governments, agencies and special districts. See OAR 660-012-0015(5).

[4] A TSP is an element of the local comprehensive plan. The City of Myrtle Creek's Planning Commission recommended approval of a draft TSP to the Myrtle Creek City Council on December 19, 2005. The City Council is expected to adopt the TSP by June 2006. While the city's TSP was developed to be consistent with the draft IAMP for interchanges 103, 106, and 108, the IAMP contains a detailed access management plan for Interchange 108 and the City will need to adopt the IAMP recommendations (see Section 8.0, Implementation of the IAMP).

standards are detailed in Policy 3C and include the distance required between an interchange and approaches and intersections. The most stringent standards apply in interchange areas.

OAR 734, Division 51 (Highway Approaches, Access Control, Spacing Standards and Medians) defines the State's role in managing access to highway facilities in outlines how the State will manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. An important component of the State strategy is the development of interchange area management plans. Section –0155 identifies when, how, and why ODOT will develop access management plans for particular sections of a highway. Division 51 also contains the Oregon highway system spacing standards for interchanges.

Chapter 9, Intersection and Interchange Design, of the Highway Design Manual implements the OHP policies. The manual includes the design standards, guidelines, and processes for designing road approaches, signalized and unsignalized at-grade intersections, and interchanges for State Highways. Improvements to I-5 interchanges must be consistent with the standards in this manual.

3.3 Local Regulatory Context for Interchange Area Management Planning

IAMPs must be consistent with the adopted local transportation system plans. 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 Myrtle Creek TSP was developed concurrently with this plan, but has not yet been adopted. The Douglas County 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 plan will need to be updated to reflect the policies, recommended improvements, and access management plans included in the IAMP for interchanges 103, 106, 108. The Tri City Urban Unincorporated Circulation Plan (2001) was also considered during the development of the IAMP. This circulation plan is one of three urban unincorporated circulation plans that are part of the Douglas County TSP. Because the City of Myrtle Creek is updating transportation information and adopting a transportation system plan (TSP), the adopted policies and improvements in the City's Comprehensive Plan (1978, Updated 1991) also were reviewed for consistency with the IAMP.

4.0 ALTERNATIVES CONSIDERED

As stated earlier, conceptual designs were only developed for Interchange 103 in this IAMP. Designs for interchanges 106 and 108 will be developed in the future planning efforts accounting for the Weaver Road Bridge and the Myrtle Creek Arch Bridge efforts, respectively. Funding for the Interchange 106 improvements is part of the federal transportation bill that was signed into law in August 2005 and conceptual designs will be coordinated with that effort as it develops.

Any future improvements to Interchange 108 will need to integrate the planning for Myrtle Creek Arch Bridge project.

For Interchange 103, four planning-level interchange concepts were evaluated to address existing deficiencies. The concepts are very conceptual in nature and, if moved forward, would likely be modified to reflect further analysis and data collection regarding: site topography, right-of-way conditions/needs, geotechnical conditions, geometric requirements for truck turning, cost considerations, and the need to keep the interchanges operational during construction.

Each concept assumed widening of the Pruner Road (crossroad) bridge from two to three lanes, and that the bridge would be long enough to accommodate I-5's expansion to six lanes. The four alternative configurations considered include:

- The Existing Configuration
- The Existing Configuration with Modified Ramp
- Diamond Configuration (Standard or Tight)
- Diamond Configuration with Two Northbound On-Ramps

The recommended alternative configuration for interchange 103 includes a northbound on-ramp in the northeast quadrant of the interchange consistent with the STIP. All of the diamond configurations considered are consistent with this recommendation (standard or tight diamond, and diamond configuration with two northbound on-ramps.) The recommended variation on the diamond interchange will be determined after further analysis of the impacts the designs.

Variations on the diamond interchange concept were discussed at length at public meetings with review of both a standard diamond interchange and a tight diamond interchange. Both variations of this concept remove the sub-standard loop ramp in the southeast quadrant of the interchange and add a northbound on-ramp in the northeast quadrant. In addition, the ramp terminals on all approaches to and from the Pruner Road are re-aligned to intersect the cross street at a 90-degree angle. In both variations, local access roads on either side of the interchange are to be maintained. More details regarding these two concepts can be found in Appendix B, Interchange 103 Concepts Memorandum.

Three other concepts were developed late in the IAMP development stages to evaluate alternatives that made improvements to the interchange without eliminating the existing loop ramp. These three concepts include: (1) keeping the existing folded diamond configuration but widening the Pruner Road bridge from two to three lanes; (2) modifying the loop ramp to improve the geometric deficiencies and improving the Pruner Road bridge, and (3) improving the loop ramp and bridge as in (2) and adding a north leg to the interchange so that there are two northbound ramps (a diamond configuration with two northbound ramps). The four design alternatives (new and existing configurations) and their potential advantages are discussed below.

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Not to Scale

Legend

- Existing Mainline
- Proposed Bridge Improvements
- Proposed Ramp Improvements
- Eliminated Ramps

Number of Lanes

- (1) One Lane
- (2) Two Lanes

Figure 5

I-5 Interchange 103 Existing Configuration with Bridge Improvements

Conceptual Design

February 2006

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4.1 Existing Configuration

The existing interchange configuration features a folded diamond for northbound traffic. (See Figure 5.) The northbound on-ramp has a sharp, low speed ramp. The merge with the northbound through lanes occurs before I-5 goes beneath the existing bridge. One of the advantages of this configuration is that traffic originating on the west side of the interchange that is seeking to go north on I-5 could do so making only right turns. There would be no need to make left turns that conflict with on-coming traffic. This is especially important for trucks when a traffic signal is not used at the ramp terminal. The existing configuration would be improved over today due to the widening of the bridge (Pruner Road) from two to three lanes. However, the loop ramp would still have geometric and ramp length deficiencies as discussed in Section 5 of this document. The three lane bridge (assumed for all the alternatives) would provide a left-turn lane improving traffic flow. This configuration is not recommended.

4.2 Existing Configuration with Modified Ramp

A modification of the existing configuration would retain the folded diamond configuration for northbound I-5 traffic. (See Figure 6). Preliminary analysis suggests that the sharp, low-speed ramp can be redesigned to provide for easier movements for large trucks, but this option would likely require a longer bridge span crossing I-5 since the merge point for the on-ramp would be to the north of the existing bridge. The length of the span would be determined during the design phase. This would likely add cost. Retaining this loop ramp in modified form allows the same advantages for right turns discussed above combined with improved ramp length and geometry. This configuration is not recommended.

4.3 Standard and Tight Diamond Interchange (Preferred Alternative, Option 1)

Both the standard or tight diamond interchange configuration are consistent with the preferred alternative calling for a northbound on-ramp in the northeast quadrant of the interchange.

A diamond interchange, such as that used at Weaver Road, is a possible configuration for Interchange 103. A diamond interchange can be described as a "standard" diamond or "tight" diamond depending on the distance between the ramp terminals. A standard diamond generally has sufficient separation that left-turn lanes at the ramp terminals do not overlap. With a tight diamond, left turn lanes in opposing directions are often side-by-side on the crossroad. To provide a through lane and a left-turn lane in each direction, a standard diamond requires a bridge three lanes wide, while a tight diamond requires four lanes.

Whether the redesigned interchange is classified as a standard diamond or a tight diamond, the design is governed by Oregon's Highway Design Manual (HDM). Where the design does not meet applicable standards, a design exception would be required.

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Not to Scale

Legend

- Existing Mainline
- Proposed Bridge Improvements
- Proposed Ramp Improvements
- Eliminated Ramps

Number of Lanes

- (1) One Lane
- (2) Two Lanes

Figure 6

I-5 Interchange 103 Existing Configuration with Modified Ramp

Conceptual Design

February 2006

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Not to Scale

Legend

- Existing Mainline
- Proposed Bridge Improvements
- Proposed Ramp Improvements
- Eliminated Ramps

Number of Lanes

- (1) One Lane
- (2) Two Lanes

Figure 7

I-5 Interchange 103 Diamond Configuration

Conceptual Design

February 2006

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A standard diamond interchange would likely be centered equally about I-5. (See Figure 7). The northbound and southbound ramp terminals would be likely be located in the same general location as today. The Pruner Road crossing is assumed to feature a three-lane cross-section, however this interchange configuration would not preclude future expansion to a five-lane section if desired. Both the acceleration and deceleration lengths on the entrance and exit ramps would be designed to meet current standards as required by the HDM.

Assuming the ramp terminals remain in approximately the current locations, the local access points along Pruner Road would probably not change, except for the removal of one access in the southwest quadrant of the interchange (one of the driveways serving the gas station). Access to properties in this vicinity might be preserved by extending Petite Street southward approximately 450 feet west of the existing road. (Petite Street is shown as platted to continue to the south on the Douglas County Tax Assessor's map.) To meet the 1,320-foot access spacing called for in the OHP, other local access points would need to either be closed, or re-routed to intersecting streets.

In a tight diamond interchange, the configuration would be similar, but the separation between the northbound and southbound ramp intersections would be shorter. A typical separation between ramp terminals at a tight diamond interchange is approximately 350 feet. Although tight diamond interchanges can operate equal to, or better than, wider "standard" diamond interchanges, the tight diamond ordinarily requires side-by-side turn lanes and a wider bridge. As described above, whatever configuration is chosen must be designed according to the HDM or exceptions must be approved.

Similar to the standard diamond interchange concept described above, a tight diamond would provide for a separate left-turn lane and a separate through lanes at each ramp terminal. Thus, the Pruner Road crossing would likely feature a four-lane cross-section, but the configuration does not preclude future expansion to a six-lane section. Both the acceleration and deceleration lengths on the entrance and exit ramps would be designed to meet current HDM standards.

With a tight diamond configuration, shortening the distance between the ramp terminals allows the designer to achieve greater separation between the ramp terminals and the nearest local access points without moving them. With a tight diamond interchange, spacing to the closest local access point would be increased by approximately 200 feet relative to the existing configuration.

Though access spacing would be improved with the tight diamond concept, it still would not meet the 1,320-foot access spacing called for in the OHP. To meet spacing standards, other local access points would need to either be closed, or re-routed to intersecting streets. Access issues are discussed in detail in Section 7 of this report. The standard diamond option provides better traffic operations for left-turning traffic onto the I-5 ramps than the tight diamond because of the greater distance between the ramps. This concept would improve forecast operations at Interchange 103 compared to a tight diamond interchange option. Operations are discussed in more detail in Subsection 5.1.2 of this plan.

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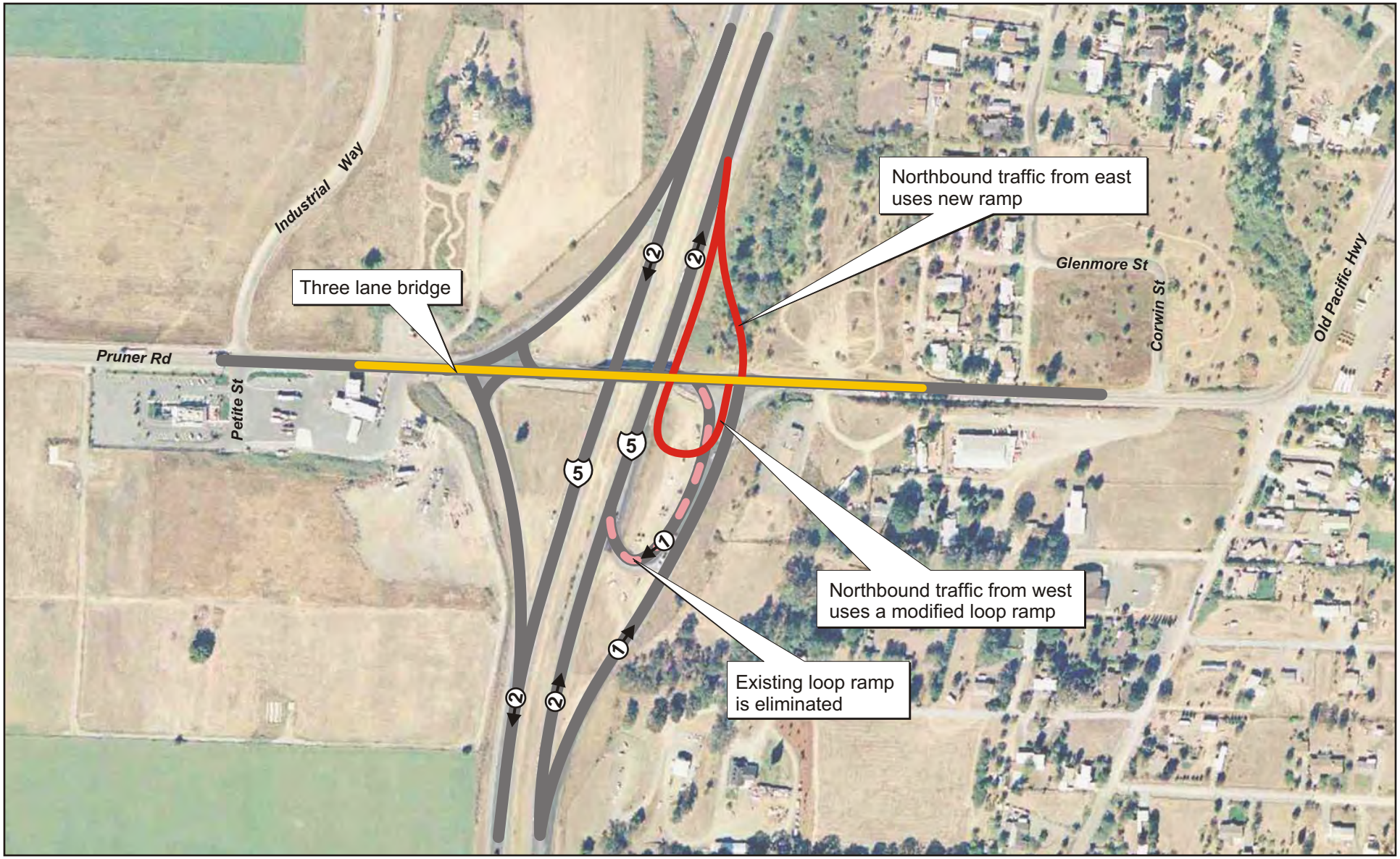

DAVID EVANS AND ASSOCIATES INC.

Not to Scale

Legend

- Existing Mainline
- Proposed Bridge Improvements
- Proposed Ramp Improvements
- Eliminated Ramps

Number of Lanes

- (1) One Lane
- (2) Two Lanes

Figure 8

I-5 Interchange 103 Diamond Configuration with Two Northbound Ramps

Conceptual Design

February 2006

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4.4 Diamond Configuration with Two Northbound On-Ramps (Preferred Alternative, Option 2)

As mentioned above, this configuration is a second option for implementing the preferred alternative, adding a new northbound on-ramp. The design option would combine a diamond interchange with a loop ramp for the traffic from the west seeking to go north on I-5. (See Figure 8). This configuration would retain the advantage by which right turns are made by vehicles from the west seeking to travel north on I-5. It would also allow vehicles from the east use right turns to access I-5 northbound. This configuration would require a longer span for the bridge carrying the traffic across I-5. The need for signalization of the northbound ramp terminals would be delayed by several years.

4.5 Interchange 103 Alternatives Summary

Each conceptual design alternative for Interchange 103 has advantaged and disadvantages. These are summarized in Table 1 below.

Table 1

Interchange Configuration Advantages and Disadvantages

Interchange Configuration	Advantages	Disadvantages
Existing	• Minimum span for bridge • Right turns are used for traffic from west seeking to go north on I-5	• Sharp, low-speed turn for northbound on-ramp • Left turns are used for traffic from east, Myrtle Creek and Tri-City, to go north on I-5
Existing with Modified Ramp	• Right turns are used for traffic from west seeking to go north on I-5 • Ramp design speed is higher than existing loop ramp speed	• Left turns are used for traffic from Myrtle Creek and Tri-City to go north on I-5 • Longer bridge required to span I-5 and new loop ramp
Diamond *(Preferred Alternative, Option 1)*	• Conventional interchange layout • Minimum span for bridge • Right turns are used by traffic from Myrtle Creek and Tri-City to go north on I-5	• Left turns are used for traffic from west seeking to go north on I-5
Diamond with Two Northbound Ramps *(Preferred Alternative, Option 2)*	• Right turns are used for traffic from Myrtle Creek and Tri-City to go north on I-5 • Right turns are used for traffic from west seeking to go north on I-5 • Signalization of the northbound ramp terminal may be delayed by several years due to the removal of many left turns from the intersection	• Longer bridge required to span I-5 to accommodate a new loop ramp ***if*** replacement the old loop ramp occurs • If the existing ramp remains in place, it does not meet current design standards

Note: The advantage of right turns at ramp terminals applies only if the ramp terminals are unsignalized.

Signal Warrants

Preliminary analysis of traffic volumes at the ramp terminals indicates that signal warrants for either the existing configuration or the diamond configuration would be met in a few years. Depending upon the rate of growth in regional traffic, traffic signal warrants could be met at both the northbound and southbound ramp terminals by approximately year 2007. However, signal installations require the approval of the State Traffic Engineer. Meeting warrants does not guarantee that they will be approved. Should the planned Weaver Road bridge connecting Interchange 106 to Myrtle Creek on the east side of the South Umpqua River be constructed, signal warrants may not be met for many years due to the shift in traffic patterns, drawing traffic from Interchange 103 and shifting it to Interchange 106.

The option that uses two northbound ramps (the loop ramp for traffic from the west and the second for traffic from the east) would further delay the need for a traffic signal at the ramp terminal. Without construction of a new Weaver Road Bridge, signal warrants would likely be met in approximately 2016 with this configuration featuring two the northbound ramps.

The ramp terminal for the southbound traffic is predicted to meet warrants for installation of a traffic signal as early as 2007 for all interchange concepts. The actual date at which the warrants will be met depends upon regional traffic growth and the presence or absence of the Weaver Road Bridge. The State Traffic Engineer must approve signal installations, and meeting warrants does not ensure approval.

Capacity and Operations

All of the potential configurations will satisfy travel demands in the future and all are expected to be far superior to the current situation because the new bridge will be designed with three lanes, allowing separation of left turns from through movements at the ramp terminals.

The traffic operations of the configurations are predicted to be similar. From a traffic standpoint, there do not appear to be significant factors influencing the selection of a preferred alternative. A determination of appropriate design elements may hinge on topographic constraints, right-of-way constraints, cost, or issues related to the construction sequence and phasing. Some design decisions may have to be made at the time of design for the replacement of the cracked bridge. However, the selection of a preferred alternative should be made prior to the design phase of the project. For planning purposes, it is important that all affected parties, including local jurisdictions and private property owners, accept the basic elements of a preferred alternative. Because all of the design options explored meet the project objectives for improving Interchange 103, all of the advantages offered under each were evaluated to determine which alternative was preferred. ODOT has determined that the operational performance and access provided by a diamond configuration that incorporates two northbound ramps is a preferable design, but is not recommending whether the preferred design concept will contain the loop ramps or not until a more detailed analysis of design considerations is undertaken.

5.0 EXISTING CONDITIONS INVENTORY AND DATA ANALYSIS

5.1 Transportation Facilities

5.1.1 Geometric Conditions and Deficiencies

I-5 Interchanges 103, 106, and 108 were analyzed to determine existing geometric and roadside deficiencies. Findings from this analysis (Appendix C., Existing Geometric Conditions of Interchanges 103, 106, & 108) are summarized below.

Interchange 103, Pruner Road/Riddle Bypass. This interchange provides access to the Umpqua Industrial Park and some commercial development in the direct vicinity, Tri City and Myrtle Creek to the east, and Riddle to the west. It is an asymmetrical half-diamond on the west side; partial clover ("parclo" A) on the east side.

The spacing between the ramps of the Pruner Road interchange and the ramps of the next nearest interchange is greater than the two-mile minimum requirement and incidents at one interchange are not likely to impact the operation of the other. However, driveways and access points are located closer to the ramp terminals than allowed by current standards. To the west of the southbound ramps, there are several accesses and one intersection within 1,320 feet, the minimum access management spacing standard. East of the northbound ramps, there are two accesses within this distance. In addition, the end terminals for all guardrails at this interchange are not to current standards.

The I-5 mainline through the Interchange 103 meets the standards for a 70 m.p.h. design speed but the overhead clearance under the overpass, which ranges between 14'8" and 15'11", is less than the required minimum clearance of 17 feet 6 inches. The *I-5 State of the Interstate Report* states that the crossroad presently has 4-foot shoulders and two 13-foot travel lanes and recommends upgrading this to 8-foot shoulders and a 40-foot-wide roadway.

This section of I-5 and the interchange were designed many years ago when different standards were applicable. The northbound off- and on-ramps at Interchange 103 are deficient when compared with current standards. The curve of the NB off-ramp does not provide a proper deceleration lane, exit angle, or spiral transition to aid in smooth exit speed reductions. The right-hand shoulder is 2 feet less than the required 6-foot width. The NB on-ramp's tight loop configuration imposes a design speed below the minimum 25 mph. The existing northbound loop ramp has a design speed in the vicinity of 15 miles per hour with a 75 foot radius. The minimum allowable design speed with new construction is 25 miles per hour with a 159-foot minimum radius. The acceleration lane length is shorter than the required 1,420 feet and the taper length at the end of the acceleration lane is also shorter than the required 300 feet. The right-hand shoulder is 2 feet less than the required 6-foot width. Ramp terminal spacing along the crossroad is approximately 400 feet, less than the bare minimum standard of 600 feet. With the current ramp configuration, this is less of an issue since there are no eastbound left turning movements to

get onto the northbound on-ramp. Therefore, there are no potential conflicts with westbound left turning movements for the southbound on-ramp.

The southbound off- and on-ramps curve and spiral transition meet requirements for their design speed; however, both are shorter than their required lengths. For both, the right-hand shoulder is 2 feet less than the required 6-foot width. These also reflect the standards that were in effect at the time the interchange was designed and do not reflect current standards.

Interchange 106, Weaver Road. Interchange 106 provides access to the Myrtle Creek Airport and to agricultural uses. It is a standard diamond interchange. The spacing between entering and exiting tapers between the Weaver Road and Myrtle Creek (108) interchanges on both the north- and southbound directions are less than the standard two miles. Thus, traffic operations at the two interchanges have the potential to affect one another with respect to weaving movements.

Access points are located closer to the ramp terminals than permitted under current standards. To the west of the southbound ramps, there are accesses and an intersection that fall within 1,320 feet of the ramp terminals and east of the northbound ramps and one intersection falls within this distance.

The bridge is functionally obsolete and does not meet vertical clearance standards. In addition, the end terminals for all guardrails are not to current standards.

The northbound off- and on-ramps have an adequate design speed, but both the deceleration and acceleration lane lengths fall short of the required 540 feet for the existing geometry. If the geometry changes, the required lengths will increase. The distance between the existing ramp terminals is 475 feet and does not meet current standards. Thus, the traffic operations on these ramps have the potential to impact each other. Especially if the Weaver Road bridge is constructed and traffic volumes increase significantly, the spacing between the ramp terminals will likely be inadequate. The taper length following the acceleration lane is also deficient, being 50 feet short of the required 300 feet. Similarly, the southbound off- and on-ramps are shy of their required lengths.

Interchange 108, Myrtle Creek. This interchange has a unique configuration due in part to I-5's tight, reversing curves in this area. This interchange is the main access into the City of Myrtle Creek. It connects to the northern part of the city, including the downtown and numerous residential areas.

The entrance ramps have tight curves and deficient acceleration lengths. The overpass bridge is functionally obsolete. The abrupt and sharp curvature of the I-5 mainline alignment through this interchange has lead to high accident rates. ODOT has installed special signage, including radar-activated devices, to warn drivers to slow down. The mainline median through the interchange is 8.4 feet in width, while the minimum required width of a median with barrier is 18 feet.

Measurements of as-built drawings show the vertical clearance underneath I-5 at the Myrtle Creek underpass at 16 feet, one foot short of the required 17 feet 6 inches. Like the two

interchanges to the south, the end terminals for all guardrail runs at Interchange 108 do not meet current standards.

The minimum required spacing from crossroad to crossroad in the vicinity of Myrtle Creek should be two miles. There is less than a two-mile separation between the Myrtle Creek interchange and the next interchange to the south. Also, there is a required spacing of two miles between the beginning and ending of exit and entrance ramp tapers. There is only approximately 1 mile distance between the Myrtle Creek interchange and the Weaver Road interchange. In addition, to the east of I-5 along Hwy 99 there are accesses that fall within 1,320 feet distance from the ramp terminals.

Both of the northbound off- and on- ramps are currently deficient. The northbound off-ramp does not conform to standard exit ramp design. The ramp diverges from the mainline at the start of a sharp curve on the mainline and features a reverse horizontal curvature and compound curvature; features that are not standard ramp design practice in Oregon.

The design speed of the ramp is limited to 30 miles per hour (mph), less than the minimum design speed of 35 mph. This vertical curve is immediately followed by a 6.6% downgrade that exceeds the desirable downgrade of 6%.

Regarding the northbound on-ramp, the *I-5 State of the Interstate Report* indicates that there is no spiral curve transition on the ramp, and while there is no data on the on-ramps given on the as-built drawings, it appears that the ramp radius is greater than the mainline radius. This would lead to speeds on the merging on-ramp to be higher than speeds on the mainline. Also, the length of the acceleration lane is inadequate. These deficiencies make it more difficult for traffic to safely merge onto I-5.

The right-hand shoulders for both off- and on-ramps are 2 feet less than the required 6-foot width. Neither cross-section of the ramps include a 2-foot "shy" distance from the edge of the standard shoulder to the face of guardrail.

The *I-5 State of the Interstate Report* indicates that the southbound off-ramp has deficiencies similar to the northbound on-ramp. The ramp's radius is not equal to the main line curve radius, there is no spiral curve transition on the ramp, and the deceleration lane length is inadequate.

The southbound on-ramp begins as a frontage road that runs north, parallel to I-5. It crosses under I-5 and loops around to connect with southbound I-5. The loop portion of the ramp has a radius of 65 feet. This yields a degree of curvature significantly sharper than the standard of 36 degrees and a design speed less than the minimum 35 mph. The existing loop ramp has a design speed of about 15 mph, which is far below current ODOT standards as specified in the HDM. Additionally, the acceleration lane is approximately 325 feet in length, far short of the minimum requirement. If the ramp were designed to the 25 mph standard, the acceleration lane would need to be at least 1,430 feet in length. The ramp entrance angle is sub-standard, as the ramp converges with the mainline on a curve. These deficiencies make it more difficult for traffic to safely merge onto I-5.

Both the southbound off- and on-ramps have right-hand shoulders that are 2 feet less than the required 6-foot width. Neither cross-section of the ramps includes a 2-foot "shy" distance from the edge of the standard shoulder to the face of guardrail. All these deficiencies reflect the lower standards that were applicable when the facility was originally designed.

5.1.2 Existing Traffic Operations in the Planning Area

One of the objectives in developing the IAMP for Interchanges 103, 106, and 108 is to gain a better understanding of the current conditions, limitations, opportunities and needs for these interchanges. This section summarizes the methods, procedures, and data used in analyzing the traffic counts and developing the 30th Highest Hour Volume. Traffic operations, merge, and diverge analyses were performed for current traffic volumes on the existing road network. Complete results are presented the Interchanges 103, 106, and 108 Existing Transportation Analysis, Appendix D.

In order to determine traffic volumes, 48-hour tube counts, manual 14-hour classification counts, and intersection peak hour counts were taken at a variety of locations. There are eight intersections of interest surrounding these three interchanges. Four of those intersections are on the Pruner Road between Interchange 103 and Old Highway 99. Three additional intersections are located on Weaver Road at Interchange 106. The final intersection is the junction of the SB ramps and NB off-ramp at Interchange 108. All intersections are currently unsignalized. The lane configuration and traffic control at each of the intersections is illustrated in Figure 1 in Appendix D. The counts were examined to determine the peak hour volume, peak hour factor, and percent of heavy vehicles at each intersection. The system peak hour for the study area was found to occur between 4:00 and 5:00 PM.

Heavy vehicle percentages were determined for each intersection from the counts provided. The count data includes truck classifications by light, medium, and heavy. The medium category includes any vehicles with 3 axles, and heavy is defined by anything with more than 3 axles. The medium and heavy trucks were combined together for the percent heavy vehicles. The percent of heavy vehicles at select locations is summarized in Table 4 in Appendix D.

Using methodology developed by the Transportation Planning Analysis Unit (TPAU) for ODOT, current year 30th highest hour traffic volumes were calculated for the areas surrounding Interchanges 103, 106, and 108. The 30th highest hour provides a good approximation of peak traffic conditions without including the busiest hours due to outlying events like major holiday traffic.

5.1.3 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 the capacity of the facility. 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[5] (OHP) sets standards for v/c ratios that are not to be exceeded for state highways. The standards show that Interstate 5 must operate with a v/c ratio at or below 0.70. The Douglas County TSP establishes standards for roads not under the state's jurisdiction. An LOS D is required for all signalized and unsignalized intersections.

In addition, analysis and results of the operational analysis for existing conditions were compiled for each ramp intersection for the three interchanges. The results of this analysis showed that all ramps are operating at an acceptable LOS and below the v/c standard of 0.70 set in the OHP. The merge and diverge analysis conducted on the freeway ramps shows that the ramps are currently operating at an acceptable LOS.

5.1.4 Safety and Crash Analysis

The safety analysis performed for the IAMP is intended to summarize and evaluate crashes along Interstate 5 (I-5) in the project area for Interchanges 103, 106, and 108. The safety analysis report (Appendix E) includes a review of ODOT's supplied Planning Research Corporation (PRC) crash listings (2001 to 2003), ODOT Safety Priority Index System (SPIS) data, and a comparison of calculated crash rates with statewide averages.

The first step in analyzing the safety data was to determine the location and frequency of crashes occurring in the study area. Next, crashes were totaled by segments of freeway and by on/off ramps of interchanges. Finally, interchange crash rates were calculated and compared to statewide averages.

PRC Reports

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

[5] 1999 Oregon Highway Plan, Oregon Department of Transportation, Salem, OR, 1999.

three complete years of reported crashes, 2001-2003. The number of crashes was determined from the PRC reports. The ADT for each location was determined from the available traffic counts. Crash rates were then calculated for the entire three-year study period. These results are shown in Table 1 in Appendix E.

SPIS Data

SPIS is a method developed by ODOT for prioritizing locations where funding for safety improvements can be spent most efficiently and effectively. Each SPIS site is assigned a Safety Investment Program (SIP) rating. This rating varies from 1 to 5, where a location having 10 or more fatal/injury crashes in a three-year period would be assigned the highest rating of 5.

A list of the sites with the top 10% SPIS scores is produced by ODOT each year. The study area has one Top 5% SPIS location, which lies between MP 107.9 and MP 108.03. It had 22 crashes within the three-year study period, with no fatal crashes. The SPIS score for the section ranges from 72.51 to 72.95 with a SIP rating of 3. The SPIS score and SIP ratings indicate that there is need for improvements to be made in the vicinity of MP 108.

Study Area Findings

At Interchange 103, a total of eight accidents were recorded at the northbound ramp terminal intersection. Six angled crashes occurred while vehicles were turning. At the Interchange 103 southbound ramp terminal, seven crashes were recorded. Six of the seven crashes occurred while vehicles made a turning movement, resulting in three angled type crashes and three sideswipes. No crashes were recorded at the ramp terminals for interchange 106 0r 108 during the three-year period examined. A summary of crashes by location for all the studied interchanges in included as Table 1 in Appendix E.

The spike in accidents occurred in 2003 might be a result of construction on the freeway, which sometimes caused traffic to detour through the Interchange 103 intersections. Crashes at the SB ramp terminal may be caused by poor sight distance for vehicles turning left from the off-ramp. The vertical curve of the bridge, along with the guardrail and security fence, combines to obscure WB cars on the overpass.

Crashes were also examined for the freeway mainline between MP 102.5 – MP 110.5. The segment of freeway between MP 108.0 – MP 108.5 has a considerably higher crash rate than the other segments. The crash rate for this segment of freeway is approximately five times higher than the statewide average crash rate for freeways. Thirty-four crashes have occurred in this segment, of which 22 have caused property damage only and the rest involved injuries. There were no fatal crashes in the segment. Seventeen of the crashes were fixed-object type. The remaining were as follows: seven sideswipes, five overturns, and four rear-end crashes involving a stopped vehicle. In addition, 55% of the crashes occurred due to excessive speed of drivers for the existing conditions, 16% due to improper lane change, 8% due to driving an unsafe vehicle and 8% of vehicles ran off the road.

The crash rate of 0.45 accidents per motor vehicle miles traveled for the segment between MP 103.0 – MP 103.5 is slightly higher than the statewide average crash rate for freeways. The segment had six crashes with two fixed object, two sideswipe crashes, a rear end, and an animal crash. Four out of the six accidents in the segment occurred on the curve. Table 2 in Appendix E summarizes the crashes on 0.5-mile segments of Interstate 5.

Recent Improvements

In the spring of 2004, ODOT installed a radar gun and overhead variable message sign (VMS) for both directions of Interstate 5 at the beginning of the MP 108 curves. The radar checks the speed of approaching vehicles and displays it on the VMS board with the message "Your Speed Is XX mph." In addition, curve warning signs with the appropriate speed are posted next to the VMS. The crash data from ODOT does not cover the time period since this technology was installed. However, area residents have voiced opinions that the sign reminds them to slow down when entering the curve.

Safety Conclusions

The safety analysis showed high crash rates at the Interchange 103 ramps terminals and near Interchange 108 on the I-5 mainline. The segment of freeway between MP 108 – MP 108.5 on Interstate 5 had a crash rate approximately five times greater than the statewide crash rate for freeways with 34 crashes between 2000 and 2002. This "Top 5%" SPIS site had primarily fixed object crashes (50%). Due to the nature of fixed object crashes, there is no simple mitigation that can be suggested. Driver inattention and excessive speeds often cause these kinds of crashes. It can be inferred from the remaining crashes that they were caused either due to the vehicle being unable to maintain its lane or due to excessive speed. The data indicates that 22 of the 34 crashes occurred on the curve. The effectiveness of the radar gun and VMS should be evaluated, however, other potential mitigation measures could include:

- Realignment of Interstate 5 to reduce or eliminate the curve.
- Relocation and/or reconstruction of the on- and off- ramps and merge points.

Both northbound and southbound ramp terminals at Interchange 103 also had a high number of crashes. The northbound ramp terminal had eight crashes and the southbound ramp terminal had seven crashes between 2001 and 2003. The majority of crashes at both locations, 75% at the northbound ramp terminal and 86% at the southbound ramp terminal, occurred while vehicles were turning. Some general suggestions can be made for the improvement of safety at this location:

- Signalization of Interchange 103 ramp terminals if warrants are met.
- Installation of overhead illumination.
- The addition of a left-turn pocket for the westbound left turn leading to the NB on-ramp.
- Elimination of the guardrail sight-distance problem for the SB off-ramp.

5.2 Land Use

Transportation and land use are integrally related. The type and density of land uses in an area strongly impacts traffic levels and patterns on the roadways. This section looks at the existing land uses in the interchange areas, and the land use regulations that apply within those areas. By reviewing what exists today, vacant and underdeveloped areas, and land use regulations, we can reasonably forecast the potential for future development and redevelopment in the interchange areas. Knowledge of land uses informs decisions related to access and local circulation.

This section provides a summary of the existing comprehensive plan designations, zoning, and existing and future land uses, including vacant/developable land and property ownership in areas around the three subject interchanges. The information included also describes expected future growth and development patterns around these interchanges that will influence the transportation system. A more detailed description of current and future land uses is included in Appendix F.

5.2.1 Interchange 108 Land use Designations, Zoning, and Existing and Future Land Use

Interchange 108

Comprehensive Plan Designations

Areas of Douglas County within the Interchange 108 study area, outside of Myrtle Creek's UGB, are designated "Farm/Forest Transitional" on the County's Comprehensive Plan Map. This designation is intended to "conserve and maintain open space lands for forest use or farm use or both, or for the protection of natural resource areas."

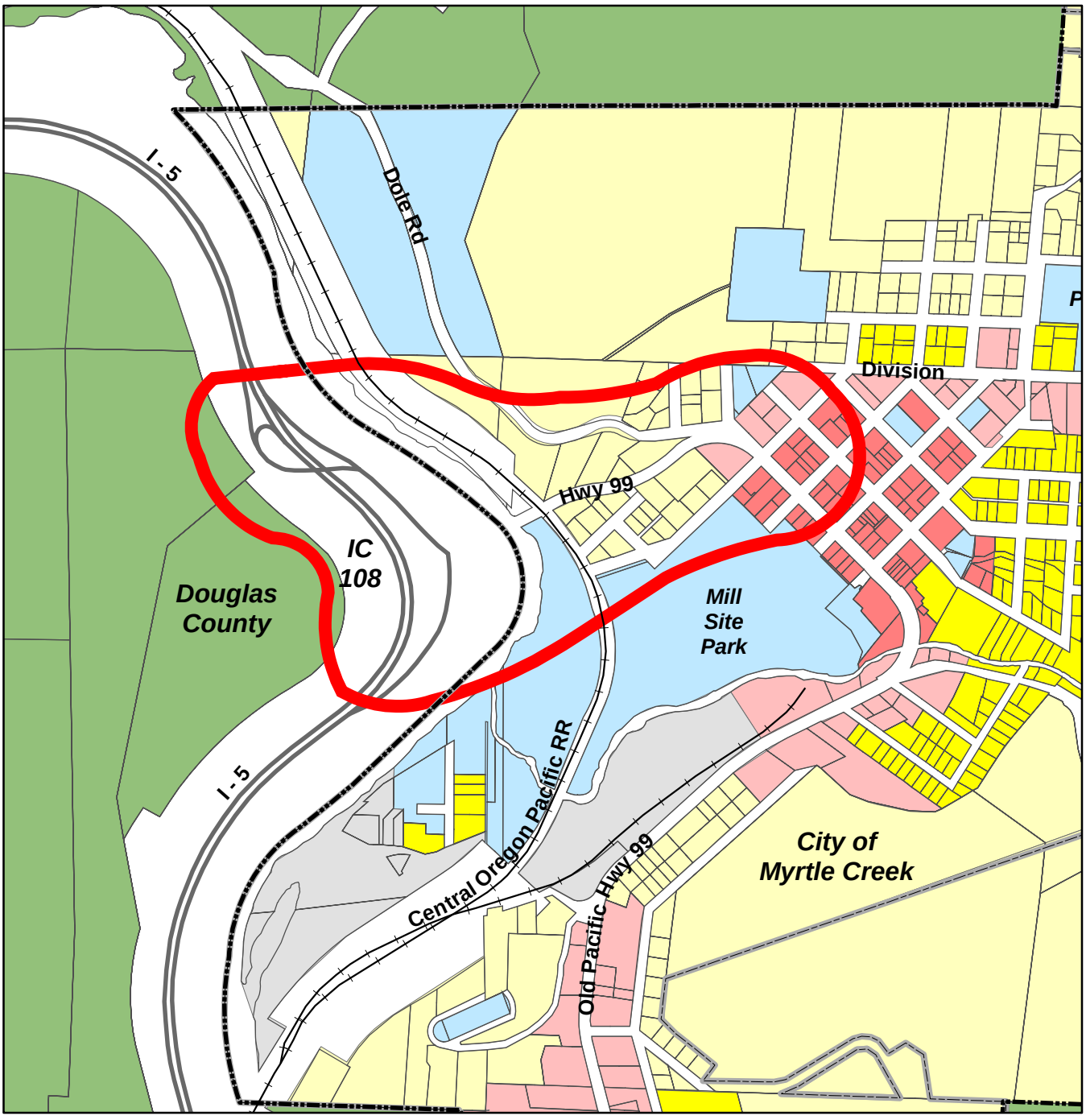
Only the land to the east of I-5 at Interchange 108 lies within the city limits of Myrtle Creek. As expected, the Myrtle Creek Comprehensive Plan designations within are more urban in nature. The Comprehensive Plan designates land in this area as Public/Semipublic, Low Density Residential, and Steep Slope Residential.

Zoning Classifications

Land to the east of I-5 at Interchange 108 is within the City of Myrtle Creek's city limits and zoned for various urban uses (See Figure 9.). The western half of Interchange 108 is outside the UGB and is zoned Farm Forest. Uses in this zone are limited to farm and forest use, associated buildings, and limited home occupations. The minimum lot size is 80 acres.

Development code designations within urban part of the study area include those for: community services and parks, single-family homes, and commercial development. Much of the residentially-zoned land is constrained by steep slopes and is limited to large lot development. Commercial zones allow a range of uses including lower intensity neighborhood commercial, downtown commercial development, and larger-scale commercial uses like department stores.

Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

- Highway
- Railroad
- Myrtle Creek Urban Growth Boundary
- Myrtle Creek City Limits
- Parcel Boundary
- Interchange Area Management Plan Study Boundary

Douglas County Zoning:

- Farm / Forest

Myrtle Creek Zoning:

- Central Business District
- Commercial
- Industrial
- Low Density Residential
- High Density Residential
- Public / Semi-Public

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Figure 9

I-5 Interchange 108
Zoning and Existing Land Use

February 2006

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Existing and Future Land Uses

There is very little development in the immediate vicinity of Interchange 108, due to the natural topography and the South Umpqua River. Further east of the interchange within the city area, there is some residential (single-family) development, the northern part of the historic downtown with commercial development and part of Millsite park.

Potential for new development is constrained in much of the study area. Steep slopes and the restrictive Farm/Forest zoning preclude new development to the west of the interchange. Directly to the east, within the City limits of Myrtle Creek, there are some existing residences that overlook the South Umpqua River and North Main Street. There are some low density development opportunities to the northeast of these homes, in areas zoned Residential Hillside. There may be some redevelopment opportunities in areas zoned R-1 to slightly higher densities, but most of the area south of North Main is already developed with single-family homes. Commercially-zoned parcels in the study area are also predominantly developed, with little opportunity for redevelopment at a higher intensity than what currently exists.

5.2.2 Interchange 106 Land Use Designations, Zoning, and Existing and Future Land Use

Comprehensive Plan Designations

Interchange 106 is within Douglas County, wholly outside of the Myrtle Creek/Tri City UGB, with access from Weaver Road to the west and a frontage road, Aviation Drive, to the east (see Figure 10.). The immediate vicinity is designated "Agricultural" in the Douglas County Comprehensive Plan. This designation is intended to preserve and maintain prime agriculture lands for farm uses and provide protection from non-farm use. The Interchange 106 study area, or interchange area management plan boundary, encompasses land in the Myrtle Creek/Tri City UGB designated for commercial and residential uses.

Zoning Classifications

Interchange 106 is within Douglas County, and county land use zoning in the vicinity of the interchange limits development by only allowing agricultural use and other uses which are compatible with agricultural activities. Permitted uses are farm uses, their associated buildings and accessory uses, and the propagation or harvesting of a forest product. Property development standards require that created parcels be a minimum of 20 acres. Much of the study area is within the floodplain further restricting development.

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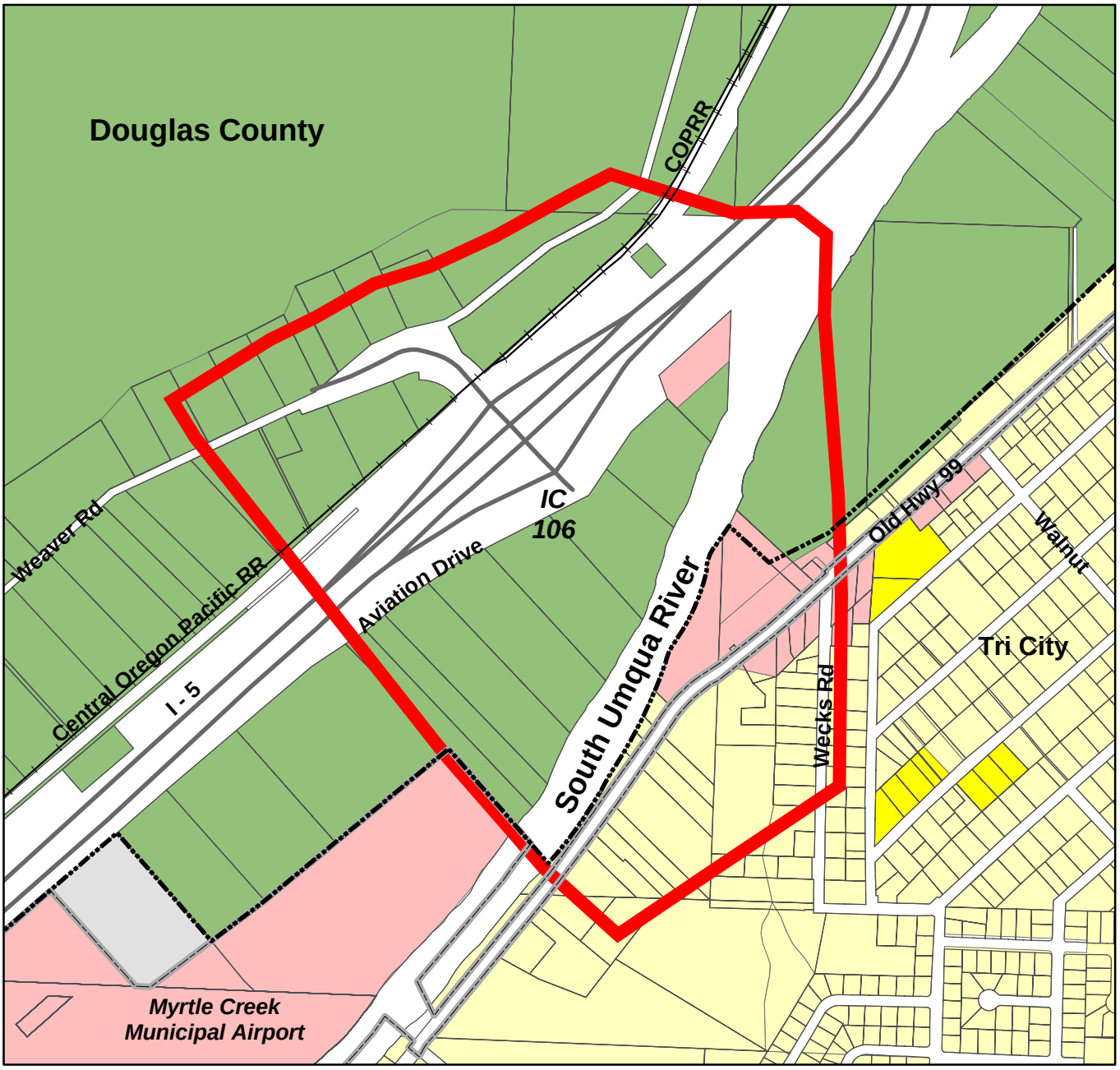
Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

- Highway
- Railroad
- Myrtle Creek Urban Growth Boundary
- Myrtle Creek City Limits
- Parcel Boundary
- Interchange Area Management Plan Study Boundary

Douglas County Zoning:

- Commercial
- Farm / Forest
- Industrial
- Single Family Residential
- Multiple Family Residential

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Figure 10

I-5 Interchange 106
Zoning and Existing Land Use

February 2006

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In addition, Douglas County has an airport impact overlay that restricts development on property near the Myrtle Creek Municipal Airport. The regulation (Section 3.334.800 of the Douglas County Zoning Code) calls for restrictions in the airport approach area and the airport clear area. Uses and activities permitted by the underlying zoning districts, as well as height and density are further restricted within these areas.

Currently, the overpass does not connect Interchange 106 to Highway 99 in Tri City. However, with the new Weaver Road bridge, the area will connect to property zoned for commercial and residential uses in Tri City as well as tribal land which is not subject to local zoning controls.

Existing and Future Land Use

Uses surrounding the interchange are consistent with the agricultural comprehensive plan designation. Rural residences and associated grazing activity (horses, goats) and farming occupy land south of Weaver Road. North of Weaver the steep slope is not conducive to farming or grazing, but there are some existing residences. Land off of Aviation Drive southeast of the interchange is parcelized in lots ranging from 2.8 to 12.3 acres and is in active farm use. The majority of this property is owned by the US Trust for the Cow Creek Band of the Umpqua Indian Tribe and is not subject to local zoning controls. The tribe owns over 32 acres of land along Aviation Drive with 20 acres comprised of four contiguous lots (29-5W-32A lots 1700 and 1800, and 29-5W-32D lots 100 and 200).

The study area east of the South Umpqua River and along Highway 99 is developed with commercial and residential uses. The proposed arterial connection between Old Pacific Highway 99 and I-5 at the Weaver Road interchange could potentially affect properties in this area. Within the study area along Highway 99, there are large lot residences, a church, manufactured and mobile homes, and some businesses. There is a small "strip mall" and a restaurant northwest of Highway 99, just south of the Wecks Road intersection. Wecks Road is fully developed with single family residences, both "stick built" and manufactured, on predominantly small lots. The southwest corner of the intersection of Wecks and Highway 99 has a vacant lot and a convenience store; the northeast corner is vacant. The three lots directly north of the intersection are vacant and total just over four acres.

The new connection between Tri City and I-5 via the anticipated Weaver Road bridge and Interchange 106 may create pressure for new development. Future development in the vicinity of Interchange 106 is limited due to the Farm/Forest designation, the floodplain and airport. However, the Cow Creek Tribe's land is not subject to land use zoning regulations. Consequently, the tribe could develop its 32 acres with land uses inconsistent with the rural designation. Some of this property could be taken up by the new bridge. In addition, much of the property appears to be in the floodplain.

Existing structures northwest of Highway 99 would likely be affected by any of the alignment options proposed for the new Weaver Road bridge (arterial connection to Interchange 106); right-of-way for a proposed four-way intersection at Wecks Road may also impact property southeast of the highway.

