Final Report for

North Redmond US 97 Interchange Area Management Plan

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November, 2006

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CHAPTER 1: EXECUTIVE SUMMARY

The report presents the Interchange Area Management Plan for the proposed new North Redmond interchange with US 97 located at milepost 119. The Interchange Area Management Plan (IAMP) presents recommendations to sustain this new interchange as land in Redmond and the surrounding area continues to develop, by implementing effective local street connectivity and access management strategies.

Plan Goals and Objectives

Project Goal

The goal of this project was to develop a North Redmond US 97 IAMP for the interchange area that describes existing traffic and land use patterns in the interchange area, identifies potential safety and traffic congestion issues, and proposed policies and implementing measures that would insure safe and efficient operation of the interchange over the 20-year planning horizon, and potentially beyond.

The IAMP was developed in partnership with affected property owners in the interchange area, the City of Redmond, Deschutes County, and the Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users. The public-at-large and any interested local business operations within the study area were notified of public meetings related to this project, and they were provided opportunities to participate outside of the formal project committee process.

Study Objectives

Objectives were identified to achieve the project goal:

1. The preparation of the IAMP shall involve affect property owners in the interchange area, the City of Redmond, Deschutes County, The Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users.
2. The IAMP shall evaluate local transportation, environmental, and land use conditions.
3. The IAMP shall identify needed transportation improvements within the Interchange Study Area and propose alternatives that conform to current design standards and accommodate the long-term capacity needs of the local transportation system.
4. The IAMP shall be developed in accordance with the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.
5. The IAMP shall include policies and implementing measures that preserve the functionality of the interchange areas.

Relevant Plans and Standards

A comprehensive review was made of relevant federal, state, regional and city plans and standard that are applicable to the plan for North Redmond interchange. The primary transportation standards that were applied in developing and evaluating strategies for the interchange area were drawn from the Oregon Highway Plan standards related to mobility and the Oregon Administrative Rules related to Access Management. The first standard measures the long-term

forecasted traffic volumes compared to the design facility capacity, as summarized in Table 1.A. For US 97, which is a statewide freight route, the mobility standard, as measured by the ratio of forecasted volume-to-capacity, varies from 0.70 to 0.75 depending on the facility posted speeds.

Table 1.A Maximum Volume-to-Capacity Ratios from the 1999 Oregon Highway Plan

Highway Category	**Inside Urban Growth Boundary**	
	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit > 45 mph
Statewide (NHS) Freight Routes	0.75	0.70
District/Local Interest Roads	0.85	0.80

Policies 3A and 3C of the 1999 Oregon Highway Plan establish access management objectives for state highways and interchange areas based on facility type and set standards for spacing of approaches. These standards have also been adopted as part of OAR 734-051, which provides the regulatory basis for implementation. Table 1.B below shows the applicable access management spacing standards for state facilities in the study area.

Table 1.B: Access Spacing Standards for Statewide Highways (measured in feet)

Posted Speed (mph)	**Rural**		**Urban**	
	Expressway (at-grade only)	**Other**	**Expressway** (at-grade only)	**Other**
> 55	5280	1320	2640	1320
50	5280	1100	2640	1100
40 & 45	5280	990	2640	990
30 & 35		770		7701
< 25		550		5503

With some design elements of the proposed project still unknown, it was assumed the North Redmond interchange would resemble a non-freeway interchange with a two-lane crossroad. The proposed locations of any new street connections within interchange areas were evaluated in accordance with the applicable Highway Design Manual standards.

Other plans and documents reviewed included:

- Oregon Transportation Plan
- Oregon Rail Plan
- Statewide Transportation Improvement Program
- Transportation Planning Rule
- Traffic Control (OAR 734-020)
- Railroad Regulations
- City of Redmond Comprehensive Plan

[1] Access spacing standards in urban areas for facilities with posted speeds of 35 mph or less may be reduced pending OTC approval of proposed *Oregon Highway Plan* amendments. Proposed spacing standards would be 720 feet (30 & 35 mph) and 520 feet (≤25 mph).

- City of Redmond Transportation System Plan
- Redmond Urban Reserves Studies
- Deschutes County Comprehensive Plan
- Deschutes County Transportation System Plan
- For a complete presentation of the background plans and studies, refer to Appendix 1.

Existing Land Use and Transportation Issues

Geographic Boundaries

The geographic boundaries for the IAMP, as illustrated in Figure 1.1, include O'Neil Highway (OR 370) / NW Pershall Road to the north, NE 17th Street/NE Negus Way to the east, NW Kingwood Avenue to the south, and NW 22nd Street to the west. Assuming the proposed interchange connecting US 97 to the US 97 Reroute is located between NW Spruce Avenue and NW Quince Avenue, these boundaries would include an area approximately ¾-mile beyond the physical limits of the interchange. While this distance would be adequate for the management of access to the crossroad (i.e. US 97 south of the interchange and Canal Boulevard north of the interchange), there is need to control the creation of new intersections on the mainline (i.e. US 97 north of the interchange and the US 97 Reroute to the south) outside of the study area for a radius of 2 miles.[2]

The travel forecasts that were developed as part of this study encompass a larger scope than the explicit boundaries noted above for detailed operational analysis and access management review. The entire City of Redmond, including the current urban limits, and the pending Urban Growth Boundary additions are contained within the travel demand model developed for local transportation studies. The expected long-term development associated with this larger Redmond urban area were be the basis for developing future year travel forecasts that were used within the focused study area noted above for the assessing the performance of the proposed interchange facilities.

Study Area Land Uses

Within the study area, there are lands both inside and outside of the City of Redmond urban growth boundary. Lands outside of the urban growth boundary (northern and eastern areas of study limits) maintain rural zoning and development patterns, consisting of a variety of agricultural uses. Within the urban growth boundary, most lands are zoned for either commercial, residential, light industrial, or park/open space uses. The commercial lands tend to surround the US 97 corridor in the middle of the study area with residential lands between this commercial corridor and the eastern and western urban growth boundaries. To the southeast of the study area, there is a significant amount of industrial land, but only about 22 acres of light industrial land lie within the study limits. All of the park/open space lands are located to the west of US 97, with most of it

Land Use Summary

Land Use	Percent of IAMP Area
Agricultural	43%
Commercial	16%
Industrial	1%
Parks/Public Facilities	7%
Residential	33%

[2] OAR 734-051-0125 , *Access Management Spacing Standards for Approaches in an Interchange Area*

assigned to Dry Canyon. Most of the land within the IAMP study area is zoned for agricultural uses, with the second largest group allowing residential development, as summarized in Table 1.C. There appears to be a significant amount of commercial property surrounding the proposed interchange area (between NW Spruce Avenue and NW Quince Avenue) that is currently vacant.

Existing Access Conditions

The existing public and private access approaches to US 97 within the study area were mapped and compared to applicable standards. A total of 80 approaches to the state highway were identified, including both sides, compared to 14 that would be allowed based on standards. Refer to Table 3.C and Figure 3.5 for more details. Substantial modifications to the current access and local circulation system would be required to comply with standards.

A similar analysis was done for the local city street facilities to compare the driveway spacing and intersection spacing with city standards. It was found that the majority of these cases do meet the city spacing standards. Notable exceptions include Maple Avenue and Negus Way, both minor arterials with a preferred spacing of ¼-mile, which have several intersecting city streets less than 500 feet apart.

Crash Analysis

State, county and city streets within the study area were evaluated to identify locations where reported vehicle crashes are excessive compared to statewide averages. The most significant finding was that the rural segment near O'Neil Highway Junction with US 97 has exceeded statewide average crash rates for the past three years of reported data (2001 to 2003). The last year crash rate was two times the statewide average. A closer review of the crash data suggested that it is concentrated at the intersection of US 97 and O'Neil Highway, and is not representative of the half-mile segment around that location. Solutions for reducing the reported crashes should concentrate on the intersection design and traffic control elements.

Existing Roadway Performance

Traffic data for 2005 were evaluated to determine how well the existing road intersections and segments perform compared to state and local standards. Three locations on US 97 were identified that fell below standards:

- US 97 / O'Neil Highway
- US 97 / Maple Avenue
- US 97 / Kingwood Avenue

All three are unsignalized intersections where the side street approaches must wait for gaps in highway traffic. In each case, the 2005 volume-to-capacity ratio was over 1.0, which is significantly above the 0.70 to 0.75 standard for this area. Two of these locations are planned to have traffic signal controls installed, based on current capital improvement plans. However, there are no identified improvements at US 97 / O'Neil Highway.

All of the city and county intersections within the study area operated within the acceptable performance ranges. Refer to Table 3.K for more details.

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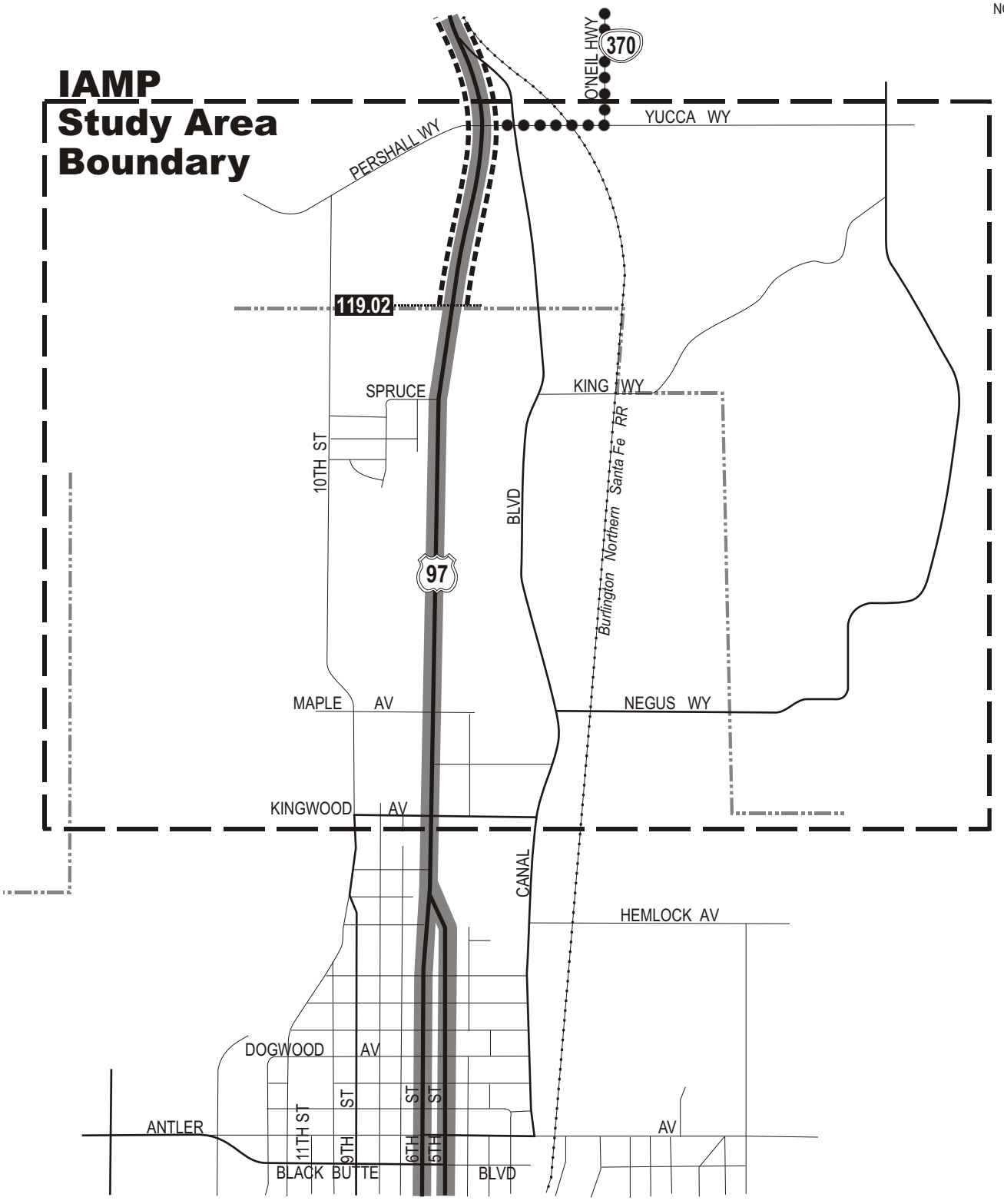
NO SCALE



LEGEND

- ●●●● - District
- ▬▬ - Statewide NHS with Freight Route
- ▬ ▬ ▬ - Expressway
- ·-·-· - Urban Growth Boundary (UGB)
- ····· 000.00 - Milepost Indicator

Figure 1.1
STATE HIGHWAY FUNCTIONAL CLASSIFICATIONS AND SEGMENT DESIGNATIONS

Future Forecasts and Needs Analysis

Land use growth in the City of Redmond and nearby communities is expected to more than double the existing number of household and employees over the next 20 years. The growth projection, show more than 11,000 new dwelling units and 10,000 new jobs within the greater Redmond area, as shown in Table 1.C below.

Table 1.C: Assumed Household and Employment Quantities

	Households	Retail Employees	Other Employees
Base Year 2000	7,418	2,330	5,492
Future Year 2025	18,356	4,969	13,040
Growth	147%	113%	137%

ODOT's Transportation Planning Analysis Unit prepared travel forecasts based on these growth assumptions, and this information was used to develop future traffic volumes for this study. Table 1.D shows how trips will grow over the next 20 years. Trips that start or end (or both) within Redmond are growing about two times faster than through trips within the community. The annual growth rate for all trips is 4.5 percent.

Table 1.D: Redmond Area Model Trip Types, PM Peak Hour

	Redmond Based Trips	Through Trips	Total Trips
Base Year 2000	8,409	1,005	9,414
Future Year 2025	18,390	1,670	20,060
Avg. Annual Growth Rate	4.8%	2.6%	4.5%

The 2025 travel volumes were applied to the city street system, which included the planned US 97 Re-Route and several additional local improvements:

- US 97 Reroute
- US 97 Interchange at Milepost 119 (near existing Quince Ave.)
- Maple Avenue extension across Dry Creek Canyon
- Quince Avenue extension
- Highland / Glacier couplet (OR 126)
- 9th Street extension

Refer to Figure 4.7 for more details on the assumed street and highway improvements by 2025.

Future 2025 Performance and Deficiencies

The North Redmond / US 97 interchange area, as proposed, would operate within standards. No deficiencies were identified. A worst-case scenario was evaluated to test the ability of the interchange design concept to serve higher travel demands. The planned commercial uses were assumed to be 30 percent higher than is typical for current zoning, and the performance analysis showed that the planned interchange could also serve that higher intensity level.

Several other highway locations and city locations outside of the immediate interchange area are expected to drop below minimum standards. These include:

- The intersection on US 97 at O'Neil Highway;
- The intersection on Maple Avenue at 9th Street; and
- The intersection on US 97 at Kingwood Avenue.

The latter two locations can be addressed through alternative traffic controls solutions; however, the US 97 at O'Neil Highway most likely would require a more significant improvement, given its rural location and high travel speeds on the highway.

Access / Intersection Spacing

In conjunction with the construction of the US 97 Reroute and the new interchange, a strategic access management plan needs to be implemented to help address the non-compliant accesses onto US 97 and affected city and county streets within the management area. An access zone system was developed to match the highway characteristics and standards required by ODOT with the access needs of the adjoining land uses. This system prescribes the spacing methods and procedures for reaching compliance within the interchange area.

In summary, the access management zone system works in combination with the recommended local connectivity plan to reduce non-compliant access near the interchange, and provide appropriate new access where allowed by standards. The six-zone system described in Chapter 4, would enact access changes as summarized in Table 1.E.

Table 1.E: Access Deficiencies by Zone*

Access Management Zone	Existing Number of Access Points	Allowed Number of Access Points
1	7	0
2A	10	0
2B	10	1
3	41	10
4	15	30
5	22	0
6	N/A	0

* Includes existing access points only. Refer to Figure 4.11 for illustration of zone locations.

Signal Spacing

As land around the interchange develops, provision of access and installation of traffic signal controls will be closely coordinated to ensure effective traffic mobility and to enhance traffic safety. The recommended IAMP plan must include a traffic signal control map that identifies the expected locations and spacing between traffic signals.

Local Connectivity

When planning for future streets to enhance local connectivity in the IAMP area, consideration should be given to the following deficiencies.

- Improving East-West Connectivity
- Providing Access to Lands Surrounding the US 97 Interchange

- Reducing Access Points to US 97 to the North of the Interchange.

Refer to Chapter 4, for more details about the constraints, issues and challenges in addressing each of these areas. Other issues identified that would be addressed through the IAMP included proper roadway design guidelines for truck traffic, enhancement of non-motorized vehicle connections, and notations about existing right-of-way constraints.

The Interchange Area Management Plan

The US 97 Redmond Reroute IAMP addresses the needs and issues identified in Chapter 4. The full plan is presented in Chapter 5 of this report. The elements of the IAMP are dividing into the following sections:

- **Transportation Facility Improvements** – these evaluations consider the proper improvements to the three locations identified as falling below the desired mobility standard by the horizon year (2025).
- **Local Connectivity Plan** – this plan (illustrated in Figure 5.4) is a conceptual plan that would be implemented by ODOT through the adoption of this IAMP, and the City of Redmond by incorporation into its TSP, to provide alternative circulation patterns and local access routes for lands within the influence area of the interchange.
- **Access Management Plan** – the six-zone access management strategy formed in Chapter 4 was defined for implementation. The plan provides priorities about when access changes are made, and which agency (or party) would be responsible for the improvements.
- **Land Use Alternatives** – The proposed interchange design was evaluated with average land development densities and a worst-case development scenario based on adopted land use plans and zoning to determine if 'travel demand management' techniques might be required for this case.
- **Implementing Code Amendments** – As land develops to urban levels within the IAMP, a system of circulation elements and access measures need to be implemented to realize the vision of this plan. The necessary amendments to the city development code are attached in Appendix 7.
- **Cost Estimates** – The preliminary cost estimates for improvement recommended by the IAMP are presented.

Transportation Facility Improvements

The four locations within the study area not expected to provide acceptable peak period performance with the proposed build project were identified in Chapter 4. An improvement has been identified for each of the four locations made for the preferred solution based on the goals and objectives of this study. The recommendations are summarized below:

- **US 97 at O'Neil Highway** – A range of options considered for this location included turn restrictions, re-aligning side street approaches, and constructing a grade-separated overpass. The IAMP proposes restricting turning movements to right-in and right-out as an interim improvement after local connectivity has been enhanced to provide parallel

routes to US 97 (see the Local Connectivity Plan), with the long-range improvement being the construction of an overpass with no connection to US 97.

- **Relocation of King Way** – Because of the close proximity of the connection of King Way to North Canal Boulevard to the northbound off-ramp to the US 97 Reroute, and concern with the existing at-grade railroad crossing on King Way, in the long-term the IAMP recommends, as part of the Local Street Connectivity Plan, that King Way be relocated to the north on a new alignment, that will include a grade separated overcrossing of the railroad, approximately ¼ mile north of the interchange.
- **US 97 at Kingwood Avenue** – In the long-term, when warranted, the IAMP proposes that the City install traffic signal controls at this intersection, with improvements to the approaches on all legs to separate left-turning traffic movements.
- **Maple Avenue at 9th Street** – In the long-term, when warranted, the IAMP proposes that the City install traffic signal controls at this intersection, with improvements to the approaches on all legs to separate left-turning traffic movements.

Traffic Signal Plan

The US 97 Redmond Reroute IAMP created a future traffic signal plan to guide the orderly installation of traffic signals within the IAMP area, especially along US 97 (6th Street) and North Canal Boulevard north of the proposed interchange, where poor progression of traffic due to inadequate signal spacing could impact long-term safety and operations at the proposed interchange ramp terminals. The Traffic Signal Plan is to be adopted by the City of Redmond and incorporated into their TSP (Appendix 8).

Figure 5.3 displays a map of future traffic signal locations within the IAMP area to be used in evaluating potential conflicts with future proposals for traffic signals on the study area streets. Near the interchange, this includes:

- North Canal Boulevard / New Collector Street (re-aligned King Way)
- US 97 Interchange Ramp Terminals
- US 97 Business Route at extension of Quince Avenue
- US 97 Business Route at new extension of Oak Avenue
- US 97 Business Route at Maple Avenue/Negus Way
- US 97 Business Route at Kingwood Avenue

Signal spacing generally is 1,300 feet apart with some exceptions of lesser distances near the interchange, including the ramp terminals themselves. Figure 5.3 identifies the locations of all currently planned traffic signals (there are currently no existing traffic signals) in the IAMP area, along with a future signal on US 97 (6th Street) between Maple Avenue and Quince Avenue (at Oak Avenue) that is anticipated to be constructed soon by an adjacent development and the recommended signal at the intersection of Maple Avenue and 9th Street.

Local Connectivity Plan

Chapter 4 of the IAMP highlighted three areas where local connectivity was in need of improvement, including:

- Improving east-west connectivity;
- Providing access to lands surrounding the US 97 interchange; and
- Reducing access points to US 97 to the north of the interchange.

In response to these needs, the IAMP developed a local connectivity plan that builds on existing and planned streets in the IAMP area. This plan not only improves overall connectivity throughout the northern end of the City, but provides the ability to eliminate direct approaches to US 97 and Canal Boulevard, while maintaining accessibility to individual properties in the corridor. Figure 5.4 displays the local connectivity plan. The Local Street Connectivity Plan is to be adopted by the City of Redmond and incorporated into their TSP (Appendix 8).

Access Management Plan

A key element of the IAMP related to the long-range preservation of operational efficiency and safety of the proposed interchange is the management of access to the interchange crossroads (US 97/6th Street and Canal Boulevard), as well as to the mainline (US 97 and the Reroute). Because access points introduce a number of potential vehicular conflicts on a roadway and are frequently the causes of slowing or stopping vehicles, they can significantly degrade the flow of traffic and reduce the efficiency of the transportation system. However, reducing the overall number of access points and providing greater separation between them can minimize the impacts of these conflicts.

Implementation of the access management plan in the IAMP is to occur over a long period of time. A number of the properties within the IAMP area were developed based on prior approvals of access locations to the subject roadways and some elements of the Access Management Plan depend on the presence of new public streets that can not be constructed until funds are made available. Therefore, the Access Management Plan has prioritized and categorized all access management recommendations into short-range, medium-range, and long-range actions, where the short-range actions are to be executed during the construction of the interchange; and the medium and long-range actions are to be executed as needed funds become available or as opportunities arise during property development or redevelopment.

To provide a basis for decision-making during the development of the Access Management Plan, an access management strategy was established. The strategy requires ODOT and/or the City to:

1. Restrict all access from abutting properties to the interchange and interchange ramps (ODOT).
2. Meet, or move in the direction of meeting, ODOT's adopted access management spacing standards for access to interchange crossroads (City).
3. Meet, or move in the direction of meeting, the City of Redmond's adopted access management guidelines on US 97 (6th Street) from a point 1,320 feet from the southbound interchange ramp terminal to Kingwood Avenue (southern boundary of IAMP area). This would require access spacing of at least 800 feet between adjacent

driveways and/or streets on the same side of the roadway and ½-mile between adjacent intersections (City).

4. In line with the recommendation evaluate and possibly consider jurisdictional transfer of Canal Boulevard from O'Neil Highway to the new North Redmond interchange from Deschutes County and City of Redmond to the Oregon Department of Transportation, meet, or move in the direction of meeting ODOT's adopted access management spacing standards for access to District Highways (City).
5. Meet ODOT's adopted access management spacing standards for an Expressway for interchange mainlines in the long-term (ODOT).
6. Purchase all abutting property access rights to US 97 (6th Street) and Canal Boulevard within 1,320 feet of the proposed interchange ramp terminals. Where accesses are allowed to remain within this area under the short-range action plan, access rights should be acquired with a temporary allowance to retain access until such time as reasonable alternate access becomes available (ODOT).
7. In attempting to meet access management spacing standards, exceptions may be allowed to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints (City).
8. Replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties (City).
9. Ensure all properties impacted by the project are provided reasonable access to the transportation system (ODOT and City).
10. Align approaches on opposite sides of roadways where feasible to reduce turning conflicts (City).
11. Short-range actions shall accommodate existing development needs, unless property is to be purchased by ODOT (ODOT and City).

Using this strategy, an action plan for each approach to the interchange mainline and crossroad was developed, as shown in Table 5.A.

- The short-range actions should be implemented during the construction of the interchange.
- The medium-range actions are to be completed within 5 to 10 years, and
- The long-range actions are to be implemented over the 20-year planning period as funding becomes available or as opportunities arise through property development.

The long-range action plan has also been illustrated in Figure 5.5 to aid in the interpretation of the actions in Table 5.A.

Land Use Alternatives

Aside from the improvements noted in the previous section, the proposed interchange improvements and surrounding transportation system was demonstrated to operate within acceptable levels by 2025 based on adopted land use plans and zoning.

A further sensitivity test was made for the commercially zone areas to evaluate if the planned system could serve more intense uses than are typically built on this type of zoning. An

alternative 'worst-case' land use evaluation was made where development around the interchange would generate about 30 percent more traffic than is typical for suburban development. It was found that even with these higher traffic generation levels that the system would continue to operate within acceptable ranges (see Table 5.C for details). Therefore, no further mitigations or limiting land use ordinances related to development levels should be required for this case.

However, the City of Redmond recently extended their Urban Growth Boundary (UGB) to include all properties north of its existing city boundary, west of US 97, to Pershall Way. Redmond also adopted an Urban Reserve Area (URA) that includes all land east of US 97 to O'Neil Way. In expanding its UGB, rather than annex and rezone the area being brought into the UGB for urban use, and having to do the TPR analysis for adequacy of the transportation system, Redmond opted to not annex the area and with the concurrence of Deschutes County had the UGB rezoned to a new Urban Holding Zone – 10 Acre Minimum (UH-10). This action first put a temporary hold on future development within the UGB until it was annexed and rezoned, and it also deferred the TPR analysis to a subsequent date. Redmond also adopted amendments to its development regulations requiring master plans be prepared for properties requesting annexation and rezoning to the City.

Consequently, by the City expanding its UGB without designating the urban zoning for the area and doing the required TPR analysis, a significant amount of land was added to the UGB that could, in the future, be annexed to the city and developed with urban intensity uses. And without a land use plan for the area, it is impossible to determine the magnitude of this action on the proposed US 97 Redmond Reroute Interchange.

