

DATE: April 21, 2009

TO: Oregon Transportation Commission

FROM: Matthew L. Garrett
Director

SUBJECT: Adoption of Interstate 5 Interchange 136 Interchange Area Management Plan

Requested Action

Adopt the Interstate 5 Interchange 136 Interchange Area Management Plan (IAMP). Adoption of this IAMP implements Policy 3C of the Oregon Highway Plan and is consistent with the IAMP requirements of the Department's Access Management Rule (OAR 731-051-0155). Findings of compliance in support of this action are found in Exhibit C. Adoption of the IAMP will constitute an amendment to the 1999 Oregon Highway Plan.

Background

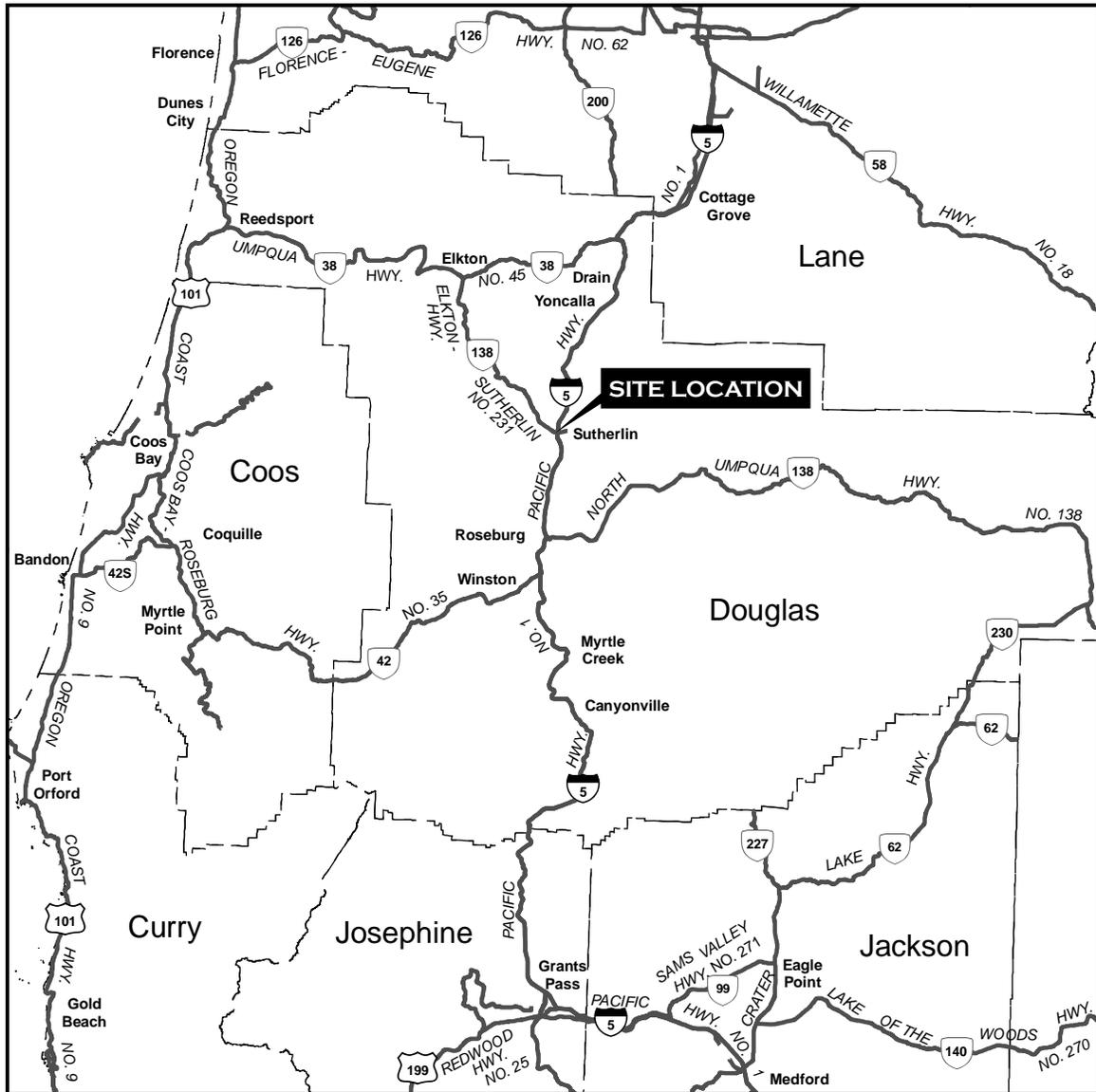
The IAMP was prepared in coordination with the City of Sutherlin. ODOT worked with the City to develop the IAMP to protect the function of the interchange and identify needed improvements. On December 8, 2008 the Sutherlin City Council held the first public hearing to adopt the IAMP as part of their Transportation System Plan. The second reading to adopt the IAMP is scheduled for May 11, 2009. ODOT also worked with DLCD and anticipates a letter of support of adoption in early May.

Attachments:

- Project Vicinity Map
- Project Location Map
- Exhibit A: Staff Report
- Exhibit B: Contact Information
- Exhibit C: IAMP Findings
- Exhibit D: City of Sutherlin Letter of Support
- Exhibit E: DLCD Letter of Support (expected 4-30-2009)

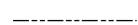
PROJECT VICINITY

ODOT REGION 3



I-5 136 INTERCHANGE AREA MANAGEMENT PLAN

LEGEND

-  SITE LOCATION
-  STATE HIGHWAY
-  COUNTY BOUNDARY

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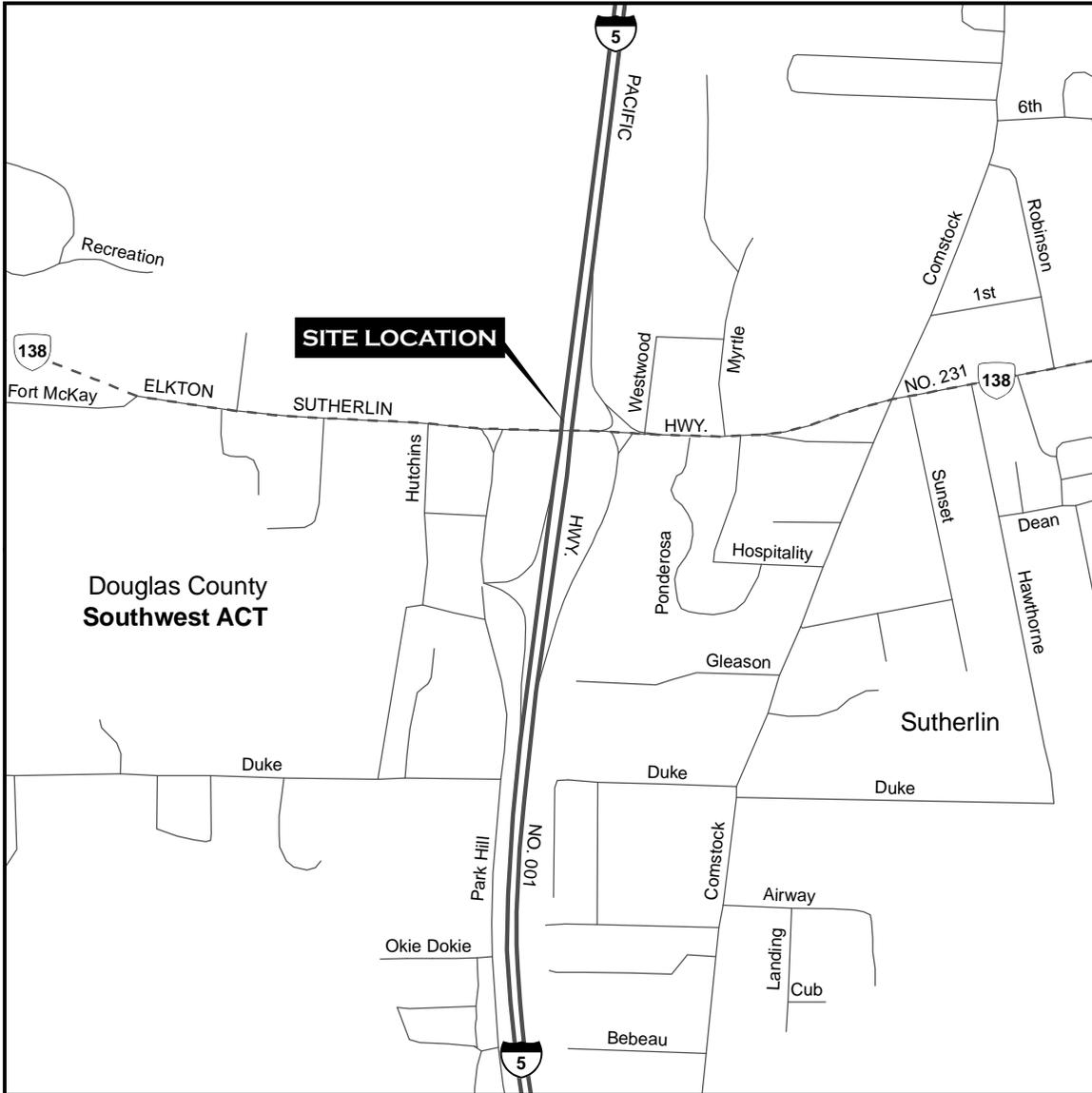
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PROJECT LOCATION

ODOT REGION 3



LEGEND

- SITE LOCATION**
- STATE HIGHWAY CLASSIFICATION**
- INTERSTATE
- STATEWIDE
- REGIONAL / DISTRICT
- REGIONAL BOUNDARY
- COUNTY BOUNDARY
- ACT BOUNDARY

I-5 136 INTERCHANGE AREA MANAGEMENT PLAN

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136 Interchange Area Management Plan

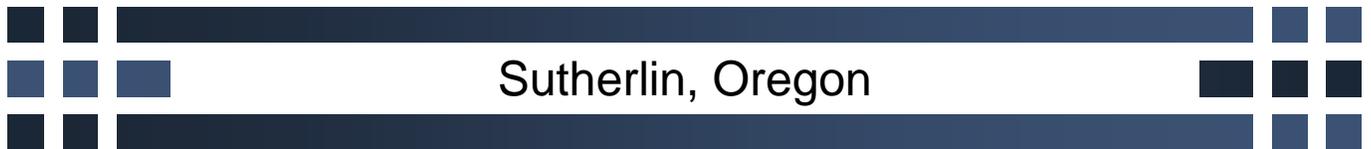


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Appendix B: Future Land Use Assumptions – January 2007

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Appendix E: Committees and Public Involvement

Appendix F: Questions and Answers – Development Assumptions and Traffic Forecasting

Acronyms

ADT	Average Daily Traffic
AMP	Access management plan
EIS	Environmental Impact Statement
BLI	Buildable Lands Inventory and Economic Opportunity Analysis
CBD	Central Business District
EB	Eastbound
I-5	Interstate 5
IAMP	Interchange Area Management Plan
ITS	Intelligent Transportation Systems
HCM	Highway Capacity Manual (Transportation Research Board)
HDM	Highway Design Manual (ODOT)
LOS	Level of service
NB	Northbound
OAR	Oregon Administrative Rule
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
OR	Oregon Route
OTC	Oregon Transportation Commission
PAC	Project Advisory Committee
SB	Southbound
SFR	Single-family residential
SMC	Sutherlin Municipal Code
STIP	State Transportation Improvement Program (ODOT)
TAC	Transportation Advisory Committee (Sutherlin)
TDM	Transportation Demand Management
TPAU	Transportation Planning and Analysis Unit (ODOT)
TSM	Transportation System Management
TSP	Transportation System Plan
UGB	Urban growth boundary
V/C	volume to capacity
WB	Westbound

1. Executive Summary

This Interchange Area Management Plan (IAMP) accomplishes the following:

- It identifies a preferred interchange design concept that is intended to fulfill the long-range needs of Sutherlin consistent with the city's long-range land use and transportation plans;
- It provides an access management plan for Oregon Highway 138/W. Central Avenue in the vicinity of the interchange;
- It identifies additional streets that help enhance local circulation; and
- It specifies amendments of the Sutherlin Transportation System Plan and Oregon Highway Plan.

Key items identified in the IAMP are:

- The existing interchange configuration is obsolete and inadequate to serve planned development of Sutherlin.
- The Project Advisory Committee and Transportation Advisory Committee selected a preferred interchange design (a question not resolved adequately in the Sutherlin TSP).
- The analysis determined where the ramp terminals will need to be located to achieve design standards and accommodate traffic that can be expected if or when Sutherlin's development fills out to its current urban growth boundary.
- The analysis verified that the intersection of Highway 138 with Park Hill Lane, which essentially serves as the ramp terminal for the southbound I-5 ramps, will need to be signalized within a few years and that signalization of this intersection will provide adequate operations for several years' growth.
- The analysis verified the need to widen Highway 138 between Comstock Road and Fort McKay Road to five lanes as prescribed in the TSP. Depending on the rate of development, the need for widening from three lanes to five lanes could be anywhere from about 10 years to 30 years from now.
- The IAMP provides an access management plan that, while not meeting full access management spacing standards, moves in the direction of those standards and is substantially better than what exists today. Implementation of access management changes will help protect the capacity of the interchange by allowing the ramp terminals to operate efficiently and improve safety by reducing conflicts at nearby local streets and driveways.
- Based on the analysis, the IAMP developed a reasonable location (across from the existing Dakota Street) for the intersection of the planned collector street serving the area south of Highway 138 and west of I-5. According to the TSP, this planned collector is intended to connect eventually with Interchange 135.
- The IAMP includes a local street system for the city and developers to implement to improve local circulation. The local street system will be implemented in connection with development and redevelopment of the area or when access restrictions are implemented by

ODOT in connection with improvements to Highway 138 between Comstock Road and Fort McKay Road.

- The analysis of future traffic for the IAMP was based on the forecasts in the TSP. Through an analysis of various planning documents, we discovered that the amount of future development potential in west Sutherlin is subject to considerable interpretation. Certain materials from the TSP planning process suggest the TSP may have overestimated future traffic. The Buildable Lands Inventory (BLI) suggests that much of the commercially designated land is impacted by wetlands and may not be developable, thus leading to a lack of adequate commercial land. The BLI states there is an excess of industrially designated lands.)
- Most management measures that can extend the life of the existing or planned facilities by limiting traffic growth are under the authority of the city of Sutherlin rather than ODOT.
- Because there are inadequate resources statewide and locally for state system modernization as well as local transportation infrastructure, ODOT and the city of Sutherlin recognize ODOT's limited ability to plan and fund a modernization project at Interchange 136. However, both parties agree that the process and plan results within the IAMP are necessary for future development and funding opportunities when available. ODOT intends to continue safety and other improvements that preserve the Interchange 136 physical structure.

2. Introduction

2.1 Purpose of an Interchange Area Management Plan

An Interchange Area Management Plan (IAMP) is a planning document used to help protect the long-range investment of an interchange. It is required for new or substantially modified interchanges according to the Oregon Administrative Rules (OAR 734-051-0155). New interchanges are very costly and it is in the interest of the state, local governments, and the citizens to ensure that the interchange functions as it was designed for as long a time period as possible. The Oregon Highway Plan (OHP) policies further direct Oregon Department of Transportation (ODOT) to plan and manage interchange areas for safe and efficient operation.

Development of an IAMP is part of the planning process intended to assess limitations, identify long-range needs and identify recommended improvements to the interchange. This process includes identifying necessary improvements to the local street network in the vicinity of the interchange to ensure consistency with operational standards. One of the cited benefits of an IAMP for local governments is using it to “balance the relationship between land use and the existing and planned transportation system to benefit the community, businesses, and traveling public.”

2.2 Purpose of the Interchange 136 IAMP

2.2.1 Problem Statement

The City of Sutherlin in Douglas County has a 2008 population of 7,795 people¹. The interchange and roadways in the project area have operational, geometric, and structural deficiencies. The existing deficiencies will be exacerbated by traffic increases resulting from development in the area. The Transportation System Plan (TSP) identifies a need to provide an interchange with increased capacity to serve the adopted land use plan for the area.

The City of Sutherlin and ODOT Region 3 identified the need to prepare an IAMP for Interchange 136 (Elkton-Sutherlin Highway). The Interchange 136 IAMP is intended to be adopted by the City of Sutherlin and the Oregon Transportation Commission (OTC).

2.2.2 Operational and Safety Deficiencies

The configuration of the interchange, particularly as related to the southbound ramps, combined with traffic volume increases that have occurred with development in the west part of Sutherlin, results in operational and safety deficiencies. Some of these were previously identified in the City of Sutherlin Transportation System Plan (TSP). The operational and safety deficiencies are:

- Access points are located closer to ramp terminals than prescribed by ODOT standards and contribute to traffic conflicts, loss of interchange efficiency and potential safety problems.
- There is insufficient capacity at key locations along Oregon Highway 138 (OR 138) to accommodate traffic from planned development.
- With only modest development consistent with adopted plans in the vicinity of the interchange or more distant areas of the west part of Sutherlin, the intersection of OR 138 with Park Hill Lane (which serves as an extension of the southbound ramp terminal) will fail to meet ODOT mobility standards without signalization.

2.2.3 Structural and Geometric Deficiencies

The original interchange, constructed decades ago, used different design standards and practices than those used today. When compared to current standards, the interchange exhibits numerous deficiencies. Substantial improvements were made in 2005 and 2006 when the mainline bridge was replaced and modifications were made to the northbound ramps. The principal geometric and structural deficiencies are:

- The southbound ramps use a “gull-wing” configuration that is no longer a standard design.
- Some ramps do not meet design current standards or achieve minimum standards rather than the higher “desirable” standard. A more thorough discussion can be found in Appendix A.

