SECTION 1. INTRODUCTION

The Oregon Department of Transportation (ODOT) plans to replace the existing Fern Valley Interchange with an interchange that will accommodate projected traffic volume growth through at least 2030. The Fern Valley Interchange is located on Interstate 5 (I-5) approximately 24 miles north of the Oregon/California border, in the City of Phoenix and Jackson County. The interchange accesses the Phoenix area via Fern Valley Road, which crosses over I-5. The interchange accommodates all directional motor vehicle movements between the two roadways.

The purpose of the project to replace the Fern Valley Interchange is to "to reduce congestion and improve operational conditions at the [I-5] interchange with Fern Valley Road, on Fern Valley Road within the City of Phoenix Urban Growth Boundary, and on OR 99 near its intersection with Fern Valley Road."[1] Appendix A contains the purpose and need text from the draft Environmental Assessment (EA) for the Fern Valley Interchange.

ODOT developed this Interchange Area Management Plan (IAMP) to comply with the ODOT policy to prepare such plans for significant modifications to existing interchanges. Appendix B contains the administrative rule that includes the policy.[2] ODOT adopted the policy as a way to maximize the value the people of Oregon receive from the large expenditure of tax dollars required to construct a new interchange. This reflects ODOT's elevated fiduciary responsibility that has resulted from the increasing scarcity of public funds for transportation investments relative to need. It also reflects a more thorough understanding of the relationships between transportation facilities and land use and between local and state transportation networks. Together, these changes have also increased the importance of collaboration between ODOT and the communities like the City of Phoenix in which its transportation network is located.

PURPOSES OF THE IAMP

In light of the purpose of the proposed new Fern Valley Interchange and the policy to prepare IAMPs referred to above, the purposes of this IAMP are to:

- Preserve the capacity of the proposed interchange for at least the first 20 years of its design life and the capacity of N. Phoenix Road, Fern Valley Road, and OR 99 in the vicinity of the interchange.
- Ensure the safe and efficient operation of the interchange and these roadways and protect their functional integrity, operations, and safety.

[1] ODOT, Draft Environmental Assessment, I-5: Fern Valley Interchange Unit 2a, Jackson County, Oregon, January 2009, p. 1-4.
[2] The policy is stated in Oregon Administrative Rule (OAR) Section 734-051-0155(7). The Oregon Transportation Commission (OTC) adopted this administrative rule. The OTC establishes ODOT policy.

IAMP CHALLENGES

This IAMP must meet both challenges common to interchanges and challenges specific to the Fern Valley Interchange. The biggest challenge common to most interchanges is that they attract retail and other land uses that benefit from good motor vehicle access and visibility and those uses can generate so much traffic that the traffic overwhelms the capacity of the interchange. This is a problem because interchanges cost tens of millions of dollars and they and the land uses they attract can impinge on the livability of areas around them. The problem is especially acute where urban growth is rapid, as is the case in the Medford-Phoenix-Talent-Ashland corridor of Jackson County.

Challenges unique to the Fern Valley Interchange area that this IAMP must balance include:

1. Access to existing businesses near the interchange needs to be preserved. These businesses include the retail mall in the existing interchange's northwest quadrant; DSU Peterbilt & GMC Truck, Inc., Home Depot, and other retail businesses along N. Phoenix Road in the interchange's northeast quadrant; the Pear Tree Truck Stop (now owned by TravelCenters of America) and nearby businesses in the interchange's southeast quadrant; the business in the interchange's southwest quadrant; and the businesses along OR 99 near its intersection with Fern Valley Road.
2. The Phoenix Comprehensive Plan calls for additional commercial development near the interchange.
3. To pay for the services it provides, the City of Phoenix needs additional taxable real property, which is most likely to come from commercial development.[3] In addition, the City is obliged to help pay for the Fern Valley Interchange project and relies on a special transportation system development charge on new development to raise the necessary funds. The more traffic a development generates, the more money the City receives.
4. Congestion at the interchange and along OR 99 impairs freight mobility, as well as mobility for other purposes in the interchange area.
5. The viability for commercial use of the land zoned commercial along OR 99 and to the north and south of Fern Valley Road needs to be supported.
6. Such commercial development must be balanced with the need to preserve the capacity of the interchange.
7. Access to and the livability of residential areas near the interchange need to be preserved. These include the Phoenix Hills subdivision in the interchange's southeast quadrant and the mobile home parks in the interchange's northwest and southwest quadrants. Residents of the Phoenix Hills subdivision would like the routing of truck stop traffic onto S. Phoenix Road reversed.
8. Most existing and projected traffic on the interchange, Fern Valley Road, OR 99, and N. Phoenix Road passes through the interchange area and so is affected by growth and development outside the Interchange Management Area (IMA).