5.2.2 Interchange 103 Land Use Designations, Zoning, and Existing and Future Land Use

Comprehensive Plan Designations

Interchange 103 primarily serves the Tri City area and is within the Myrtle Creek/Tri City UGB (see Figure 11.). It also is the primary north access to the City of Riddle. Riddle is roughly four miles southwest of the interchange and has a population of approximately 1,000 people. Pruner Road/Old Pacific Highway 99 crosses over I-5 at this interchange, providing access to urban areas to the east; agricultural, industrial, and commercial areas to the west; and Riddle farther to the southwest. The Comprehensive Plan designations for the immediate vicinity are commercial and industrial to the west of I-5, and commercial and low density residential to the east of I-5. The Comprehensive Plan designation for the area south and west of the UGB is agricultural.

Zoning Classifications

The study area is within the UGB and is subject to Douglas County zoning for Tri City. Most of the land on the west, north of Pruner Road, is part of a County-owned Industrial Park and is zoned Heavy Industrial (M-3). An Urban Growth Management Agreement (UGMA) between the City of Myrtle Creek and Douglas County allows manufacturing uses outright in the South Umpqua/Riddle Interchange Industrial Park. Other industrial uses in this area are subject to the provisions of the LUDO Article 3.35.300, Architecturally Controlled Districts.

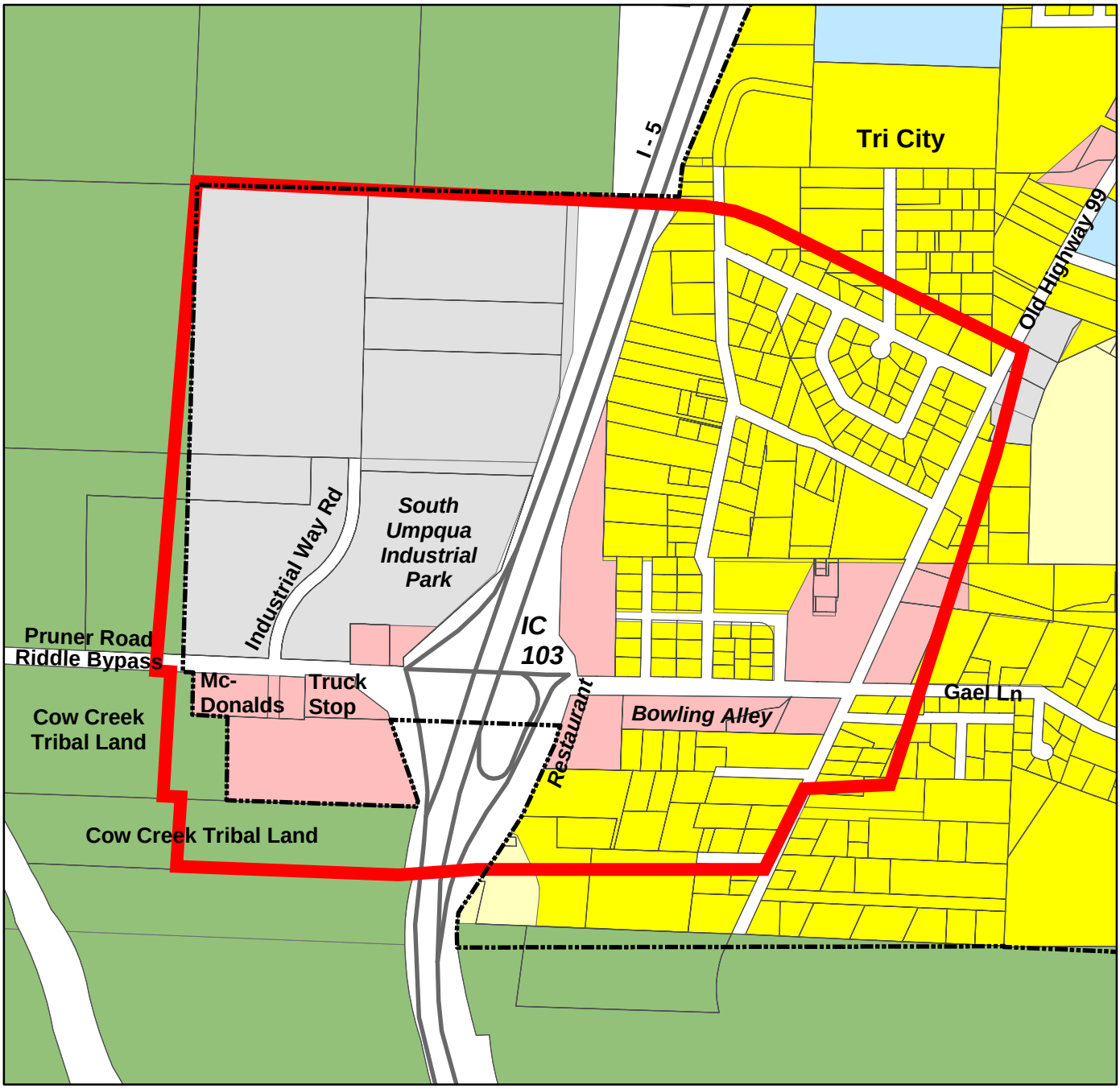
Parcels closest to the interchange are zoned tourist commercial (CT), as are some parcels east of the interchange, along Highway 99. The IAMP study area boundary for this interchange extends south of the UGB, west of I-5, to include a small area zoned F1 (Exclusive Farm Use – Cropland, 20 acres minimum lot size). Douglas County zoning in the study area east of the interchange is predominantly Single-Family Residential (R-1, 6,500 square foot minimum lot area), with the only exception being the area around the Old Pacific Highway 99 intersection, where there is some CT and C3 (General Commercial) zoning.

The Cow Creek Band of the Umpqua Tribe owns two large parcels south of Pruner Road and west of the interchange, totaling 35 acres. The property has an "Exclusive Farm Use-Cropland (F1)" zone designation, which allows agricultural use. It is expected that these parcels will ultimately be placed in the Tribal Trust, at which time land uses will be determined by the Tribe.

Existing and Future Land Use

Commercial property in the southwest quadrant of Interchange 103 is developed with traveler-oriented services, including a fast food/drive-through restaurant and a truck stop (gas, drive-through restaurant, and convenience store). Property south of these commercial properties is outside of the UGB and is in active farm use.

Interstate 5 Interchanges 103 (Riddle Road), 106 (Weaver Road), and 108 (Myrtle Creek)
Interchange Area Management Plan



Legend

- Highway
- Myrtle Creek Urban Growth Boundary
- Parcel Boundary
- Interchange Area Management Plan Study Boundary

Douglas County Comprehensive Plan:

- Commercial
- Farm / Forest
- Industrial
- Low Density Residential
- Medium Density Residential
- Public / Semi-Public

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Figure 11

I-5 Interchange 103
Zoning and Existing Land Use

February 2006

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The Douglas County-owned South Umpqua Industrial Park is north of Pruner Road This area is largely undeveloped and, according to the South Umpqua Development Partnership website (http://www.umpquaedp.org), 48 acres remain available for future development. A sign in the vicinity of the interchange indicates that Roseburg Trailer Works, a horse trailer manufacturer, will soon be located in the area and a WinCo Distribution Center is visible from I-5 and takes access from Pruner Road. The type of businesses that are eligible for the Enterprise Zone credit in the industrial park are either industrial or manufacturing in nature. Business that are deemed more traditionally retail, or commercial do not qualify. Though, warehouses for retail chains are eligible.

Uses east of the highway within the study area include a restaurant, a bowling alley, a church, manufactured homes and other residences, and a grocery store. A heavy-industrial use (Tri City Retread Company) occupies the site to the east, across Highway 99. Although much of the study area property is already developed, there is some infill development potential east of the interchange. Notably, there are four sizeable vacant commercial properties that take access from Highway 99 totaling a little over 16 acres.

The most apparent residential development activity was northwest of the Highway 99 intersection where there are new manufactured homes and some (potentially 3) vacant lots for sale off of Corwin Street. The area directly north of this is vacant and zoned for low-density residential.

The portion of the IAMP study area east of the interchange and south of Highway 99 is predominantly residential, with existing manufactured and "stick built" homes. There is a vacant lot advertising 18 spaces available for mobile homes. There is limited potential for infill development, where lots are large enough to be partitioned. In addition to sites already discussed, a recent site visit identified only one large homestead (at the southwest corner of Susan Street and Old Pacific Highway) that was large enough to be subdivided.

There are industrial development opportunities in the South Umpqua Industrial Park and vacant land available for commercial development at Interchange 103. The 103 bridge has been load posted due to deficiencies. Once the bridge is repaired, there may be more pressure for development in the area. There is some vacant commercial and residential property to the east of the interchange, near the intersection of Highway 99. As is the case near interchange 106, the Cow Creek Tribe owns a large amount of land (35 acres) near the interchange. If the land is put into the tribal trust, it will not subject to local land use regulations limiting development to commercial use. Development of the vacant parcels could be agricultural, commercial, industrial, or residential in nature. ODOT should coordinate with the Cow Creek Tribe to help protect access and functioning of the interchange.

5.4 Natural and Historic Resources

The most prominent natural features in the Tri City area is the South Umpqua River[6] and a ridge line (2,100 feet) that forms the eastern boundary of the Urban Unincorporated Area. Storm water runoff creates "V" shaped creeks that eventually sheet over flat land near Old Pacific Highway 99. Historically, most storm drainage has been handled by a combination of roadside ditches, driveway and road culverts, swales and creeks.

Per Chapter 6 of the Douglas County Comprehensive Plan, Natural Features Element, there are no listed significant wetlands in the vicinity of the three interchanges. There are wetlands identified on the U.S. Fish and Wildlife Service National Wetlands Inventory map. (These are shown on the baseline report maps included in the appendix of the IAMP.) The County has not adopted the National Wetland Inventory.

There are no mapped National Historic Register sites or Douglas County historical sites in the study area. The Cultural and Historic Resource Inventory for Douglas County was updated in 2002. There is one property listed on the Myrtle Creek Historic Register that is within the IAMP study area for Interchange 108. This property is north of Dole Road and is listed because there are signs of the Applegate Trail in this area. Improvements to this property are subject to review by the Myrtle Creek Historic Resource Review Committee prior to City approval.

Appendix G documents the existing natural and historic resources in the vicinity of Interchanges 103, 106, and 108. 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 for potential archeology sites.

5.4.1 Goal 5 Resources

All 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

[6] Section 3.32.200, Riparian Vegetation Corridor Overlay (RVCO), of the Douglas County Land Use and Development Ordinance regulates development along all perennial and intermittent watercourses in Douglas County.

vicinity of the interchanges. The South Umpqua River was not identified as a Goal 5 resource, but has been identified as having severe water quality impacts and is on the DEQ list of water quality limited streams.[7]

5.4.2 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 for the three interchanges. Floodplains for the South Umpqua River are located adjacent to much of I-5 and near the interchanges. Interchange 106 may be the most constrained of the three interchanges because the floodplain is located on both sides of the interstate and even includes portions of the interchange itself. Further analysis is necessary to determine the level of constraint for the interchanges. Appendix G includes an analysis of potential floodplain impacts for each interchange.

5.4.3 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. The natural resources analysis (Appendix G) found that there are no endangered species near the three interchanges.

5.4.4 Wetlands

Per Chapter 6 of the Douglas County Comprehensive Plan, Natural Features Element, there are no listed significant wetlands in the vicinity of the three interchanges. There are wetlands identified on the U.S. Fish and Wildlife Service National Wetlands Inventory map, although the County has not adopted the National Wetland Inventory (NWI). An analysis of wetlands in the vicinity of each of the subject interchanges is found in Appendix G.

Improvements to the 103 interchange will almost certainly lead that unavoidable impacts to a wetland and will require permits or consultation from both U.S. Army Corps of Engineers and the Oregon Division of State Lands. The wetland will need to be delineated and the delineation report will need to be reviewed for a jurisdictional determination by the Division of State Lands and the U.S. Army Corps of Engineers. Additional fieldwork may be required to determine if any wetlands exist in the vicinity of Interchange 106. On-site observations did not identify any wetlands in the vicinity of Interchange 108.

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[7] Oregon Department of Fish and Wildlife evaluation, *I-5 State of the Interstate Report (2000)*.

5.4.5 Hazardous Materials

An evaluation of the regulatory status of sites within a 2,000-foot radius of each bridge 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 bridge and the area surrounding each bridge was performed in order to evaluate the potential for recognized environmental conditions. This research is compiled in the Existing Soils, Agriculture, and Natural Resources Narrative in Appendix G.

The research revealed that there are three sites of concern located near Interchange 103. If either 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.

Interchange 106 was not mapped for hazardous materials, but information was mapped for the area for a nearby bridge. A review of that data showed only one identifiable site of concern. The Myrtle Creek Municipal Airport, located approximately 1/3 mile south of the interchange 106, may contain hazardous materials. It is likely that chemicals such as fuel and oils are located at the airport. Prior to ground disturbance, an evaluation of potential hazardous materials and other sites of concern will need to be completed for areas in the vicinity of Interchange 106

One site of concern was located near interchange 108, where a diesel spill occurred. Based on available information, this site is a recognized environmental concern and should be taken into account if construction is planned there.

5.4.6 Cultural and Historic Resources

Archeological Record

The Oregon State Museum of Anthropology conducted surface surveys near the three 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.

There are no mapped National Historic Register sites or Douglas County historical sites in the study area for the three interchanges. There is one property listed on the Myrtle Creek Historic Register that is within the IAMP study area for interchange 108. This property is north of Dole Road and is listed because there are signs of the Applegate Trail in this area. Improvements to this property are subject to review by the Myrtle Creek Historic Resource Review Committee prior to City approval.

No special protective measures or mitigation are recommended prior to bridge 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 notified immediately.

Surface examinations in the vicinity of Interchange 103 and Interchange 108 in July 2003 did not identify any archaeological sites. Because of the degree of disturbances at these interchanges, buried cultural deposits are unlikely to be present. At Interchange 103, two historic resources were identified near the interchange, including the existing bridge and one commercial building. Neither of these structures appears to be eligible for inclusion in the NRHP. The Interchange 108 area contains one resource (Myrtle Creek Bridge 490A) that has been previously determined eligible for the NRHP. No further research is necessary for historic properties near these interchanges.

Site surveys were not completed for interchange 106 as part of the baseline report and no cultural resource surveys have been completed by the state near interchange 106. SHPO believes there is a high probability that the area contains cultural resources and recommended caution during any future ground disturbing activities. Additional work may be required to identify any cultural or historic resources that may be located in the vicinity of the interchange.

6.0 FUTURE TRANSPORTATION CONDITIONS AND PLANNING AREA IMPROVEMENTS

The Interchanges 103, 106, and 108 Future Transportation Conditions Report (Appendix H) focuses on long-range improvement needs to these Interstate 5 interchanges in the Myrtle Creek area of Douglas County, south of Roseburg. This section summarizes the information in the technical report, which is based on projected 2025 traffic volumes and the results of the future traffic operations analysis for 2025 under the No-Build Conditions and two Build Scenarios. The

Build Option #1 focuses on improvements to the Interchange 103 bridge and ramps. Build Option #2 includes the addition of a bridge ("Weaver Bridge") across the South Umpqua River connecting Interchange 106 to Old Pacific Highway.

6.1 Planning Area Improvements

6.1.1 103 Improvements

The planned improvements at Interchange 103 include reconstruction of the bridge to a 3-lane facility and implementing one of four alternative ramp configurations. The ramp configurations range from keeping the current configurations with a folded diamond northbound ramp, keeping the folded diamond configurations but modifying the loop ramp to improve geometry and ramp length, removing the current northbound loop ramp and creating either a standard diamond or tight diamond configuration, and a diamond configuration with two northbound ramps (keeping the northbound loop ramp and adding another northbound on-ramp).

The preferred alternative will be selected after further analysis of geometric, right-of-way, cost and construction implications is completed. The widened bridge allows for a new left turn lanes at the ramp terminals reducing traffic delays. It is assumed that signals will be installed at the ramp terminals. These projects are included in the 2004-2007 and the 2006-2009 STIP.

6.1.2 Weaver Road Bridge

This project would extend Weaver Road across the South Umpqua River and provide a new connection to the Old Pacific Highway at Wecks Road. It is expected that the new roadway would sit at least 10-15 feet above the existing ground elevation in order to connect with the Interchange 106 overpass and the planned Umpqua River Bridge. The design process must ensure the proposed roadway will not encroach on the runway glide slope of the Myrtle Creek Municipal Airport. It will also need to be closely coordinated with ODOT to ensure compatibility with improvements to Interchange 106.

6.1.3 South Umpqua Bridge Rehabilitation

The Myrtle Creek Arch Bridge is scheduled to be widened and strengthened as part of the Oregon Transportation Investment Act III (OTIA III) bonding package under the direction of the Governor and Legislature. The bridge went through a deck-widening project in 1987. Original roadway on the deck was 20 feet. The project will enhance the historical features of the bridge, and will double the width of the deck. The bridge will remain a two-lane facility, but the deck widening will provide 7-foot shoulders for emergency work and pedestrian facilities. Currently this bridge is weight restricted and is eligible for listing on the National Historic Register.

As part of the project planning process, the two main goals of the project are to widen the structure to current standards and strengthen the superstructure enough to remove the weight restriction limits. Concurrently, the project team decided to improve Highway 99 east of the bridge to tie the bridge improvements into recently improved Main Street.

Douglas County provided the following description of the bridge improvement project:

- Build a twin structure on the upstream side. This structure will be the stronger of the two and thereby relieve some burden of the old structure and provide needed seismic resistance. Construct a railroad crash wall at the east bent.
- Strengthen the old structures approach girders where load cannot be transferred to the new structure.
- Tie the old and new deck together to provide two-12-foot travel lanes and two 7-foot multi-use shoulders. Construct a deck overlay, install new bridge joints to limit water infiltration.
- Replace existing concrete bridge rail with historically similar, but crashworthy rails.
- Replace existing luminaries with more appropriate period lighting.
- Roadway improvements are as follows:
  - Widen the road from east end of bridge to the end of recently constructed south side sidewalk. Road section will be two, 12-foot lanes, two, 5-foot bike lanes, one, 6-foot sidewalk on south side, from 5th Street to that location.
  - Road widening will occur mostly on the north side of road. This will correct sight distance and cross-slope issues. Curb and gutter will be installed and a new road surface will be laid down.
  - Close the 5th Street access point to vehicles, but leave it open to pedestrians and bicycles. Close the one private access on south side of road. This is a secondary residential access and the owners have it chained off.

The estimated cost of this project is $8 million dollars. It is scheduled to begin March 2006 and run until August 2007. Through much of the construction the bridge will be restricted to one lane and a full closure is expected for 4 months in spring 2007.

6.1.4 Myrtle Creek Curves

This project was intended to improve safety on Interstate 5 by creating a new alignment through the mountain located west of Myrtle Creek. The project was identified in the Myrtle Creek Comprehensive Plan and was included as a modernization project in the 2006 and 2009 STIP. Various smaller projects have tried to improve safety in this area with little success. Such measures as reduced speed, advanced warning signs, and improvements to the super-elevation have all failed to reach the desired level of crash reductions.

Although this project was scheduled to begin construction in 2009, the preliminary planning for the project found daunting geotechnical issues that have resulted in the abandonment of the project. Geotechnical analysis of the rock substrates showed that if the rock were cut to straighten the mainline, it would not weather well and could become unstable. This could result in a catastrophic failure of the cut slopes. Consequently, a cut option is not feasible. The other

remaining option of building a tunnel, would cost more than the amount of funds available. Consequently, this project has been dropped and the STIP is being revised to reflect the change.

6.2 2025 Future Operations Analysis

6.2.1 Build Options

The No-Build scenario assumes no changes to the existing lane configuration or traffic control.

The Option 1 scenario assumes improvements to Interchange 103 as discussed under Section 6.1 above.

The Option 2 scenario includes all 103 improvements described above along with a new Weaver Road Bridge over the South Umpqua River. The connection between Weaver Road and Old Pacific Highway is assumed to be just south of Wecks Road. No changes are assumed for the Interchange 106 ramp terminals.

6.2.2 Traffic Forecasts

The methodology for forecasting the 2025 volumes is summarized in Appendix I, Forecasting Methodologies for Intersection and Roadway Segment Analysis. The methodology was used for both this IAMP and the Myrtle Creek TSP. It involved a multi-step approach applying a background growth rate, a freeway volume growth rate, a review of vacant and underdeveloped lands in the Myrtle Creek Urban Growth Boundary, and forecast of anticipated site-specific growth. The forecast volumes are the same for the No Build and Option 1 analyses.

The completion of the Weaver Road Bridge, as demonstrated by the traffic forecasting for Option 2, is expected to trigger a significant change in use of all three interchanges. Table 1 in Appendix H summarizes the 2025 No Build forecast volumes by ramp for both the No Build/Build Option 1 and the Build Option 2.

6.2.3 Traffic Operations Analysis

The level of service[8] and a comparison of traffic volume demand to intersection capacity (v/c) was determined for the approach ramps no-build and the two build options. In addition, a signal warrant analysis was performed for Interchange 103, 106 and the connection of Weaver Road at

[8] 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.

Old Pacific Highway for Build Option #2. Finally, an intersection analysis was performed for each interchange, using 2025 traffic volumes and traffic and signal/unsignalized assumptions for the No Build and Build options. Table 5 in Appendix H shows the LOS for individual movements at the intersections under each scenario.

Conclusions resulting from this analysis are as follows:

- The Interchange 103 ramp terminals will operate at LOS F within 20 years unless improvements are made. The planned widening of the bridge and likely signalization of the ramps will allow the intersections to operate at LOS B and C during the PM peak hour.
- The ramp merge and diverge areas for all three interchanges will continue to operate at acceptable LOS within the next 20 years.
- The intersection of Pruner Road and Old Pacific Highway should be redesigned with a curve between the north and west legs and removal of the stop signs for these approaches. This would allow for the heavy north-west traffic movements to flow freely. The east and south legs could be combined into one approach with a stop sign.
- The Interchange 106 ramp terminals will be able to handle the additional traffic demand resulting from the construction of the Weaver Road Bridge without any improvements. Ramp terminals for Interchange 106 are predicted to operate at an acceptable level of service under stop control with volume to capacity ratios well below the ODOT standards even with construction of the proposed bridge.
- The increase in truck volume at Interchange 106 may be problematic due to current deficiencies in the interchange geometry. Douglas County will need to examine heavy vehicle turning radii to make sure the appropriate design vehicle can be accommodated at the existing ramp terminals when making improvements in the Weaver Road corridor, including Interchange 106. Modification to the existing ramp terminal geometrics or increasing the bridge width may be necessary to accommodate heavy trucks.

7.0 ACCESS MANAGEMENT

Access management is an essential tool for maintaining capacity and traffic flow. The access management strategy and plan are major components of this IAMP. One of the goals of the IAMP is to develop an access management strategy that helps preserve the functionality of the interchanges, protecting their ability to accommodate traffic volumes safely and efficiently into the future. Access to the roads connecting to the interstate system is vital to the adjacent property owners who need access to their businesses and residences but driveways and minor street intersections near a ramp terminal can drastically increase conflicts, causing operational problems, reducing the capacity of the intersections, and generally degrading service for all system users.

The access management strategy must balance the competing needs of traffic capacity and safety for I-5 and local access needs. The Oregon Highway Plan (OHP) devotes an entire section to the

discussion of access management. More detailed requirements and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians. Ideally, a project will include provisions by which access within the project limits can be made fully compliant with Division 51. In many instances, however, access needed for existing development will not allow these standards to be met. When the requirements and standards cannot be met, the access management strategy must demonstrate progress toward meeting the applicable standards.

This section summarizes the IAMP's Access Management Plan (Appendix J). Although the access management plan imposes some restrictions and reductions of access for property near the interchanges, access management actions in this plan do not prevent the properties from being used or developed to be used in a manner consistent with their adopted comprehensive planning designations. The access management plan will help to maintain the locational advantage for these properties by improving traffic circulation, mobility, and freeway access.

7.1 Access Standards

OAR 734-051 and the OHP contain standards for private driveway and public road approach spacing based on highway classifications and speeds. According to these standards, the first full intersection on the crossroad at an interchange should be no closer than 1,320 feet for rural interchanges with two-lane crossroads. Approach roads that are less than 1,320 feet but no closer than 750 feet shall be limited to right-in/right-out. Requests for deviations from these standards can be made, and the process is outlined in OAR 734-051-0135.

OAR 734-51-0115 (1)(c)(C) and 734-051-0125 (1)(c)(C) require that "for a highway or interchange construction or modernization project…the project will improve spacing and safety factors by moving in the direction of the access management spacing standards, with the goal of meeting or improving compliance with the access management spacing standards." The OAR 734-051 and OHP access spacing standards apply to both streets and driveway approaches and are measured from the center of one access to the center of the next access on the same side of the road.

7.2 Existing Access and Permits

An inventory was conducted of public street intersections and approaches to major roads within the study area. The locations are shown on the access recommendation maps (Figures 12, 13, and 14). Numerous access points do not meet ODOT's standards for access near the interchanges. For private approaches, information including the tax lot, property owner, use, and related information is summarized in the approach inventory and access management actions tables in Appendix J: Access Management Plan.

ODOT requires approach permits for approaches to highways under its jurisdiction, but many driveways and public streets predate the permitting process or have come into existence without

permits. Access permits were found for only four approaches in the planning area. Of these, the permit for Weaver Road is outside of the 1,320 foot influence area. The permits for the properties near Interchange 108 provide access to Dole Road rather than the interchange crossroad and are therefore acceptable. The permit near Interchange 103 provides access to a rural use which will need to be addressed if the use changes.

7.3 Access Management Strategy and Access Management Plan

An access management strategy identifies the location and type of approaches and any other necessary improvements to the highway (operations, medians, etc.) within the project area. The access management plan includes the elements of the strategy with the addition of a comprehensive area-wide solution for local access and circulation to minimize use of state highway for local access and circulation and to preserve the functional capacity of the highway. The IAMP's access management strategy contains short-term actions that may be implemented and that are consistent with the IAMP goals. The short-term actions are those that may be implemented in connection with the Interchange 103 Improvement Project and the Interchange. The Access Management Plan includes medium- and long-term actions recommended as land use changes and redevelopment occurs or in concurrence with future roadway improvement projects.

The strategy and actions in the IAMP are based on existing land uses for each parcel. When a property is developed, redeveloped or a change-of-use occurs, an application for an approach road will be required if access is proposed from the state highway system. At that time, any existing approach and any new proposed approach will be evaluated. The IAMP will guide ODOT and Douglas County when completing a change-of-use assessment.

The access management strategy and actions presented in this section of the IAMP are intended to improve highway conditions by moving towards meeting the appropriate ODOT access management standards, while at the same time taking into consideration the need to maintain reasonable access to existing properties and addressing safety priorities. The IAMP relies upon changes that will occur as part of future construction projects, or when property is developed, redeveloped, or undergoes a change-of-use to improve access spacing near the interchange. Construction projects and land use changes near interchange 103, 106, and 108 will require approach permits from ODOT. Because modifying approach roads in the planning area to meet spacing standards would create safety and traffic operations problems, findings will be prepared as part of the approach permit approval process to explain why the approach cannot meet the standards as required by OAR 734-051-0135 (Deviations from Access Management Spacing Standards). The Region Access Management Engineer may require that a plan identifies measures to reduce the number of approaches to the highway in order to approve a deviation for a public approach.[9] This IAMP identifies measures to reduce the number of approaches near Interchanges 103/106/108, and therefore would fulfill this potential requirement.

[9] In accordance with OAR 734-051-0135 (7).

The overall goal of the access management plan is to protect traffic operations and safety within the interchange area management plan boundary. This will have the affect of protecting the state's investment in the interchange facilities while ensuring circulation necessary for good access to the highway. This will be accomplished using short, medium, and long-term actions in the area. Actions for individual approaches are summarized below.

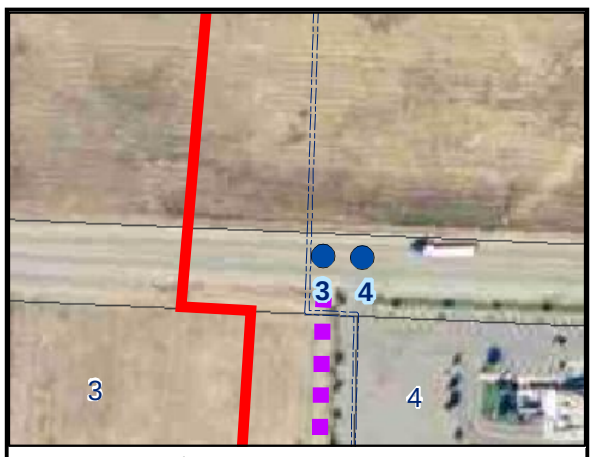
7.3.1 Access Management Strategy (Short-Term Actions)

Interchange 103

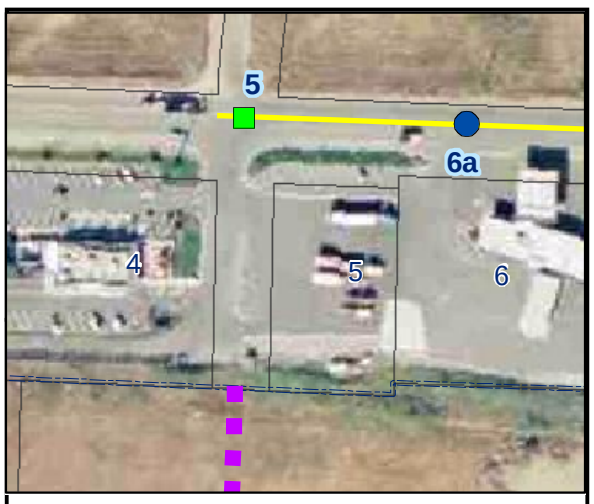
Access management actions may be incorporated into the bridge reconstruction and ramp building project that is planned for this interchange. Although, the decision of whether to pair a northbound loop ramp with the new northbound ramp in the preferred alternative will be determined after further analysis, the access management strategy will serve any of the alternatives under consideration. (See IAMP Section 4.0, Alternatives Considered.)

Access management actions for Interchange 103 are illustrated in Figure 12 and are described as follows:

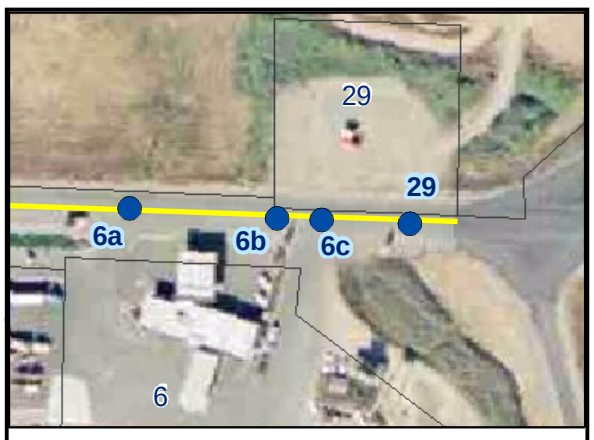
1. ODOT intends to acquire jurisdiction and potentially, access control of the interchange crossroad, Pruner Road, within the immediate interchange area. This access control area will encompass Pruner Road from the eastern boundary of Industrial Way's right-of-way to the western boundary of Corwin Street's right-of-way.
2. Reservations of access would be issued for existing approaches within the access control area on Pruner Road, as described above, for properties with no alternative access. A reservation of access gives a property owner the right to submit an Application for State Highway Approach at a specific location where ODOT has acquired access control. A reservation of access may contain use restrictions and does not guarantee approval of the approach or the location of the approach.
3. ODOT intends to acquire Parcel 29 and the existing access for this parcel (TL T30S R5W Section 7C 300) in the northwest quadrant of the interchange area. Parcel 29 is currently a gravel parking lot. For future development, ODOT may choose to work out an access agreement with the owner of Parcel 1(TL T30S R5W Section 7C 200) providing Parcel 29 access to Industrial Way.
4. Access to the Pruner Road Chevron (TL 30S 5W 7C 400) would be reduced from three access points (6a, 6b, and 6c) to two. Access 6a shall be narrowed from approximately 80 feet in width to 40 feet in width. Access points 6b and 6c shall be combined to one access, 40 feet in width. The new access will be restricted to right-in/right-out movements. A median shall be constructed on Pruner Road to prevent left turns in and out of this driveway.



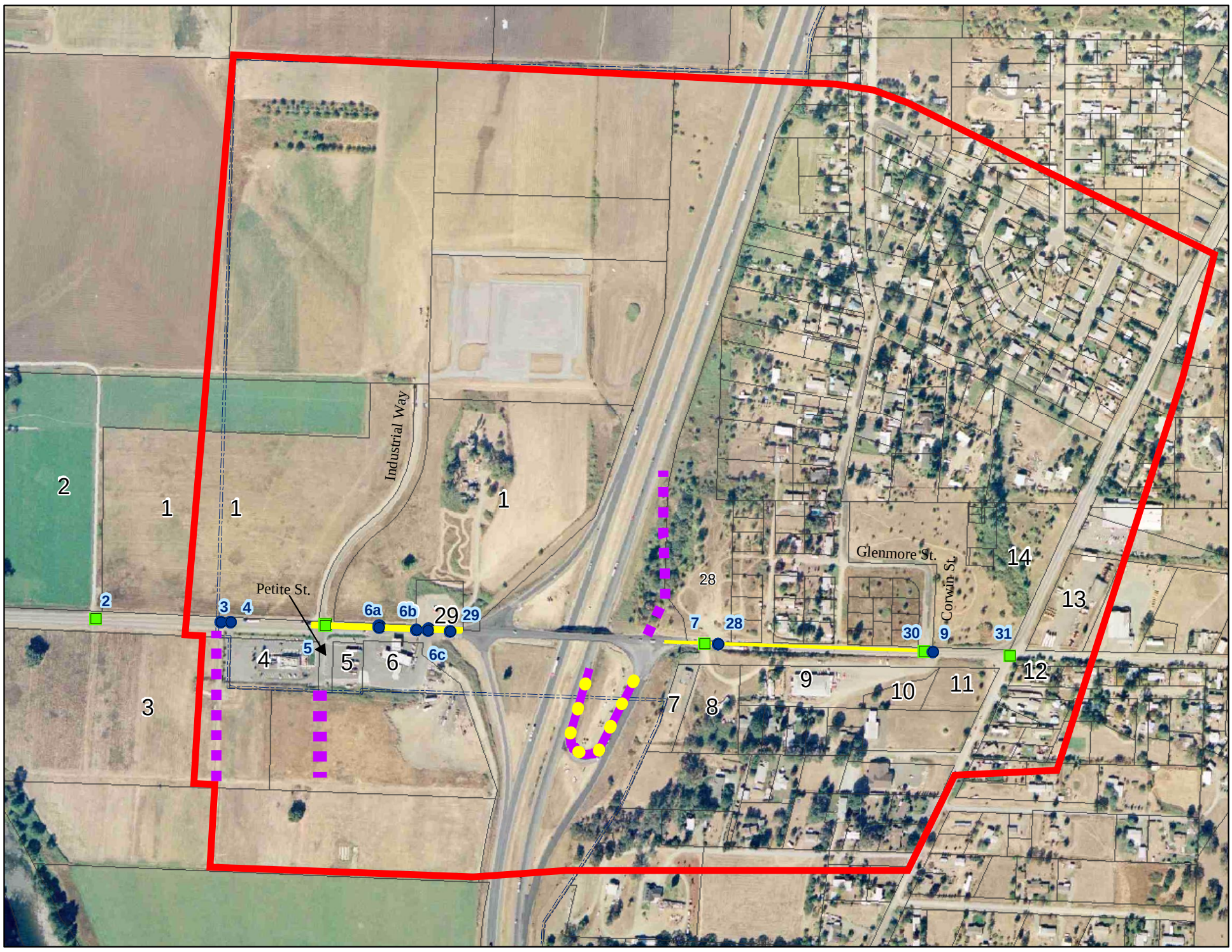
Recommendation to County:
When parcel 3 is developed, construct circulation road to the south. Close driveway 4 and build new driveway off of circulation road.

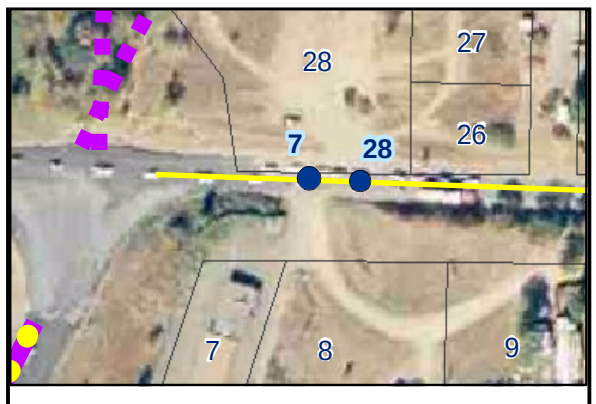


Continue building Petite Street southward to access properties south of existing commercial.

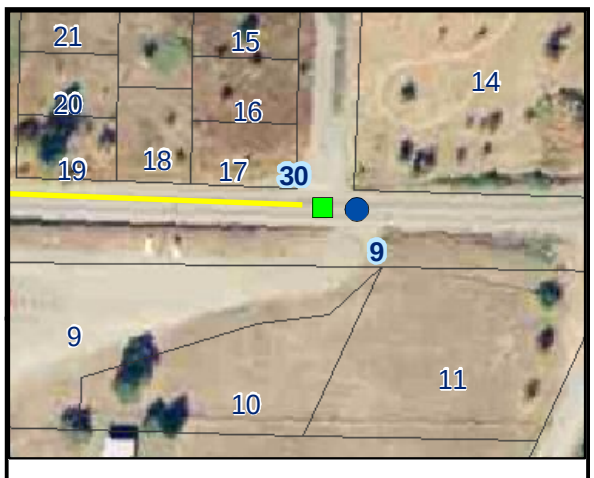


Narrow 6a to 40 feet and ensure reciprocal access agreement is in place with Parcel 5. Combine together 6b, 6c as right-in, right-out. Install median on Pruner Road. Close driveway 29 and develop alternative access to street.





Restrict all movements at driveways 7 and 28 to right-in, right-out. Install median on Pruner Road. Build deceleration lane for EB right-in to driveway 7. Parcel 28 has access via Glenmore Street to East.



Driveway 9 is aligned with approach 30 (Corwin St.). All movements allowed at intersection 30.

Legend

- Potential Ramp Modifications
- Future Public Road
- Road Approach
- Driveway Approach
- ODOT Access Control Area
- 3 — Approach Number
- 3 — Parcel Number
- Access Study Area
- Urban Growth Boundary

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Feet

Notes:
The ODOT Access Control Area indicates the area in which ODOT will purchase rights of access.

Figure 12

Access Management Plan for I-5 Interchange 103

Map is for general planning purposes only.

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5. To improve circulation, Parcel 6 (Chevron, TL 30S 5W 7C 400) should obtain a reciprocal cross-access agreement with Parcel 5 (TL 30S 5W 7C 500). Parcel 5 is currently used for parking large trucks and could easily have a lane reserved for truck maneuvering in and out of the service station.
6. Access 7, providing access to Parcel 7, (Broasters Chicken, TL 30S 5W Section 7DC 400) would be restricted to right-in, right-out movements. A deceleration lane would be built on Pruner Road for eastbound right-in movement and a median shall be constructed to prevent left turns in and out of this driveway.

It is recommended that the private properties which are located along the driveway with an outlet at Access 7 (Broaster's Chicken) and Access 9 (Nickel Bowl) develop a reciprocity agreement to share the private drive which parallels Pruner Road or dedicate the drive to a public entity and make it a public roadway. This will allow vehicles that can no longer turn left from Access 7 onto Pruner Road to do some from Access 9.

Interchange 106

No short-term access management actions are proposed for the Interchange 106 area.

Interchange 108

No short-term access management actions are proposed for the Interchange 108 area. Due to the configuration of the I-5 ramps, topographical constraints and limited number of existing approaches, new access management actions are not critical to the functioning of this interchange.

7.3.2 Access Management Plan

The actions described in this plan are intended to serve as a guide to maintain the capacity and traffic flow in the interchange areas. They may not be implemented exactly as stated, as conditions may change over time.

7.3.2.1 Medium-Term Actions

Interchange 103

1. When a change of use occurs on Parcel 28 (T30D R5W Sec 7DB TL 2400), Access 28 onto Pruner Road will be restricted to right-in, right-out movements. Glenmore Street stubs to Parcel 28's eastern lot line providing an alternate access.

2. If a change of use occurs on Parcel 9 (Nickel Bowl T30S R5W Sec 7DC TL 200) or Pruner Road is widened along the parcel frontage, Access 9 will be moved to align with Corwin Street (Access 30).

3. Petite Street should be continued southward on the west side of the freeway to provide access to any future development of property behind (south of) the existing Chevron station and McDonalds restaurant on Pruner Road.

Interchange 106

Access management actions should be incorporated into the construction of a new bridge over the South Umpqua River. These actions are shown on Figure 13 and described as follows:

1. To the west of Interchange 106, ODOT will acquire access control and jurisdiction of Weaver Road within the interchange area management plan boundary to a distance of 750 feet of the I-5 ramp terminals. To the east of Interchange 106, ODOT will acquire access control and jurisdiction of Weaver Road from the ramp terminal to the abutment of the new Weaver Road bridge. Reservations of access will be issued for existing approaches within the interchange access control area for properties with no alternative access.[10]

2. Upon change of use, Parcel 1 (T29S R5W Sec 32A TL 1500) should develop alternative access to Weaver Road spur road to the north of Weaver Road.

3. Circulation plans should be developed for large developments to provide access on secondary roadways as practical.

4. ODOT should work with the County to relocate the intersection of Weaver Road/Aviation Drive further east from the interchange.

5. In conjunction with a new Weaver Road bridge, the Weaver Road/Aviation Drive intersection would be relocated and redesigned.

6. In conjunction with a new Weaver Road bridge, driveway Access 20 (Tax lot T29S R5W Section 32D TL 100) will need to be relocated. Preferably, the parcel would take access from a secondary roadway.

7. If a change of use occurs on properties within 1,320 feet of the ramp terminals, access points will be consolidated.

[10] A reservation of access gives a property owner the right to submit an Application for State Highway Approach at a specific location where ODOT has acquired access control. A reservation of access may contain use restrictions and does not guarantee approval of the approach or the location of the approach.

Interchange 108

Access management actions will be incorporated into the re-alignment of I-5 if this project moves forward. These actions are shown on Figure 14 and described as follows:

1. The gravel parking area next to the river has no defined driveway with cars entering and exiting along its entire length. Reduce the access to a standard width, single access point to reduce conflicts and driver confusion when the alignment improvements occur.

2. As new development occurs, access to Old Pacific Highway (Highway 99) should be closed for properties with alternative access points.

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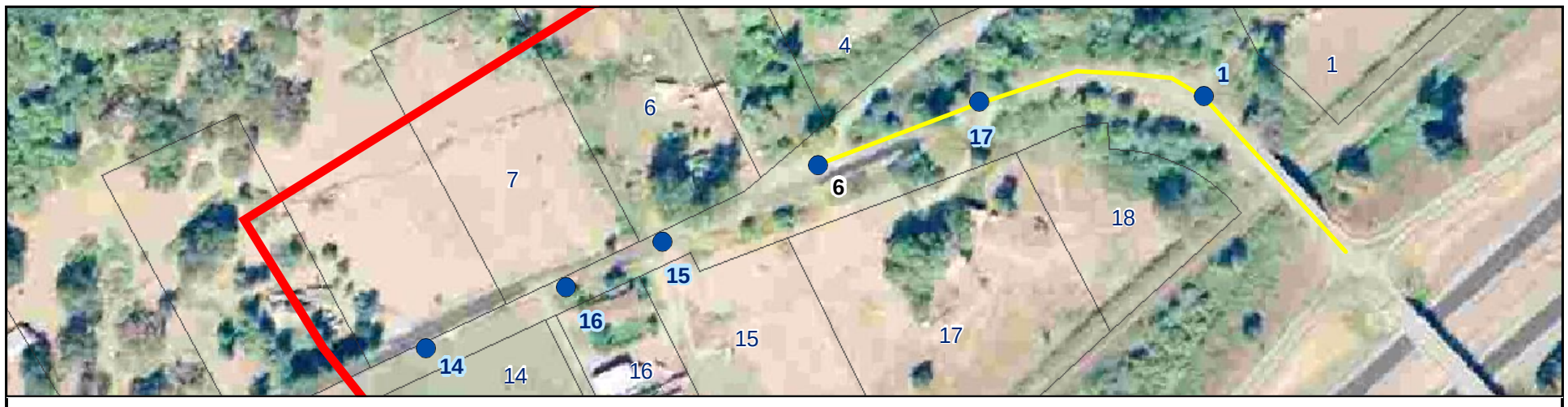
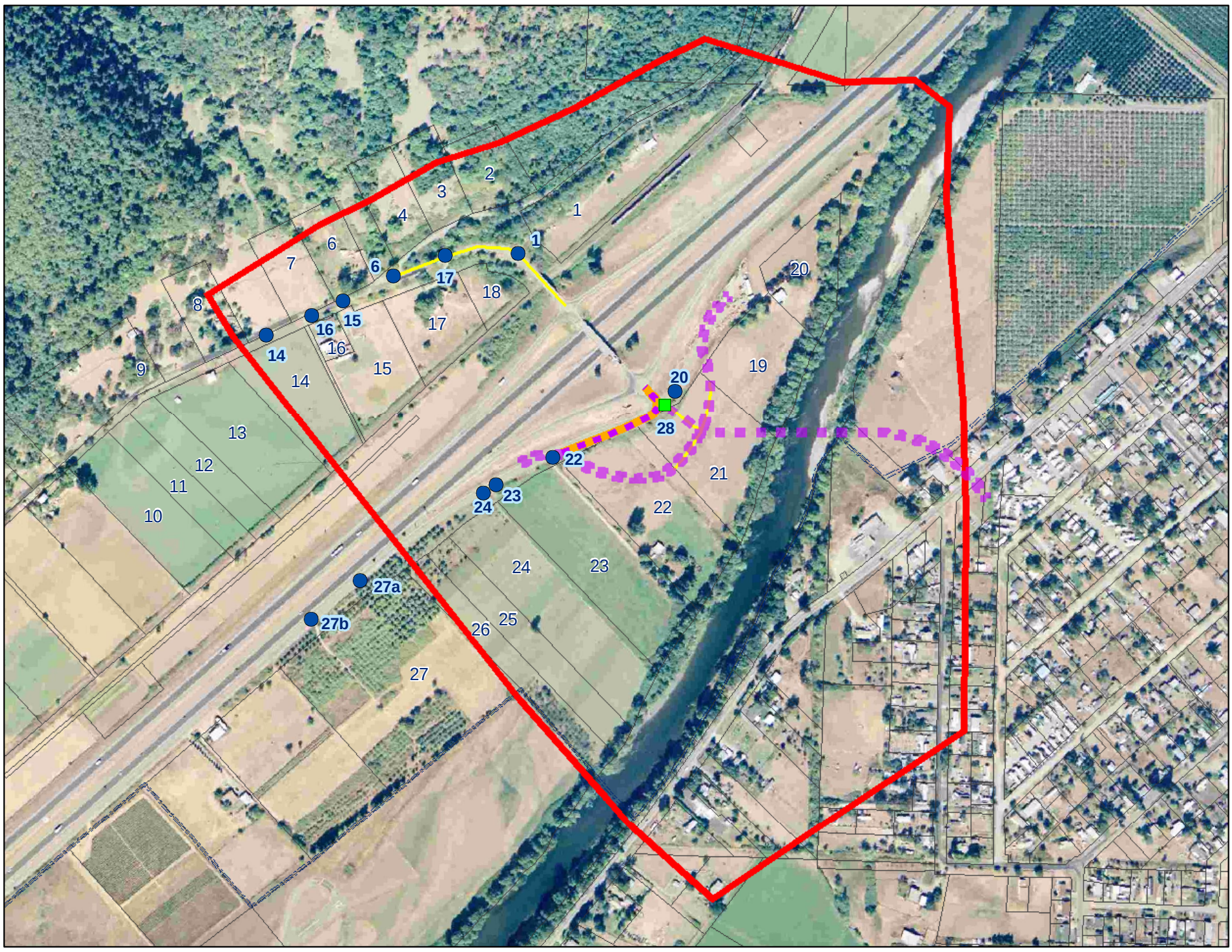
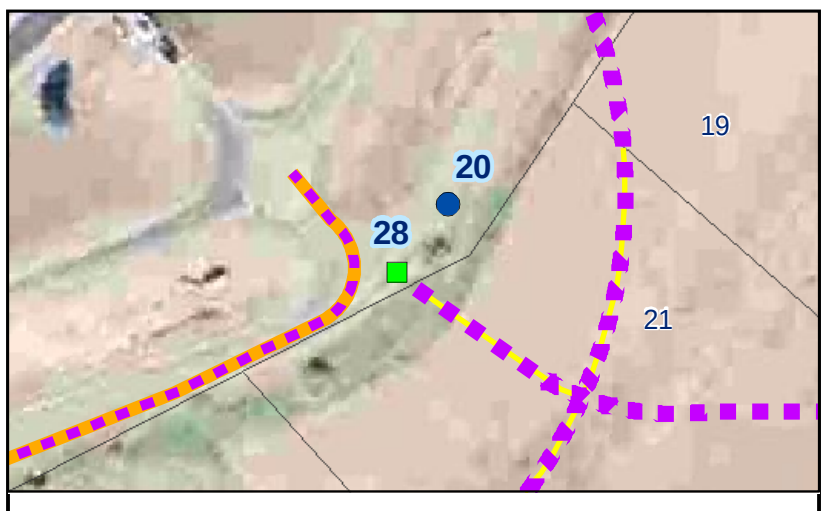


Consolidate access points on property lines when possible.
Develop plan for local circulation roads as properties develop.