¹ Portland State University Population Research Center

2.3 Goals and Objectives

The goals of the Interchange 136 IAMP are to develop a plan for improvements that can be implemented over time to:

- Improve safety and operations of the interchange.
- Protect the investment in I-5 and the interchange and maintain the function of the interchange.
- Provide better accessibility to the cities of Sutherlin and Elkton that are consistent with the adopted local comprehensive land use and transportation plans.

The objectives of the IAMP are to:

- Develop concepts to improve safety and increase capacity of the interchange and roadways to address existing and future needs.
- Evaluate the need for capacity improvements based on the adopted, comprehensive land use plans of Sutherlin, the Sutherlin TSP, the OHP, and the appropriate level-of-service standards.
- Develop an access management plan that provides for safe and acceptable operations on the transportation network and that move in the direction to meet the access spacing standards prescribed in the OHP.

2.4 Interchange Function

Interchange 136 serves multiple users. The intended function of Interchange 136 is to safely and efficiently accommodate current and future traffic demands generated by population and employment growth in the region. It provides access to and from the City of Sutherlin, serving local trips by residential and commercial/industrial users. It also serves non-local traffic, such as traffic connecting from distant locations, such as the Oregon Coast, along OR 138 with I-5. In addition, it serves commuter traffic between Roseburg, Elkton and Sutherlin.

Interchange 136 is an urban, service interchange between I-5 and OR 138. In contrast to a freeway-to-freeway or “system” interchange, a service interchange connects a freeway or controlled-access freeway to a lower level roadway such as an arterial or collector street network. It serves commercial and non-commercial uses.

2.4.1 Interchange Configuration

The configuration of the interchange is a standard diamond for the northbound ramps and a gull wing for the southbound ramps. The interchange is a unique configuration since the southbound ramp terminal directly intersects with Park Hill Lane, which intersects with OR 138. A more usual configuration would have both ramp terminals intersect directly with the crossroad.

2.4.2 Roadway Classification

Interchange 136 connects I-5 with OR 138, which is classified by the Oregon Highway Plan (OHP) as a Regional Highway. In the Sutherlin TSP, OR 138 is classified as an Urban Minor Arterial.

The function of a regional highway is to provide connections and links to regions within the state, and between small urbanized areas and larger population centers through connections and links to Freeways, Expressways, or Statewide Highways. The roadway classification is important because it dictates the spacing standards between roadways and the volume-to-capacity (v/c) ratio for the facility. As a regional highway inside an urban growth boundary, the maximum v/c ratio for peak hour operating conditions through a planning horizon for state highway sections located outside the Portland metropolitan area is 0.85. OR 138 is not classified as a freight route in the OHP.

2.5 Planning/Management Area

2.5.1 Planning Area

The Planning Area includes OR 138 and W. Central Avenue between Fort McKay Road to Hawthorne Street and includes Park Hill Lane from Duke Road to Highway 138. Because of the unique configuration of Sutherlin, OR 138 is the only connection between the portions of the city east and west of I-5. To address the impact of development on the interchange, OR 138, and W. Central Avenue, the analysis considered potential development in Sutherlin with special emphasis on land west of I-5 within the city's urban growth boundary (UGB). Figure 1 illustrates the interchange and the features in the immediate area.

2.5.2 Zoning

On the west side of Sutherlin, the City of Sutherlin's UGB includes all land with the current city limits plus some of the surrounding area currently subject to county zoning. Adjacent to, but just beyond the UGB, the Sutherlin Comprehensive Plan designates Urban Growth Areas (UGA) that could be added within the UGB in the future. Figure 2 illustrates current zoning, city limits, UGB and key features of the IAMP Planning Area. The main zoning designations within the IAMP Planning Area are residential, commercial and industrial. The principal residential areas are designated R-1, Low Density Residential. The commercial land is zoned C-3, Community Commercial. Industrial land is zoned M1, Industrial Light, or M2, Industrial Heavy.

According to the Sutherlin Comprehensive Plan, the Community Commercial zoning designation, "...is intended to accommodate a full range of heavy retail and service commercial uses and tourist-oriented commercial uses. It has generally been applied to areas where uses of these types exist. Future tourist-oriented uses are encouraged to locate at or near the I-5/Highway 138 interchange, while heavier commercial uses are intended for the Central Avenue corridor between I-5 and the CBD." (Sutherlin Comprehensive Plan, p. 66)

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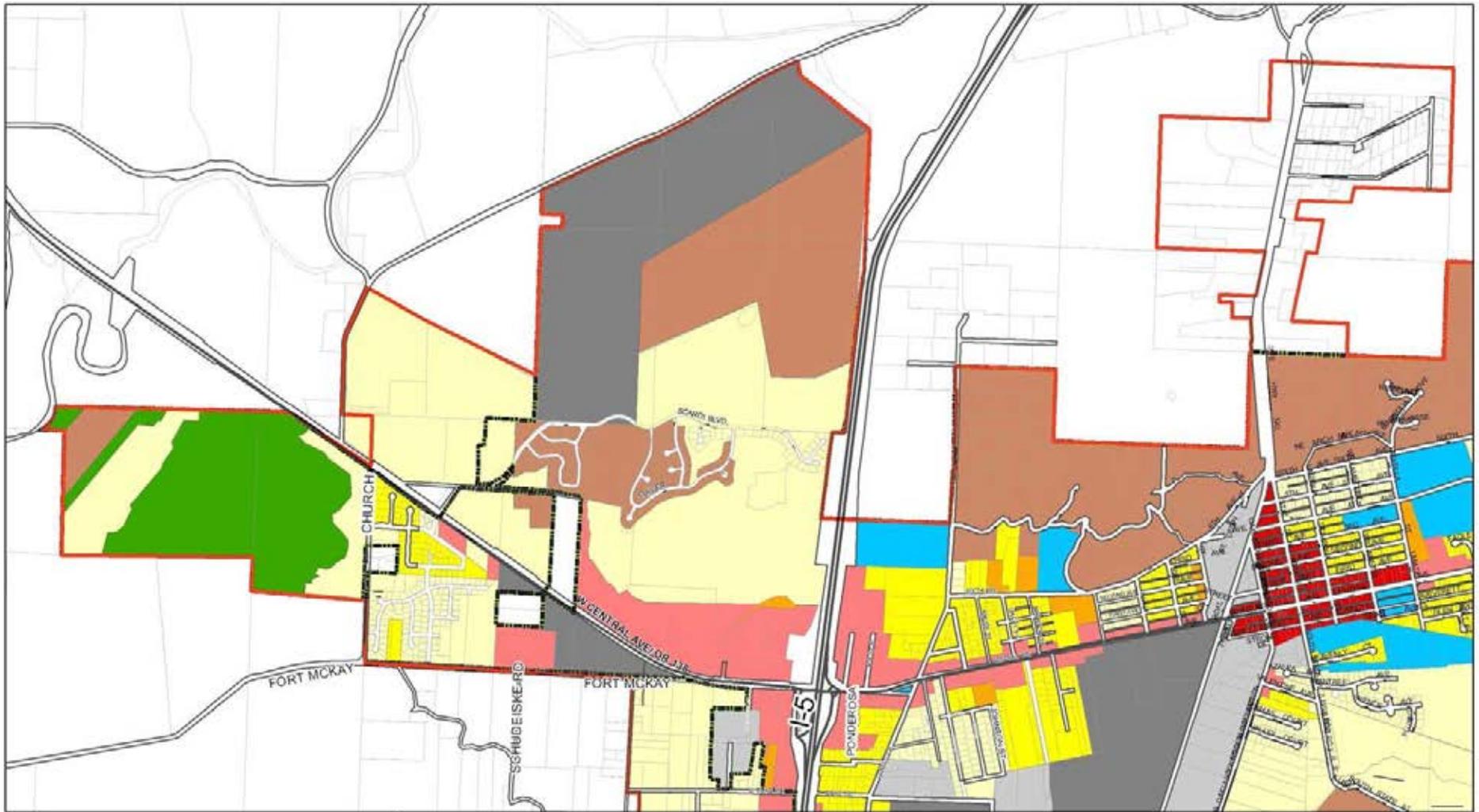
GIS Data Source: City of Sutherlin

Sutherlin IC 136 IAMP

Figure 1

Project Vicinity

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 1,200 600 0 1,200 Feet
 GIS Data Source: City of Sutherlin
 The data shown on this map is based on the City of Sutherlin Zoning Map Updated 1/1/08 and indicates City Zoning only.

Legend		City Zoning	
	Urban Growth Boundary		C1 - Commercial Downtown District
	City Limits		C3 - Commercial Community District
			CG - Industrial Park
			FR - Forest Resource District
			M1 - Industrial Light District
			M2 - Industrial Heavy District
			R1 - Low Density Residential District
			R2 - Medium Density Residential District
			R3 - High Density Residential District
			RH - Residential Hillside District

Sutherlin IC 136 IAMP
 Figure 2
 City Zoning and Boundaries

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3. Existing Conditions: Operations and Safety

3.1 Operational Standards

Operational analyses were conducted for the interchange area for the existing, future no-build, and future build alternatives. The analyses are compared against operational standards applicable to the area. Operational standards specified in the OHP and HDM vary from a v/c ratio of 0.65 to 0.90. For evaluating operations of the existing configuration (including existing and future no-build analyses) the OHP standards are most appropriate; requiring a v/c ratio of 0.85 for ramp terminals or intersections along OR 138/W. Central Avenue. When evaluating capacity improvements, such as interchange alternatives, the HDM operational standards are used. The HDM specifies a v/c of 0.75 for Regional Highways in cities such as Sutherlin and applies to the intersections along OR 138/W Central Avenue.

3.1.1 Existing Operational Conditions

The existing conditions operational analysis shows free flow along the OR 138/W. Central Avenue corridor as well as minimum delay for most side streets. The TSP indicated that the northbound off-ramp approach experienced significant delays when it operated as a stop-controlled intersection. Subsequent to the adoption of the TSP, the intersection was signalized. Table 1 summarizes the existing conditions operational results including the signalization of the northbound ramp terminal.

Table 1: Intersection Operational Analysis-Existing Conditions

Intersection	Critical Movement	v/c Ratio	LOS	OHP Std. ¹	HDM Std. ²	D.C. Std. ³
Interchange 136 Analysis Area						
OR 138 @ Fort McKay Road ^{5,6}	NB L/R	0.11	B	0.85	0.75	0.90
OR 138 @ Dakota Street ⁴	SB L/R	0.24	B	0.85	0.75	0.90
OR 138 @ Park Hill Lane ^{5,7}	NB L	0.25	D	0.85	0.75	-
Park Hill Lane @ SB Ramp Terminal ⁵	WB L	0.03	A	0.85	0.75	-
	NB T/R	0.14	B	0.85	0.75	-
W. Central Avenue @ NB Ramp Terminal ⁸	Overall	0.50	A	0.85	0.75	-
W. Central Avenue @ Ponderosa Drive ⁴	NBL/R	0.17	B	0.85	0.75	-
W. Central Avenue @ Myrtle Street ⁴	SBL/R	0.24	C	0.85	0.75	0.90
W. Central Avenue @ Comstock Road ⁵	SB L/T/R	0.30	C	0.85	0.75	-
	NB L/T/R	0.28	C	0.85	0.75	-

NB-Northbound, SB-southbound, EB-eastbound, WB-westbound

L-Left, T-Through, R-Right

Notes:

1. 1999 Oregon Highway Plan Mobility Standards (Table 6)
2. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1)
3. Operational standards for Douglas County roadway facilities (Source: Sutherlin Transportation System Plan)
4. Data from June 2006, seasonally adjusted volumes
5. Existing conditions data from 2005 Sutherlin TSP
6. 2005 Sutherlin TSP models this intersection with volumes on 4-legs
7. This is a non-conventional intersection that precludes standard analysis techniques.

8. Subsequent to the adoption of the TSP, this intersection was improved with the addition of turn lanes and signalization. The traffic operations of the improved, signalized intersection reported in this table are from “Northwest Sutherlin Rezoning Traffic Impact Analysis,” prepared by Lancaster Engineering, August 2007.

3.1.2 Safety

A safety analysis was conducted to determine if there were any significant documented safety issues within the analysis area and to recommend measures at specific locations or general strategies for improving overall safety.

Documented crashes between the years 2003 and 2005 were summarized by location for each of the study intersections. After sorting crashes by location, intersection crash rates were calculated. Table 2 shows the ADT that was determined for each intersection and the calculated crash rates. For intersection crash rate or segment crash rate calculations, and crash details see Appendix A.

Table 2. Study Area Intersection Crash Rates

Intersection	ADT	3-Year Crash Rate
OR 138 at Park Hill Lane	18,890	0.15
West Central Avenue at NB ramp terminal	20,740	0.09
West Central Avenue at Ponderosa Drive	8,980	0.10
West Central Avenue at Comstock Road	10,720	0.60

The safety analysis showed that none of the intersections in the study area has a crash rate significantly greater than that of the surrounding area. The ODOT 2005 5-year Comparison of State Highway Crash Rates shows an average crash rate of 1.94 for an Urban Minor Arterial (OR 138). As a rule of thumb, intersections with crash rates of 1.0 or above are potentially problematic and are candidates for further investigation. As Table 2 shows, all of the intersection crash rates are well below both of the thresholds.

3.1.3 Geometric Issues

As described above, the existing interchange is a conventional standard diamond configuration for northbound I-5, but a non-standard, unique gull-wing configuration for southbound I-5. With the recent reconstruction of the I-5 mainline bridge over OR 138, significant improvements were made, particularly for southbound I-5, but several substandard features exist, including less deceleration distance, curves with smaller radii, less shy distance, and lower design speeds than desirable. A more comprehensive explanation can be found in Appendix A.

4. Future Conditions: Operations and Safety

4.1 Future Conditions

The analysis of future conditions is based on the traffic volumes predicted in the Sutherlin TSP. At the time of its development, the TSP was generally assumed to correspond with year 2025, but additional analysis suggests those volumes may not occur until 2027 or later. The analysis of future traffic operations is based on what is referred to as “TSP Future Year (2027) Volumes.”

Further discussion of the rate of growth and future traffic volumes is found in Appendix B, Appendix C and in Section 10.2.

Future analyses evaluated two no-build alternatives, which in this case refer to retaining the current interchange configuration, and build alternatives based on three different interchange concepts.

The two no-build alternatives consisted of

- A three-lane cross-section for OR 138/W. Central Avenue; and
- A five-lane cross-section along OR 138/W. Central Avenue.

The build alternative concepts consisted of

- A folded diamond,
- A standard diamond, and
- A standard diamond with loop ramp for westbound OR 138/W. Central Avenue traffic to access southbound I-5 (TSP Preferred Concept).

The analysis of all future analyses (no-build and build) includes the following system improvements and assumptions:

- Signalized intersections in the immediate vicinity of the interchange include:
 - W. Central Avenue and Comstock Road (currently unsignalized, but included in the TSP),
 - Northbound ramp terminal (currently signalized), and
 - Southbound ramp terminal (currently unsignalized, but included in the TSP).
- The northbound ramp terminal remains in its current location
- Optimized signal timing and cycle lengths.

4.2 Analysis of No-Build Scenarios

The operational analysis of future no-build scenarios considered two cross-sections for OR 138/W. Central Avenue. These two analyses were used to verify the need for a five-lane cross-section for OR 138/W. Central Avenue, a project included in the TSP. These scenarios were used to predict when it would be necessary to move from a three-lane cross section to a five-lane cross section. The five-lane no-build scenario was also used as the basis upon which different interchange configurations were analyzed.

As indicated in the analysis of the existing conditions (summarized in Table 1), the key intersections in the vicinity of the interchange are the intersection of Park Hill Lane with OR 138 on the west side of the interchange and the intersection of the northbound ramp with W. Central Avenue on the east side of the interchange. Failure of either of these two intersections to meet the ODOT mobility standards would adversely impact the interchange and would trigger the need for widening of OR 138/W. Central Avenue. The southbound ramp terminal is technically

where the ramps intersect Park Hill Lane rather than the intersection of Park Hill Lane with OR 138, but practically, the intersection of Park Hill Lane and OR 138 is the more important intersection. Its traffic volumes are significantly higher, congestion is more severe, and delays are longer.

The discussion of the no-build scenarios below focuses on the predicted operations at OR 138 with Park Hill Lane and the intersection of the northbound ramps with W. Central Avenue. Information on the operations at other intersections further from the interchange, including the intersection of Ft. McKay Road with OR 138, and the intersection of W. Central Avenue with Comstock Road can be found in Appendix A.

As described above, one focus of the analysis of no-build conditions was to assess the need for the widening of OR 138/W. Central Avenue from three lanes to five lanes, a project included in the TSP. As indicated in Table 3, the three-lane cross-section analysis shows traffic operations at both ramp terminals are very poor. With TSP future year traffic volumes, both ramp terminals fail to meet both the OHP and HDM mobility standards and both are calculated to exceed the capacity of the intersections. Simply put, more traffic desires to use both intersections than either can accommodate. The result will be long queues as more and more traffic backs up at both intersections, adversely impacting the entire interchange even with both intersections being signalized.

Table 3. Traffic Operations Analysis Results for Three-Lane Scenario using TSP Future Year (2027) Traffic Volumes

Intersection	Signalized Intersection Performance	v/c Ratio	LOS	OHP Std.¹	HDM Std.²
<i>Interchange 136 Analysis Area</i>					
OR 138 @ Park Hill Lane	Overall	1.01	E	0.85	0.75
W. Central Avenue @ Northbound Ramp Terminal	Overall	1.19	F	0.85	0.75

Notes:

1. 1999 Oregon Highway Plan Mobility Standards (Table 6)
2. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1)

Based on the failure of a three-lane section for OR 138 to achieve either the OHP or HDM mobility standards, the second no-build scenario was analyzed based on a five-lane cross-section for OR 138. It is described as a no-build scenario because it retains the existing interchange configuration.