[3] The City of Phoenix's total assessed value per capita is 25 percent lower than the City of Medford's.

9. OR 99, Fern Valley Road, and N. Phoenix Road serve important intra-regional travel roles.
10. Policies of ODOT, the City of Phoenix, and Jackson County applicable to the interchange, OR 99, Fern Valley Road, and N. Phoenix Road need to be met.
11. Bicycle and pedestrian movement on Fern Valley Road between OR 99 and the interchange and across the interchange needs to be accommodated.

INTERCHANGE FUNCTION

Based on the classification of I-5 and applicable policies, the function of the Fern Valley Interchange is to serve statewide, regional, and local travel and freight mobility by providing safe and efficient connections between I-5 and Fern Valley Road that meet or exceed applicable mobility standards. Appendix C contains the classifications on which the standards are based and the standards themselves. Appendix D contains other regulations, plans, and policies relevant to the Fern Valley Interchange and this IAMP.

GOAL AND OBJECTIVES OF THE IAMP

The goal of this IAMP is to preserve over at least the first 20 years of the design life of the proposed new Fern Valley Interchange its function to serve statewide, regional, and local travel and freight mobility by providing safe and efficient connections between I-5 and Fern Valley Road that meet or exceed applicable mobility standards. This IAMP seeks to achieve the following objectives to the greatest extent possible:

1. Provide for the safe and efficient operation of the interchange and approaches to it.
2. Protect the function of I-5 as an Interstate Highway, part of the National Highway System, a Freeway, and a Statewide Freight Route; the function of the ODOT portion of Fern Valley Road as a District Highway[4] and of the City of Phoenix portion as a Collector; the function of N. Phoenix Road as an Arterial;[5] the functions of the ODOT portion of OR 99 as a District Highway and Regional Freight Route; and the function of the City of Phoenix portion of OR 99 as an Arterial.
3. Meet the performance standards applicable to I-5, the interchange, OR 99, Fern Valley Road, and N. Phoenix Road in the IMA for at least the first 20 years of the design life of the interchange.
4. Provide for the transportation needs of current and planned land uses, as contained in the City of Phoenix Comprehensive Plan.
5. Take into consideration the possibility that additional development will occur west, north and east of the existing City of Phoenix urban growth boundary

[4] As part of the Fern Valley Interchange Project, ODOT plans to accept from the City of Phoenix jurisdiction over Fern Valley Road between OR 99 and the Fern Valley Road/N. Phoenix Road intersection under the Fern Valley Thru Alternative or the N. Phoenix Road/S. Phoenix Road Extension intersection under the N. Phoenix Thru Alternative and to classify it as a District Highway.
[5] This IAMP includes a measure whereby the City of Phoenix changes the classification of N. Phoenix Road from Collector to Arterial.

(UGB), as contemplated by the proposed Greater Bear Creek Valley Regional Plan.[6]

6. Take into consideration that most existing and projected traffic on the interchange, Fern Valley Road, OR 99, and N. Phoenix Road passes through the interchange area and so is affected by growth and development outside the IMA.
7. Minimize adverse impacts on existing businesses and residences.
8. Provide adequate access to developable lands in the interchange area, within the constraints required to ensure continued function of the interchange and local street network.
9. Balance the multiple challenges listed on page 2.

Table 1 illustrates some of the trade-offs the IAMP faces in meeting these objectives. The City of Phoenix system development charge to pay its share of the cost of the Fern Valley Interchange goes up with the number of trips a land use generates because it is tied to trip generation. However, as the table shows, the assessed value and thus the amount of annual property tax revenue different land uses generate varies, with some uses generating high numbers of trips and having low assessed values and vice versa.