To address this unknown within the context of the IAMP, the City of Redmond is required to amend its development regulations to require master plans prepared for properties adjacent to US 97 show as an element of their plan no direct access to US97 (Appendix 7). In addition, for an area defined as the "Highway Area Plan", or HAP (Appendix 8), adjacent to US97, the City is to prepare an area plan (A.K.A. master plan) that will establish a land use plan along US 97 that based on traffic analysis of the plan will not result in the planned land use exceeding the capacity of the interchange during the plan period.

Implementing Ordinances and Memorandum of Understanding

As land develops to urban densities within the interchange area, compliance will be required with the access management and circulation plans developed through the IAMP process. As part of the adoption of the IAMP, a number of amendments will be made to the City of Redmond Comprehensive Plan, Transportation System Plan (TSP) and development codes to reflect the amendments contained in Appendix 7 and actions outlined in the Memorandum of Understanding (MOU) in Appendix 8. In brief, they are as follows:

Comprehensive Plan Chapter 14 (Urbanization) –

- Master plans to be consistent with the Local Street Connectivity Plan (Figure 5.4),
- Property annexed to relinquish all direct access rights to the highway, and
- Incorporate access management strategy for US 97 (6th Street) and North Canal Boulevard.

Transportation System Plan –

- Identify phased improvement at US 97 and O'Neil Highway to include right-in/right-out and a grade separated overcrossing,
- Identify need for signals at US 97 (6th Street) and Kingwood Avenue, and NW Maple and 9th Street,
- Access spacing requirements for US 97 (6th Street) and North Canal Boulevard,
- Local Street connectivity (Figure 5.6) and access closures (Table 5.A and Figures 5.5a-5.5c), and
- Signal Plan for US 97 Business (6th Street) and North Canal Boulevard (Figure 5.3).

Development Codes –

- Master plans shall show direct access to local street, not the State highway, be consistent with the Local Street Connectivity Plan, and relinquish all direct access to the highway, and
- Adopt access management spacing standards for US 97 (6th Street) and North Canal Boulevard consistent with the Oregon Highway Plan for highways classified as "Statewide" and "District" within an urban area.

Memorandum of Understanding –

In moving the US 97 Reroute into the construction phase, it was determined that the original agreement between ODOT and the City needed to be revised to incorporate changes to the project, and consummate in an MOU their agreement on long-term transportation and land use issues as they relate to the US 97 Reroute. This agreement, No. 23704, has been incorporated into the IAMP by reference and is included as Appendix 8. In general the MOU between ODOT and the City of Redmond:

- Identifies the US 97 Reroute, Phase 1, as the first phase of a long-term solution for US 97 through Redmond;
- Sets forth that US 97 through Redmond will be managed as an Expressway facility from the O'Neil Junction through the Reroute Phase 1, and future phases consistent with the recommendations of the US 97 Redmond Refinement Plan;
- Requires the City to adopt the Access Management Plan for the US 97 Reroute and all the recommendations contained in the IAMP including amendments to Redmond's comprehensive Plan, TSP, and development codes as enumerated above.

Cost Estimate

Planning-level cost estimates for all recommended improvement alternatives were calculated to aid in the identification of needed funding. Cost estimates included the fundamental elements of roadway construction projects, such as the roadway structure, bridge structures, curb and sidewalk, earthwork, retaining walls, right of way, pavement removal, and traffic signals. The estimated costs are shown below in Table 1.F, with work sheets showing assumed unit costs for construction elements provided in the Appendix 5.

For the purposes of providing these estimates, it was assumed that 40% of the road-miles within the County and City would be classified as collectors, with the remaining 60% classified as local streets. All costs are in 2006 dollars and do not reflect the added cost of inflation. Note that the recommended installation of a traffic signal at the US 97/Kingwood Avenue intersection has not been included as it is already listed in the City's CIP to be constructed when warranted, with an estimated cost of $375,650. When considering needed funding to construct the identified improvements below, it should be recognized that landowners typically construct local streets as development occurs.

Table 1.F: Planning-Level Cost Estimates for Recommended Improvement Alternatives

Alternative		Estimated Cost
US 97/O'Neil Highway		
	Restrict turn movements to r-in/r-out	$225,000
	Offset intersection approaches	$1.4 million
	Construct overpass	$3.2 million
Maple Ave/9th St signalization*		$220,000
Expanded Public Street Network		
	City collectors	$9.9 million
	City local streets	$13.4 million
	County collectors**	$13.4 million
	County local streets***	$21.2 million

* Assumes intersection geometry will be improved through projects already planned in the City CIP.
** Includes $5.9 million in "High-Priority" Streets.
*** Includes $3.8 million in "High-Priority" Streets.

Prioritization of Improvements

The improvement alternatives recommended as part of the IAMP have been prioritized into short, medium, and long-range actions, as shown in Table 1.G, to provide guidance for future implementation and funding. Short-range actions represent immediate needs and should be implemented at the time of interchange construction. Medium-range actions represent improvements that are not required immediately, but should be given priority over improvements identified as long-range actions. Assuming all improvements are planned for construction within a 20-year period, medium-range actions should be considered for implementation within 5 to 10 years. Long-range actions typically represent improvements of lower priority or requiring higher levels of funding. These improvements should be planned for construction within 10 to 20 years. The improvements listed in Table 1.G have also been illustrated in a Transportation Improvements Map (Figure 5.6) for the IAMP area.

It should be recognized that this prioritization of projects is not intended to imply that projects of higher priority must be implemented before projects of lower priority. Should opportunities arise, through private land development or other means, to construct specific projects earlier than the estimated time frame provided by this list, those resources should be utilized.

Table 1.G: Transportation Improvement Prioritization

Short-Range Improvements (At the time of interchange construction)
· Short-range actions from access management plan.
Medium-Range Improvements (5 to 10 years)
· Construct "High-Priority" public streets according to adopted Local Connectivity Plan.
· US 97/O'Neil Highway intersection improvements (right-in/right-out restrictions).
· US 97 (6th St.)/Kingwood Ave.: Construct separate left turn lanes on Kingwood Ave. and install traffic signal.
· Maple Ave./9th St.: Construct separate left turn lanes on Maple Ave. and install traffic signal.
· Medium-range actions from access management plan.
Long-Range Improvements (10 to 20 years)
· Construct remainder of new public streets according to adopted Local Connectivity Plan.
· Long-range actions from access management plan.
· US 97 (6th St.)/Quince Ave.: Construct separate left turn lanes on Quince Ave. and install traffic signal.
· US 97/O'Neil Highway intersection improvements (grade-separated crossing over US 97).
· King Way Realignment (grade-separated crossing over BNSF).

Note: Medium and long-range improvements could be constructed sooner than anticipated as opportunities arise through private property development or other means.

CHAPTER 2: PLAN GOALS, OBJECTIVES, AND EVALUATION CRITERIA

This chapter describes the presents the goals and objectives for the plan, as well as evaluation criteria to measure the effectiveness of proposed strategies. A policy framework was identified based on reviews and summary of the applicable state and local plans, policies, regulations, and design standards (see Appendix 1 for details). This policy framework was used to develop the project goals, objectives and evaluation criteria that are presented in the following sections.

Recommended Goals & Objectives

Project Goal

The goal of this project is to develop a North Redmond US 97 IAMP for the interchange area that describes existing traffic and land use patterns in the interchange area, identifies potential safety and traffic congestion issues, and proposed policies and implementing measures that will insure safe and efficient operation of the interchange over the a 20-year planning horizon, and potentially beyond. The IAMP was developed in partnership with affected property owners in the interchange area, the City of Redmond, Deschutes County, and the Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users. The public-at-large and any interested local business operations within the study area will be notified of public meeting related to this project, and be provided opportunities to participate outside of the formal project committee process.

Objectives and Evaluation Criteria

The Project Goal will be met if the following objectives are achieved. A bulleted list of evaluation criteria follows each objective.

1. The preparation of the IAMP shall involve affect property owners in the interchange area, the City of Redmond, Deschutes County, The Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users.
    - The IAMP incorporates input and guidance from the Project Management Team (PMT).
    - The IAMP reflects, to the extent possible, the input of local property owners, interchange users, and other stakeholders, as gathered through public comments.

2. The IAMP shall evaluate local transportation, environmental, and land use conditions.
    - The IAMP identifies and addresses existing and foreseeable issues related to land use, mobility, accessibility, and safety within the analysis area of the planned interchange.
    - The IAMP describes the roadway network, right-of-way, access control and land parcels in the Interchange Study Area. It also evaluates local street access, circulation, connectivity, and the potential effect of local land use designations on the interchange.
    - The IAMP includes inventory maps summarizing the existing conditions within the Interchange Study Area.
    - The IAMP identifies and either complies with or amends the policy direction from the City and County comprehensive plans, zoning codes, Transportation System Plans, and any relevant corridor plans.

3. The IAMP shall identify needed transportation improvements within the Interchange Study Area and propose alternatives that conform to current design standards and accommodate the long-term capacity needs of the local transportation system.
    - The IAMP identifies and prioritizes the transportation improvements, land use, and access management plans needed to maintain acceptable traffic operations in the Interchange Study Area for the 20-year planning horizon, with the potential for remaining capacity to serve beyond the planning horizon.
    - The IAMP includes a Transportation Improvements Map showing the opportunities to improve operations and safety within the Interchange Study Area.
    - The IAMP identifies and describes up to three alternatives for the Interchange Area and evaluates how each would protect the safe and efficient operation of the interchange. The evaluation identifies how each alternative meets the provisions of OAR 734-051-0155 and other applicable state laws. A preferred alternative is selected and recommended for adoption.

4. The IAMP shall be developed in accordance with the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.
    - The IAMP meets the minimum level of service / mobility standards and other requirements identified in state transportation plans, such as the Oregon Transportation Plan, 1999 Oregon Highway Plan (OHP).
    - The IAMP implements the OHP's Policy 3C criteria, which requires the planning and management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.
    - The IAMP satisfies the requirements for interchange area management plans in OAR 734-051-0155 and other state rules, including OHP policies and standards, ODOT Division 51 interchange spacing standards, the 2003 Highway Design Manual and the Oregon Transportation Commission's OTIA conditions for interchanges.

5. The IAMP shall include policies and implementing measures that preserve the functionality of the interchange areas.
    - The IAMP identifies future land use conditions and induced effects, and identifies needed land protection measures.
    - The IAMP includes short, medium and long-range actions to improve and maintain roadway operations and safety in the Interchange Study Area. These actions may include local street network improvements, driveway consolidations, shared roadways, access management, traffic control devices, and / or local land use actions.
    - The IAMP includes amendments to Redmond and Deschutes County's Comprehensive Plans, Zoning Ordinances, Transportation System Plans, and other official documents as necessary to implement the recommended alternative for the Interchange Study Area.
    - The IAMP identifies likely funding sources and requirements for the construction of the infrastructure and facility improvements as new development is approved.
    - The IAMP identifies partnerships for the cooperative management of future projects and establishes a process for coordinated review of land use decisions affecting transportation facilities.
    - A draft version of the IAMP is reviewed by the Redmond and Deschutes County Planning Commissions, as well as the Redmond City Council and the Deschutes County Board of Commissioners. A final draft of the IAMP is adopted by the City Council and Board of Commissioners.

CHAPTER 3: EXISTING LAND USE AND TRANSPORTATION CONDITIONS

This chapter provides an inventory and evaluation of existing land uses and transportation facilities within the IAMP study area, which can be used to identify areas needing improvement and can act as a baseline for assessment of future conditions. This includes identification and description of existing land uses, area streets, traffic controls, and property access, as well as an analysis of the crash history, access management deficiencies, intersection capacity, and potential land development.

Study Area Land Uses

The selected geographic boundaries for the IAMP include O'Neil Highway (OR 370)/NW Pershall Way to the north, NE 17th Street/NE Negus Way to the east, NW Kingwood Avenue to the south, and NW 22nd Street to the west. This area is illustrated in Figure 3.1, which shows all existing streets and property zoning within the study area boundaries.

Within this area, there are lands both inside and outside of the City of Redmond urban growth boundary. Lands outside of the urban growth boundary (northern and eastern areas of study limits) maintain rural zoning and development patterns, consisting of a variety of agricultural uses. Within the urban growth boundary, most lands are zoned for either commercial, residential, light industrial, or park/open space uses. The commercial lands tend to surround the US 97 corridor in the middle of the study area with residential lands between this commercial corridor and the eastern and western urban growth boundaries. To the southeast of the study area, there is a significant amount of industrial land, but only about 22 acres of light industrial land lie within the study limits. All of the park/open space lands are located to the west of US 97, with most of it assigned to Dry Canyon.

Figure 3.1 displays the locations of different land use zones in the study area and also provides total acreages for each zone type and identifies lands currently undeveloped. Most of the land within the IAMP study area is zoned for agricultural uses, with the second largest group allowing residential development, as summarized in Table 3.A. There appears to be a significant amount of commercial property surrounding the proposed interchange area (between NW Spruce Avenue and NW Quince Avenue) that is currently vacant.

Table 3. A: Land Use Summary

Land Use	Percent of IAMP Area
Agricultural	43%
Commercial	16%
Industrial	1%
Parks/Public Facilities	7%
Residential	33%

A comparison of future growth and development assumptions in the IAMP study area from the Redmond urban transportation demand model and the recently completed buildable lands inventory conducted by EcoNorthwest was provided by Winterbrook Planning. From this comparison, it was discovered that the estimated growth in residential development was approximately 30% higher in the transportation demand model, with much of the additional housing found in the areas around the urban growth boundary. The estimates for employment growth were much closer, with the buildable lands inventory projecting less than 5% more growth in this area than the transportation demand model. A memorandum describing this comparison is attached as Appendix 2.

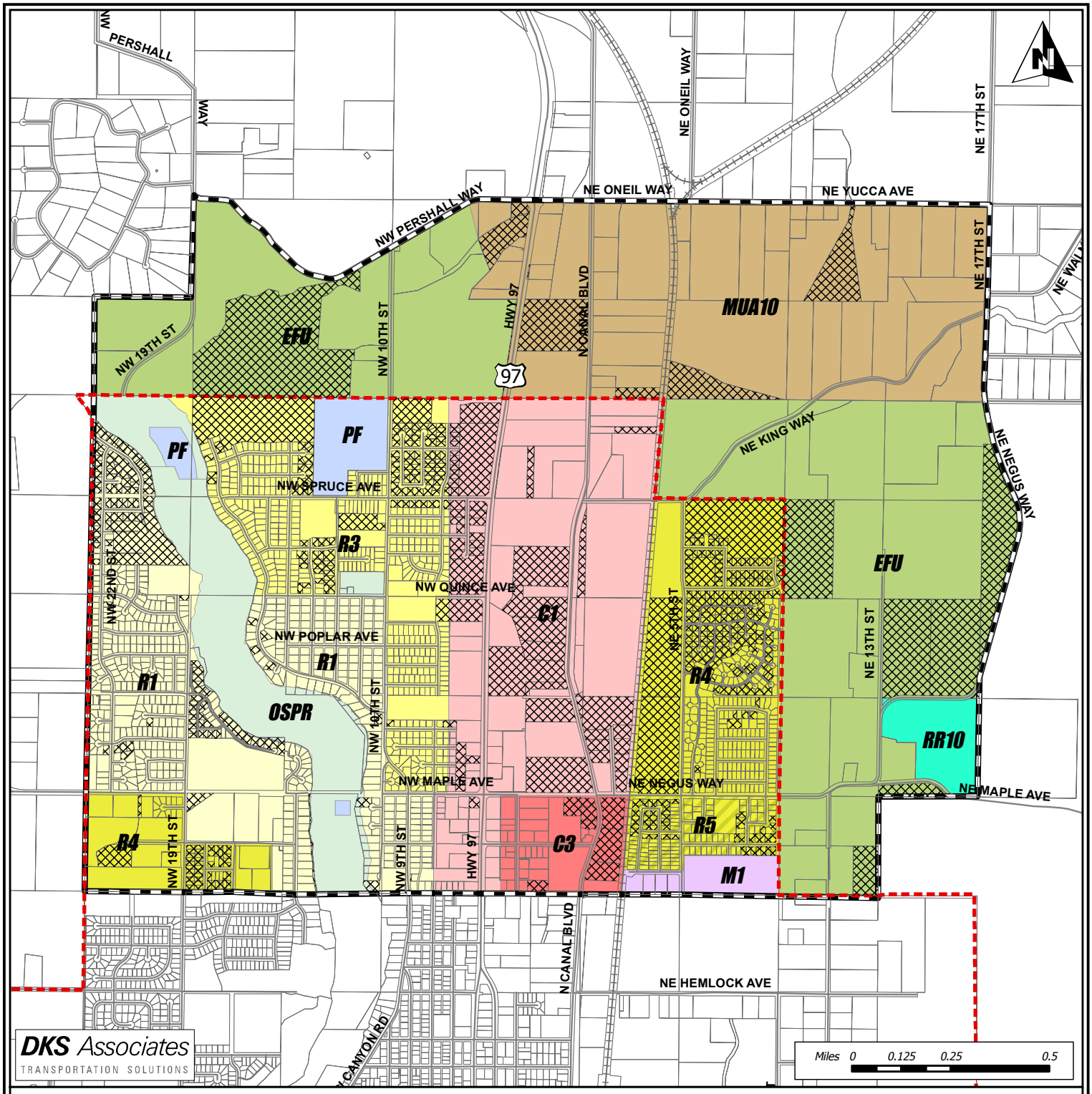


FIGURE 3-1
ZONING AND LAND USE

US 97 NORTH INTERCHANGE
AREA MANAGEMENT PLAN

Zoning

- Strip Service Commercial - 347.3 ac.
- Special Service Commercial - 50.4 ac.
- Exclusive Farm Use - 644.2 ac.
- Light Industrial - 21.8 ac.
- Multi-Use Agricultural - 397.3 ac.
- Parks and Open Space - 133.5 ac.
- Public Facilities - 32.4 ac.
- Residential 1 - 289.6 ac.
- Residential 3 - 208.1 ac.
- Residential 4 - 227.3 ac.
- High Density Residential - 40.5 ac.
- Rural Residential 10 - 28.8 ac.

- VACANT PROPERTIES
  Does not include vacant City-owned.
- RAILROAD
- EXISTING STREETS
- IAMP STUDY AREA
- PARCELS
- URBAN GROWTH BOUNDARY

Study Area Street Network

Within the study area, there are roadways within the jurisdiction of the Oregon Department of Transportation (ODOT), Deschutes County, and the City of Redmond, ranging in functional classification from major arterials to local streets. Figure 3.3 displays the study area street network and identifies the assigned functional classification of each roadway. For the purposes of the IAMP, the roadways maintaining a functional classification of collector or higher were selected. These roadways are listed below in Table 3.B.

Table 3.B: Study Area Roadways

ODOT Jurisdiction		
Roadway	**Limits**	**Functional Classification**
US 97	O'Neil Highway - NW Kingwood Avenue	major arterial
O'Neil Highway	US 97 - NE Yucca Avenue	rural collector
Deschutes County Jurisdiction		
Roadway	**Limits**	**Functional Classification**
NW Pershall Way	NW 19th Street - US 97	rural collector
NW 10th Street	Redmond UGB - NW Pershall Way	rural collector
N Canal Boulevard	Redmond UGB - O'Neil Highway	rural collector
NE Yucca Avenue	O'Neil Highway - NE 17th Street	rural collector
NE King Way	Redmond UGB - NE 17th Street	rural collector
NE 17th Street	NE Negus Way - NE Yucca Avenue	rural collector
NE Negus Way	Redmond UGB - NE 17th Street	rural collector
City of Redmond Jurisdiction		
Roadway	**Limits**	**Functional Classification**
NW Kingwood Avenue	NW 9th Street - US 97	minor collector
NW Kingwood Avenue	US 97 - N Canal Boulevard	major collector
NW Maple Avenue	NW 22nd Street - NW 4th Street	minor arterial
NE Negus Way	N Canal Boulevard - Redmond UGB	minor arterial
N Canal Boulevard	NW Kingwood Avenue - NW Maple Avenue	minor arterial
N Canal Boulevard	NW Maple Avenue - Redmond UGB	major collector
NW 9th Street	NW Kingwood Avenue - NW Maple Avenue	minor collector
NW 10th Street	NW Maple Avenue - Redmond UGB	major collector
NW 19th Street	NW Jackpine Avenue - NW Quince Avenue	major collector
NW Quince Avenue	NW 10th Street - US 97	major collector
NE King Way	N Canal Boulevard - Redmond UGB	major collector

With these roadways identified as the primary means of circulation through the area, key intersections along these routes were selected for capacity analysis. Through a field inventory, the existing lane configurations and traffic controls at each intersection were documented and have been displayed in Figure 3.4. From this figure, it can be seen that there are no signalized intersections within the study area and, with the exception of US 97, all roadways are currently limited to two lanes with no separate turning lanes available at intersections.

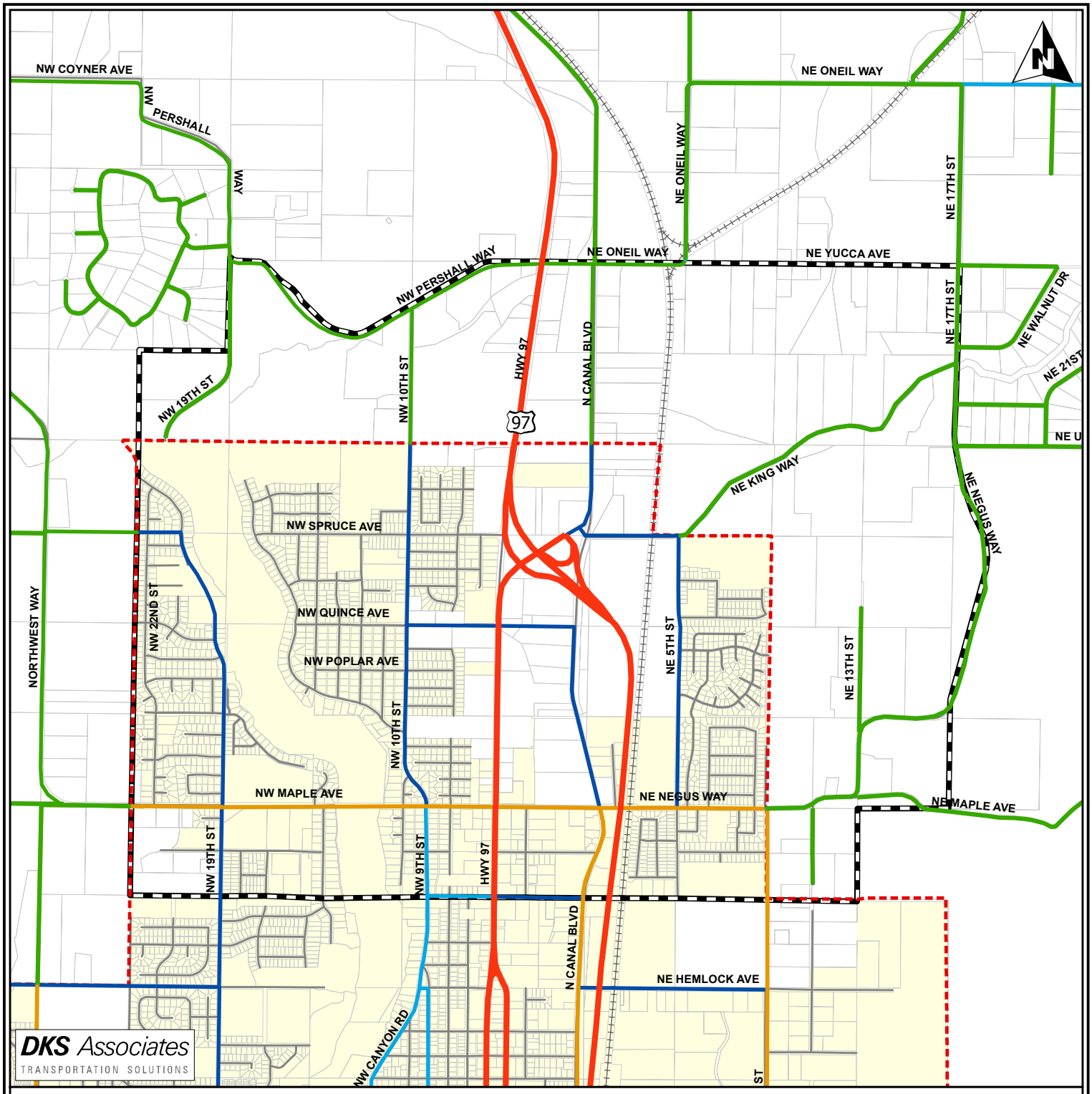


FIGURE 3-3
STUDY AREA ROADWAY CLASSIFICATION

US 97 NORTH INTERCHANGE
AREA MANAGEMENT PLAN

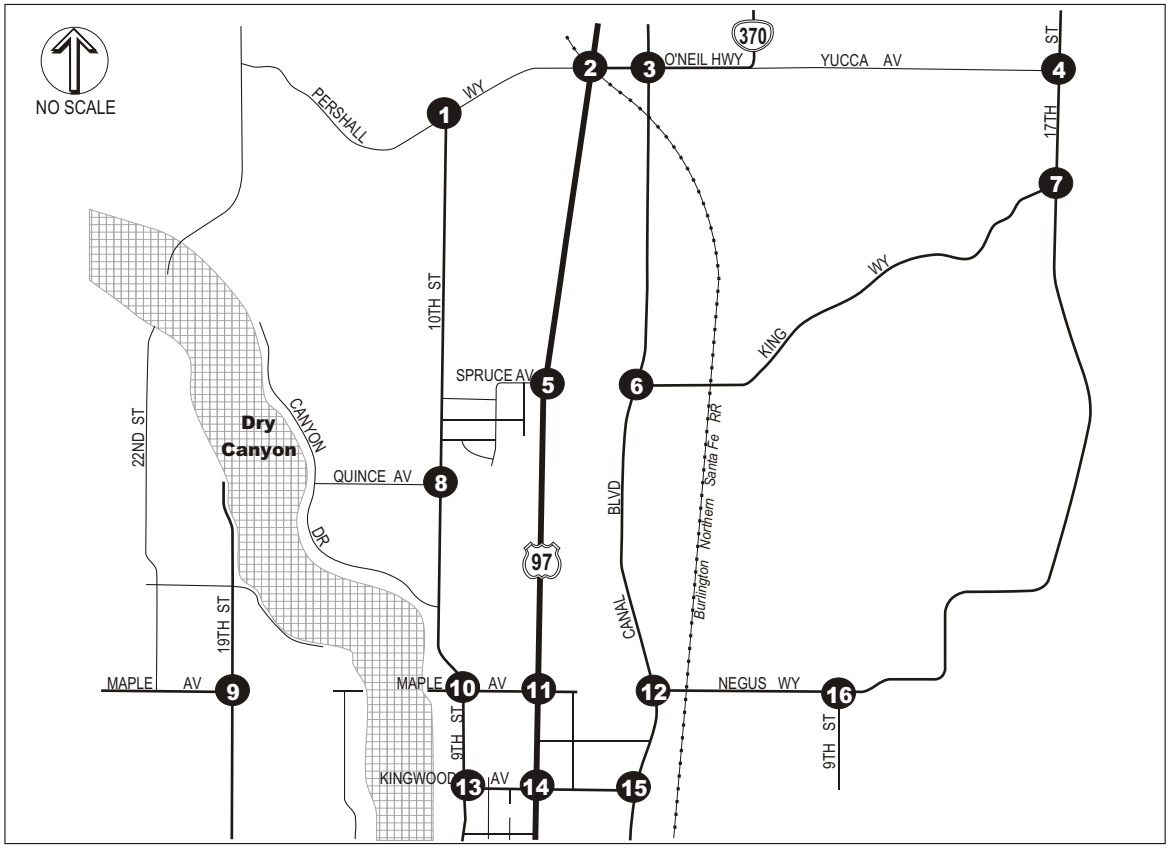
Functional Classification

- MAJOR ARTERIAL
- MINOR ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- RURAL COLLECTOR - DESCHUTES CO.
- LOCAL STREET