Table 4 summarizes the traffic operations for the two key intersections for the future no build five-lane cross-section. The results for the five-lane cross-section show improved operations over the three-lane cross-section. Though both intersections are predicted to meet OHP mobility standards, the five-lane no-build alternative is predicted to fail to meet the HDM mobility standard. The HDM mobility standard requires of v/c ratio less than or equal to 0.75.

Table 4. Traffic Operations Analysis Results for Five-Lane Scenario using TSP Future Year (2027) Traffic Volumes

Intersection	Signalized Intersection Performance	v/c Ratio	LOS	OHP Std.¹	HDM Std.²
<i>Interchange 136 Analysis Area</i>					
OR 138 @ Park Hill Lane	Overall	0.84	B	0.85	0.75
W. Central Avenue @ Northbound Ramp Terminal	Overall	0.80	B	0.85	0.75

Notes:

1. 1999 Oregon Highway Plan Mobility Standards (Table 6)
2. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1)

4.3 Analysis of Build Scenarios

Because both the three-lane and five-lane no-build scenarios described in Section 4.2 failed to achieve the HDM mobility standards, three alternative interchange concepts were evaluated.

Alternative interchange concepts include a folded diamond, a standard diamond, and the TSP Preferred Concept, which is a standard diamond with an additional loop ramp for southbound I-5 traffic. All three concepts were analyzed for their ability to accommodate forecast TSP future year traffic volumes. Since the Baseline Future analyses indicated that three lanes would be inadequate to meet forecast TSP future year traffic demands, the analyses of all three new interchange concepts were based on a five-lane facility for OR 138/W. Central Avenue from Fort McKay Road to Comstock Road.

Like the no-build scenarios, the build scenarios assume signalization of both ramp terminals. In addition to the base system improvements made for the no-build future analyses, the build alternatives include the following additional attributes:

- Five lanes are provided on W. Central Avenue and OR 138 from Comstock Road to Fort McKay Road.
- Replacement of the existing gull-wing configuration of the southbound ramps, which currently allows the southbound ramps to connect with Park Hill Lane, with a conventional ramp configuration where the southbound ramp terminal intersects with OR 138.
- Elimination of the connection from the southbound ramp to W. Duke Road via Park Hill Lane.
- Construction of a new frontage road that runs parallel with I-5 to the west and connects OR 138 to W. Duke Road and to Interchange 135.
- A supplemental right-turn lane is provided westbound at the on-ramp to I-5 northbound.
- A supplemental right-turn lane is provided eastbound at the on-ramp to I-5 southbound.
- Separate lanes are provided for left turns and right turns as the off-ramps approach the ramp terminals.
- Dual left-turn lanes are provided at the intersection of the northbound off-ramp at W. Central Avenue.
- Longer cycle lengths are used for the traffic signals at the ramp terminals (80 seconds to 120 seconds).

Each of the three interchange concepts is discussed below with a summary following. The traffic operations analyses of the three interchange concepts are summarized in Table 5.

4.3.1 Folded Diamond Concept

The folded diamond concept is illustrated in Figure 3. The folded diamond interchange configuration is most like the existing interchange. Unlike the existing gull wing interchange, the southbound ramp terminal is relocated to intersect with OR 138.

Figure 3 illustrates the lane configurations used in the traffic operations analysis; it is not drawn to scale. Additional information on the lane configurations and traffic volumes is contained in Appendix C.

Figure 4 illustrates the folded diamond concept overlaid on an aerial photograph of the interchange. This figure is drawn to scale and shows the preliminary centerline of the new ramps.

Figure 5 illustrates the configuration of OR 138 between the ramp terminals under the folded diamond concept. This figure illustrates the turn lanes, storage distances and tapers between the ramp terminals.

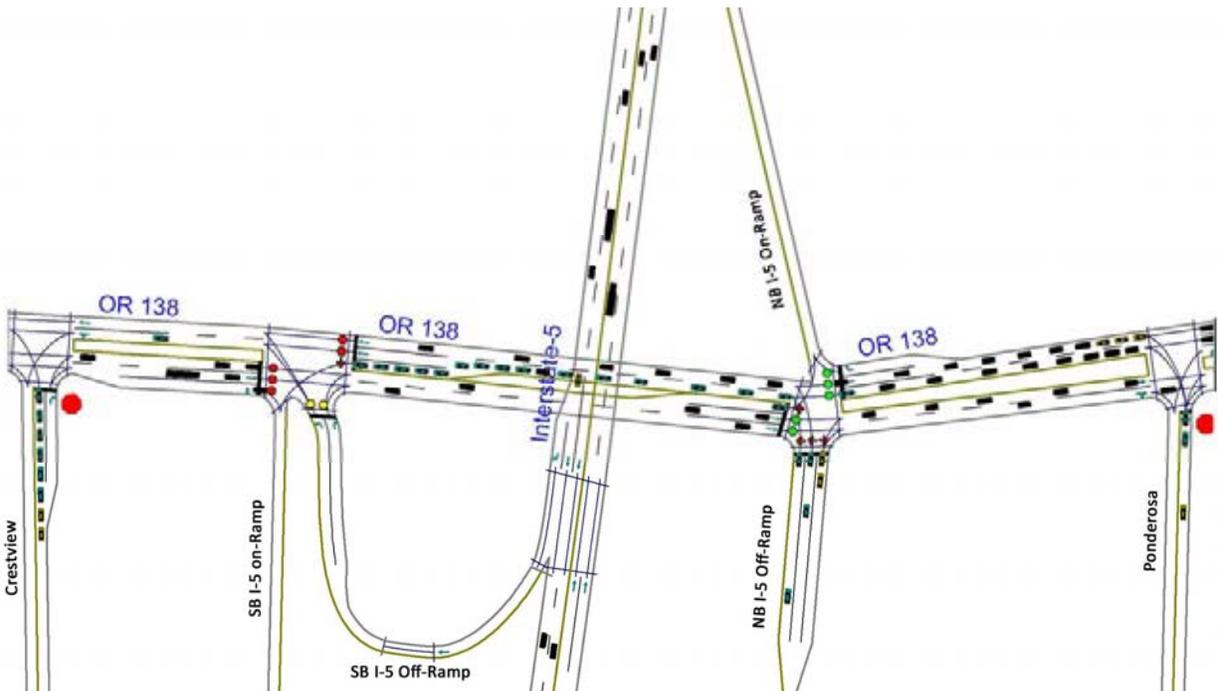
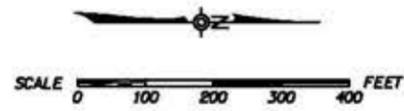
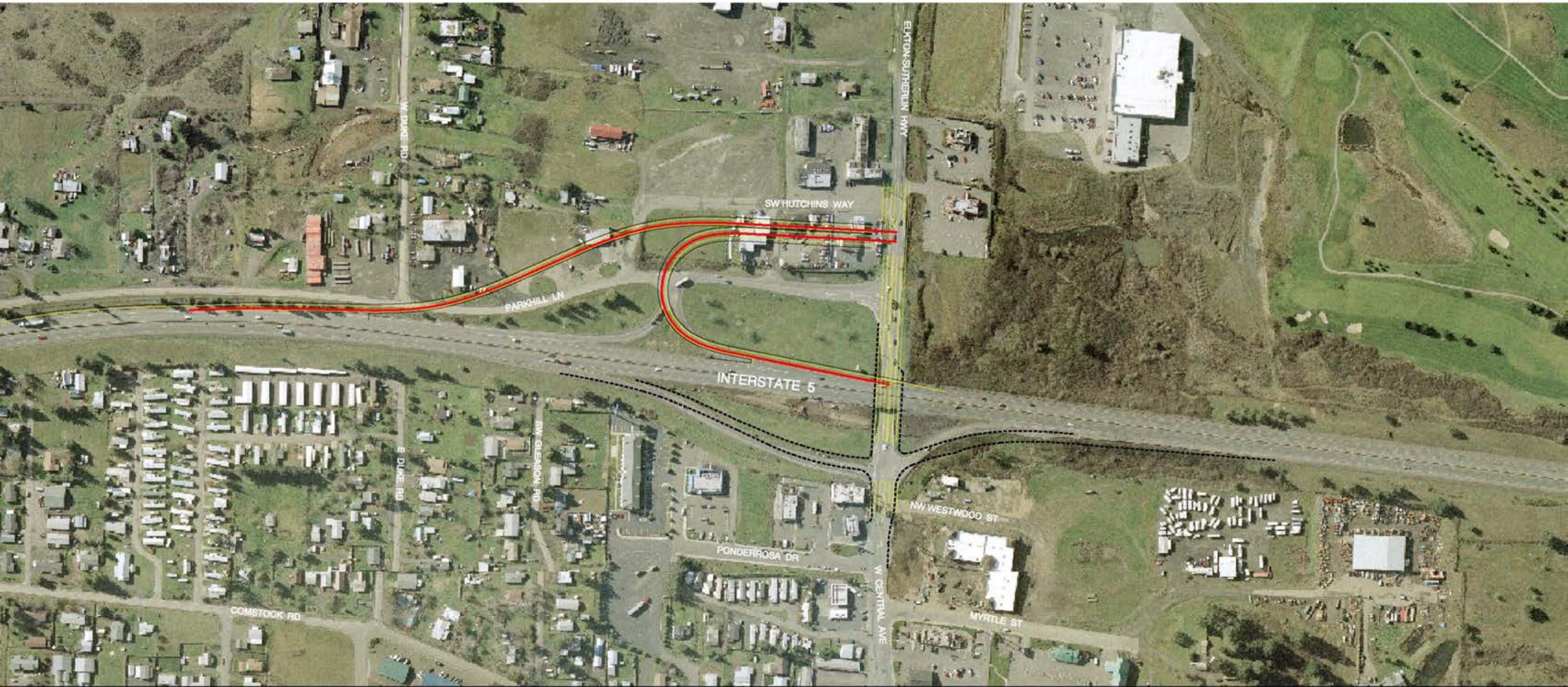


Figure 3: Folded Diamond Concept – Lane Configurations

The folded diamond concept showed acceptable traffic operations using TSP future year traffic volumes and meets both OHP and HDM standards.

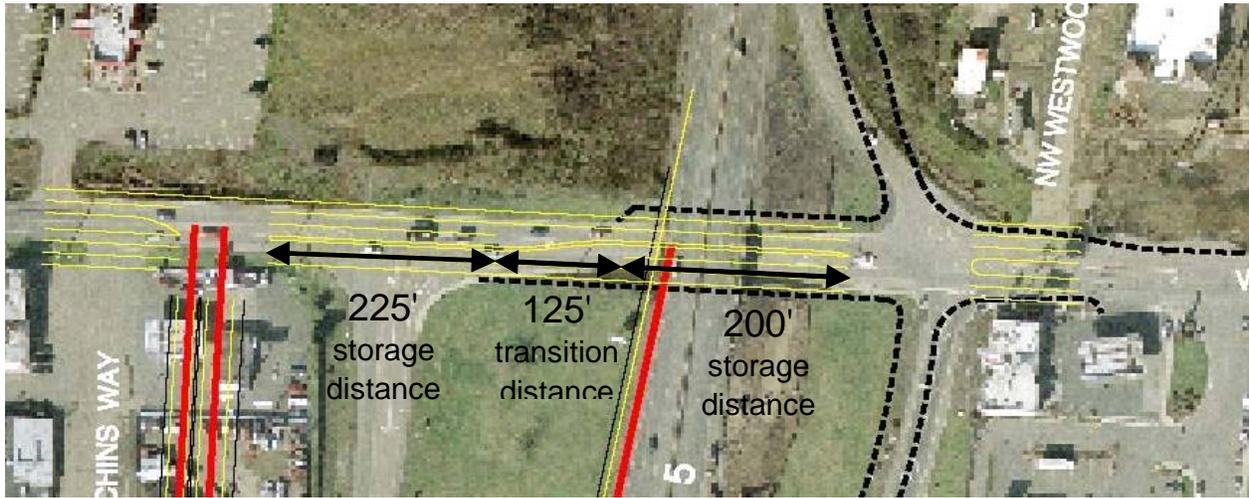


FOLDED DIAMOND CONCEPT

PRELIMINARY CONCEPT ONLY
Approximate Pavement Only.
No Slope Information Or
Right-Of-Way Is Shown

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Figure 5. Folded Diamond Concept – Ramp Terminal Area



4.3.2 Standard Diamond Concept

The current interchange configuration uses a standard diamond configuration for the northbound ramps. This concept repeats that configuration for the southbound ramp terminal.

The standard diamond concept is shown in Figure 6. Like the Figure 3 in the preceding section, this is an illustration and is not to scale. Additional information on the lane configurations and traffic volumes is contained in Appendix C.

Figure 7 illustrates the standard diamond concept overlaid on an aerial photograph of the interchange. This figure is drawn to scale and shows the preliminary centerline of the new ramps.

Figure 8 illustrates the configuration of OR 138 between the ramp terminals under the standard diamond concept. This figure illustrates the turn lanes, storage distances and tapers between the ramp terminals.

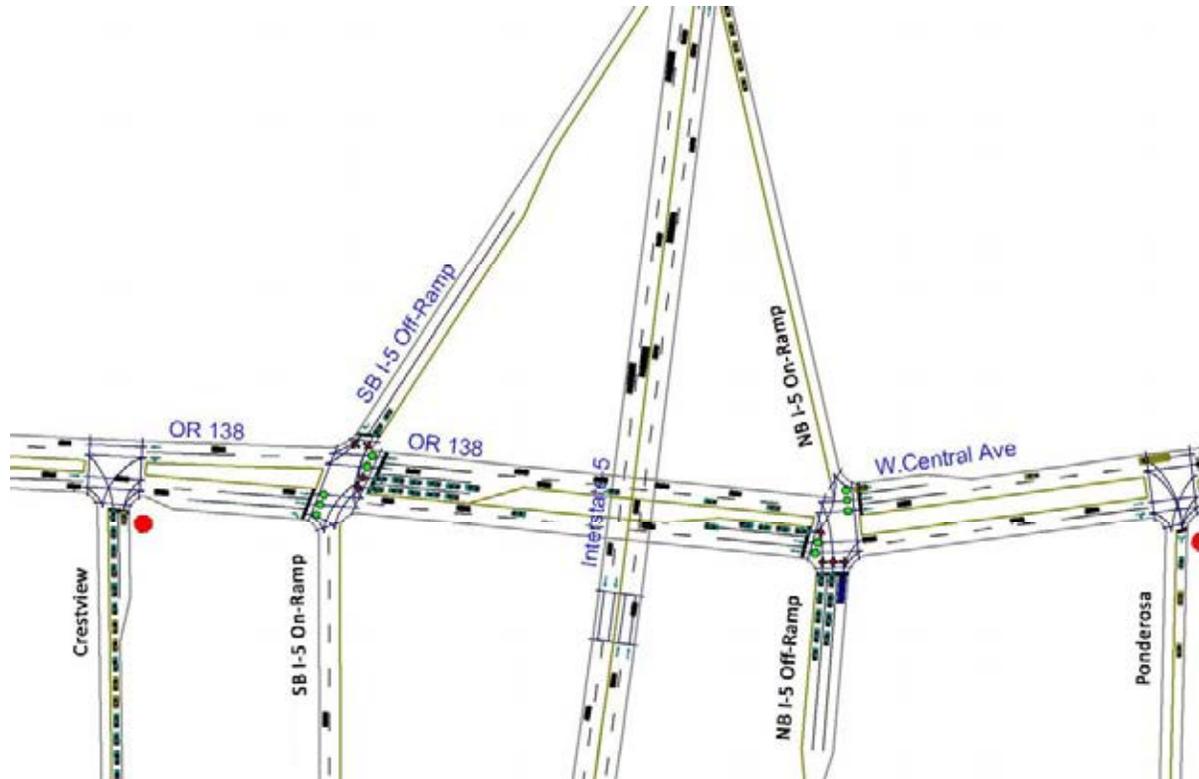
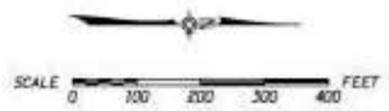


Figure 6: Standard Diamond Concept – Lane Configurations

The standard diamond concept is also predicted to meet both OHP and HDM operational standards using future year 2027 traffic volumes.