DESCRIPTION OF THE INTERCHANGE MANAGEMENT AREA

Figure 1 shows the boundaries of the IMA. The boundaries are intended to balance the following objectives:

1. Include all lands within at least one-half mile of the interchange.[7]
2. Include urban reserve areas identified by the proposed Greater Bear Creek Valley Regional Plan,[8] the development of which could affect traffic volumes on the interchange.
3. Exclude land zoned and already developed for single-family housing and other land unlikely to be developed or redeveloped with uses that could generate large amounts of motor vehicle traffic.

TRAFFIC ANALYSIS

As part of the development of this IAMP, ODOT's Transportation Planning Analysis Unit (TPAU) forecasted peak-hour traffic volumes and volume/capacity (v/c) ratios in the interchange area and compared them to applicable standards. See Appendix E. As stated in the Oregon Highway Plan (OHP), a v/c ratio is the volume of traffic on a roadway divided by the maximum volume the roadway can handle. For example, when v/c equals 0.85, traffic uses 85 percent of an intersection's capacity and 15 percent of the capacity is not used. When v/c is less than but close to 1.0 (e.g., 0.95), traffic flow becomes unstable.

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[6] Rogue Valley Council of Governments, Greater Bear Creek Valley Regional Plan, Draft, October 2008, http://rvcog.org/mn.asp?pg=rps_regional_plan. The reference is to urban reserve areas PH-1, PH-2, PH-5, and PH-10, as addressed in the plan. Urban reserve area PH-3 is already developed.
[7] See ODOT, Interchange Area Management Plan Guidelines, July 12, 2006, p. 10.
[8] Rogue Valley Council of Governments, op. cit.

TABLE 1. PM PEAK-HOUR TRIPS, ASSESSED VALUE, AND INTERCHANGE DEVELOPMENT CHARGES PER ACRE					
	Type of Land Use	Trips Per Acre[1]	Assessed Value Per Acre (X 1,000)[2]	Assessed Value Per Acre Per Trip[2]	IDC Per Acre of Use[3]
1	Mini-Warehouse	2	$350	$150,000	$2,200
2	Congregate Care Facility	7	$1,700	$238,000	$6,800
3	Furniture Store	9	$650	$70,700	$8,800
4	Medical-Dental Office Building	9	$250	$26,900	$8,900
5	Industrial Park	9	$850	$89,900	$9,000
6	General Light Industrial	12	$550	$46,800	$11,300
7	General Office Building	20	$1,300	$64,600	$19,300
8	Motel	20	$2,100	$104,000	$19,300
9	Day Care Center[5]	24	$200	$8,400	$22,900
10	Specialty Retail Center[4]	27	$800	$29,500	$25,900
11	High-Turnover Sit-down Restaurant[5]	31	$800	$25,700	$29,800
12	Free-Standing Discount Superstore[5]	39	$1,100	$27,900	$37,800
13	Discount Club	42	$700	$16,500	$40,600
14	Pharmacy/Drugstore w/out Drive-Through Window[5]	59	$1,200	$20,200	$56,800
15	Athletic Club	60	$500	$8,300	$57,900
16	Supermarket[5]	67	$550	$8,200	$64,000
17	Gasoline/Service Station with Convenience Market[5]	71	$550	$7,800	$67,600
18	Fast-Food Restaurant w/ Drive-Through Window[5]	87	$1,350	$15,600	$82,900
19	Drive-in Bank[5]	133	$1,600	$12,0000	$128,000

[1] Based on rates from Institute of Transportation Engineers, Trip Generation, 7th Edition, 2003, adjusted to rates per acre using ratios of building square footage, fueling positions, and rooms per acre from properties in Phoenix, Medford, and Talent.
[2] Based on Jackson County property assessment records for comparable uses in Phoenix, Medford, and Talent. Rounded to nearest hundred.
[3] IDC stands for Interchange Development Charge. Amounts calculated from City of Phoenix Transportation Interchange Development Charge Calculation Sheet. Rounded to nearest hundred.
[4] Based on gross leasable area, which in the study area is the same as gross floor area.
[5] Trip rate adjusted for pass-by trips based on the City of Phoenix Interchange Development Charge calculation. See FCS Group, Transportation System Development Charge Study, May 2006, pp. 5 – 10.
Source: URS Corporation