Shift intersection 28 to align with reconfigured frontage road. Relocate driveway 20.

Legend

- Future Road
- Road Approach
- Driveway Approach
- ODOT Access Control Area
- 14 Approach Number
- 14 Parcel Number
- Access Study Area
- Urban Growth Boundary
- Remove Road

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0 500 1,000
Feet

Notes:
The ODOT Access Control Area indicates the area in which ODOT will purchase rights of access.

Figure 13
Access Recommendations for I-5 Interchange 106

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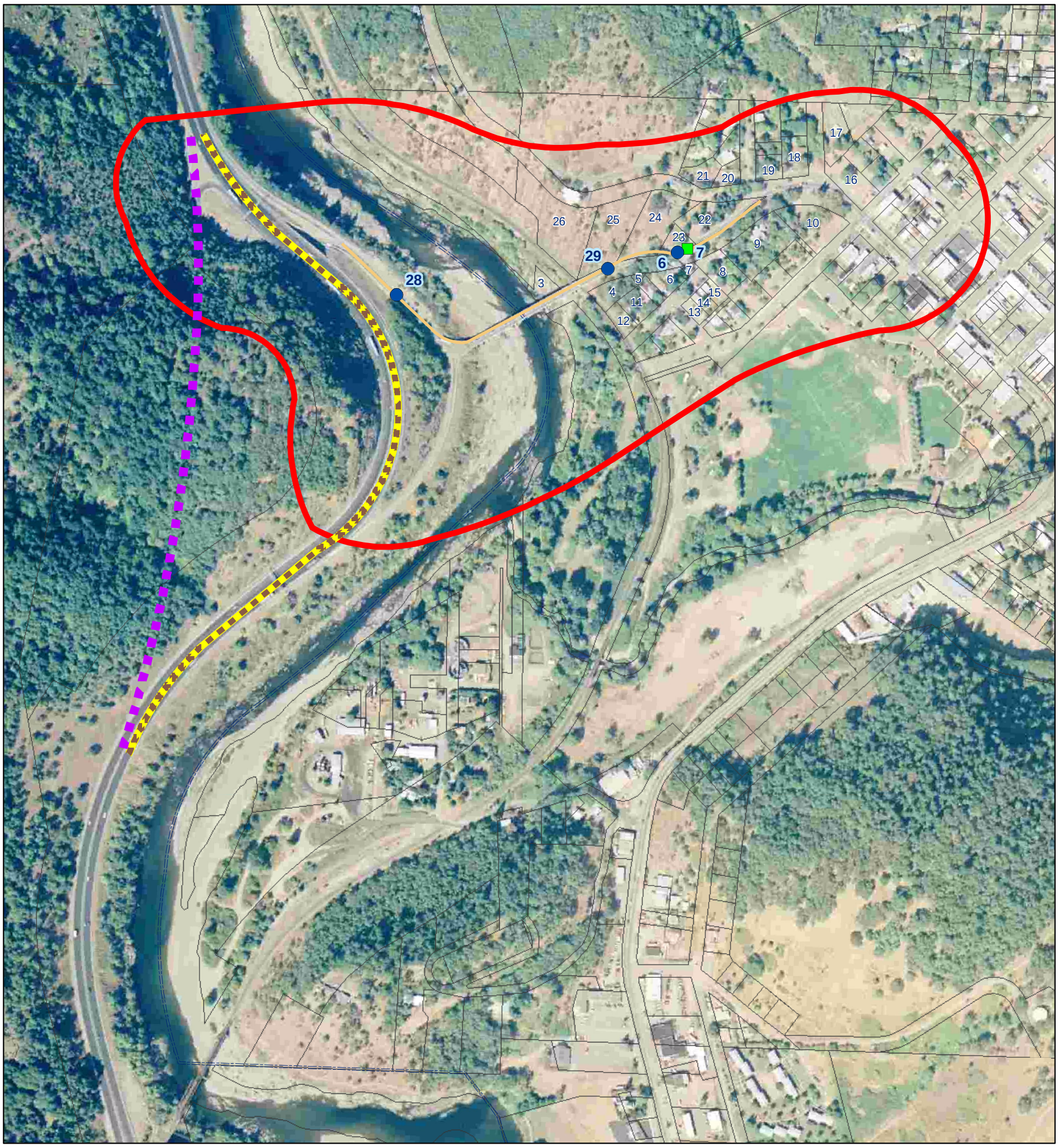
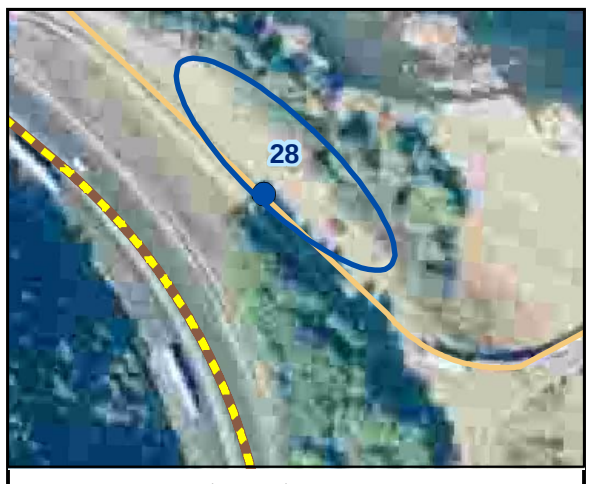
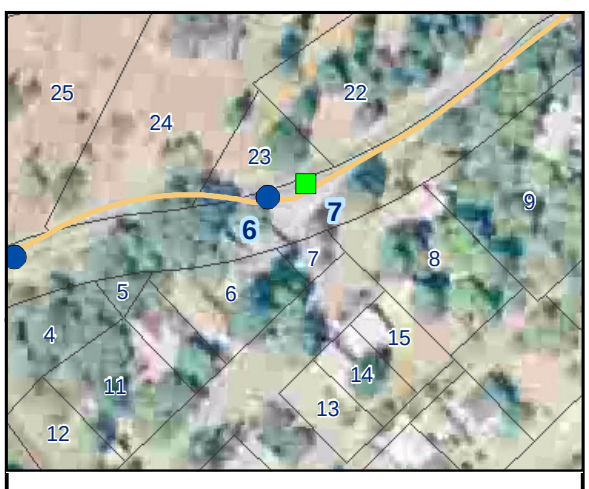




Concurrent with I-5 alignment, minimize access to a single point between bridge and ramp termini.



As development occurs, access to Old Pacific Highway should be closed for properties with alternative access points.

Legend

- Future Road
- Road Approach
- Driveway Approach
- Interchange Influence Area
- 6 — Approach Number
- 6 — Parcel Number
- Access Study Area
- Urban Growth Boundary
- Realign Road/Highway

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Notes:
The Interchange Influence Area indicates the area within 1,320 feet of the I-5 ramp terminal.

Figure 14
Access Management Plan
for I-5 Interchange 108

Map is intended for general planning purposes only.

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7.3.2.2 Long-Term Actions

Long-range actions are those which could be implemented as land use changes and redevelopment occur, in concurrence with future roadway improvement projects, or as needed to rectify safety problems. General actions throughout the planning area include:

- Encourage redevelopment opportunities that consolidate access points.
- Encourage sharing of access points between adjacent properties.
- Offset driveways at proper distances to minimize the number of conflict points between traffic using the driveways and through-traffic.
- Provide driveway access via local roads where possible.
- Enforce access management spacing standards to the extent possible.
- Minimize driveway widths.
- When traffic signals are installed, interconnect them with adjacent signals to create a coordinated timing system.

The factors that need to be considered for each approach before an access is altered include: access rights, safety concerns, existing and potential land use, existing site development including access use and function, parking, and circulation. Also, whether or not the property has more than one approach road to the state highway and if the property had available or potential access to a local street needs to be considered.

8.0 IMPLEMENTATION OF THE IAMP

The IAMP for the interchanges 103, 106, and 108 will be jointly adopted by the Oregon Transportation Commission (OTC), the City of Myrtle Creek and Douglas County. The Statewide Transportation Improvement Program (STIP) for the Interchange 103 project requires the completion of the 103, 106, 108 IAMP as a condition of approval prior to construction contract being awarded. In addition, the IAMP will need to be adopted prior to the Weaver Road extension occurring since this project will connect the rural interchange to urban uses significantly and result in significant altering and modernization of Interchange 106.

The preparation of the IAMP needs to be completed before the construction contracts can be awarded for the interchange 103 northbound improvements. The IAMP has been developed in accordance with the Oregon Highway Plan Policy 3C, Oregon Administrative Rule 734-051-125, and Interchange Access Management Standards for Approaches. The 103, 106, 108 IAMP also complies with the Oregon Transportation Investment Act (OTIA) conditions for interchanges adopted by the Oregon Transportation Commission (OTC) on January 6, 2002. In addition, it complies with recently modified plans and policies of the local jurisdictions.

The Myrtle Creek Curves project that was identified for funding in the STIP also required completion of the IAMP prior to construction contracts being awarded. That project is no longer

going forward. However, the research and analysis conducted for that interchange is still included in this document. It will provide an understanding of the conditions and concerns near Interchange 108 for any future planning efforts there.

The Southern Douglas County area has been promoted and targeted for new industrial growth. Interchanges 103, 106, and 108 are important to achieve economic development goals in the area. They provide vital access between I-5 and the communities of Myrtle Creek, Tri City, and Riddle; the Myrtle Creek Airport; and the South Umpqua Industrial Park at Interchange 103. Making improvements to these three interchanges is integral to ensuring a viable statewide highway system, as well as providing for safe and efficient access to I-5 for businesses and residents that rely on the Interstate. The interchange improvements outlined for interchange 103 IAMP are not intended to facilitate unplanned major commercial or residential development in the interchange area. However, the interchange's continued smooth operation is necessary to support future expected job growth in the County, as well as existing businesses and residents that rely on the interchanges to access I-5.

The implementation of the IAMP requires extensive coordination between the jurisdictions. In particular, the Weaver Road Bridge project, led by Douglas County, must be coordinated with ODOT to ensure that the new facility is compatible with Interchange 106. An intergovernmental agreement (IGA) will need to be adopted by ODOT and Douglas County describing how the coordination will be conducted as well as each party's responsibilities. The IGA should include a discussion of who is responsible for the Federal Access Modification Request. In addition, the Weaver Road bridge should be designed so that it does not preclude future improvements to the interchange.

Douglas County will amend the Douglas County TSP to include the 103, 106, 108 IAMP. Because the TSP is an element of the County's comprehensive plan, adopting the IAMP is considered a legislative action, subject to the procedures in the Douglas County Douglas County Land Use and Development Ordinance (LUDO). The adoption of the IAMP constitutes a major text amendment, as it adopts new policy and implementation measures for the interchange areas. The approval criteria for a legislative amendment can be found in the LUDO.

The Myrtle Creek Transportation System Plan (TSP) update was conducted concurrently with development of the IAMP. The City has considered the Draft TSP at public hearing and it is expected to be adopted in the first half of 2006. While the findings and recommendations of the IAMP process are integrated into the Myrtle Creek TSP, the City will also adopt the 103, 106, 108 IAMP. Once adopted, the IAMP will amend the City's TSP, and element of the City's comprehensive plan, to include policy language, necessary transportation improvements, and access management strategies that will enable improvements at the interchanges.

8.1 Proposed Amendments

8.1.1 Douglas County

- The following summarizes the major Douglas County TSP amendments that will need to occur to support adoption of the I-5 Interchange 103/106/108 IAMP.

- The list of Roadway Improvement Projects necessary to implement the preferred alternative for Interchange 103 improvements shall be adopted by reference into the Douglas County TSP. The list of Roadway Improvement Projects includes transportation projects that implement the "Option 2" build scenario that anticipates a new Weaver Road Bridge over the South Umpqua River. The projects include:

    - The extension of Petite Street southward approximately 450 feet west of the existing road at Interchange 103.
    - The redesign of the Pruner Road/Old Pacific Highway intersection redesign to include a curve between the north and west legs and removal of stop signs for these approaches.
    - Widening the Interchange 103 bridge, reconfiguration of ramps on the east side, and eventual signalization of the ramps.
    - A new connection between Weaver Road and Old Pacific Highway (Highway 99) south of Wecks Road to accommodate a new Weaver Road Bridge over the South Umpqua River at Interchange 106.
    - A reconfiguration of Aviation Drive and potentially relocated intersection with Weaver Road to accommodate the new Weaver Road Bridge.

- The Short-Term Access Management Strategies and the Medium- and Long-Term Actions of the IAMP's Access Management Plan (Appendix J and summarized in Section 7.3.1 of the IAMP) that are necessary to implement the interchange improvements shall be adopted by reference into the County's TSP. Adoption of these strategies and actions is necessary wherever ODOT does not have jurisdiction of the roadway right-of-ways.

In addition, upon County adoption of the IAMP, the following policy statements that support the preferred alternative for Interchange 103 improvements and access management strategies for interchanges 103, 106, 108 will be incorporated into the Douglas County TSP:

- *Douglas County recognizes the importance of Interstate 5 in the movement of people and goods to and from the region and is committed to protecting the function of interchanges 103, 106, and 108 to provide access to I-5. The function of these interchanges, as defined in the I-5 Interchange 103, 106, 108 Interchange Area Management Plan, is to safely and efficiently accommodate the future traffic demands associated with current rural and urban land uses in the planning area and the expected state and regional growth.*

- *The County supports land uses in the vicinity of interchanges 103, 106, and 108 consistent with the adopted improvements in the Interchange Area Management Plan for these interchanges. Consistent with this policy, the County supports continued agricultural use of land in the Interchange 106 interchange study area, in accordance with the Exclusive Farm Use zoning designation that currently exists in most of this defined area.*

- *Douglas County will coordinate with ODOT in evaluating land use actions that could affect the function of interchanges 103, 106, and 108.*

- *Douglas County will coordinate with ODOT prior to amending its transportation system plan or proposing transportation improvements that could affect the function of interchanges 103, 106, 108.*

- *Douglas County will not rely on interchanges 103, 106, or 108 for providing additional capacity to support future land use actions in the County that are not consistent with the planned improvements to these interchanges.*

8.1.2 City of Myrtle Creek

The following summarizes the major Myrtle Creek TSP amendments that will need to occur to support adoption of the I-5 Interchange 103/106/108 IAMP.

- The Short-Term Access Management Strategies and the Medium- and Long-Term Actions of the IAMP's Access Management Plan (Appendix J and summarized in Section 7.3.1 of the IAMP) that are necessary to implement the interchange improvements at Interchange 106 and 108 shall be adopted by reference into the County's TSP.

- The transportation improvements necessary to extend Weaver Road across the South Umpqua River and provide a new connection to the Old Pacific Highway at Wecks Road, as described in Section 6.1.2 and Appendix H, Future Transportation Conditions Report, of the 103, 106, 108 Interchange Area Management Plan.

- The transportation improvements necessary to implement the Myrtle Creek Arch Bridge Rehabilitation, as described in Section 6.1.3 and Appendix H, Future Transportation Conditions Report, of the 103, 106, 108 Interchange Area Management Plan.

In addition, upon City adoption of the IAMP, the following policy statements that support the preferred alternative for access management strategies for interchanges 106 and 108 will be incorporated into the Myrtle Creek TSP:

- *The City of Myrtle Creek recognizes the importance of Interstate 5 in the movement of people and goods to and from the region and is committed to protecting the function of interchanges 106 and 108 to provide access to I-5. The function of these interchanges, as defined in the I-5 Interchange 103, 106, 108 Interchange Area Management Plan, is to safely and efficiently accommodate the future traffic demands associated with current*

rural and urban land uses in the planning area and the expected state and regional growth.

- *The City supports land uses in the vicinity of interchanges 103, 106 and 108 consistent with the expected improvements in the Interchange Area Management Plan for these interchanges (see Section 6.0 of the IAMP and Appendix K. Roadway Improvement Projects). Consistent with this policy, the City supports continued agricultural use of land in the Interchange 106 interchange study area, in accordance with the Douglas County Exclusive Farm Use zoning designation that currently exists in most of this defined area.*

- *The City will coordinate with ODOT in evaluating land use actions that could affect the function of interchanges 106 and 108.*

- *The City will coordinate with ODOT prior to amending its transportation system plan or proposing transportation improvements that could affect the function of interchanges 103, 106 and 108.*

- *The City will not rely on interchanges 106 or 108 for providing additional capacity to support future land use actions in the City that are not consistent with the planned improvements to these interchanges.*

8.2 Other Related Actions

8.2.1 Protection of Farmland

The existing state statutes and administrative rules, combined with the Oregon Statewide Planning Goals and implementing regulations, have been very effective in protecting resource lands and it is expected that they will provide long-term protection for the agricultural lands and land uses in the vicinity of interchanges 103, 106, and 108. As documented in the Existing Land Use Analysis (Appendix F), there is County resource land in the vicinity of all three interchanges.

Areas within the Interchange 108 study area, outside of the UGB, are zoned Farm Forest. Uses in this zone are limited to farm and forest use, associated buildings, and limited home occupations. The minimum lot size is 80 acres. Interchange 106 is wholly outside of the Myrtle Creek/Tri City UGB, with access from Weaver Road to the north and a frontage road, Aviation Drive, to the south (see Figure 9.). Interchange 106 is within Douglas County, and land in the vicinity of the interchange is zoned Exclusive Farm Use – Cropland (FC). Development is limited by the FC zone which only allows agricultural use and other uses which are compatible with agricultural activities. Permitted uses are farm uses, their associated buildings and accessory uses, and the propagation or harvesting of a forest product. Property development standards for land in the vicinity of Interchange 106, which is classified "FC-1," requires that

created parcels be a minimum of 20 acres. Land to the west of Interchange 103, south of Pruner Road, is also designated Exclusive Farm Use-Cropland.[11]

8.2.2 Potential Future Urbanization

Interchanges 103 and 108 partially lie in unincorporated Douglas County and Interchange 106 lies wholly within the County. All three interchanges face urbanization pressures and interchange improvements can act as a catalyst to attracting more growth, in particular attracting commercial uses that benefit from highway visibility. In the case of Interchange 106, the new Weaver Road bridge is likely to create more pressure for development, as well.

The policies contained in Section 8.3 are recommended to protect the function of the interchange in the event that the UGB is expanded into the area or urban uses are allowed to occur at an intensity that is not anticipated by the IAMP.

8.3 Additional Proposed Amendments

The following additional policies are recommended for incorporation into the Douglas County and City of Myrtle Creek TSPs respectively to address potential land use changes that could have the effect of negatively impacting transportation operations at interchanges 103, 106, and 108. These policies establish a process by which ODOT and the local jurisdictions will coordinate planning efforts in the event of changes to the adopted land use designations (comprehensive plan designations).

ODOT will continue to coordinate with local jurisdictions and state agencies, through the plan amendment and development review process, to keep existing land use protections in place. ODOT will also monitor and comment on any future actions that would amend the urban growth boundary in the vicinity of interchanges 103, 106 and 108.

8.3.1 Douglas County

- *ODOT will continue to coordinate with local jurisdictions and state agencies, through the plan amendment and development review process, to keep existing land use protections in place. ODOT will also monitor and comment on any future actions that would amend the urban growth boundary in the vicinity of interchanges 103, 106 and 108.*

[11] The Cow Creek Band of the Umpqua Tribe has recently purchased two large parcels south of Pruner Road and west of the interchange, totaling 35 acres. It is expected that these parcels will ultimately be placed in the Tribal Trust at which time land uses will be determined by the Tribe.

- *If future County-initiated changes to the land use designations or uses allowed in the IAMP Planning Area result in the need for additional capacity at the interchange, Douglas County shall prepare amendments to the IAMP and shall adopt a funding plan for the provision of any improvements to interchanges 103, 106 or 108. Proposed IAMP amendments shall be coordinated with ODOT staff and the revised IAMP and funding plan shall be submitted to the OTC for approval.*

- *If future County-initiated changes to the land use designations or allowed uses outside the IAMP Planning Area result in the need for additional capacity at the interchange, Douglas County shall prepare amendments to the IAMP and shall adopt a funding plan for the provision of any improvements to interchanges 103, 106 and/or 108. Proposed IAMP amendments shall be coordinated with ODOT staff and the revised IAMP and funding plan shall be submitted to the OTC for approval.*

8.3.2 City of Myrtle Creek

- *If the City of Myrtle Creek proposes to expand its UGB to include additional land within the interchange study areas of Interchange 106 or Interchange 108, then the City will amend its TSP to incorporate all applicable IAMP policies and implementation measures, previously only applicable to the County. Prior to, or concurrently with, plan amendments or rezoning of land that affects the IAMP Planning Areas, the City of Myrtle Creek will prepare amendments to the IAMP to identify any additional improvements to the affected interchange and shall adopt an accompanying funding plan to provide those improvements. Proposed IAMP amendments and any associated funding plan shall be coordinated with ODOT and submitted to the Oregon Transportation Commission for approval.*

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Appendix A.

Review of Transportation and Land Use Plans and Policies

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I-5 INTERCHANGES 103, 106, 108 MANAGEMENT PLAN
REVIEW OF TRANSPORTATION AND LAND USE PLANS AND POLICIES

TECHNICAL MEMORANDUM
September 22, 2004 Draft

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This memorandum summarizes relevant plans and policies (Task 3.0) pertaining to land use and transportation systems in the vicinity of I-5 Interchanges 103, 106, and 108 and identifies how they influence future planning for these facilities.

I. Background

The Oregon Transportation Commission approved Oregon Transportation Investment Act (OTIA) funding for improvements to interchanges along I-5 at its January 16, 2002 meeting, subject to conditions. Principally, the Commission required that an Interchange Area Management Plan (IAMP) be developed and submitted for their review and approval before funds for construction are released on specified projects. These conditions apply to future improvements on I-5 interchanges in the Myrtle Creek/Tri City. The OTIA conditions for interchanges read as follows:

> *ODOT, in concert with local government, shall develop an interchange area management plan following the provisions of OAR 731-051-0200 [1]for the project consistent with the Oregon Highway Plan. [Local government] shall adopt the interchange area management plan as part of a legally binding, enforceable intergovernmental agreement between [local government] and ODOT as provided in Oregon Law. The intergovernmental agreement shall include the following elements:*
>
> - *The interchange management plan shall be presented to the OTC for review and approval before funds for construction are released.*
> - *Protection of resource lands will be addressed in the interchange management plan.*
> - *If the agreement is to be terminated that [local government] give notice to ODOT in advance of a public hearing on the matter and that the public hearing be held prior to the expiration of the agreement.*
> - *Changes or termination of the agreement in advance of expiration shall require formal affirmative action by the Oregon Transportation Commission and [local government].*
> - *The agreement can expire if [local government] includes the interchange area management plan in its Transportation System Plan.*
> - *The interchange management plan will also include measures to prevent growth-induced development on exception lands or urban growth boundary expansion in the vicinity of the interchange.*
> - *The interchange area management plan will provide for the protection of safe and efficient operation of the interchange between connecting roadways and will minimize the need for major improvements to existing interchanges.*
> - *The intergovernmental agreement will call for any amendments to the local plan and Oregon Highway Plan needed for this to be accomplished.*

This memorandum provides an overview of the regulatory context within which interchange area management planning for the I-5 Interchanges 103, 106 and 108 will take place. Included in this

[1] Per amendments to Division 51 that occurred in 2004, the applicable provisions are found in OAR 731-051-0125.

review are existing land uses and key land use regulations governing land use and development in the vicinity of the interchanges.

II. Study Area Description

The purpose of the planning project is to evaluate the operation of Interchanges 103, 106 and 108; assess limitations and issues of concern, and, in general terms, identify possible future long-range development in the area. Interchange 103 was recently identified as deficient due to structural cracks and is in need of replacement. Interchange 106 serving the Myrtle Creek Municipal Airport may need to be relocated and is constrained by floodway/floodplain. The Myrtle Creek Bridge, Interchange 108, needs to be evaluated for historic status and additional changes may be required, depending on funding for the Myrtle Creek Curves project. An additional consideration for the planning exercise is that Douglas County is seeking funding for the construction of the Weaver Road Bridge, from Interchange 106 to Myrtle Creek Highway, over the Umpqua River.

The land use study area for each interchange (see Figures ___) defines the general area where the interchange improvements could potentially influence land use patterns or have land use impacts. At a minimum, the IAMP land use study area to the north and south includes all land uses and roadways located within approximately 1,320 feet of the existing interchanges. This distance corresponds to the spacing standard outlined in the OAR 734-051 Division 51 rules for interchange ramps.

III. Existing Comprehensive Plan and Zoning Designations in the Study Areas

Pursuant to the requirements stated in the Oregon Administrative Rule 734-051-0125 for the preparation of an IAMP, a summary of land uses are described below for the three IAMP study areas. This section provides a description of the existing comprehensive plan designations, zoning, and development policies that currently govern land within the study areas for the three subject interchanges.

The three interchanges serve the Myrtle Creek and Tri City Unincorporated Urban Area in Douglas County. Half of Interchange 108, to the east of I-5, lies within the Myrtle Creek City Limits. The western half of Interchange 108 is outside the Urban Growth Boundary (UGB). Interchange 106 is wholly outside of the UGB, with access from Weaver Road to the north and a frontage road, Aviation Drive, to the south. Interchange 103 primarily serves the Tri City area and is within the UGB. Old Pacific Highway 99 crosses over I-5 at this interchange, providing access to urban areas to the east, and agricultural area to the west.

Douglas County

Douglas County has land use planning jurisdiction for areas in the vicinity of the interchanges outside the Myrtle Creek UGB, as well as areas that fall within the UGB for the Tri City Urban Unincorporated Area. The Douglas County Comprehensive Plan (2003) contains maps that

designate land use in these areas. Chapter 3 of the Douglas County Land Use and Development Ordinance contains the County's zoning classifications.

Areas within the Interchange 108 Study Area, outside of Myrtle Creek's UGB, are designated "Farm/Forest Transitional" on the County's Comprehensive Plan Map. This designation is intended to "conserve and maintain open space lands for forest use or farm use or both, or for the protection of natural resource areas." Consistent with the Comprehensive Plan designation, the County zoning west of Interchange 108 is Farm Forest. Article 5 in the County's Land Development Ordinance contains the development standards for land with this zoning designation. The stated purpose of the Farm Forest (FF) classification is to promote management, utilization, and conservation of currently, or potential, forested grazing lands. Uses in this zone are limited to farm and forest use, associated buildings, and limited home occupations. The minimum lot size is 80 acres (*see section later in this report regarding ORS 215.283*).

Interchange 106 is within Douglas County, outside the UGB, and the Comprehensive Plan designation in its immediate vicinity are zoned "Agricultural." This designation is intended to preserve and maintain prime agriculture lands for farm uses and provide protection from non-farm use. Consistent with the designation, land in the vicinity of Interchange 106 is zoned Exclusive Farm Use – Cropland (FC – F1, F2, F3). The purpose and intent of the zone is to provide areas for the continued agricultural use and permit the establishment of only those new uses which are compatible with agricultural activities. The minimum property size established by this zone (Article 4) is intended to promote commercial agricultural pursuits, such as grainlands, croplands and horticultural areas. Permitted uses are farm uses, their associated buildings and accessory uses, and the propagation or harvesting of a forest product. Property development standards for land in the vicinity of Interchange 106, which is classified "FC-2," requires that created parcels be a minimum of 40 acres.

Parcels on both sides (north and south) of Highway 99 at Interchange 103 are within the Tri City UGB. This is not entirely consistent with the Douglas County Comprehensive Plan map, which shows only areas to the northwest, northeast and southeast of the interchange within the Myrtle Creek-Tri City urban growth area. The Comprehensive Plan designation for the area south of Highway 99, west of I-5, is Agricultural. Most of the land on the west, north of Highway 99 is zoned Heavy Industrial (M-3). Heavy Industrial is reserved for heavy industrial development and uses "free from conflict" with other incompatible land uses. M-3 permits processing of aggregate and mineral resources (including asphalt plants), all uses allowed in the County's Medium Industrial zone, and any uses not included in the other industrial zones.

Two parcels are zoned tourist commercial (CT), as are parcels within the UGB, south of Highway 99, and those closest to I-5, east of the interchange. The IAMP Study Area boundary for this interchange extends south of the UGB, west of I-5, to include a small area zoned F1 (Exclusive Farm Use – Cropland, 20 acres minimum lot size). Tri City zoning in the Study Area is predominantly Single-Family Residential (R-1, 6,500 square foot minimum lot area), with the only exception being the area around the Old Pacific Highway 99 intersection, where there is some CT and C3 (General Commercial) zoning.

Allowed uses in R-1 are single-family dwellings, duplexes, accessory buildings, and limited home occupations. Uses "permitted with standards" include schools, churches, bed and breakfast establishments, and mobile home parks (subject to the density of the R-1 zone). The General Commercial zoning is intended to provide areas within which a variety of retail sales and services are allowed. Allowed uses include wholesale businesses and other types of activities that do not need to be conducted wholly within an enclosed building, nurseries (growing, sale and display of trees, shrubs, and flowers), building supplies (including retail sales of lumber), hotel/motel, stadiums, medical and dental clinics, and indoor theaters. Commercial uses in this zone do not have a minimum or maximum density requirement, nor are there front, side or rear yard set-backs if the property abuts a commercial or industrial zone. The Tourist Commercial classification is intended to provide areas for commercial uses oriented to tourists and the recreation public. Allowed uses include antique shops, galleries, book stores, condominiums (subject to multi-family development standards, R-2), hotel/motels, and curio shops. Development standards dictate that not more than 75% of the property can be covered by buildings and there is a 15-foot front yard setback.

City of Myrtle Creek

The land to the east of I-5 at Interchange 108 lies within the City limits of Myrtle Creek. Myrtle Creek Comprehensive Plan designations within the Study Area are Public/Semipublic, Low Density Residential, and Steep Slope Residential. Corresponding urban zoning is Special District-Community Services (SD/CS), Low Density Residential (R-1), and Residential Hillside (R-H). The City of Myrtle Creek Zoning Ordinance (2004) contains the development regulations for land within the city limits.

Regulations for the Special District-Community Services can be found in Article 3, District Regulations, Section 3.30, of the City of Myrtle Creek Zoning Ordinance. This is the designation used for the existing Mill Site Park. It is used primarily for public uses and facilities such as parks. The intent of the Low-Density Residential District (Section 3.02.0) is to promote the development of high quality residential neighborhoods and to encourage the construction of higher income housing by retaining areas for large-lot development. The R-1 designation allows single-family, detached dwellings with a minimum 6,000 square-foot lot size. The maximum density is five (5) units per gross acre. The R-H designation has a similar intent to the R-1 zone, but recognizes that densities should vary according to location and topography (Section 3.01.0). Properties classified as Residential Hillside are recognized as containing areas where slope may be a development factor. The objective of the zone is to provide development standards intended to minimize impacts in hazardous areas and to encourage clustered development and a variety of housing types to better utilize lands with topographic constraints. Minimum lot size shall be 10,000 feet, or 6,000 where slopes are less tan 12% and natural constraints total less than 6% of the site area (3.01.3(3)). The gross density for this zone is four units per acre.

IV. Regulatory Context for Interchange Area Management Planning[2]

[2] While Statewide Planning Goals and of the Transportation Planning Rule were not called out in the work order contract, the provisions noted here also have relevancy for the subject interchanges. Information for this section was

Land use decision-making in the vicinity of the I-5 Interchanges 103, 106 and 108 is governed by a number of different rules and regulations. The purpose of this section is to identify the principal regulations and provide an overview of them in sufficient detail to provide a working understanding of how these rules are likely to affect land conservation and development in the vicinity of the interchange.

The principal regulations addressed are:

- Statewide Planning Goals 2 (Land Use Planning), 3 (Agricultural Lands), 11 (Public Facilities Planning), 12 (Transportation) and 14 (Urbanization)
- OAR 660, Division 4 (Interpretation of Goal 2 Exceptions Process)
- ORS 215.780 (Minimum Lot or Parcel Sizes)
- ORS 215.283 (Uses Permitted in Exclusive Farm Use Zones in Nonmarginal Land Counties)
- OAR 660, Division 33 (Agricultural Land Rule)
- OAR 660, Division 11 (Public Facilities Planning)
- OAR 660, Division 12 (Transportation Planning Rule)
- ORS 197.298 (Priority of Land to be Included within Urban Growth Boundaries)
- 1999 Oregon Highway Plan
- OAR 734, Division 51 (Access Management)
- ODOT 2002 Highway Design Manual
- Douglas County Transportation Plan Policies
- City of Myrtle Creek Transportation Policies

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. This Goal is one of five statewide planning goals that play a key role in management planning for the subject interchanges. The other goals are Goals 3 (Agricultural Lands), 11 (Public Facilities Planning), 12 (Transportation) and 14 (Urbanization).

Goal 2 is important for four 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, regarding land use and transportation facilities in the County and the Unincorporated Urban Area of Tri City, and the City Myrtle Creek, both of which have planning authority over the areas impacted by any proposed interchange improvements. Coordination is particularly important because development within both the City and the County will impact use

taken in part from materials developed for the Jackson School Road Interchange Project and the Interchange Area Management Plan that was subsequently prepared for ODOT Region 1. The consultant team on that project included David Evans and Associates, Inc., Mark J. Greenfield, Cogan Owens Cogan, and Angelo Eaton & Associates.

of the proposed interchange, and land use decisions in that area could affect future use and operation of the interchange.[3]

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 elements of an interchange area management plan (IAMP) developed for these interchanges will need to be adopted by either, or by both the City and County and elements may ultimately be incorporated into the jurisdictions' transportation system plans (TSPs)[4].

Finally, Goal 2 includes standards for taking an "exception" to one or more statewide planning goals.[5] The Goal 2 exception standards apply when a local government or property owner proposes to use property in a manner otherwise prohibited by one or more statewide planning goals. The exception standards also apply when a government agency proposes to expand an urban growth boundary (UGB). In both instances, the Goal 2 exception standards require the local government taking the exception to demonstrate how the following standards are met:

- Reasons justify why the state policy embodied in the applicable goals should not apply;
- Areas which do not require a new exception cannot reasonably accommodate the use;
- The long term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site; and
- The proposed uses are compatible with other adjacent land uses or will be so rendered through measures designed to reduce adverse impacts.[6]

The Goal 2 exceptions standards are interpreted in significant detail in **OAR 660, Division 4**. Rule sections particularly relevant to developing an IAMP are:

[3] The Transportation Planning Rule also requires coordination among affected local governments, agencies and special districts. See OAR 660-012-0015(5).
[4] A TSP is an element of the local comprehensive plan.
[5] An "exception" is a comprehensive plan provision, including an amendment to an acknowledged comprehensive plan, that is (a) applicable to specific properties or situations and does not establish a planning or zoning policy of general applicability; (b) does not comply with some or all goal requirements applicable to the subject properties or situations; and (c) complies with the standards for taking goal exceptions. ORS 197.732(8).
[6] See also ORS 197.732(1)(c).

- OAR 660-004-0010(1)(c)(B), which requires a local government amending a UGB to demonstrate compliance with the four factors listed above and the "seven factors of Goal 14" governing establishment and change of urban growth boundaries (addressed in the discussion of Goal 14 below).
- OAR 660-004-0022, which establishes standards under which uses such as residential or industrial development may be justified on rural lands.
- OAR 660-004-0020(2)(b), which requires demonstration why a proposed use cannot reasonably be accommodated on nonresource land or inside a UGB.

As indicated by a significant body of case law dating back to the 1970s, the Goal 2 exceptions criteria provide agricultural lands with a very high level of protection from higher intensity rural nonfarm uses.[7] Accordingly, Goal 2's exception standards cannot be lightly regarded.

2. Statewide Planning Goal 3, ORS 215.780, ORS 215.213 and OAR 660, Division 33.

Statewide Planning Goal 3, Agricultural Lands, requires that agricultural lands be preserved and maintained for farm use. The goal is implemented through zoning that limits uses on agricultural lands to "farm uses and those nonfarm uses defined by commission rule that will not have significant adverse effects on accepted farm or forest practices." Such zoning is commonly referred to as "exclusive farm use" zoning.

Goal 3 and **ORS 215.780** also require counties to establish minimum sizes for new lots or parcels in each agricultural land designation. ORS 215.780(1)(a) provides that for land zoned for exclusive farm use and not designated rangeland, the minimum lot or parcel size shall be at least 80 acres. (check zoning) This is the minimum lot size applicable to the EFU-zoned lands in the County in the vicinity of Interchange 108.[8]

Because Douglas County is a "nonmarginal lands" county for purposes of Goal 3 compliance, the uses identified in **ORS 215.283** may be permitted on EFU-zoned lands in the county. Those uses include:

- Schools, churches, certain utility facilities, farm dwellings, reconstruction or modification of public roads, certain other roadway improvements, wineries, farm stands, and facilities for processing farm crops, which are permitted under ORS 215.283(1);
- Mining activities, community centers, public and private parks, playgrounds, golf courses, commercial activities in conjunction with farm use, and additional roadway improvements, which are permitted under ORS 215.283(2); and

[7] As used in this discussion, "nonfarm uses" does not include those uses that are statutorily permitted in exclusive farm use zones under ORS 215.213 or 215.283.

[8] Douglas County implements Goal 3 through its Exclusive Farm Use (EFU) Districts. See Douglas County Land Use and Development Ordinance, Chapter 3, Articles 2 and 3. The minimum lot size is 80 acres for Exclusive Farm Use-Grazing (FG) and 20, 40, or 80 acres in Exclusive Farm Use-Cropland (FC-1, FC-2, and FC-3 respectively). Farm Forest (FF) zoning also has a minimum lot size of 80 acres.

- Road, highway and other transportation improvements not allowed under ORS 215.283(1) or (2), which are permitted under ORS 215.283(3).

OAR 660, Division 33 is the Land Conservation and Development Commission's (LCDC) rule establishing limitations on uses statutorily permitted in EFU zones. It includes limitations on uses permitted under ORS 215.283(1) that counties otherwise could not have adopted. It also includes limitations on uses allowed under ORS 215.283(2) that counties may further regulate.

Like ORS 215.780, OAR 660-033-0100(1) requires counties to establish minimum parcel sizes of at least 80 acres for land zoned for exclusive farm use. OAR 660-033-0120 and OAR 660-033-0130 respectively address uses authorized on high value agricultural lands and establish minimum standards applicable to those allowed uses. Under these rules, for example, new public and private schools, churches, golf courses, and private parks, playgrounds and campgrounds are not permitted. Moreover, new schools and churches, and most private campgrounds, are not permitted within three miles of a UGB unless an exception is approved pursuant to ORS 197.732 and OAR 660, Division 4. See OAR 660-033-0120, Table 1, and 660-033-0130(2), (19). Commercial uses in conjunction with farm use are permitted only where such uses will not force a significant change in, or significantly increase the cost of, accepted farm or forest practices on surrounding lands devoted to farm or forest uses.[9]

3. 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."

Goal 11 prohibits the establishment of sewer systems outside urban growth boundaries and the extension of sewer lines from within UGBs to serve lands outside UGBs, except where a new or extended system is the only practicable alternative to mitigate a public health hazard and will not adversely affect farm or forest land. This effectively limits the ability to establish urban scale uses within some areas within the IAMP study boundaries for the three intersections. Also, Goal 11's implementing rule, **OAR 660, Division 11**, prohibits local governments from using the presence, establishment or extension of a water system on rural lands to allow an increase in the allowable density of residential development. See OAR 660-011-0065. This means that to provide urban-scale facilities in the EFU area adjacent to the interchanges, a Goal 11 exception is required.[10]

[9] To be "in conjunction with farm use", the commercial activity must enhance the farming enterprises of the local agricultural community to which the EFU land hosting that commercial activity relates. *City of Sandy v. Clackamas County*, 28 Or LUBA 316 (1994). Whether or not such an activity would "force a significant change in" or "significantly increase the cost of" farming practices is a judgment call for the reviewing county, taking into consideration the cumulative impacts of nonfarm uses on farming operations as a whole. *Von Lubken v. Hood River County*, 28 Or LUBA 362 (1994).

[10] Public facilities needed to serve urban scale uses would also be considered urban in scale.

4. 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.

The IAMP for Interchange 103, 106 and 108 will need to be found in compliance with the provisions of the TPR before it can be adopted by the City and the County. 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. This could involve the purchase of access rights within at least one-quarter mile of the interchange ramps.

5. Goal 14 and ORS 197.298.

Goal 14 regulates urban growth boundaries. The goal provides that establishment and change of a UGB shall be based upon considerations of the following seven factors:

- Demonstrated need to accommodate long-range urban population growth requirements consistent with LCDC goals;

- Need for housing, economic opportunities, and livability;
- Orderly and economic provision for public facilities and services;
- Maximum efficiency of land uses within and on the fringe of the existing urban area;
- Environmental, energy, economic and social consequences;
- Retention of agricultural land as defined, with Class I being the highest priority for retention and Class VI the lowest priority; and
- Compatibility of the proposed urban uses with nearby agricultural activities.

There are no LCDC rules addressing the application of these seven factors to UGB amendments. However, there is substantial case law on the issue, in the form of opinions by the Land Use Board of Appeals and the Oregon Court of Appeals and Supreme Court. These opinions hold that Goal 14 requires not only a demonstration of need for land to accommodate population growth, housing, economic opportunities and livability, but also justification for the number of acres proposed for inclusion inside a UGB.

Additionally, **ORS 197.298** establishes priorities for including land inside urban growth boundaries. The first (highest) priority for inclusion is land that is designated "urban reserve" land. The second priority is land adjacent to a UGB that is identified as "an exception area or nonresource land." The third priority is land that is designated as "marginal land" pursuant to ORS 197.247. The final (lowest) priority is land that is designated for agriculture, forestry, or both.

The EFU land in Douglas County, within the study areas for the three intersections, is lowest priority for inclusion into the UGB. While the proximity of this land to the interchange makes it susceptible over time to inclusion inside a UGB, such an action would need to be based on a demonstration of need and the application of the standards in ORS 197.298.

6. 1999 Oregon Highway Plan

The 1999 Oregon Highway Plan (OHP) is one modal element of the Oregon Transportation Plan. The OHP outlines the policies and strategies to guide the Highway Division's operating and fiscal activities. 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 found within the OHP that apply to future interchange improvements include:

- Policy 1B: Land Use and Transportation,
- Policy 1C: State Highway Freight System,
- Policy 1F: Highway Mobility Standards,
- Policy 1G: Major Improvements,

- Policy 2B: Off-System Improvements
- Policy 2F: Traffic Safety,
- Policy 3A: Classification and Spacing Standards,
- Policy 3C: Interchange Access Management Areas, and
- Policy 4A: Efficiency of Freight Movement.

Policy 1B: Land Use and Transportation. This policy recognizes the role of both the State and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning.

Policy 1C: State Highway Freight System. This policy recognizes the need for the efficient movement of freight through the state. I-5 is listed as a Designated Freight Route.

Policy 1F: Highway Mobility Standards. This policy addresses state highway performance expectations, providing guidance for managing access and traffic control systems related to interchanges. This policy 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 the OHP.

Policy 1G: Major Improvements. This policy emphasizes the state's preference for improving system efficiency and management before adding capacity.

Policy 2B: Off-System Improvements. This policy helps local jurisdictions adopt land use and access management policies; and

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

Policy 3A: Classification and Spacing Standards. This policy addresses the location, spacing and type of road and street intersections and approach roads on state highways. The adopted standards can be found in Appendix C of the *Oregon Highway Plan.* It includes standards for each highway classification; generally, the access spacing distance increases as either the highway's importance or posted speed increases. In urban areas the spacing standard is 1,320 feet for Statewide Highways other than Expressways.

Policy 3C: Interchange Access Management Areas. This policy addresses management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. Action items include developing interchange area management plans to protect the function of the interchange to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges. The local jurisdiction's role in access management is stated in Policy 3C as follows: "necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange

management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place (Action 3C.2)."

Access management standards are detailed in Policy 3C and include the distance required between an interchange and approaches and intersections. The most stringent standards apply in interchange areas. Table 16 contains the minimum spacing standards applicable to freeway interchanges that have a two-lane crossroad. The spacing standards in an urban area for this type of interchange are:

1 mile (1.6 km)	Distance between the start and end of tapers of adjacent interchanges.
1,320 feet (400 m)	Distance to the first major intersection or approach (no left turns allowed).
990 feet (300 m)	Distance between the last right in/right out approach road and the start of the taper for the on-ramp.

Policy 4A: Efficiency of Freight Movement. This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. As noted previously, Interstate 5 is a Designated Freight Route.

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

This Administrative Rule (OAR) defines the State's role in managing access to highway facilities in order to maintain functional use, safety and preserve public investment.

> *The purpose of division 51 rules is to provide a safe and efficient transportation system through the preservation of public safety, the improvement and development of transportation facilities, the protection of highway traffic from the hazards of unrestricted and unregulated entry from adjacent property, and the elimination of hazards due to highway grade intersections. These rules establish procedures and criteria used by the Department to govern highway approaches, access control, spacing standards, medians and restriction of turning movements in compliance with statewide planning goals and in a manner compatible with acknowledged comprehensive plans and consistent with Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR), and the 1999 Oregon Highway Plan (OHP)(OAR 734-051-0020).*

The OAR outlines how the State will manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. An important component of the State strategy is the development of interchange area management plans. Section –0155 identifies when, how and why ODOT will develop access management plans for particular sections of a highway. The Rules states that:

> *(2) Access Management Plans and Access Management Plans for Interchanges are developed for a designated section of highway with priority placed on facilities with high volumes or providing important statewide or regional connectivity where:*

(a) Existing developments do not meet spacing standards;
(b) Existing development patterns, land ownership patterns, and land use plans are likely to result in a need for deviations; or
(c) An access management plan would preserve or enhance the safe and efficient operation of a state highway.

4) Access Management Plans and Access Management Plans for Interchanges comply with all of the following:
(a) Are prepared for a logical segment of the state highway and include sufficient area to address highway operation and safety issues and development of adjoining properties including local access and circulation.
(b) Describe the roadway network, right-of-way, access control, and land parcels in the analysis area.
(c) Are developed in coordination with local governments and property owners in the affected area.
(d) Are consistent with any applicable adopted Transportation System Plan, Local Comprehensive Plan, Corridor Plan, or Special Transportation Area or Urban Business Area designation, or amendments to the Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.
(e) Are consistent with the 1999 Oregon Highway Plan.
(f) Contain short, medium, and long-range actions to improve operations and safety and preserve the functional integrity of the highway system.
(g) Consider whether improvements to local street networks are feasible.
(h) Promote safe and efficient operation of the state highway consistent with the highway classification and the highway segment designation.
(i) Consider the use of the adjoining property consistent with the comprehensive plan designation and zoning of the area.
(j) Provide a comprehensive, area-wide solution for local access and circulation that minimizes use of the state highway for local access and circulation.
(k) Are approved by the Department through an intergovernmental agreement and adopted by the local government, and adopted into a Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.
(l) Are used for evaluation of development proposals.
(m) May be used in conjunction with mitigation measures.

Division 51 also contains the Oregon highway system spacing standards for interchanges. Where interchange area management plans are included in transportation system plans, they must be consistent with the spacing standards as outlined in Tables 5, 6, 7, and 8, of the Division 51 document. Interchange access management spacing standards must be applied to the improvement of an existing interchange (734-051-0125).

(1) Access management spacing standards for approaches in an interchange area:

(a) Are based on classification of highway and highway segment designation, type of area, and posted speed;
(b) Apply to properties abutting state highways, highway or interchange construction and modernization projects, planning processes involving state highways, or other projects determined by the Region Manager; and
(c) Do not apply to approaches in existence prior to April 1, 2000 except where any of the following occur:
(A) These standards will apply to private approaches at the time of a change of use.
(B) If infill development or redevelopment occurs, spacing and safety factors will improve by moving in the direction of the access management spacing standards, with the goal of meeting or improving compliance with the access management spacing standards.
(C) For a highway or interchange construction or modernization project or other roadway or interchange project determined by the Region Manager, the project will improve spacing and safety factors by moving in the direction of the access management spacing standards, with the goal of meeting or improving compliance with the access management spacing standards.

8. ODOT 2002 Highway Design Manual

The Highway Design Manual implements Oregon Highway Plan policies and is a multi-modal design manual. Chapter 9, Intersection and Interchange Design, covers the design standards, guidelines, and processes for designing road approaches, signalized and unsignalized at-grade intersections, and interchanges for State Highways. Improvements to I-5 interchanges will need to be consistent with the standards in this manual.

9. Douglas County Transportation Plan Policies

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.

Functional classifications in the "transportation element findings" categorize I-5 as a Principal Highway and sections of the Old Pacific Highway as a Major Collector (I-5 Exit 103 to Wecks Road) and a Arterial (Wecks Road to I-5 Exit 108). The TSP does not list any projects specifically related to I-5 Interchanges 103, 106 or 108.

The Central Oregon Pacific Railroad runs through the City of Myrtle Creek, passes under under I-5, and parallels the highway south of the City. The TSP includes a Rail Transportation section, which identifies the Central Oregon Pacific Railroad as providing an important service to the region by providing a lower cost option for freight shipments.

Tri City Urban Unincorporated Circulation Plan (2001)

The Tri City 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 Green, 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 in the Tri City Circulation Plan described the topographical constraints in the area and the long, and relatively narrow corridor of development bounded by the river and freeway to the west and steep hills on the east. The major north-south routes through the area are I-5 and Highway 99.