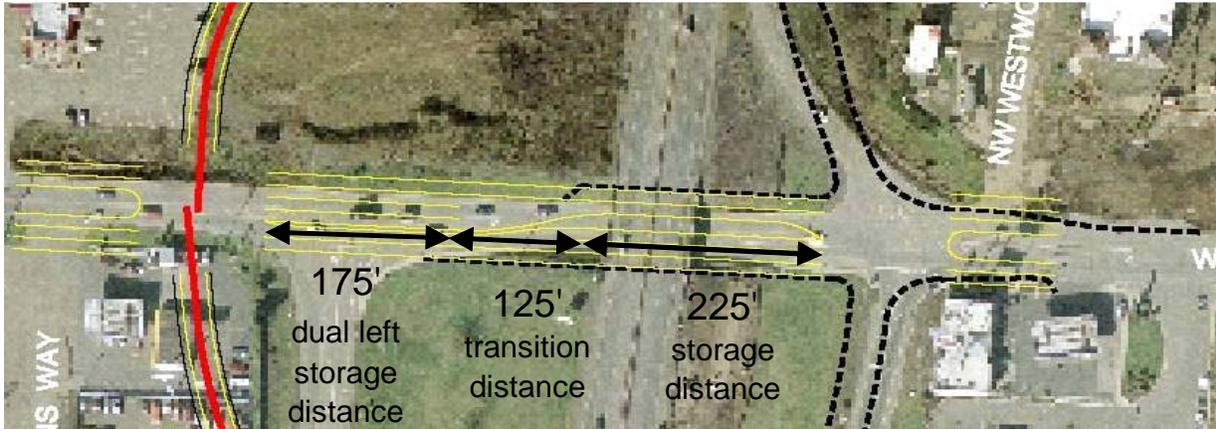


STANDARD DIAMOND CONCEPT

PRELIMINARY CONCEPT ONLY
Approximate Pavement Only.
No Slope Information Or
Right-Of-Way Is Shown

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Figure 8: Standard Diamond Concept – Ramp Terminal Area



4.3.3 TSP Preferred Concept

The TSP preferred concept takes its name from the interchange design identified in the TSP. It is similar to the standard diamond, but includes a supplemental loop ramp that provides for movements for westbound traffic to southbound I-5. This concept eliminates the need for left turns from OR 138 at the SB ramp.

The TSP preferred concept is illustrated in Figure 9. Like the Figures 3 and 6, the illustration indicates the lane configurations, but it is not to scale. Additional information on the lane configurations and volumes is contained in Appendix C.

Figure 9 illustrates the TSP preferred concept overlaid on an aerial photograph of the interchange. This figure is drawn to scale and shows the preliminary centerline of the new ramps.

Figure 10 illustrates the configuration of OR 138 between the ramp terminals under the TSP preferred diamond concept. This figure illustrates the turn lanes, storage distances and tapers between the ramp terminals.

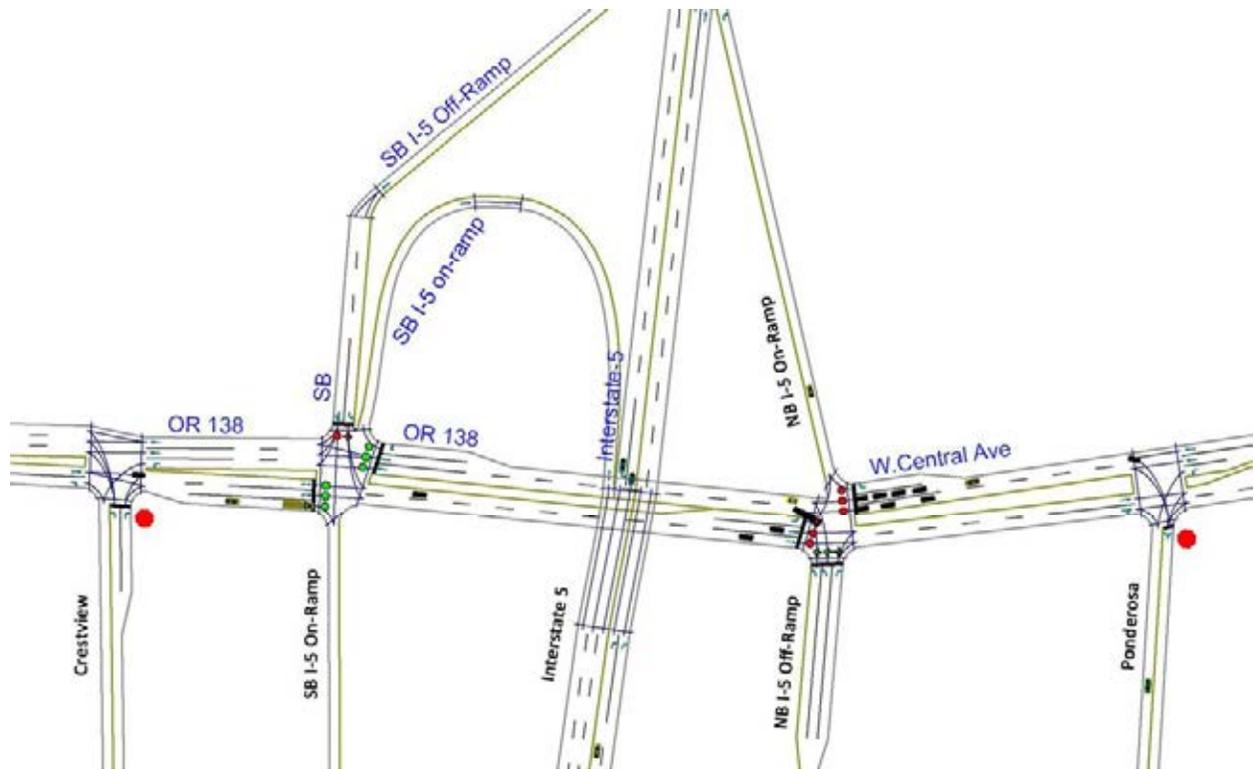
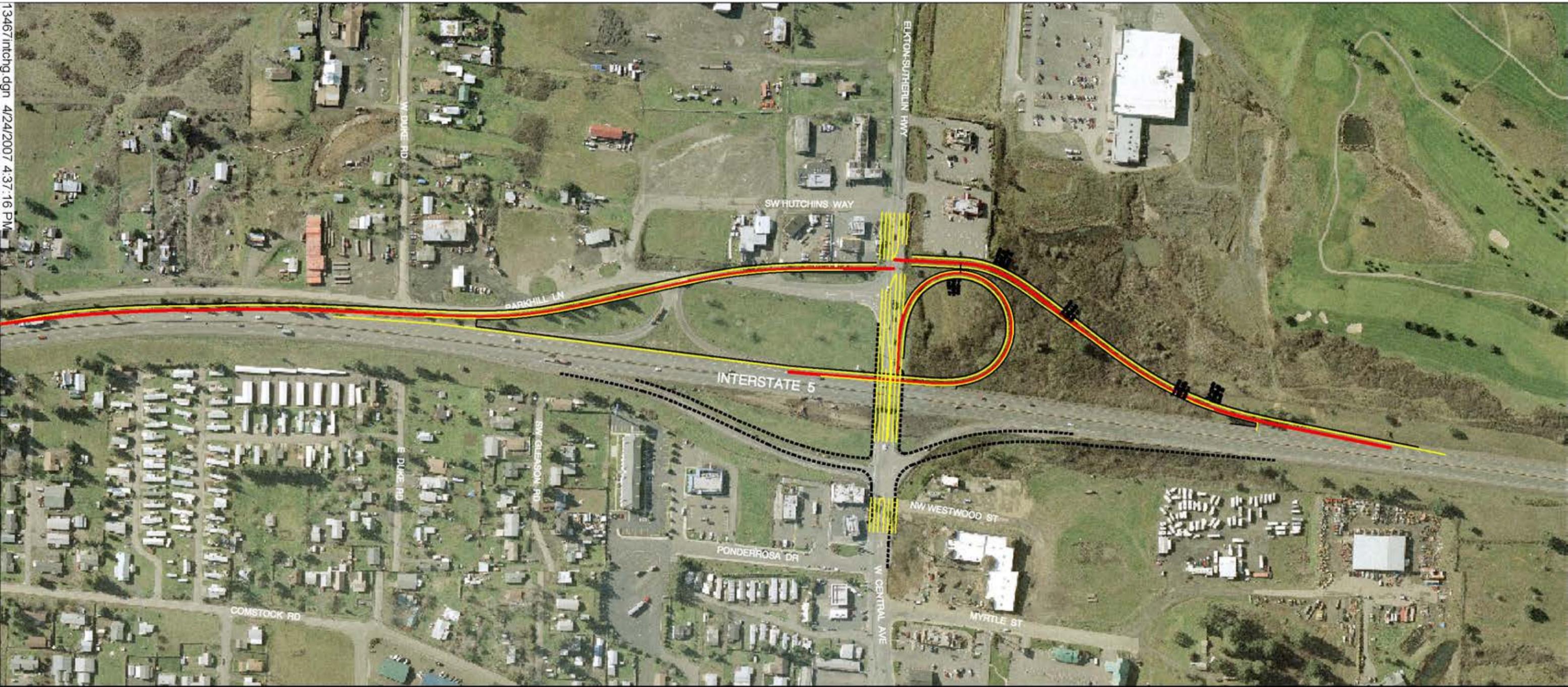


Figure 9: TSP Preferred Concept – Lane Configuration

The TSP preferred concept is also predicted to meet both OHP and HDM operational standards using future year 2027 traffic volumes.

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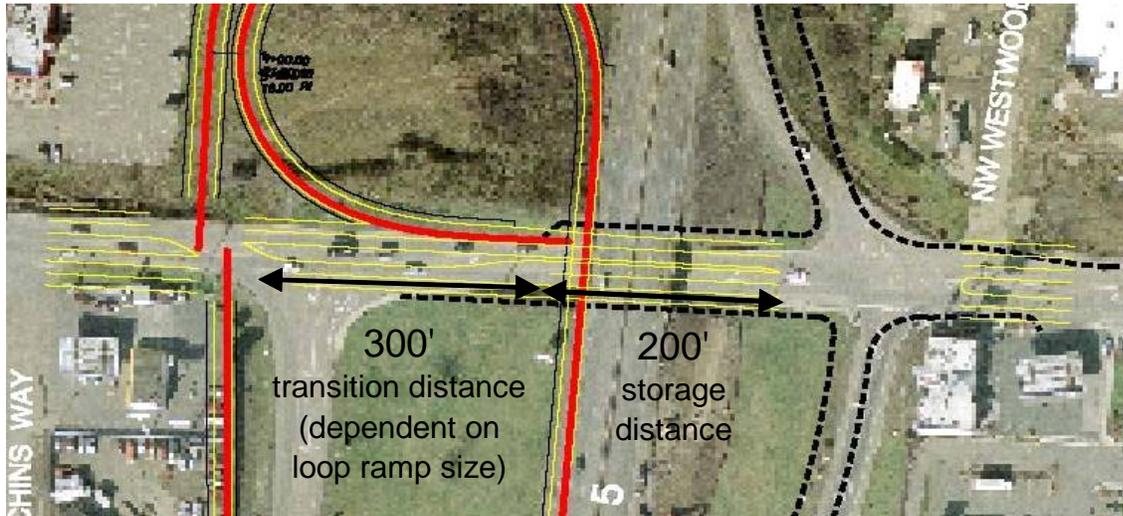
STANDARD DIAMOND WITH LOOP RAMP CONCEPT



PRELIMINARY CONCEPT ONLY
 Approximate Pavement Only.
 No Slope Information Or
 Right-Of-Way Is Shown

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Figure 11. TSP Preferred Concept – Ramp Terminal Area



4.3.4 Traffic Operations of Ramp Terminals for all Build Concepts

Table 5 summarizes the traffic operations analysis results for the three concepts. In all cases, the concepts met the operational standards of both the OHP and HDM.

Table 5. Traffic Operations Analysis Results for Three Build Alternatives using TSP Future Year (2027) Traffic Volumes

Intersection	Folded Diamond		Standard Diamond		Standard Diamond with Loop Ramp - "TSP Preferred Concept"	
	v/c ratio	LOS	v/c ratio	LOS	v/c ratio	LOS
SB Ramp Terminal	0.71	C	0.63	C	0.42	A
NB Ramp Terminal	0.65	C	0.65	C	0.63	D

Note: Both ramp terminals are signalized for all concepts.

4.3.5 Queue Storage Requirements of Ramp Terminals

Providing sufficient capacity to accommodate vehicles at signalized intersection is important to assure efficient operation of intersections. Typically, the length of turn lanes is designed to accommodate the 95 percentile queue during peak hour traffic conditions.

Only minor differences were calculated for the queue storage among the three interchange design concepts. The length of turn lanes needed to accommodate the 95 percentile queue was one of the factors used to determine the spacing between the ramp terminals and, specifically, the location of the southbound ramp terminal illustrated in Figures 4, 6, and 8.

Details on the queuing and lengths needed for each lane at the ramp terminals can be found in Appendix D.

4.3.6 Merge/Diverge Analysis

The performance of the ramp terminals is usually the critical factor in determining how well an interchange functions. Another important factor may be the operations of the merge movements, where the on-ramps merge with the mainline, and the diverge movements, where traffic on the mainline takes the off-ramp.

A merge/diverge analysis was conducted for the northbound and southbound on/off-ramps of I-5. This analysis utilizes TSP future year traffic volumes and is based on Analysis Procedures Manual (TPAU, April 2006). The analysis looks at multiple segments in the merge and diverge sections. All segments were analyzed and the highest v/c ratios are shown in Table 6.

The merge analysis looks at two different segments:

- Merge influence area, and
- Downstream basic freeway segment.

The diverge analysis looks at four different segments:

- Downstream freeway leg,
- Ramp flow,
- Freeway flow upstream of the diverge point, and
- Flow rate entering lanes 1 and 2 immediately upstream of the deceleration lane.

More details on these analyses are provided in Appendix C.

Table 6. Merge/Diverge Analysis Results using TSP Future Year Traffic Volumes

	V/C ratio of merge and diverge movements with I-5 mainline			
	No Build	Folded Diamond	Standard Diamond	TSP Preferred
<i>Interchange 136 Analysis Area</i>				
NB On-ramp (merge)	0.35 ¹	0.35 ¹	0.35 ¹	0.35 ¹
NB Off-ramp (diverge)	0.43 ²	0.40 ²	0.40 ²	0.40 ²
SB On-ramp (merge) ³	0.56 ¹	0.56 ¹	0.56 ¹	0.57 ¹
SB Loop On-ramp (merge) ³	NA	NA	NA	0.47 ¹
SB Off-ramp (diverge)	0.44 ²	0.44 ²	0.44 ²	0.44 ²

Notes:

1 Value shown is for merge influence area; the volume to capacity of the downstream basic freeway segment is less than value shown.

2 Controlling v/c ratio is shown. Four v/c ratios were considered: downstream freeway leg capacity, ramp flow capacity, freeway flow upstream of the diverge capacity, and flow rate entering lanes 1 and 2 immediately upstream of the deceleration lane capacity.

3 Note that the TSP preferred concept has two southbound on-ramp merges. The no-build and each of the other build scenarios, the folded diamond concept and the standard diamond concept, has only one on-ramp to southbound I-5.

For the no-build and all build scenarios, the merge and diverge movements meet the OHP and HDM operational standards. With regard to mainline I-5 operations and the merge and diverge movements, there is essentially no difference among the alternatives.

4.4 Other Considerations Relating to Interchange Redesign Concepts

4.4.1 Geometric Differences

Geometric differences are evident among the concepts. The folded diamond concept avoids any construction in the northwest quadrant of the interchange. The standard diamond concept requires additional width at the southbound ramp terminal to accommodate dual left-turn lanes for the westbound to southbound I-5 movement. The TSP preferred concept involves two new ramps in the northwest quadrant of the interchange.

4.4.2 TSP Compatibility

All three concepts appear to be compatible with the TSP. All three concepts retain the basic five-lane section for the OR 138/W. Central Avenue corridor, but all assume additional lanes will be required for right turns at the ramp terminals.

4.4.3 Safety Issues

All three concepts are likely to be an improvement over the existing, non-standard configuration for the southbound ramp terminals. Current design standards would be expected to provide superior performance from a safety standpoint. There is likely to be little difference among the concepts.

4.4.4 Bicyclist/Pedestrian Issues

The Oregon Revised Statutes require accommodations for bicyclists and pedestrians for all new and reconstructed street and highway projects. Sidewalks and bicycle lanes would be a standard provision with a new interchange.

Two issues may require special attention. High-speed turn movements, such as those associated with right-turn lanes or free-flow ramps, are difficult for pedestrians and bicyclists needing to cross them. Such designs are not preferred from a bicyclist or pedestrian standpoint. All three concepts utilize supplemental right-turn ramps that would cause concern. The TSP Preferred Concept utilizes a free-flow ramp for the westbound to southbound I-5 movement. This ramp would be least desirable from a bicyclist/pedestrian standpoint. Dual turn lanes, such as proposed with the standard diamond configuration, are also difficult. ODOT generally does not allow crosswalks on the receiving street where dual turn lanes are used. Crosswalks are still allowed on the approach side even when dual turn lanes are used.

4.4.5 Right-of-Way Issues

The amount of right of way required to accommodate any of the interchange concepts may be greater than people realize. Based on the traffic operations analysis performed and the conclusion that supplemental right-turn lanes will be needed at the approaches to the ramp terminals to accommodate TSP future year volumes. ODOT's design standards are considerably different from those used with the original design of Interchange 136. Even the lowest design speeds typically used by ODOT require larger curves and longer transitions than used in the past. Better identification of right-of-way issues will be needed during the preliminary engineering and right-of-way phases following the identification of an interchange project and its inclusion in a future State Transportation Improvement Program (STIP).

4.4.6 Signal and Intersection Spacing Issues

The analysis of existing conditions confirmed that the current intersection spacing along the corridor does not meet ODOT access spacing standards. The likely location of the signalized ramp terminals is similar for all three of the interchange concepts, so complying with basic driveway and intersection spacing requirements is similar among the concepts. The efficiency and safety of all three concepts would benefit from implementing access management changes. None of the concepts offers advantages over the others with respect to intersection spacing and the level of difficulty of implementing good spacing is the same for the three concepts.

4.4.7 Other Street Improvements

As indicated above, all three concepts require elimination of Park Hill Lane between OR 138 and W. Duke Road. This section of Park Hill Lane is too close to the mainline of I-5 to allow a modern interchange with sufficient distance between the ramp terminals to be constructed.