Small disruptions can cause traffic flow to break down and long traffic queues to form.[9] To achieve efficient traffic flow, for roadway planning, ODOT applies v/c standards of from .70 to .90, depending on a roadway's function and location.[10] For designing roadway improvements, ODOT applies the stricter standards in the Oregon Design Manual.[11]

TPAU forecasted traffic volumes and v/c ratios for two land use "scenarios." Scenario 1

[9] ODOT, Oregon Highway Plan, Updated in June 2006, http://www.oregon.gov/ODOT/TD/TP/orhwyplan.shtml#1999_Oregon_Highway_Plan, pp. 75-76.
[10] Ibid., Table 6, p. 83.
[11] 2003 Highway Design Manual, http://www.oregon.gov/ODOT/HWY/ENGSERVICES/hwy_manuals.shtml. See Table 10-1, p. 10-38.

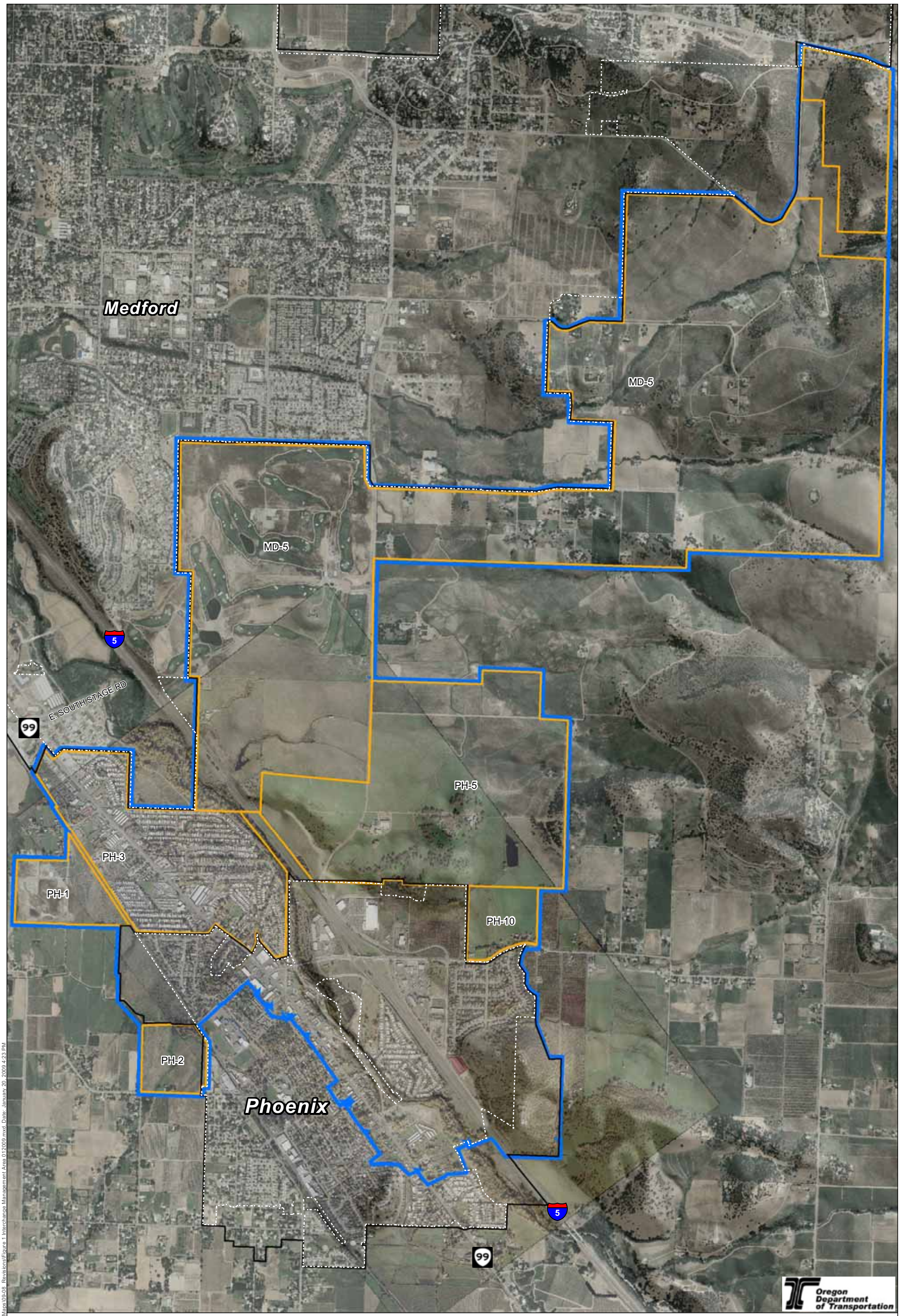
represents the build-out of the City of Phoenix Comprehensive Plan. Scenario 2 adds to Scenario 1 development of the Phoenix urban reserve areas identified by the proposed Greater Bear Creek Valley Regional Plan, referenced on page 3. Appendix F describes the two scenarios. Because this IAMP must be compatible with the City of Phoenix Comprehensive Plan,[12] it has been written to be consistent with Scenario 1. However, the City of Phoenix Comprehensive Plan, including its UGB, is long overdue for updating. Expansion of the UGB and other amendments to the Comprehensive Plan during the 20-year planning period for this IAMP are a certainty. TPAU forecasted traffic volumes and v/c ratios for Scenario 2 to provide an indication of the consequences of development over and above what the existing Comprehensive Plan provides for. Comparing forecasted traffic volumes and v/c ratios under Scenarios 1 and 2 to applicable standards shows that v/c ratios will approach and exceed applicable standards during the planning period for the IAMP.