- RAILROAD
- PARCELS
- STREAMS
- CITY OF REDMOND
- URBAN GROWTH BOUNDARY

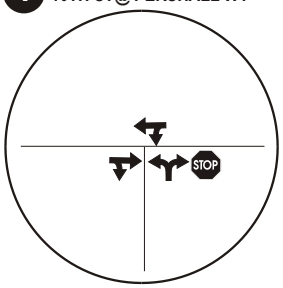
- IAMP STUDY AREA

Miles 0 0.125 0.25 0.5

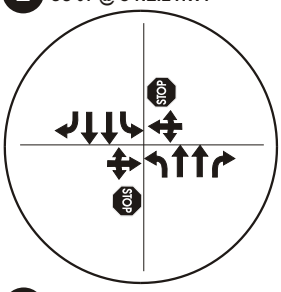


DKS Associates
TRANSPORTATION SOLUTIONS

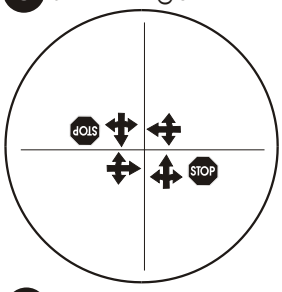
1 10TH ST@ PERSHALL WY



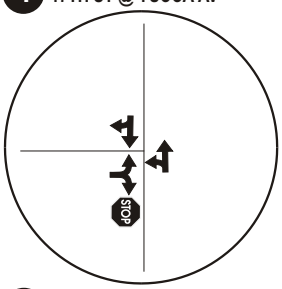
2 US 97 @ O'NEIL HWY



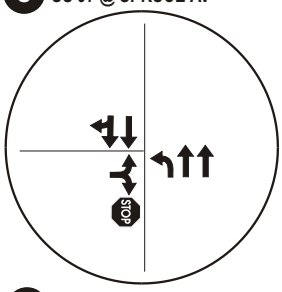
3 CANAL BLVD @ O'NEIL HWY



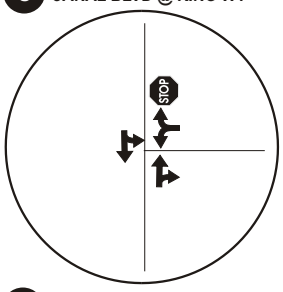
4 17TH ST @ YUCCA AV



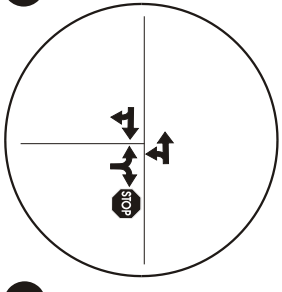
5 US 97 @ SPRUCE AV



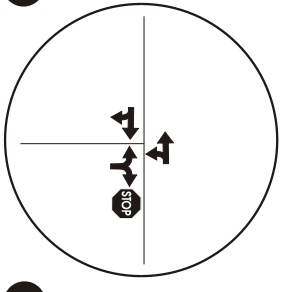
6 CANAL BLVD @ KING WY



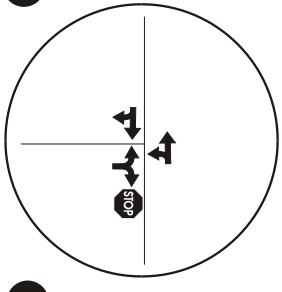
7 KING WY @ 17TH ST



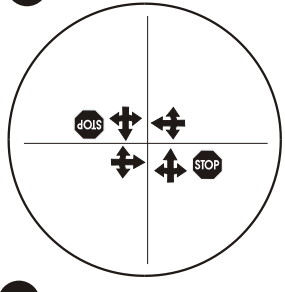
8 10TH ST @ QUINCE AV



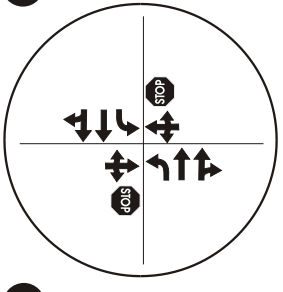
9 19TH ST @ MAPLE AV



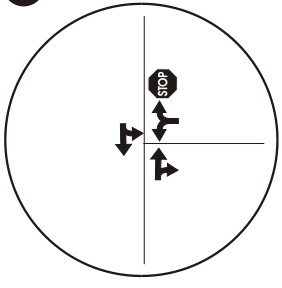
10 9TH ST @ MAPLE AV



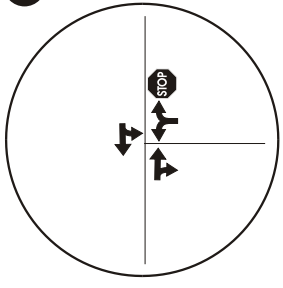
11 US 97 @ MAPLE AV



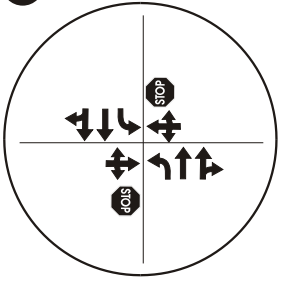
12 CANAL BLVD @ NEGUS WY



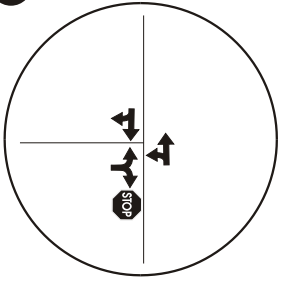
13 9TH ST @ KINGWOOD AV



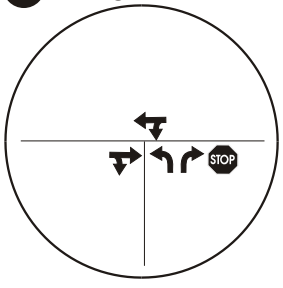
14 US 97 @ KINGWOOD AV



15 CANAL BLVD @ KINGWOOD AV



16 9TH ST @ NEGUS WY



LEGEND

- **0** - Study Intersection Number
- ← - Lane Configuration
- STOP - Stop Sign Controlled Intersection

Figure 3.4

EXISTING INTERSECTION CONTROL AND LANE CONFIGURATION

Existing Access Conditions

Access to US 97

A physical inventory of existing approaches to US 97 was collected through the study area, with descriptive information recorded for each approach indicating the approach's location, how the approach has been constructed and how it is currently being used. This physical inventory was compiled into Table 3.A., which is attached in Appendix 3. In addition, the individual approaches are shown in Figure 3.5.

Using this information, a comparison of existing conditions to ODOT's access management spacing standards was made to evaluate areas needing improvement. However, ODOT's access management spacing standards for US 97 through this area vary, as the highway passes through both rural and urban areas, contains a change in posted speeds, and maintains an expressway designation at the northern end. Therefore, in comparing existing conditions to the desired conditions, the study area was divided into sections according to changes triggered by urban growth boundaries, expressway designations, and posted speeds.

Tables 3.C provides the results of this investigation, displaying the number of approaches found in these sections for each side of US 97 and comparing the average approach spacing per section to the applicable access management spacing standard. While this level of analysis cannot be used to identify potential improvements to approach spacing, it does reflect the degree to which the spacing standards are being met and provides an indication of the extent of improvements needed. The rightmost column in the table indicates the number of driveway or public street approaches that would be allowed to fully comply with access spacing standards.

Table 3.C: US 97 Existing Approach Spacing

Highway Segment	Number of Approaches	Segment Length (feet)	Average Approach Spacing (feet)		Number of Approaches to Meet Standard
			Actual	Standard	
West Side of Highway					
MP 118.52 (O'Neil Hwy) - MP 119.02 (North UGB)	9	2640	293	5280	1
MP 119.02 (North UGB) - MP 119.75 (posted speed change)	9	3854	428	1320	3
MP 119.75 (posted speed change) - MP 120.27 (Kingwood Ave)	17	2745	161	990	3
East Side of Highway					
MP 118.52 (O'Neil Hwy) - MP 119.02 (North UGB)	8	2640	330	5280	1
MP 119.02 (North UGB) - MP 119.75 (posted speed change)	20	3854	193	1320	3
MP 119.75 (posted speed change) - MP 120.27 (Kingwood Ave)	17	2745	161	990	3

The table shows that the average approach spacing experienced within sections of US 97 is much shorter than the adopted standards require, indicating that a significant amount of improvement would be necessary if the standards were to be met. It should be recognized that these figures include public

approaches to US 97, which in some cases, would make it very difficult to meet the spacing standards without significant realignments.

Access to City Streets

In addition to assessing existing access conditions to US 97, the City's arterial and collector streets within the study area were examined as well to identify current access density in comparison to what the City access management guidelines recommend.

The City of Redmond Transportation System Plan has adopted access management guidelines for arterials, collectors, and local streets. These standards were applied to evaluate access and intersection spacing for the collector and arterial systems within the study area. The collector streets that were evaluated include NW 19th Street, NW 10th Street, NW Kingwood Avenue and NW 9th Street, while the arterials include NE Negus Way, N Canal Boulevard (between Kingwood Avenue and Negus Way), and NW Maple Avenue.

Tables 3.D and 3.E show the driveway and intersection spacing for the various City collectors and arterial streets within the study area and compare them with the adopted guidelines. As can be seen from these tables, the average access spacing on the collector streets is very close to meeting the recommended minimum approach spacing shown. However, most of the arterials examined appear to serve far too many approaches to meet these guidelines, mainly due to the high number of public street intersections.

Access to County Roads

As noted in Chapter 2, Deschutes County does not maintain adopted access management spacing standards, but does have general policies indicating that access points to arterials and collectors should be limited.

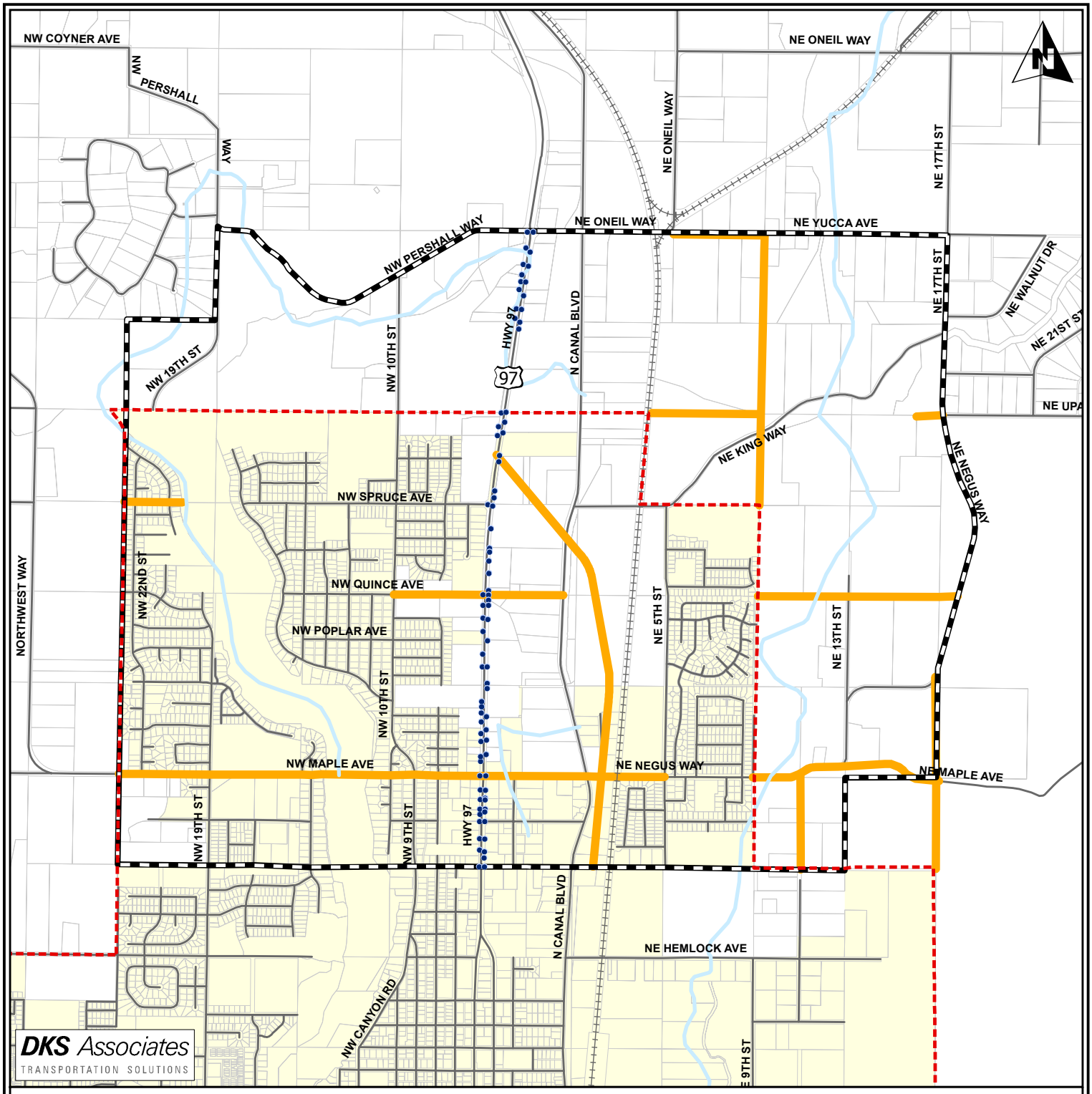


FIGURE 3-5
ROADWAYS AND APPROACHES

US 97 NORTH INTERCHANGE
AREA MANAGEMENT PLAN

Legend

- PUBLIC AND PRIVATE APPROACHES
- EXISTING STREETS
- COMMITTED STREETS
- IAMP STUDY AREA
- RAILROAD
- PARCELS
- STREAMS
- CITY OF REDMOND
- URBAN GROWTH BOUNDARY

Miles 0 0.125 0.25 0.5

Table 3.D: Intersection Spacing on City Streets

Roadway	Length (feet)	Direction	Intersection Spacing		Intersection Spacing (feet)*	Meets Stan–dards?
			Number of Intersection	Average Intersection Spacing (feet)		
Major Collectors						
19th Street (Maple Ave to Quince Ave)	2,600	Northbound	3	865	330	Yes
		Southbound	9	290	330	No
10th Avenue (Maple Ave to Spruce Ave)	3,800	Northbound	9	425	330	Yes
		Southbound	5	760	330	Yes
Kingwood Avenue (US 97 to N Canal Blvd.)	1,280	Eastbound	1	1280	330	Yes
		Westbound	2	640	330	Yes
Minor Collectors						
Kingwood Avenue (9th St. to US 97)	960	Eastbound	3	320	330	No
		Westbound	1	960	330	Yes
9th Street (Maple Ave. to Kingwood Ave.)	1,320	Northbound	2	660	330	Yes
		Southbound	2	660	330	Yes
Minor Arterials						
Negus Way (Canal Blvd to 9th St.)	2,500	Eastbound	5	500	1/4 mile	No
		Westbound	5	500	1/4 mile	No
N Canal Boulevard (Kingwood Ave. to Negus Way)	1,350	Northbound	1	1350	1/4 mile	Yes
		Southbound	2	675	1/4 mile	No
Maple Avenue (West UGB to 19th St.)	1,200	Eastbound	1	1,200**	1/4 mile	Yes
		Westbound	2	600	1/4 mile	No
Maple Avenue (9th St. to 4th St.)	1,450	Eastbound	4	365	1/4 mile	No
		Westbound	3	485	1/4 mile	No

* Source: City of Redmond Transportation System Plan, 2000.
** Segment Shorter than Desired Spacing

Crash Analysis

The last five years (1999 – 2003) of available crash data for the US 97 study corridor was obtained from the ODOT Crash Analysis and Reporting Unit to analyze current conditions. To identify potential deficiencies, crash rates for sections of US 97 were compared to statewide average crash rates for similar facilities. Sections experiencing higher crash rates than the statewide average were investigated further to see if crash patterns could be mitigated through countermeasure implementation.
This analysis was supplemented by reviewing ODOT's Safety Priority Index System listing for locations in the study corridor ranked among the state's top 10% of hazardous locations. The Safety Priority Index System (SPIS) is a method developed by ODOT for identifying hazardous locations on state highways. The SPIS score is based on three years of crash data and considers crash frequency, crash rate, and crash severity. ODOT bases its SPIS on 0.10-mile segments to account for variances in how crash locations are

reported. This information is a general comparison of the overall safety of the highway based on crash information for all sections throughout the state.

Crash rates identifying the number of crashes per million vehicle-miles traveled for specified sections of US 97, as well as statewide average crash rates for various facility types, were obtained from ODOT's 2003 State Highway Crash Rate Tables1. Highway sections analyzed in these tables are categorized by area type and functional classification to provide a basis for comparison between various facilities. For this analysis, US 97 was classified as a non-freeway principal arterial, and the study corridor was separated into "Rural Area", "Suburban Area", and "Urban City" categories. Pre-established highway sections within these categories are provided in the crash rate tables with crash rates calculated for each section, as well as for groups of contiguous sections within the same area type.

Rural Areas

Within the study corridor, the lands outside of the urban growth boundary (O'Neil Highway to approximately ¼-mile north of Spruce Avenue) fall under the Rural Area category. North of the Redmond urban growth boundary (UGB), Table 3.F shows the section from the O'Neil Highway to the Redmond UGB experiencing a significantly higher crash rate than the statewide average for Rural Areas over the last three years. However, it should be noted that this section is only ½-mile long and that crash rates for sections of less than one mile in length often appear to be much higher than warranted, especially when they include a significant intersection, such as the one on US 97 at O'Neil Highway.

Table 3.E: US 97 5-year Crash Rate Comparison for Statewide Rural Areas

Section Limits (Milepost)	Section Description	Crashes per Million Vehicles				
		2003	2002	2001	2000	1999
	Statewide Average Rate	0.72	0.72	0.85	0.82	0.8
118.52 - 119.02	O'Neil Hwy - Redmond UGB	**1.47**	**0.88**	**2.08**	0.61	-

Note: Bold and boxed type indicates the crash rate is greater than the statewide average.

Through an examination of individual crashes over the last five years, it was noted that about 45% of the crashes in this section occurred at the US 97/O'Neil Highway intersection and that if this intersection were removed from the section, the crash rates for three of the five years would drop well below the statewide average rate. During the remaining two years (2001 & 2002), there are fewer than five crashes per year, with most of the crashes appearing to be related to motorists driving too fast under icy conditions. Investigating further, it was found that the crash rates for other sections greater than one mile long in the same Rural Area between Madras and Redmond were approximately the same as, or much lower than, the statewide average and that the crash rate for this entire Rural Area as a whole was significantly lower. It should also be noted that no top 10% SPIS locations were found between the O'Neil Highway and the north Redmond UGB.
Considering this information, it does not appear that this section of US 97 is actually experiencing an above average rate of crashes. Therefore, no countermeasures for crash reduction are recommended.

[1] *2003 State Highway Crash Rate Tables (January 2005)*. Retrieved April 4, 2005, from Oregon Dept. of Transportation Web site: http://www.oregon.gov/ODOT/TD/TDATA/car/docs/2003shcrt.pdf

Suburban Areas

Suburban Areas represent lands between urban growth boundaries and city limits. Table 3.G shows that the area approximately between Spruce Avenue and Maple Avenue falls within this category and that it experiences crash rates well below the statewide average. In addition, there are no top 10% SPIS locations within this section. Therefore, no countermeasures are proposed for crash reduction.

Table 3.F: US 97 5-year Crash Rate Comparison for Statewide Suburban Areas

Section Limits (Milepost)	Section Description	Crashes per Million Vehicles				
		2003	2002	2001	2000	1999
	Statewide Average Rate	1.34	1.51	1.44	1.52	1.64
119.02 - 119.98	Redmond UGB - North City Limits	-	0.11	0.23	0.36	0.74

Urban Cities

Within the study corridor, the only area classified under the Urban Cities category is the segment from the Redmond city limits (just north of Maple Avenue) to Kingwood Avenue. Note that the predetermined section from the crash rate tables includes an additional 0.15 miles from Kingwood Avenue to the beginning of the couplet. Looking at Table 3.H, it appears that this section experienced a crash rate higher than the statewide average only during the last year. However, much like the rural section between the O'Neil Highway and the Redmond UGB previously discussed, this section is less than one mile in length and may have reported crash rates that are heavily influenced by individual intersections. Therefore, identifying high crash locations within the city limits of Redmond by reviewing these crash rates may not be an effective approach.

Table 3.G: US 97 5-year Crash Rate Comparison for Statewide Urban Cities

Section Limits (Milepost)	Section Description	Crashes per Million Vehicles				
		2003	2002	2001	2000	1999
	Statewide Average Rate	3.15	2.88	3.59	3.46	3.8
119.98 - 120.42	Redmond N. City Limits - Begin Couplet	**3.28**	2.29	3.01	2.33	1.89

Note: Bold and boxed type indicates the crash rate is greater than the statewide average.

To supplement this analysis, ODOT's SPIS listings for this area were reviewed to identify any locations with ratings in the state's top 10%. Because SPIS scores are calculated for 0.10-mile segments, the exact location of the problem is not identified by ODOT, but engineering judgment can be used to make a reasonable estimate. Through examination of this list, it was found that the intersection of US 97 at Kingwood Avenue was rated within the top 10%.

The four-way intersection on US 97 at Kingwood Avenue maintains stop-control on the east and west Kingwood Avenue approaches and is located within a tangent, five-lane, 45-mph section of the highway. When examining the individual crashes that have occurred here over that last five years, it appears that the high SPIS rating is probably due to a single crash that actually occurred about 100 feet south of the intersection, resulting in two fatalities. This crash, a head-on collision, occurred around 3:00 p.m. on a clear August Wednesday afternoon. No apparent cause of the crash was provided. Given that this area is on a tangent segment of roadway and a 14-foot-wide median lane is separating the northbound and

southbound traffic, it does not appear any countermeasures are needed. Excluding this crash, which should not be related to the US 97/Kingwood Avenue intersection, the number of remaining crashes does not appear to be unusually high. Signalization of this intersection could mitigate most of these crashes, but the quantity of crashes would not be enough to warrant the installation. Therefore, no countermeasures are recommended at this time.

In addition to the analysis conducted along US 97, another set of crash data (2000-2004) covering the city and county arterial and collector system within the study area was obtained from the ODOT Crash Analysis and Reporting Unit and categorized based on the types and severity of crashes for the various roadway sections. The results are displayed in Table 3.I.

Table 3.H: Collision Data for Non-State Study Area Roadways (2000-2004)

Roadway	Crash Severity			Type of Collision				Total Crashes
	Fatal	Injury	Property Damage Only	Turning	Angle	Rear-end	Fixed / Other object	
NW Maple Ave: NW 22nd St - NW 4th St	0	3	2	4	1	0	0	5
NE Negus Way: N Canal Blvd - Redmond UGB	0	0	0	0	0	0	0	0
N Canal Blvd: NW Kingwood Ave - NW Maple Ave	0	0	3	3	0	0	0	3
NW Pershall Way: NW 19th St - US 97	0	0	4	1	0	2	1	4
O'Neil Hwy: US 97 - NE Yucca Ave	0	4	1	2	1	2	0	5
NE Yucca Ave: O'Neil Hwy - NE 17th St	0	0	0	0	0	0	0	0
NW 10th St: NW Pershall Way - NW Maple Ave	0	0	0	0	0	0	0	0
NW 9th St: NW Maple Ave - NW Kingwood Ave	0	0	0	0	0	0	0	0
NE King Way: N Canal Blvd - NE 17th St	0	1	0	0	1	0	0	1
NE 17th St: NE Negus Way - NE Yucca Ave	0	0	0	0	0	0	0	0
NE Negus Way: Redmond UGB - NE 17th St	0	0	0	0	0	0	0	0
NW Kingwood Ave: NW 9th St - N Canal Blvd	0	5	5	8	1	1	0	10
N Canal Blvd: NW Maple Ave - O'Neil Hwy	0	6	2	2	0	1	5	8
NW 19th St: NW 22nd St - NW Jackpine Ave	0	0	0	0	0	0	0	0

Source: ODOT PRC Reports, Crash Analysis and Reporting Unit.

From examining this table, it is seen that, overall, the occurrence of crashes on the City and County roadways has been relatively low, with only two of the roadway segments analyzed averaging more than one crash per year and half of the segments experiencing no crashes at all. Note that four of the five crashes occurring on NW Maple Avenue and nine of the ten crashes occurring on NW Kingwood Avenue, were located at the intersections with US 97. Also of note is that all three of the crashes on N Canal Boulevard between NW Kingwood Avenue and NW Maple Avenue occurred at the intersection with NW Larch Avenue. North of NW Maple Avenue, three of the eight crashes on N Canal Boulevard occurred at the intersection with NE Negus Way and four others involved fixed object collisions.