Since Park Hill Lane currently provides the principal access from OR 138 to W. Duke Road and the land to the south, a substitute connection would be required. A new frontage road or collector road that extends from OR 138 to W. Duke Road, located far enough west of the interchange to meet ODOT access spacing standards, is a key requirement of all three concepts.

All three interchange concepts also benefit from a well-connected local street system. The implementation of local street system improvements would also be essentially the same for all three concepts. The local circulation network is discussed in greater detail in Section 7.

5. Evaluation and Selection of a Preferred Interchange Concept

All three of the interchange concepts were evaluated based on several factors discussed in the previous section. The most important included their ability to meet the HDM mobility standards with future TSP traffic volumes, to meet modern design standards, and to be compatible with the recently reconstructed I-5 bridge and the recent improvements to the northbound ramps on the east side of the interchange. Operational results are discussed in the Future Conditions Alternative Interchange Concepts section above. A summary of advantages and disadvantages for each concept are shown in Table 7, while a summary of concept cost estimates is shown in Table 8. More details of the concepts and evaluation can be found in Appendix D.

Table 7. Interchange Concept Advantages and Disadvantages

Concept	Advantages	Disadvantages
Common to all build alternatives	<ul style="list-style-type: none"> • Modern Design • I-5 SB off-ramp meets standards • Eliminates gull wing configuration involving an intersection with Park Hill Lane prior to intersecting with OR 138 • Improved, longer SB I-5 on-ramp acceleration distance • Supplemental right-turn lanes • Longer merge distance • Meets mobility standards 	<ul style="list-style-type: none"> • Requires construction of a new “frontage road” to replace Park Hill Lane • Right-of-way impacts to SW quadrant
Folded Diamond	<ul style="list-style-type: none"> • Minimal right-of-way impacts to NW quadrant 	<ul style="list-style-type: none"> • Limited potential for expansion to increase capacity • Not compatible with loop ramp to facilitate westbound to southbound I-5 movement
Standard Diamond	<ul style="list-style-type: none"> • Compatible with Loop ramp to facilitate westbound to southbound I-5 movement 	<ul style="list-style-type: none"> • Right-of-way impacts to NW quadrant
TSP Preferred Concept (Standard Diamond with loop ramp)	<ul style="list-style-type: none"> • Loop ramp meets standards and provides longer merge distance than existing condition • Phased implementation is possible 	<ul style="list-style-type: none"> • Right-of-way impacts to NW quadrant

Table 8. Cost Estimate Summary

Interchange Concept	Project Component	2007 Estimated Cost (Millions)
Folded Diamond	Interchange construction cost ¹	\$3.2
Standard Diamond	Interchange construction cost ¹	\$3.3
TSP Preferred Concept (standard diamond with supplemental loop ramp)	Interchange construction cost ¹	\$5.4

¹ Includes engineering and construction costs, but not right-of-way or relocation.

The three build concepts were evaluated by the Project Advisory Committee (PAC) and the Transportation Advisory Committee (TAC). The selection criteria used during the process included the need to meet Highway Design Manual operational standards, an ability to provide future capacity and possible phased implementation, and limited ROW impacts.

At their meetings on March 8, 2007 the PAC and the TAC both selected the TSP Preferred Concept as their preference for the ultimate interchange configuration. Because the TSP Preferred Concept is the standard diamond plus an additional loop ramp, the committees identified the standard diamond concept as an appropriate initial project as part of phased implementation of the TSP Preferred Concept.

6. Development Assumptions and Traffic Growth

6.1 Transportation System Plan

The TSP, prepared in 2005, was generally based on the adopted Sutherlin Comprehensive Plan. The TSP's assumptions accounted for build out of the areas within the city's urban growth boundary (UGB). The city staff also assumed that substantial development would occur on land outside the city's UGB.

These development assumptions, combined with more recent information discussed below, suggest that the traffic volumes forecast in the TSP may be too high for a twenty-year planning horizon. By some estimates, the traffic volumes in the TSP may be 1/3 higher than is likely in twenty years. The need for certain improvements may not occur until a later date than suggested in the TSP. Further discussion can be found in Appendix B and Appendix F.

6.2 Buildable Lands Inventory

The Sutherlin Buildable Lands Inventory and Economic Opportunities Analysis (BLI) was completed in June 2005. Unlike the TSP, the BLI assessed only land within the UGB. In addition, it considered the implications of constraints, including terrain (hillsides) and wetlands.

Among other conclusions, the BLI's authors concluded that there was a deficit of vacant residential land, which led to a private developer's application in 2006 for a UGB expansion to add residential land to the city. The BLI did not provide a specific recommendation for the number of acres needed for residential development to accommodate 5500 new residents predicted in the BLI. The new residences could be accommodated on existing vacant land or on existing partially-vacant parcels or on land added to the UGB.

The BLI also noted a deficit of commercial land and a deficit of land for public and semi-public uses such as parks, schools, and government facilities. On the other hand, the BLI identified a surplus of industrial land. Further discussion can be found in Appendix B and Appendix F.

Based on the information from the BLI, the Comprehensive Plan, and trip generation rates derived from the Institute of Transportation Engineers' *Trip Generation*, we developed trip generation estimates for lands in west Sutherlin (west of I-5). These estimates are presented in Table 9 and represent development consistent with the BLI assumptions.

Table 9: Traffic Generation Potential of Available Developable Land in the West Sutherlin Area

Land Use	Acres	Trip Rate	Inbound PM Peak Hour Trips	Outbound PM Peak Hour Trips
Low Density Residential	250	1 trip/dwelling; 4 dwelling/acre	640	360
High Density Residential	3	0.6 trip/dwelling 12 dwellings/acre	14	7
Commercial	12	56 trips/acre	336	336
Light Industrial	6	3 trips/acre	3	15
Heavy Industrial	40	3 trips/acre	24	96
Industrial Park	200	3 trips/acre	120	480
Total			1137	1294

6.3 Alternative Development Scenarios

Based upon a review of the information in the BLI and the city’s development code, there appear to various development scenarios that could produce either more traffic or less traffic than calculated for the TSP. Scenarios that could produce less traffic include those where wetlands constraints preclude development or where the UGB is not expanded as in the BLI. Scenarios that could produce greater traffic volumes include those where certain allowed commercial development occurs on land designated for industrial use or where UGB expansions occur.

Developing commercial establishments with high traffic characteristics on land designated for industrial use is a significant possibility in Sutherlin because both the city’s M-1 and M-2 zoning designations allow restaurants and lumber or building material sales. Fast food restaurants and home improvement superstores, which appear to be allowed in these zoning categories, are among the uses that produce high traffic volumes.

More detailed discussion of development assumptions used in the TSP, the BLI, and various land use scenarios and their traffic impacts can be found in Appendix B and Appendix F.

7. Preserving Interchange Operations

The goal of an IAMP is to help protect the investment in an interchange and extend its operational life for the long term. Preserving or extending the operational life of an interchange can be accomplished through access management and the development of an interconnected local street system, and through the use of management measures, particularly those that preclude previously unplanned development.

The IAMP identifies solutions to resolve the problems and issues described in greater detail in Section 2. Specifically, the IAMP deals with issues of inadequate capacity of the interchange to accommodate planned development and to address issues relating to geometric deficiencies and access points closer to the interchange than is appropriate.

7.1 Access Management

Access management seeks to maximize the effective capacity and improve operations at the interchange by minimizing the conflicts from traffic operations at nearby driveways and intersections with nearby streets. Located close to an interchange, excess driveways and local streets reduce safety and capacity of ramp terminals.

Access management 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, action definitions, and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians². 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, progress toward meeting the applicable standards must be demonstrated.

Ideally, the first intersection allowing full movements is located not less than 1320 feet from an interchange ramp terminal. Under ODOT's access management rules, approach roads less than 1320 feet, but at least 750 feet, from the ramp terminal are limited to right-in, right-out movements.

The access management plan described in this section was prepared based on the TSP preferred concept though it could be applied equally well to either of the other interchange concepts. It does not meet the ideal specifications summarized above, but it does demonstrate progress toward those standards.

7.2 Circulation Plan with Enhanced Local Street Network

The development of an interconnected local street network is also part of the solution to transportation in the vicinity of the interchange. An interconnected local street system helps motorists complete their trips without going through the interchange area and provides improved access to businesses and residences in the area where access management changes are made.

The TSP includes several policies that support an enhanced local street network. The following are among the goals and policies that support an enhanced local street system:

- Goal 3. Enhanced Livability, Objective D. "Manage transportation system for adequate and efficient operations.
- Goal 4. Street System, Objective A. "Develop a street classification system to provide an optimal balance between mobility and accessibility for all transportation modes consistent with street function," and

² A complete copy of Division 51 can be found online at:
http://www.oregon.gov/ODOT/HWY/ACCESSMGT/docs/DIVISION_51.pdf

- Goal 4. Street System, Objective F. “Balance the needed street function for all travel modes with the adjacent land uses through context-sensitive design and streetscape design techniques.”

The TSP currently lacks specific local street system projects to enhance connectivity in the vicinity of the interchange. This is remedied by the inclusion of specific projects in the TSP as specified in Section 10 of this document.

The access management plan expands upon and reinforces some of the street network recommendations included in the adopted TSP. One of the key streets identified in the TSP is a collector street intended to replace Park Hill Lane that currently serves as the principal connection between OR 138 and W. Duke Road. As explained in a previous section, the existing Park Hill Lane between OR 138 and W. Duke Road must be abandoned to allow the construction of a new, modern interchange recommended to replace the current gull wing interchange configuration. As discussed below, the intersection of OR 138 and Dakota Street has been identified as the recommended connection for the new collector that would extend to W. Duke Road. This could also be a logical route to extend a collector road south to Interchange 135, a project included in the TSP.

The local road network is fairly well developed and interconnected on the east side of I-5, but is limited on the west side. There is only one route that connects the east and west sides in the vicinity of Interchange 136, OR 138/W. Central Avenue. As discussed in Appendix B, significant growth is anticipated to occur near the interchange in the future. The current system will necessitate the majority of the traffic that travels between east and west Sutherlin to use OR 138/W. Central Avenue and compromise the function of the proposed interchange.

To protect the function of the interchange, and enhance mobility, a series of local road improvements are needed as shown in Figure 9. Many improvements are identified for the west side of Sutherlin to provide connectivity. Though some consolidation of driveways can occur prior to the development of an improved local street network, improved connectivity may allow further consolidation of approaches to OR 138. Consolidation of approaches will allow the maximum capacity to be gained for the interchange design. It will also increase the safety along OR 138 by reducing the number of conflict points in the vicinity of the interchange. The local street system helps move in the direction of compliance with OAR’s access management spacing standards.

Appendix C identifies signal warrants at Dakota Street to be met in the future. The consolidation of accesses to the Dakota Street extension will increase the likelihood of this location meeting signal warrants in the future. After consolidation, the signal will help traffic move safely and efficiently between the northwestern and southwestern quadrants or to the east of the interchange. The signal, however, will need to meet warrants as well as gain approval from the State Traffic Engineer prior to installation.

The local street system will also help support the construction of one of the Sutherlin TSP’s projects, a collector street parallel with I-5 extending from OR 138 to Interchange 135. The northerly connection with OR 138 would be Dakota Street, which, as indicated above, is anticipated to be a signalized intersection. The alignment of the new collector street might

follow Park Hill Lane, but might follow a different route depending on future analysis. In either case, this new collector street would allow some traffic originating in or destined for the western portion of Sutherlin to avoid Interchange 136 completely, relying upon Interchange 135 for trips to and from Roseburg or I-5 south. The local street system reinforces and takes advantage of this planned TSP project.

7.3 Access Management Plan

The actions for access points within the interchange influence area and details regarding the access management plan are presented in Table 10 and Figures 12, 13, 14 and 15. The plan provides actions for both the west and east sides of the interchange.

The implementation of the access management plan will occur over a long period of time. To provide a timeline for the plan, the actions have been categorized into short-, medium- and long-term. The timeline is not absolute or indicative of a specific sequence of the actions, but can be thought of in these terms:

- **Short-term:** These actions are likely to occur prior to a major interchange improvement project designed to increase its capacity or address geometric issues. The most likely reason for implementing these actions will be the development or redevelopment of the parcels. A change of use, with or without rezoning, may be sufficient to trigger a change in access. Another possible reason for undertaking the short-term actions include a roadway improvement project initiated by the city or by ODOT, including projects that have not been identified previously, such as a safety improvement.
- **Medium-term:** These actions are likely to occur concurrently with an interchange improvement project. If the actions identified as short-term actions have not been implemented prior to the initiation of the interchange improvement project, it is assumed that the short-term actions will also be undertaken in connection with the interchange project.
- **Long-term:** These actions are likely to occur after the interchange improvement project has been completed. The long-term actions are principally based on the need to change access control to reduce safety problems resulting from traffic growth in the interchange area and Sutherlin in general. Depending upon the rate of growth in the community and how much traffic growth occurs before the planned interchange improvement project is constructed, some or all of the projects listed in the long-term category may need to be implemented concurrently with the interchange project.

General policies 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.

A traffic evaluation may be required for development or redevelopment of parcels in the study area. Any required study should address access points and potential safety issues. The access standards are further discussed in the following section. The traffic evaluation may result in a possible need for access control (including restrictions that prohibit certain movements). Near the interchange right-in/right-out restrictions are typical. Under certain circumstances left-in movements may also be appropriate where turn restrictions are applied. In order to increase accessibility to/from intersections with restricted movements u-turns or alternative routes may be necessary in combination with the restrictions.

Access management actions for the west side of the interchange include reduction and/or consolidation of access points and occasional turning movement restrictions either in conjunction with the interchange project or as redevelopment occurs.

Minimal access management actions are identified for the east side of the interchange influence area. These actions include alternative connections between Myrtle Street and Comstock Road as well as Ponderosa Drive and Comstock Road. Access management actions for the east side of the interchange include reduction and/or consolidation of access points and occasional turning movement restrictions either in conjunction with the interchange project or as redevelopment occurs.

Table 10: Access Actions by Individual Approach

Approach #	Short-term Action Pre-Interchange	Medium-term Action Concurrent with Interchange Improvement Project	Long-term Action Post-Interchange
1	No Action	No Action	No Action
2 (Dakota St)	-Extend south of OR 138 to provide access to approach 14 -Signalize this intersection and interconnect to nearby signals, when warrants are met ³ - See Circulation Plan for related projects	- Same as Short-term.	Same as Short-term
3 (Crestview St)	-Close approach when intermediate access is established (see approach 32)	Same as Short-term	-When traffic volume increases cause operational or safety problems, restrict turning movements to allow only right-ins and right-outs (see approach 32).
4 (SW Hutchins St)	-Close and combine with parcels if development opportunity arises; consider joint access at approach 32.	-If not closed in short-term, close access in connection with interchange project and provide alternative access.	Same as Medium-term
5 (Park Hill Ln)	-No Action	-Close intersection in conjunction with interchange improvements. For alternative access see approach 2.	Same as Medium-term
6 (Northbound ramp terminal)	No Action	No Action	No Action
7 (Ponderosa Dr)	No Action	-See Project #5 on Circulation Plan (Figure 12)	-When traffic volume increases cause operational or safety problems, restrict turning movements to allow only right-ins and right-outs
8 (Myrtle St)	No Action	-See Project #6 on Circulation Plan (Figure 12)	-When traffic volume increases cause operational or safety problems, restrict turning movements to allow only right-ins and right-outs

³ See Appendix C or OAR 734-20-(400-500) for more details

9	-Upon property redevelopment, close approach and provide access via Ponderosa Drive.	Same as Short-term	-If redevelopment does not occur as discussed in short-term actions, restrict access to right-in, right-out only
10 (Old Comstock Rd alignment)	-Restrict access to right-in. Full access gained from Comstock Road.	Same as Short-term	Same as Short-term
11 (Comstock Rd)	Signalize this intersection and interconnect to nearby signals, when warrants are met ⁴	Same as Short-term	Same as Short-term
12 (Sunset Dr)	No Action	-See Circulation Plan for related projects	-When traffic volume increases cause operational or safety problems, restrict turning movements to allow only right-ins and right-outs
13 (Hawthorne St)	No Action	No Action	No Action
14	-Close access. Access to be gained from Dakota extension (see approach 2)	Same as Short-term	Same as Short-term
15	-See Project #2 on Circulation Plan (Figure 12)	- Close approach when intermediate access is established (see approach 32)	Same as Medium-term
16	-Close approach at such time as reasonable alternative access becomes available from approach 32, by means of cross-easement or consolidation of parcels, or other redevelopment	Same as Short-term	Same as Short-term
17	See Project #2 on Circulation Plan (Figure 12)	- Close approach when intermediate access is established (see approach 32). Future access to be taken from approach 32, may require a cross-easement serving adjacent properties	Same as Medium-term
18	-Close approach at such time as reasonable alternative access is available to Comstock Road; see Project #5 on Circulation Plan (Figure 12)	Same as Short-term	Same as Short-term

⁴ See Appendix C or OAR 734-20-(400-500) for more details

19	-Close approach at such time as reasonable alternative access is available to Comstock Road via Ponderosa (see Project #5 on Circulation Plan, Figure 12)	Same as Short-term	Same as Short-term
20	-Close approach at such time as reasonable alternative access is available to Comstock Road (see Project #6 on Circulation Plan, Figure 12)	Same as Short-term	Same as Short-term
21	-As redevelopment occurs, access should be gained from Comstock Road	Same as Short-term	Same as Short-term
22	-As redevelopment occurs, access should be gained from Hawthorne Street	Same as Short-term	Same as Short-term
23	-Combine with approach 24 -When traffic volume increases cause operational or safety problems, restrict combined approach to right-in, right-out	Same as Short-term	Same as Short-term
24	-Combine with approach 23 -When traffic volume increases cause operational or safety problems, restrict combined approach to right-in, right-out	Same as Short-term	Same as Short-term
25 (W. Duke Road)	No Action	No Action	No Action
26 (SW Hutchins Way)	No Action	No Action ⁵	No Action
27	No Action	-Close approach in conjunction with interchange improvements. Alternative access will be dependent on the final design of the interchange improvement project	Same as Medium-term
28	-Close approach in conjunction with redevelopment	-If not closed due to redevelopment, close approach in conjunction with interchange improvements.	Same as Medium-term
29	No Action	No Action	No Action
30	No Action	No Action	No Action
31	No Action	No Action	No Action

⁵ Depending on final design of the ramps, changes to Park Hill Lane may require closure of this access.