The Circulation Plan refers to the Myrtle Creek Area Transportation Study (1995 "MCATS") that identified two problem areas in the I-5 corridor that impact the Tri City area. Both of these issues involved overpasses that were too low for some trucks to go under. The study recommended raising the bridge and adding a traffic signal at the Chadwick Road Overpass. The study recommended ramp/intersection improvements to either raise the bridge or provide alternative routing via re-designed on/off ramps for the Riddle Interchange Overpass (Interchange 103). In addition to these improvements, a minor collector is proposed through the foothills of Tri City, paralleling Highway 99, to serve as an alternate collector and to provide an alternate access to a number of developed and developing areas. Due to the topography in the foothills, this minor collector is not intended to carry through traffic or reduce volumes on Highway 99, but rather will provide an alternative route and access, particularly when Highway 99 is inundated during periods of flooding.

A proposed arterial connection between Old Pacific Highway and I-5 at the Weaver Road interchange (Interchange 106) is expected to reduce traffic volumes on Highway 99. This proposed connection would intersect Old Pacific highway opposite Wecks Road and would provide an alternate route for traffic between I-5 south of Tri City, or from the Riddle Area and the northern portion of Tri City or Myrtle Creek. The 1995 Myrtle Creek Area Transportation Plan contains three possible routes for the Weaver Road Interchange.

10. City of Myrtle Creek Transportation Policies

The City of Myrtle Creek is in the process of updating transportation information and adopting a transportation system plan (TSP). The City produced a 2002 document entitled *City of Myrtle Creek Transportation Systems Plan* (MC-TSP), but it has not been adopted by the jurisdiction. This draft plan incorporated information compiled for the1995 Myrtle Creek Area Transportation Study (MCATS) and the 1997 Myrtle Creek Local Street Network Plan (MC-LSNP).

The Myrtle Creek Comprehensive Plan was adopted in 1991. It describes the dual function of the Old Pacific Highway as an arterial highway link between Tri City and the Myrtle Creek freeway access and as Main Street, a major shopping street within Myrtle Creek's Central Business District. The TSP references the Douglas County Comprehensive Plan and the intent to develop an alternate north/south route and additional freeway access to lessen congestion on Main Street. Transportation policies support this proposal, in addition to adopting a Future Street Plan for Myrtle Creek to tie into the Tri City Street Plan developed by Douglas County. The overall goal is to alleviate existing inefficient or hazardous situations and to encourage the creation of an improved vehicular system that is safe, efficient and economical (p. 11-2, Vehicular Travel & Street Network).

Background statements point to the large volume of traffic crossing the Myrtle Creek/South Umpqua River Bridge at I-5 exit 108. The nearest alternate freeway access is located approximately 6 miles south (exit 103). The Old Pacific Highway and the South Umpqua River Bridge not only provides freeway access to Myrtle Creek, it also provides access to much of the growing Tri City area as well as surrounding rural lands (p. 11-3, Traffic Volumes).

Local transportation policies (p. 11-7) that directly pertain to, or that may affect traffic on, the interstate or I-5 interchanges include:

14) Support Federal and State improvements to the existing I-5 interchange and access at Myrtle Creek Exit 108.

(15) Support the development of additional freeway access to the Myrtle Creek/Tri City corridor by the connection of Pacific Highway to the Weaver Road exit (Exit 106).

(34) Support the Douglas County plan for an alternate north/south arterial route through Tri City to Myrtle Creek.

The stated intent of Chapter 13 of the Myrtle Creek Comprehensive Plan, entitled "Tri City Service Districts," is to describe important land use factors and issues particularly affecting development in the Tri City Service Districts. As explained in this chapter, as well as in the Land Use and Urbanization Chapter, one of the major aspects of the 1990 Periodic Review of Myrtle Creek's Comprehensive Plan was a major amendment of the urban growth boundary to include the Tri City urban area. The County retains full planning jurisdiction within the Tri City portion of the boundary. As a result of the intergovernmental agreement between the City and Douglas County, the Tri City Comprehensive Plan was incorporated into the Myrtle Creek Comprehensive Plan by reference.

Information in this section of the Comprehensive Plan reiterates the fact that Old Pacific Highway serves as the major north-south spine for the area and that the number of accesses to this arterial has been identified as creating a major traffic problem in the area. This section also references the Douglas County Comprehensive Plan transportation policies of restricting future accesses to Old Pacific Highway, encouraging development of an arterial connecting Old Pacific

Highway and the Weaver Road interchange, and the proposed collector street plan to provide a north-south collector parallel to Old Pacific Highway in the foothills. Policies applicable to Tri City are contained within the Douglas County Comprehensive Plan.

V. Summary

The goals of this IAMP are to evaluate existing and future conditions of I-5 Interchanges 103, 106 and 108, to identify necessary improvements and modifications to provide safe and efficient operations, and to protect the transportation function of the interchanges. Improvements to these interchanges are eligible for funding through the Oregon Transportation Investment Act (OTIA). Before construction funds can be released for any necessary future improvements, ODOT, Douglas County and the City of Myrtle Creek must agree on an acceptable Interchange Area Management Plan.

Amendments to local plans to incorporate modifications to the function and design of the interchanges must be consistent with the regulatory requirements outlined in this memo. The allowed land uses in the vicinity of the interchanges will also have an affect on the operation of the transportation facility. The traffic generation potential of allowed and future land uses, both in the County and in the City, will need to be examined for the combined affect on how the interchanges function.

Appendix B.

Interchange 103 Concepts Memorandum

Interchange Configuration Options for IC 103

The existing interchange configuration for interchange 103 is a standard diamond for southbound traffic and a folded diamond for northbound traffic. The crossroad, known as the Riddle Bypass or Pruner Road, consists of two lanes on a bridge which spans I-5's two northbound and two southbound lanes.

As discussed in the summary of existing conditions, the interchange and its ramps do not meet current design standards. The most obvious geometric limitation is the tight radius of the loop ramp that provides access from the Riddle Bypass Road to I-5 northbound. The design speed is less than 25 mph.

Replacement of the "cracked bridge" that carries the Riddle Bypass over I-5 is planned to alleviate the detours required now by some large trucks. At least four different design options are available to improve this interchange in connection with the replacement of the "cracked bridge." All improvement options are based on some common assumptions: 1) the replacement bridge will be wide enough to carry three lanes (rather than the current two lanes) and 2) the replacement bridge will be long enough that the I-5 mainline could be widened to accommodate three northbound and three southbound lanes (rather than the current two lanes in each direction.)

The major options for design and their potential advantages are discussed below.

Existing Configuration

As illustrated in Figure 1, the existing interchange configuration features a folded diamond for northbound traffic. The northbound on-ramp has a sharp, low speed ramp. The merge with the northbound through lanes occurs before I-5 goes beneath the existing bridge. One of the advantages of this configuration is that traffic originating on the west side of the interchange that is seeking to go north on I-5 can do so making only right turns. There is no need to make left turns that conflict with on-coming traffic. This is especially important for trucks when a traffic signal is not used at the ramp terminal.

Existing Configuration with Modified Ramp

A modification of the existing configuration retains the folded diamond configuration for northbound I-5 traffic. Preliminary analysis suggests that the sharp, low-speed ramp can be redesigned to provide for easier movements for large trucks, but this option would require a longer bridge span crossing I-5 since the merge point for the on-ramp would be to the north of the existing bridge. Retaining this loop ramp in modified form allows the same advantages for right turns discussed above.

Diamond Configuration

A diamond configuration as used for the southbound half of the interchange could also be used for the northbound part of the interchange. This is a fairly standard configuration

and is used at the Weaver Road interchange about three miles to the north. This configuration does require left turns for vehicles from the west seeking to travel north on I-5.

Diamond Configuration with Two Northbound On-Ramps

Another design option combines a diamond interchange with a loop ramp for the traffic from the west seeking to go north on I-5. This configuration retains the advantage by which right turns are made by vehicles from the west seeking to travel north on I-5. This configuration requires a longer span for the bridge carrying the traffic across I-5. The need for signalization of the northbound ramp terminals is delayed by several years.

Preliminary analysis of traffic volumes at the ramp terminals indicates that signal warrants for either the existing configuration or the diamond configuration will be met in a few years. Depending upon the rate of growth in regional traffic, traffic signal warrants may be met at both the northbound and southbound ramp terminals by approximately year 2007. Should the planned Weaver Road bridge connecting Interchange 106 to Myrtle Creek on the east side of the South Umpqua River be constructed, signal warrants may not be met for many years due to the shift in traffic patterns, drawing traffic from Interchange 103 and shifting it to Interchange 106.

The option that uses two northbound ramps (the loop ramp for traffic from the west and the second for traffic from the east) also delays the need for a traffic signal at the ramp terminal. Signal warrants would likely be met in approximately 2016 with this configuration for the northbound ramp terminal.

The ramp terminal for the southbound traffic is predicted to meet warrants for installation of a traffic signal as early as 2007 for all interchange concepts. The actual date at which the warrants will be met depends upon regional traffic growth and the presence or absence of the Weaver Road Bridge.

Advantages and disadvantages of the various intersection configurations are summarized in Table 1.

Table 1 Interchange Configuration Advantages and Disadvantages		
Interchange Configuration	**Advantages**	**Disadvantages**
Existing	• Minimum span for bridge • Right turns are used for traffic from west seeking to go north on I-5	• Sharp, low-speed turn for northbound on-ramp • Left turns are used for traffic from Myrtle Creek and Tri-City to go north on I-5
Existing with Modified Ramp	• Right turns are used for traffic from west seeking to go north on I-5 • Ramp design speed is higher than existing loop ramp speed	• Left turns are used for traffic from Myrtle Creek and Tri-City to go north on I-5 • Long bridge required to span I-5 and new loop ramp
Diamond	• Conventional interchange layout • Minimum span for bridge • Right turns are used by traffic from Myrtle Creek and Tri-City to go north on I-5	• Left turns are used for traffic from west seeking to go north on I-5
Diamond with Two Northbound Ramps	• Right turns are used for traffic from Myrtle Creek and Tri-City makes to go north on I-5 • Right turns are used for traffic from west seeking to go north on I-5	• Long bridge required to span I-5 and new loop ramp • Signalization of the northbound ramp terminal may be delayed by several years due to the removal of many left turns from the intersection
Note: The advantage of right turns at ramp terminals applies only if the ramp terminals are unsignalized.		

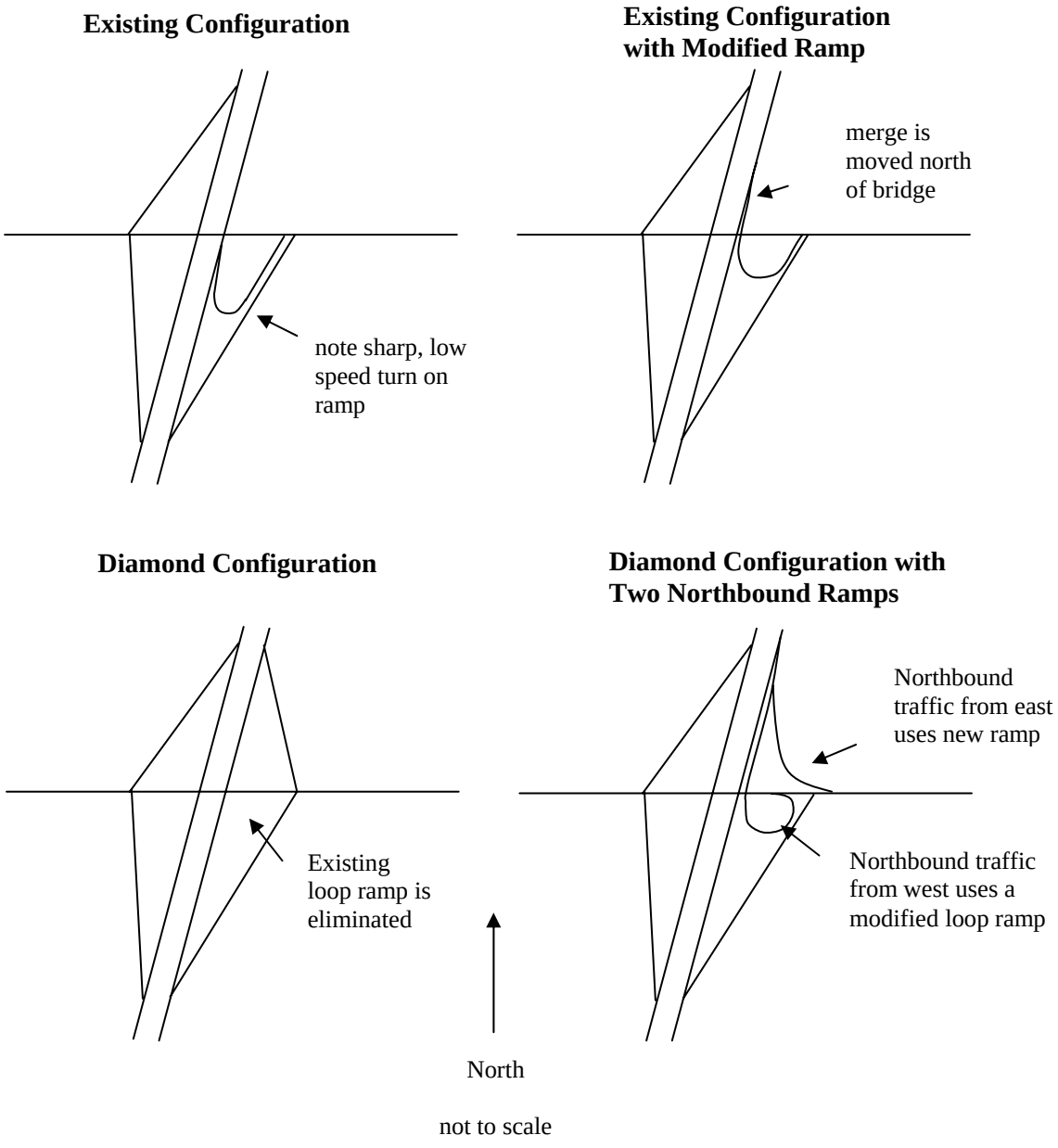
Conclusion

All of the potential configurations will satisfy travel demands in the future and all are expected to be far superior to the current situation because the new bridge will be designed with three lanes, allowing separation of left turns from through movements at the ramp terminals.

The traffic operations of the configurations are predicted to be similar. The selection of a preferred alternative can be made at the time of design for the replacement of the cracked bridge. The final decision on the preferred alternative may hinge on topographic

constraints, right-of-way constraints, or issues related to the construction sequence and phasing. From a traffic standpoint, there do not appear to be significant factors influencing the selection of the preferred alternative.

Figure 1. Schematic of Interchange Configuration Options for Interchange 103



Appendix C.

Existing Geometric Conditions of Interchanges 103, 106, & 108

EXISTING GEOMETRIC CONDITIONS OF INTERCHANGES 103, 106, & 108

PREPARED FOR: John Replinger/DEA

PREPARED BY: Rick Kuehn/CH2M HILL
Steve Katko/CH2M HILL HILL

DATE: March 1, 2005

Introduction

This memorandum summarizes the findings of a CH2M HILL analysis to identify existing geometric and roadside deficiencies at the following Interstate 5 interchanges: Milepost 103 (Riddle), Milepost 106 (Weaver Road), and Milepost 108 (Myrtle Creek). The analysis is based upon as-built drawings of the interchanges, the *I-5 State of the Interstate Report* (ODOT, 2000), and a report titled *Myrtle Creek Area Transportation Study* (Parametrix, Inc., 1995). The existing roadway geometries were compared with standards prescribed in ODOT's *2003 English Highway Design Manual* (HDM).

Interchange 103 (Riddle)

Mainline. The I-5 mainline through the Riddle interchange meets the standards for a 70 m.p.h. design speed. The 2004 ODOT Bridge Log reports that the overhead vertical clearance is 17′-6″ for northbound I-5 and 17′-10″ for southbound I-5. The required minimum clearance is 17′.

Crossroad. The *I-5 State of the Interstate Report* states that the crossroad, including the overcrossing structure, presently has 4′ shoulders and two 13′ travel lanes. The report recommends upgrading to 8′ shoulders and a 40′ roadway. The bridge over I-5 currently is restricted to 20,000 pounds for single axle, 34,000 pounds for tandem axle, and a maximum weight of 80,000 pounds.

Northbound Off-Ramp. The northbound off-ramp diverges from the mainline on a curve. As such, there is not a proper deceleration lane, exit angle, and no spiral transition to aid in smooth exit speed reductions. The need for a 400′ deceleration lane on the mainline prior to the exit curve should be studied. The right-hand shoulder is 2 feet less than the required 6′ width.

Northbound On-Ramp. This on-ramp is a tight loop configuration, with a degree of curvature of 76 degrees. Standard maximum loop curvature is a 36 degree curve. This tighter curvature imposes a design speed below the minimum 25 mph. The exact design speed cannot be determined since this curvature is sharper than what the ODOT Design manual allows. There is no spiral transition curve leading into the loop and spiral transition curve into the acceleration lane is only 100′, whereas the minimum to provide smooth

driving conditions is 200′. The acceleration lane length is approximately 80′ short of the required 1000′ and the taper length at the end of the acceleration lane is 50′ short of the required 300′. The right-hand shoulder is 2 feet less than the required 6′ width. Ramp terminal spacing along the crossroad is approximately 400′, less than the minimum standard of 600′. With the current ramp configuration, this is less of an issue since there are no eastbound left turning movements to get onto the northbound on-ramp. Therefore, there are no potential conflicts with westbound left turning movements for the southbound on-ramp. If the northbound on-ramp is relocated to create a diamond interchange, the ramp termini would need to be further separated.

Southbound Off-Ramp. The exit curve and spiral transition meet requirements for a 45 m.p.h. design speed. However, the deceleration lane is approximately 80′ short of their respective required lengths. The right-hand shoulder is 2 feet less than the required 6′ width.

There is a sight distance issue at the intersection of the off-ramp and Riddle Road. Vehicles approaching the intersection from the off-ramp have an obstructed view to the east, over the overcrossing. The overcrossing vertical curvature and the guardrail at the intersection limit the sight distance for vehicles entering the intersection from the off-ramp.

Southbound On-Ramp. The southbound on-ramp entrance curve and spiral transition meet requirements for a 55 m.p.h. design speed. However, the acceleration lane is approximately 270′ short of the required distance. The right-hand shoulder is 2 feet less than the required 6′ width.

Interchange Spacing. The spacing between the ramps of the Riddle Road interchange and the ramps of the next nearest interchange is greater than the two-mile minimum requirement. Incidents at one interchange are not likely to impact the operation of the other. Also, there is enough distance to accommodate weaving movements between vehicles entering I-5 and those trying to exit at the following interchange.

Access Management. The access management standard for spacing to the nearest driveway or street intersection from I-5 ramp intersections is 1,320 feet. To the west of the southbound ramps, there are several accesses and one intersection within 1,320 feet. East of the northbound ramps, there are two accesses within this distance.

Guardrail. The end terminals for all guardrails at this interchange are not to current standards.

Interchange 106 (Weaver Road)

Mainline. The mainline of I-5 through the interchange meets HDM geometric standards. The overcrossing structure meets the minimum 17′ clearance, as indicated by as-built drawings. However, the *I-5 State of the Interstate Report* indicates it is less than 17′. This is probably the result of overlays on I-5 since the original construction.

Crossroad. The *I-5 State of the Interstate Report* states that the crossroad, including the overcrossing structure, presently has 4′ shoulders and two 12′ travel lanes. The report recommends upgrading to 8′ shoulders and a 40′ roadway.

Northbound Off-Ramp. The design speed for this ramp is 70 m.p.h.; this is an adequate design speed. However, the deceleration lane length is 310', 30' feet short of the required 340'. The distance between the existing ramp terminals is 475' versus a desirable 555'. Thus, the traffic operations on these ramps have the potential to impact each other.

Northbound On-Ramp. This ramp is designed for approximately 63 m.p.h., which is consistent with the HDM. The acceleration lane is approximately 75' short. The taper length following the acceleration lane is also deficient, being 50' short of the required 300'.

Southbound Off-Ramp. The ramp is designed for 70 m.p.h., as assessed by reviewing the spiral curve data. However, the deceleration lane is 55' short of the standard 340'. The southbound off-ramp shares the same ramp terminal spread deficiency as the northbound off-ramp.

Southbound On-Ramp. The ramp is designed for 70 m.p.h., as assessed by reviewing the spiral curve data. However, the existing acceleration lane of 520' is 60' shy of the standard 580'. Also, the taper distance following the acceleration lane is 40 feet less than standard.

Interchange Spacing. The spacing between entering and exiting tapers between the Weaver Road and Myrtle Creek interchanges on both the north- and southbound directions are less than the standard two miles. Thus, traffic operations at the two interchanges have the potential to affect one another with respect to weaving movements.

As stated in the Interchange 103 discussion, the spacing between Interchange 106 and Interchange 103 meets accepted standards.

Access Management. The same access management standard of 1,320 feet to the nearest driveway or street intersection from the I-5 ramps also applies at this interchange. To the west of the southbound ramps, there are two accesses and one intersection that fall within this distance. East of the northbound ramps, one intersection falls within this distance.

Guardrail. The end terminals for all guardrail runs at the interchange do not meet current standards.

Interchange 108 (Myrtle Creek)

Mainline. The mainline through this interchange is made up of tight reversing curves. There is a 9 degree curve, with a superelevation of 11 percent, immediately south of the interchange. This exceeds the maximum allowable superelevation of 10 percent for freeways. Also, the 300'/360' spiral transitions leading into and out of the curve are below the 600' that would be required for this tight of a curve. The abrupt and sharp curvature of the mainline alignment through this interchange has lead to high accident rates. ODOT has installed special signage, including radar-activated devices, to warn drivers to slow down. The mainline median through the interchange is 8.4' width. The minimum required width of a median with barrier is 18'.

The vertical clearance underneath I-5 at the Myrtle Creek underpass should be field-verified. Measurements of as-built drawings result in a clearance of 16', one foot short of the required 17'.

Northbound Off-Ramp. The northbound off-ramp does not conform to standard exit ramp design. The ramp diverges from the mainline at the start of a sharp curve on the mainline. This leaves no exit angle to clearly delineate the off-ramp. The ramp also features reverse horizontal curvature and compound curvature; features that are not standard ramp design practice in Oregon. The right-hand shoulder is 2 feet less than the required 6' width.

The design speed of the ramp is limited to 30 m.p.h. by a short vertical curve located just beyond the gore point of the diverging ramp. This is less than the minimum design speed of 35 m.p.h. (HDM Table 9-3). This vertical curve is immediately followed by a 6.6% downgrade that exceeds the desirable downgrade of 6%.

The cross-section of the ramp does not include a 2' "shy" distance from the edge of the standard shoulder to the face of guardrail.

Northbound On-Ramp. The *I-5 State of the Interstate Report* indicates that there is no spiral curve transition on the ramp and that the ramp radius at the gore is not equal to the mainline curve radius. There is no data on the on-ramps given on the as-built drawings, however it appears that the ramp radius is greater than the mainline radius. This would lead to speeds on the merging on-ramp to be higher than speeds on the mainline. Also, the length of the acceleration lane is inadequate. These deficiencies make it more difficult for traffic to safely merge onto I-5. The right-hand shoulder is 2 feet less than the required 6' width.

The cross-section of the ramp does not presently include a 2' "shy" distance from the edge of the standard shoulder to the face of guardrail.

Southbound Off-Ramp. The *I-5 State of the Interstate Report* indicates that the ramp has deficiencies similar to the northbound on-ramp. The ramp's radius at the gore is not equal to the main line curve radius, there is no spiral curve transition on the ramp, and the deceleration lane length is inadequate. The right-hand shoulder is 2 feet less than the required 6' width.

The cross-section of the ramp does not presently include a 2' "shy" distance from the edge of the standard shoulder to the face of guardrail.

Southbound On-Ramp. This on-ramp begins as a frontage road that runs north, parallel to I-5. It crosses under I-5 and loops around to connect with southbound I-5. The loop portion of the ramp has a radius of 65 feet. This yields a degree of curvature significantly sharper than the standard of 36 degrees and a design speed less than the minimum 35 m.p.h.. The exact design speed cannot be determined since this curvature is sharper than what the ODOT Design manual allows.

The originally 1958 configuration for this on-ramp acceleration lane was approximately 325' in length, far short of the minimum requirement of 1,230 feet. In 1999-2001, ODOT widened the existing I-5 bridge to allow for a longer acceleration lane, however it remains below the required 1,230 foot length.

The ramp entrance angle is sub-standard, as the ramp converges with the mainline on a curve. These deficiencies make it more difficult for traffic to safely merge onto I-5. The right-hand shoulder is 2 feet less than the required 6' width.

The cross-section of the ramp does not presently include a 2' "shy" distance from the edge of the standard shoulder to the face of guardrail.

Interchange Spacing. The minimum required spacing from crossroad to crossroad in the vicinity of Myrtle Creek should be two miles. There is less than a two-mile separation between the Myrtle Creek interchange and the next interchange to the north. Also, there is a required spacing of two miles between the beginning and ending of exit and entrance ramp tapers. There is only approximately 1 mile distance between the Myrtle Creek interchange and the Weaver Road interchange.

Access Management. The access management standard for spacing to the nearest driveway or street intersection from I-5 ramp intersections is 1,320 feet. To the east of I-5 along Hwy 99, there are potentially two accesses within this distance.

Guardrail. The end terminals for all guardrail runs at the interchange do not meet current standards.

Appendix D.

Existing Transportation Analysis

Interchanges 103, 106, and 108
Conditions Report

DRAFT Existing Transportation Analysis

Prepared for

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Prepared by

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September 27, 2004

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1 INTRODUCTION

The Interchanges 103, 106, and 108 Conditions Report is intended to be the first step in planning for long-range improvements to these Interstate 5 interchanges in the Myrtle Creek area of Douglas County, south of Roseburg. The conditions report will help gain a better understanding of the current conditions, limitations, opportunities and needs 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 diverge analyses were performed for current traffic volumes on the existing road network. Those results are presented in this report.

Interchanges 103, 106, and 108 on I-5 provide connections to Myrtle Creek and the Tri-City area. The Riddle Bypass Road connects with I-5 at Interchange 103. Old Highway 99 parallels I-5 between Interchanges 103 and 108 and serves as an arterial for local traffic between Riddle, Tri-City, and downtown Myrtle Creek.

There are eight intersections of interest surrounding these three interchanges. Four of those intersections are on the Riddle Bypass Road between Interchange 103 and Old Highway 99. Three additional intersections are located on Weaver Road at Interchange 106. The final intersection is the junction of the SB ramps and NB off-ramp at Interchange 108. All intersections are currently unsignalized.

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

2 TRAFFIC COUNTS

Traffic Smithy conducted 48-hour tube counts, manual 14-hour classification counts, and intersection peak hour counts. The following tables shows the location and date for each of the counts.

Table 1. Location and Date for 48-hour Tube Counts

Location	Date
Riddle Bypass west of truck stop	Tues. 8/17/2004 – Thurs. 8/19/2004
Riddle Bypass west of Interchange 103	Tues. 8/17/2004 – Thurs. 8/19/2004
Riddle Bypass west of Old Hwy. 99	Tues. 8/17/2004 – Thurs. 8/19/2004
Old Hwy. 99 north of Riddle Bypass – Gael Lane	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 106 NB off-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 106 NB on-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 106 SB off-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 106 SB on-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 108 NB off-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 108 NB on-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 108 SB off-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
Interchange 108 SB on-ramp	Tues. 8/17/2004 – Thurs. 8/19/2004
South Umpqua River Bridge (includes classification)	Tues. 8/17/2004 – Thurs. 8/19/2004

Table 2. Location and Date for 14-hour Classification Counts

Location	Date
Interchange 103 Southbound Ramp Terminal	Wed. 8/18/2004
Interchange 103 Northbound Ramp Terminal	Wed. 8/18/2004
I-5 Northbound (between 106 and 108)	Wed. 8/18/2004
I-5 Southbound (between 106 and 108)	Wed. 8/18/2004

Table 3. Location and Date for Peak Hour Classification Counts

Location	Date
Old Hwy. 99 / Corwin	Tue. 8/17/2004
Old Hwy. 99 / Gael Lane	Tue. 8/17/2004

The counts were examined to determine the peak hour volume, peak hour factor, and percent of heavy vehicles at each intersection. The system peak hour for the study area was found to occur between 4:00 and 5:00 PM. Existing peak hour volumes are illustrated in **Figure 2**.

Individual peak hours were calculated for the intersections. A peak hour of 0.93 was calculated for the freeway mainline. This value was used in both the merge and diverge analyses of the ramps.

Heavy vehicle percentages were determined for each intersection from the counts provided. The count data includes truck classifications by light, medium, and heavy. The medium category includes any vehicles with 3 axles, and heavy is defined by anything with more than 3 axles. The medium and heavy trucks were combined together for the percent heavy vehicles. The following table summarizes the percent of heavy vehicles at select locations:

Table 4. Percent of Heavy Vehicles

Location	% Heavy Vehicles
I-5 Mainline – NB	21%
I-5 Mainline – SB	20%
103 NB off-ramp	8%
103 NB on-ramp	13%
103 SB off-ramp	9%
103 SB on-ramp	10%
South Umpqua River Bridge – EB	6%
South Umpqua River Bridge – WB	6%

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 103, 106, and 108.

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 the non-interstate facilities within the study area, the nearest ATRs with similar characteristics were determined to be:

- 22-010 (ORE 226, Albany-Lyons Highway, 2.5 miles west of Crabtree)
- 15-011 (ORE 238, Jacksonville Highway, 0.5 mile west of Ruch)

These locations were suggested by ODOT Planning staff.

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

	May	August	September	October
Non-interstate Seasonal Factor	1.09	1.00	1.07	1.10

A separate seasonal factor was calculated for the freeway mainline and ramps. ATR 17-001, located 5.7 miles north of Grants Pass on I-5, was used to determine an appropriate seasonal factor. The following summarizes those values:

	May	August	September	October
Interstate Seasonal Factor	1.23	1.00	1.15	1.27

Traffic volumes were then multiplied by their appropriate seasonal factor to determine the 30th Hour Volumes. Since the 2004 counts were all taken during mid-August, the factor was 1.00. 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. All of the intersections in the study area are stop-controlled. 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 reports summarizes the calculations, density, and LOS.

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 Interstate 5 must operate with a v/c ratio at or below 0.70. The Douglas County Transportation System Plan establishes standards for roads not under the state's jurisdiction. An LOS D is required for all signalized and unsignalized intersections.

[1] *Highway Capacity Manual, Transportation Research Board, Washington DC, 2000.*
[2] *1999 Oregon Highway Plan, Oregon Department of Transportation, Salem, OR, 1999.*

6 INTERSECTION RESULTS

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

INTERCHANGE 103

Riddle Bypass Road / I-5 SB Ramps

Riddle Bypass Road at the SB on/off-ramps for interchange 103 is a two-way stop-controlled intersection. Table 5 shows the 2004 30th Hour Volume analysis results:

Table 5. 2004 Analysis of Riddle Bypass / 103 SB Ramps

Approach	Movements	V/C Ratio	95th Queue Length (feet)	LOS
Southbound	Left, Thru,Right	0.57	87	C
Eastbound	Thru,Right	0.3	0	A
Westbound	Left	0.11	9	A
	Thru	0.14	0	A

Riddle Bypass Road / I-5 NB Ramps

Riddle Bypass Road at the NB on/off-ramps for interchange 103 is a two-way stop-controlled intersection. Table 6 shows the 2004 30th Hour Volume analysis results:

Table 6. 2004 Analysis of Riddle Bypass / 103 NB Ramps

Approach	Movements	V/C Ratio	95th Queue Length (feet)	LOS
Northbound	Left,Right	0.42	51	C
Eastbound	Thru,Right	0.30	0	A
Westbound	Thru,Left	0.04	3	A

Riddle Bypass Road / Corwin Street

This T-intersection has stop control for Corwin Street. The EB and WB movements on Riddle Bypass Road operate freely. The southern leg of the intersection is a driveway to the bowling alley. It was excluded from the analysis. Table 7 shows the 2004 30th Hour Volume analysis results:

Table 7. 2004 Analysis of Riddle Bypass / Corwin Street

Approach	Movements	V/C Ratio	95th Queue Length (feet)	LOS
Southbound	Left,Right	0.03	2	B
Eastbound	Thru,Left	0.01	1	A
Westbound	Thru,Right	0.17	0	A

Riddle Bypass-Gael Lane / Old Highway 99

This four-legged intersection operates with stop control in the SB, WB, and NB directions. The heaviest movements are the SB right turn and the EB left turn. The EB approach operates freely. The SB approach permits right turns without stopping. Table 8 shows the 2004 30th Hour Volume analysis results:

Table 8. 2004 Analysis of Riddle Bypass-Gael Lane / Old Hwy 99

Approach*	Movements	V/C Ratio	95th Queue Length (feet)	LOS
Northbound + Westbound	Left,Thru,Right	0.17	15	C
Southbound	Left,Thru,Right	0.03	2	A
Eastbound	Left,Thru,Right	0.00	0	A

* For this analysis, the NB and WB approaches have been combined. The SB approach was coded as the WB approach in order to accurately model allowable movements.

INTERCHANGE 106

The intersections of Weaver Road / I-5 SB Ramps, Weaver Road / I-5 NB Ramps, and Weaver Road / Aviation Drive were not analyzed due to their low volumes. As the ramps carry only 10 vehicles per hour, the intersections are assumed to operate at LOS A. The interchange only serves as a connection to the airport east of the freeway, and to Weaver Road on the west side.

INTERCHANGE 108

SB Ramps / I-5 NB Off-Ramp

This T-intersection is on the west side of the Umpqua River Bridge. The EB leg carries from the SB Off-ramp towards downtown. The WB leg carries traffic from downtown to either the NB or SB on-ramps. These movements operate freely. The NB Off-ramp has a stop sign at the intersection. Table 9 shows the 2004 30th Hour Volume analysis results:

Table 9. 2004 Analysis of 108 SB Ramps / 108 NB Off-Ramp

Approach	Movements	V/C Ratio	95th Queue Length (feet)	LOS
Northbound	Left,Right	0.16	14	B
Eastbound	Thru	0.22	0	A
Westbound	Thru	0.18	0	A

7 MERGE ANALYSIS

The traffic count on I-5 was taken between Interchanges 106 and 108. To obtain the volumes on the freeway between Interchanges 103 and 106, the known ramp volumes were added and subtracted from the mainline count.

Table 10 shows the ramp volumes used in the weave/merge analysis on each of the ramps.

Table 10. 30th Hour Ramp Volumes

Interchange	Ramp	Volume
103	Northbound Off	170
	Southbound Off	230
	Northbound On	210
	Southbound On	150
106	Northbound Off	10
	Southbound Off	10
	Northbound On	10
	Southbound On	10
108	Northbound Off	95
	Southbound Off	330
	Northbound On	195
	Southbound On	75

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

The classification counts do not distinguish between trucks and recreational vehicles. It was therefore assumed, for the mainline, 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 Inventory Reports. The ramp grades were estimated.

Table 11 summarizes the data that was used in the analysis:

Table 11. Ramp Analysis Data

Interchange	Ramp/Freeway	Accel / Decel (miles)	PHF	Truck %	RV %	Speed (mph)	Terrain
103	NB Mainline	-	0.93	19%	2%	65	Level
	Northbound Off	0.04	0.93	8%	0%	45	Grade +4%
	Northbound On	0.12	0.93	13%	2%	25	Grade –3%
	SB Mainline	-	0.93	18%	0%	65	Level
	Southbound Off	0.05	0.93	9%	0%	35	Grade +4%
	Southbound On	0.16	0.93	10%	0%	35	Grade -4%
106	NB Mainline	-	0.93	19%	2%	65	Level
	Northbound Off	0.05	0.93	2%	0%	45	Grade +4%
	Northbound On	0.09	0.93	2%	0%	35	Grade -4%
	SB Mainline	-	0.93	18%	2%	65	Level
	Southbound Off	0.06	0.93	2%	0%	45	Grade +4%
	Southbound On	0.25	0.93	2%	0%	35	Grade -4%
108	NB Mainline	-	0.93	19%	2%	55	Grade 2%
	Northbound Off	0.04	0.93	6%	0%	45	Grade -3%
	Northbound On	0.25	0.93	6%	0%	35	Grade +4%
	SB Mainline	-	0.93	18%	2%	55	Grade 2%
	Southbound Off	0.06	0.93	6%	0%	25	Grade -4%
	Southbound On	0.20	0.93	6%	0%	25	Grade +4%

The table below shows the density, LOS, and v/c ratios for each of the ramps:

Table 12. Ramp Analysis Results

Interchange	Ramp	Density (pc/mi/ln)	LOS	V/C Ratio
103	Northbound Off	12.4	B	0.31
	Northbound On	10.8	B	0.26
	Southbound Off	13.6	B	0.36
	Southbound On	10.0	A	0.29
106	Northbound Off	12.3	B	0.28
	Northbound On	11.9	B	0.26
	Southbound Off	13.1	B	0.31
	Southbound On	7.8	A	0.30
108	Northbound Off	12.8	B	0.30
	Northbound On	7.4	A	0.29
	Southbound Off	15.7	B	0.46
	Southbound On	9.4	A	0.30

V/C ratios were calculated using HCM methodology. The standard set in the OHP for merge and diverge areas is 0.70, that of the highway. 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 CONCLUSIONS

All of the analyzed intersections are shown to operate at an acceptable LOS and within the v/c parameters established by the agency with jurisdiction for the facility. The lowest LOS of C was observed at the Interchange 103 ramp terminals.

The merge and diverge analysis conducted on the freeway ramps shows that the ramps are currently operating at an acceptable level of service.

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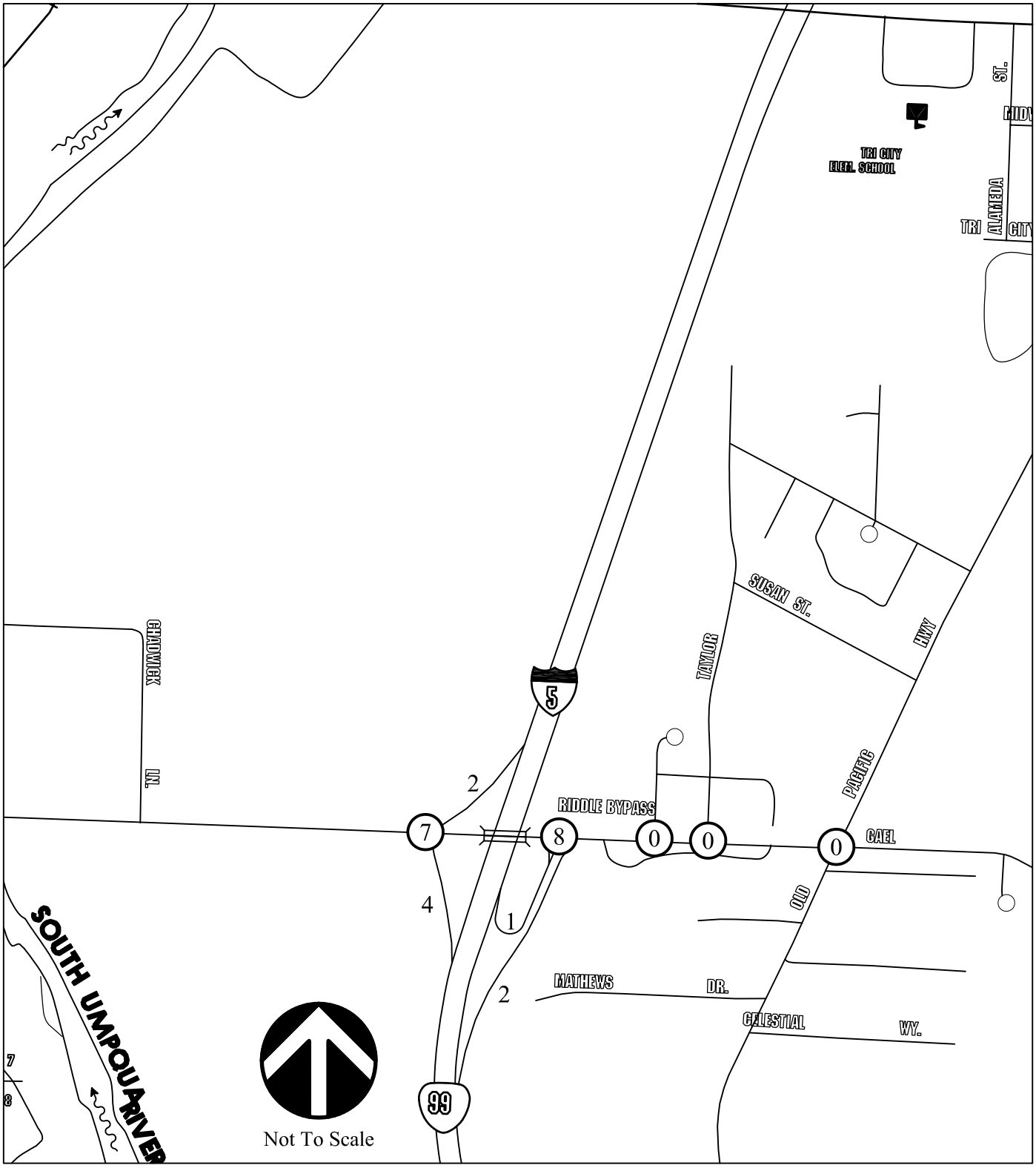
Appendix E.

Safety Analysis Memorandum



DAVID EVANS AND ASSOCIATES INC.

LEGEND

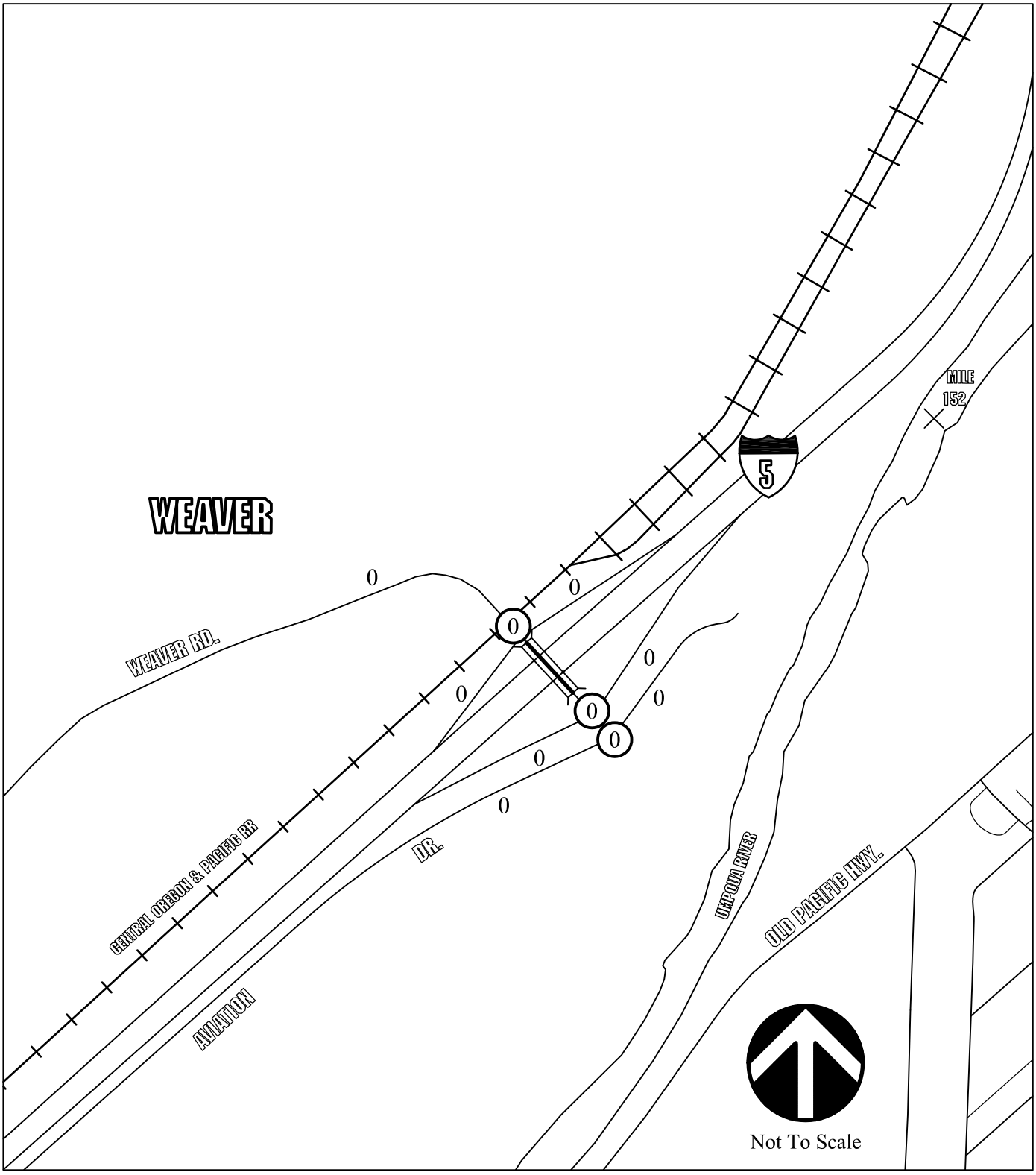
X = Number of Ramp Crashes

(X) = Number of Intersection Crashes

Figure 1A

Crash Summary
(Years 2001-2003)

Interchange 103



DAVID EVANS AND ASSOCIATES INC.

LEGEND

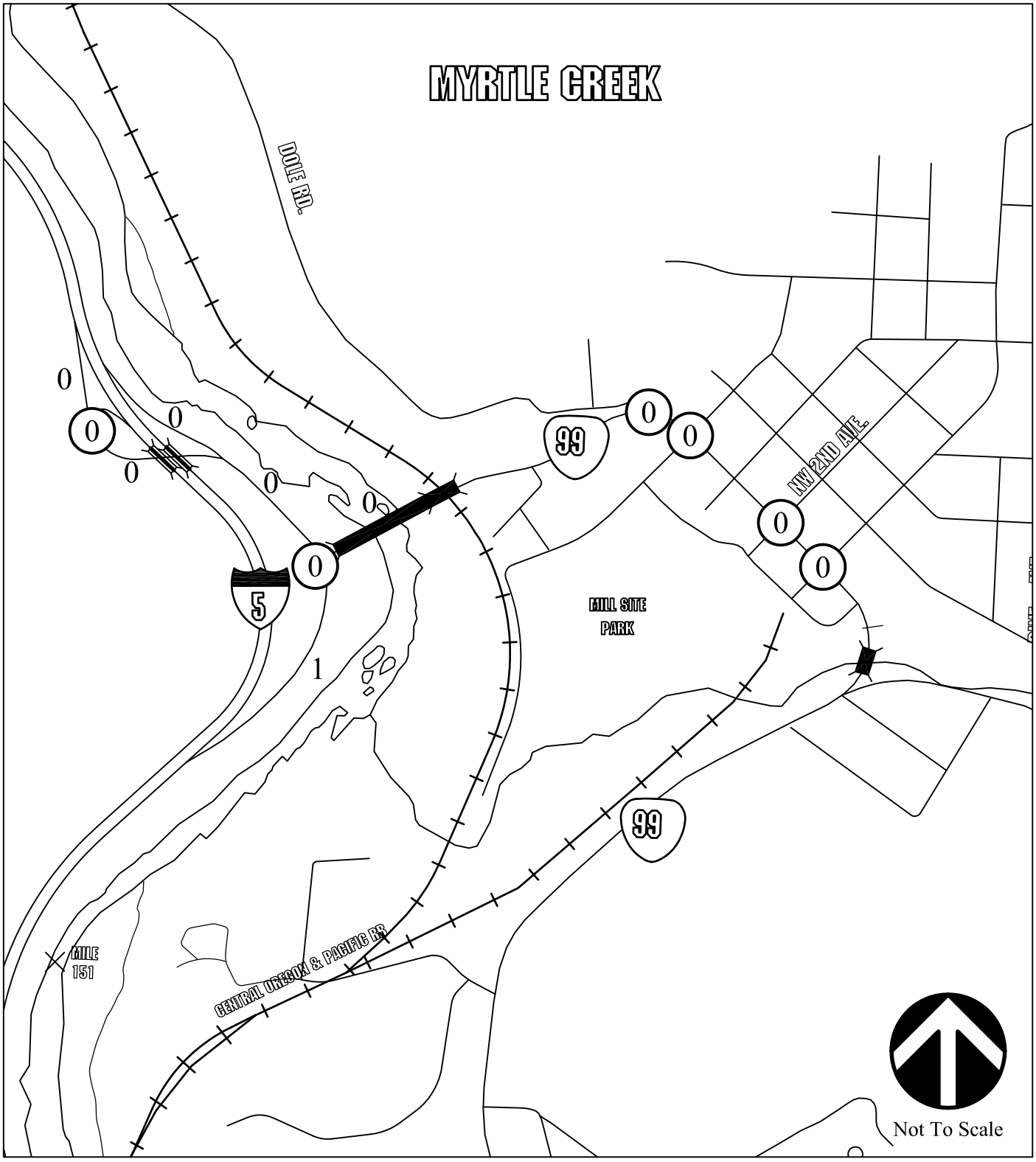
X = Number of Ramp Crashes

(X) = Number of Intersection Crashes

Figure 1B

Crash Summary
(Years 2001-2003)

Interchange 106



DAVID EVANS AND ASSOCIATES INC.

LEGEND

X = Number of Ramp Crashes

(X) = Number of Intersection Crashes

Figure 1C

Crash Summary
(Years 2001-2003)

Interchange 108

Appendix F.