Operational Analysis

Traffic Volumes

Traffic volume data for the study area was collected from the Oregon Department of Transportation (ODOT) Traffic Volume Tables, the Automatic Traffic Recorder (ATR) located 1.7 miles south of Redmond, and recent turn movement counts collected in 2005. From this data, it was found that the average daily traffic volume on US 97 ranges from approximately 19,200 vehicles per day near the O'Neil Highway to as much as 25,500 vehicles per day at NW Maple Avenue, with trucks making up less than 10% of the total volume.

New manual turn movement counts were collected during the weekday p.m. peak period (4:00 – 6:00 p.m.) in July and August of 2005 at many of the study intersections to supplement counts previously obtained in the same year for other studies. According to several traffic studies previously completed by ODOT and data from the ATR south of Redmond, the 30th highest hour of annual traffic (30 HV) on US 97 occurs during a weekday p.m. peak hour in the summer. All manual counts collected were adjusted to represent weekday p.m. peak hour volumes in August by applying a seasonal factor, which was calculated using data from the ATR that related monthly traffic volumes to the annual average daily volume.

Traffic volumes during the 30 HV for the year 2005 at study area intersections are displayed[2] in Figure 3.6. From this figure, it can be seen that northbound volumes along US 97 are typically higher than southbound volumes during this period and that volumes on the City and County roads are very low, only exceeding 200 vehicles per hour in any one direction on N Canal Boulevard between NE Negus Way and NW Kingwood Avenue.

Study Area Roadway Performance

Study intersections within the IAMP area were analyzed through the use of a Synchro model that was created using field inventory data, aerial photos, and the traffic volume data shown in Figure 3.6. From this analysis, intersection levels of service and volume to capacity ratios were obtained using Highway Capacity Manual[3] methodologies for unsignalized intersections for comparison with the applicable jurisdiction's adopted performance standards. ODOT has designated US 97 as a Statewide Highway on the National Highway System, with an additional Freight Route designation. Performance standards for this facility have been adopted by ODOT in the 1999 Oregon Highway Plan[4] (OHP). Table 6 in Policy 1F of the OHP displays the maximum allowable volume to capacity ratios for the 30 HV in areas outside of the Portland Metropolitan Area. Relevant sections are presented in Table 3.J.

[2] Note that the volumes shown in Figure 3.6 have been balanced to reduce discrepancies between intersections.
[3] *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2000.
[4] *1999 Oregon Highway Plan*, Oregon Department of Transportation, 1999.

Table 3.I: Maximum Volume to Capacity Ratios from the 1999 Oregon Highway Plan

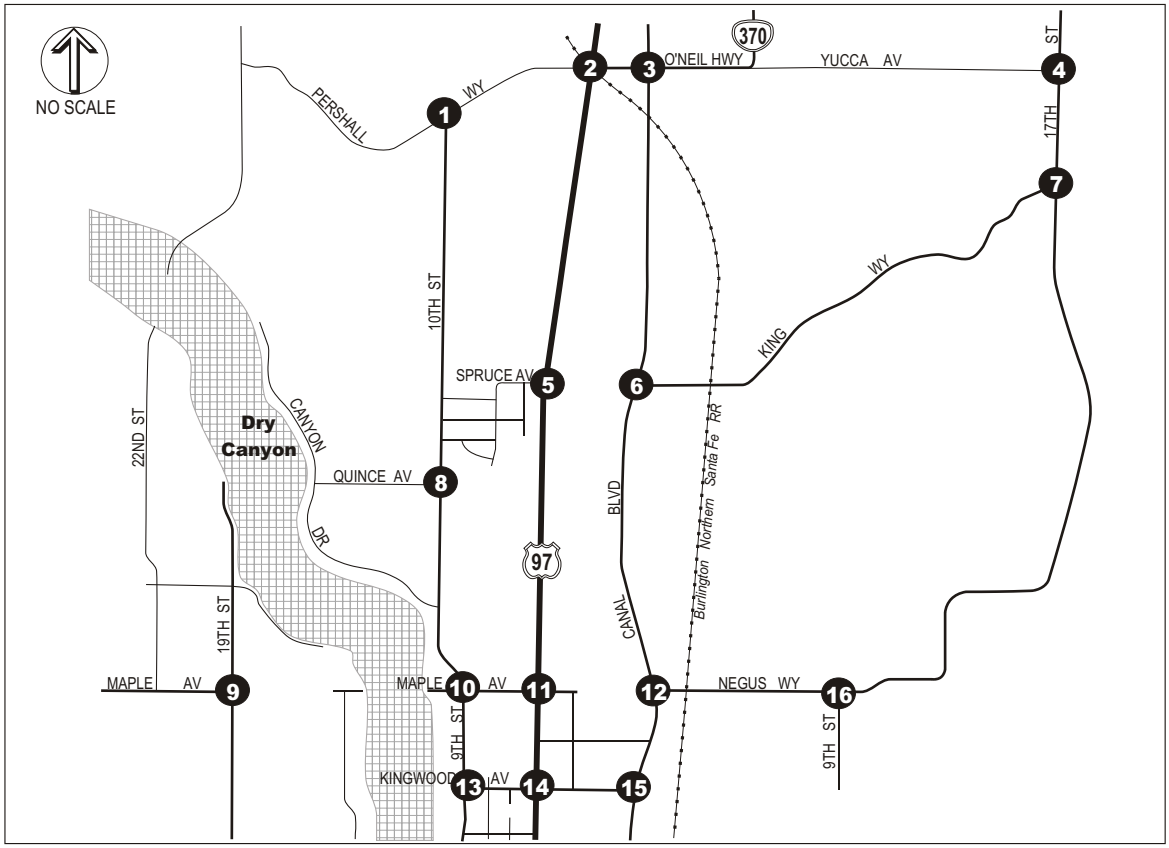
Highway Category	Inside Urban Growth Boundary	
	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit > 45 mph
Statewide (NHS) Freight Routes	0.75	0.70
District/Local Interest Roads	0.85	0.80

At unsignalized intersections (all study area intersections are unsignalized), these standards are applicable only to movements that are not required to stop. For other movements at unsignalized intersections that are required to stop or otherwise yield the right of way, the standards for District/Local Interest Roads shall be applied for areas within urban growth boundaries and a maximum volume to capacity ratio of 0.80 shall be applied for areas outside of urban growth boundaries.

All non-state roadways within the Redmond UGB are under the jurisdiction of the City of Redmond. The City has adopted standards for performance of City streets requiring operation of level of service "E" or better during the peak 15 minutes of the peak hour of the average weekday. A lesser standard is allowed at unsignalized intersections with low volume minor street approaches, requiring operation at a volume to capacity ratio less than 0.90 and a 95th percentile vehicle queue less than four vehicles during the peak hour.

For non-state roadways outside of the Redmond UGB, which are under the jurisdiction of Deschutes County, the Deschutes County Transportation System Plan includes a goal to maintain a level of service of "D" or better during the peak hour throughout the County arterial and collector road system over the next 20 years.

Table 3.K shows the existing operational analysis for the study area unsignalized intersections and compares the results to the applicable performance standards. Note that the results shown represent the critical movement at each intersection (usually a stop-controlled movement, such as a side-street left turn or crossing movement). As can be seen from this table, none of the intersections on City or County roadways fail to operate within acceptable standards. For the intersections under ODOT jurisdiction, the intersection on O'Neil Highway at N Canal Boulevard is currently operating well, but along US 97, only the intersection at NW Spruce Ave is meeting adopted performance standards.



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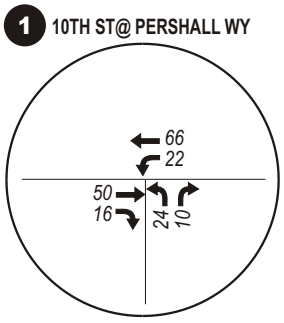
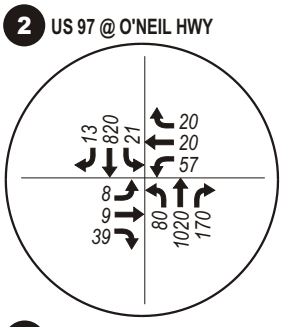
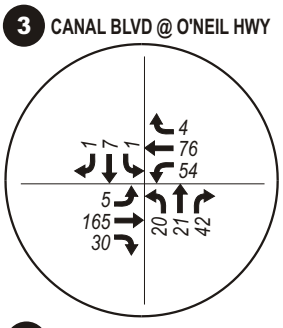
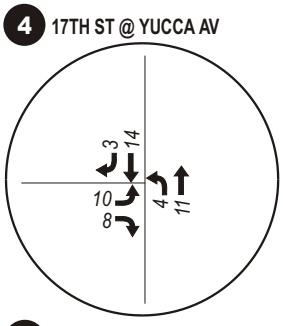
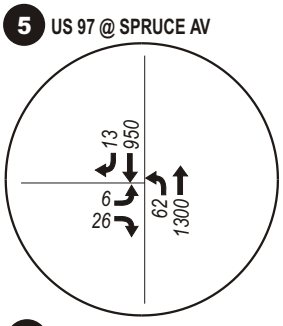
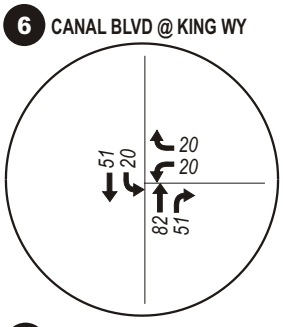


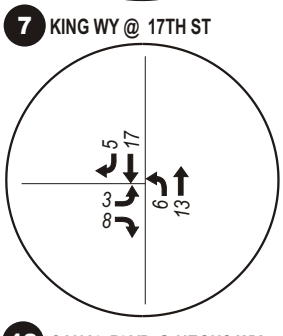


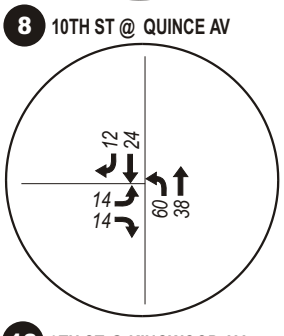


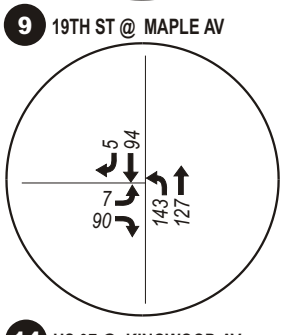


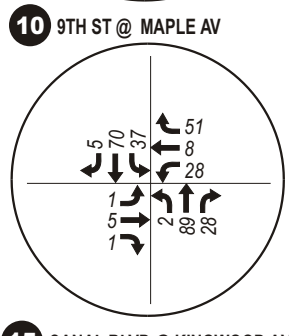


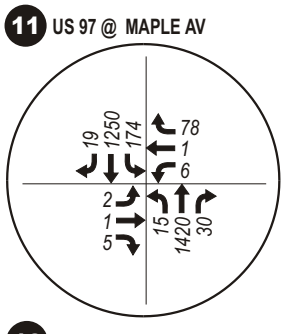


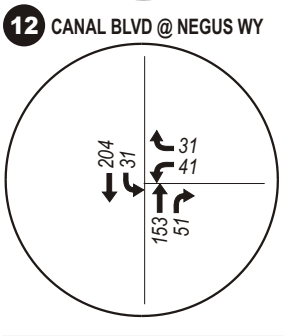


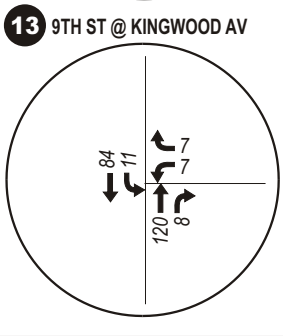


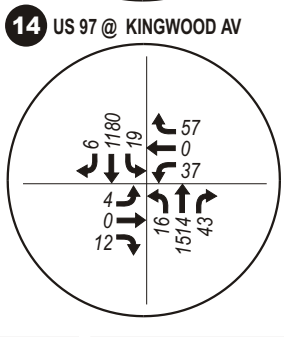


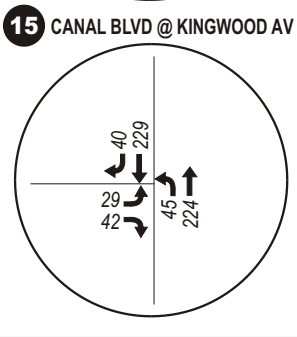


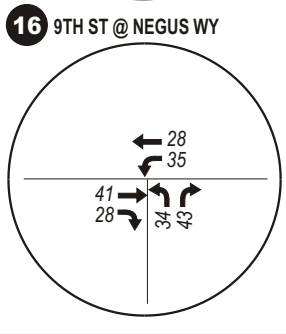












LEGEND

0 - Study Intersection Number

← 00 - Traffic Volume

Figure 3.6

2005 30TH HIGHEST HOUR TRAFFIC VOLUME

Table 3.J: 2005 30th Highest Hour Volume Intersection Operations

Intersection	Volume to Capacity Ratio		Level of Service		Performance Standard Met?
	measured	required	measured	required	
ODOT Facilities – Volume to Capacity Ratio Determines Performance Standard					
US 97 / O'Neil Hwy	>1.0 (WB)	0.80	F (WB)	E	No
US 97 / Spruce Ave	0.15 (EB)	0.80	C (EB)	E	Yes
US 97 / Maple Ave	>1.0 (WB)	0.80	F (WB)	E	No
US 97 / Kingwood Ave	>1.0 (WB)	0.80	F (WB)	E	No
O'Neil Hwy / Canal Blvd	0.14 (NB)	0.80	B (NB)	E	Yes
City of Redmond Facilities – Level of Service Determines Performance Standard					
Canal Blvd / Kingwood Ave	0.19 (SB)	-	B (EB)	E	Yes
Canal Blvd / King Way	0.10 (NB)	-	A (WB)	E	Yes
Canal Blvd / Negus Way	0.15 (WB)	-	B (WB)	E	Yes
Quince Ave / 10th St	0.05 (NB)	-	A (EB)	E	Yes
Maple Ave / 9th St	0.19 (SB)	-	B (SB)	E	Yes
Maple Ave / 19th St	0.12 (EB)	-	A (EB)	E	Yes
Kingwood Ave / 9th St	0.09 (NB)	-	A (WB)	E	Yes
Negus Way / 9th St	0.09 (EB)	-	A (WB)	E	Yes
Deschutes County Facilities – Level of Service Determines Performance Standard					
Yucca Ave / 17th St	0.03 (EB)	-	A (EB)	D	Yes
17th St / King Way	0.02 (NB)	-	A (NB)	D	Yes
Pershall Way /10th St	0.06 (NB)	-	A (NB)	D	Yes

Note: (XX) = critical movement

Because of the changing nature of US 97 through the IAMP area, additional analysis was conducted to better reflect operating conditions, including multi-lane highway capacity analysis for a section from NW Spruce Avenue to NW Maple Avenue. All analysis conducted was in accordance with Highway Capacity Manual methodologies. The results of the analysis, provided in Table 3.L, show that this section of US 97 is operating well under capacity during the 30 HV in 2005, and meets ODOT's adopted performance standard requiring operation at or below a volume to capacity ratio of 0.70.

Table 3.K: 2005 30th Highest Hour Volume Multi-lane Highway Analysis

Location	Measured V/C Ratio	Required V/C Ratio
US 97 Southbound: Spruce Ave. to Maple Ave.	0.42	0.70
US 97 Northbound: Spruce Ave. to Maple Ave.	0.45	0.70

CHAPTER 4: FUTURE TRAVEL FORECASTS AND NEEDS ANALYSIS

The travel demand model for the City of Redmond, prepared by ODOT's Transportation Planning Analysis Unit, was used to develop future traffic volumes for the year 2025 throughout the study area street network. Using these volumes, along with the future street network resulting from planned projects through 2025, the transportation system was evaluated and deficiencies were identified through the use of the same analysis procedures previously employed for the existing conditions. This chapter presents the future volumes at study area intersections, describes key assumptions and refinements used in the model development, and discusses the ability of the transportation system to accommodate forecasted growth.

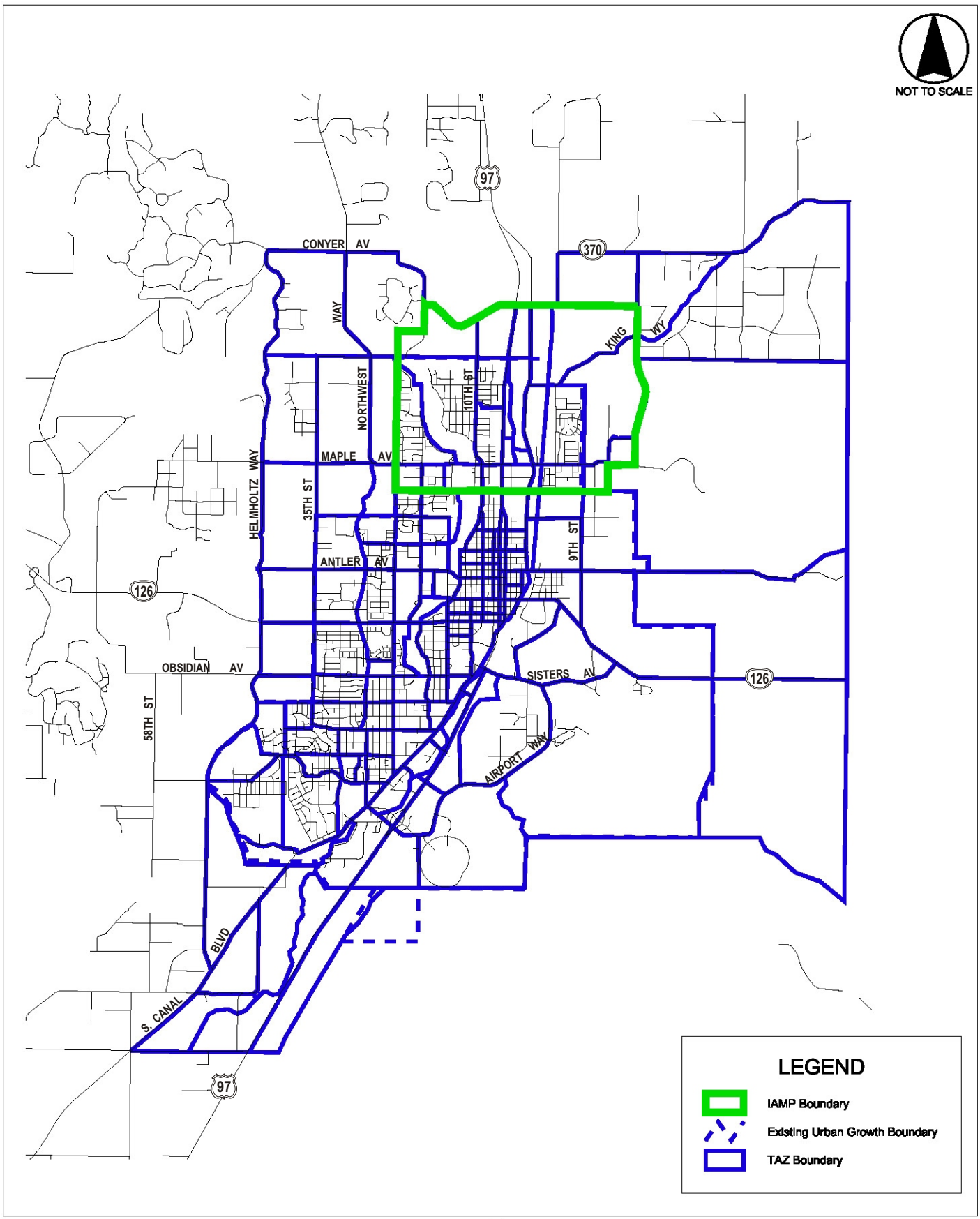
Model Assumptions

The City of Redmond travel demand model is divided into 148 small, internal geographic areas called Transportation Analysis Zones (TAZ) and eight external stations containing information related to base and future year households and employment. TAZs serve as the places where individual trips begin or end. External stations are similar to TAZs, but are located around the perimeter of the model area and represent origins and destinations associated with large geographic areas beyond the limits of the model. The creation of the internal TAZs was primarily based on aggregations of census blocks. Figure 4.1 displays the model TAZ network against the existing transportation system through the City of Redmond.

Trip generation associated with each TAZ is based on household characteristics, such as household size and number of workers, and trip purposes, such as home-based trips (e.g. home to work, school, shopping, and recreation) or non-home-based trips. Therefore, the number of trips generated during a given scenario is primarily dependent on the assumed quantity and locations of housing and employment. Table 4.A presents the total number of households and employees (separated into retail and other) assumed to be present within the model area for the base year 2000 and future year 2025 scenarios and compares them to show the growth experienced over this planning period. Also, Figures 4.3, 4.4, and 4.5 show the growth in housing and employment by TAZ within the model area. It should be noted that a buildable lands inventory was recently completed to provide an updated forecast of future trip patterns in the City of Redmond. This work is being incorporated into the City's Comprehensive Plan and will be used in future transportation planning efforts.

Table 4.A: Assumed Household and Employment Quantities

	Households	Retail Employees	Other Employees
Base Year 2000	7,418	2,330	5,492
Future Year 2025	18,356	4,969	13,040
Growth	147%	113%	137%



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Sources:
Oregon Department of Transportation
Deschutes County

Figure 4.1
REDMOND AREA MODEL
TRANSPORTATION ANALYSIS ZONE SYSTEM

The generated trips calculated from this information are distributed between TAZs in consideration of each TAZ's trip production and relative attractiveness. The attractiveness of a TAZ as a destination is determined by travel times from origin TAZs and the types of employment and number of households contained within the potential destination TAZ. Origins and destinations can be associated with either TAZs or external stations. When associated with TAZs, these trips are considered to be internal trip ends. External trip ends occur at the external stations surrounding the model area. Identifying the locations of trip ends as internal or external provides an understanding of the nature of travel during the modeled time period. For example, trips with internal origins and destinations indicate travel contained entirely within the model area, while trips with external origins and destinations indicate travel only passing through the model area (see Figure 4.2).

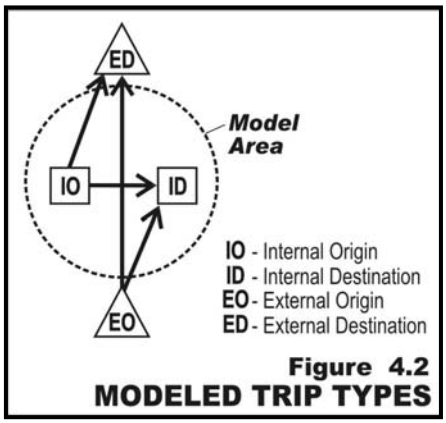


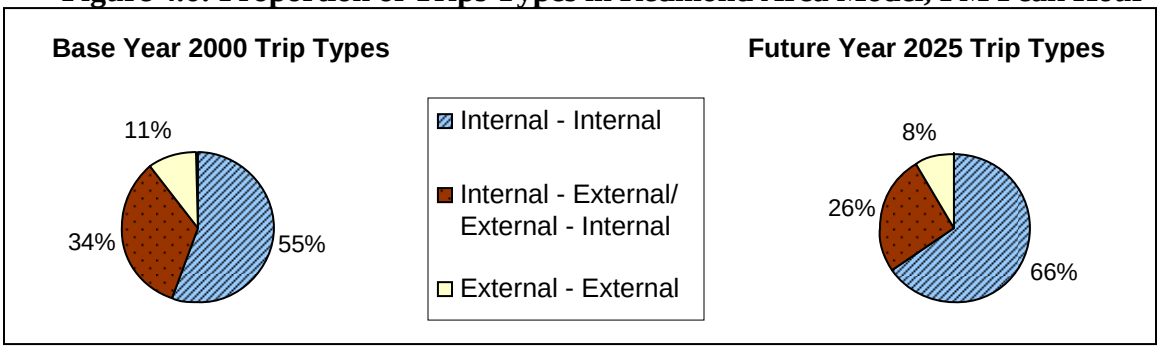
Figure 4.2
MODELED TRIP TYPES

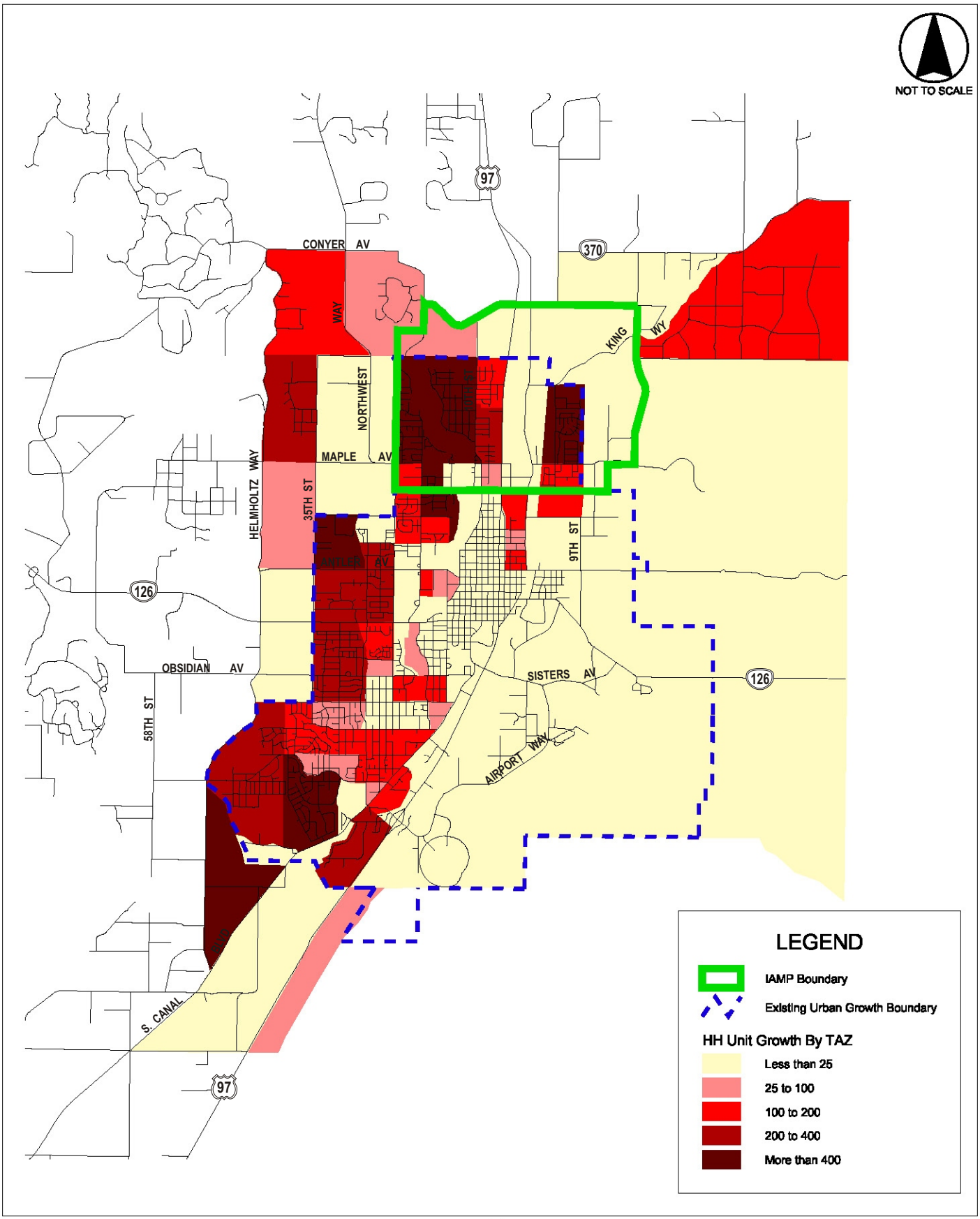
Table 4.B and Figure 4.6 display the assumed number of trips associated with internal and external origins and destinations in the base year 2000 and future year 2025 model scenarios. As shown in Figure 4.6, the travel demand model assumes a majority of trips occurring during the p.m. peak hour have both internal origins and destinations, while a minority of the trips has both external origins and destinations. Furthermore, the growth in local trips (internal – internal) is anticipated to exceed the growth in through traffic (external – external), with an annual growth rate more than two times the growth rate of any other trip type.