32	-Provide an intermediate access point for properties north and south of OR 138. For related short-term actions, see approaches 3, 15, and 17.	Same as Short-term	-When traffic volume increases cause operational or safety problems, restrict turning movements to allow only right-ins and right-outs
Not Illustrated	Reservations of access not being used are not illustrated on Figures 10 and 11. These reservations of access are assumed to be cancelled when alternative access becomes available as shown in this plan.		

The access management actions in this plan are based on current property ownership and existing property boundaries and access points, and building configurations. Should the property boundaries change in the future due to consolidation, land use changes, redevelopment or specific design decisions related to roadway improvement projects, the access management plan may need to be modified.

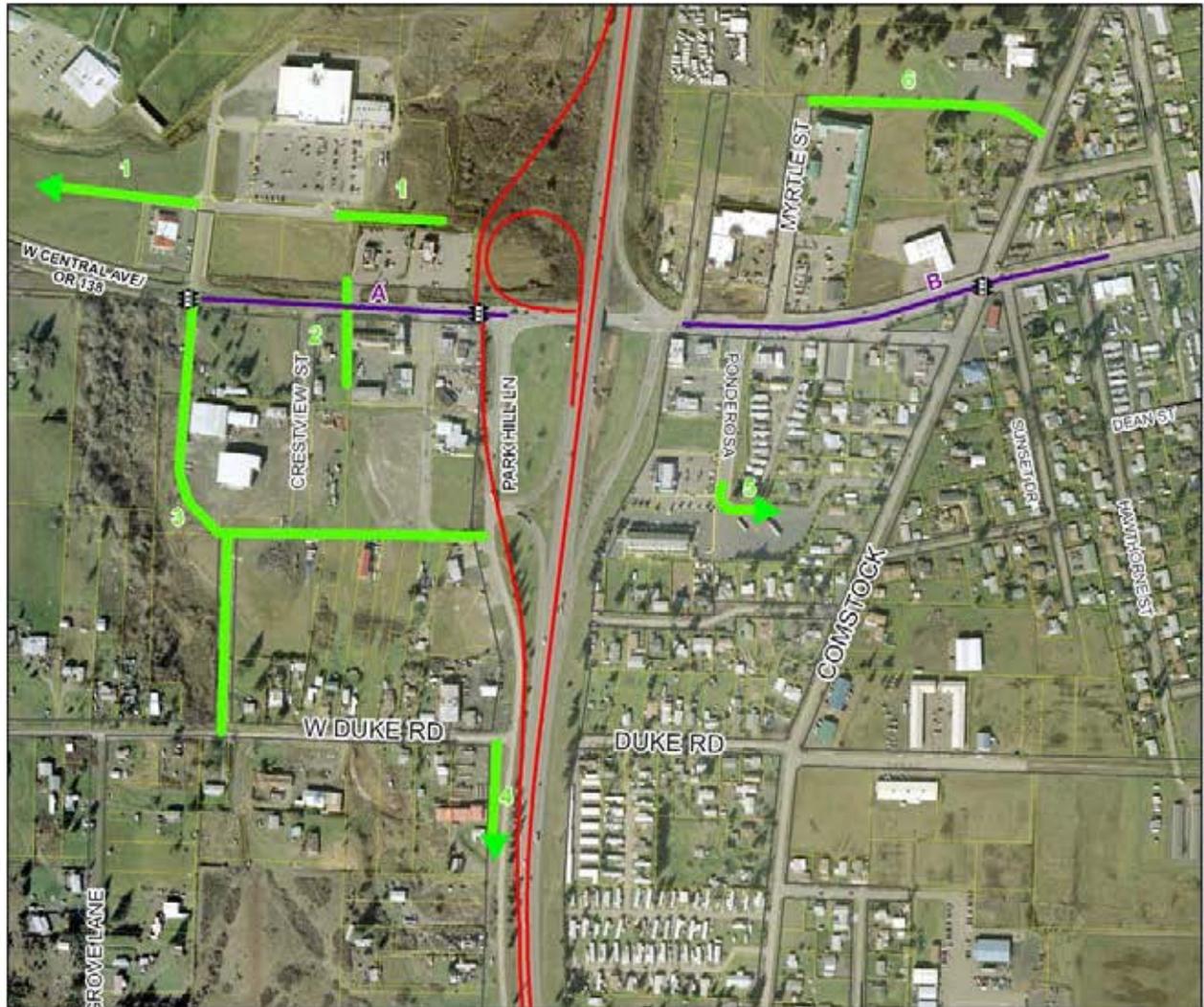
Consistent with the adopted access management spacing standards in the Oregon Highway Plan (OHP) and Oregon Administrative Rules (OAR) 734-051 (Highway Approaches, Access Control, Spacing Standards and Medians), the following policies are adopted for OR 138 in Sutherlin:

Policy: Where modifications of the actions specified in Table 10 of the IAMP are necessary, the access must move in the direction of the access standards as prescribed in OAR 734-051 (Highway Approaches, Access Control, Spacing Standards and Medians).

Policy: A future land partition or subdivision is not sufficient justification to create an additional access point beyond what is currently allowed or is provided for in this plan.

Where ODOT has jurisdiction relating to access, ODOT has final authority to implement an access management strategy, though the City of Sutherlin may be consulted about such changes. The actions listed in this plan shall not prevent the reconstruction of approaches as necessary to meet City or ODOT standards.

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Legend

1. Extend service road to the east along back of parcels fronting OR 138. Additionally, extend service road to the west to OR 138 at Fort McKay Road or to Dovetail Lane.
 2. Create new intermediate access (either local street or shared driveway) serving multiple parcels north and south of OR 138. Initially, this is expected to be a full-movement intersection, but may be restricted to right-in, right-out when traffic volumes increase causing operational or safety problems.
 3. Extend Dakota Street south to connect with W. Duke Road or to Park Hill Lane or both. This new street will substitute for Park Hill Lane that must be abandoned in connection with the planned interchange improvement project.
 4. Develop new collector street between W. Duke Road and Interchange 135. This new street is a recommended project in the Sutherlin Transportation System Plan. The alignment will need to be determined based on further study. It will not necessarily follow the alignment of Park Hill Lane as shown in this figure.
 5. Develop a connection from Ponderosa Drive to Comstock Road.
 6. Develop new local street to provide alternative access between Myrtle Street and Comstock Road north of W. Central Avenue.
- A. Implement access management plan on the west side of the interchange as described in Figure 13.
- B. Implement access management plan on the east side of the interchange as described in Figure 14.

Legend

 Future Signal



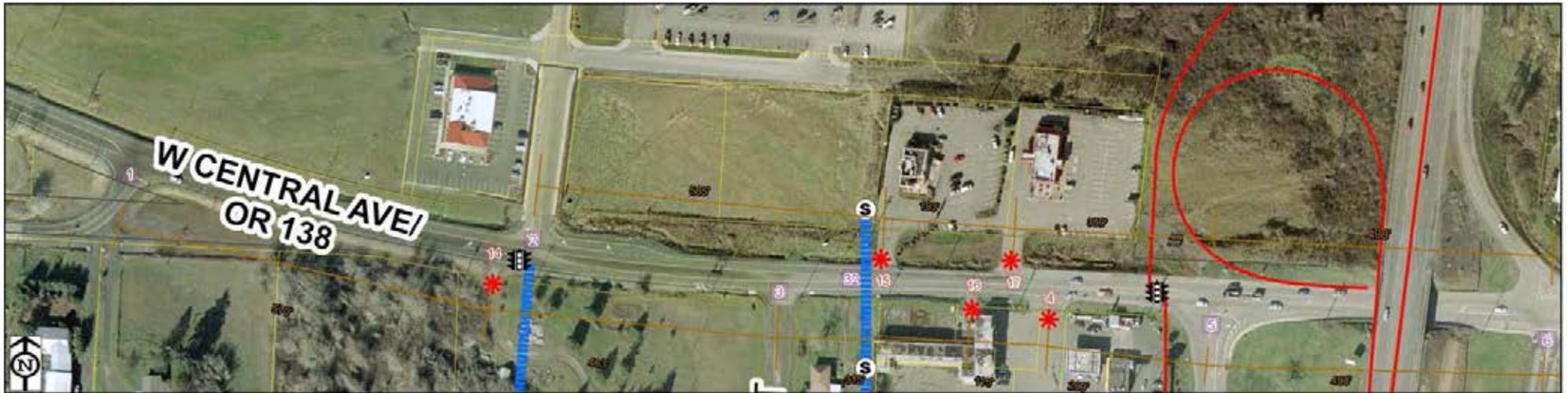
GIS Data Source: City of Sutherlin

Sutherlin IC 136 IAMP

Figure 12

Circulation Plan with
Enhanced Local Street Network

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Interchange 136 Vicinity (Not to Scale)

150 75 0 150 Feet



GIS Data Source: City of Sutherlin

Legend

- Parcels
- Private Driveway with Approach Number
- Public/Private Road with Approach Number
- Future Signal
- New Access
- Preferred Alternative

- S Retain intersection, but restrict turn movements as required for traffic operations and safety
- * Consolidate or close in connection with development or redevelopment. Restrict turn movements as required for traffic operations and safety. Provide alternative access, if possible.

Sutherlin IC 136 IAMP

Figure 13

Access Actions - Westside

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Interchange 136 Vicinity (Not to Scale)



GIS Data Source: City of Sutherlin

Legend

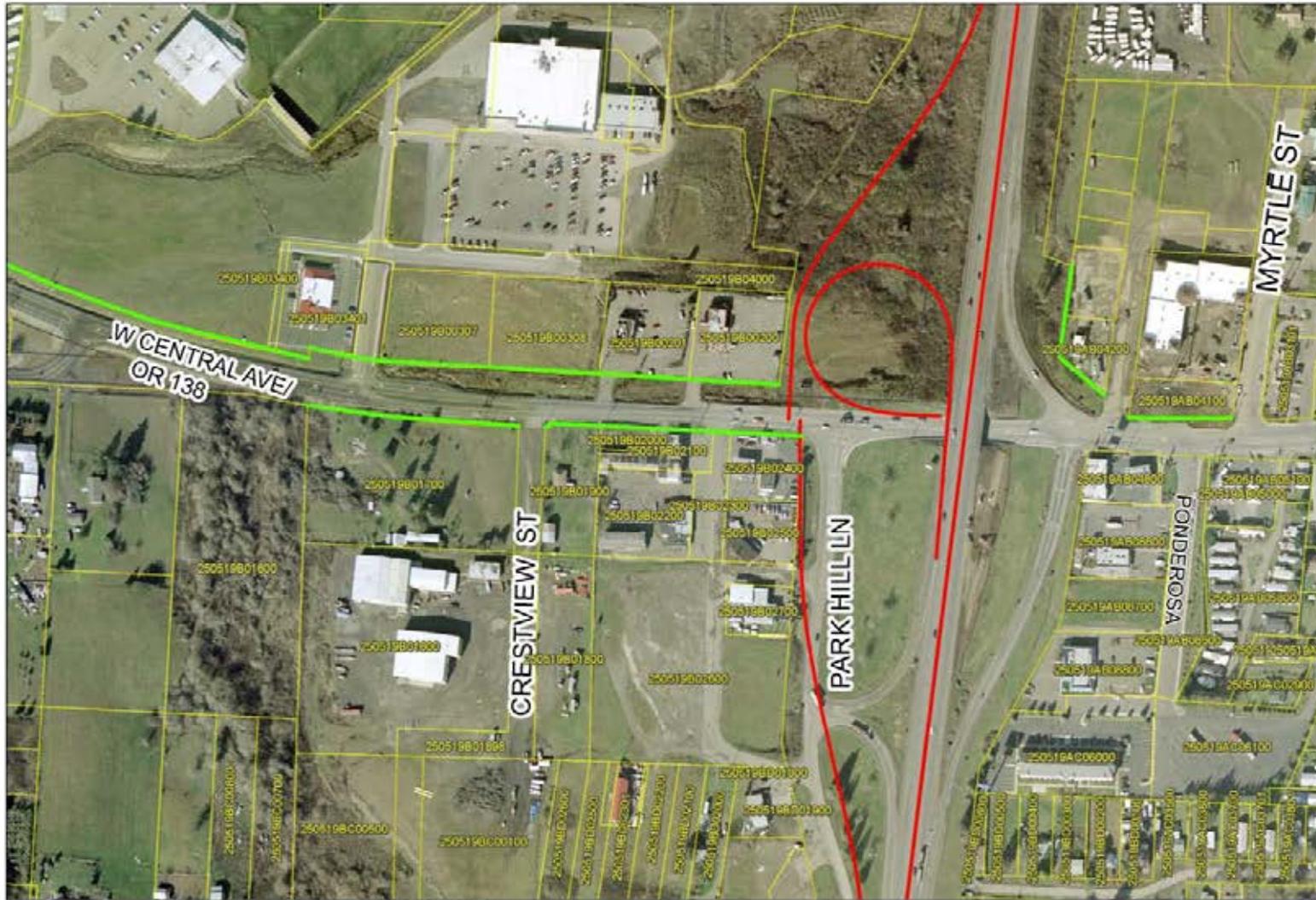
- Parcels
- Private Driveway with Approach Number
- Public/Private Road with Approach Number
- Future Signal
- New Access
- Preferred Concept
- S Retain intersection, but restrict turn movements as required for traffic operations and safety
- * Consolidate or close in connection with development or redevelopment. Restrict turn movements as required for traffic operations and safety. Provide alternative access, if possible.

Sutherlin IC 136 IAMP

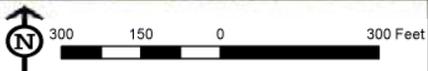
Figure 14

Access Actions - Eastside

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Interchange 136 Vicinity (Not to Scale)



GIS Data Source: City of Sutherlin

Legend

- Access Control Line
- Parcels
- Preferred Concept

Sutherlin IC 136 IAMP

Figure 15

Access Control
and Parcel Details

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8. Other Management Strategies

A variety of other management strategies were also evaluated for their potential to reduce traffic impacts and preserve the capacity of the interchange. The toolkit of potential management actions includes strategies that:

- Provide travel options to reduce the number of trips or vehicles on the road;
- Improve system efficiency and reduce delays; and
- Guide land use development to result in fewer trips in the interchange area.

Many management actions are most applicable when applied throughout a region or in a large urban area. A positive impact may be produced by some even if applied only in Sutherlin or in the study area.

8.1 *Recommended Management Measures*

In addition to the implementation of an enhanced local street system and access management as discussed in the previous section, other management measures were recommended. These include the use of Transportation Demand Management (TDM) measures; the application of Transportation System Management (TSM) measures, and the possible inclusion of the Sutherlin area interchanges in Intelligent Transportation Systems (ITS) or ramp metering if such systems are implemented in the Roseburg area.

TSM strategies focus on maximizing use of the operational efficiency of the system. TSM measures have long been standard operating practice of ODOT and TSM measures are assumed to be included when any signals are designed and constructed at the interchange or on OR 138. This includes signal interconnect, and optimized signal timing.

TDM strategies that encourage the use of carpools, vanpools, bicycling and walking should be implemented, especially in areas with high employment levels or high residential densities where such developments occur. A Transportation Management Association (TMA) would be useful to promote travel options, coordinate shared rides, obtain grants, advocate for transit service, and provide incentives to participants. Sutherlin may wish to establish a mechanism by which employers of a certain size are required to participate in a TMA, or provide incentives to employers who choose to participate in a TMA.

Congestion on I-5 is not predicted for the next 20 years based on TSP traffic analysis. However, it is possible that the rate and type of development may occur differently than anticipated, and congestion may become an issue on the freeway. While an ITS or ATMS program would not be reasonable to employ in just the Sutherlin area in the foreseeable future, the Sutherlin area interchanges might be included as part of a Roseburg region implementation. The ultimate decision about the employment of ramp metering, ITS, and ATMS would belong to ODOT.

8.2 Candidate Measures for Possible Future Implementation

After careful consideration, the City of Sutherlin rejected other management measures, at least for now. Some of the management measures evaluated as part of the study included the establishment of a “trip cap” or “trip budget” or changes to zoning that would limit the traffic impact of future development.

The practice of limiting trips, or placing “trip caps” or “trip budgets” involves permitting development projects based on the number of trips each will generate, in the context of development within a specified area. This method is typically employed in areas with a combination of significant congestion, capacity constraints, and few options for maintaining traffic flow.

Using a trip budget program could provide a measure of flexibility for developers while limiting the total impact of development. A development that did not use all the allowable traffic generation potential of its land might be able to pass on its unused traffic potential to an adjacent development that could be allowed to generate more traffic. As long as the total traffic generation from the area remained within limits, the interchange operations would be protected.