Existing Land Use Analysis

ANGELO EATON
& Associates

I-5 INTERCHANGES 103, 106, 108 MANAGEMENT PLAN
EXISTING LAND USE ANALYSIS

TECHNICAL MEMORANDUM
October 11, 2004 Draft

Prepared for:
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I. Introduction

The goals of the interchange area management plans (IAMPs) are to evaluate existing and future conditions of I-5 Interchanges 103, 106 and 108, to identify necessary improvements and modifications to provide safe and efficient operations, and to protect the transportation function of the interchanges. This memorandum provides an overview of the existing land uses, vacant/developable land, property ownership, and land use regulations in areas around the I-5 103, 106, 108 Interchanges. The information included also describes expected future growth and development patterns around these interchanges that will influence the transportation system. ***The information in this memorandum is intended to satisfy, in part, Task 4.2, Review Existing Land Use Analysis, in the Interchanges 103, 106, 108 Area Management Plan Work Order Contract.***

The land use study area for each interchange defines the general area where the interchange improvements could potentially influence land use patterns or have land use impacts. A previous memorandum entitled "Review of Transportation and Land Use Plans and Policies" summarized planned land uses and zoning designations within the boundaries of the three study areas. Figures 1 through 6 show the general land use designations for each of the three interchanges. The following information will include an overview of the zoning designations; transportation projects in the vicinity of the interchanges that may affect land development and; an examination of existing land uses, conditions, and general information regarding ownership within the study areas for the three interchanges.

II. Existing Zoning

<u>Interchange 108</u>

Land to the east of I-5 at Interchange 108 is within the City of Myrtle Creek's City Limits (See Figure 1.) The western half of Interchange 108 is outside the Urban Growth Boundary (UGB). Areas within the Interchange 108 study area, outside of the UGB, are zoned Farm Forest. Uses in this zone are limited to farm and forest use, associated buildings, and limited home occupations. The minimum lot size is 80 acres.

Myrtle Creek land use zones within the study area east of the interchange include: Special District-Community Services (Mill Site Park), Low Density Residential (R-1), and Residential Hillside (R-H). The R-1 designation allows single-family, detached dwellings with a minimum 6,000 square-foot lot size. The maximum density is five (5) units per gross acre. Properties classified as Residential Hillside contain steep slope which may constrain development. The objective of the zone is to provide development standards intended to minimize impacts in hazardous areas, and encourage clustered development and a variety of housing types to better utilize lands with topographic constraints. Required minimum lot size is 10,000 square feet, or 6,000 where slopes are less than 12% and natural constraints total less than 6% of the site area. The gross density for this zone is four (4) units per acre.

The eastern boundary of the study area captures a section of commercially zoned parcels south of Main Street. Parcels in this area are zoned C-2, Neighborhood Business District, or C-1, Central Business District. The two commercial zones share many allowed and conditional uses, including automobile supply and parts stores, bakeries, convenience stores, and laundromat/dry cleaning establishments. Some differences include book, furniture, garden supply, and department stores, which are allowed outright in C-1, but not C-2. Hotels and Bed and Breakfast establishments are allowed outright in C-2, but not in C-1. The height limit in both zones is 50 feet and the yard setbacks are the same, except that zero-lot line setbacks are allowed in the Central Business District.

Interchange 106

Interchange 106 is wholly outside of the Myrtle Creek/Tri City UGB, with access from Weaver Road to the north and a frontage road, Aviation Drive, to the south. (See Figure 2.) Interchange 106 is within Douglas County, and land in the vicinity of the interchange is zoned Exclusive Farm Use – Cropland (FC). Development is limited, by the FC zone which only allows agricultural use and other uses which are compatible with agricultural activities. Permitted uses are farm uses, their associated buildings and accessory uses, and the propagation or harvesting of a forest product. Property development standards for land in the vicinity of Interchange 106, which is classified "FC-1," requires that created parcels be a minimum of 20 acres. This area is entirely within the floodplain.

In addition, Douglas County has an airport impact overlay that restricts development on property near the Myrtle Creek Municipal Airport. The regulation (Section 3.334.800 of the Douglas County Zoning Code) calls for restrictions in the airport approach area and the airport clear area. These areas include land within 2,500 feet from the terminus of the runway and within 1,250 feet from the runway termini. Uses and activities permitted by the underlying zoning districts are further restricted within these areas. No place of public assembly nor multi-family dwellings are permitted in the Airport Approach Area. In addition, no structure or object exceeding 35 feet in height, no signs that blink or otherwise distract pilots, and no uses attracting unusual quantities of birds are allowed.

East of I-5, property on Highway 99 is zoned Tourist Commercial (CT), Community Commercial (C-2), and Multiple Family Residential (R-2). The C-2 designation permits more uses than the CT designation, including community service-oriented uses such as clinics, banks and office supply stores. Neither commercial designation has a minimum or maximum lot size requirement, but "full coverage" of the lot is permissible for buildings in C-2, whereas only 75% building coverage is allowed in CT zones. Minimum lot sizes allowed in the R-2 zone are 6,500 square feet for single-family dwellings and 10,000 square feet for multiple-family dwellings (minimum property area per dwelling unit is 2,000 square feet). There are parcels along Highway 99 with existing single family dwellings that could be redeveloped to higher intensity residential uses.

Parcels along Wecks Road are zoned Suburban Residential (RS). The RS designation permits single-family residences and duplexes. This street is predominantly built out with single family residences. Most existing lots are significantly smaller than the minimum area required by the County's ordinance (15,000 square feet when served by community water or sanitary sewer systems).

Interchange 103

Interchange 103 primarily serves the Tri City area and is within the UGB. (See Figure 3.) Old Pacific Highway 99 ("Highway 99") crosses over I-5 at this interchange, providing access to urban areas to the east, and agricultural, industrial, and commercial areas to the west.

Parcels on both sides (north and south) of Highway 99 at Interchange 103 are within the Myrtle Creek-Tri City Urban Growth Area and the UGB. Most of the land on the west, north of Highway 99, is part of a County owned Industrial Park and is zoned Heavy Industrial (M-3). According to the Urban Growth Management Agreement (UGMA) between the City of Myrtle Creek and Douglas County, manufacturing uses listed in the Douglas County Land Use and Development Ordinance (LUDO) shall be permitted outright the South Umpqua/Riddle Interchange Industrial Park. Any other industrial uses shall be subject to the provisions of the LUDO Article 3.35.300, Architecturally Controlled Districts. Commercial uses are not allowed unless accessory to permitted Industrial uses. The Industrial Park shall not be used to accommodate extensive primary processing of resources related materials.

Parcels closest to the interchange are zoned tourist commercial (CT), as are some parcels east of the interchange, along Highway 99. The IAMP study area boundary for this interchange extends south of the UGB, west of I-5, to include a small area zoned F1 (Exclusive Farm Use – Cropland, 20 acres minimum lot size). Douglas County zoning in the study area east of the interchange is predominantly Single-Family Residential (R-1, 6,500 square foot minimum lot area), with the only exception being the area around the Old Pacific Highway 99 intersection, where there is some CT and C3 (General Commercial) zoning.

The Cow Creek Band of the Umpqua Tribe has recently purchased two large parcels south of Pruner Road and west of the interchange, totaling 35 acres. The property has a "Exclusive Farm Use-Cropland (F1)" zone designation, which allows agricultural use. It is expected that this parcel will ultimately be placed in the Tribal Trust at which time land uses will be determined by the Tribe.

III. Proposed Transportation Improvements

Interchange 108

While not adopted by the City, the Myrtle Creek Area Transportation study (1995 "MCATS") identifies improvement options for Interchange 108 that include straightening out the "Myrtle Creek Curves" and reconfiguring the northbound and southbound on-ramps. Due to the limited

amount of development in the area, and the limited opportunities for future development due to topography, the assumption is that similar proposed intersection design alternatives will have little impact on development in the study area for Interchange 108.

Interchange 106

Transportation policies adopted by both Myrtle Creek and Douglas County support a proposed arterial connection between Old Pacific Highway 99 and I-5 at the Weaver Road interchange (Interchange 106). This proposed connection would intersect Old Pacific Highway 99 in the vicinity of the intersection of Wecks Road. The Myrtle Creek Area Transportation Study offers three alternative alignment options for a new bridge: intersecting Highway 99 at Wecks road, creating a four-leg intersection; creating a "T" intersection south of Wecks Road; or creating a "T" intersection north of Wecks Road.

Interchange 103

The Myrtle Creek Area Transportation Study also identifies improvements to the Riddle Interchange (Interchange 103) to increase the vertical clearance of the overpass, increase capacity and improve operational efficiency and safety at the ramp intersections. Improvements such as widening the overpass and adding additional turn lanes would seem to have limited direct impact on properties in the vicinity of the interchange.

IV. Existing and Future Land Use

Interchange 108

There is very little development in the immediate vicinity of Interchange 108, due to the natural topography. Steep slopes and the restrictive Farm/Forest zoning preclude development to the west of the interchange. Directly to the east, within the City limits of Myrtle Creek, there are some existing residences that overlook the South Umpqua River and North Main Street. There are some development opportunities to the northeast of these homes, in areas zoned Residential Hillside. There may be some redevelopment opportunities in areas zoned R-1 to slightly higher densities, but most of the area south of North Main is already developed with single-family homes. Commercially-zoned parcels in the study area are also predominantly developed, with little opportunity for redevelopment at a higher intensity than what currently exists.

Interchange 106

Uses surrounding the interchange are consistent with the Exclusive Farm Use designation. Rural residences and associated grazing activity (horses, goats) and farming occupy land south of Weaver Road. North of Weaver the steep slope is not conducive to farming or grazing, but there are some existing residences. Land off of Aviation Drive southeast of the interchange is parcelized in lots ranging from 2.8 to 12.3 acres and is in active farm use. The majority of this property is owned by the US Trust for the Cow Creek Band of the Umpqua Indian Tribe and is not subject to local zoning controls. The tribe owns over 32 acres of land along Aviation Drive with 20 acres comprised of four contiguous lots (29-5W-32A lots 1700 and 1800, and 29-5W-32D lots 100 and 200).

Parts of the study area south of the South Umpqua River and along Highway 99 are developed with commercial and residential uses. The proposed arterial connection between Old Pacific Highway 99 and I-5 at the Weaver Road interchange could potentially affect properties in this area. Within the study area along Highway 99, there are large lot residences, a church, manufactured and mobile homes, and some businesses. There is a small "strip mall" and a restaurant northwest of Highway 99, just south of the Wecks Road intersection. Wecks Road is fully developed with single family residences, both "stick built" and manufactured, on predominantly small lots. The southwest corner of the intersection of Wecks and Highway 99 has a vacant lot and a convenience store; the northeast corner is vacant. The three lots directly north of the intersection are vacant and total just over four acres.

Existing structures northwest of Highway 99 would likely be affected by any of the alignment options proposed for the new bridge (arterial connection to Interchange 16); right-of-way for a proposed four-way intersection at Wecks Road may impact property southeast of the highway.

Interchange 103

Commercial property in the southwest quadrant of Interchange 103 is developed with traveler-oriented services, including a fast food/drive-through restaurant and a truck stop (gas, drive-through restaurant, and convenience store). Property south of these commercial properties is outside of the UGB and is in active farm use.

The Douglas County-owned South Umpqua Industrial Park is north of Highway 99. This area is largely undeveloped and, according to the South Umpqua Development Partnership website (http://www.umpquaedp.org), 60 acres remain available for future development. A sign in the vicinity of the interchange indicates that Roseburg Trailer Works, a horse trailer manufacturer, will soon be located in the area and a WinCo Distribution Center is visible from I-5 and takes access from Highway 99.

Uses east of the highway, within the study area, include a restaurant, a bowling alley, a church, manufactured homes and other residences, and a grocery store. A heavy-industrial use (Tri City Retread Company) occupies the site to the east, across Highway 99. Although much of the study area property is already developed, there is some infill development potential east of the interchange. Notably, there are four sizeable vacant commercial properties that take access from Highway 99: tax lot 30-05-07DB 2400 directly northeast of the interchange (5.45 acres), tax lots 30-05-7DC 200 (2.51 acres) and 201 (.59 acres) on the southwest corner of the intersection of the Riddle Bypass Road and Old Highway 99, and tax lot 30-05-07DB 4000 (7.84 acres) northwest of the intersection of the Riddle Bypass Road and Old Highway 99. Tax lot 4000 has split zoning, with the area closest to the highway zoned commercial and the remaining portion zoned for low-density residential.

The most apparent residential development activity was northwest of the Highway 99 intersection where there are new manufactured homes and some (potentially 3) vacant lots for sale off of Corwin Street. The area directly north of this is vacant and zoned for low-density residential (the residential portion of the 7.84 acre lot).

The portion of the IAMP study area east of the interchange and south of Highway 99 is predominantly residential, with existing manufactured and "stick built" homes. There is a vacant lot advertising 18 spaces available for mobile homes. There is limited potential for infill development, where lots are large enough to be partitioned. In addition to sites already discussed, a recent site visit identified only one large homestead (at the southwest corner of Susan Street and Old Pacific Highway) that was large enough to be subdivided.

Natural and Historic Resources

Findings and policies pertaining to natural resources in the Tri City Urban Unincorporated Area can be found in the Douglas County Comprehensive Plan (Revised December 17, 2003). The most prominent natural features in the Tri City area is the South Umpqua River and a ridge line (2,100 feet) that forms the eastern boundary of the Urban Unincorporated Area. Storm water runoff creates "V" shaped creeks that eventually sheet over flat land near Old Pacific Highway 99 (p. 15-103). Historically most storm drainage has been handled by a combination of roadside ditches, driveway and road culverts, swales and creeks. New development is subject to storm drainage improvements required by the County's Land Use and Development Ordinance. The Tri City Sewer, Water and Storm Drainage Study (1990) provides a detailed review and analysis of public facilities in the unincorporated Tri City area and proposes a range of options for meeting the area's future facility needs.

Section 3.32.200, Riparian Vegetation Corridor Overlay (RVCO), of the Douglas County Land Use and Development Ordinance regulates development along all perennial and intermittent watercourses in Douglas County. The requirement for building setback is fifty (50) feet from the bank-line. Douglas County utilizes the Oregon Department of Fish and Wildlife Riparian Corridor Map to identify where the RVCO applies. The study area is not subject to the Peripheral Big Game Habitat Overlay or the Special Bird Habitat provisions of the Douglas County Land Use and Development Ordinance.

Per Chapter 6 of the Douglas County Comprehensive Plan, Natural Features Element, there are no listed significant wetlands in the vicinity of the three interchanges. There are wetlands identified on the U.S. Fish and Wildlife Service National Wetlands Inventory map. (These are shown on the baseline report maps included in the appendix of the IAMP.) The County has not adopted the National Wetland Inventory.

There are no mapped National Historic Register sites or Douglas County historical sites in the study area. The Cultural and Historic Resource Inventory for Douglas County was updated in 2002. There is one property listed on the Myrtle Creek Historic Register that is within the IAMP study area for Interchange 108. This property is north of Dole Road and is listed because there are signs of the Applegate Trail in this area. Improvements to this property are subject to review by the Myrtle Creek Historic Resource Review Committee prior to City approval.

V. Summary

The information in this memorandum is part of the evaluation of existing and future conditions in the vicinity of I-5 Interchanges 103, 106 and 108. Existing land uses, and the regulations that apply to the land, provide an indication of the intensity of development and the potential for development and redevelopment. Knowledge of land uses also informs decisions related to access and local circulation. Some general conclusions from this examination of land uses around the interchanges include:

- Development in the immediate vicinity of Interchange 108 is limited due to topography. Some hillside residential development is possible.

- Development in the vicinity of Interchange 106 is limited due to the Farm/Forest designation. Existing development south of the river, on Old Pacific Highway 99, may be affected by a new Weaver Road bridge connecting the interchange with Highway 99.
- There are industrial development opportunities in the South Umpqua Industrial Park and vacant land available for commercial development at Interchange 103. There is one 7.84 acre property zoned commercial and residential that is vacant (Highway 99 intersection) and two vacant commercial properties (3.08 acres, southwest corner of the Highway 99 intersection).

Information regarding existing and potential land uses will be used to identify necessary improvements and modifications to provide safe and efficient operations, and to protect the transportation function of the interchanges.

Appendix G.

Existing Soils, Agriculture, and Natural Resources Narrative

DAVID EVANS
AND ASSOCIATES INC.

I-5 INTERCHANGES 103, 106, AND 108
INTERCHANGE AREA MANAGEMENT PLAN

EXISTING SOILS, AGRICULTURE, AND NATURAL RESOURCES, NARRATIVE

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February 14, 2005

DAVID EVANS AND ASSOCIATES INC.

INTRODUCTION

This Technical Memorandum No. 2 documents the existing natural and historic resources for inclusion in the I-5 Interchanges 103, 106, and 108 Management Plan. 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 for potential archeology sites.

GOAL 5 RESOURCES

All 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 Oregon Department of Fish and Wildlife 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 interstate improvements. Interchanges 103, 106, and 108 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 DEQ list of water quality limited streams.

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 for the three interchanges. Applicable map panels are shown in **Table 1**. Floodplains for the South Umpqua River are located adjacent to much of I-5 and near the interchanges. The 100-year floodplain is generally located to the west of interchange 103. Farther north where the interstate crosses the river, the 100-year floodplain spreads to both sides of I-5 at interchange 106 before it stays to the east near interchange 108. Interchange 106 may be the most constrained of the three interchanges because the floodplain is located on both sides of the interstate and even includes portions of the interchange itself. Further analysis would further determine the level of constraint for the interchanges.

Table 1. Floodplain Map Panel Numbers

Interchange	FEMA Floodplain map panel number
103	4100591140A
106	4100591135A
108	4100591135A

Interchange 103

Interchange 103 is located relatively close to the South Umpqua River and its floodplain, requiring any future development to address floodplain protection needs in permitting and designing the repair or replacement of the interchange. Site visits did not find any obvious evidence of flooding at the interchange site. The South Umpqua River's floodplain has 30- to 60-degree slopes with a stable broad channel that is constrained by terraces. The piers/abutments of the interchange are located outside of the main channel of the river; they also appear to be located outside of (but near) the floodplain.

Interchange 106

As with interchange 103, interchange 106 is located near the South Umpqua River and appears to be within the 100-year floodplain. Future improvements to the interchange would need to consider floodplain protection needs at this site. Several permits could apply to improvements at this interchange including local floodplain permits and requirements for balancing cut and fill. Regulations that protect floodplain habitats such as wetlands, open water, and riparian areas may also affect this site.

Site surveys would need to be conducted at this bridge to better ascertain any floodplain constraints.

Interchange 108

Interchange 108 is located relatively close to the South Umpqua River and its floodplain and future improvements to the interchange will need to consider floodplain protection needs. As is the case for interchange 103, site surveys did not identify any obvious evidence of flooding at the interchange. The South Umpqua River's floodplain has 30- to 60-degree slopes, with a stable broad channel that is constrained by terraces. The piers/abutments of interchange 108 are currently located outside of the channel of the river, but may be within its associated floodplain.

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. The Fish and Wildlife Service of the Oregon Fish and Wildlife Office was contacted and asked to provide a list of threatened or endangered species which may occur in the project study area, which are shown in **Table 2**. Threatened species, including the bald eagle, northern spotted owl, coho salmon (Oregon Coast), and Kincaid's

lupine, are potentially located in the area surrounding interchanges 103, 106, and 108. There are no endangered species near the three interchanges.

Table 2. Threatened, Endangered, and Species of Concern

Common Name	Scientific Name
Threatened Species	
Bald eagle	*Haliaeetus leucocephalus*
Northern spotted owl	*Strix occidentalis caurina*
Coho salmon (Oregon coast)	*Oncorhynchus kisutch*
Kincaid's lupine	*Lupinus sulphureus var. kincaidii*
Candidate Species	
Pacific fisher	*Martes pennanti pacifica*
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*
Northern goshawk	*Accipiter gentilis*
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*
Mountain quail	*Oreortyx pictus*
Oregon vesper sparrow	*Pooecetes gramineus affinis*
Purple martin	*Progne subis*
Northwestern pond turtle	*Emys marmorata marmorata*
Common kingsnake	*Lampropeltis getula*
California mountain kingsnake	*Lampropeltis zonata*
Northern red legged frog	*Rana aurora aurora*
Foothill yellow-legged frog	*Rana boylii*
Pacific lamprey	*Lampetra tridentata*

Common Name	Scientific Name
Coastal cutthroat trout (Oregon Coast)	*Oncorhynchus clarki clarki*
Umpqua chub	*Oregonichthys kalawatseti*
Franklin's bumblebee	*Bombus franklini*
Cox's mariposa-lily	*Calochortus coxii*
Shaggy horkelia	*Horkelia congesta ssp. Congesta*
Red-root yampah	*Perideridia erythrorhiza*
Hitchchock's blue-eyed grass	*Sisyrinchium hitchcockii*

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

WETLANDS

Per Chapter 6 of the Douglas County Comprehensive Plan, Natural Features Element, there are no listed significant wetlands in the vicinity of the three interchanges. There are wetlands identified on the U.S. Fish and Wildlife Service National Wetlands Inventory map, although the County has not adopted the National Wetland Inventory (NWI).

Interchange 103

NWI maps identified a palustrine, emergent, persistent, temporarily flooded wetland (PEM1A) in the NE quadrant of interchange 103. The area is a vacant lot surrounded by urban development. The Douglas County Area soil survey identified an area of Conser silty clay loam (map unit 44A), a hydric soil, along the east side of I-5. The following soils contain hydric inclusions: Debenger-Brader complex, 2-12 percent slopes (map unit 51C) in the SE quadrant; Fordice very cobbly loam, 0-12 percent slopes (map unit 82C) in the NE and SE quadrants; Roseburg loam, 0-3 percent slopes (map unit 214A) in the NW and SW quadrants; Sibold fine sandy loam, 0-5 percent slopes (map unit 224B) in the western portions of the NW and SW quadrants; and Sutherlin silt loam, 3-12 percent slopes (map unit 235C) in the NE and SE quadrants.

On-site observation identified one wetland in the NE and SE quadrants, along the east side of I-5 in the area containing hydric soils. This wetland is regulated for removal and fill activities by Army Corps of Engineers (COE) under the Clean Water Act and Oregon Department of State Lands (DSL) under the Removal/Fill Law. Unavoidable impacts to this wetland will require permits or consultation from both COE and DSL. The wetland will need to be delineated and the delineation report will need to be reviewed for a jurisdictional determination by DSL and the COE.

Interchange 106

No site surveys were conducted in the vicinity of Interchange 106. The NWI maps the South Umpqua River as riverine, upper perennial, rock bed, seasonally flooded (R3BB1C). The Douglas County Area soil survey identified an area of Riverwash (map unit 210), a hydric soil, along the South Umpqua River. The following soils consist of hydric inclusions: Camas-Newberg complex, 0-3 percent slopes (map unit

34A) in the SE quadrant between I-5 and the South Umpqua River; and Evans loam, 0-3 percent slopes (map unit 78A) in the SE quadrant adjacent to the river.

Additional fieldwork may be required to determine if any wetlands exist in the vicinity of the interchange.

Interchange 108

No wetlands were identified on NWI maps or during site visits in the vicinity of Interchange 108, although *the Douglas County Area Soil Survey* identified an area of Riverwash (map unit 210), a hydric soil, along the South Umpqua River. The following soils contain hydric inclusions: Josephine gravelly loam, 12-30 percent slopes (map unit115E) in the NE quadrant; and McMullin-Reston-Rock outcrop complex, 30-75 percent slopes (map unit 150F) east of the bridge.

On-site observation did not identify any wetlands. The area mapped with hydric soils did not contain wetland vegetation and/or hydrology.

HAZARDOUS MATERIALS

An evaluation of the regulatory status of sites within a 2,000-foot radius of each bridge 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 bridge and the area surrounding each bridge was performed in order to evaluate the potential for recognized environmental conditions.

Interchange 103

A review of hazardous materials databases and field surveys found three sites located near interchange 103. There are two sites listed on the underground storage tank (UST) and leaking UST (LUST) databases and one site identified during site reconnaissance that are recognized environmental concerns. If either 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. The three sites are:

The Freeway Chevron is located at 200 Pruner Road (Riddle Bypass Road), approximately 320 feet west of interchange 103. The site is included in the UST and LUST databases. Five decommissioned USTs and four active USTs are listed for the site. The LUST cleanup was initiated in September 1993. No other information regarding the LUST is reported. No other information regarding this site was discovered during a supplemental DEQ database search. Groundwater monitoring wells and a treatment system were noted in the parking lot of the Chevron station during site reconnaissance, indicating the site is currently

undergoing environmental investigation and remediation. Based on available information, this site is a recognized environmental concern.

Chevron USA Inc.-94805 (Location A on Figure 3.11-4) is located at 161 Pruner Road, approximately 370 feet west of interchange 103. The site is included in the UST and LUST databases. Eight decommissioned USTs are listed for the site. No active USTs are reported. The LUST cleanup was initiated in March 1989 and completed in October 1998. Closure was obtained in December 1998. No other information regarding this site was discovered during a supplemental DEQ database search. During site reconnaissance, no facility with this address was noted. Based on observed addresses and a review of historical aerial photographs, the facility has since been demolished. Based on available information, this site is a recognized environmental concern.

Site reconnaissance indicates that a Pacific Pride vehicle-fueling station is located approximately 320 feet west of Interchange 103, adjacent to the Freeway Chevron station. No information regarding this site was discovered during a supplemental DEQ database search and based on the lack of 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 106

Interchange 106 was not mapped for hazardous materials as a part of the baseline report, although the interchange is located within the one-mile radius of another bridge where hazardous sites of concern were evaluated for the baseline report. Within 1/4 mile of the interchange, no sites were identified, based on information gathered for sites with one mile of bridge 07952A located approximately 1/2 mile north of interchange 106. One identifiable site that may contain hazardous materials is the Myrtle Creek Municipal Airport, located approximately 1/3 mile south of the interchange 106. It is likely that chemicals such as fuel and oils are located at the airport.

Prior to ground disturbance, an evaluation of potential hazardous materials and other sites of concern will need to be completed.

Interchange 108

One of the 34 databases reviewed included information on one site near interchange 108. A former spill site was identified on the OR SPILLS database and located at MP 108 of I-5, approximately 300 feet southwest of interchange 108. The database described the spill as a 75-gallon diesel spill occurring in April 1991. No further information is reported. No other information regarding this site was discovered during a supplemental DEQ database search. Based on available information, this site is a recognized environmental concern.

CULTURAL AND HISTORIC RESOURCES

Archeological Record

The Oregon State Museum of Anthropology conducted surface surveys near the three 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. The Cultural and Historic Resource Inventory for Douglas County was updated in 2002. There is one property listed on the Myrtle Creek Historic Register that is within the IAMP study area for interchange 108. This property is north of Dole Road and is listed because there are signs of the Applegate Trail in this area. Improvements to this property are subject to review by the Myrtle Creek Historic Resource Review Committee prior to City approval.

No special protective measures or mitigation are recommended prior to bridge 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 notified immediately.

Interchange 103

No archaeological sites were identified during a surface examination, which occurred in July 2003. The project area, located along Riddle Road (Pruner Road) over I-5, is occupied by residential structures in the eastern half, and by commercial developments and agricultural fields in the western half. Road construction, plowed fields, residential and commercial developments, and terracing/leveling are the major disturbances near the interchange. Because of the degree of these disturbances, buried cultural deposits are unlikely to be present.

A survey of the project area was conducted on June 30, 2003 to identify properties near interchange 103 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. Photos of the existing bridge were also taken. Two historic resources were identified near the interchange, including the existing bridge and one commercial building. Neither of these structures appear to be eligible for inclusion in the NRHP. No further research is necessary for historic properties near the interchange.

Interchange 106

Site surveys were not completed for interchange 106 as part of the baseline report. SHPO was contacted and the statewide cultural resource database was reviewed. It was found that no cultural resource surveys have been completed near interchange 106. The agency believes there is a high probability that the area contains cultural resources and recommended caution during any future ground disturbing activities. Additional work may be required to identify any cultural or historic resources that may be located in the vicinity of the interchange.

Interchange 108

No archaeological sites were identified during a surface examination, which occurred in July 2003. The western half of the project area is characterized by steep uplands (20-90 degrees) covered in thick, mixed

forest. The eastern half is dominated by the South Umpqua River and its active floodplain. Given the extensive cut and fill disturbances associated with highway construction, intact cultural deposits are unlikely to be present. This assessment is consistent with a previous archaeological survey conducted in 1994 immediately to the west of the current project area.

A survey of the project area was conducted on June 2003 to identify properties near interchange 108 that may meet NRHP criteria. The interchange area contains one resource (Myrtle Creek Bridge 490A) that has been previously determined eligible for the NRHP. No further research is necessary for historic properties within this APE.

REFERENCES

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Personal Contacts

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Appendix H.

Future Transportation Conditions Report

Interchange 103,106,108
Interchange Area Management Plan

Future Transportation Conditions Report

Prepared for

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February 2005

TABLE OF CONTENTS

1 INTRODUCTION

The Interchanges 103, 106, and 108 Future Conditions Report focuses on long-range improvement needs to these Interstate 5 interchanges in the Myrtle Creek area of Douglas County, south of Roseburg. This technical report presents the projected 2025 traffic volumes, the results of the future traffic operations analysis for 2025 under No-Build Conditions and two Build Scenarios. The Build Option #1 focuses on improvements to the Interchange 103 bridge and ramps. Build Option #2 includes the addition of a bridge across the South Umpqua River connecting Interchange 106 to Old Pacific Highway.

2 BUILD OPTIONS

NO-BUILD SCENARIO

The No-Build scenario assumes no changes to the existing lane configuration or traffic control.

OPTION 1 – 103 IMPROVEMENTS

The Option 1 scenario assumes improvements at Interchange 103. These include reconstruction of the bridge to a 3-lane facility and installation of a new NB on-ramp to complete a full-diamond configuration. The existing NB loop ramp is removed. The widened bridge allows for a new WB left turn lane at the SB ramp terminal, and an EB left turn lane. It is assumed that signals will be installed at the ramp terminals.

OPTION 2 – 103 IMPROVEMENTS AND WEAVER ROAD BRIDGE

The Option 2 scenario includes all 103 improvements described above along with a new Weaver Road Bridge over the South Umpqua River. The connection between Weaver Road and Old Pacific Highway is assumed to be just south of Wecks Road. No changes are assumed for the Interchange 106 ramp terminals.

3 TRAFFIC FORECASTS

2025 NO BUILD AND OPTION 1

The methodology for forecasting the 2025 volumes is summarized in a separate document, entitled "Forecasting Methodologies for Intersection and Roadway Segment Analysis". The forecast volumes are the same for the No Build and Option 1 analyses.

2025 OPTION 2

The completion of the Weaver Road Bridge is expected to trigger a significant change in use of all three interchanges. Table 1 summarizes the 2025 No Build forecast volumes by ramp. The "% of direction" indicates for example, how many of the total NB On movements are made at each interchange. The volumes shown in parentheses represent those that come and go to the west of the 103 interchange. It was assumed that none of these trips would change after the construction of the Weaver Road bridge.

The redistribution of trips was loosely based on the existing patterns, combined with an analysis of the developed land area and proximity to each of the interchanges. The land area analysis shows that 41% is nearest to Interchange 108, 36% is nearest to Interchange 106, and 23% is nearest to Interchange 103. These percentages were used as a base, but were then adjusted to account for the heavy movements to and from the north at 108, and movements to and from the south at 103.

For now, the analysis assumes no change in land use between the No Build, Option 1, and Option 2 conditions.

Table 1. 2025 Ramp Volumes

		No Build, Option 1		Build Option 2	
Interchange	**Ramp**	**Volume**	**% of direction**	**Volume**	**% of direction**
103	Northbound Off	205 (+80)	57%	145 (+80)	40%
	Northbound On	75 (+262)	19%	40 (+262)	10%
	Southbound Off	85 (+168)	15%	57 (+168)	10%
	Southbound On	168 (+88)	54%	123 (+88)	40%
106	Northbound Off	16	4%	145	40%
	Northbound On	18	4%	160	40%
	Southbound Off	15	3%	228	40%
	Southbound On	20	7%	123	40%
108	Northbound Off	142	39%	73	40%
	Northbound On	308	77%	201	50%
	Southbound Off	470	82%	285	50%
	Southbound On	120	39%	62	20%
Totals		1,642 (2,240)		1,642 (2,240)	

Notes: The volumes shown in parentheses (##) represent additional ramp volumes that come and go to the west of the 103 interchange. It was assumed that none of these trips would change after the construction of the Weaver Road bridge.

4 TRAFFIC OPERATIONS ANALYSIS

METHODOLOGY

Synchro and SimTraffic were selected for performing the traffic operational analysis. The Level-of-Service report from Synchro on 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 diverge analyses 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 reports summarizes the calculations, density, and LOS.

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

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 Interstate 5 must operate with a v/c ratio at or below 0.70. The Douglas County Transportation System Plan establishes standards for roads not under the state's jurisdiction. An LOS D is required for all signalized and unsignalized intersections.

[2] *1999 Oregon Highway Plan, Oregon Department of Transportation, Salem, OR, 1999.*

5 INTERSECTION RESULTS

INTERCHANGE 103

Riddle Bypass Road / I-5 SB Ramps

Riddle Bypass Road at the SB on/off-ramps for Interchange 103 is a two-way stop-controlled intersection. For the Option 1 and 2 scenarios the intersection is assumed to be signalized. Table 2 shows the 2025 30th Hour Volume analysis results:

Table 2. 2025 Analysis of Riddle Bypass / 103 SB Ramps

		No-Build			Option #1			Option #2		
Approach	**Mvmt.**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**
Southbound	Left, Thru,Right	**1.63**	**560**	**F**		146			83	
Eastbound	Thru,Right	0.44	0	A	0.84	417	C	0.74	401	C
Westbound	Left	0.21	20	B		154			138	
	Thru	0.22	0	A		10			2	

Riddle Bypass Road / I-5 NB Ramps

Riddle Bypass Road at the NB on/off-ramps for Interchange 103 is a two-way stop-controlled intersection. For the Option 1 and 2 scenarios, the intersection is assumed to be signalized. Additional changes include the construction of a new NB on-ramp to complete the full-diamond configuration of the interchange. The analysis assumes the loop ramp has been removed. Table 3 shows the 2025 30th Hour Volume analysis results:

Table 3. 2025 Analysis of Riddle Bypass / 103 NB Ramps

		No-Build			Option #1			Option #2		
Approach	**Mvmt.**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**
Northbound	Left, Right	**1.23**	**419**	**F**	-	-	-	-	-	-
Eastbound	Thru,Right	0.48	0	A	-	-	-	-	-	-
Westbound	Thru,Left	0.09	7	A	-	-	-	-	-	-
Northbound	Left	-	-	-		63			73	
	Thru,Right	-	-	-		10			0	
Eastbound	Left	-	-	-	0.58	95	B	0.65	144	C
	Thru	-	-	-		4			6	
Westbound	Thru,Right	-	-	-		223			272	

Riddle Bypass Road / Corwin Street

This T-intersection has stop control for Corwin Street. The EB and WB movements on Riddle Bypass Road operate freely. The southern leg of the intersection is a driveway to the bowling alley. It was excluded from the analysis. Table 4 shows the 2025 30th Hour Volume analysis results:

Table 4. 2025 Analysis of Riddle Bypass / Corwin Street

		No-Build			Option #1			Option #2		
Approach	Mvmt.	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS
Southbound	Left,Right	0.06	5	C	0.06	5	C	0.05	4	B
Eastbound	Thru,Left	0.01	1	A	0.01	1	A	0.01	1	A
Westbound	Thru,Right	0.27	0	A	0.27	0	A	0.26	0	A

Riddle Bypass-Gael Lane / Old Pacific Highway

This four-legged intersection operates with stop control in the SB, WB, and NB directions. The heaviest movements are the SB right turn and the EB left turn. The EB approach operates freely. The SB approach permits right turns without stopping. Table 5 shows the 2025 30th Hour Volume analysis results:

Table 5. 2025 Analysis of Riddle Bypass-Gael Lane / Old Pacific Highway

		No-Build			Option #1			Option #2		
Approach*	Mvmt.	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS
North and Westbound	Left,Thru, Right	**0.69**	**103**	**F**	**0.69**	**103**	**F**	0.51	65	D
Southbound	Left,Thru, Right	0.06	5	A	0.06	5	A	0.05	4	A
Eastbound	Left,Thru, Right	0.0	0	A	0.0	0	A	0.0	0	A

* For this analysis, the NB and WB approaches have been combined. The SB approach was coded as the WB approach in order to accurately model allowable movements.

INTERCHANGE 106

Weaver Road / I-5 SB Ramps

Weaver Road at the SB on/off-ramps for Interchange 106 is a two-way stop-controlled intersection. No changes in lane configuration are expected for the future analysis. Table 6 shows the 2025 30th Hour Volume analysis results:

Table 6. 2025 Analysis of Weaver / 106 SB Ramps

		No-Build			Option #1			Option #2		
Approach	**Mvmt.**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**
Southbound	Left,Right	0.02	1	A	0.02	1	A	0.37	42	B
Eastbound	Thru,Right	0.01	0	A	0.01	0	A	0.01	0	A
Westbound	Thru,Left	0.01	1	A	0.01	1	A	0.08	6	A

Weaver Road / I-5 NB Ramps

Weaver Road at the NB on/off-ramps for Interchange 106 is a two-way stop-controlled intersection. No changes to lane configuration are expected for the future analysis. Table 7 shows the 2025 30th Hour Volume analysis results:

Table 7. 2025 Analysis of Weaver / 106 NB Ramps

		No-Build			Option #1			Option #2		
Approach	**Mvmt.**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**
Northbound	Left,Right	0.02	1	A	0.02	1	A	0.02	18	B
Eastbound	Thru,Left	0.01	0	A	0.01	0	A	0.0	1	A
Westbound	Thru,Right	0.01	0	A	0.01	0	A	0.16	0	A

Weaver Road / Aviation Drive

Weaver Road/Aviation Drive is presently an uncontrolled intersection. For purposes of future analysis, the north and south approaches are assumed to have stop signs. Table 8 shows the 2025 30th Hour Volume analysis results:

Table 8. 2025 Analysis of Weaver / Aviation

		No-Build			Option #1			Option #2		
Approach	**Mvmt.**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**	**V/C Ratio**	**95th Queue (feet)**	**LOS**
Northbound	Left,Right	0.0	0	A	0.0	0	A	0.04	3	B
Southbound	Thru, Left,Right	0.0	0	A	0.0	0	A	0.0	0	A
Eastbound	Thru,Right	0.0	0	A	0.0	0	A	0.22	0	A
Westbound	Thru,Left	0.0	0	A	0.0	0	A	0.0	0	A

INTERCHANGE 108

SB Ramps / I-5 NB Off-Ramp

This T-intersection is on the west side of the Umpqua River Bridge. The EB leg carries traffic from the SB Off-ramp towards downtown. The WB leg carries traffic from downtown to either the NB or SB on-ramps. These movements operate freely. The NB Off-ramp has a stop sign at the intersection. Table 9 shows the 2025 30th Hour Volume analysis results:

Table 9. 2025 Analysis of 108 SB Ramps / 108 NB Off-Ramp

		No-Build			Option #1			Option #2		
Approach	Mvmt.	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS	V/C Ratio	95th Queue (feet)	LOS
Northbound	Left,Right	0.16	14	B	0.16	14	B	0.16	14	B
Eastbound	Thru	0.22	0	A	0.22	0	A	0.22	0	A
Westbound	Thru	0.18	0	A	0.18	0	A	0.18	0	A

6 MERGE ANALYSIS

Each of the ramps was analyzed using the Ramps and Ramp Junction methodology in HCS 2000. For each analysis, the following information is required: freeway volume, ramp volume, peak hour factor, truck percentage, recreational vehicle percentage, freeway speed, ramp speed, and the terrain. The following table shows the density and LOS for each of the ramps:

Table 10. Ramp Analysis Results

		No-Build		Build Option #1 Improved 103		Build Option #2 Improved 103 + Weaver Road Bridge	
Interchange	Ramp	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS	Density (pc/mi/ln)	LOS
103	Northbound Off	15.2	B	15.2	B	15.2	B
	Northbound On	13.3	B	13.6	B	14.7	B
	Southbound Off	16.7	B	16.7	B	16.9	B
	Southbound On	13.4	B	13.3	B	13.5	B
106	Northbound Off	15.2	B	15.2	B	15.5	B
	Northbound On	14.5	B	14.5	B	14.7	B
	Southbound Off	16.3	B	16.3	B	17.4	B
	Southbound On	10.7	B	10.7	B	10.7	B
108	Northbound Off	15.6	B	15.6	B	16.1	B
	Northbound On	10.4	B	10.4	B	10.6	B
	Southbound Off	19.8	B	19.8	B	19.6	B
	Southbound On	12.3	B	12.3	B	13.3	B

The results of the operational analysis show that all of the ramps will operate at an acceptable Level of Service under future traffic conditions.

7 CONCLUSIONS

Conclusions resulting from this analysis are as follows:

- The Interchange 103 ramp terminals will operate at LOS F within 20 years unless improvements are made. The planned widening of the bridge and likely signalization of the ramps will allow the intersections to operate at LOS B and C during the PM peak hour.
- The Interchange 106 ramp terminals will be able to handle the additional traffic demand resulting from the construction of the Weaver Road bridge without any improvements.
- The ramp merge and diverge areas will continue to operate at acceptable LOS within the next 20 years.

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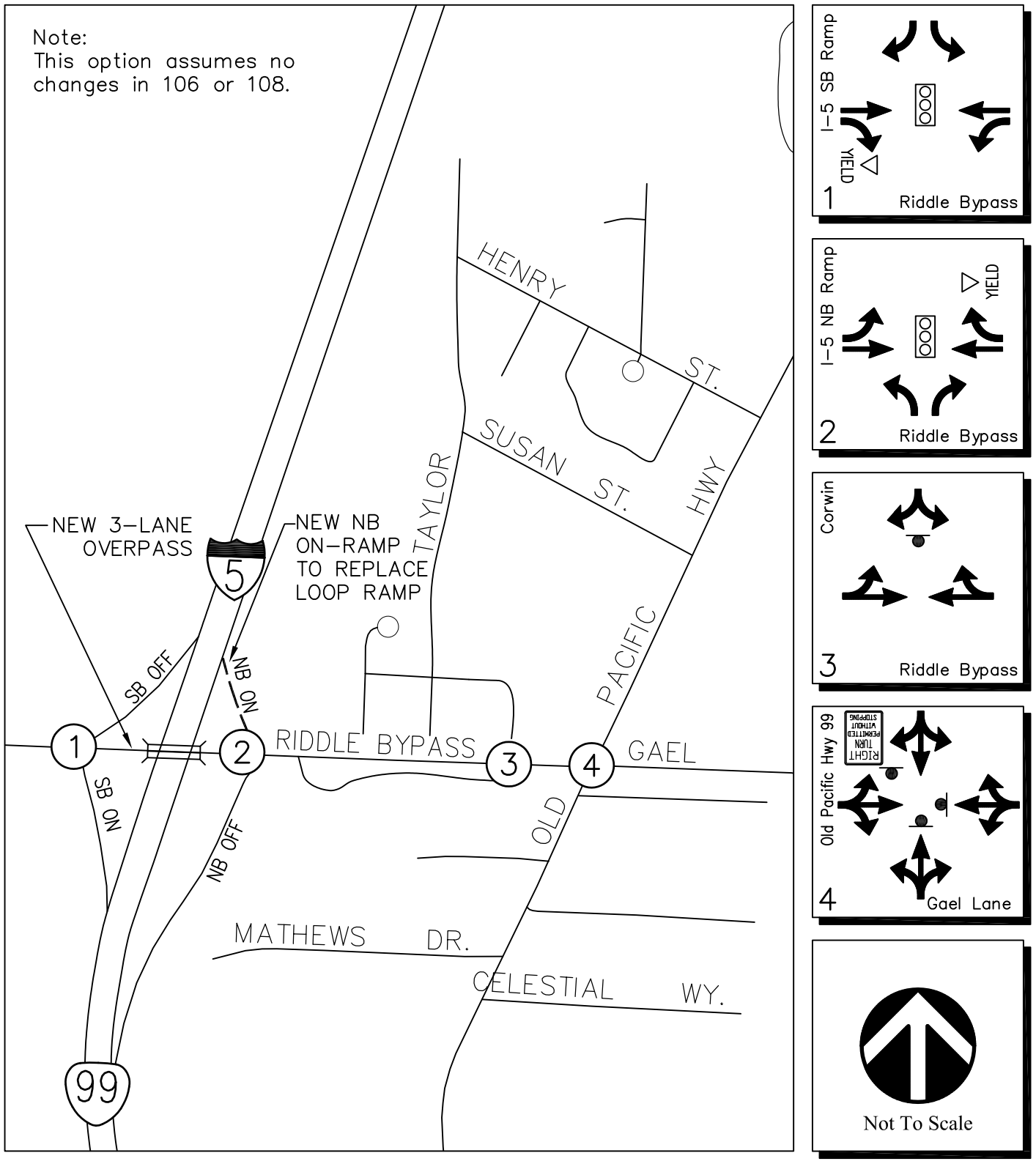


DAVID EVANS AND ASSOCIATES INC.

LEGEND

= Turning Movement

④ = Intersection Number

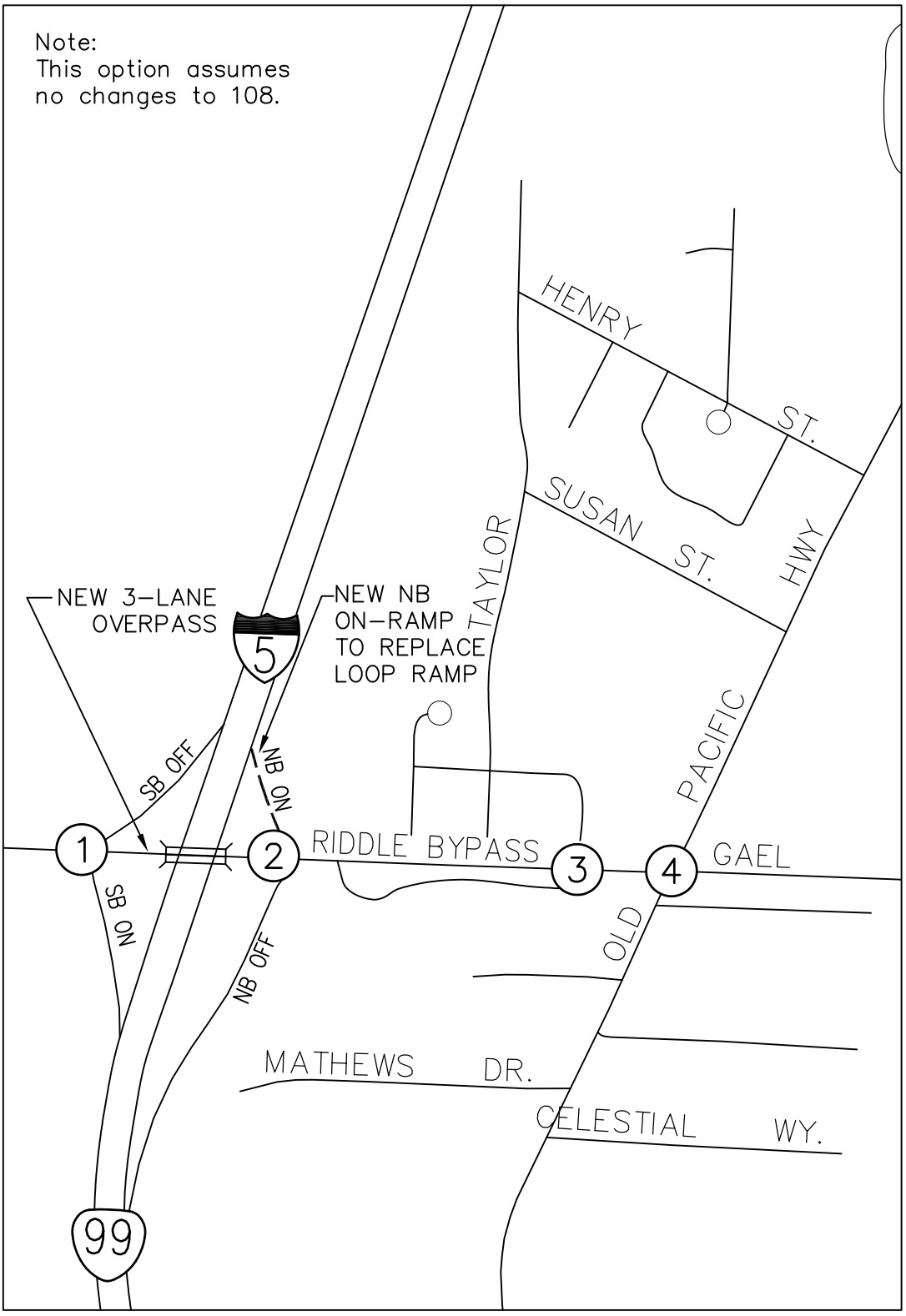
= Stop Sign

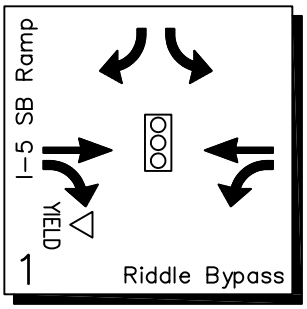
= Signal

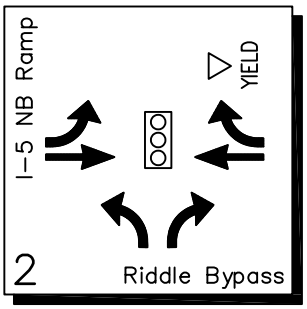
Figure 1

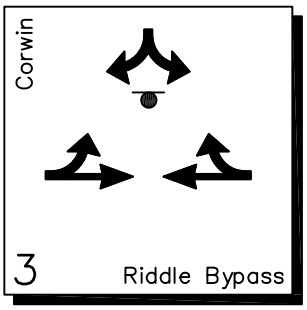
Lane Configurations for Build Option #1
Interchange 103 Improvements

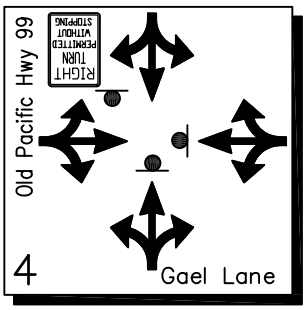
Interchange 103

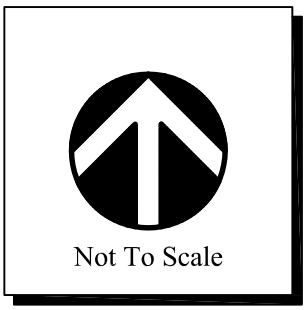












DAVID EVANS AND ASSOCIATES INC.