Table 4.B: Redmond Area Model Trip Types, PM Peak Hour

	Trip End Locations (origin – destination)			
	Internal – Internal	Internal – External/ External – Internal	External – External	Total Trips
Base Year 2000	5,235	3,174	1,005	9,414
Future Year 2025	13,100	5,290	1,670	20,060
Growth	150%	67%	66%	113%
Avg. Annual Growth Rate	6.0%	2.7%	2.6%	4.5%

Figure 4.6: Proportion of Trips Types in Redmond Area Model, PM Peak Hour





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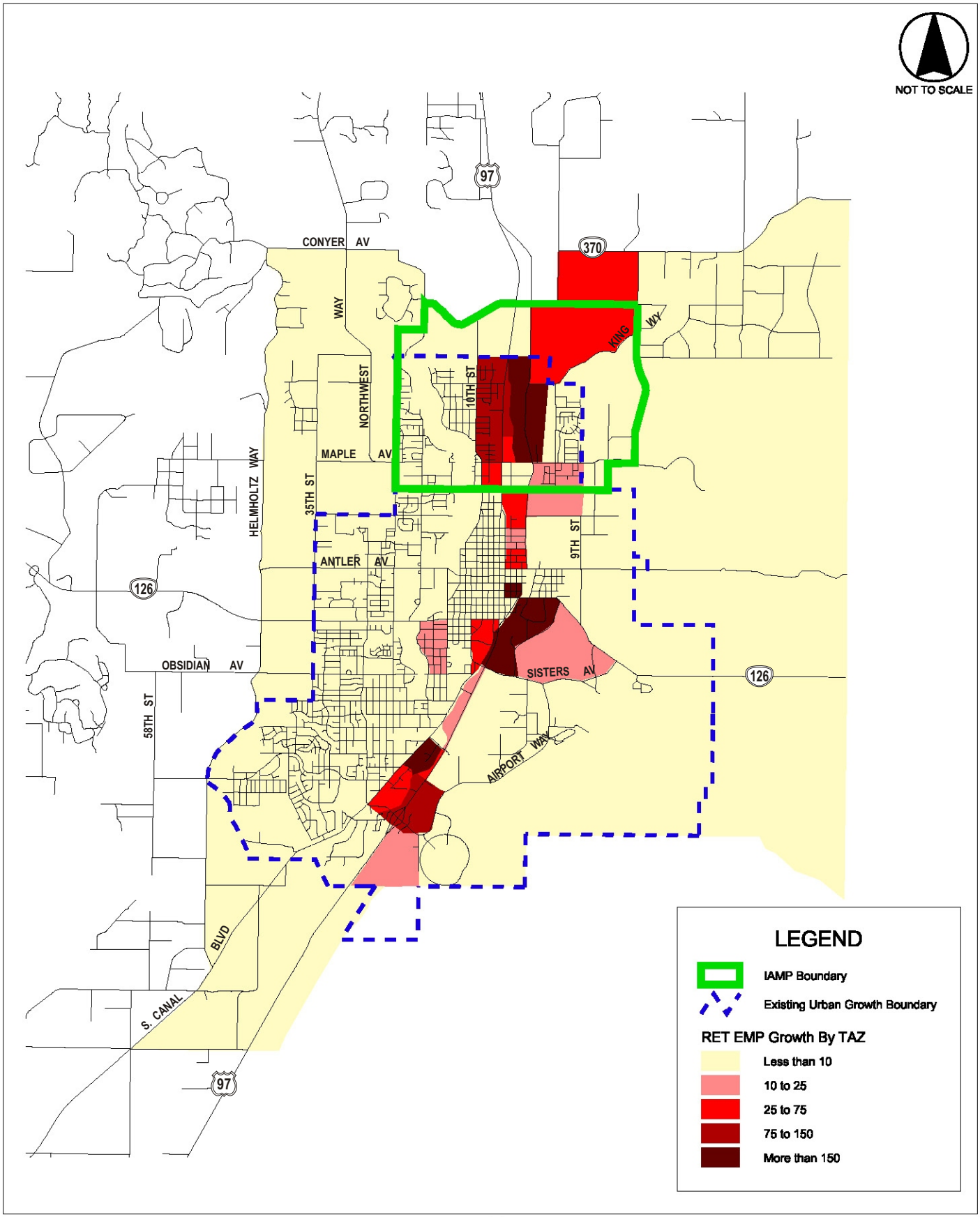
Sources:
Oregon Department of Transportation
Deschutes County

Figure 4.3
REDMOND AREA MODEL
HOUSEHOLD GROWTH FROM 2000 TO 2025



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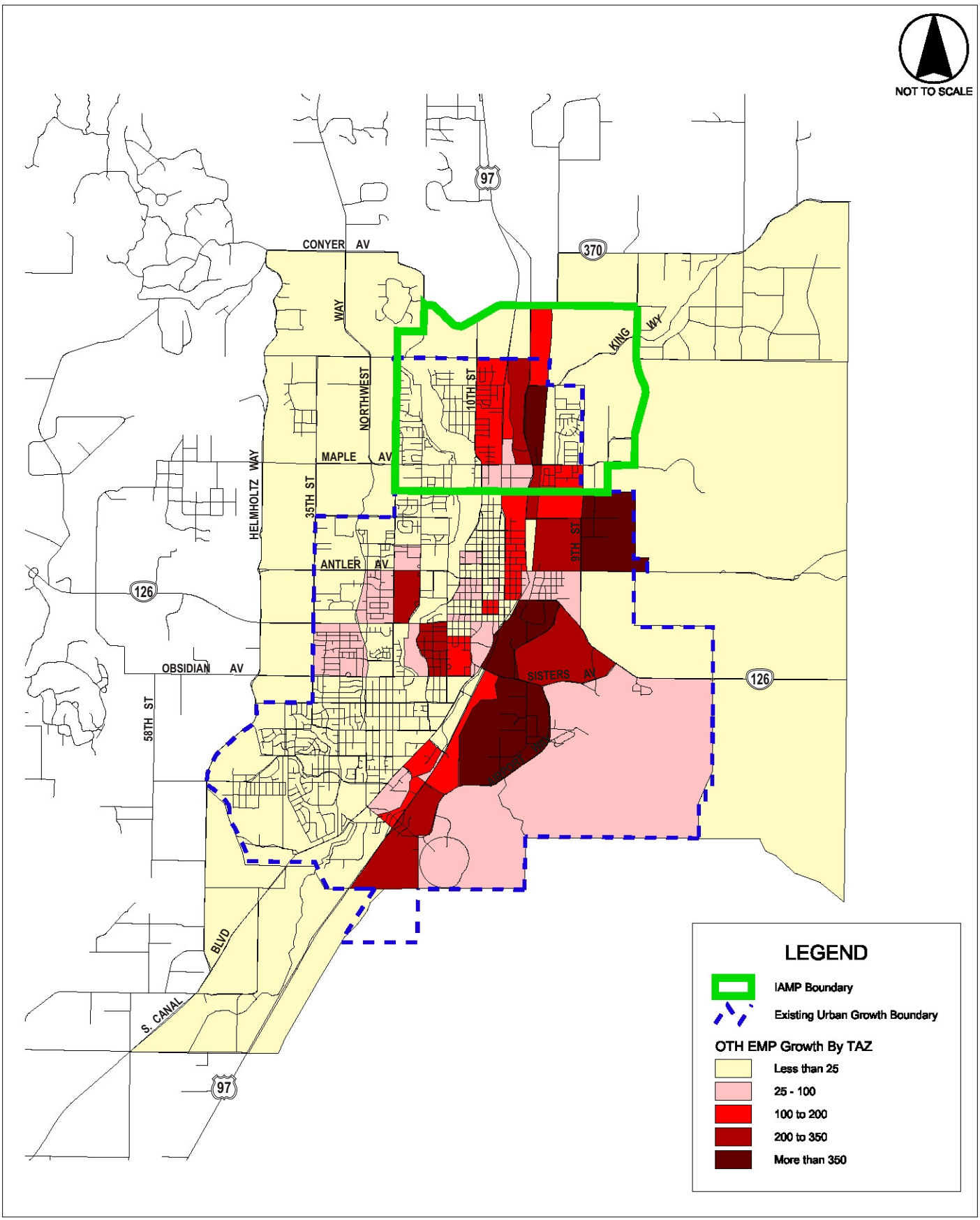
Sources:
Oregon Department of Transportation
Deschutes County

Figure 4.4
REDMOND AREA MODEL RETAIL
EMPLOYMENT GROWTH FROM 2000 TO 2025



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TRANSPORTATION SOLUTIONS

Sources:
Oregon Department of Transportation
Deschutes County

Figure 4.5
REDMOND AREA NON-RETAIL
EMPLOYMENT GROWTH FROM 2000 TO 2025

Model Network Refinement

The base year 2000 and future year 2025 model scenarios included different street networks, with the base year network closely resembling the existing transportation system and the future year network reflecting conditions planned to exist according to the City of Redmond's Transportation System Plan. Figure 4.7 provides a side-by-side comparison of the networks associated with these scenarios.

Prior to forecasting future volumes, the future year 2025 network was refined to better provide for the needs of this study. Refinements made to the network are listed below.

- Refinement of the US 97 Reroute north interchange area to more accurately reflect the current design;
- Quince Avenue extension from 10th Street to Canal Boulevard;
- Right-in/right-out connection to west side of US 97 Reroute at Larch Avenue;
- Right-in/right-out connection to east side of US 97 Reroute at Hemlock Avenue;
- Right-in/right-out connection to both sides of US 97 Reroute at Antler Avenue;
- Removed centroid connectors from US 97 Reroute and replaced them to local streets to reflect appropriate access restrictions;
- Extended 19th Street to Quarry Road;
- Removed centroid connection from TAZ paralleling east side of US 97 north of Quarry Road and reconnected to 19th Street extension; and
- Added diamond interchange on US 97 at Quarry Road.

Future Year Forecasts

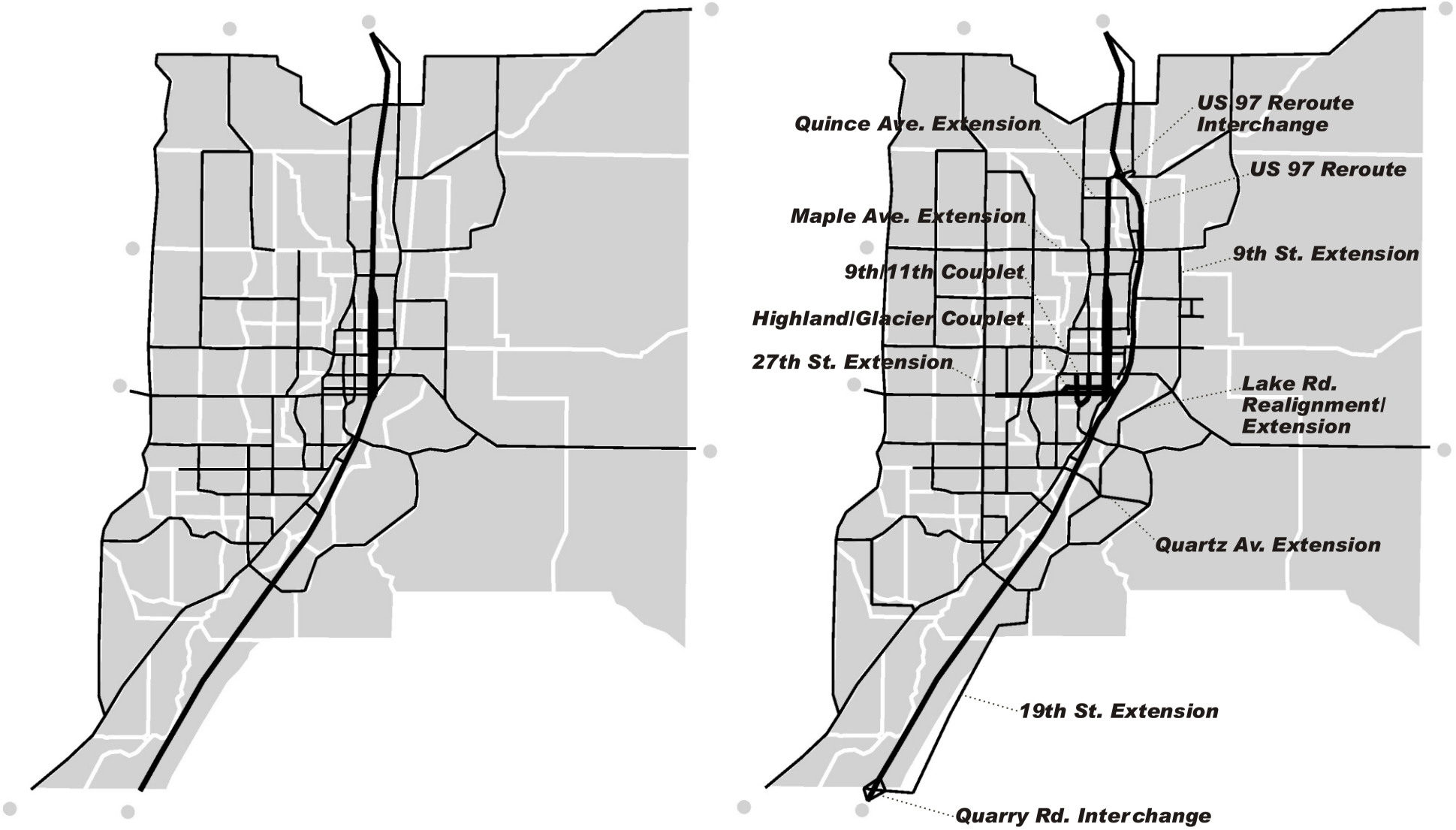
Using the Redmond travel demand model, future year traffic volumes were forecast for streets within the study area. Because the model forecasts average month traffic conditions, a seasonal factor must be applied to these volumes to reflect conditions during the design hour (equivalent to the 30th highest hour of the future year). However, because the growth between the base year model (2000) and future year model (2025) was applied to 2005 volumes that had already been adjusted with a seasonal factor, no further adjustments were necessary to reflect conditions in the desired design hour.

Turn movement volumes at study area intersections were primarily obtained through application of a post-processing technique where the incremental differences between the future and base year volumes from the model were added to the seasonally adjusted volumes collected in the field. Additional refinement was required for some intersections where the geometry was modified between the base and future years to ensure forecasted turning movements were consistent with the future year street network. For some movements experiencing extreme or unrealistic changes, a different post-processing technique was applied that included factoring the collected turn movement volumes under existing conditions by the ratio of the future model forecast volume to the base year model volume.

Because of the impact of the US 97 Reroute on north-south travel choices, screenlines were drawn along the major north-south routes in the study area (10th Street, US 97, Canal Boulevard, and the US 97 Reroute) to track north-south volume growth and trip distribution. This technique was used to aid in the assignment of future trips in a corridor where a major facility did not exist in the base year model, making a direct comparison of base and future year conditions difficult.

Base Year 2000 Network

Future Year 2025 Network
(Indicating Key Projects)



DKS Associates
TRANSPORTATION SOLUTIONS

Source: Oregon Department of Transportation

NO SCALE

LEGEND
- TAZ
- 2-Lane Roadway
- Multi-Lane Roadway

Figure 4.7
REDMOND AREA MODEL BASE & FUTURE YEAR STREET NETWORKS

Additional refinements to the forecasted volumes were made to account for the potential trips generated by a proposed Wal-Mart store to be located east of US 97 and north of Maple Avenue. By comparing the trips generated by the TAZs encompassing the approximate area to be developed by the Wal-Mart to the estimated trips generated by the Wal-Mart (as shown in the traffic impact study1), it was found that the proposed Wal-Mart would generate nearly three times the trips forecasted by the model for that property. Therefore, the trips associated with the subject property from the model were removed from the 2025 forecast and replaced with the trips from the proposed Wal-Mart store.

Figure 4.8 displays the forecasted turning movement volumes at study intersections for the year 2025. In addition to the post-processing procedures described above, these values have been balanced to produce reasonable volume fluctuations between adjacent study intersections. The degree of change allowed in traffic volumes between intersections was dependant on the distance between intersections and the quantity and quality of potential destinations and origins located between them.

Compared to the traffic volumes collected in 2005 (displayed in Figure 3.6), the most significant changes in the IAMP area occur on US 97, Maple Avenue, and 19th Street. The addition of the US 97 Reroute appears to have a significant effect on US 97 south of the new US 97/US 97 Reroute interchange, where forecasted volumes for 2025 are actually lower than current volumes experienced in 2005, with reductions ranging from 30 to 50% (approximately 800 to 1,400 vehicles per hour). However, to the north of the US 97 Reroute, traffic volumes on US 97 within the study area are projected to increase by approximately 25% (more than 525 vehicles per hour) over current volumes.

On the City street network, Maple Avenue is significantly impacted following the extension across Dry Canyon and the connection to Negus Way via a grade separated crossing of the US 97 Reroute. With these improvements in place, Maple Avenue will become an attractive east-west route providing connectivity between US 97, the residential properties to the west, and the employment opportunities to the east. To the west of US 97, traffic volumes are projected to increase on Maple Avenue to more than seven times current levels (increase of nearly 1,000 vehicles per hour), while to the east of the US 97 Reroute, an increase of approximately five times current levels (increase of over 600 vehicles per hour) is projected.

In addition, there is significant growth on 19th Street within the IAMP area, with traffic volumes increasing by more than two times current levels (increase of more than 570 vehicles per hour). This growth may be a result of increased housing, as illustrated in Figure 4.3.

Despite being severed by the proposed US 97 Reroute, Canal Boulevard also shows some significant growth north of Maple Avenue (approximately 45%). This growth is most likely the result of new development on properties between US 97 and Canal Boulevard that are currently vacant (see projected employment growth in Figures 4.4 and 4.5).

Positive growth also occurs on other local streets such as 10th Street, King Way, and 17th Street, but total traffic volumes in 2025 will remain relatively low (less than 500 vehicles per hour).

[1] Wal-Mart Traffic Impact Study conducted by Kittelson & Associates, Inc., 2005.

Assumed Future Street Network

As previously described, the future year 2025 travel demand model was refined to account for planned transportation projects in the area that would influence travel choices and change system capacity. To analyze system operations under this scenario, the Synchro model that was used to perform the operational analysis of study area intersections was updated to account for these projects and included several additional refinements of smaller scale that would not have impacted the route choice provided by the travel demand model. Such refinements typically included modifying lane configurations for streets and intersections undergoing improvements and installing traffic signals where they do not exist today. New traffic signals were installed in accordance with planned projects and a listing of intersections in the City Transportation Capital Improvement Plan (CIP) that are noted as being signalized when warranted. These intersections include:

- US 97 at Maple Avenue;
- US 97 at Kingwood Avenue;
- US 97 at Quince Avenue; and
- NW 19th Street at Maple Avenue.

Intersections on this list were assumed to be signalized by 2025 where the analysis of the unsignalized condition found operations failing to meet the applicable agency mobility standard and mitigation through other means did not appear feasible. An illustration of assumed traffic controls and lane configurations at study intersections is provided in Figure 4.9.

Future 2025 Operations

An operational analysis of the US 97 corridor and study area intersections for the design hour (future 30th highest hour of annual traffic, referred to as DHV) in 2025 was conducted for the IAMP area using the assumed lane configurations and traffic controls shown in Figure 4.9 and the forecasted traffic volumes documented in Figure 4.8. The analysis methodologies employed and corresponding results are discussed below.

Performance Standards

ODOT has designated US 97 as a Statewide Highway on the National Highway System, with an additional Freight Route designation. North of the Redmond urban growth boundary, US 97 also maintains an expressway designation. Within the IAMP area, ODOT also owns O'Neil Highway, which has been designated as a District Highway. Performance standards for these facilities have been adopted by ODOT in the 1999 Oregon Highway Plan2 (OHP). While these performance standards were amended in August of 2005, the changes made did not affect the study area, as all state highways within it operate with posted speeds of 45 mph or greater. Table 6 in Policy 1F of the OHP displays the maximum allowable volume to capacity ratios for the 30 HV in areas outside of the Portland Metropolitan Area. Sections from that table relevant to the study area are presented below in Table 4.3.

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

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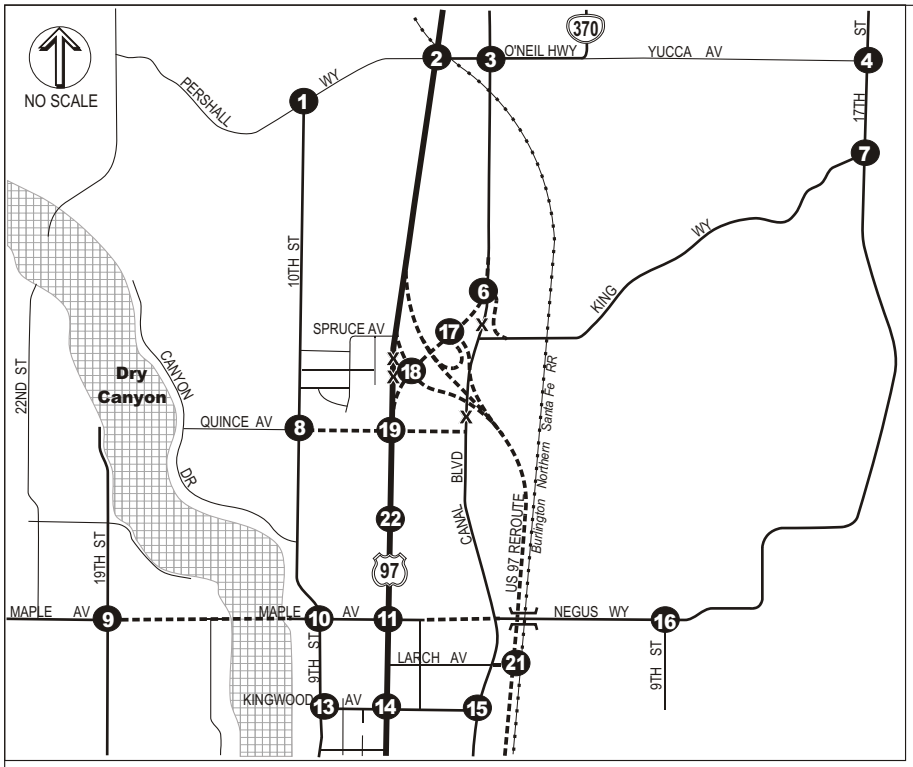