1. The v/c ratio at the interchange, itself, will comply with the applicable OHP standard under Scenario 1, i.e., build-out of the existing Phoenix Comprehensive Plan. However, the v/c ratio at the OR 99/Fern Valley Road intersection will exceed the applicable OHP standard by 2030, without the addition of a second westbound right-turn lane and a second exclusive westbound left-turn lane. These are the "added capacity" in Table 2. Even with the added capacity, the forecasted v/c ratio is within 0.03 of the OHP standard and exceeds the HDM standard.

2. Similarly, without the additional turn lanes described in item 3, below, the N. Phoenix Road/S. Phoenix Road Extension and S. Phoenix Road/Fern Valley Road intersections will exceed the applicable OHP standards by 2030. In fact, volumes will exceed the capacity of both intersections.

3. If a second westbound left-turn lane is added to the N. Phoenix Road/S. Phoenix Road Extension intersection, the forecasted v/c ratio will meet applicable OHP standard in 2030 under Scenario 1. Similarly, if the southbound right-turn lane at the S. Phoenix Road/Fern Valley Road intersection is retained and the intersection is made a four-way stop, the intersection will meet the applicable OHP standard in 2030.

[12] ORS 197.180 requires that ". . . state agencies shall carry out their planning duties, powers and responsibilities and take actions that are authorized by law with respect to programs affecting land use. . . (b) In a manner compatible with: (A) Comprehensive plans and land use regulations. . ." OAR 660-012-0015(1)(b), part of the Transportation Planning Rule, states "State transportation project plans shall be compatible with acknowledged comprehensive plans as provided for in OAR 731, Division 15. . ." OAR 734-051-0155, an ODOT administrative rule, states that ". . . the Department will work with local governments on any amendments to local comprehensive plans and transportation system plans and local land use and subdivision codes to ensure the proposed Access Management Plan and Interchange Area Management Plan is consistent with the local plan and codes."