LEGEND

= Turning Movement

= Intersection Number

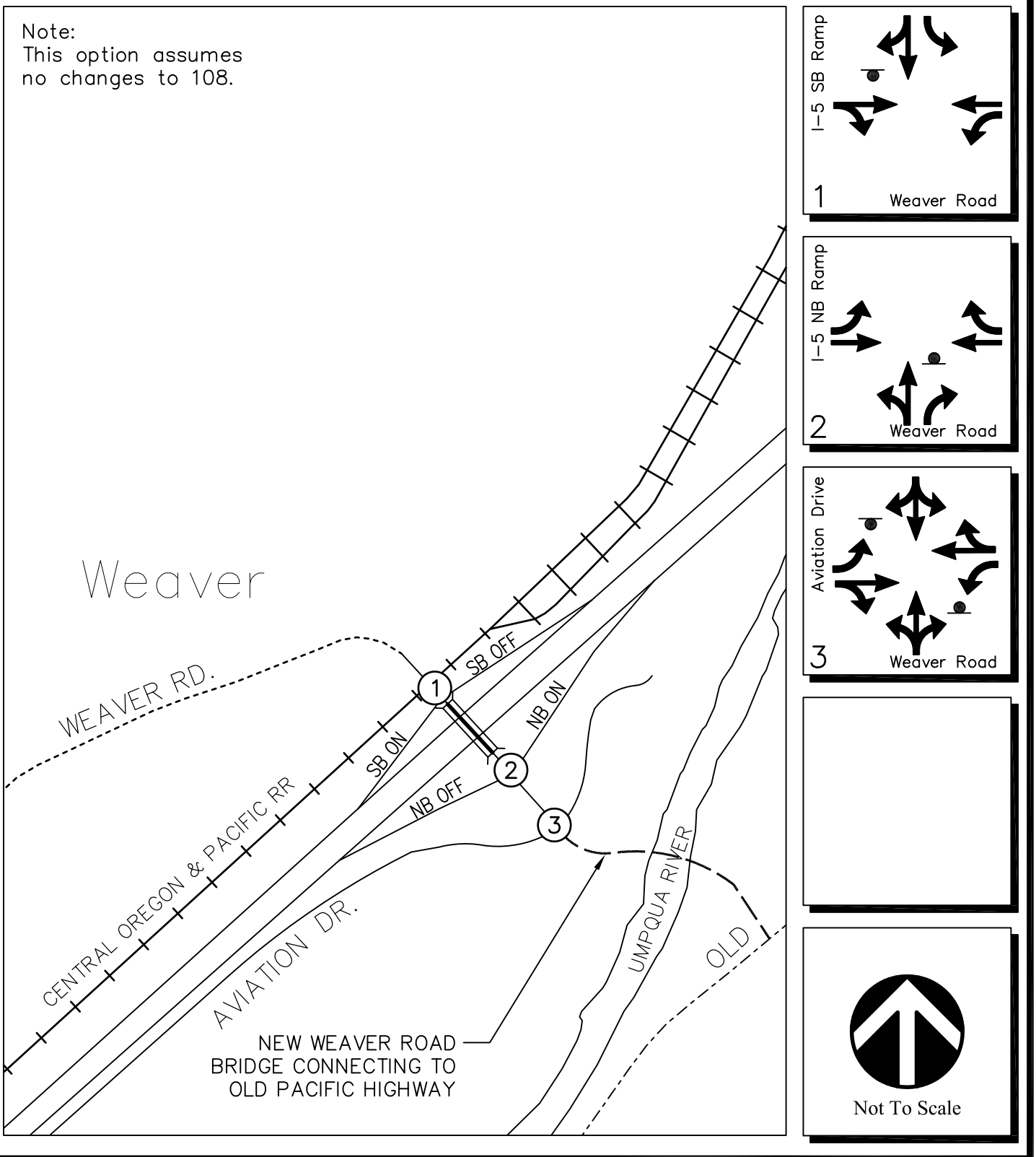
= Stop Sign

= Signal

Figure 2A

Lane Configurations for Build Option #2
Interchange 103 and 106 Improvements

Interchange 103



DAVID EVANS AND ASSOCIATES INC.

LEGEND

= Turning Movement

④ = Intersection Number

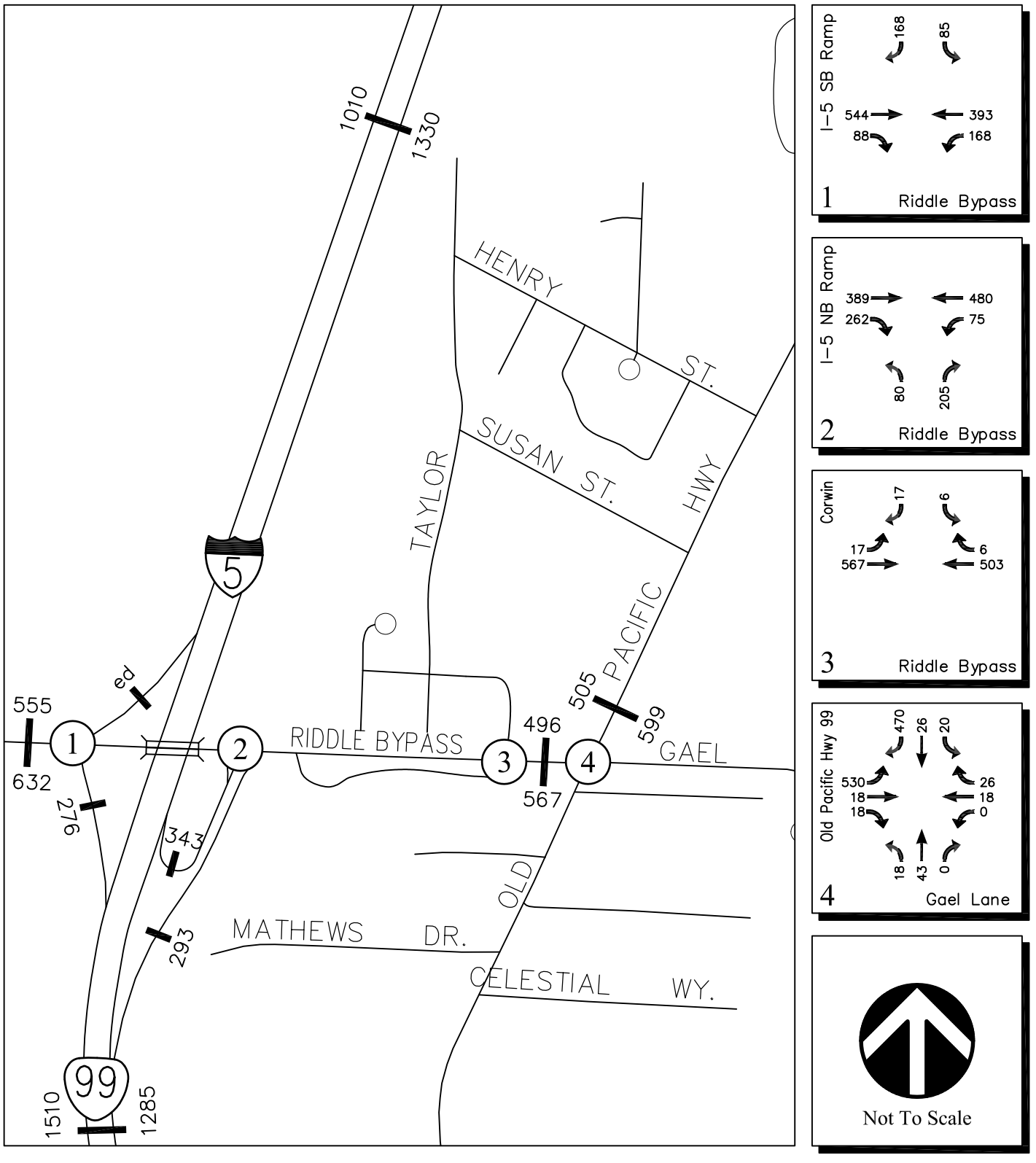
= Stop Sign

= Signal

Figure 2B

Lane Configurations for Build Option #2
Interchange 103 and 106 Improvements

Interchange 106



DAVID EVANS AND ASSOCIATES INC.

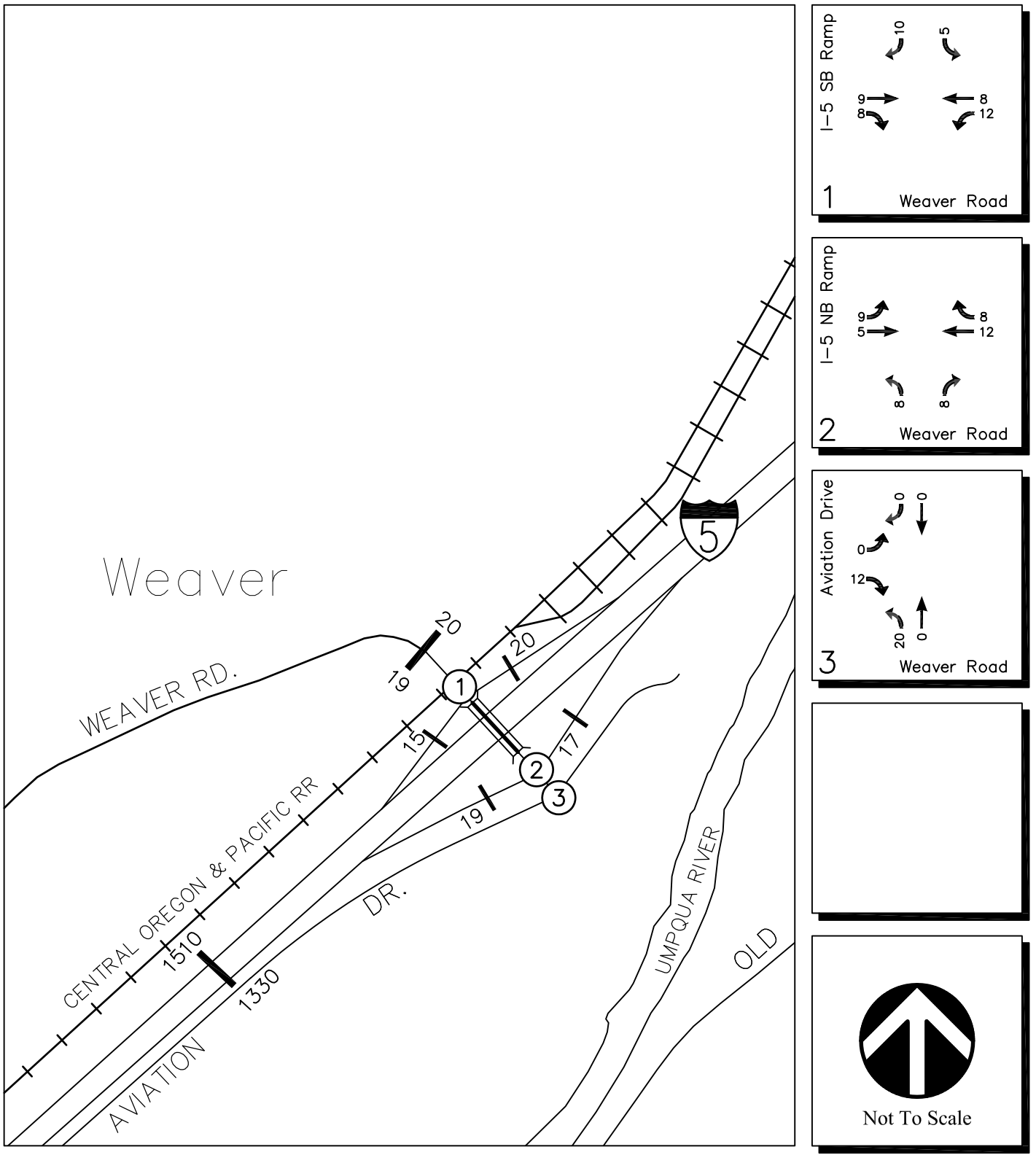
LEGEND

000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

Figure 3A

2025 Design Hour Volumes
No - Build

Interchange 103



DAVID EVANS AND ASSOCIATES INC.

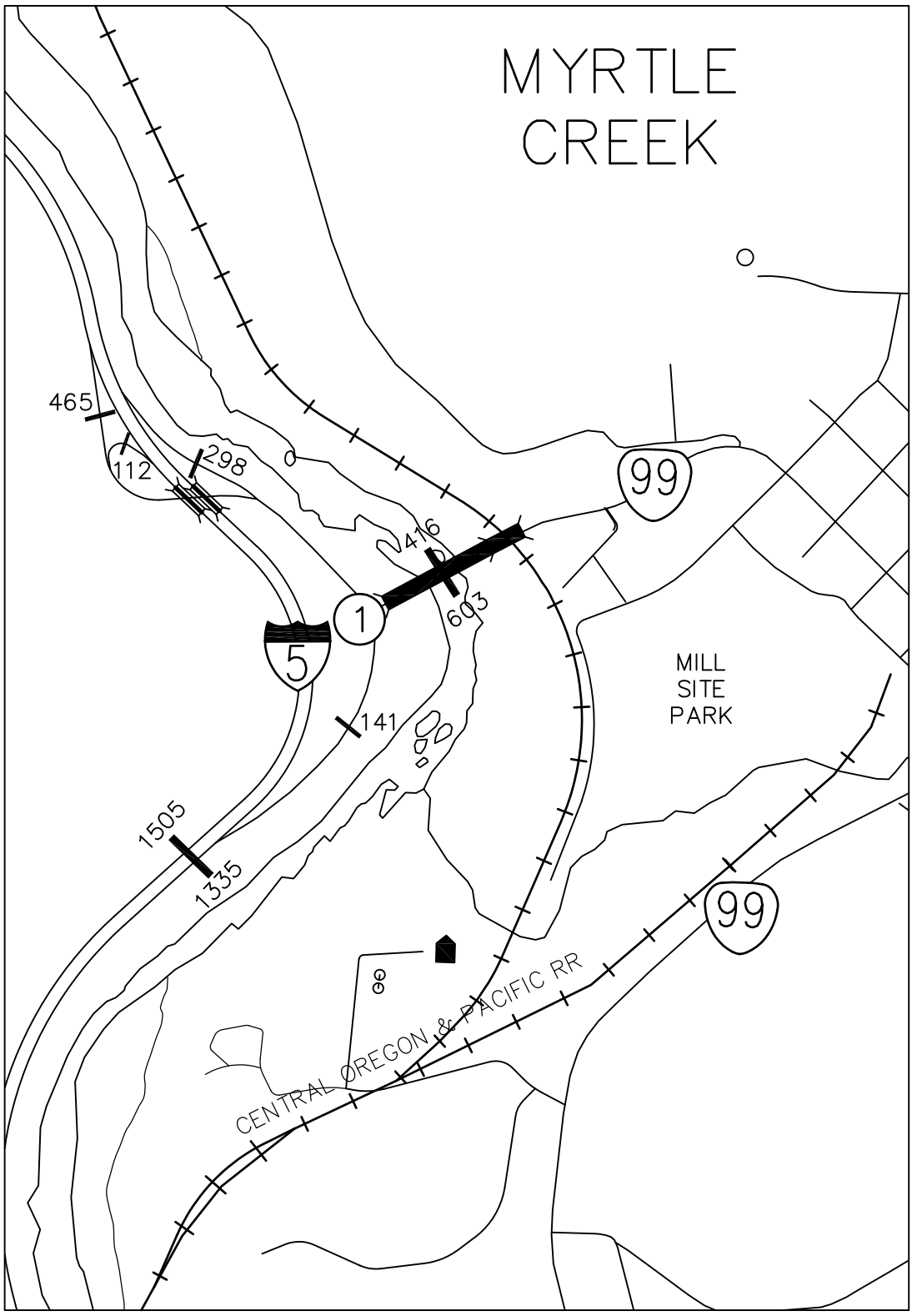
LEGEND

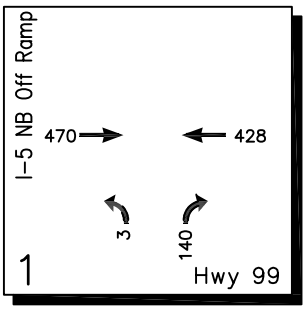
000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

Figure 3B

2025 Design Hour Volumes
No - Build

Interchange 106





Not To Scale

DAVID EVANS AND ASSOCIATES INC.

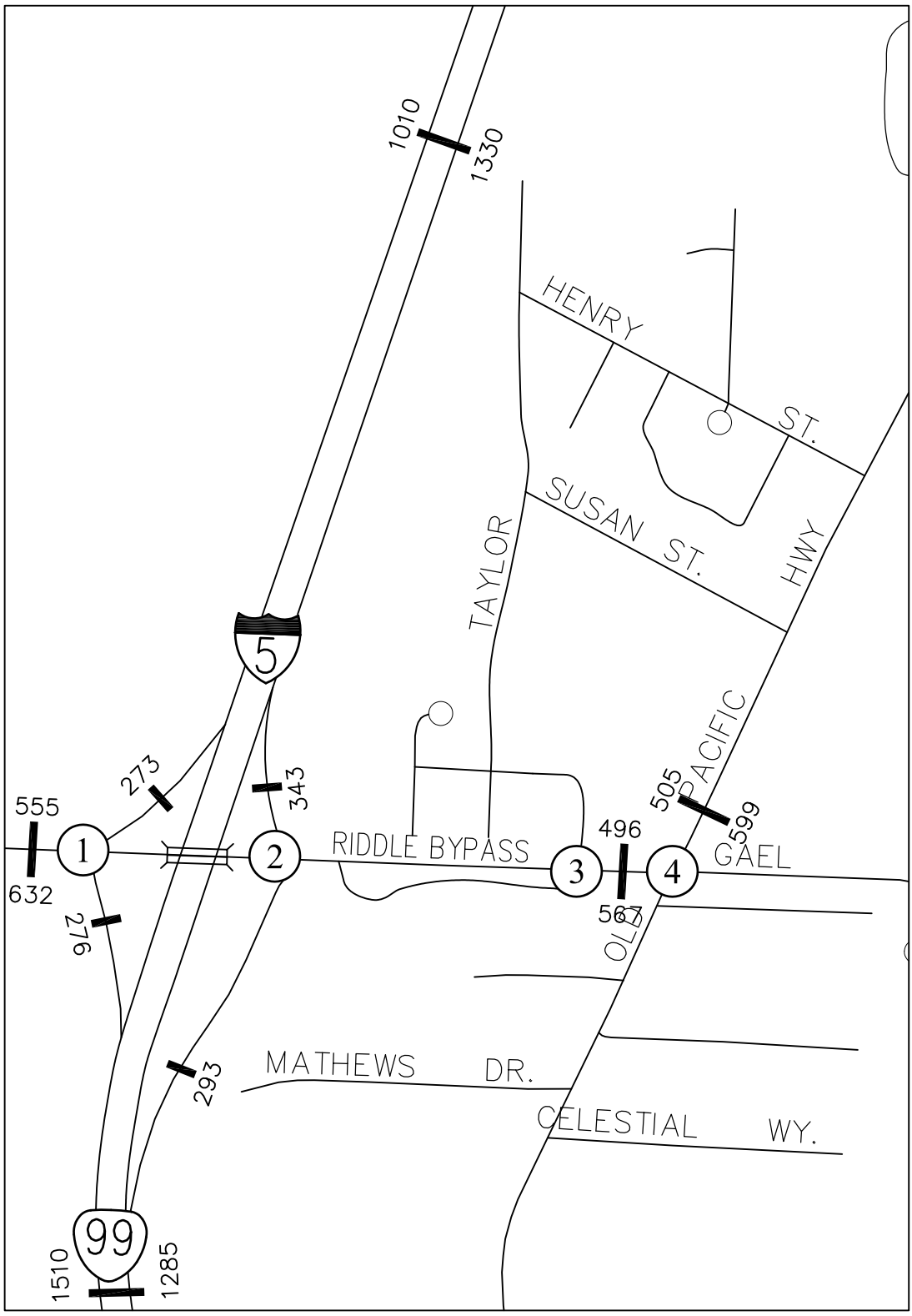
LEGEND

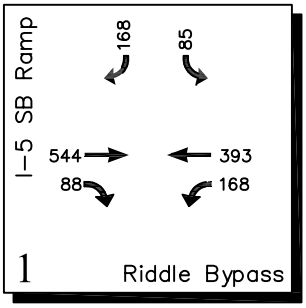
000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

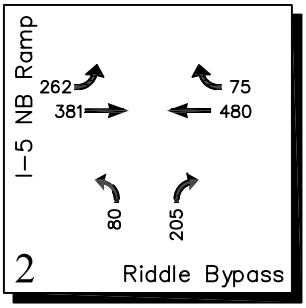
Figure 3C

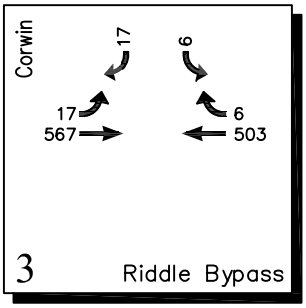
2025 Design Hour Volumes
No - Build

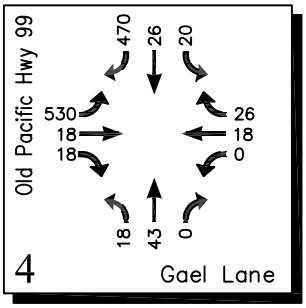
Interchange 108

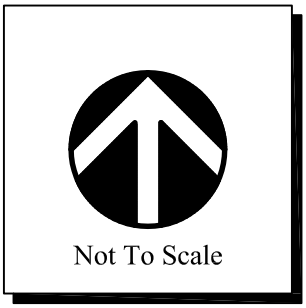












DAVID EVANS AND ASSOCIATES INC.

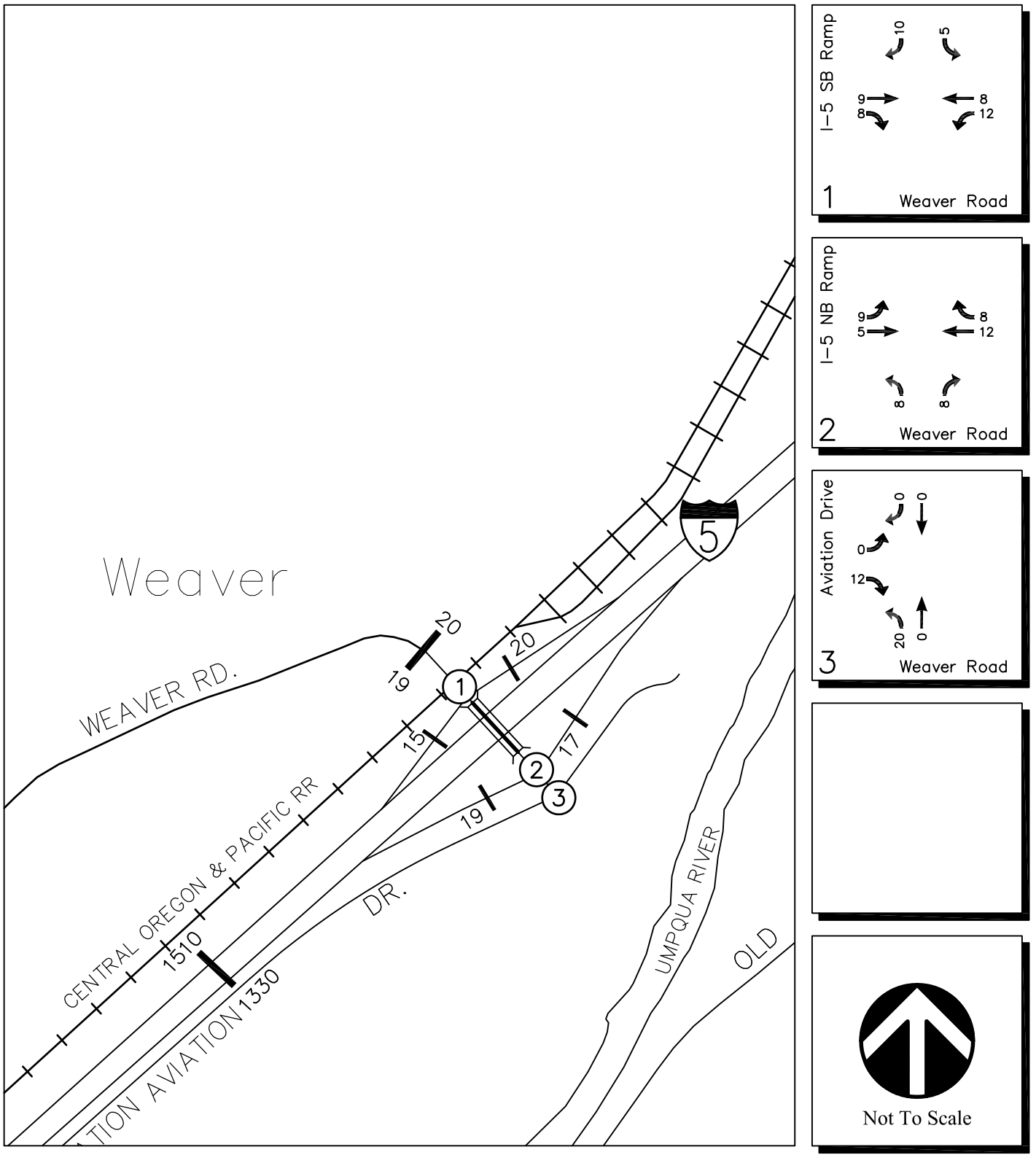
LEGEND

000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

Figure 4A

2025 Design Hour Volumes
Build Option #1

Interchange 103



DAVID EVANS AND ASSOCIATES INC.

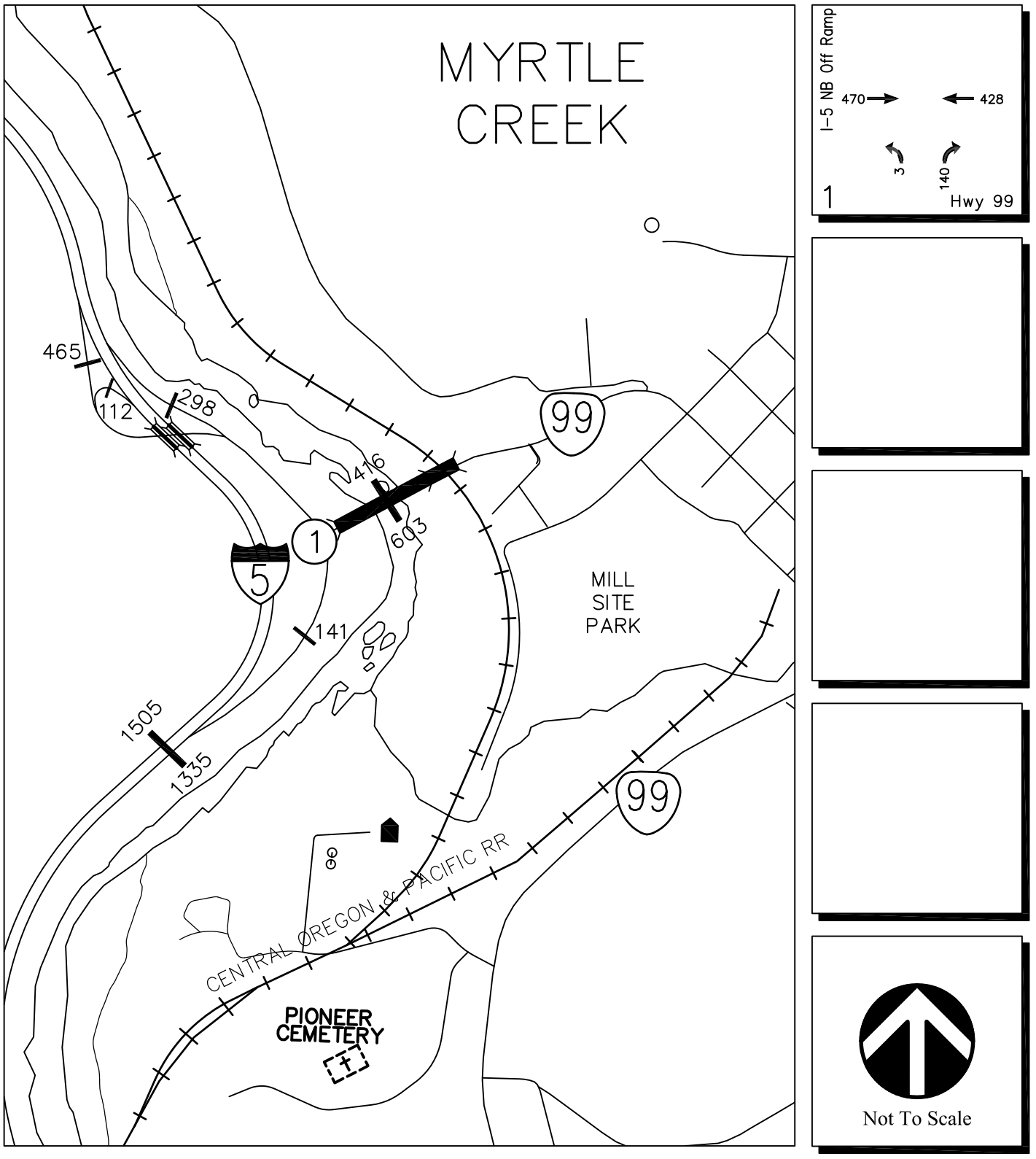
LEGEND

000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

Figure 4B

2025 Design Hour Volumes
Build Option #1

Interchange 106



DAVID EVANS AND ASSOCIATES INC.

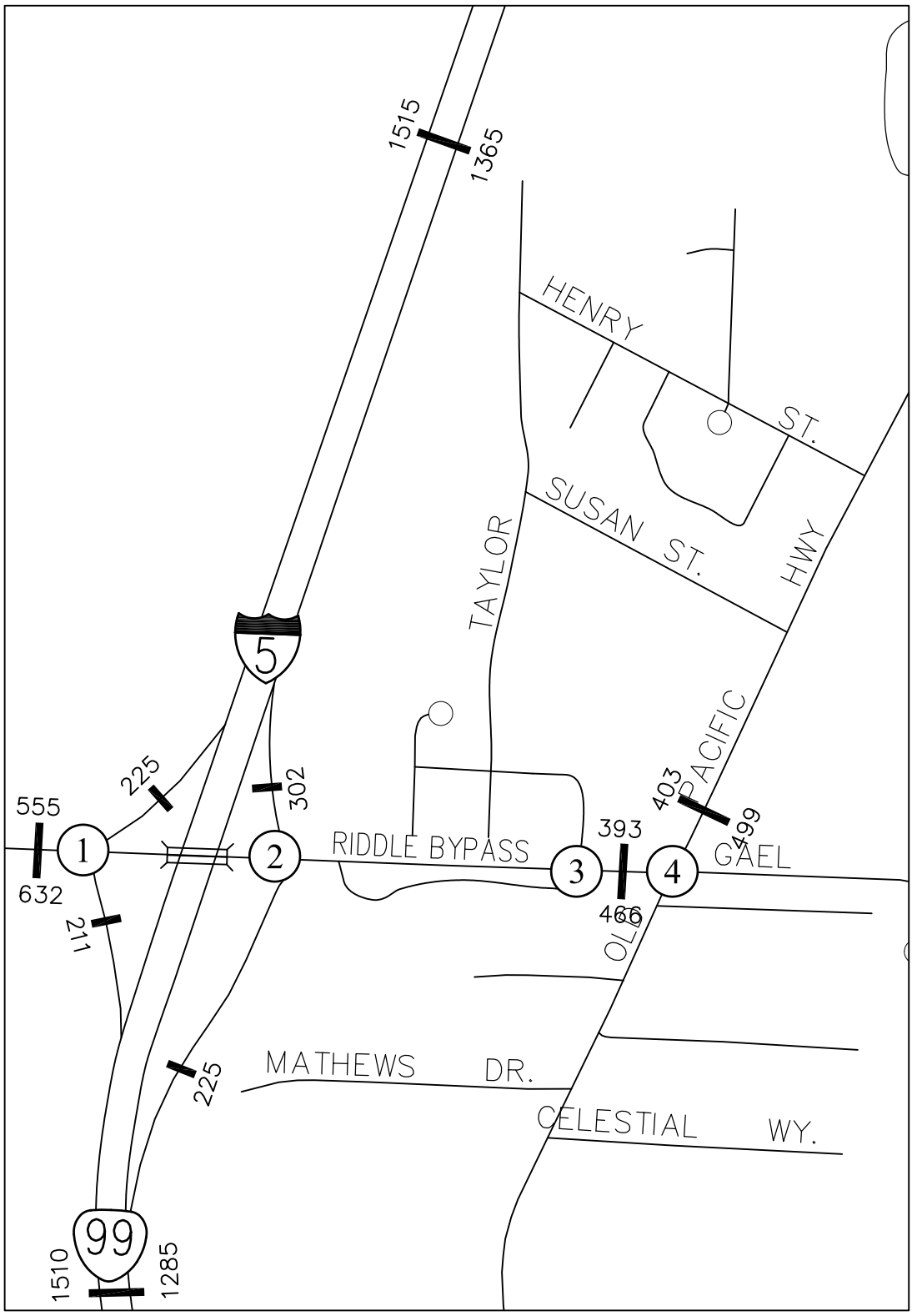
LEGEND

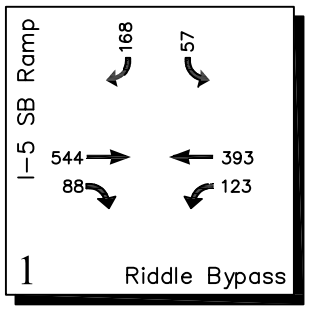
000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

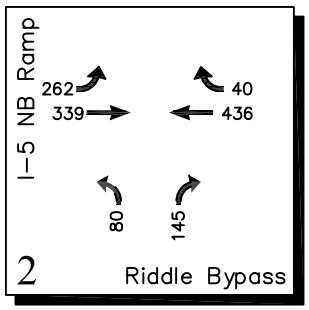
Figure 4C

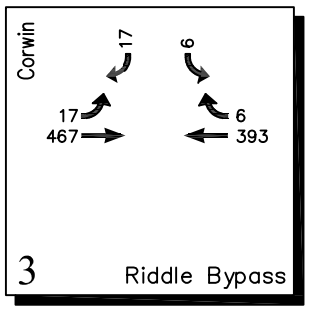
2025 Design Hour Volumes
Build Option #1

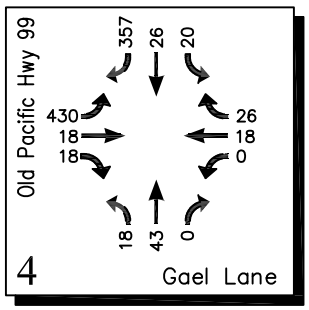
Interchange 108

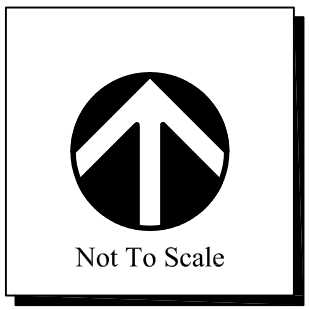












DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

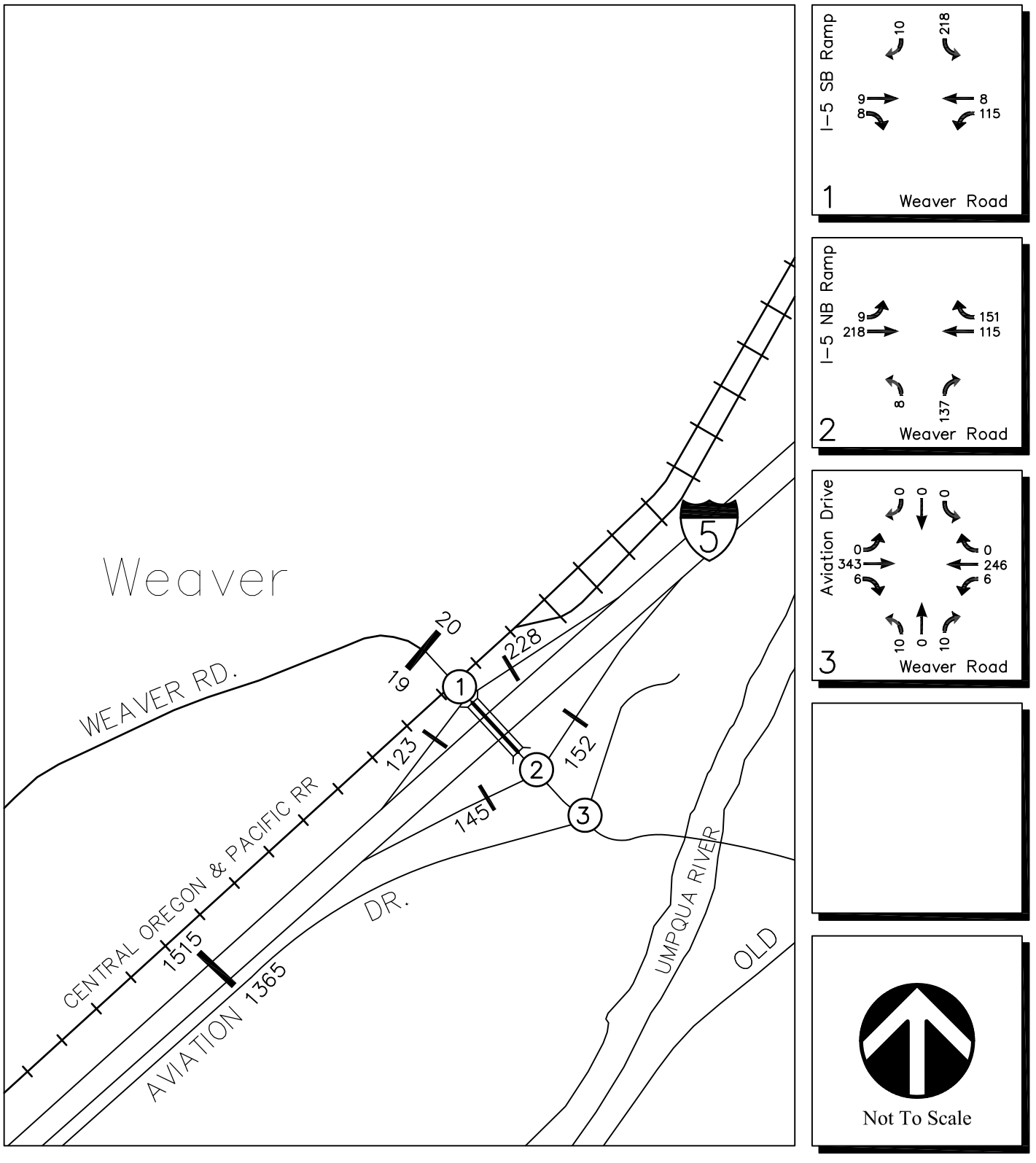
(4) = Intersection Number

= Stop Sign

Figure 5A

2025 Design Hour Volumes
Build Option #2

Interchange 103



DAVID EVANS AND ASSOCIATES INC.

LEGEND

000 = PM Peak Hour Turning Movement Volume

= Turning Movement

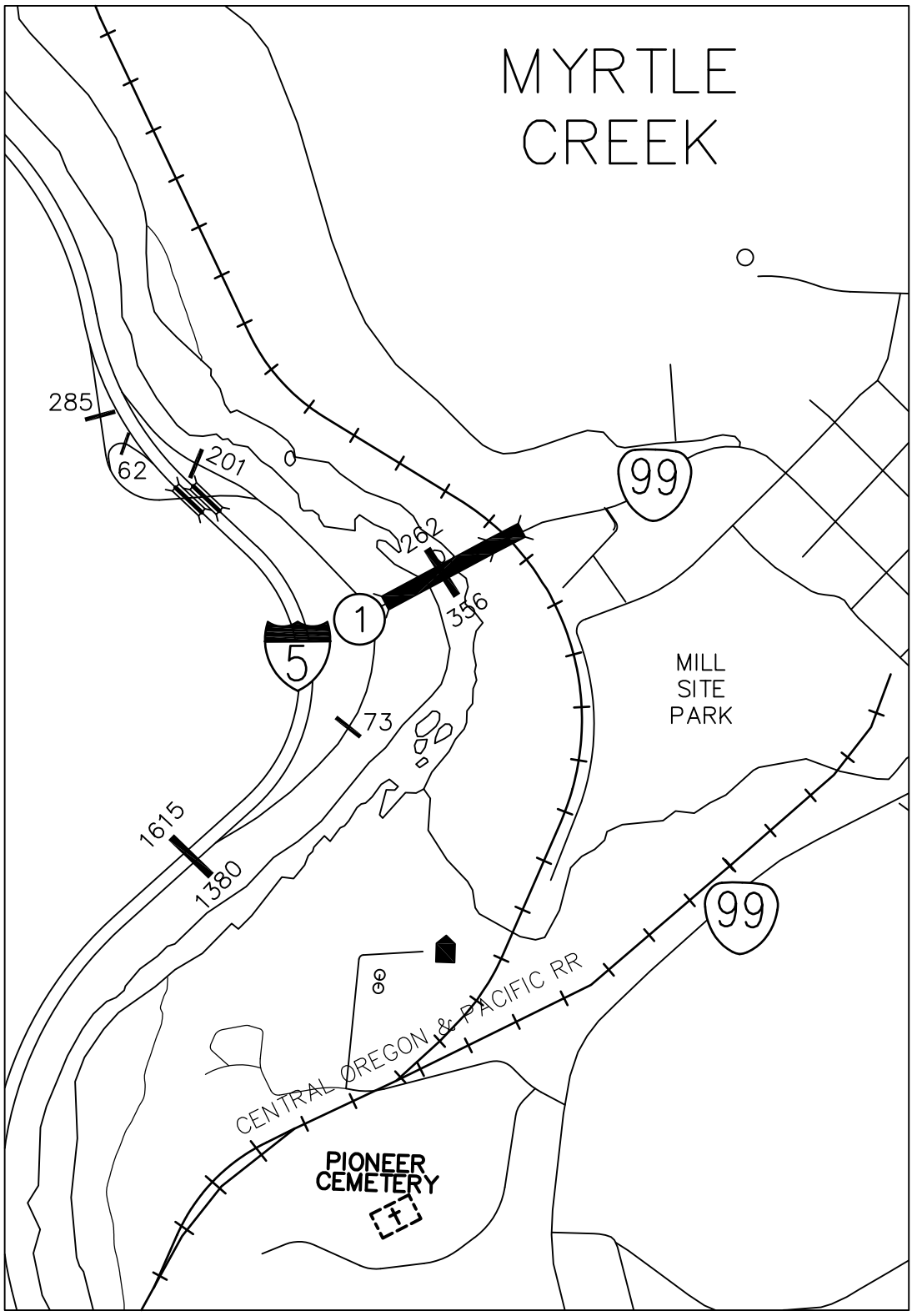
(4) = Intersection Number

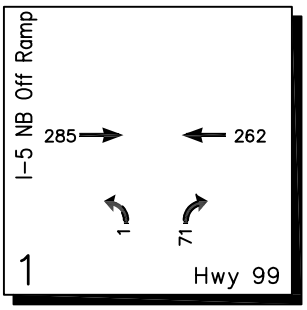
= Stop Sign

Figure 5B

2025 Design Hour Volumes
Build Option #2

Interchange 106





Not To Scale

DAVID EVANS AND ASSOCIATES INC.

LEGEND

000	= PM Peak Hour Turning Movement Volume
	= Turning Movement
(4)	= Intersection Number
	= Stop Sign

Figure 5C

2025 Design Hour Volumes
Build Option #2

Interchange 108

Appendix I.

Forecasting Methodologies for Intersection and Roadway Segment Analysis

DAVID EVANS AND ASSOCIATES INC.

MEMORANDUM

DATE: February 14, 2005

TO: Technical Advisory Committee

FROM: David Evans and Associates, Inc.

SUBJECT: **Forecasting Methodologies for Intersection and Roadway Segment Analysis**

PROJECT: Myrtle Creek Transportation System Plan

PROJECT NO: ODOT0000-0462, ODOT000-0456

COPIES: Steve Johnson, Lisa Cortes

This memorandum summarizes the methodology used for forecasting demand at the study area intersections and on the roadway segments. The discussion applies to both the 103, 106, and 108 Interchange Area Management Plan and the Myrtle Creek Transportation System Plan.

BACKGROUND DATA

Historic Population

Table 1 summarizes the historic population data for the study area. Population growth has averaged 1.07% per year during the past decade.

TABLE 1.
STUDY AREA POPULATION (1993-2004)

	City of Myrtle Creek			Unincorporated Area (Tri-City)		
Year	Population	Change from Previous Year	Change from 1993 to 2004	Population	Change from Previous Year	Change from 1993 to 2004
1990	3,063	-	-	3,585	-	-
1993	3,105	0.3%		-	-	
1994	3,190	2.7%		-	-	
1995	3,290	3.1%		-	-	
1996	3,410	3.6%		-	-	
1997	3,475	1.9%	1.07% per year	-	-	-
1998	3,600	3.6%		-	-	
1999	3,670	1.9%		-	-	
2000	3,419	-6.9%		3,519	-	
2001	3,410	-0.3%		-	-	
2002	3,460	1.5%		-	-	
2003	3,480	0.6%		-	-	
2004	3,490	0.3%		-	-	

Source: Portland State University Center for Population Research, Census 1990, and Census 2000. The 2004 population is a preliminary estimate.

Draft 2002 Myrtle Creek Transportation Plan
The draft Transportation Plan recommends using the state-approved average annual growth rate for Myrtle Creek of 2.5% per year, for both the City and the unincorporated areas outside of the City limits.

Douglas County Comprehensive Plan
The Douglas County Comprehensive Plan includes a section on population forecasts. It projects future population for the entire county, and also for the sub-areas of Coastal, North, Central, and South Douglas County. Myrtle Creek is included in the South sub-area. The predicted county-wide growth rate is 1.19% - 1.57% per year. For the South sub-area, population growth is predicted at 1.07% - 1.38% per year.

Interstate 5
ADT volumes for I-5 were taken from the Grave Creek Roseburg count stations. The counters indicate that traffic volumes have increased by 2.0% - 2.5% per year over the past decade.

TABLE 2.
I-5 AADT

	Grave Creek 17-001			Roseburg 10-005		
Year	ADT	Change from Previous Year	Change from 1994 to 2003	ADT	Change from Previous Year	Change from 2000 to 2003
1994	17,553	-		-	-	
1995	17,777	1.3%		-	-	
1996	17,662	-0.6%		-	-	
1997	18,467	4.5%		-	-	
1998	19,177	3.8%	2.4% per year	-	-	2.2% per year
1999	19,968	4.1%		-	-	
2000	20,354	1.9%		29,881	-	
2001	20,599	1.2%		29,871	0.0%	
2002	21,648	5.1%		31,532	5.5%	
2003	21,819	0.8%		31,953	1.3%	

Source: ODOT permanent count stations.

ODOT provides 20-year forecasts for all primary and secondary highways in the state. Forecast volumes for this segment of I-5 are shown in Table 3.

TABLE 3.
I-5 FORECASTS

	MP 103.65	MP 106.41	MP 107.91	MP 109.86
Year	S/o Riddle Road	S/o Weaver Road	S/o Myrtle Creek	S/o Boomer Hill Road
2002	26,000	25,900	26,100	30,700
2023	36,100	37,200	37,100	44,100
Growth Rate (linear)	1.84%	2.10%	2.00%	2.10%

Source: www.oregon.gov/ODOT/TD/TP/docs/TADR/Primary2023FVT.pdf.

FORECASTING METHODOLOGY

A multi-step approach was used for development of 2025 forecast volumes.

1. A background growth rate was applied to all roadways in the area. Based on the relatively low predicted population growth rates, a base rate of 0.75% per year was used.

2. A freeway volume growth rate of 1.7% per year was used based on ODOT's forecast volumes. The base growth rate for freeway ramps was the average of 0.75% and 1.7%, or 1.23%.

3. Locations, sizes, and zoning of vacant residential and industrial property clusters were available from the Umpqua Regional Council of Governments website, discussions with City staff, and research by Angelo Eaton. Expected areas of 20-year growth were mapped and then used to develop future volume estimates using average trip generation rates and average densities according to zoning. Daily and peak hour trips were distributed to adjacent roadways and intersections of interest as site-specific growth.

4. The background and site-specific growth were added to existing traffic volumes.

FUTURE DEVELOPMENT

Growth in the study area is somewhat limited by the natural features of the hillsides and river. Vacant or partially vacant parcels with potential for future development are shown on Figure 1.

Trip Generation - Residential
The trip generation characteristics for each of the parcels is outlined in Table 4. Generally the parcel acreage, zoning, percent built-out, and any development restrictions were available. An estimate was made for the number of residential units that could be added within 20 years. Then PM peak hour and ADT trips were calculated from these units.