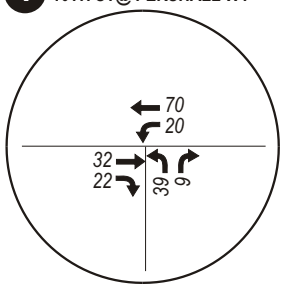

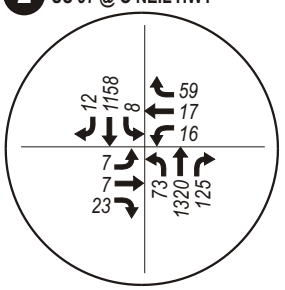

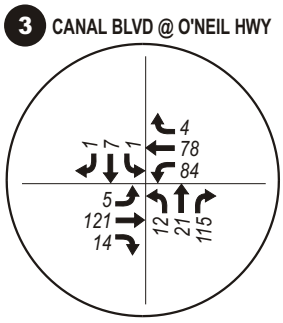

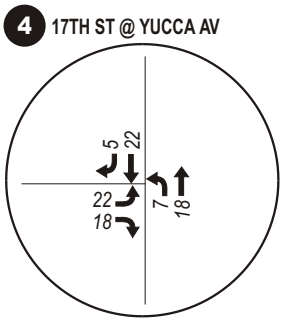

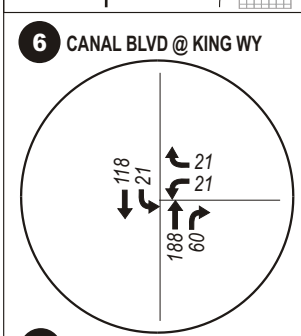

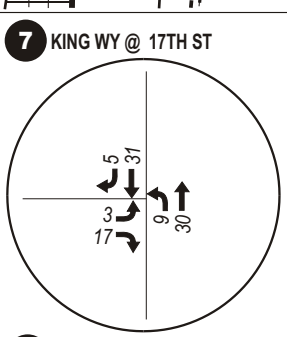

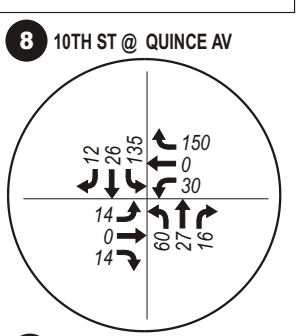

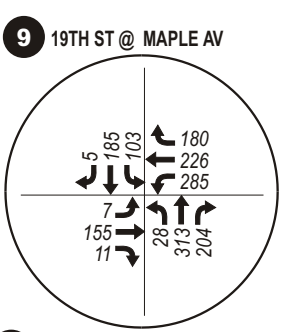

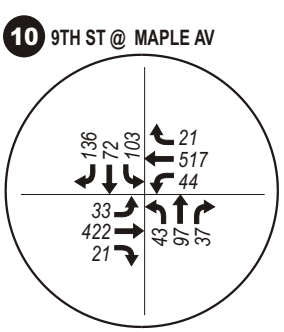

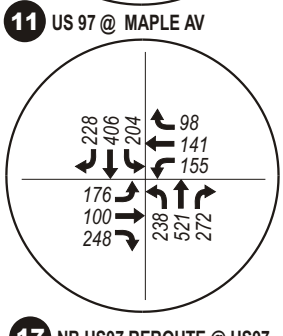

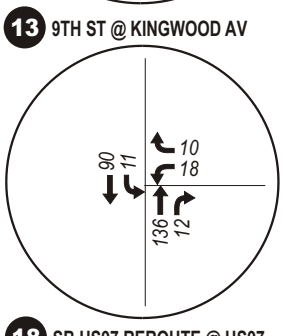

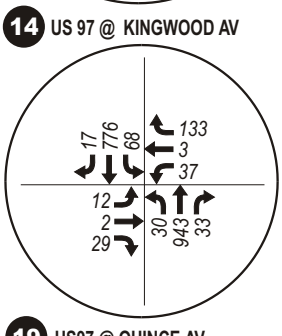

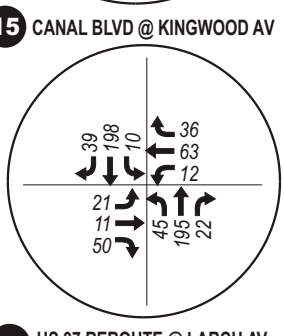

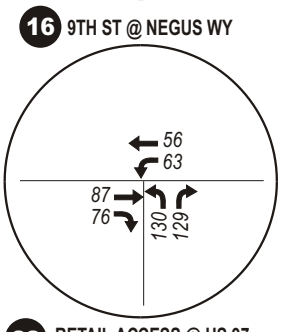

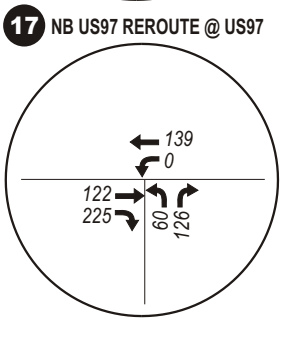

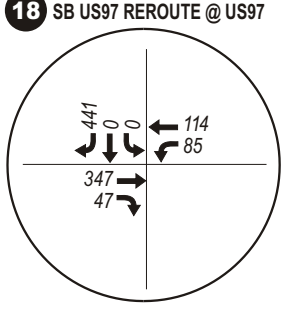

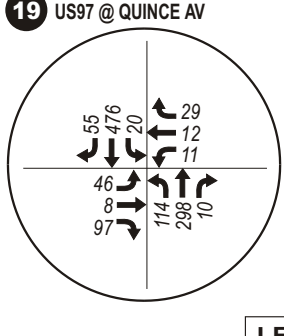

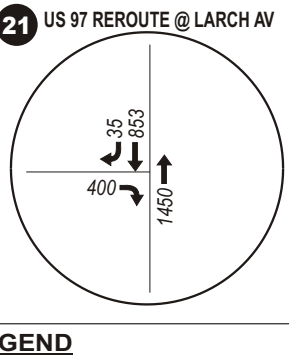

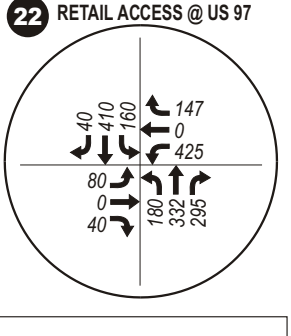

LEGEND

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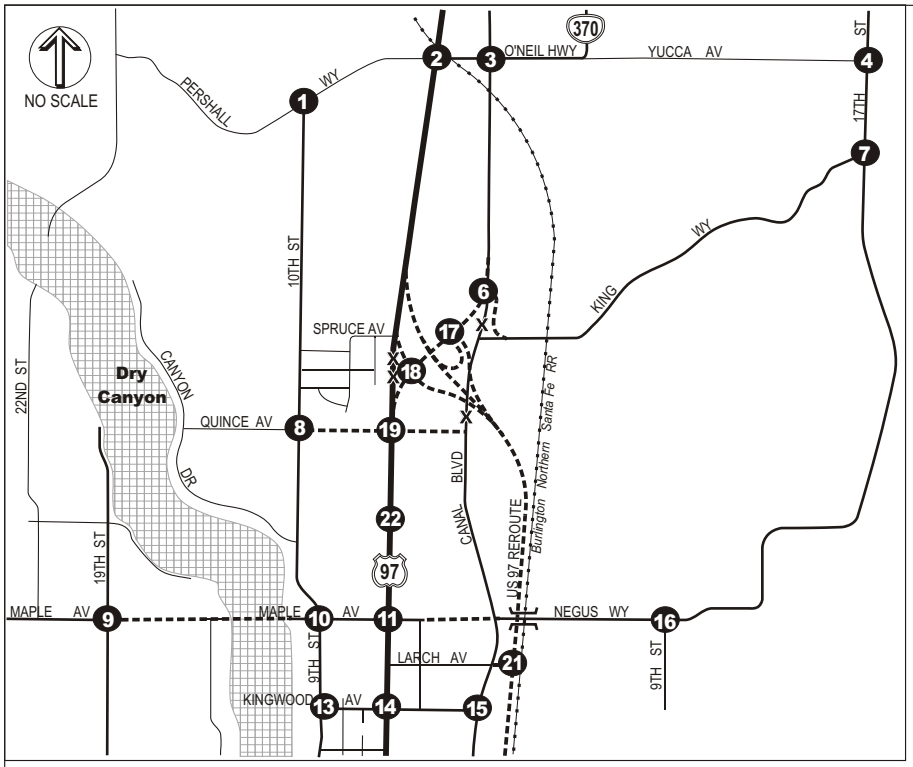
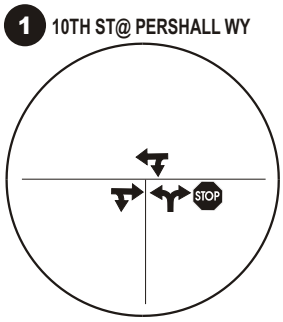
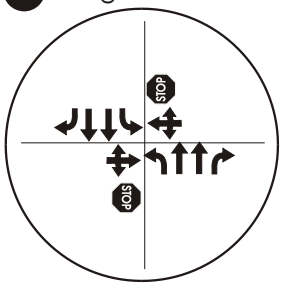
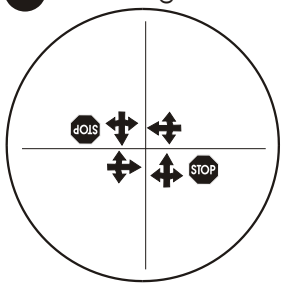
----- - Planned Roadways
X - Remove Roadway
← 00 - Traffic Volume

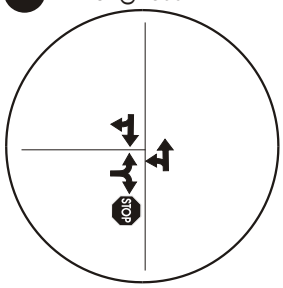
Figure 4.8
2025 NO BUILD DESIGN HOUR TRAFFIC VOLUMES

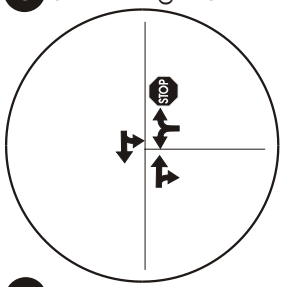


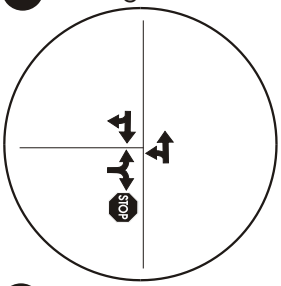


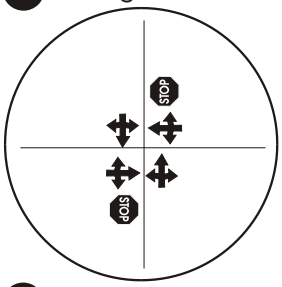


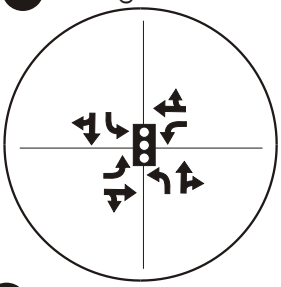


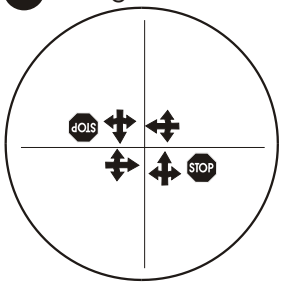


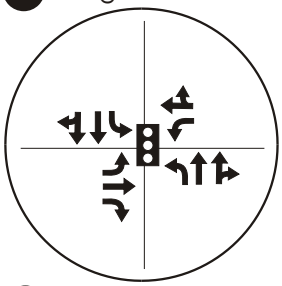


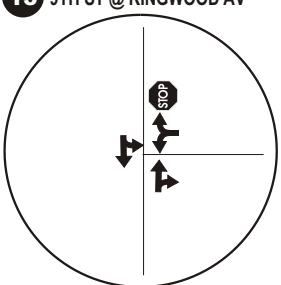


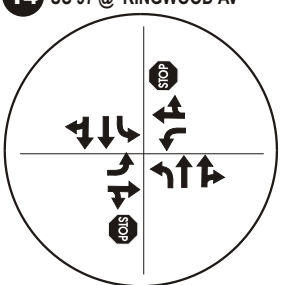


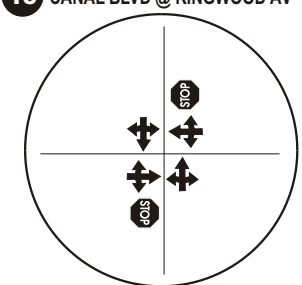


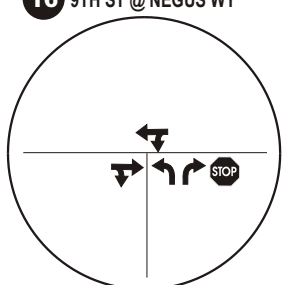


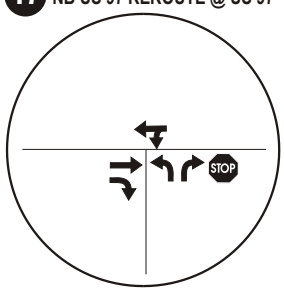


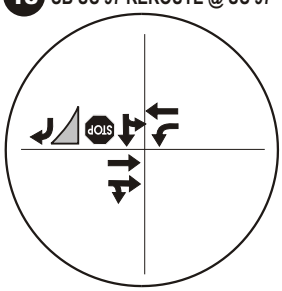


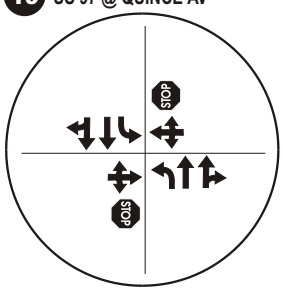


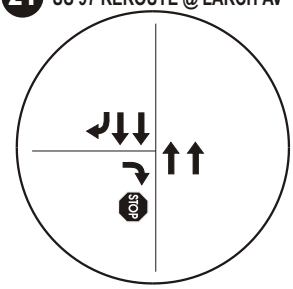


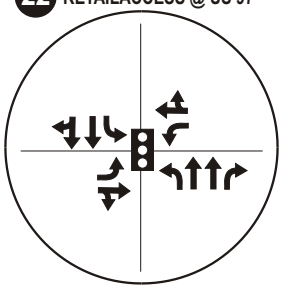












LEGEND

- 0 - Study Intersection Number
- ----- - Planned Roadways
- X - Remove Roadway
- ← - Lane Configuration
- STOP - Stop Sign Controlled Intersection
- - Signalized Intersection

Figure 4.9

2025 ASSUMED INTERSECTION CONTROL AND LANE CONFIGURATIONS

Table 4.C: Maximum Volume to Capacity Ratios Outside Metro*

Highway Category	Land Use Type/Speed Limits	
	Inside Urban Growth Boundary	Outside Urban Growth Boundary
	Non-MPO where non-freeway speed limit > 45 mph	Rural Lands
Statewide Expressways	0.70	0.70
Statewide (NHS) Freight Routes	0.70	0.70
District/Local Interest Roads	0.80	0.75

* Source: 1999 Oregon Highway Plan, Table 6 (Policy 1F), as amended August 2005.

At unsignalized intersections, these standards are applicable only to movements that are not required to stop. For other movements at unsignalized intersections that are required to stop or otherwise yield the right of way, the standards for District/Local Interest Roads shall be applied for areas within urban growth boundaries and a maximum volume to capacity ratio of 0.80 shall be applied for areas outside of urban growth boundaries.

All non-state roadways within the Redmond UGB are under the jurisdiction of the City of Redmond. In addition, as ODOT and the City have formed an agreement that would transfer ownership of the existing US 97 alignment from the new interchange to Veteran's Way (section by-passed by the Reroute) following the construction of the interchange, the study intersections along this corridor were assumed to be under City jurisdiction by 2025 as well. The City has adopted standards for performance of City streets requiring operation of level of service "E" or better during the peak 15 minutes of the peak hour of the average weekday. A lesser standard is allowed at unsignalized intersections with low volume minor street approaches, requiring operation at a volume to capacity ratio less than 0.90 and a 95th percentile vehicle queue less than four vehicles during the peak hour.

For non-state roadways outside of the Redmond UGB, which are under the jurisdiction of Deschutes County, the Deschutes County Transportation System Plan includes a goal to maintain a level of service of "D" or better during the peak hour throughout the County arterial and collector road system over the next 20 years.

Intersection Operations

Study intersections within the IAMP area were analyzed through the use of the updated Synchro model that was used to examine existing conditions, along with the traffic volume data shown in Figure 4.8. From this analysis, intersection levels of service and volume to capacity ratios were obtained using Highway Capacity Manual3 methodologies for signalized and unsignalized intersections for comparison with the applicable jurisdiction's adopted performance standards. The results of this analysis are shown below in Table 4.4, and further illustrated in Figure 4.10. It should be noted that for unsignalized intersections, the operation of the critical movement (usually stop-controlled) is often of most interest. Therefore, the results provided in Table 4.4 for these intersections show the volume to capacity ratios and levels of service for the critical movements only.

[3] *Highway Capacity Manual*, Transportation Research Board, Washington, D.C., 2000.

When comparing this table to Table 3.H, which displays the results of the existing conditions analysis, it is noticed that operations at the intersections on US 97 at Maple Avenue and Kingwood Avenue have been improved, with US 97 at Maple Avenue meeting the City's adopted performance standards. Factors in the improved operations of these intersections included signalization and the addition of turn lanes at Maple Avenue, adding separate left turn lanes on the Kingwood Avenue approaches, and the drop in traffic volumes along US 97 resulting from the construction of the Reroute.

The intersection on US 97 at O'Neil Highway is left as the only intersection on state facilities failing to meet ODOT's performance standards. There are no planned projects to mitigate this intersection and the side-street volumes on O'Neil Highway and Pershall Way appear to be too low to justify signal installation on a high-speed, rural expressway. If safety becomes a concern at this location, the appropriate mitigation may be to offset the east and west approaches or restrict turning movements to right-in/right-out only. However, it should be recognized that issues such as topography, proximity to the proposed interchange, and availability of alternate routes may impact the decision on how to best mitigate this intersection.

While the intersection on US 97 at Kingwood Avenue will not meet the City's preferred performance standard, it may meet the lesser standard requiring operation at a volume to capacity ratio less than 0.90 and a 95th percentile vehicle queue less than four vehicles. The installation of a traffic signal "when warranted" is listed in the City CIP as a future project, but the side-street volumes on Kingwood Avenue appear to be too low to satisfy the signal warrants provided in the Manual on Uniform Traffic Control Devices4. As future development patterns surrounding this intersection may differ from those assumed in the City-wide demand model used, creating localized impacts to side-street volumes, this intersection should be monitored to note if side-street volumes increase enough to warrant signalization.

Also on the City street network, the intersection on Maple Avenue at 19th Street required mitigation including signalization and turn lanes in accordance with planned projects in the City's CIP calling for capacity improvements and a traffic signal. The only City intersection, other than US 97 at Kingwood Avenue, shown to be failing is on Maple Avenue at 9th Street. There is a project listed in the City CIP for this intersection calling for capacity improvements, but it appears a traffic signal may be necessary to meet the adopted performance standard.

Very little change is noticed in the operation of County intersections from the existing condition to the future condition, with all locations operating well within adopted performance standards.

Highway/Interchange Operations

In addition to analyzing the operations at study area intersections, US 97 and the new US 97 Reroute were also examined from O'Neil Highway to Larch Avenue. This included capacity analysis of the highway segments between O'Neil Highway and the new interchange and between the new interchange and Larch Avenue, as well as an analysis of the merging and diverging movements to and from the interchange ramps. All analysis conducted was in accordance with Highway Capacity Manual methodologies.
The results of the analysis, provided in Table 4.E, show that US 97 and the US 97 Reroute will operate well within ODOT's adopted performance standards throughout the study area.

[4] *Manual on Uniform Traffic Control Devices*, Federal Highway Administration, Washington, D.C., 2003, p. 4C-1.

Table 4.D: 2025 No Build Design Hour Intersection Operations

	Intersection	Volume to Capacity Ratio		Level of Service		Performance Standard Met?
		Measured	required	measured	required	
	ODOT Facilities – Volume to Capacity Ratio Determines Performance Standard					
U	US 97 / O'Neil Hwy	>1.0 (EB)*	0.80	F (EB/WB)	E	No
U	US 97 / NB US 97 Reroute	0.14 (NB)	0.85	A (NB)	E	Yes
U	US 97 / SB US 97 Reroute	0.14 (EB)	0.85	A (WB)	E	Yes
U	US 97 Reroute / Larch Ave	0.76 (EB)	0.80	D (EB)	E	Yes
U	O'Neil Hwy / Canal Blvd	0.22 (NB)	0.80	B (NB)	E	Yes
	City of Redmond Facilities – Level of Service Determines Performance Standard					
U	US 97 / Quince Ave	0.40 (EB)	0.80	C (EB)	E	Yes
S	US 97 / Wal-Mart Access	0.59	0.70	D	E	Yes
S	US 97 / Maple Ave	0.69	0.70	C	E	Yes
U	US 97 / Kingwood Ave	0.72 (WB)	0.80	F (WB)	E	No
U	Canal Blvd / Kingwood Ave	0.30 (WB)	-	C (WB)	E	Yes
U	Canal Blvd / King Way	0.15 (NB)	-	B (WB)	E	Yes
U	Canal Blvd / Negus Way	0.71 (WB)	-	D (WB)	E	Yes
U	Negus Way / Canal Blvd	0.36 (SB)	-	C (SB)	E	Yes
U	Quince Ave / 10th St	0.27 (WB)	-	B (EB/WB)	E	Yes
U	Maple Ave / 9th St	4.57 (SB)	-	F (NB/SB)	E	No
S	Maple Ave / 19th St	0.90	-	D	E	Yes
U	Kingwood Ave / 9th St	0.10 (NB)	-	B (WB)	E	Yes
U	Negus Way / 9th St	0.25 (NB)	-	B (NB)	E	Yes
	Deschutes County Facilities – Level of Service Determines Performance Standard					
U	Yucca Ave / 17th St	0.06 (EB)	-	A (EB)	D	Yes
U	17th St / King Way	0.03 (EB)	-	A (EB)	D	Yes
U	Pershall Way /10th St	0.09 (NB)	-	B (NB)	D	Yes

Notes: (XX) = critical movement

S = signalized intersection * EB approach has no capacity

U = unsignalized intersection

Table 4.E: 2025 No Build Design Hour Multi-lane Highway & Ramp Analysis

Location	Direction of Travel	Measured V/C Ratio	Required V/C Ratio
O'Neil Hwy to North Interchange	Southbound	0.36	0.70
	Northbound	0.46	0.70
Off-ramp Diverge to Old US 97	Southbound	0.22	0.70
On-ramp Merge from Old US 97	Northbound	0.24	0.70
Off-ramp Diverge to Old US 97	Southbound	0.36	0.70
On-ramp Merge from Old US 97	Northbound	0.41	0.70
North Interchange to Larch Ave.	Southbound	0.27	0.70
	Northbound	0.44	0.70

Future 2025 Deficiencies

Traffic Operations

As previously discussed, and illustrated in Figure 4.10, most of the study area intersections are projected to operate within adopted performance standards in 2025. In addition, the US 97 Reroute and US 97 north of the new interchange will have adequate capacity to serve the forecasted future demand. In focusing on the operational deficiencies, three locations are identified:

- The intersection on US 97 at O'Neil Highway;
- The intersection on Maple Avenue at 9th Street; and
- The intersection on US 97 at Kingwood Avenue.

US 97 at O'Neil Highway

This intersection was shown to be failing to meet performance standards under existing conditions with the stop-controlled approaches operating at level of service F and v/c ratios greater than 1.00. While the volumes of traffic attempting to leave the stop-controlled approaches are fairly low, the high volumes of traffic on US 97 do not provide enough gaps in traffic to serve them. With traffic volumes projected to increase by 2025, this condition worsens.

While the installation of a traffic signal would mitigate operations to be well within the adopted standards, the volumes of traffic on the stop-controlled approaches appear to be too low to meet the required warrants for such an installation. In addition, given the isolated, rural nature of the surrounding area and the high travel speeds on US 97, the installation of a traffic signal at this intersection may conflict with driver expectations and could create a safety hazard.

With a majority of the traffic on the stop-controlled approaches being associated with right turn movements, a potential improvement may be to restrict turns (e.g. right-in and right-out movements only). However, a complete engineering investigation considering the impacts of such an improvement and the availability of alternate routes for the restricted movements should be conducted first.

Another option may to offset the east and west approaches. This type of improvement does not mitigate the left turn movements, but would convert the through movements to right turns, which typically require fewer gaps on the highway and can often operate more safely. To convert through movements to right turns, the west approach must be located to the north of the east approach. In this case, Cinder Butte may

make moving Pershall Way to the north infeasible and the proximity to the proposed interchange may make moving O'Neil Highway to the south undesirable.

Maple Avenue at 9th Street

The intersection on Maple Avenue at 9th Street operated well under existing conditions, but degraded significantly by 2025, operating at a level of service F and failing to meet the City's performance standard. The failing future operations are largely due to the increased volumes on Maple Avenue resulting from the street extension from Negus Way to 19th Street.

The City of Redmond CIP includes a project at this intersection for "capacity improvements" with estimated funding at approximately $35,000. Further analysis revealed that the installation of a traffic signal would be required to restore operating conditions to meet performance standards. New traffic signal installations typically cost around $175,000. The installation of a roundabout may be another option for improving this intersection, but was not investigated due to the limited right-of-way available in this area.

US 97 at Kingwood Avenue

This intersection operated very poorly under existing conditions, but has been shown to improve in 2025 due to decreased traffic volumes on US 97 and the addition of separate left turn lanes on the east and west approaches. However, it will not meet the City's preferred performance standard requiring operation of level of service "E" or better, but may meet the lesser standard allowing low volume minor street approaches to operate at v/c ratios less than 0.90 with 95th percentile vehicle queues less than four vehicles during the peak hour.

A traffic signal, which has been identified in the City CIP as a future improvement at this intersection, could restore operations such that City performance standards are be met, but the traffic volumes on the east and west approaches may be too low to meet signal warrants. Therefore, finding a suitable solution will require further study. As future development patterns surrounding this intersection may differ from those assumed in the City-wide demand model used, creating localized impacts to side-street volumes, this intersection should be monitored to note if side-street volumes increase enough to warrant signalization.

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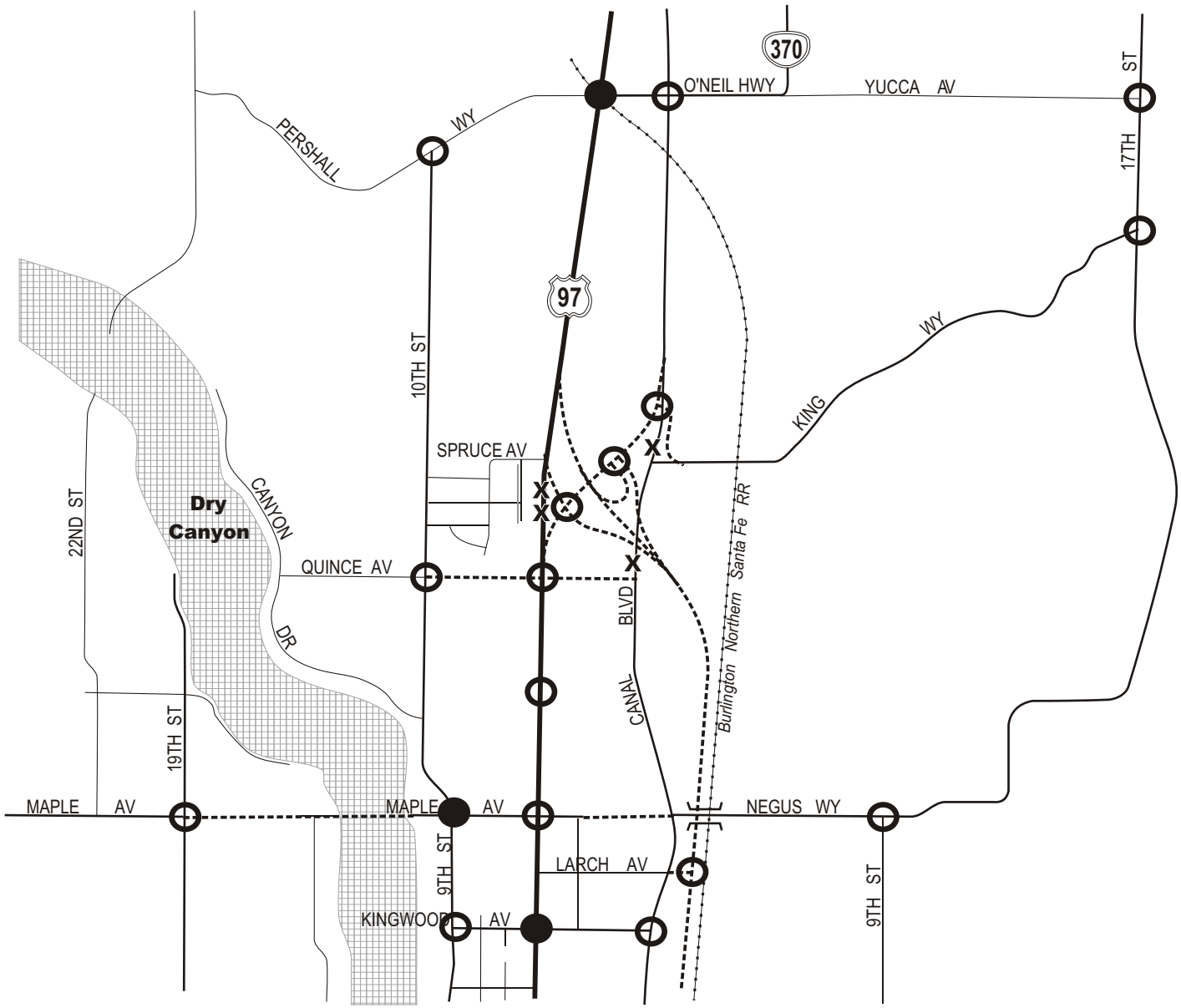
NO SCALE



LEGEND

- ● - Failing to Meet Adopted Performance Measures
- ○ - Meeting Adopted Performance Measures
- ----- - Planned Roadways
- X - Remove Roadway

Figure 4.10
IAMP AREA INTERSECTIONS FAILING TO MEET ADOPTED PERFORMANCE MEASURES - 2025 DHV

Access / Intersection Spacing

In Chapter 3, the existing access spacing on the area street network was compared to adopted access management spacing standards. It was found that on US 97, the number of approaches to the highway is far greater than would be allowed under ODOT's spacing standards, with access density increasing to the south. Access spacing on City streets generally met standards with some deficiencies noted to be related to public street intersection spacing on arterials. County roads were not assessed, as the County does not maintain access management spacing standards.