Ultimately, the city rejected the concept of implementing a trip cap or trip budget at this time. Among the reasons cited were the administrative burdens associated with keeping track of trips related to proposed development; concern that a trip budget would stifle development needed for growth and economic diversification; and the importance of other issues currently requiring the city’s attention.

Another concept that was evaluated during the course of the study was the possibility of altering the allowed uses in some zoning categories. To address the possibility that industrially zoned land in interchange area could become a hub for high-generation land uses, such as fast food restaurants and building materials retail stores, restrictions to exclude these high traffic generators were discussed. The city also rejected these management measures, principally because they could require the city to compensate property owners for reduced development potential and property value. There was also concern that eliminating some ancillary uses could adversely affect the ability of the city to attract some highly desirable industrial development.

While not permanently rejecting the concept of new management measures involving trip caps or development restrictions to extend the functional life of an interchange improvement, the city thinks it lacks the resources to implement and administer such management measures at this time. The city remains open to the idea of implementing any such measures once an interchange improvement project has advanced to the development phase.

9. Priorities and Timing of Improvement Needs

9.1 State Priorities

Improvements to Interchange 136 are not currently listed in the STIP. Advancing the interchange improvements described in this IAMP is likely to be difficult given the funding conditions and the state’s investment policy. The OHP contains the following language:

It is the policy of the State of Oregon to place the highest priority for making investments in the state highway system on safety and managing and preserving the physical infrastructure.

With regard to modernization, the OHP provides the following language:

Give priority to modernization projects that improve livability and/or address critical safety problems and high levels of congestion.

With regard to preservation, the OHP provides the following language:

Maintain Statewide Highways at a higher condition than Regional and District Highways, and invest in thicker pavement on designated freight routes.

As described in other sections of this report, there are certain elements of the existing Interchange 136 design that are substandard. However, these have not resulted in high crash rates that could support a claim of significant safety problems. This could change with increases in traffic volumes, but the overall conclusion is that safety is not as a major argument for advancing interchange improvements.

Based on the analysis performed for this study, the performance of the southbound ramp terminal will eventually fall below mobility standards. However, relatively low volumes of traffic in comparison to that of larger metropolitan areas, suggests it will be difficult to demonstrate “high levels of congestion” needed to advance a modernization project.

Another difficulty faced by Sutherlin in promoting the advancement of improvements at Interchange 136 is OR 138’s classification as a Regional Highway, which according to state policy has a lower priority than a Statewide Highway.

The city’s inability or current lack of willingness to impose new management measures on property owners beyond the current specifications of the Sutherlin Municipal Code and Sutherlin Comprehensive Plan is a disincentive for the state to expend substantial resources for this interchange.

9.2 *Timing of Need for Improvements*

As summarized in Section 6 and discussed in detail in Appendix D, the development potential of west Sutherlin and the impact of traffic from new development is highly dependent on what land is ultimately developable and the type of development that actually occurs. Key factors include the possible expansion of the urban growth boundary and limitations on development imposed by wetlands or hillside constraints. In addition, Sutherlin’s development code allows a fairly high degree of flexibility with regard to development on land designated for industrial use.

Finally, the rate of development is dependent on economic and demographic factors that are determined on a scale far beyond Sutherlin’s influence. Appendix C presents the results of a

sensitivity analysis that illustrates the effect of different growth rates on the need to implement various capacity-increasing improvements, particularly the widening of OR 138/W. Central Avenue from three lanes to five lanes at the interchange. Depending on the rate of growth, a major interchange modernization project that includes expanding OR 138/W. Central Avenue to five lanes could occur as soon as 2014. On the other extreme, a slow growth rate in line with historical trends for traffic on OR 138 at the west city limit could result in delaying major improvements to beyond year 2030.

Table 11 summarizes the information in Appendix C and presents the year at which future traffic volume reaches the levels at which the OHP mobility standards are no longer met. Five different growth rates are provided in Table 11. The rates range from the historical growth rate at the low end to the TSP growth rate at the high end. The middle rate is that associated with the BLI and is derived from the land use assumptions and trip generation rates described in Table 9. Two other rates are included that bracket the BLI rate, one higher and one lower. Note that the growth rates for the northbound and southbound ramp terminals are different. This reflects the greater potential for growth in the western part of Sutherlin than in the east part of the city.

Table 11. Year When Volume Reaches Maximum Allowable According to OHP Mobility Standards by Various Growth Rates and Various Interchange Configurations

Intersection	Growth Scenario	Annual Rate (percent)	3-Lane Cross Road ¹	5-Lane Cross Road ²	5-Lane Cross Road with Supplemental Right Turn Lane ³	5-Lane Cross Road with Loop Ramp ⁴
NB Ramp Terminal	Historical	1.6	2030> ⁵	2030>	2030>	n/a
		3.7	2021	2030>	2030>	n/a
	BLI	4.6	2018	2030>	2030>	n/a
		5.4	2015	2030>	2030>	n/a
	TSP	6.4	2014	2030>	2030>	n/a
SB Ramp Terminal	Historical	2.7	2030>	2030>	2030>	2030>
		4.4	2022	2030>	2030>	2030>
	BLI	5.4	2017	2030	2030>	2030>
		6.4	2015	2026	2030>	2030>
	TSP	7.4	2014	2023	2030	2030>

¹ A 3-lane cross road provides for one through lane in each direction plus a left turn lane for each approach at each ramp terminal. A folded-diamond configuration for the southbound ramp terminal eliminates left turns for the eastbound approach.

² A 5-lane cross road provides for two through lanes in each direction plus a left turn lane for each approach at each ramp terminal. A folded-diamond configuration for the southbound ramp terminal eliminates left turns for the eastbound approach.

³ At the northbound ramp, the supplemental right turn lane refers to a lane added to accommodate the right turn for the westbound approach to the northbound on-ramp. At the southbound ramp, the supplemental right turn lane refers to a lane added to accommodate the right turn for the eastbound approach to the southbound ramp.

⁴ The loop ramp, which is part of the TSP's Preferred Interchange Concept, eliminates left turns for westbound traffic to the southbound ramp. It replaces that with a loop ramp. A loop ramp is not a feature of the northbound ramp terminal.

⁵ 2030> indicates the year calculated is beyond year 2030.

Among all the potential improvements that could be made in the vicinity of Interchange 136, the improvement most likely to be needed first is a project to signalize the intersection of Park Hill Lane and OR 138. Because the current interchange is actually a gull wing configuration, this intersection is not technically the southbound ramp terminal, though the vast majority of traffic using the southbound on- and off-ramps uses this intersection. Justification for signalization might be based on development impacts or traffic safety. In any case, signalization must be based on meeting applicable signal warrants and approval by the State Traffic Engineer based on established criteria.

A modernization project to replace the existing gull wing configuration and improve ramp designs could be expected to improve safety and traffic operations. As discussed above, the improvement could have a useful life of several to many years depending on the rate of growth.

Once OR 138/W. Central Avenue is widened to five lanes it is predicted to provide adequate operation at the ramp terminals for many years. For most growth rate scenarios, this would prove adequate beyond year 2030. Adding supplemental right turn lanes to accommodate movements from eastbound OR 138 to southbound I-5 and from westbound W. Central Avenue to northbound I-5 would increase capacity further, extending the useful life beyond year 2030.

Adding the supplemental loop ramp for the westbound W. Central Avenue to southbound I-5 movement is another way to increase capacity of the northbound ramp terminal. This improvement would also extend the life of the interchange beyond 2030.

10. Implementation

As of December 2008, a potential modernization project to upgrade Interchange 136 is not a funded project. No project to improve this interchange is included in the current STIP. The adoption of an IAMP is a requirement for interchanges undergoing significant modification. To implement the TSP preferred interchange concept identified in this study requires adoption of an IAMP.

The inclusion of projects in the City's TSP, including the identification of the TSP Preferred Concept for Interchange 136 in this IAMP, is not to be relied upon as the basis for development approval as specified in OAR 660-12-060.⁶

The elements adopted by the City and the OTC as part of this IAMP are specified below. Some actions are to be adopted by the OTC as a "facility plan" that implements the OHP. Other actions are adopted by the City of Sutherlin. Each subsection specifies which agency is responsible.

10.1 Access Management

Adoption of the Access Management Plan is a state responsibility.

"Access Management Plan" from Section 7 of this document is adopted, including Table 10 and Figures 12, 13, 14 and 15 and explanatory materials.

10.2 OHP Policy Statement

Adoption of the OHP is a state responsibility. Adopting a new policy statement describing the priorities associated with potential interchange improvements is a state responsibility.

The following policy statements are added to the Investment Policies and Scenarios section of the OHP:

The highest priority for investments by the State to interchange 136 shall be directed toward critical safety problems and maintaining the interchange's existing physical infrastructure.

10.3 Amend TSP Chapter 2 TSP Goals and Objectives

The TSP is a locally-adopted plan and is thus a responsibility of the City of Sutherlin. Amendment of the TSP Goals and Objectives is also a city responsibility.

Additional policy language is adopted for Chapter 2: TSP Goals and Objectives.

⁶ A complete copy of OAR 660 can be found at:
http://arcweb.sos.state.or.us/rules/OARS_600/OAR_660/660_tofc.html

To implement the local circulation plan, which supports and enhances the development of an improved, interconnected local street network, the following TSP amendments are adopted as additional “objectives” under “Goal 4. Street System:”

- I. *Develop a new local street or shared private driveway with an east-west orientation to enhance access to properties north of West Central Avenue between Comstock Road and Myrtle Street.*
- J. *Develop a new local street or shared private driveway with an east-west orientation to enhance access to properties south of West Central Avenue between Comstock Road and Ponderosa Street.*
- K. *Develop a new collector street extending southward from the intersection of OR 138 and Dakota Street to West Duke Road and eventually to Interchange 135 as a substitute for Park Hill Lane (which must be disconnected to allow development of an interchange improvement project meeting modern design standards).*
- L. *Support ODOT’s efforts to implement an access management plan, especially along OR 138 and West Central Avenue between Comstock Road and Dakota Street, to protect the operations and function of Interchange 138.*

10.4 Amend TSP Chapter 7 Street Network Plan

The TSP is a locally-adopted plan and is thus a responsibility of the City of Sutherlin. Amendment of the TSP Street Network Plan is also a city responsibility.

To provide clarity and additional information produced in this study, Chapter 7: Street Network Plan is amended as follows:

The adopted 2005 TSP (page 7-5) includes the following description related to the **Vicinity of I-5 Exit 136 Interchange at Oregon Highway 138/Central Avenue:**

I-5 Interchange: IAMP needed at this interchange to study

- *Improvements to I-5 on- and off-ramps*
- *Park Hill (sic) Lane and Frontage Road access*
- *Analysis of land uses around interchange*

Now that the IAMP has been undertaken, the “study” described in the TSP has been completed. The TSP is amended by deleting the preceding reference and replacing it with an actual “project.” The Street Network Plan is amended with a revised project description as follows:

I-5 Interchange: Modernization project consisting of:

- *Disconnect Park Hill Lane between OR 138 and W. Duke Road*
- *Replace existing gull wing interchange configuration for the southbound on- and off-ramps with a modern diamond interchange configuration compatible with a supplemental loop ramp to serve westbound OR 138 to southbound I-5 traffic*

- *Construct or upgrade appropriate streets between OR 138 and W. Duke Road that serves as a substitute for Park Hill Lane*
- *Implement access management along OR 138 and W. Central Avenue consistent with the Access Management Plan*

The adopted 2005 TSP (page 7-5) includes six streets under the caption **West of I-5**. For clarity, the Street Network Plan is amended to include a seventh street project as follows:

Dakota Street Extension: Construct a new collector street from the intersection of OR 138 and Dakota Street south to W. Duke Street and eventually to Interchange 135 that provides access for development in the area and serves as a substitute for Park Hill Lane. Provide for signalization of the intersection of OR 138 and Dakota Street when signal warrants are met.

The adopted 2005 TSP (pages 7-6 through 7-9) lists nine streets under the caption **East of I-5**. For clarity, the Street Network Plan is amended to add two new street projects as follows:

Comstock Road to Ponderosa Street Connection: Construct a new local street or shared private driveway south of and parallel to W. Central Avenue to serve parcels along W. Central Avenue near Interchange 136. This street should help provide additional access to properties and help minimize impacts from possible access restrictions needed to protect the function of the interchange.

Comstock Road to Myrtle Street Connection: Construct a new local street or shared private driveway north of and parallel to W. Central Avenue to serve parcels along W. Central Avenue near Interchange 136. This street should help provide additional access to properties and help minimize impacts from possible access restrictions needed to protect the function of the interchange.

10.5 Amend TSP Chapter 13 TSP Financial Plan

The TSP is a locally-adopted plan and is thus a responsibility of the City of Sutherlin. Amendment of the TSP Financial Plan is also a city responsibility.

The adopted 2005 TSP also includes a financial plan. Table 13-1 (page 13-2) includes twenty specific roadway projects. The table includes the project name, cost, primary funding responsibility and the city funding percentage and city share of project costs.

During the development of this IAMP, the interchange improvement concepts were developed to a higher level of detail than was undertaken for the TSP. Updated cost estimates were also prepared. The updated cost estimates are included in the TSP capital improvement project list. In addition, the PAC and TAC recognized the potential for the TSP preferred interchange concept to be implemented in phases, beginning with a standard diamond with a loop ramp as a second phase.

It is also recognized that funding sources originally listed in the TSP may have been too specific, especially in relation to ODOT’s anticipated long-range funding shortfall. “Unknown” is now listed as one of the potential funding partners.

During the development of the IAMP, the need for local street projects and an extension of Dakota Street were also identified.

To account for the updated costs and added projects described above, the following changes to the TSP Financial Plan and Table 13-1 are adopted as follows:

Deletions from the original Table 13-1 from the TSP are shown using ~~strike through~~. Additions are designated in **bold** font.

Table 13-1 Capital Improvements List & Potential Funding Partners

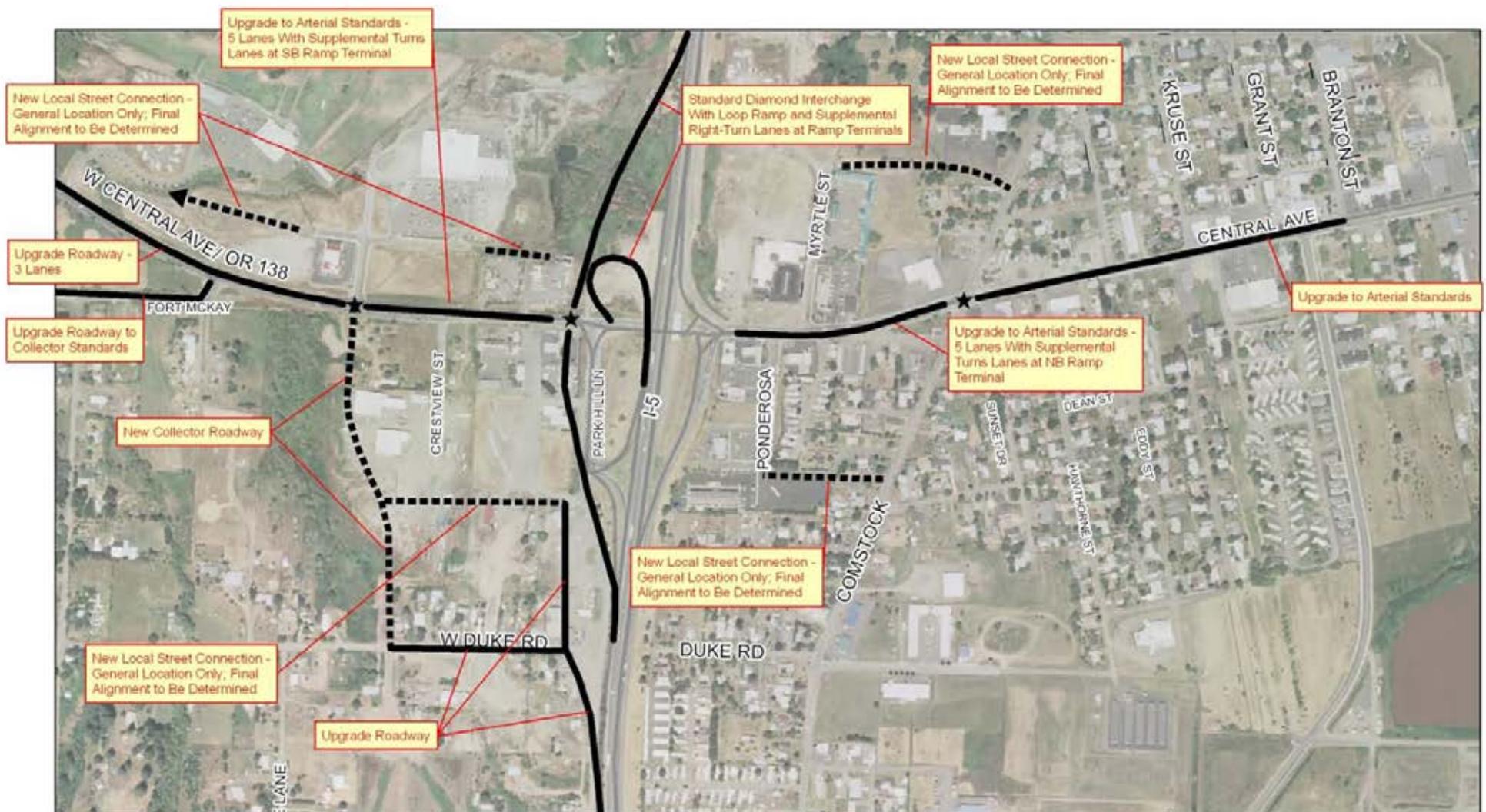
Project Name	Cost	Potential Funding Partners ¹
Stearns Lane - Improvement and realignment	\$8,269,952	County/Developer
Dovetail Lane improvement	\$2,439,293	City/Developer
Dovetail Lane-new connection east	\$8,092,857	City/Developer
Dovetail Lane-new connection west	\$6,026,051	City/Developer
Church Road - improvement	\$1,432,090	City
Fort McKay Road - Improvement	\$3,635,487	County
New collector (Church to Plat M)	\$5,356,799	County
Plat M Road - Upgrade and new collector to South interchange	\$9,181,152	County
N Calapooia St (improvement/realignment)	\$2,549,354	City/ State Unknown
Duke - Hastings Avenue improvement	\$2,355,822	County
New east/west parkway (Southside Parkway)	\$13,829,512	City
E Central Avenue- Comstock to east city limit	\$4,635,362	State Unknown
Waite Street improvements	\$1,081,698	City
E 4th Avenue - State Street to Jade Street	\$4,056,261	City
W 6th Avenue and RR overpass	\$13,302,848	City/ State Unknown
New - Hawthorne-W Central at Sherman	\$4,687,012	City
E 6th Avenue improvements (missing sections)	\$2,163,611	City/Developer
Oregon Highway 138 Ft McKay to Comstock	\$3,406,698	State Unknown
Oregon Highway 138 Ft McKay to Church	\$3,229,927	State Unknown
Connection from New Parkway to Central	\$1,506,566	City
I-5 Interchange – west side at Oregon 138	\$2,192,667	State
I-5 Interchange – Upgrade on west side to standard diamond²	4,300,000³	Unknown
I-5 Interchange – Add supplemental loop ramp to standard diamond⁴	1,900,000⁵	Unknown
Dakota Street Extension from OR 138 to W. Duke Road	1,500,000⁶	
Comstock to Ponderosa Connection	300,000⁷	City/Developer
Comstock to Myrtle Connection	450,000⁷	City/Developer