Trip Generation - Commercial/Industrial
The trip generation characteristics for each of the parcels is outlined in Table 5. The parcel acreage, zoning, and percent built-out were available. Trip generation was based on the acreage and zoning to calculate PM peak hour and ADT trips.

Trip Distribution
Trips from these new development projects were distributed throughout the study area. The distribution was based on knowledge of local traffic patterns and on existing turning movement counts.

TABLE 4.
RESIDENTIAL GROWTH

Parcel	Acreage	Zoning	Vacant	Hillside	Floodplain	# of New Units
1	57	Large	Partial	Y	N	36
2	21	Small	Y	Partial	N	80
3	26	Large	Partial	Partial	N	2
4	3	Small	Y	N	N	9
5	86	Large	Partial	Partial	Partial	7
6	54	Large	Partial	Partial	N	5
7	38	Large	Partial	Partial	N	28
8	11	Small	Y	Y	N	41
9	32	Large	Partial	N	N	0
10	7	Small	Y	N	N	13
11	17	Large	Partial	N	Partial	2
12	2	Small	Y	N	Partial	12
13	90	Large	Y	Partial	N	69
14	6	Small	Y	Partial	N	24
15	10	Large	Partial	Y	Partial	5
16	61	Large	Partial	Partial	N	3
17	69	Large	Partial	Partial	N	50
18	4	Small	Y	N	N	8
19	3	Small	Y	N	N	14
20	15	Large	Y	Partial	N	14
21	98	Large	Partial	Partial	Partial	61
22	74	Large	Partial	Partial	Y	7
23	7	Small	Y	Partial	Partial	29
24	11	Small	Partial	Partial	N	22
25	9	Small	Partial	Partial	N	8
26	39	Large	Partial	Y	N	16
27	2	Small	Y	Partial	N	20
28	18	Large	Partial	N	Y	12
29	35	Large	Partial	N	N	21
30	6	Small	Y	N	N	15
31	19	Large	Partial	Partial	N	2
32	4	Small	Y	N	N	14
33	3	Small	Y	N	N	15
34	15	Large	Partial	N	N	12

The Douglas County Comprehensive Plan predicts a population growth rate of 1.07%-1.38% per year for the South sub-area.

New Houses	**675**
Added persons	1824
2004 Population	7,050
2025 Population	**8,874**
Avg. Annual Growth	**1.10%**

Notes: For calculation purposes, small lot is defined as 4.5 units/ acre, large lot is 1 unit/acre. In some cases the number of lots had already been defined, and was used instead of a calculation based on acreage.

TABLE 5.
COMMERCIAL/INDUSTRIAL GROWTH

Parcel	Acreage	Zoning	% Built Out during 20 years	ITE Daily Trips per acre	Added ADT
A	59	GM	80%	38	1,798
B	28	GM	80%	38	860
C	25	C3	80%	195	3,850
D	13	C3	80%	195	2,104
E	17	M2	80%	20	268
F	19	M2	80%	20	302
G	85	GM,M,IN	50%*	20	846

Zoning:
GM = General manufacturing (wood products, electronics, pharmaceuticals, publishing, automotive)
M2 = Medium Industrial (freight or truck yards, welding and machine shops, concrete batching, wholesale business)
C3 = General Commercial
* The Industrial Park is already partially built out.

2025 VOLUMES

The 2025 ADT and PM peak hour volumes are shown on Figures 4 and 5. For comparison purposes, the 2004 ADT and PM peak hour volumes are also provided in Figures 2 and 3.

In summary, the forecast volumes are based upon the following:

- A 0.75% background growth rate for the local roads, and a 1.7% growth rate for Interstate 5.
- Additional traffic from new residential development resulting in a 1.1% increase in population.
- Additional traffic from specific commercial/industrial development.

Overall, the average annual traffic growth rate ranges from 1-3% at most locations. This is consistent with the recommendations of the 2002 draft Myrtle Creek Transportation Plan.

Initials: imn
File Name: P:\O\ODOT00000462\0600INFO\0670Reports\Tech Memos\Draft MC TSP Forecasting 2_14_05.doc
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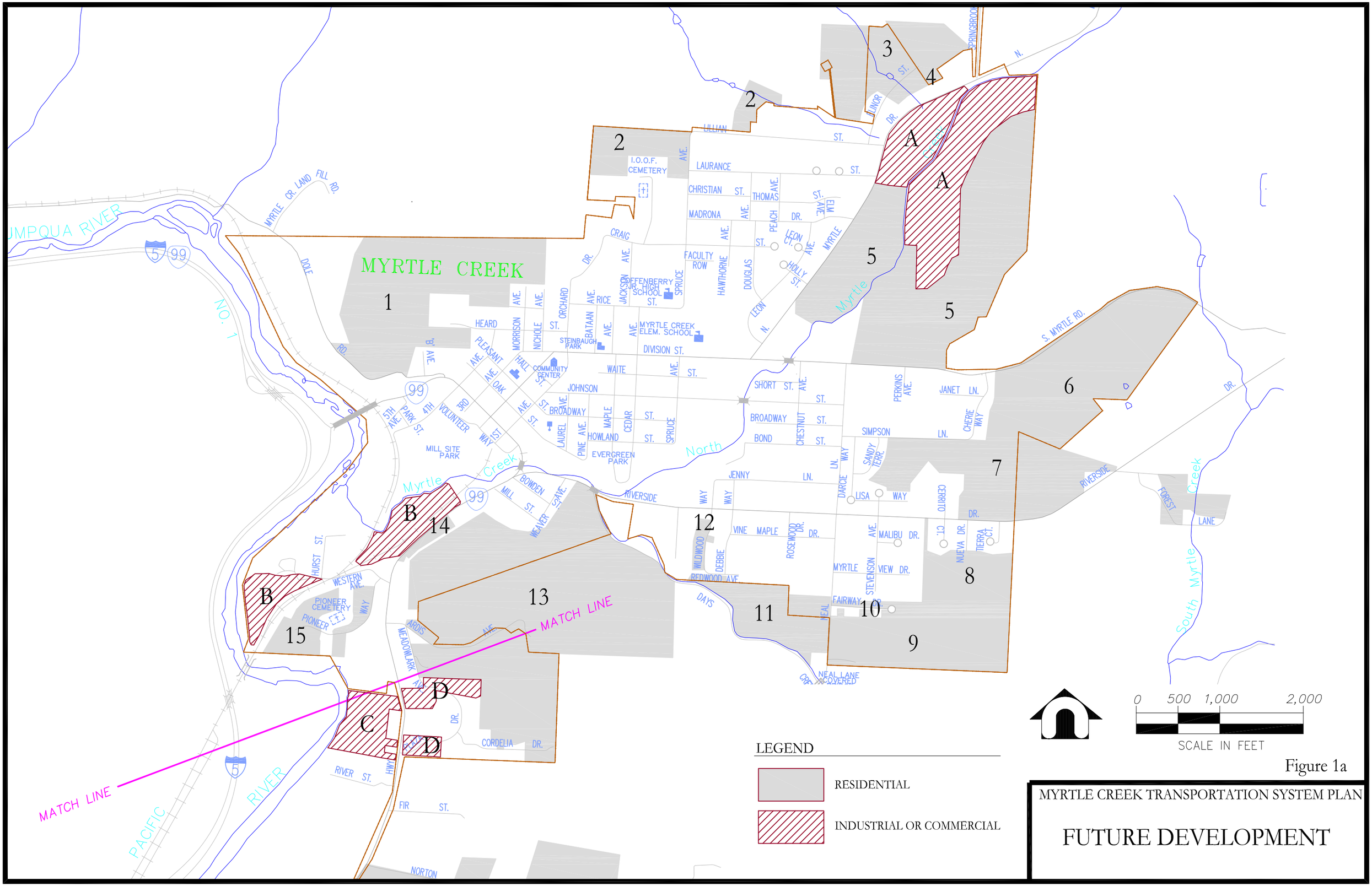


LEGEND

- RESIDENTIAL
- INDUSTRIAL OR COMMERCIAL

Figure 1a

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

FUTURE DEVELOPMENT

T. 30 S.

MATCH LINE

MATCH LINE

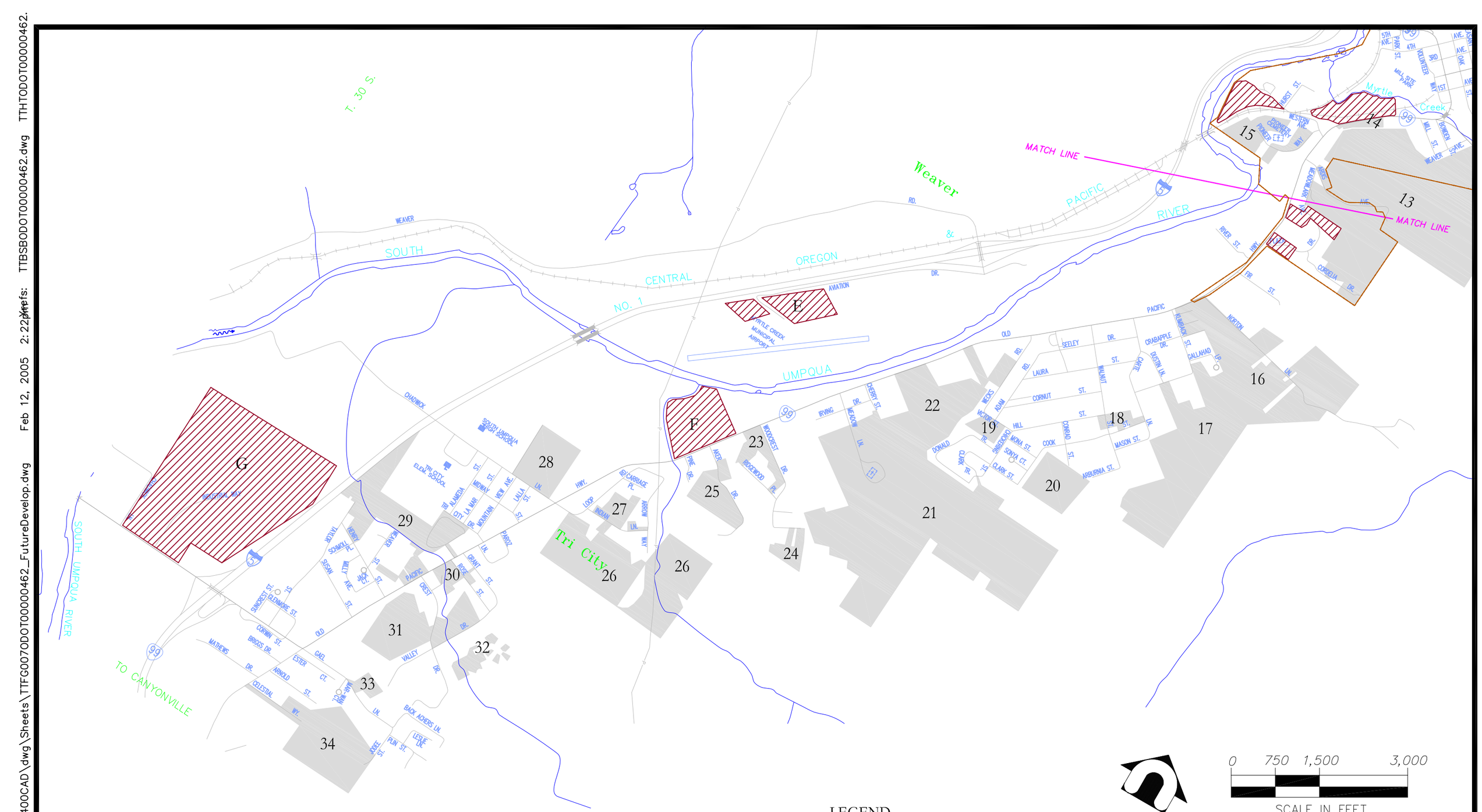
Weaver

Myrtle Creek

Tri City

TO CANYONVILLE

SOUTH UMPQUA RIVER



LEGEND

RESIDENTIAL

INDUSTRIAL OR COMMERCIAL

0 750 1,500 3,000

SCALE IN FEET

Figure 1b

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

FUTURE DEVELOPMENT

MYRTLE CREEK

UMPQUA RIVER

MATCH LINE

MATCH LINE

PACIFIC RIVER

Myrtle Creek

North Myrtle Creek

South Myrtle Creek

Days Creek

Myrtle Creek Cutoff

NEAL LANE COVERED BRIDGE

I.O.O.F. CEMETERY

PIONEER CEMETERY

MILL SITE PARK

EVERGREEN PARK

SITE PARK

COMMUNITY CENTER

JEFFENBERRY JR. HIGH SCHOOL

MYRTLE CREEK ELEM. SCHOOL

FACULTY ROW

MYRTLE CR. LAND FILL RD.

DOLF RD.

CRAIG DR.

LILLIAN ST.

LAURANCE ST.

CHRISTIAN ST.

MADRONA AVE.

ELMOR DR.

SPRINGBROOK N.

THOMAS AVE.

PEACH DR.

ELM AVE.

LEON CT.

HOLLY ST.

MYRTLE AVE.

DOUGLAS AVE.

HAWTHORNE AVE.

LEON N.

SPRUCE ST.

JACKSON ST.

ORCHARD AVE.

RICE ST.

BATAAN AVE.

HEARD AVE.

MORRISON AVE.

NICHOLE AVE.

PLEASANT AVE.

HALL AVE.

OAK AVE.

3RD ST.

VOLUNTEER WAY

1ST AVE.

PARK ST.

5TH AVE.

B AVE.

DIVISION ST.

WAITE ST.

JOHNSON AVE.

BROADWAY ST.

LAUREL ST.

MAPLE ST.

CEDAR ST.

PINE ST.

HOWLAND ST.

SPRUCE ST.

CHESTNUT ST.

SHORT ST.

PERKINS AVE.

JANET LN.

CHERIE WAY

SIMPSON LN.

BOND ST.

SANDY TERR.

D'ARCIE LN.

WAY

JENNY LN.

LISA WAY

CERRITO DR.

CT.

NUEVA DR.

TIERRA CT.

MALIBU DR.

VINE MAPLE DR.

ROSEWOOD DR.

WILDWOOD DEBBIE

REDWOOD AVE

MYRTLE VIEW DR.

STEVENSON

FAIRWAY DR.

NEAL

DAYS

RIVERSIDE

FOREST LANE

BOWDEN MILL ST.

WEAVER SAVE

HURST ST.

WESTERN AVE.

PIONEER WAY

ARDIS AVE.

MEADOWLARK AVE.

PLAZA DR.

CORDELIA DR.

HWY.

RIVER ST.

FIR ST.

NORTON

385
348
672
588
3289
1160
3138
3904
4060
1059
5128
5054
4640
2127
2283
2281
2218
2213
2102
1649
1471
376
420
864
896
915
944
4544
4977
764
484
575
1401
2795
2563

0 500 1,000 2,000

SCALE IN FEET

Figure 2a

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2004 AVERAGE DAILY TRAFFIC VOLUMES

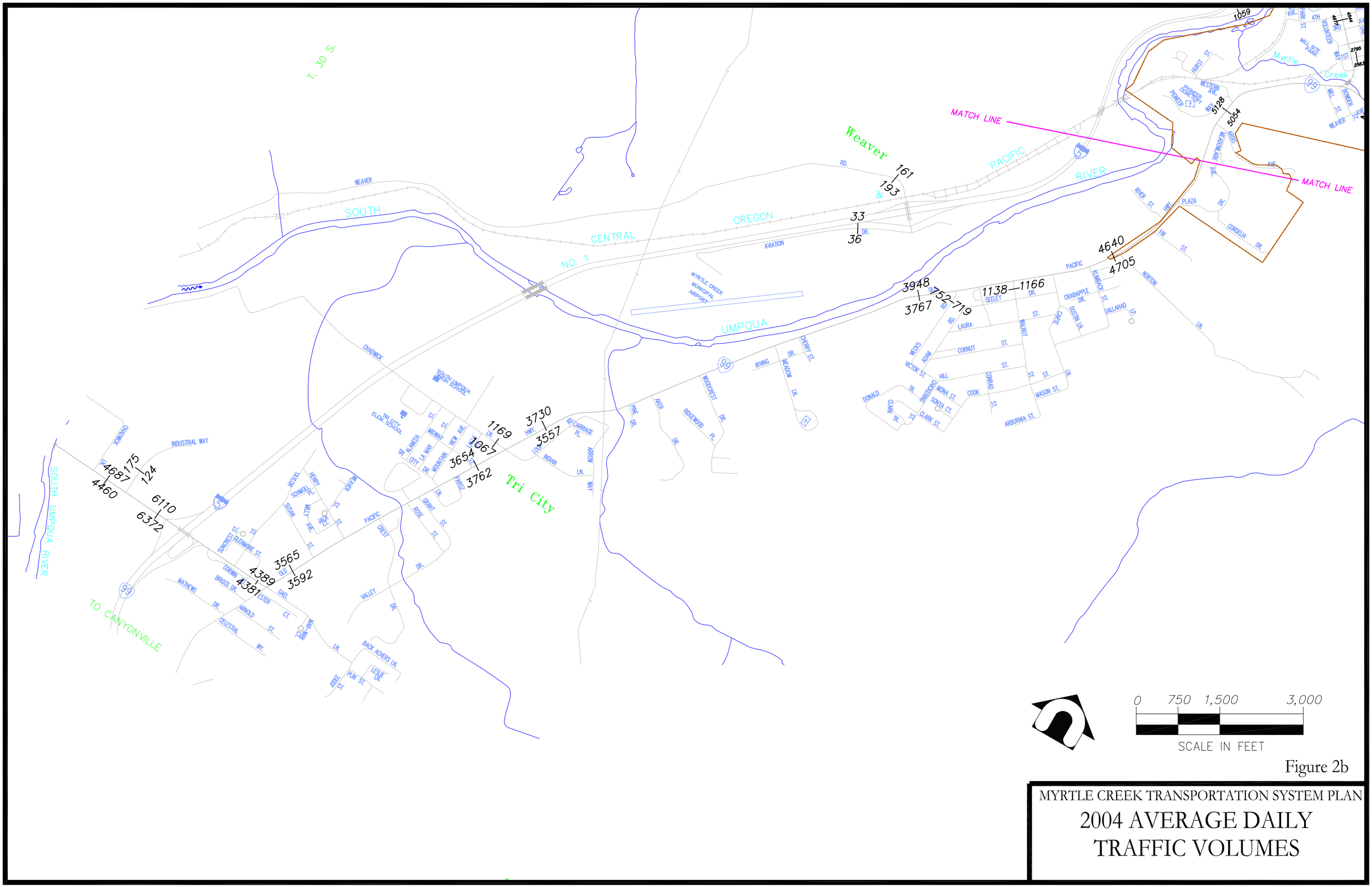


Figure 2b

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2004 AVERAGE DAILY TRAFFIC VOLUMES

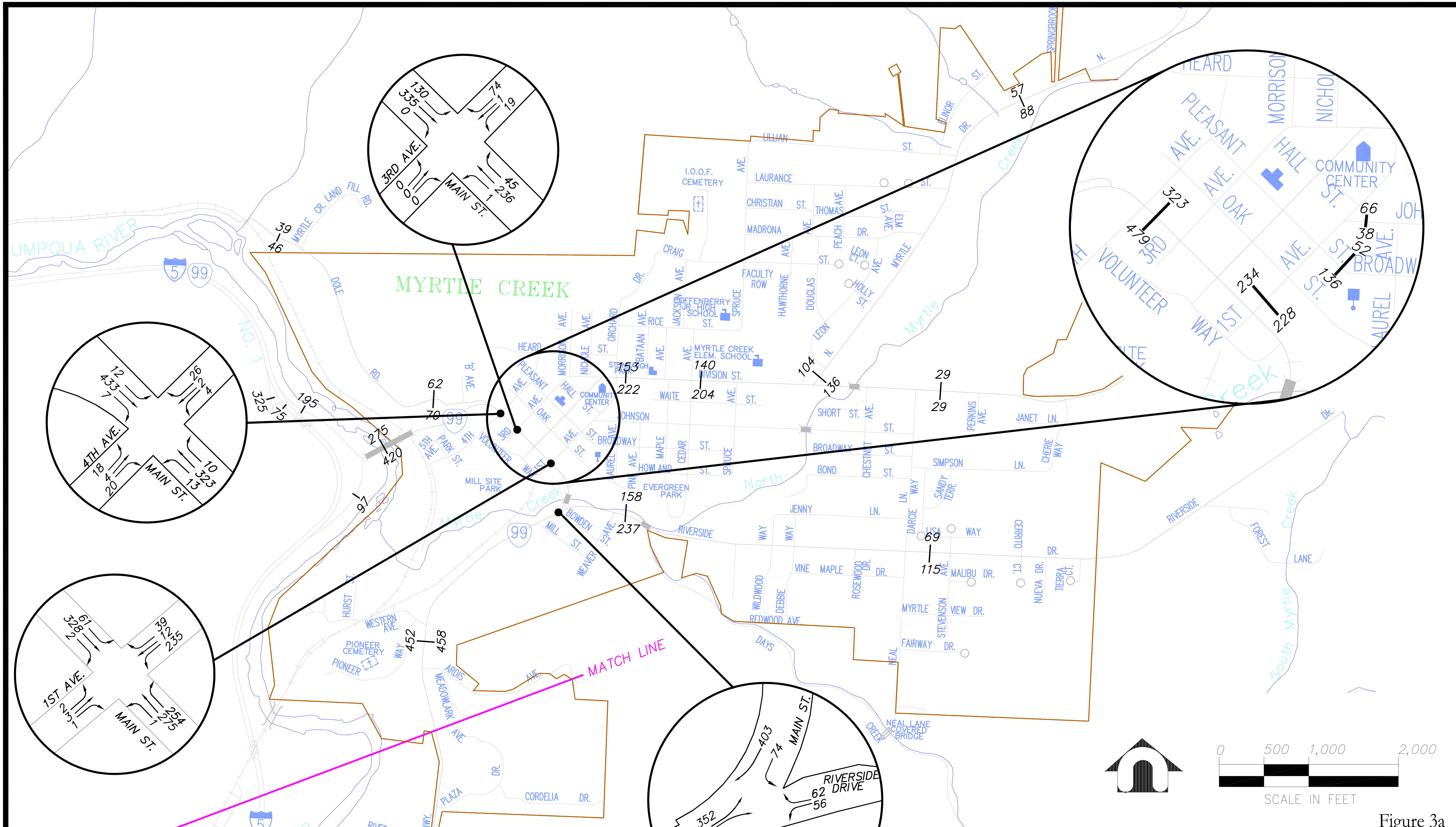


Figure 3a

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2004 PM PEAK HOUR TRAFFIC VOLUMES

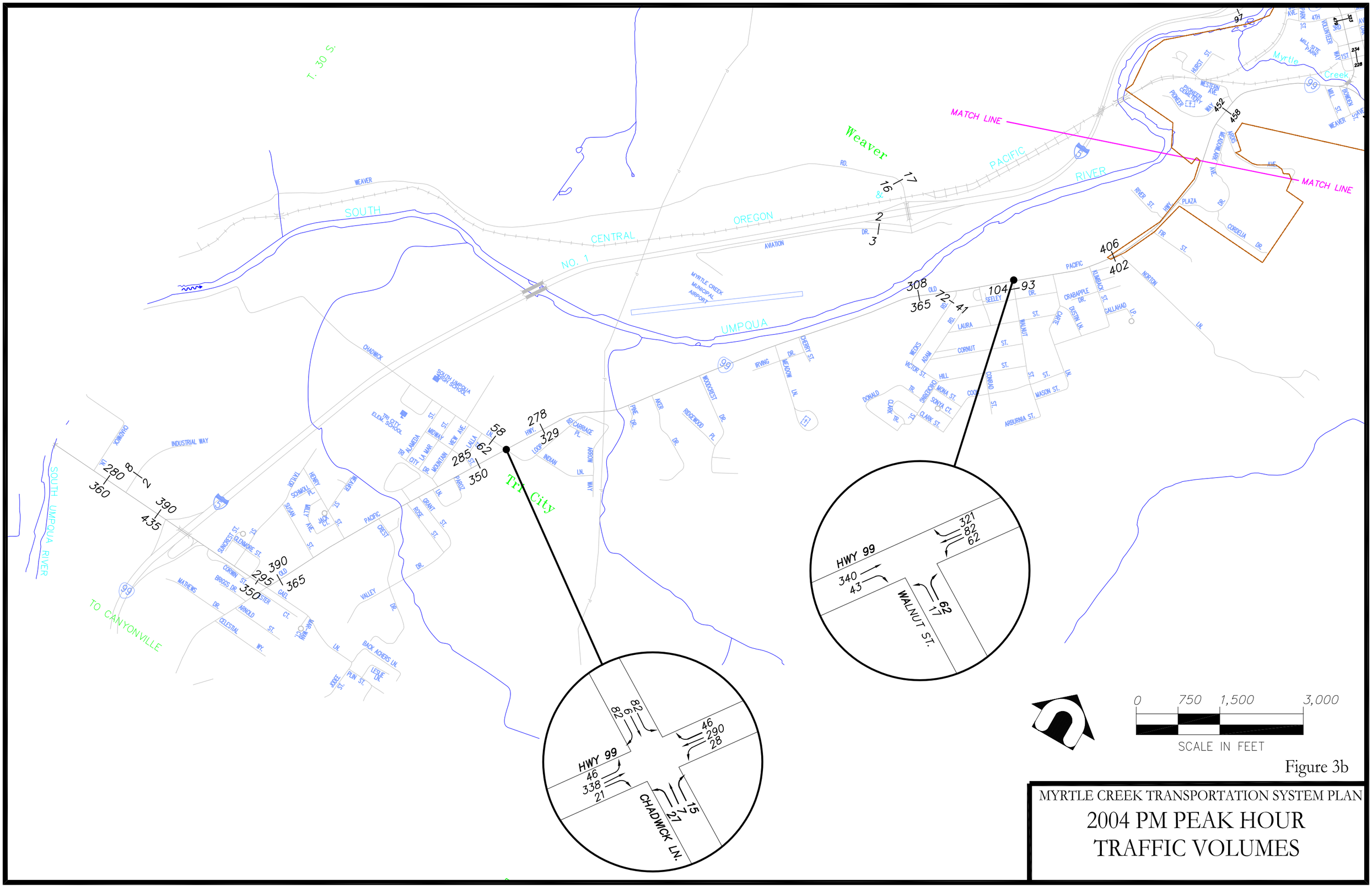


Figure 3b

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2004 PM PEAK HOUR TRAFFIC VOLUMES

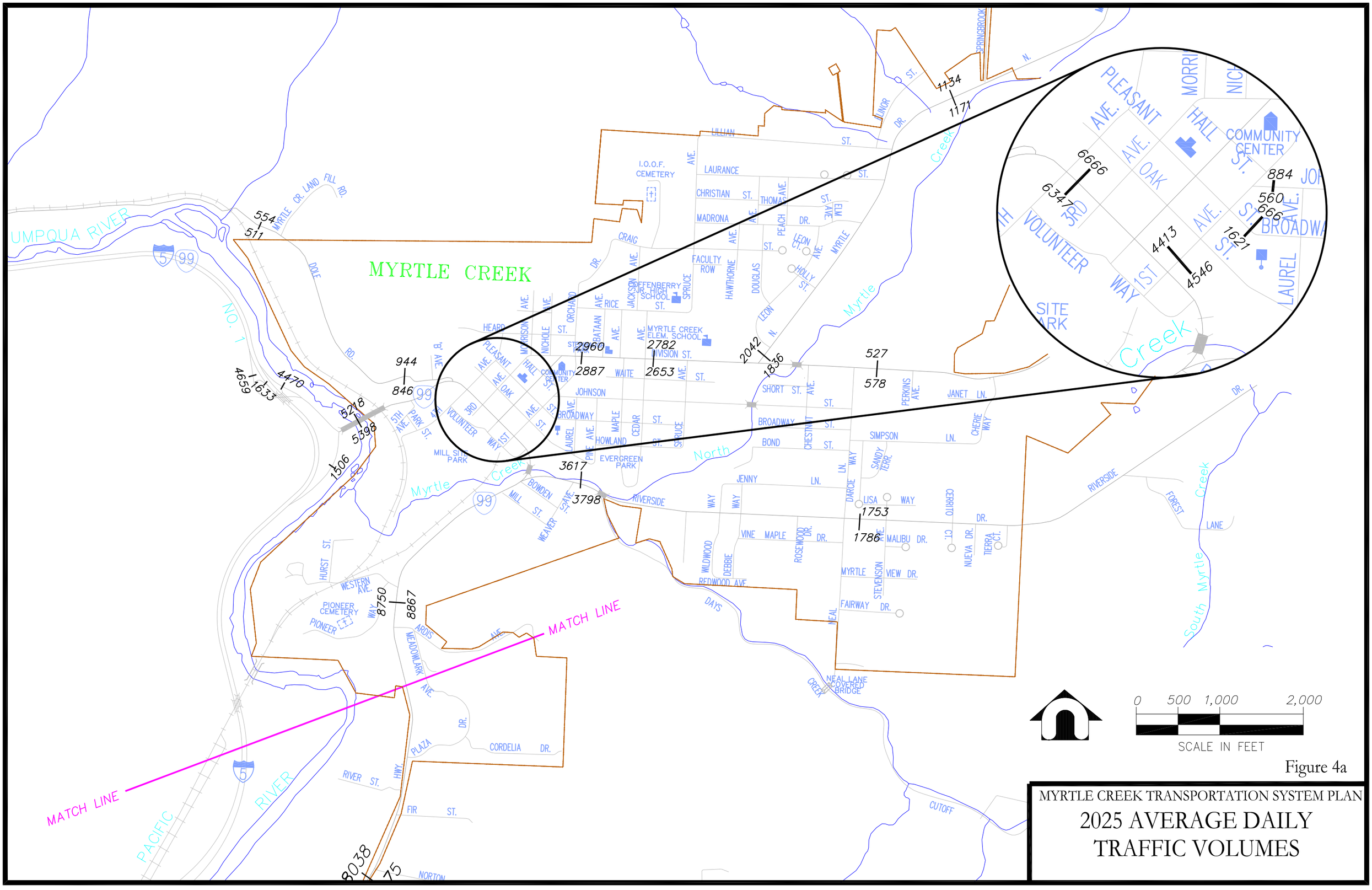
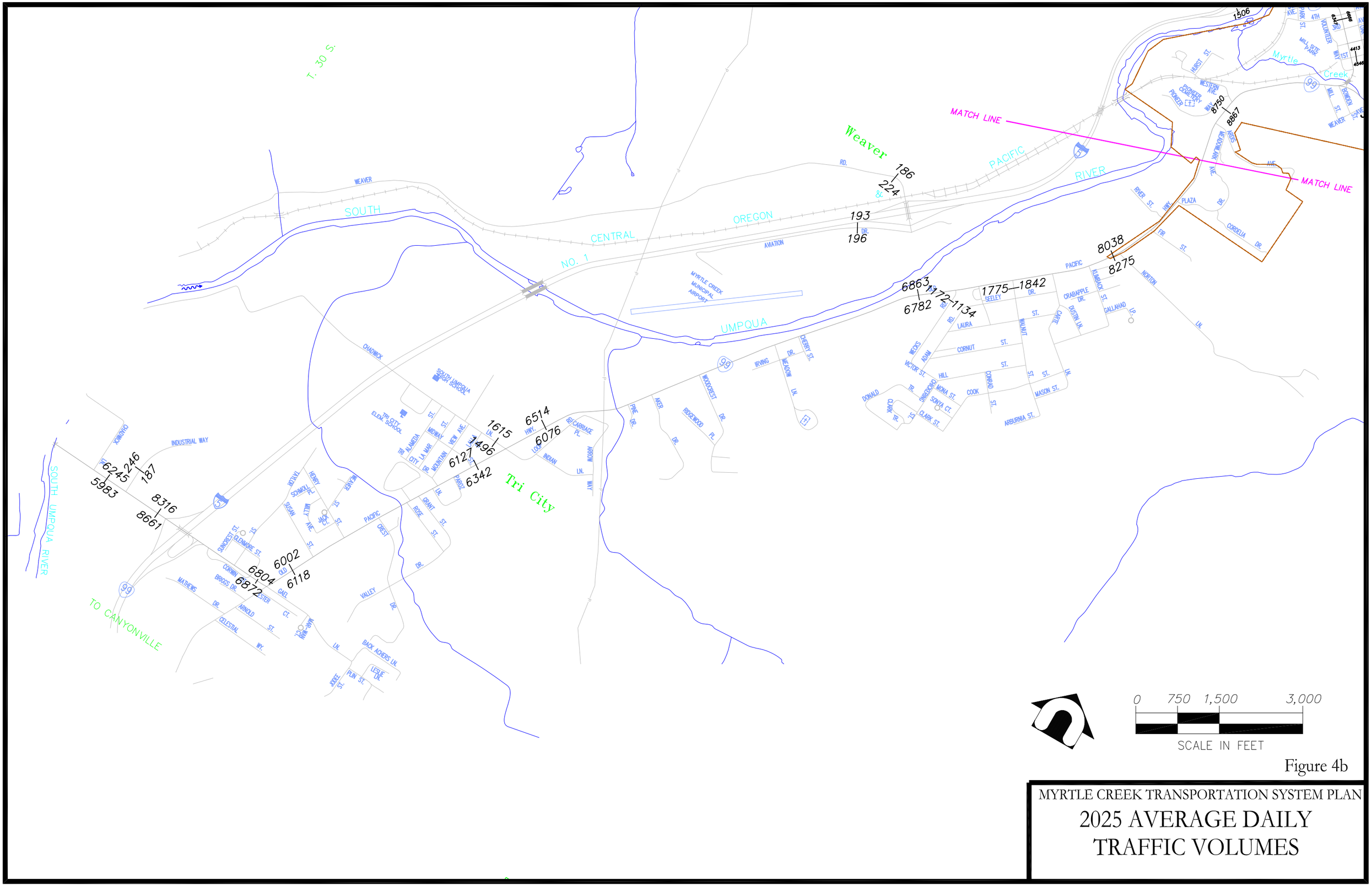


Figure 4a

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2025 AVERAGE DAILY TRAFFIC VOLUMES



0 750 1,500 3,000

SCALE IN FEET

Figure 4b

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2025 AVERAGE DAILY TRAFFIC VOLUMES

MYRTLE CREEK

UMPQUA RIVER

MATCH LINE

MATCH LINE

SCALE IN FEET

0 500 1,000 2,000

Figure 5a

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2025 PM PEAK HOUR TRAFFIC VOLUMES

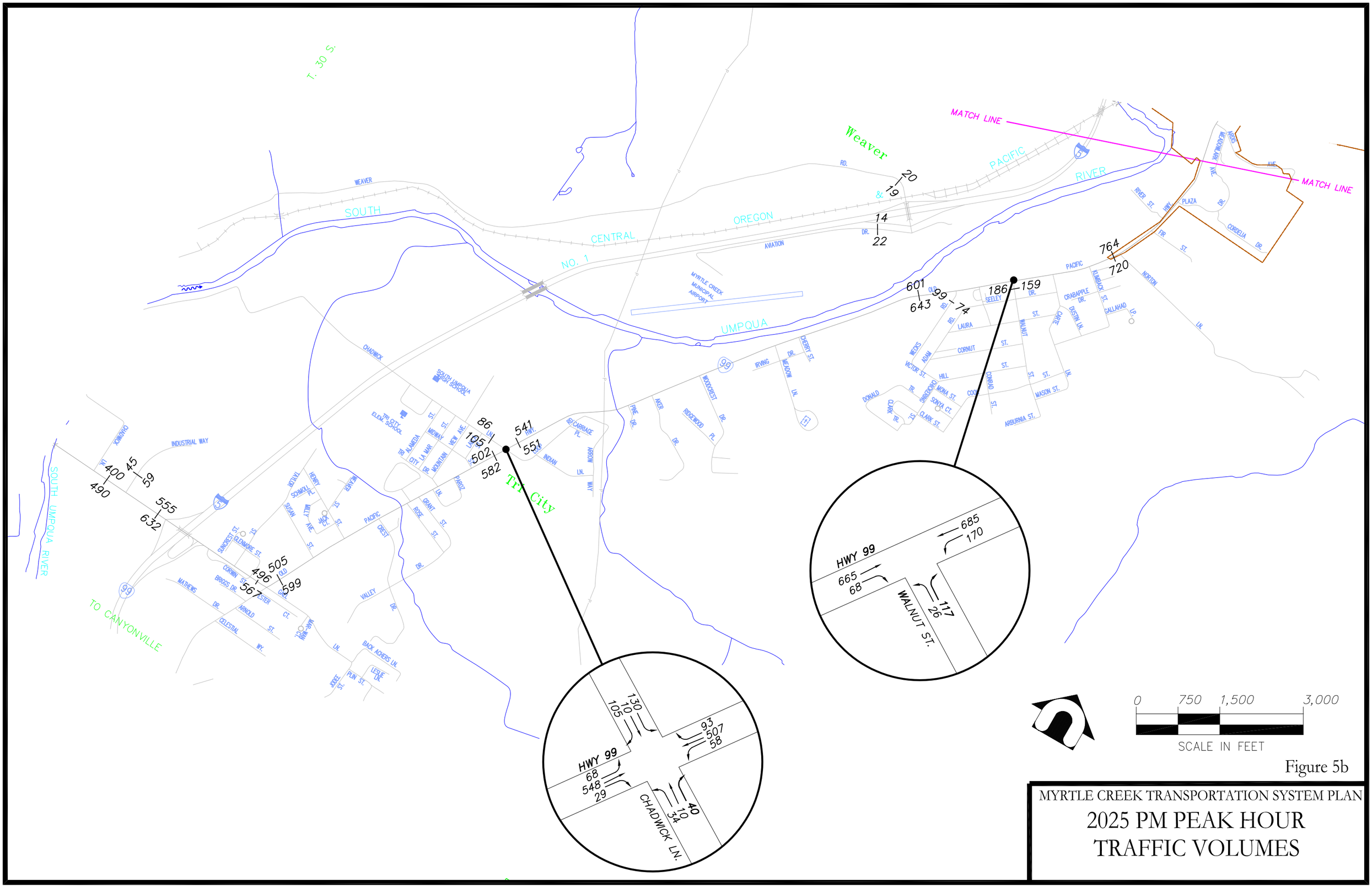


Figure 5b

MYRTLE CREEK TRANSPORTATION SYSTEM PLAN

2025 PM PEAK HOUR TRAFFIC VOLUMES

Appendix J.

Access Management Plan

DAVID EVANS
AND ASSOCIATES INC.

MEMORANDUM

DATE: April 2006

TO: Interchange 103/106/108 IAMP Technical Advisory Committee

FROM: David Evans and Associates, Inc.

SUBJECT: **Access Management Plan**

PROJECT: Interchange 103/106/108 IAMP

PROJECT NO: ODOT0000-0456

COPIES:

ACCESS MANAGEMENT

Background

One of the goals of the IAMP is to develop an access management strategy that helps preserve the functionality of the interchanges, protecting their ability to accommodate traffic volumes safely and efficiently into the future. Access to the roads connecting to the interstate system is vital to the adjacent property owners who need access for their businesses and residences. It has also been shown, however, that a proliferation of driveways and minor street intersections near a ramp terminal can drastically increase conflicts, causing operational problems, reducing the capacity of the intersections, and generally degrading service for all system users.

The access management strategy must balance the competing needs of traffic capacity and safety for I-5 and local access needs. The Oregon Highway Plan (OHP) devotes an entire section to the discussion of access management. More detailed requirements and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians. Ideally, a project will include provisions by which access within the project limits can be made fully compliant with Division 51. In many instances, however, access needed for existing development will not allow these standards to be met. When the requirements and standards cannot be met, the access management strategy must demonstrate progress toward meeting the applicable standards.

Although the access management plan imposes some restrictions and reductions of access for property near the interchanges, the plan may in fact, improve property values in the long term. This is because a primary advantage for these properties is easy access and close proximity to I-5. A comprehensive access management plan will help to maintain easy access for these properties by improving traffic circulation, mobility, and freeway access, thereby protecting these properties' locational advantage. In addition, access management actions in this plan do not prevent the properties from being used or developed to be used in a manner consistent with their adopted comprehensive planning designations.

Properties designated for a certain type of use will still have adequate access to be developed for that purpose.

Access Standards

OAR 734-051 and the OHP contain standards for private driveway and public road approach spacing based on highway classifications and speeds. According to these standards, the first full intersection on the crossroad at an interchange should be no closer than 1,320 feet for rural interchanges with two-lane crossroads. Approach roads that are less than 1,320 feet but no closer than 750 feet shall be limited to right-in/right-out. Requests for deviations from these standards can be made, and the process is outlined in OAR 734-051-0135.

OAR 734-51-0115 (1)(c)(C) and 734-051-0125 (1)(c)(C) require that "for a highway or interchange construction or modernization project…the project will improve spacing and safety factors by moving in the direction of the access management spacing standards, with the goal of meeting or improving compliance with the access management spacing standards." The OAR 734-051 and OHP access spacing standards apply to both streets and driveway approaches and are measured from the center of one access to the center of the next access on the same side of the road.

Existing Access and Permits

An inventory was conducted of public street intersections and approaches to major roads within the study area. The locations are shown on the access recommendation maps (Figures 1a, 1b, and 1c). Numerous access points do not meet ODOT's standards for access near the interchanges. For private approaches, information including the tax lot, property owner, use, and related information is summarized in the approach inventory and access management actions tables.

ODOT requires approach permits for approaches to highways under its jurisdiction, but many driveways and public streets predate the permitting process or have come into existence without permits. Access permits were found for only four approaches in the planning area. Of these, the permit for Weaver Road is outside of the 1,320 foot influence area. The permits for the properties near Interchange 108 provide access to Dole Road rather than the interchange crossroad and are therefore acceptable. The permit near Interchange 103 provides access to a rural use which will need to be addressed if the use changes.

Definitions

The following definitions are taken from a memorandum dated February 28th, 2005 from the Assistant Attorney General to ODOT's Access Management Program Manager.

Access Management Strategy (AMS): Is defined as a project delivery that identifies the location and type of approaches and any other necessary improvements to the highway (operations, medians, etc.) within the project area. The strategy must move the management of highway access in the direction of the spacing standards.

Access Management Plan (AMP): Is defined as an AMS plus a comprehensive area-wide solution for local access and circulation to minimize use of state highway for local access and circulation and to preserve the functional capacity of the highway. These planning actions could include relocating, severing or adding new city streets, land use controls, trip caps, and adoption of ordinances to allow cross-over easements.

Interchange Area Management Plan (IAMP): Is defined as a comprehensive access management plan for a grade separated interchange focused upon longer term management solutions to ensure safe and efficient operation between connecting roadways and to protect the functional integrity of the facility for the design life (at least 20 years). It must identify opportunities to improve operations through road projects and property development and redevelopment. An IAMP includes an AMS plus an AMP. The planning focus of an IAMP is for the longer-term operations of the facility and must address land uses, zoning and long-range planning strategies. Therefore, the planning area around a new interchange will extend approximately beyond the ramps.

The following definitions are taken directly from 734-051-0045:

Access Control: no right of access exists between a property abutting the highway and the highway. The right of access may have been acquired by the Oregon Department of Transportation or eliminated by law.

Influence area of an interchange: the area 1,320 feet from an interchange ramp terminal measured on the crossroad away from the mainline.

Move in the direction of: that changes in the approach(es) to a property abutting the highway would bring a site closer to conformance with existing highway standards including where existing approaches to the highway or expressway are combined or eliminated resulting in a net reduction in the number of approaches to the highway or expressway, improvements in spacing of private approaches or public approaches, or improvements to intersection sight distance.

Reasonable Access: the ability to access a property in a manner that meets the criteria under ORS 374.310(3) – see below:

> ***ORS 374.310(3)*** *The powers granted by this section and ORS 374.315 may not be exercised so as to deny any property adjoining the road or highway reasonable access. In determining what is reasonable, the department or county court or board of county commissioners shall apply the following criteria:*
> *(a) The access must be sufficient to allow the authorized uses for the property identified in the acknowledged local comprehensive plan.*
> *(b) The type, number, size and location of approaches must be adequate to serve the volume and type of traffic reasonably anticipated to enter and exit the property, based on the planned uses for the property.*

Reservation of Access: a limitation of a common law right of access to a specific location where the Department has acquired access control subject to restrictions that are designated in a deed. A reservation of access may include a use restriction limiting the right of access to a specified use or restriction against a specified use. A use restriction included in a reservation of access does not restrict turning movements nor does the absence of a use restriction allow unrestricted turning movements. A reservation of access affords the right to apply for an approach but does not guarantee approval of an Application for State Highway Approach or the location of an approach.

Right of access: the right of ingress and egress to the roadway and includes a common law right of access, reservation of access, or grant of access.

Change of Use of an Approach:

(1) This rule applies to private approaches existing under a valid Permit to Operate and private grandfathered approaches.

(2) A change of use of an approach occurs, and an application must be submitted, when an action or event identified in subsection (a) of this section, results in an effect identified in subsection (b) of this section.

(a) The Department may review an approach at the time of an action such as:

(A) Zoning or plan amendment designation changes;

(B) Construction of new buildings;

(C) Floor space of existing buildings increase;

(D) Division or consolidation of property boundaries;

(E) Changes in the character of traffic using the approach;

(F) Internal site circulation design or inter-parcel circulation changes; or

(G) Reestablishment of a property's use after discontinuance for two years or more.

(b) An application must be submitted when an action in subsection (a) of this section may result in any of the following:

(A) Site traffic volume generation increases by more than 250 average daily trips or 25 peak hour trips (external trip generation for multi-use developments).

(B) Operational problems occur or are anticipated.

(C) The approach does not meet sight distance requirements.

(D) The approach is not consistent with the safety factors set forth in OAR 734-051-0080(9).

(E) Use of the approach by vehicles exceeding 20,000 pound gross vehicle weight increases by 10 vehicles or more per day.

(3) The following actions do not constitute a change of use:

(a) Modifications in advertising, landscaping, general maintenance, or aesthetics not affecting internal or external traffic flow or safety; or

(b) Buildout or redevelopment of an approved site plan or multi-phased development within the parameters of a Traffic Impact Study that is less than five years old or where within parameters of the future year analysis of the Traffic Impact Study, whichever is greater, and that is certified by a Professional Engineer.

Access Management Strategy and Access Management Plan

This section identifies an access management strategy with short-term actions that may be implemented and that are consistent with the IAMP goals. The short-term actions are those that could be implemented in connection with the Interchange 103 Improvement Project and the South Umpqua Bridge improvements between Interchange 108 and Myrtle Creek. The Access Management Plan includes medium- and long-term actions recommended as land use changes and redevelopment occurs or in concurrence with future roadway improvement projects.

The strategy and actions in the IAMP are based on existing land uses for each parcel. When a property is developed, redeveloped or a change-of-use occurs, an application for an approach road will be required if access is proposed from the state highway system. At that time, any existing approach and any new proposed approach will be evaluated. The IAMP will guide ODOT when completing a change-of-use assessment.

For ease of understanding, numbers were assigned to all the approaches and adjacent parcels within the access study area. The "parcel numbers" correspond with the access numbers and are *not* consistent with the legal tax lot numbers. These assigned "parcel numbers" are used in the figures and within the text of this document for simplicity. The legal tax lot numbers associated with the assigned parcel numbers are included in the text of this document and within the approach inventory tables.

Considering the need to maintain reasonable access to existing properties while addressing safety priorities, the access management strategy and actions presented in this section of the IAMP are

intended to improve highway conditions by moving towards meeting the appropriate ODOT access management standards. This IAMP relies upon changes that will occur as part of future construction projects, or when property is developed, redeveloped, or undergoes a change-of-use to improve access spacing near the interchange.

As mentioned earlier, construction projects and land use changes near interchange 103, 106, and 108 will require approach permits from ODOT. As part of the approach permit approval process, deviation findings will be prepared if necessary, to explain why the approach can not meet the standards as required by OAR 734-051-0135 (Deviations from Access Management Spacing Standards). Modifying approach roads in the planning area to adhere to spacing standards would create safety and traffic operation problems. Therefore, deviation findings will identify OAR 734-051-0135 (5) as a rationale for approval of public approach deviations. As per OAR 734-051-0135 (7), the Region Access Management Engineer may require that a plan identifies measures to reduce the number of approaches to the highway in order to approve a deviation for a public approach. This IAMP identifies measures to reduce the number of approaches near Interchanges 103/106/108, and therefore would fulfill this potential requirement.

The overall goal of this access management plan is to protect traffic operations and safety within the interchange influence area. This will have the effect of protecting the state's investment in the interchange facilities while ensuring circulation necessary for good access to the highway. This will be accomplished using short, medium, and long-term actions in the area. Actions for individual approaches are summarized below.

ACCESS MANAGEMENT STRATEGY

Interchange 103

Access management actions will be incorporated into the bridge reconstruction and ramp building project that is planned for this interchange. The interchange will be reconfigured to one the following alternatives: either a standard or tight diamond configuration with a new northbound ramp in the northeast quadrant of the interchange, or a northbound loop ramp in the southeast quandrant with a new northbound ramp in the northeast.

These actions are illustrated in Figure 1a and are described as follows:

1. ODOT will acquire access control and jurisdiction of the interchange crossroad, Pruner Road, within the immediate interchange area. This access control area will encompass Pruner Road from the western boundary of Industrial Way's right-of-way (approximately 650 feet from the southbound ramp terminal) to the western boundary of Corwin Street's right-of-way (approximately 1,150 feet from the northbound ramp terminal).
2. Reservations of access will be issued for existing approaches within the access control area on Pruner Road, described above, for properties with no alternative access. A reservation of access

gives a property owner the right to submit an Application for State Highway Approach at a specific location where ODOT has acquired access control. A reservation of access may contain use restrictions and does not guarantee approval of the approach or the location of the approach.