The changes to the state highway system resulting from the construction of the US 97 Reroute and interchange will require additional access management spacing standards to be applied to this area that specifically address interchange areas. Figure 4.11 displays US 97, the US 97 Reroute, and the new interchange (the primary routes of interests regarding access management), over an aerial photograph showing existing5 land development and associated access points and identifies different zones where access management spacing standards change. These zones are described below.

Zone 1: This zone includes the segment of US 97/US 97 Reroute bounded by the interchange, the interchange ramps, and the crossroad between the ramp terminals. According to OAR 734-051-0070(4)(a), "The Department shall not accept an application for an approach to a freeway, a freeway ramp, or an expressway ramp, or where an approach would be aligned opposite a freeway or expressway ramp terminal."

Recommendation: Within Zone 1, all access rights should be purchased and no access to the highway system should be allowed.

Zone 2: Zone 2 includes the interchange crossroads of US 97 and Canal Boulevard to the north and south of the interchange ramp terminals for a minimum distance of 1,320 feet. The southern section of this zone along US 97 (Zone 2A) covers an urban, multi-lane highway, with applicable access management spacing standards coming from Table 8 and Figure 4, as referenced in OAR 734-051-0125(2).

Recommendation: Within Zone 2A, a distance of at least 1,320 feet should be maintained between the interchange ramp terminal and the first right-in/right-out approach or first intersection allowing left turns and the last right-in/right-out approach and the start of the taper for the on-ramp.
The northern section along Canal Boulevard (Zone 2B) covers an urban, two-lane facility owned by the City of Redmond. While ODOT does maintain interchange area spacing standards for interchange crossroads, they are not directly applicable to facilities under the jurisdiction of other agencies. To maintain consistency with the treatment of access on the south side of the interchange, it is recommended that the City adopt ODOT's access management spacing standards for an area extending 1,320 feet from the US 97 northbound interchange ramp terminal. ODOT's access management spacing standards for two-lane crossroads in interchange areas are slightly different than those for multi-lane crossroads. As shown in Table 7 and Figure 3 of OAR 734-051, a distance of at least 1,320 feet should be maintained between the interchange ramp terminal and the first right-in/right-out approach or first intersection allowing left turns, but a shorter distance of 990 feet is allowed between the last right-in/right-out approach and the start of the taper for the on-ramp.

Recommendation: Within Zone 2B, a distance of at least 1,320 feet should be maintained between the interchange ramp terminal and the first right-in/right-out approach or first intersection allowing left turns.

[5] Photo taken in 2004.

A minimum distance of 990 feet should be maintained between the last right-in/right-out approach and the start of the taper for the on-ramp.

Zone 3: Zone 3 includes the remainder of US 97 south of the new interchange that is outside of Zone 2A. It is anticipated that the jurisdiction of this segment of US 97 will be transferred to the City of Redmond following the construction of the Reroute. This area maintains a lesser access spacing requirement than Zone 2A, but, as a major arterial[6], still demands a significant degree of protection. Assuming the current 45 mph speed zone is extended to cover this entire area, the City's adopted access management spacing guidelines from Table 15-2 in the City of Redmond Transportation System Plan (January 2000) require a separation of at least 800 feet between adjacent driveways and/or streets on the same side of the roadway and ½ mile between adjacent intersections.

Recommendation: Within Zone 3, a distance of at least 800 feet should be maintained between adjacent driveways and/or streets on the same side of the roadway. A minimum distance of ½ mile should be maintained between adjacent intersections.

Zone 4: Zone 4 includes the remainder of Canal Boulevard north of the new interchange that is outside of Zone 2B. With the exception of a small 200-foot segment at the southern end, which is City-owned, this section of Canal Boulevard is under the jurisdiction of Deschutes County, who does not maintain any access management spacing standards. However, since the land surrounding this roadway is included within the urban reserve area, it is recommended that the County adopt the current City of Redmond access management guidelines for major collector streets, requiring a minimum of 165 feet between driveways and/or streets and 330 feet between intersections. Implementing these guidelines will provide further protection for the interchange area and will ensure access spacing has been planned in accordance with City requirements prior to the roadway's future incorporation into the City.

Recommendation: Within Zone 4, it is recommended that the City continue to implement their adopted access management guidelines for major collector streets, requiring a minimum of 165 feet between driveways and/or streets and 330 feet between intersections. It is further recommended that the County adopt the same access management spacing guidelines for implementation on Canal Boulevard within this zone.

Zone 5: This zone includes US 97 to the north of the new interchange. While this section will continue to maintain the current alignment, the inclusion of the interchange will have a significant impact on access management needs. As a rural, Statewide Freight Route on the National Highway System and expressway with a posted speed of 55 mph, Table 2 from OAR 734-051 requires a separation of at least 5,280 feet (1-mile) between adjacent approaches on the same side of the highway. However, the construction of the new interchange will result in the application of spacing standards for interchange areas, which are more restrictive. According to Table 8 in OAR 734-051, these new spacing standards would require a minimum distance of 2 miles between the start of the ramp tapers and the nearest at-grade intersection (extending well beyond the IAMP area to nearly Davidson Way).

Recommendation: Within Zone 5, no direct access to the highway should be permitted. From Spruce Avenue north to O'Neil Highway, the City of Redmond and Deschutes County TSPs should be amended to show a frontage/backage road on both sides of US 97. At the time of development of redevelopment of properties adjacent to the highway, the City of Redmond and Deschutes County should require that a frontage/backage road be incorporated into the design of the development and should not allow any direct access to US 97. Where property adjacent to US 97 has access to a local street, through the application of

[6] As shown in the City of Redmond Urban Area Transportation Plan map (January 13, 2005).

local development regulations and OAR 734-051, the City, County, and State should require all new development to take access to the local street and not permit direct access to the highway.

Zone 6: Zone 6 includes the US 97 Reroute south of the new interchange. This zone is similar to Zone 5 in that the spacing standards for interchange areas from Table 8 in OAR 734-051 will apply, with the difference being that this area is entirely within the urban growth boundary. Therefore, the spacing standard from this table will require a minimum distance of 1 mile between the start of the ramp tapers and the nearest at-grade intersection (nearly reaching Hemlock Avenue). However, in the design of the US 97 Reroute, a right-in/right-out approach at Larch Avenue for southbound traffic has been included within this 1-mile envelope. To accommodate this element into the design, ODOT needs to approve a deviation to the access management spacing standards in Table 8 of OAR 734-051 prior to construction.

Recommendation: Within Zone 6, ODOT needs to approve a deviation to the access management spacing standards in Table 8 of OAR 734-051 for the US 97 right-in/right-out at Larch Avenue prior to construction.

Beyond the area bounded by the IAMP, it should also be acknowledged that ODOT maintains spacing standards for the separation of interchanges as well. For rural areas, these standards require 3 miles of separation between adjacent interchanges. For urban areas, a shorter distance of 1.9 miles is required. Therefore, with the proposed interchange in place, the construction of adjacent interchanges on US 97 would be restricted within an envelope ranging from approximately 11th Street in Terrebonne to the north and Highland Avenue to the south.

By looking at the number of access points per zone, the deficiency analysis (Chapter 3) an be refined to account for the future roadway system. Figure 4.12 displays the locations of existing access points along US 97 and the future crossroads over the new interchange and Table 4.F compares the number of existing access points in each access management zone to the number of access points that would be allowed to remain under the spacing standards applied in the description of each zone.

From Table 4.F, it can be seen that there are a significant number of access points that will require closure if compliance with spacing standards is to be attained. Options to explore for moving in the direction of the applicable access management spacing standards that should be considered during the development of preliminary improvement alternatives should include:

- The construction of new local roads to provide alternate access;
- The establishment of shared access points by creating easements; and
- The purchase of access rights for long-range protection.

Table 4.F: Access Deficiencies by Zone*

Access Management Zone	Existing Number of Access Points	Allowed Number of Access Points
1	7	0
2A	10	0
2B	10	1
3	41	10
4	15	30
5	22	0
6	N/A	0

* Includes existing access points only.

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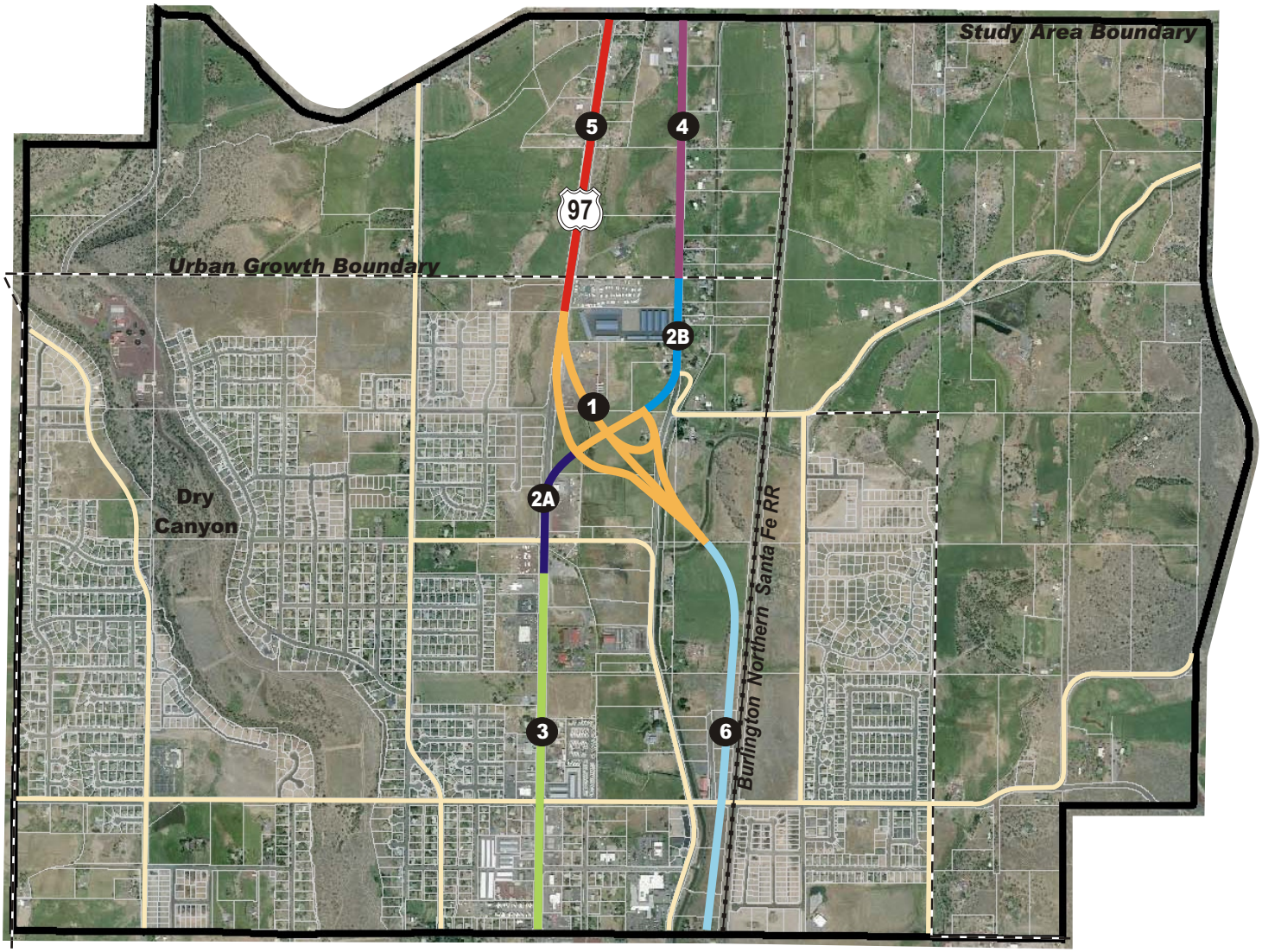
NO SCALE



LEGEND

0 - Access Management Zone

- Future Study Area Arterial & Collector Roadways

Figure 4.11
ACCESS MANAGEMENT ZONES

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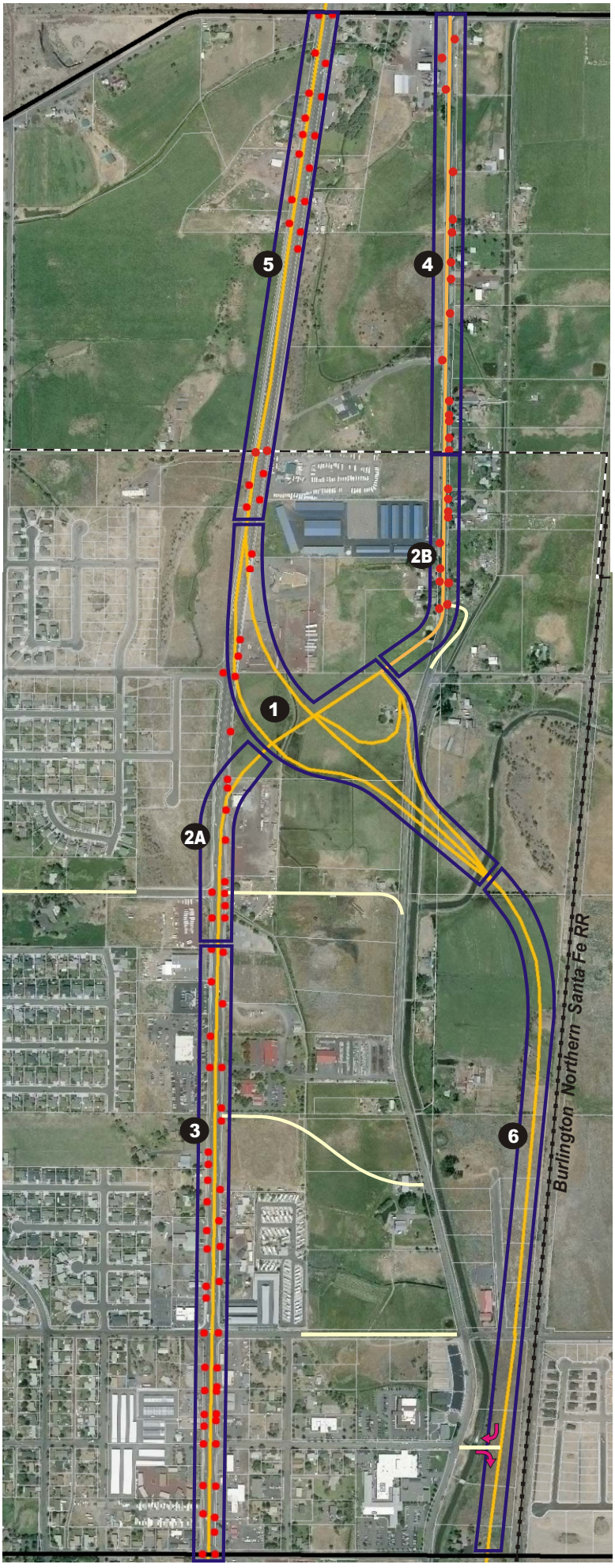
NO SCALE



LEGEND

- Access Point
- Planned Roadways
- US 97 Interchange Mainline and Crossroad
- Future Right-In/Right-Out Approach
- 6 - Access Management Zone

Figure 4.12
EXISTING ACCESS POINTS

Signal Spacing

ODOT's desired traffic signal spacing is ½-mile. While there are no traffic signals in the study area under existing conditions, there are several signals on US 97 planned for in the City of Redmond CIP that could be constructed in the future. These include signals at the intersections with Quince Avenue, a new public street to be constructed with the Wal-Mart development, Maple Avenue, and Kingwood Avenue. In addition, while it is currently unknown whether signals will be constructed at the interchange ramp terminals, it should be assumed that at some point in the future they will be needed there so as not to preclude their ability to function properly by locating another signal in close proximity.

On the City street system, another traffic signal is planned for in the City CIP at the intersection on Maple Avenue with 19th Street. In addition, while not currently planned for, the operations analysis of future conditions found that a traffic signal may be needed at the intersection on Maple Avenue at 9th Street as well.

It should be noted that signals spaced at least ½-mile (2,640 feet) apart generally do not impact each other and can operate without need for coordination. When closer than ½-mile, coordination of adjacent signals is typically recommended, especially on the state system, but the ability of the signals to operate well together is usually very good if spacing of at least ¼-mile (1,320 feet) is maintained. Under ¼-mile, coordination of adjacent signals is strongly recommended, with the ability of these signals to function without impacting each other degrading as spacing decreases.

Figure 4.13 illustrates the study area and identifies the locations of these potential future signals. As shown, with the exception of the signals at the interchange ramp terminals, the signals on US 97 would maintain spacing of at least 1,000 feet, with most signals being close to ¼-mile apart. On Maple Avenue, the signal at 9th Street would be approximately 1,000 feet from the signal on US 97. Therefore, the future signals on US 97 will all require coordination and the signal on Maple Avenue at 9th Street should be coordinated with the signal on Maple Avenue at US 97. Given the resulting signal spacing on US 97 from these planned signals, it is recommended that no additional signals be constructed south of the interchange on US 97 in the IAMP area.

Recommendation: Within the study area, with the exception of US 97 at the interchange ramp terminals, Quince Avenue, the proposed street to be constructed by Wal-Mart, Maple Avenue, and Kingwood Avenue, no additional signals should be approved on US 97 south of the interchange.

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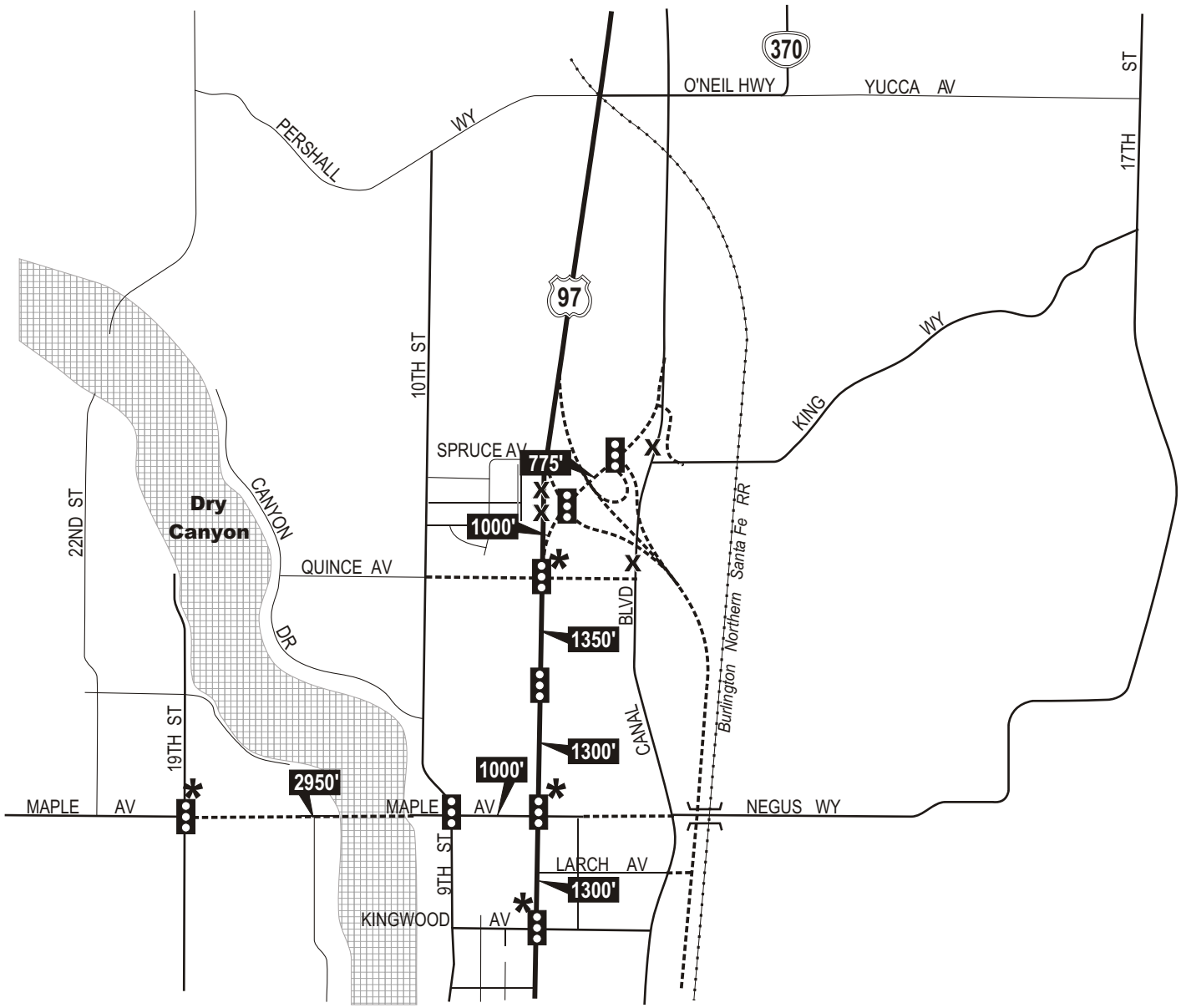
NO SCALE



LEGEND

- Potential Location of Future Traffic Signal
- 0000' - Distance Between Potential Location of Traffic Signal
- * - Planned in City CIP
- ----- - Planned Roadways
- x - Remove Roadway

Figure 4.13
POTENTIAL LOCATIONS OF FUTURE TRAFFIC SIGNALS IN THE IAMP AREA

Local Connectivity

When planning for future streets to enhance local connectivity in the IAMP area, consideration should be given to the following deficiencies.

- **Improving East-West Connectivity**: Within the IAMP study area, there are several north-south routes of significant length, but very few east-west routes due to a limited number of crossings at US 97, the canal, the railroad, and Dry Canyon (see Figure 3.3). This could result in increased demand at the available crossings, putting pressure on areas like Maple Avenue, O'Neil Highway/Pershall Way, and specifically at the intersections on US 97 at Maple Avenue, Quince Avenue, the northbound and southbound interchange ramp terminals, and O'Neil Highway/Pershall Way.
- **Providing Access to Lands Surrounding the US 97 Interchange**: The land surrounding the proposed interchange is predominantly vacant or underdeveloped (see Figure 3.1 and Figure 4.11). It should be anticipated that these lands would develop at urban densities with types of developments consistent with the commercial zoning. To ensure adequate access can be provided to these developments while maintaining the desired access management spacing standards on US 97 and the interchange crossroad, a local street plan should be adopted that will provide access to lands surrounding the interchange with connections to the interchange crossroad (US 97 and Canal Boulevard) located 1,320 feet from the interchange ramp terminals. This would result in all access provided through a future signal at Quince Avenue to the south and a new public street intersection on Canal Boulevard near the current urban growth boundary to the north. This plan should also include a new alignment of King Way to the north to improve the substandard spacing currently planned.
- **Reducing Access Points to US 97 to the North of the Interchange**: Much of the land to the north of the proposed interchange is currently outside of the urban growth boundary, with no public street intersections on US 97 prior to the intersection at O'Neil Highway/Pershall Way (see Figure 4.11). While some properties abutting US 97 can be accessed via 10th Street, Pershall Way, O'Neil Highway, or Canal Boulevard, there are several that can be accessed only from US 97. In recognition of the access management spacing standards and proximity to the new interchange that would prohibit direct access to US 97 in this area, a system of frontage roads or other local streets should be planned for to serve this area without creating access points to US 97 between the interchange and the intersection at Pershall Way/O'Neil Highway.

Freight Mobility

As noted in Chapter 3, the current land use zoning in the IAMP area includes commercial zoning down the middle surrounding US 97 and Canal Boulevard, with residential zoning of various densities to the east and west. While only a small amount of industrial land is located within the IAMP area, there is a significant amount to the southeast, including much of the lands within the City to the east of the railroad tracks.

There is a significant amount of truck traffic on US 97 moving freight through and within the City. While the US 97 Reroute should remove the through truck trips from the local system, other trips associated with origins or destinations within the City will remain. Considering the zoning surrounding this area, most local truck trips are anticipated to be traveling to and from the commercial and industrial developments along the highway and to the east of the US 97 Reroute. Therefore, the routes most heavily relied upon for freight movement in the IAMP area would include US 97, Canal Boulevard, Negus Way, NE 9th Street, and Quince Avenue within the commercially zoned area.