Total Roadway Improvements	\$109,688,352	
Pedestrian improvements	\$6,620,789	
Personal Electric Vehicle additional multi-use paths	\$3,939,515	
Grand Totals	\$120,248,656	

Footnotes:

- 1 Potential funding partners lists possible participants and does not represent a commitment to participate. Funding arrangements will need to be negotiated when more is know about project costs and benefits and the sources of funds that may become available.
- 2 A standard diamond interchange was recognized by the PAC and TAC as a potential first phase of the TSP preferred interchange concept. This is a replacement description and cost for the project listed above and in the original Table 13-1
- 3 Project cost is based on the construction cost estimate cited in Appendix D for the standard diamond concept plus an assumed right-of-way acquisition and relocation cost of \$1.0 million.
- 4 Adding a supplemental loop ramp to serve the westbound Central Avenue to southbound I-5 movement would convert the standard diamond configuration to the TSP preferred interchange concept. This might be constructed as a second phase of interchange improvements.
- 5 As described in Appendix D, the cost of the TSP preferred concept was estimated to cost \$1.9 million more than the standard diamond concept.
- 6 The cost of a collector road constructed on a new alignment is based on an assumed cost of \$6.0 million per mile.
- 7 The cost of a local street constructed on a new alignment is based on an assumed cost of \$3.0 million per mile.

Adding the new projects described above and specified in the revised version of Table 13-1 alters the street network in the vicinity of Interchange 136. Figure 16 shows the revised street network with the addition of the local projects and the Preferred Interchange Concept. Facilities for bicyclists and pedestrians will be enhanced in the vicinity of the interchange by projects included in the original TSP project list as well as the new local road connections added with the IAMP. Figure 17 shows the new streets that will include enhanced sidewalks in the interchange area and indicates bike lanes along OR 138 in the interchange area as included in the original TSP.



New Local Street Connection - General Location Only; Final Alignment to Be Determined

Upgrade to Arterial Standards - 5 Lanes With Supplemental Turns Lanes at SB Ramp Terminal

Upgrade Roadway - 3 Lanes

Upgrade Roadway to Collector Standards

New Collector Roadway

New Local Street Connection - General Location Only; Final Alignment to Be Determined

Upgrade Roadway

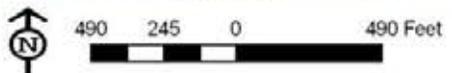
Standard Diamond Interchange With Loop Ramp and Supplemental Right-Turn Lanes at Ramp Terminals

New Local Street Connection - General Location Only; Final Alignment to Be Determined

Upgrade to Arterial Standards - 5 Lanes With Supplemental Turns Lanes at NB Ramp Terminal

New Local Street Connection - General Location Only; Final Alignment to Be Determined

Upgrade to Arterial Standards



GIS Data Source: City of Sutherlin

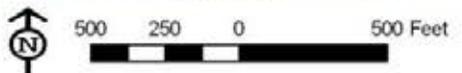
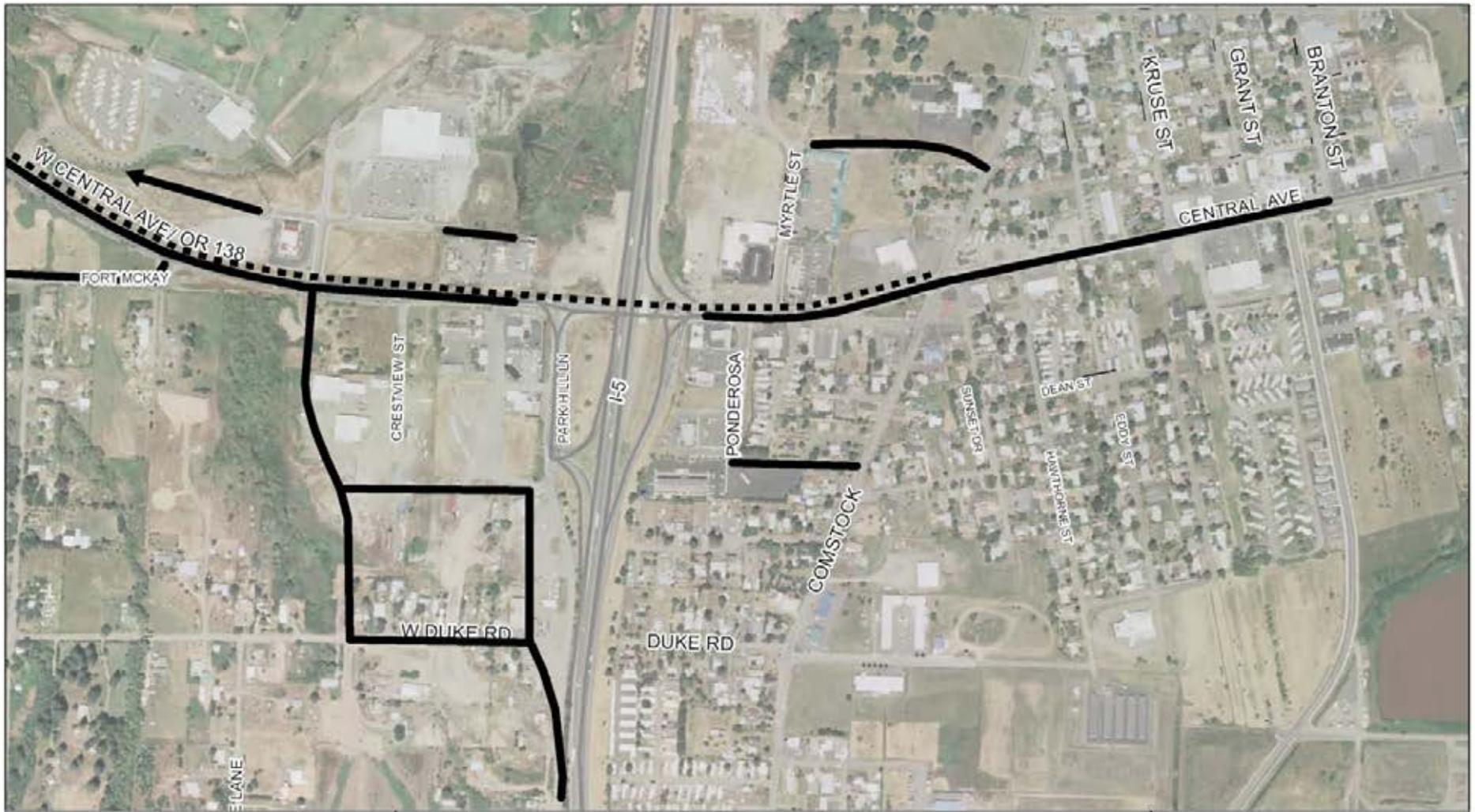
- Legend**
- Road Upgrades
 - Future Road
 - New Traffic Signal

Sutherlin IC 136 IAMP

Figure 16

TSP with IAMP Projects
In Vicinity of Interchange

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GIS Data Source: City of Sutherlin

Legend

- New or Upgraded Sidewalks in Connection w/Street Projects
- Arterial Street with Bike Lanes (both directions)

Sutherlin IC 136 IAMP

Figure 17

Planned Bikes Lanes & New or Upgraded Pedestrian Facilities in Connection w/Street Projects

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10.6 Amend Sutherlin Municipal Code

The Sutherlin Municipal Code (SMC) includes the Development Code that regulates land use activities in the City and is thus a responsibility of the City of Sutherlin. Amendment of the SMC is also a city responsibility.

Upon adoption of the IAMP, the findings for TPR compliance for future zone changes within the Interchange 136 influence area may be deferred until time of development pursuant to Development Code Section 4.8.110(C)(2). At time of development, compliance with OAR 660-012-0060 (1) (c) may be demonstrated by showing that the most intensive use and density allowed by the development will not exceed the peak hour trips allowed by Table 9 of the IAMP. The City may issue a finding of “no significant affect” when it places a condition of approval that limits uses within the zone to those in Table 9 of the IAMP and identifies funding.

Sutherlin Development Code⁷ allows any agency with access jurisdiction to require applicant to prepare a traffic study for the development proposal. The City of Sutherlin will further protect the integrity of the interchange facility by adding a condition of approval that applicant(s) agree to participate in a LID that consists of identified improvements in the IAMP.

To provide clarity and additional guidance on how to implement the provisions of this study, amendments to the SMC are enacted as follows (deletions are indicated by ~~strikeouts~~; additions are in **bold and underlined**):

CHAPTER 3 DESIGN STANDARDS

Section 3.2 Access and Circulation

3.2.100 Purpose. The purpose of this chapter is to ensure that developments provide safe, efficient and functional access and circulation, for pedestrians and vehicles. Section 3.2.110 provides standards for vehicular access and circulation. Section 3.2.120 provides standards for pedestrian access and circulation. Standards for transportation infrastructure improvements within the public right-of-way are provided in section 3.5.

3.2.110 Vehicular Access and Circulation.

A. Intent and Purpose.

1. The intent of this section is to manage vehicle access to development through a connected street system with shared driveways, where practicable, and circulation systems that allow multiple transportation modes and technology, while preserving the flow of traffic in terms of safety, roadway capacity, and efficiency. Access shall be managed to maintain an adequate “level of service” and to maintain the “functional classification” of roadways [See Transportation System Plan adopted November 2006 **and amended in April 2009**]. Major roadways, including highways, arterials, and collectors, serve as the primary system for moving people and goods. “Access management” is a primary concern on these roads. Local streets and alleys provide

⁷ Sutherlin Development Code Sections 3.2.110(D)

access to individual properties. If vehicular access and circulation are not properly designed, these roadways will be unable to accommodate the needs of development and serve their transportation function. This section balances the right of reasonable access to private property with the right of the public to safe and efficient travel.

2. To achieve this policy intent, county and local roadways have been categorized in the comprehensive plan by function and classified for access purposes based upon their level of importance and function. (See section 3.5, Infrastructure Standards) Regulations apply to these roadways for the purpose of reducing traffic accidents, personal injury, and property damage attributable to access systems, and to thereby improve the safety and operation of the roadway network. The regulations are also intended to protect the substantial public investment in the transportation system, facilitate economic development, and reduce the need for expensive remedial measures. These regulations also further the orderly layout and use of land, protect community character, and conserve natural resources by promoting well-designed road and access systems and discouraging the unplanned **development, such as developments that generate more traffic than assumed in the Transportation System Plan, or the subdivision of land designated for agricultural use in the Comprehensive Plan.**

D. Traffic Study Requirements. The city or other agency with access jurisdiction may require a traffic study prepared by a traffic engineer to determine access, circulation and other transportation requirements **including identification of projects needed to implement the Transportation System Plan or other projects needed to mitigate for traffic impacts resulting from development that exceeds assumptions from the Transportation System Plan.** (See also, section 3.5, Infrastructure.)

3.5.110 Transportation Standards.

A. Purpose. The purpose of this section is to implement the Transportation System Plan **(including the Interchange Area Management Plan, which was incorporated into the TSP in April 2009)** and protect the ~~City's~~ investment **of the City, the County, and ODOT** in the public street system. Upon dedication of streets to the public, the City accepts maintenance responsibility for the street. Failure to meet City standards may place an undue maintenance burden on the public, which may be only marginally benefited by the street improvement. Variances to street standards must be evaluated in this context.

B. Development Standards. No development shall occur unless the development has frontage onto or approved access from a public street, in conformance with the provisions of section 3.2, Access and Circulation, and the following standards are met:

1. Private streets shall not be permitted, except as approved by a PUD. In approving a private street as part of a PUD, the city must find that construction of a public street is impracticable, and the street will be constructed to a standard that approximates the city standards for public streets, except as modified to address physical site constraints. The city shall not be responsible for maintaining or improving any private street.
2. Streets within and/or adjacent to a development shall be improved in accordance with the comprehensive plan, transportation system plan and the provisions of this section, as determined by the city.
3. Development of new streets, and additional street width or improvements planned as a portion of an existing street, shall be improved in accordance with this section, and public streets shall be dedicated to the applicable City, County or ~~County~~ **ODOT** jurisdiction.

CHAPTER 4 DEVELOPMENT APPLICATIONS AND REVIEW PROCEDURES

Section 4.8 Zoning District Map Amendments

4.8.100 Purpose. The purpose of this section is to provide standards and procedures for legislative and quasi-judicial amendments to the zoning district map. These will be referred to as “zoning map amendments.” Map amendments may be necessary from time to time to reflect changing community conditions, needs and desires, to correct mistakes, or to address changes in the law.

4.8.110 Approval Procedures

C. Criteria for Amendment. The planning commission shall approve, approve with conditions or deny an application for a quasi-zoning map amendment based on all of the following criteria.

1. Demonstration of compliance with all applicable comprehensive plan policies and map designations. Where this criterion cannot be met, a comprehensive plan amendment shall be a prerequisite to approval;
2. Demonstration that the most intense uses and density that would be allowed, outright in the proposed zone, considering the sites characteristics, can be served through the orderly extension of urban facilities and services, including a demonstration of consistency with OAR660-012-0060; and . The determination of consistency with OAR 660-012-0060 can be deferred to development review pursuant to 4.3.120 for those zone changes that are located within the approved interchange 136 IAMP area and do not require a comprehensive plan amendment; and

Section 4.3 Development Review and Site Plan Review

4.3.120 Development Review Approval Criteria. Applications for development review shall be conducted as a Type I procedure, as described in section 4.2.120. Prior to issuance of building permits, the following standards shall be met:

- A. The proposed land use is permitted by the underlying zoning district (chapter 2);
- B. The land use, building/yard setback, lot area, lot dimension, density, lot coverage, building height and other applicable standards of the underlying zoning district and any overlay zone are met (chapter 2);
- C. All applicable building and fire code standards are met; ~~and~~
- D. Approval shall lapse, and a new application shall be required, if a building permit has not been issued within one (1) year of development review approval; and
- E. Traffic impacts from the proposed development are consistent with the traffic impacts for the subject parcel prescribed in Table 9 of the Interchange Area Management Plan or the development will mitigate for the increased traffic beyond that described in Table 9 of the Interchange Area Management Plan. Those zone changes within the Interchange 136 IAMP area that deferred compliance with OAR 660-012-0060 must demonstrate consistency with OAR 660-012-0060.

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Oregon

Theodore R. Kulongoski, Governor

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April 23, 2009

Gail Achterman, Chair
Oregon Transportation Commission
Transportation Building
355 Capitol Street NE, Room 135
Salem, OR 97301



Regarding: 136 (Sutherlin) Interchange Area Management Plan (IAMP)

Chair Achterman:

The Department of Land Conservation and Development is pleased to support approval of the 136 Interchange Area Management Plan (IAMP).

As you know, our department has been involved in the development of interchange area management plans from their inception and we have participated in virtually all of the IAMPs prepared to date. A major issue around most interchanges is that adopted zoning allows more development – and thus more trips - than our transportation plans assume will occur. This means that it is possible and in some cases likely that allowed development will exceed available capacity and, over time, creating the need for additional improvements.

The Interchange 136/Sutherlin plan is noteworthy because it clearly and effectively addresses this issue. It does so through a trip allocation which the city is adopting as part of its development code. The allocation identifies the number of trips per acre that properties within the interchange are entitled to. The city will apply the trip allocation in its review and approval of individual developments, thus assuring that that new developments are consistent with the trip assumptions in the IAMP. This is important because it fairly portions out available capacity among interchange properties. It also provides the opportunity for ODOT, the city, and property owners to work together to develop creative solutions when a proposed development would exceed the trip allocation.

The trip allocation provisions in the Interchange 136 Plan represent a significant improvement in interchange area management plans. We applaud work by ODOT Region 3 staff and the city and support your approval of this plan.

Sincerely,

Robert Cortright
Transportation Planning Coordinator