PH-5 Proposed Urban Reserve Area

City Limits

Urban Growth Boundary (UGB)

Interchange Management Area Boundary

N

Feet

0 1,800 3,600

Figure 1

Interchange Management Area

Fern Valley Interchange

January 20, 2009

File Path: K:\Fern_Valley_MXDs\Alternative_Maps\09-08_Revisions\Figure 1 Interchange Management Area 012009.mxd, Date: January 20, 2009 4:23 PM

TABLE 2. APPLICABLE STANDARDS AND FORECASTED 2030 V/C RATIOS						
	Standards[2]		Scenario 1		Scenario 2	
Critical Intersection[1]	Oregon Highway Plan	Highway Design Manual	Proposed Project Without Added Capacity	Proposed Project With Added Capacity	Proposed Project Without Added Capacity	Proposed Project With Added Capacity
Northbound Interchange ramp/Fern Valley Rd.	.85	.75	.68	.68[3]	.76	.76[3]
OR 99/Fern Valley Rd.	.90	.85	1.15	.87[4]	1.35	.88[4]
N. Phoenix Rd./S. Phoenix Rd. Extension	.90	.85	1.21	.80[5]	1.35	.93[5]
S. Phoenix Road/Fern Valley Road	.90	.85	>2.0	.43[6]	>2.0	0.84[6]

Note: Forecasted v/c ratios do not assume construction of the South Stage Over Crossing.
[1] Intersections where forecasted v/c ratios approach or exceed the applicable standard.
[2] Appendix C contains the sources of the standards and the roadway classifications on which they are based.
[3] No added capacity proposed.
[4] Added capacity consists of a second westbound right-turn lane and a second exclusive westbound left-turn lane. (When the second westbound exclusive left-turn lane is added, the center westbound lane would become an exclusive through-lane, i.e., left turns would not be permitted from it.)
[5] Added capacity consists of a second westbound left-turn lane.
[6] Added capacity consists of retaining the southbound right-turn lane and making the intersection a four-way stop.
Source of forecasted v/c ratios: shaded ratios, ODOT Transportation Planning Analysis Unit; other ratios, Appendix E.

4. Forecasted v/c ratios for Scenario 2 show that, when growth occurs beyond Scenario 1, i.e., beyond build-out of the existing Phoenix Comprehensive Plan, at the N. Phoenix Road/S. Phoenix Road Extension intersection, at some point in the future, v/c ratios will exceed the applicable standard. This is even with the addition of a second westbound left-turn lane.

V/c ratios at intersections in the interchange area not included in Table 2 are not forecasted to approach or exceed applicable standards under either Scenario 1 or Scenario 2. See Appendix E.

It is unknown when traffic volumes will exceed the applicable OHP standards at the Fern Valley Road/N. Phoenix Road intersection. It could be during the 20-year planning period for the IAMP or it could be after the planning period. There are three reasons for this uncertainty: 1) land development under Scenario 2 is not linked to a specific year and may not fully occur until after 2030; 2) the amount of Scenario 2 development that would cause violation of the standards has not been determined; and, 3) the pace of future development is unknown.

Based on this traffic analysis, to meet the goal and objectives on page 3, the IAMP must rely on a combination of the capacity expansion and retention measures and other measures to avoid violation of the mobility performance standards applicable to the

OR 99/Fern Valley Road intersection and the N. Phoenix Road/S. Phoenix Road Extension and S. Phoenix Road/Fern Valley Road intersections.

Note that the traffic analysis summarized above is different from the traffic analysis prepared for the EA referenced on page 1. ODOT prepared a separate forecast of traffic and congestion for the IAMP because the IAMP required a finer level of detail than the EA. The traffic analysis TPAU prepared for the EA used the Rogue Valley Council of Governments (RVCOG) regional traffic model. The RVCOG model uses broad employment categories because of the region's large area and large numbers of residents and employees. These categories combine businesses that vary widely in the number of motor vehicle trips they generate. The RVCOG model also uses projections of only one category of households, while households occupying different types of housing (e.g., single-family, apartments, mobile homes) generate different numbers of trips. This general level of traffic information is sufficient to address conceptual design issues and to determine comparative environmental impacts. To determine needed measures to include in the IAMP, it is necessary to base trips generated in the area of the interchange on more specific categories of retail, service, and industrial business types. It is also necessary to distinguish among households occupying different types of housing.

ORGANIZATION OF THIS IAMP

Following this introductory section of the IAMP is a section that contains the IAMP measures. It is followed by findings that support the adoption of this IAMP. This IAMP also includes appendices, several of which are incorporated by reference into the IAMP by IAMP measures.