3. ODOT will acquire Parcel 29 (T30S R5W Section 7C TL 300) and close access number 29 in the northwest quadrant of the interchange area. Parcel 29 is currently a gravel parking lot. For future development, ODOT may choose to work out an access agreement with the owner of Parcel 1 (T30S R5W Section 7C TL 200) providing Parcel 29 access to Industrial Way.
4. In the southwest quadrant of the interchange area, access to the Pruner Road Chevron (Parcel 6, T30S R5W 7C TL 400) shall be reduced from three access points (6a, 6b, and 6c) to two. Access 6a shall be narrowed from approximately 80 feet in width to 40 feet in width. 6b and 6c shall be combined to one access 40 feet in width. This new access point shall be restricted to right-in, right-out movements. A median shall be constructed on Pruner Road to prevent left turns in and out of this driveway.
5. To improve circulation, Parcel 6 (Chevron, T30S R5W 7C TL 400) should obtain a reciprocal cross-access agreement with Parcel 5 (T30S R5W 7C TL 500). Parcel 5 is currently used for parking large trucks and could easily have a lane reserved for truck maneuvering in and out of the service station.
6. In the southeast quadrant of the interchange area, Access 7, which provides access to Parcel 7 (Broasters Chicken, T30S R5W Section 7DC TL 400), shall be restricted to right-in, right-out movements. A deceleration lane shall be built on Pruner Road for an eastbound right-in movement and a median shall be constructed to prevent left turns in and out of this driveway.
7. If traffic signals are installed on Pruner Road between Industrial Way and Old Highway 99 as part of the Interchange 103 improvements, the signals shall be interconnected.

Interchange 106

No short-term access management actions are proposed for the Interchange 106 area.

Interchange 108

No short-term access management actions are proposed for the Interchange 108 area. Due to the configuration of the I-5 ramps, topographical constraints and limited number of existing approaches, new access management actions are not critical to the functioning of this interchange.

ACCESS MANAGEMENT PLAN

The access management plan consists of the medium- and long-term actions for the three interchanges. These actions are described below.

Medium-term Actions

Interchange 103

1. When a change of use occurs on Parcel 28 (T30S R5W Sec 7DB TL 2400), Access 28 onto Pruner Road will be restricted to right-in, right-out movements. Glenmore Street stubs to Parcel 28's eastern lot line providing an alternate access.

2. If a change of use occurs on Parcel 9 (Nickel Bowl T30S R5W Sec 7DC TL 200) or Pruner Road is widened along the parcel frontage, Access 9 will be moved to align with Corwin Street (Access 30).

3. Petite Street should be continued southward on the west side of the freeway to provide access to any future development of property behind (south of) the existing Chevron station and McDonalds restaurant on Pruner Road.

Interchange 106

Access management actions should be incorporated into the construction of a new bridge over the South Umpqua River. These actions are described as follows:

1. To the west of Interchange 106, ODOT will acquire access control and jurisdiction of Weaver Road within the interchange influence area to a distance of 1,320 feet of the I-5 ramp terminals. To the east of Interchange 106, ODOT will acquire access control and jurisdiction of Weaver Road from the ramp terminal to the abutment of the new Weaver Road bridge and to the north and south lot lines of Parcel 21 (T29S R5W Sec 32D TL 100).
2. Reservations of access will be issued for the north and south property lines of Parcel 21 (T29S R5W Sec 32D TL 100). Reservations of access will be issued for existing approaches within the interchange access control area for other properties with no alternative access. A reservation of access gives a property owner the right to submit an Application for State Highway Approach at a specific location where ODOT has acquired access control. A reservation of access may contain use restrictions and does not guarantee approval of the approach or the location of the approach.
3. Upon change of use, Parcel 1 (T29S R5W 32A TL 1500) should develop alternative access to Weaver Road spur road to the north of Weaver Road.
4. Circulation plans should be developed for large developments to provide access on secondary roadways as practical.
5. ODOT should work with the County to relocate the intersection of Weaver Road / Aviation Drive further east from the interchange.
6. In conjunction with a new Weaver Road bridge, intersection Access 28 would be relocated and redesigned.

7. In conjunction with a new Weaver Road bridge, driveway Access 20 will need to be relocated. Preferably, the parcel would take access from a secondary roadway.
8. If a change of use occurs on properties within 1,320 feet of the ramp terminals, access points will be consolidated.

Interchange 108

Access management actions should be incorporated into the re-alignment of I-5 if this project moves forward. These actions are described as follows:

1. The gravel parking area next to the river is currently used for river access and informally as a carpool lot. There is no defined driveway for this parking area with cars entering and exiting along its entire length. Reduce the access to a standard width, single access point to reduce conflicts and driver confusion when the alignment improvements occur.
2. As new development occurs, access to Old Pacific Highway should be closed for properties with alternative access points.

Long-term Actions

The long-term actions identified for the 103/106/108 IAMP apply to all three interchange areas. Long-term actions are those which should be implemented as land use changes/redevelopment applications occur, in concurrence with future roadway improvement projects, or as needed to rectify safety problems. General actions throughout the planning area include:

- Encourage redevelopment opportunities that consolidate access points.
- Encourage sharing of access points between adjacent properties.
- Offset driveways at proper distances to minimize the number of conflict points between traffic using the driveways and through-traffic.
- Provide driveway access via local roads where possible.
- Enforce access management spacing standards to the extent possible.
- Minimize driveway widths.
- When traffic signals are installed, interconnect them with adjacent signals to create a coordinated timing system.

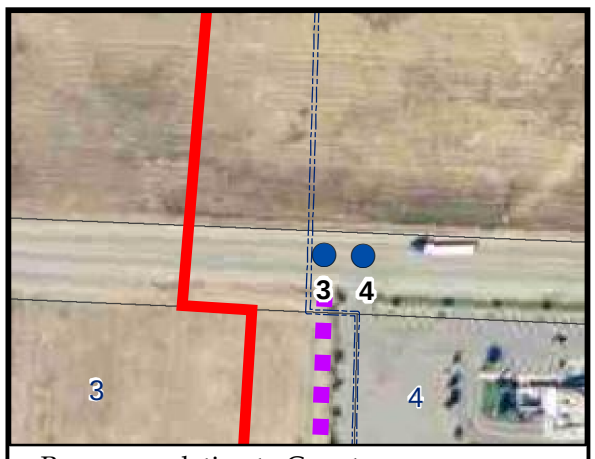
The factors that need to be considered for each approach before an access is altered include: access rights, safety concerns, existing and potential land use, existing site development including access use and function, parking, and circulation. Also, whether or not the property has more than one approach road to the state highway and if the property had available or potential access to a local street needs to be considered.

This plan recommends that Douglas County consider the following actions as well:

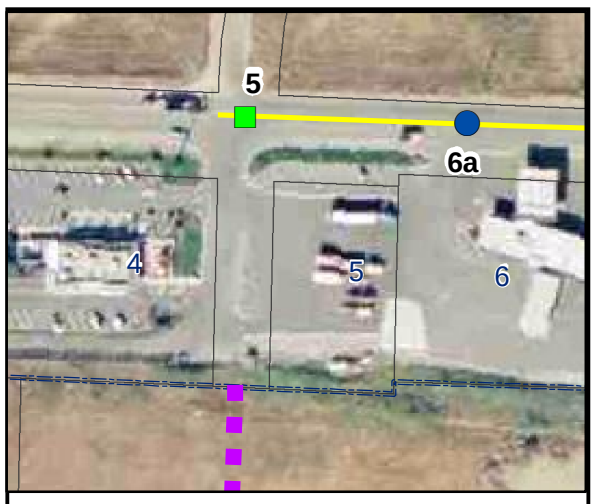
For Interchange 103

1. When Parcel 3 (T30S R5W 7C TL 900) is developed and a change of use occurs, a circulation road should be extended south along Parcel 4 (McDonald's, T30S R5W 7C TL 800) to provide access to the properties south of Pruner Road. At this time, driveway Access 4 to Parcel 4 would be closed and a new driveway connecting to the circulation road would be developed on the west side of Parcel 4.

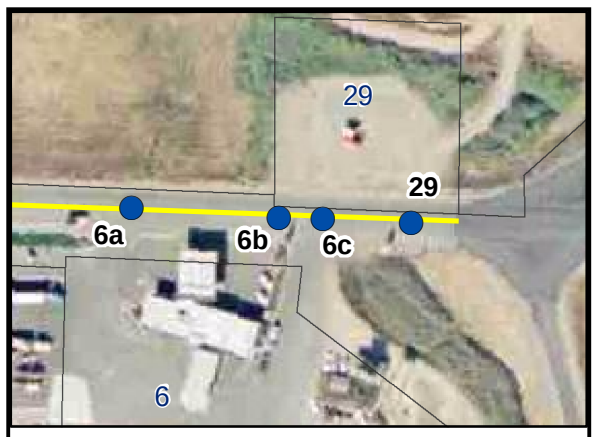
Attachments: 103 Approach Inventory and Access Management Actions, 106 Approach Inventory and Access Management Actions, 108 Approach Inventory and Access Management Actions, and Figures 1a-1c.



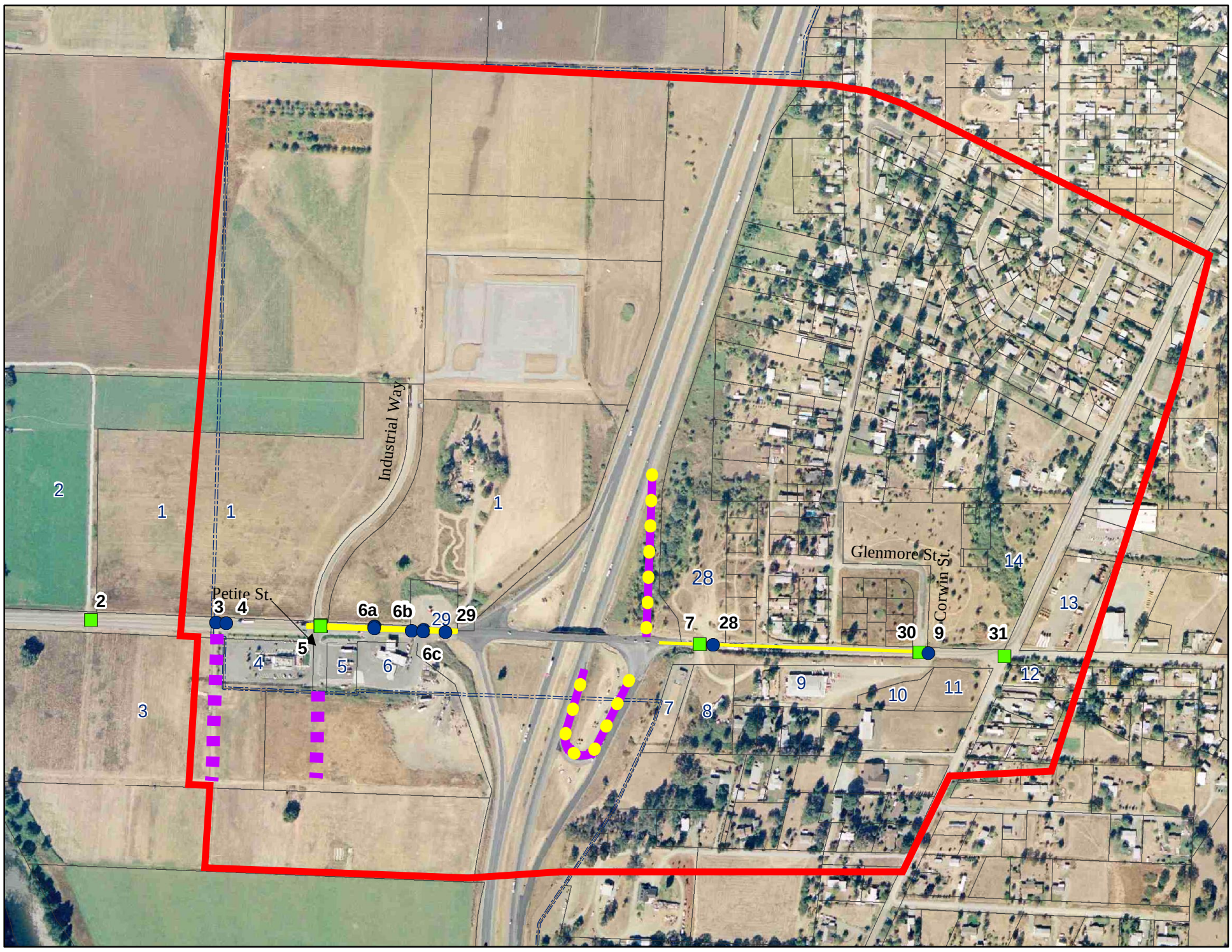
Recommendation to County:
When parcel 3 is developed, construct land circulation road to the south. Close driveway 4 and build new driveway off of circulation road.

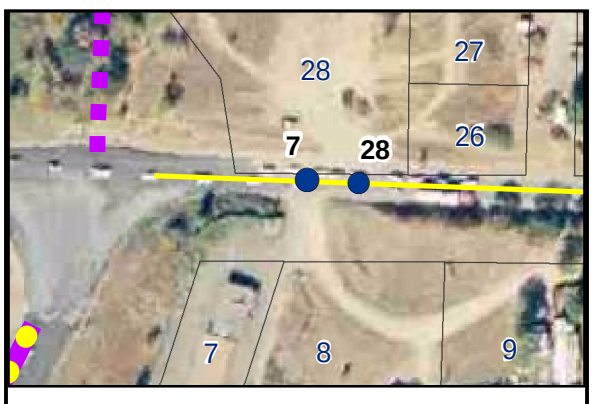


Continue building Petite Street southward to access properties south of existing commercial.

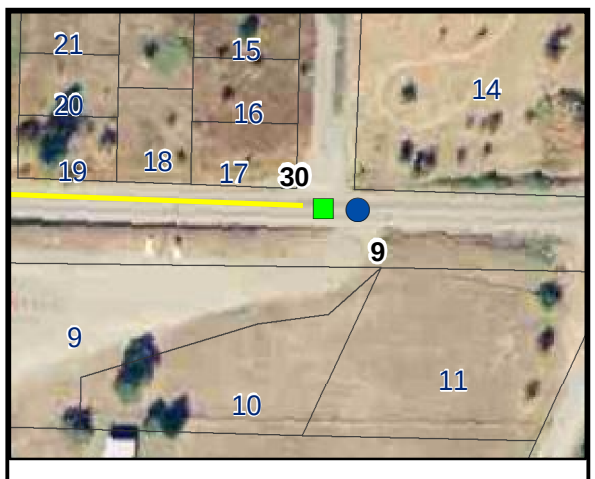


Narrow 6a to 40 feet and ensure reciprocal access agreement is in place with Parcel 5. Combine together 6b, 6c as right-in, right-out. Install median on Pruner Road. Close driveway 29 and develop alternative access to street.





Restrict all movements at driveways 7 and 28 to right-in, right-out. Install median on Pruner Road. Build deceleration lane for EB right-in to driveway 7. Parcel 28 has access via Glenmore Street to East.



Driveway 9 is aligned with approach 30 (Corwin St.). All movements allowed at intersection 30.

Legend

- Potential Ramp Modifications
- Future Public Road
- Road Approach
- Driveway Approach
- ODOT Access Control Area
- 3 — Approach Number
- 3 — Parcel Number
- Access Study Area
- Urban Growth Boundary

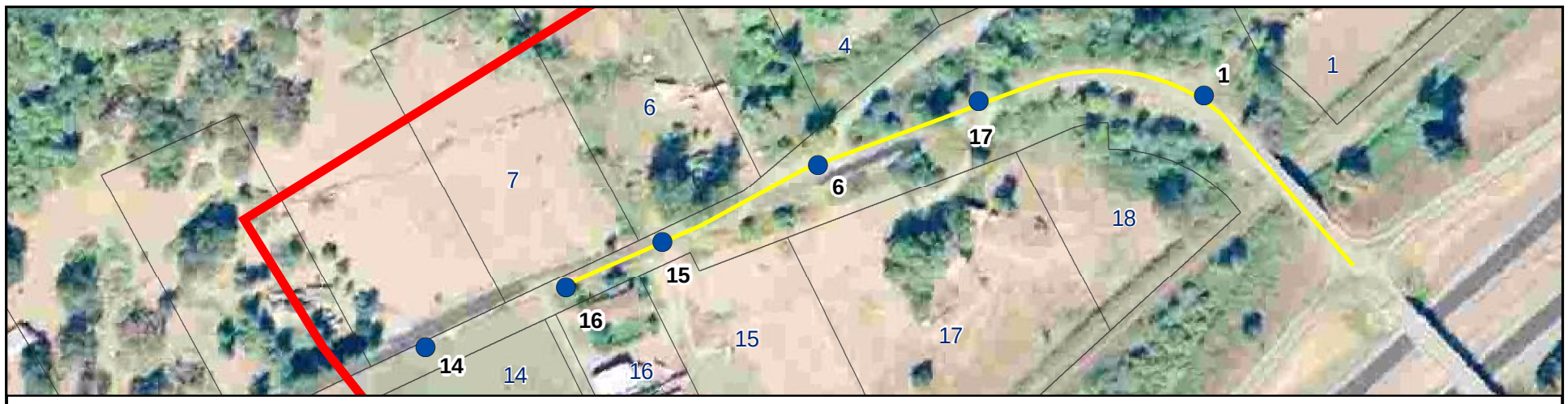
DAVID EVANS AND ASSOCIATES INC.

0 460 920
Feet

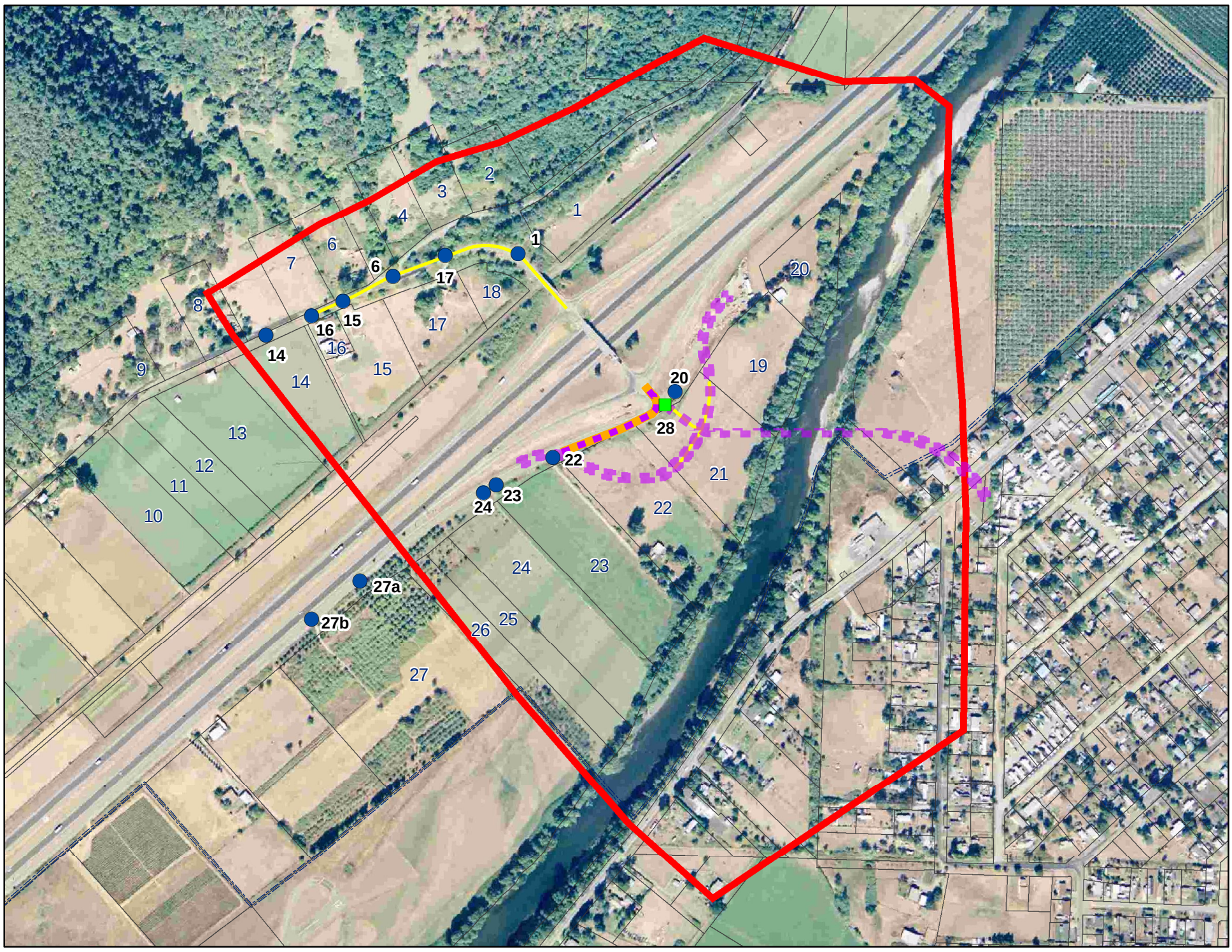
Notes:
The ODOT Access Control Area indicates the area in which ODOT will purchase rights of access.

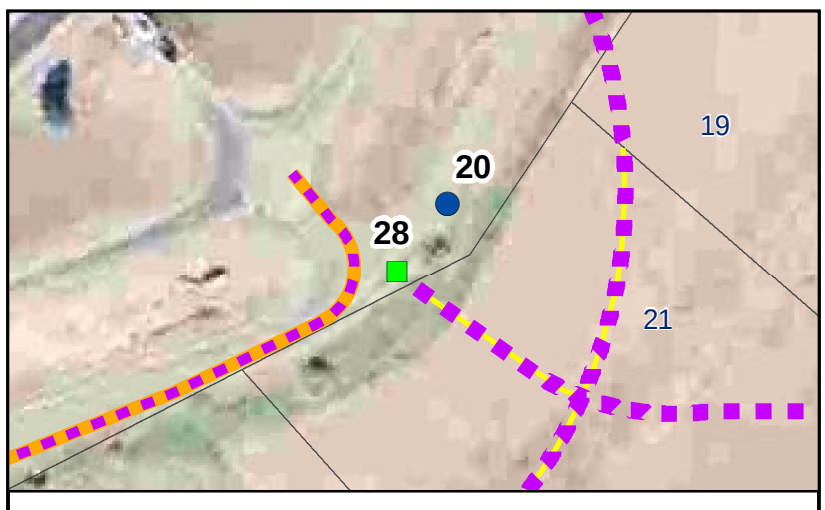
Figure 1a
Access Management Plan for
I-5 Interchange 103

December 2005



Consolidate access points on property lines when possible.
Develop plan for local circulation roads as properties develop.





Shift intersection 28 to align with reconfigured frontage road. Relocate driveway 20.

Legend

- Future Road
- Road Approach
- Driveway Approach
- ODOT Access Control Area
- 14 Approach Number
- 14 Parcel Number
- Access Study Area
- Urban Growth Boundary
- Remove Road

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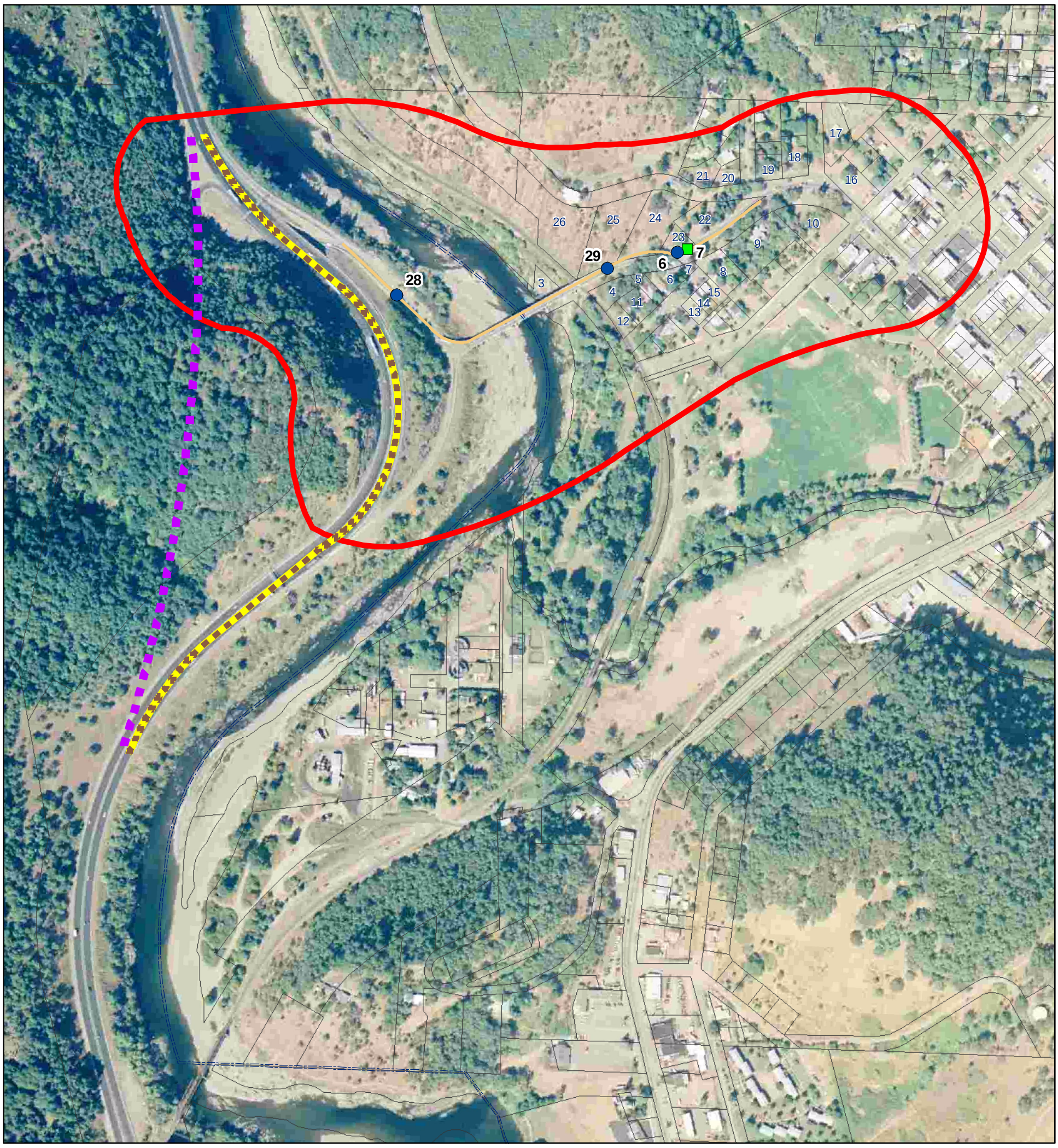
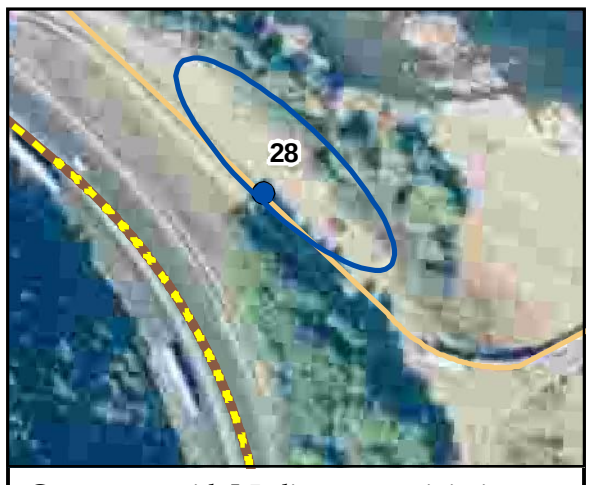
0 500 1,000
Feet

Notes:
The ODOT Access Control Area indicates the area in which ODOT will purchase rights of access.

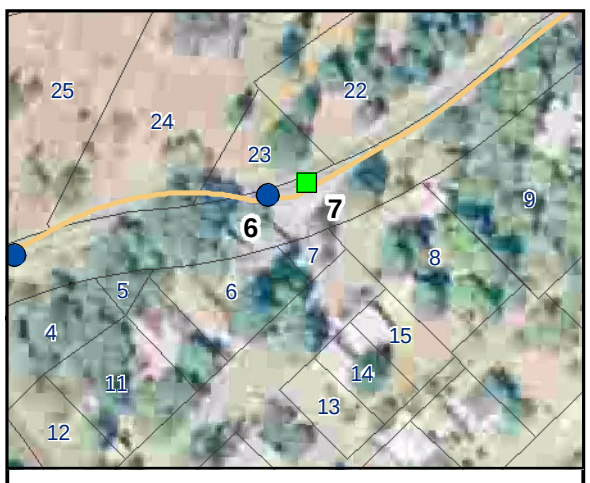
Figure 13
Access Recommendations for I-5 Interchange 106

February 2006





Concurrent with I-5 alignment, minimize access to a single point between bridge and ramp termini.



As development occurs, access to Old Pacific Highway should be closed for properties with alternative access points.

Legend

- Future Road
- Road Approach
- Driveway Approach
- Interchange Influence Area
- 6 Approach Number
- 6 Parcel Number
- Access Study Area
- Urban Growth Boundary
- Realign Road/Highway

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0 387.5 775
Feet

Notes:
The Interchange Influence Area indicates the area within 1,320 feet of the I-5 ramp terminal.

Figure 1c
Access Management Plan
for I-5 Interchange 108

December 2005

IC 103 IAMP Approach Inventory and Access Management Actions

Aerial Approach Number[1]	Loc. N/S E/W[2]	Tax Lot Number	Assesors Site Address	Property Use[4]	Business Name[5]	Approach Width (m)	Permit Info	Description	Short-Term Action	Medium-Long Term Action	ODOT Right-of-way Restrictions	ODOT File Number
1	N. of Riddle By-Pass, NW Quadrant of Interchange	T30S R5W Sec 7C TL 200	165 PRUNER RD.	Commercial / Retail / Farm				No Access.	No permit or existing approach. No action.	Upon development, property should take access via Industrial Way.	Complete Restriction to Parcel	21040
2	N. of Riddle By-Pass, NW Quadrant of Interchange	T30S R5W Sec 7C TL 100	1995 CHADWICK LANE	Residential		6.1 (20')		Intersection of Chadwick Lane with Old Pacific Hwy, also residential access	Outside approach restriction zone. No action.	No action.		
3	S. of Riddle By-Pass, SW Quadrant of Interchange	T30S R5W Sec 7C TL 900	330 PRUNER RD.	Farm		4.6 (15')	5883 - Driveway Access permitted allowing access "right next to McDonalds access"	Approach onto Old Pacific Highway	No action	Access Management Plan recommendation to Douglas County. When Parcel 3 is developed, construct local circulation road from Pruner Road to the south. Close driveway 4 and build a new driveway connecting to the circulation road.		
4	S. of Riddle By-Pass, SW Quadrant of Interchange	T30S R5W Sec 7C TL 800	280 PRUNER RD.	Restaurant	Mc Donalds	12.2 (40'), 6.1 (20')		Approach onto Old Pacific Highway	Issue reservation of access.	Access Management Plan recommendation to Douglas County. When Parcel 3 is developed, construct local circulation road from Pruner Road to the south. Close driveway 4 and build a new driveway connecting to the circulation road.		
5	S. of Riddle By-Pass, SW Quadrant of Interchange	T30S R5W Sec 7C TL 500	0 PRUNER RD.	Gas Station	Chevron	12.2 (40'), 6.1 (20')		Approach onto Old Pacific Highway	Existing approach is via Petite Street. No action.	No action.		
6a	S. of Riddle By-Pass, SW Quadrant of Interchange	T30S R5W Sec 7C TL 400	200 PRUNER RD.	Gas Station	Chevron	12.2 (40'), 6.1 (20')		Approach onto Old Pacific Highway	Narrow 6a to 40 feet, ensure reciprocal access agreement is in place with Parcel 5.	No action.	Complete Restriction to Highway. No control to Frontage Road	21042 (same for 400 & 700)
6b									Combine 6b, 6c into one driveway and reconstruct to allow only right-in, right-out movements. Install median to prohibit left turns.	No action.		
6c												
7	S. of Gael Lane, SE Quadrant of Interchange	T30S R5W Sec 7DC TL 400	860 S, OLD PACIFIC HWY	Restaurant	Broasters	15.2 (50')		Approach onto Dirt Road	Restrict all movements at Driveway 7 to right-in, right-out. Build deceleration lane for EB right-in movement.	No action.	Complete Restiction to Parcel	25774
8	S. of Gael Lane, SE Quadrant of Interchange	T30S R5W Sec 7DC TL 300	854 S. OLD PACIFIC HWY						No action	No action.		
9	S. of Gael Lane, SE Quadrant of Interchange	T30S R5W Sec 7DC TL 200	670 S OLD PACIFIC HWY / 187 PEACOCK LN	Bowling Alley	Nickel Bowl	12.2 (40')		Approach onto Dirt Road	No action.	If a change of use occurs on property 9, or widening of Pruner Road occurs along the frontage, move driveway #9 to align with Corwin St. (Approach 30).		
10	S. of Gael Lane, SE Quadrant of Interchange	T30S R5W Sec 7DC TL 201	0 S OLD PACIFIC HWY						No action.	No action.		
11	S. of Gael Lane, SE Quadrant of Interchange	T30S R5W Sec 7DC TL 100	0 S OLD PACIFIC HWY						No action.	No action.		
12	S. of Gael / E. of Old Highway 99	T30S R5W Sec 7DD TL 1900	592 BILLS RD.	Residential		3.0 (10')		Approach onto Bills Road	Outside approach restriction zone. No action.	No action.		
13	N. of Gael / E. of Old Highway 99	T30S R5W Sec 7DA TL 1800	125 GAEL LN	Commercial Storage		6.1 (20')		Approach onto Gael Lane	No action. Has approach on Gael Lane	Will continue to have access to Gael Lane.		
14	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 4000	0 TAYLOR ST						No action.	Upon development, parcel will access Corwin, Glenmore, Taylor, and/or Old Pacific Highway.		
15	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 4900	595 CORWIN ST						No action. Has approach on Corwin St.	Will continue to have access to Corwin St.		
16	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5000	605 CORWIN ST	Residential		3.0 (10')		Approach onto Corwin Street	No action. Has approach on Corwin St.	Will continue to have access to Corwin St.		

IC 103 IAMP Approach Inventory and Access Management Actions

Aerial Approach Number[1]	Loc. N/S E/W[2]	Tax Lot Number	Assesors Site Address	Property Use[4]	Business Name[5]	Approach Width (m)	Permit Info	Description	Short-Term Action	Medium-Long Term Action	ODOT Right-of-way Restrictions	ODOT File Number
17	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5100	609 CORWIN ST						No action. Has approach on Corwin St.	Will continue to have access to Corwin St.		
18	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5200	119 GLENMORE ST						No action.	Develop alternative access.		
19	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5600	610 TAYLOR ST						No action. Has approach on Taylor St.	Will continue to have access to Taylor St.		
20	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5500	604 TAYLOR ST						No action. Has approach on Taylor St.	Will continue to have access to Taylor St.		
21	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 5400	590 TAYLOR ST						No action. Has approach on Taylor St.	Will continue to have access to Taylor St.		
22	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 3800	601 TAYLOR ST						No action. Has approach on Taylor St.	Will continue to have access to Taylor St.		
23	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 3900	611 TAYLOR ST						No action. Has approach on Taylor St.	Will continue to have access to Taylor St.		
24	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 2800	610 SUNCREST ST						No action. Has approach on Suncrest St.	Will continue to have access to Suncrest St.		
25	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 2900	600 SUNCREST ST						No action. Has approach on Suncrest St.	Will continue to have access to Suncrest St.		
26	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 2700	615 SUNCREST ST						No action. Has approach on Suncrest St.	Will continue to have access to Suncrest St.		
27	N. of Gael Lane, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 2600	0 SUNCREST ST						No action. Has approach on Suncrest St.	Will continue to have access to Suncrest St.		
28	N. of Pruner Rd, NE Quadrant of Interchange	T30S R5W Sec 7DB TL 2400	0 TAYLOR ST	Commercial Vacant		9.1 (30')		Approach onto Old Pacific Highway	No action.	When a change of use occurs, driveway 28 will be restricted to right-in, right-out. New median in Pruner to prohibit left turns. Glenmore Street stubs to parcel 28 providing alternate access.	Complete Restriction to Parcel - one line. Second line -Controlled to County Road. Completely restricted westerly of a point which is 210 ft. Easterly of the SW corner of Gov. Lot 2	48656 & 37814
29	N of Pruner Rd, NW Quadrant of Interchange	T30S R5W Sec 7C TL 300	none	Vacant, Informal car sales				Gravel Parking	ODOT will purchase property and access control.	Construct new access via local circulation road connecting to Industrial Way when property is developed.		
30	Intersection of Corwin St & Pruner Rd, NE Quadrant of Interchange			Street				Corwin Street	No action.	No action.		
31	Intersection of Old Pac Highway and Pruner Rd			Street				Old Pacific Highway	No action.	No action.		

1. Numbers assigned to access points as shown on the aerials.
2. This indicates the side of the roadway/ramp that the approach is on, from the perspective of driver.
3. Property owner and address from the tax assessor data.
4. Property use describes type of use on property. For example "ice cream store."
5. Business name is for example "Top Banana." Business name and use may seem redundant, but the use may not be apparent from the name.

IC 106 IAMP Approach Inventory and Access Management Actions

Aerial Approach Number[1]	Loc. N/S E/W[2]	Tax Lot Number	Assesor Site Address	Property Use[4]	Business Name[5]	Approach Width (m)	Permit Info	Description	Short-Term Action	Medium-Long Term Action	ODOT Access Restrictions	Access File Number
1	N. of WeaverS. of County Road	T29S R5W Sec 32A TL 1500	271 Weaver Road	Residential		6.1 (20')		Approach onto Weaver Road	Issue reservation of access at this location restricted to farming use.	Develop alternative access through Weaver Spur.	Could have restrictions two file nos with no tls - both call for complete restriction to Hwy. One calls for No control to frontage road	22482 & 25622
2	N. of County Road	T29S R5W Sec 32A TL 200	0 Weaver Road						No permit or existing approach. No action.	No action.		
3	N. of County Road	T29S R5W Sec 32A TL 300	0 Weaver Road						No permit or existing approach. No action.	No action.		
4	N. of County Road	T29S R5W Sec 32A TL 400	0 Weaver Road						Access via Weaver Spur. No action.	No action.		
5	N. of County Road	T29S R5W Sec 32 TL 100	0 Weaver Road						No permit or existing approach. No action.	No action.		
6	N. of Weaver	T29S R5W Sec 32A TL 500	305 Weaver Road	Residential		3.0 (10')		Approach onto Weaver Road	Issue reservation of access at this location restricted to farming and residential use.	With development,work to consolidate access with property 7. Develop local street circulation plan.		
7	N. of Weaver	T29S R5W Sec 32A TL 600	0 Weaver Road						Issue reservation of access at this location restricted to farming use.	With development, work to consolidate access with property 6. Develop local street circulation plan.		
8	N. of Weaver	T29S R5W Sec 32A TL 700	419 Weaver Road	Residential		3.0 (10')		Approach onto Weaver Road	Outside approach restriction zone. No action.	No action.		
9	N. of Weaver	T29S R5W Sec 32A TL 800	0 Weaver Road						Outside approach restriction zone. No action.	No action.		
10	S. of Weaver	T29S R5W Sec 32C TL 2000	0 Weaver Road						Outside approach restriction zone. No action.	No action.		
11	S. of Weaver	T29S R5W Sec 32C TL 2100	0 Weaver Road						Outside approach restriction zone. No action.	No action.		
12	S. of Weaver	T29S R5W Sec 32C TL 2200	0 Weaver Road						Outside approach restriction zone. No action.	No action.		
13	S. of Weaver	T29S R5W Sec 32C TL 2300	0 Weaver Road		Residential / Farm	4.6 (15')		Approach onto Weaver Road	Outside approach restriction zone. No action.	No action.		
14	S. of Weaver	T29S R5W Sec 32A TL 900	400 Weaver Road				12048		Outside approach restriction zone. No action.	No action.		
15	S. of Weaver	T29S R5W Sec 32A TL 1100	364 Weaver Road		Residential	3.0 (10')		Approach onto Weaver Road	Issue reservation of access at this location restricted to residential and farming use.	With future development, work to consolidate access with property 16. Develop local street circulation plan.		
16	S. of Weaver	T29S R5W Sec 32A TL 1200	368 Weaver Road		Residential	3.0 (10')		Approach onto Weaver Road	Issue reservation of access at this location restricted to residential and farming use.	With future development, work to consolidate access with property 15. Develop local street circulation plan.		

IC 106 IAMP Approach Inventory and Access Management Actions

Aerial Approach Number[1]	Loc. N/S E/W[2]	Tax Lot Number	Assesor Site Address	Property Use[4]	Business Name[5]	Approach Width (m)	Permit Info	Description	Short-Term Action	Medium-Long Term Action	ODOT Access Restrictions	Access File Number
17	S. of Weaver	T29S R5W Sec 32A TL 1300	240 Weaver Road		Residential	4.6 (15')		Approach onto Weaver Road	Issue reservation of access at this location restricted to residential and farming use.	With future development, relocate driveway to southwest side of property. Develop local street circulation plan.		
18	S. of Weaver	T29S R5W Sec 32A TL 1400	0 Weaver Road						No permit or existing approach. No action.	With future development, develop access through parcel 17.		
19	NE of Weaver @ Airport	T29S R5W Sec 32A TL 1800	0 Weaver Road						No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47660
20	NE of Weaver @ Airport	T29S R5W Sec 32A TL 1700	100 Aviation Dr.		Residential	9.0		????	No action.	With Weaver Rd bridge, the Weaver Rd./Aviation Dr. intersection will be relocated and redesigned. Preferably access will be via secondary road.	Complete Restriction to Hwy.	21012 & 22483
21	S. of Airport Access	T29S R5W Sec 32D TL 100	0 Aviation Dr						No action.	ODOT will acquire access control and issue a reservation of access along the north and south lot lines.	Complete Restriction to Hwy. No control to Frontage Rd.	47661
22	S. of Airport Access	T29S R5W Sec 32D TL 200	322 Aviation Dr.		Residential / Farm	3.0 (10')		Approach onto Aviation Drive	No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47662
23	S. of Airport Access	T29S R5W Sec 32D TL 300	0 Aviation Dr		Farm	3.0 (10')		Approach onto Aviation Drive	No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47663
24	S. of Airport Access	T29S R5W Sec 32D TL 500	0 Aviation Dr		Farm	3.0 (10')		Approach onto Aviation Drive	Outside approach restriction zone. No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47664
25	S. of Airport Access	T29S R5W Sec 32D TL 600	0 Aviation Dr						Outside approach restriction zone. No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47665 (600 & 700 same)
26	S. of Airport Access	T29S R5W Sec 32D TL 700	0 Aviation Dr						Outside approach restriction zone. No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47665 (600 & 700 same)
27	S. of Airport Access	T29S R5W Sec 32D TL 800	0 Aviation Dr		Farm	3.0 (10')		Approach onto Aviation Drive	Outside approach restriction zone. No action.	No action.	Complete Restriction to Hwy. No control to Frontage Rd.	47666
28	connection to new bridge			Street				Aviation Drive	No action.	Relocate intersection further east with extension of Weaver Road.		

1. These correspond to the numbered approaches on the aerials.
2.This indicates the side of the roadway/ramp that the approach is on, from the perspective of driver.
3. Property owner and address are from the tax assessor data.
4. Describes current property use such as "ice cream store"
5. Business name is for example "Top Banana." Business name and use may seem redundant, but the use may not be apparent from the name.

IC 108 IAMP Approach Inventory and Access Management Actions

Aerial Approach Number[1]	Loc. N/S E/W[2]	Tax Lot Number	Assessors Site Address	Property Use[4]	Business Name[5]	Approach Width (m)	Permit Info	Description	Short-Term Action	Medium-Long Term Action
1	W of I-5	T29S R5W Sec 28 TL 401	0 N. Main Street						No permit or existing approach. No action.	No action.
2	W of I-5	T29S R5W Sec 28 TL 400	0 N. Main Street						No permit or existing approach. No action.	No action.
3	N of Main	T29S R5W Sec 28 TL 399	0 N. Main Street						No permit or existing approach. No action.	No action.
4	S of Main	T29S R5W Sec 28AB TL 1401	0 N. Main Street						No permit or existing approach. No action.	No action.
5	S of Main	T29S R5W Sec 28AB TL 1500	0 N. Main Street						No permit or existing approach. No action.	No action.
6	S of Main	T29S R5W Sec 28AB TL 2000	336 SW 5th Ave	Residential		6.1 (20')		Has an approach onto both SW 5th Ave & Main St.	No action	No action.
7	S of Main	T29S R5W Sec 28AB TL 1900	0 SW 5th Ave	Street - 5th Avenue		?		Public Road intersection with 5th Avenue.	No action	No action.
8	S of Main	T29S R5W Sec 28AB TL 3100	301 SW 5th Ave	Residential		4.6 (15')		Approach onto SW 5th AVE.	No action. Has approach on 5th Ave.	No action.
9	S of Main	T29S R5W Sec 28AB TL 3101	152 SW 4th Ave						No action, has approach on 4th or 5th.	No action.
10	S of Main	T29S R5W Sec 28AB TL 3102	150 SW 4th Ave	Commercial	Myrtle Creek Saw Shop	6.1 (20') , 6.1 (20')		Approach onto SW 4th AVE	No action. Has approach on 5th Ave.	No action.
11	S of Main/ N. of 5th	T29S R5W Sec 28AB TL 2100	402 SW 5th Ave	Residential		4.6 (15')		Approach onto SW 5th AVE.	No action. Has approach on 5th Ave.	No action.
12	S of Main/ N. of 5th	T29S R5W Sec 28AB TL 2200	406 SW 5th Ave	Residential		3.0 (10')		Approach onto SW 5th AVE.	No action. Has approach on 5th Ave.	No action.
13	S of Main/ N. of 5th	T29S R5W Sec 28AB TL 2800	335 SW 5th Ave	Residential		3.0 (10')		Approach onto SW Park Street	No action. Has approach on Park Street.	No action.
14	S of Main/ N. of 5th	T29S R5W Sec 28AB TL 2900	321 SW 5th Ave	Residential		4.6 (15')		Approach onto SW 5th AVE.	No action. Has approach on 5th Ave.	No action.
15	S of Main/ N. of 5th	T29S R5W Sec 28AB TL 3000	307 SW 5th Ave	Residential		3.0 (10')		Approach onto SW 5th AVE.	No action. Has approach on 5th Ave.	No action.
16	N. of Main at Dole	T29S R5W Sec 28AA TL 11400	425 N. Main St	Commercial	Espresso Shop	6.1 (20'), 9.1(30')		Approach onto Main Street	Outside approach restriction zone. No action.	No action.
17	N. of Main at Dole	T29S R5W Sec 28AB TL 200	0 NW A Ave						Outside approach restriction zone. No action.	No action.
18	N. of Main at Dole	T29S R5W Sec 28AB TL 400	505 Dole Rd.	Residential		3.0 (10')		Approach onto Dole St./Main St.	Outside approach restriction zone. No action.	No action.
19	N. of Dole	T29S R5W Sec 28AB TL 500	535 Dole Rd.	Residential		3.0 (10')		Approach onto NW B AVE.	Outside approach restriction zone. No action.	No action.

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20	N. of Dole	T29S R5W Sec 28AB TL 1000	605 Dole Rd.	Residential		3.0 (10')		Approach onto NW B AVE.	No action. Has approach on B Ave.	No action.
21	N. of Dole	T29S R5W Sec 28AB TL 1100	625 Dole Rd.	Residential		3.0 (10')		Approach onto Dole St.	No action. Has approach on Dole Rd.	No action.
22	S. of Main	T29S R5W Sec 28AB TL 1600	0 N. Main St.						No action. Has approach on Dole Rd.	No action.
23	S. of Main	T29S R5W Sec 28AB TL 1700	645 N. Main St.						No action. Has approach on Dole Rd.	No action.
24	S. of Main	T29S R5W Sec 28AB TL 1501	644 Dole Rd.	Residential		4.6 (15')		Approach onto Dole St.	No action. Has approach on Dole Rd.	No action.
25	S. of Main	T29S R5W Sec 28AB TL 1402					10520 or 12482 - Approach onto Dole Rd. not crossroad.	Approach onto Dole Rd. not crossroad.	No action. Has approach on Dole Rd.	No action.
26	S. of Main	T29S R5W Sec 28AB TL 1400	780 Dole Rd.				10520 or 12482 - Approach onto Dole Rd. not crossroad.		No action. Has approach on Dole Rd.	No action.
27	S. of Main	T29S R5W Sec 28AB TL 399	0 N. Main St.						No action.	No action.
28	W. of river							Gravel Parking	No action.	With I-5 realignment, if practicable, create defined access point located between the west end of the bridge and the ramp termini. Current access is length of parking area.
29	N. of Main							Gravel Pullout	No action.	No action.
30	N. of Main			Street				Dole Road	Outside approach restriction zone. No action.	No action.
31				Street				4th Avenue	Outside approach restriction zone. No action.	No action.

1. These correspond to the numbered approaches on the aerials.
2.This indicates the side of the roadway/ramp that the approach is on, from the perspective of driver.
3. Property owner and address are from the tax assessor data.
4. Describes current property use such as "ice cream store"
5. Business name is for example "Top Banana." Business name and use may seem redundant, but the use may not be apparent from the name.

NOTE: ODOT access controls were researched. No file numbers were found in the interchange influence area.