Of these routes, US 97 and NE 9th Street are currently constructed to accommodate truck traffic. The future projects to construct the US 97/US 97 Reroute interchange, the extensions of Quince Avenue and Negus Way, and the reconstruction of Canal Boulevard will need to consider freight movement requirements during the design process and should comply with the Highway Design Manual[7] for State facilities and the City of Redmond Standards and Specifications[8] for City streets. In addition, the design of future local streets planned to serve lands surrounding US 97 and the new interchange for the purpose of consolidating access (see "Local Connectivity" discussion above) should accommodate freight needs and should also be designed in accordance with the City's standards and specifications.

Bicycle and Pedestrian Facilities

While some bicycle and pedestrian facilities exist on the IAMP area streets, most of the arterial and collector routes studied maintain only partial improvements with many gaps needing to be filled (see Figure 4.14). The City of Redmond Transportation CIP contains several projects including bike lane construction, sidewalk construction, and complete street modernization/reconstruction that when completed will provide continuous bicycle and pedestrian facilities throughout most of the area's arterials and collectors, with some small gaps remaining to be filled by land development. The approximate locations of these planned projects are illustrated in Figure 4.14.

Multi-modal Constraints

The major modes of transportation existing within the IAMP area include motor vehicles (passenger cars and trucks), freight trains, bicycles, and pedestrians. With the construction of planned improvements listed in the City's Transportation CIP, the area street network will provide for adequate facilities for motor vehicle, bicycle, and pedestrian travel. As noted previously, the ability to facilitate these modes in the east-west direction is somewhat limited by the presence of Dry Canyon, US 97, the canal, and the Burlington Northern Santa Fe (BNSF) railway. These features may also have a significant impact on the development of future local street networks and frontage roads.

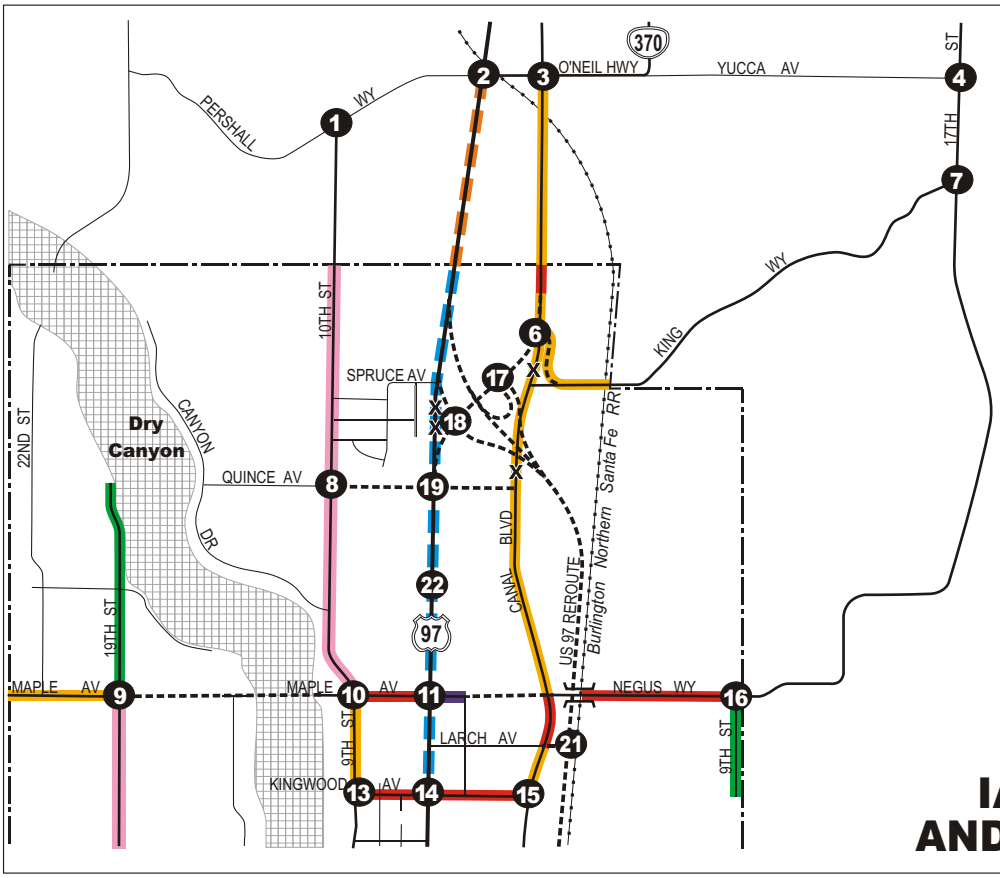
Potential Mode Conflicts

With the completion of the planned improvement projects in the City's Transportation CIP, most of the arterial and collector streets within the IAMP area will maintain separate bicycle lanes and sidewalks to minimize motor vehicle, bicycle, and pedestrian conflicts.
No new conflicts are anticipated to occur between rail movement along the BNSF railway and other transportation modes following the US 97 Reroute and interchange construction, as no new at-grade crossings are proposed and one existing at-grade crossing will be replaced by a grade-separated crossing. As future local streets are planned to enhance connectivity, the creation of additional at-grade crossings should be avoided.

Potential Right of Way Constraints

While much vacant or underdeveloped land remains in the IAMP area, there are a number of potential constraints to the purchase of additional right of way for future roadway alignments. In addition to existing developments, other features impacting potential roadway alignments include Dry Creek, the BNSF railway, the canal, lands zoned for park use, and lands zoned for exclusive farm use outside of the urban growth boundary.

[7] *Highway Design Manual*, Oregon Department of Transportation, 2003
[8] *Standards and Specifications*, City of Redmond Public Works Department, April 2003.



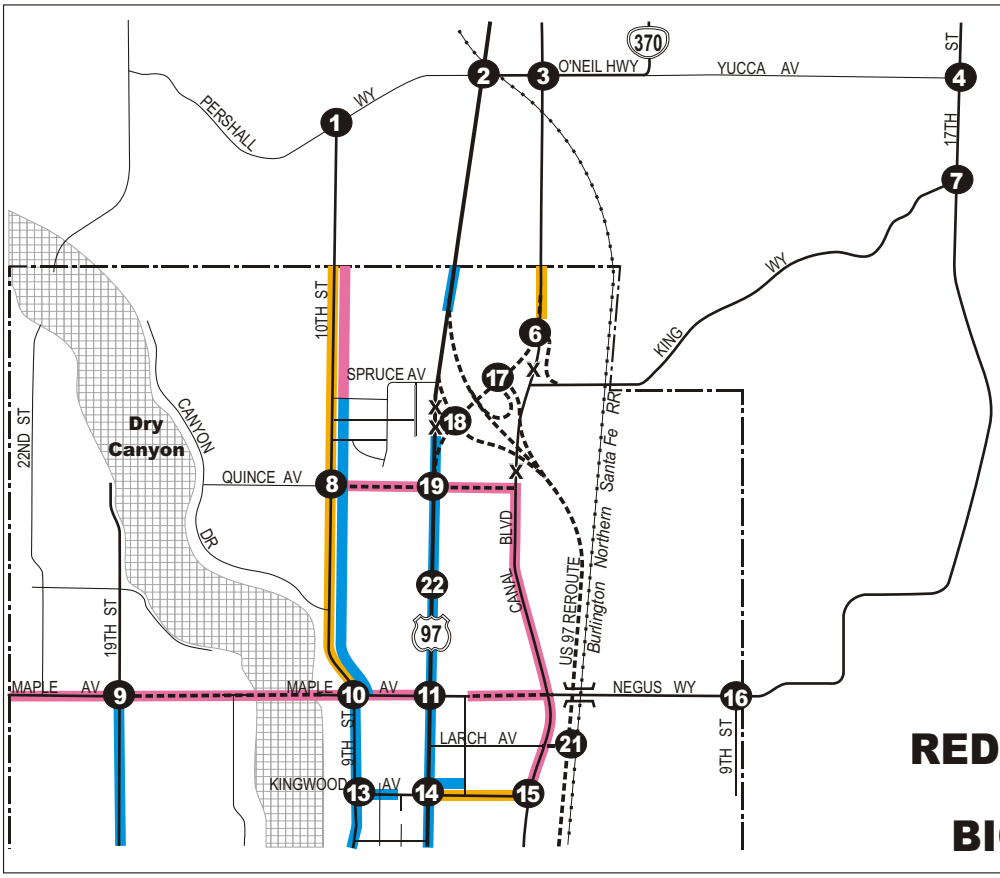
NO SCALE

LEGEND

- Sidewalk & Bike Lane
- Sidewalk, No Bike Lane
- Partial Sidewalk, Full Bike Lane
- Partial Sidewalk & Partial Bike Lane
- Partial Sidewalk, No Bike Lane
- No Sidewalk, Full Bike Lane
- No Sidewalk, No Bike Lane

0 - Study Intersection Number
X - Remove Roadway
- Planned Roadways
- Urban Growth Boundary

EXISTING IAMP AREA SIDEWALK AND BICYCLE FACILITIES



NO SCALE

LEGEND

- Modernization Project
- Bicycle Project
- Sidewalk Project

0 - Study Intersection Number
X - Remove Roadway
- Planned Roadways
- Urban Growth Boundary

REDMOND CIP PROJECTS WITH SIDEWALK OR BICYCLE COMPONENTS

Figure 4.14

CHAPTER 5: INTERCHANGE AREA MANAGEMENT PLAN

A range of facility improvements for providing adequate operation of the proposed interchange and surrounding transportation system were developed and evaluated. This chapter summarizes the facility improvements considered, including cost estimates, and provides prioritization for the implementation of these improvements through recommended short, medium, and long-range actions.

Transportation Facility Improvements

Transportation facility improvements are aimed at improving capacity and safety through measures such as traffic controls, turn lanes, enhanced street connectivity, and system management techniques. The transportation facility improvements considered are described below.

Traffic Controls & Geometric Improvements

In Chapter 4 a future deficiencies analysis identified three study area intersections that were projected to not meet adopted mobility standards. These locations included the intersections on US 97 @ O'Neil Highway, US 97 @ Kingwood Avenue, and Maple Avenue @ 9th Street. Improvements needed to restore operations in accordance with mobility standards at each location are described below.

US 97 @ O'Neil Highway

This intersection was shown to be not meeting performance standards under existing and future conditions with the stop-controlled approaches, operating at level of service F and volume-to-capacity ratios greater than 1.00. While the volumes of traffic attempting to leave the stop-controlled approaches are fairly low, the high volumes of traffic on US 97 do not provide sufficient gaps in traffic to serve them.

The installation of a traffic signal would mitigate operations to be well within the adopted standards, but the volumes of traffic on the stop-controlled approaches appear to be too low to meet the required warrants for such an installation. In addition, given the isolated, rural nature of the surrounding area and the high travel speeds on US 97, the installation of a traffic signal at this intersection may conflict with driver expectations and could create a safety hazard.

Apart from constructing a traffic signal, three other improvement options evaluated included:

- Implementing turn restrictions (Right-in/Right-out);
- Offsetting the intersection approaches; and
- Construction of an overpass.

With a majority of the traffic on the stop-controlled approaches being associated with right turn movements, a potential improvement may be to restrict turns (e.g. right-in and right-out movements only). Converting this intersection to right-in/right-out only would mitigate the failing operations and improve highway safety by eliminating the minor street through and left turn movements, which will experience very high delays in 2025. The existence of the right-in/right-out approaches would still fail to meet the access management spacing standard given the proximity to the new interchange, but would have a lesser degree of conflict with the interchange ramp movements than the existing configuration. However, such an improvement would result in a diversion of approximately 130 vehicles during the peak hour to other routes because several movements would no longer be available at this intersection. It would

also further degrade the east-west connectivity in the Redmond area, which is already limited. Another constraint to the implementation of this improvement option is the existence of developed properties whose only means of access is the highway. To restrict movement at US 97 and O'Neil Way to would make it extremely difficult to reasonably access the property with out the development of a local system of streets that could provide an alternate means of access to the properties.

Another alternative would be to offset the east and west approaches. This type of improvement does not mitigate the left turn movements, but would convert the through movements to right turns, which typically require fewer gaps on the highway and can often operate more safely. To convert through movements to right turns, the west approach must be located to the north of the east approach. In this case, Cinder Butte may make moving Pershall Way to the north infeasible and the proximity to the proposed interchange may make moving O'Neil Highway to the south undesirable. As this alternative would require the construction of new roadways, it would be more expensive to implement than the first alternative that restricts turn movements. It should also be noted that even with this improvement in place, the westbound approach is still expected to operate at a volume-to-capacity ratio of 0.67, which is greater than the maximum volume-to-capacity ratio of 0.60 allowed by the Highway Design Manual.1 Therefore, a design exception would be required before this alternative could be implemented.

Constructing an overpass would enhance east-west connectivity and would move in the direction of meeting ODOT's adopted access management spacing standards. However, this would be the most expensive alternative of the three considered and would only serve some of the smaller movements at this intersection, while cutting off the higher-volume ones. Like the first alternative that restricted turns, this alternative would also result in a diversion of traffic, but to a greater degree, with approximately 325 vehicles during the peak hour seeking new routes.

Considering these three improvement options, and the limitations associated with each, a phased approach to improvements at US 97 and O'Neil Highway was selected. The initial improvement is to restrict turning movements to right-in and right-out as warranted as an interim improvement after local connectivity has been enhanced to provide parallel routes to US 97 (see the Local Connectivity Plan), with the long-range improvement being the construction of an overpass. At the time the US 97 at O'Neil Highway intersection is restricted to right-in and right-out movements only, Canal Boulevard from O'Neil Highway to the new North Redmond interchange is to be evaluated for rerouting the O'Neil Highway to provide better access between US 97 and O'Neil Highway.

As previously noted, approximately 325 vehicles would be required to divert to other routes during the peak hour when the overpass is constructed, as no highway access would be allowed. Under the conservative assumption that all diverting traffic would reroute through the new North Redmond interchange via Canal Boulevard on the east side and 10th Street and Quince Avenue on the west side, the capacity analysis for study area intersections was revisited for the year 2025. It was found that all study intersections would continue to operate within adopted performance standards even with the turning movements removed from the US 97 at O'Neil Highway intersection.

As a note, while the analysis of the O'Neil Highway at Canal Boulevard intersection indicated operations would continue to be adequate in 2025 with traffic diverted in response to the construction of an overpass at US 97, the existing lane configurations and traffic controls may not be ideal to serve the new demand. With no direct access to US 97 from the existing intersection with O'Neil Highway, the dominant traffic movements are anticipated to be associated with the westbound left turns and northbound right turns, as vehicles divert to the new North Redmond interchange. Using typical applications of stop-sign traffic controls, where opposing approaches are required to stop, one of the two high-volume movements would

[1] *Highway Design Manual*, Oregon Department of Transportation, Table 10-1, 2003.

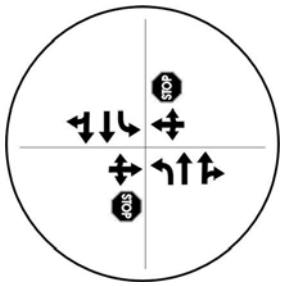
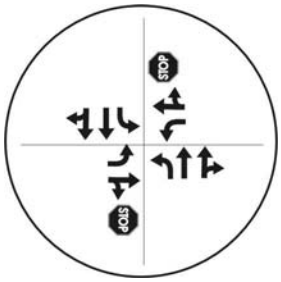
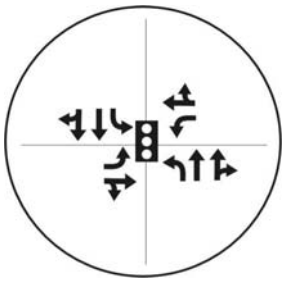
be required to stop with right of way being given to movements maintaining very low volumes. This configuration would not only be an inefficient way to serve traffic, but may conflict with expectations when O'Neil Highway is rerouted over Canal Boulevard to the south.

To improve intersection efficiency, stop-control could be shifted to the north and west approaches only. However, because that configuration is atypical and may be confusing to some motorists, other options for consideration should include roadway realignments to provide continuous, uncontrolled movements along the new O'Neil Highway approaches or the construction of a roundabout.

US 97 @ Kingwood Avenue

Despite decreased traffic volumes on US 97 (6th Street) resulting from the construction of the Reroute and the addition of separate left turn lanes on the east and west approaches, this intersection will not meet the City's preferred performance standard requiring operation of level of service "E" or better. A traffic signal, which has been identified in the City CIP as a future improvement at this intersection, will mitigate the failing minor street left turn movements and restore operations such that City performance standards are met. Because projected minor street volumes are low, the timing of the need for this signal is uncertain and may depend on the actual pattern of development in the area of the intersection. Therefore, the construction of the separate left turn lanes on the Kingwood Avenue approaches is to be implemented in the near term, with signalization being considered as a long-range improvement that would be implemented when warranted. Figure 5.1 provides a comparison of the 2025 no-build and mitigated scenarios.

Figure 5.1: US 97 at Kingwood Ave. Operational Improvements (2025)

No Build	Construction of Turn Lanes	Turn Lanes & Signalization
		
v/c = >1.0	v/c = 0.72	v/c = 0.53
LOS = F	LOS = F	LOS = B

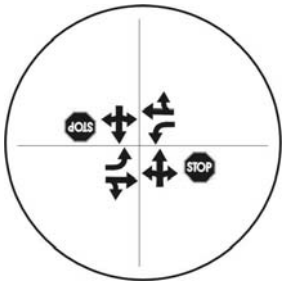
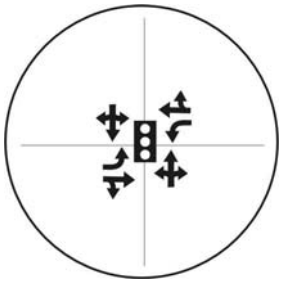
Maple Avenue @ 9th Street

The intersection on Maple Avenue at 9th Street was found to be operating at a level of service F and not meeting the City's performance standard by 2025. The failing future operations are largely due to the increased volumes on Maple Avenue resulting from the street extension from Negus Way to 19th Street.

Because Maple Avenue is classified as a minor arterial, it was assumed that future capacity improvements at this intersection would include the construction of separate left turn lanes on Maple Avenue, which would be consistent with the 3-lane standard cross-section shown in the City of Redmond Standards and

Specifications.2 However, even with this improvement in place, it was found that signalization would still be required to achieve acceptable operation. Because of the horizontal curve to the north on 9th/10th Street, sight distance for the northbound left turn traffic may be limited, requiring protected phasing. Figure 5.2 below, which compares the operations at this intersection in 2025 under the no-build (with CIP improvements in place) and mitigated conditions, shows the above described mitigation will provide operation consistent with the City's adopted performance standard requiring operation at a level of service E or better.

Figure 5.2: Maple Avenue at 9th Street Operational Improvements (2025)

No Build (w/CIP Improvements)		Proposed Mitigation	
			
v/c =	>1.0	v/c =	0.84
LOS =	F	LOS =	C

The City of Redmond CIP includes a project at this intersection for "capacity improvements" with estimated funding at approximately $35,000. New traffic signal installations typically cost around $175,000 (not including interconnect with adjacent signals, if needed), making the currently programmed project under-funded to construct all needed improvements. Therefore, an additional project must be added to the City CIP to construct a traffic signal at this intersection when warranted. The installation of a roundabout was not investigated due to the limited right-of-way available in this area.

Because the future deficiencies analysis found all other study area intersections to operate within adopted mobility standards in the year 2025, assuming planned projects in the City CIP and State STIP were in place, no other capacity improvements were considered.

Traffic Signal Plan

A future traffic signal plan was created to guide the orderly installation of traffic signals in the IAMP area, especially along US 97 (6th Street) and Canal Boulevard north of the proposed interchange, where poor progression of traffic due to inadequate signal spacing could impact long-term safety and operations at the proposed interchange ramp terminals.

Figure 5.3 displays a map of future traffic signal locations within the IAMP area to be used in evaluating potential conflicts with future proposals for traffic signals on the study area streets. This map identifies the locations of all currently planned traffic signals (there are currently no existing traffic signals) in the IAMP area, along with a future signal on US 97 (6th Street) between Maple Avenue and Quince Avenue

[2] *Standards and Specifications*, City of Redmond Public Works Department, April 2003.

that is anticipated to be constructed soon by an adjacent development and the recommended signal at the intersection of Maple Avenue and 9th Street described above.

A new signal on Canal Boulevard near the City of Redmond urban growth boundary has also been identified, as this would be the approximate location of the nearest traffic signal that could be constructed north of the interchange according to the recommended access spacing for this area. This signal would provide needed access to the lands surrounding the east side of the new interchange through future public streets (a future King Way alignment), as shown in the Local Connectivity Plan.

In evaluating future signal proposals, a traffic engineering investigation will need to be conducted to ensure that the proposed signal does not negatively impact the signals illustrated in Figure 5.3. A distance of at least 1,320 feet between new signals is to be required wherever feasible. Furthermore, no additional traffic signals will be constructed along the US 97 (6th Street)/Canal Boulevard corridor between Kingwood Avenue and the proposed King Way extension. In establishing the timing plans for all future signals, priority shall be given to the efficient operation of the interchange ramp terminals and the ability of the interchange crossroads to carry traffic away from the interchange.

Local Connectivity Plan

The future deficiencies analysis in Chapter 4 highlighted three areas where local connectivity was in need of improvement, including:

- Improving east-west connectivity;
- Providing access to lands surrounding the US 97 interchange; and
- Reducing access points to US 97 to the north of the interchange.

In response to these needs, a local connectivity plan was developed that builds on existing and planned streets in the IAMP area. This plan not only improves overall connectivity throughout the northern end of the City, but provides the ability eliminate direct approaches to US 97 and consolidate approaches to Canal Boulevard, while maintaining accessibility to individual properties in the corridor. Figure 5.4 displays the local connectivity plan, with key elements described below.

East-west connectivity will be enhanced through the proposed construction of:

- An overpass at the existing US 97 intersection with O'Neil Highway,
- A new street (Oak Avenue) from the intersection of Canyon Drive at 10th Street to Canal Boulevard. This new street would include a signalized intersection on US 97 (6th Street) between the intersections at Quince Avenue and Maple Avenue.
- A realigned of King Way, to include an overcrossing of the BNSF railroad, approximately ¼ mile north of the interchange
- Additional east-west streets are shown north of the proposed interchange, but no additional crossings of US 97 have been proposed as they would require costly grade separation.

To prevent access directly to the interchange crossroads within the access management spacing standards for interchange areas, new streets have been included to provide alternate access to properties in the immediate vicinity of the interchange. To the south of the interchange, these new streets would enable the first access point to US 97 (6th Street) to be limited to Quince Avenue, which is approximately 1,000 feet from the nearest interchange ramp terminal. To the north, the first access point would be limited to a new public street intersection near the current urban growth boundary (approximately 1,500 feet from the

nearest interchange ramp terminal), with an optional right-in/right-out approach on the west side of Canal Boulevard approximately 800 feet from the nearest interchange ramp terminal.

In recognition of the access management spacing standards for interchanges that would prohibit direct access to US 97 north of the proposed interchange within the IAMP area, a system of new public streets will be provided so that properties adjacent to US 97 can be accessed through City and County roads. While some of these roads may be constructed by land developers over time, it is recommended that the construction of select routes (identified in Figure 5.4 as "high-priority" streets) be prioritized so that they are in place within the next 5 to 10 years, which may require them to be incorporated into a capital improvement program.

All proposed streets shown in Figure 5.4 that are located within the urban growth boundary would be constructed to City of Redmond standards, with streets outside of the urban growth boundary being constructed to Deschutes County standards. Because of the relatively short segment lengths, it is assumed that all proposed streets would either be classified as collectors or local streets. According to the City of Redmond's Typical Minimum Street Cross Section Dimensions3, 5-foot wide sidewalks would be constructed as part of all collectors or local streets, with separate bike lanes only being constructed for major collectors and industrial collectors. Deschutes County's design standards4 do not include sidewalks for any road classifications, but allow for optional 4-foot wide bikeways on rural collectors.

Access Management Plan

A key element of the IAMP related to the long-range preservation of operational efficiency and safety of the proposed interchange is the management of access to the interchange crossroads (US 97/6th Street and Canal Boulevard), as well as to the mainline (US 97 and the Reroute). Because access points introduce a number of potential vehicular conflicts on a roadway and are frequently the causes of slowing or stopping vehicles, they can significantly degrade the flow of traffic and reduce the efficiency of the transportation system. By reducing the overall number of access points and providing greater separation between them, the impacts of these conflicts can be minimized.

Further Public Coordination Recommended
The access management actions in the IAMP are based on current property configurations and ownerships. Should property boundaries change in the future through consolidation or other land use action, the access management plan will be modified through agreement by the City of Redmond, Deschutes County, and ODOT, where such modifications will move in the direction of the adopted access management spacing standards contained in this plan. Additional access points will not be allowed where they would result from future land partitions or subdivisions. The actions listed in this plan shall not prevent the reconstruction of approaches as necessary to meet City, County, or ODOT standard design.

Implementation of the access management plan will occur incrementally over a long period of time because:

- Some affected properties maintain infrastructure (e.g. buildings and internal roadways) that was established based on prior approvals of access locations to the subject roadways, and
- Some elements of the plan depend on the presence of new local public streets that can not be constructed until funds are made available.

[3] *Standards and Specifications*, City of Redmond Public Works Department, April 2003.
[4] *Deschutes County Transportation System Plan*, 1998.

- The access management recommendations in this plan have been prioritized and categorized into short-range, medium-range, and long-range actions based on the constraints associated with their implementation. Short-range actions are to be executed during the construction of the interchange and the medium and long-range actions are to be executed as needed funds become available or as opportunities arise during property development/redevelopment.

To provide a basis for decision-making during the development of the access management plan, an access management strategy was established. The objectives of this plan are listed below.

1. Restrict all access from abutting properties to the interchange and interchange ramps.

2. Meet, or move in the direction of meeting, ODOT's adopted access management spacing standards for access to interchange crossroads.
    a. For US 97 (6th Street) from the southbound interchange ramp terminal to a distance of 1,320 feet to the south, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which would restrict all access for the full distance of 1,320 feet.
    b. For Canal Boulevard from the northbound interchange ramp terminal to a distance of 1,320 feet to the north, the spacing standards from OAR 734-051-0125(2), Table 7 and Figure 3 apply, which would restrict all access for the full distance of 1,320 feet, with a right-in/right-out access allowed on the southbound side of Canal Boulevard no closer than 990 feet from the interchange ramp terminal.

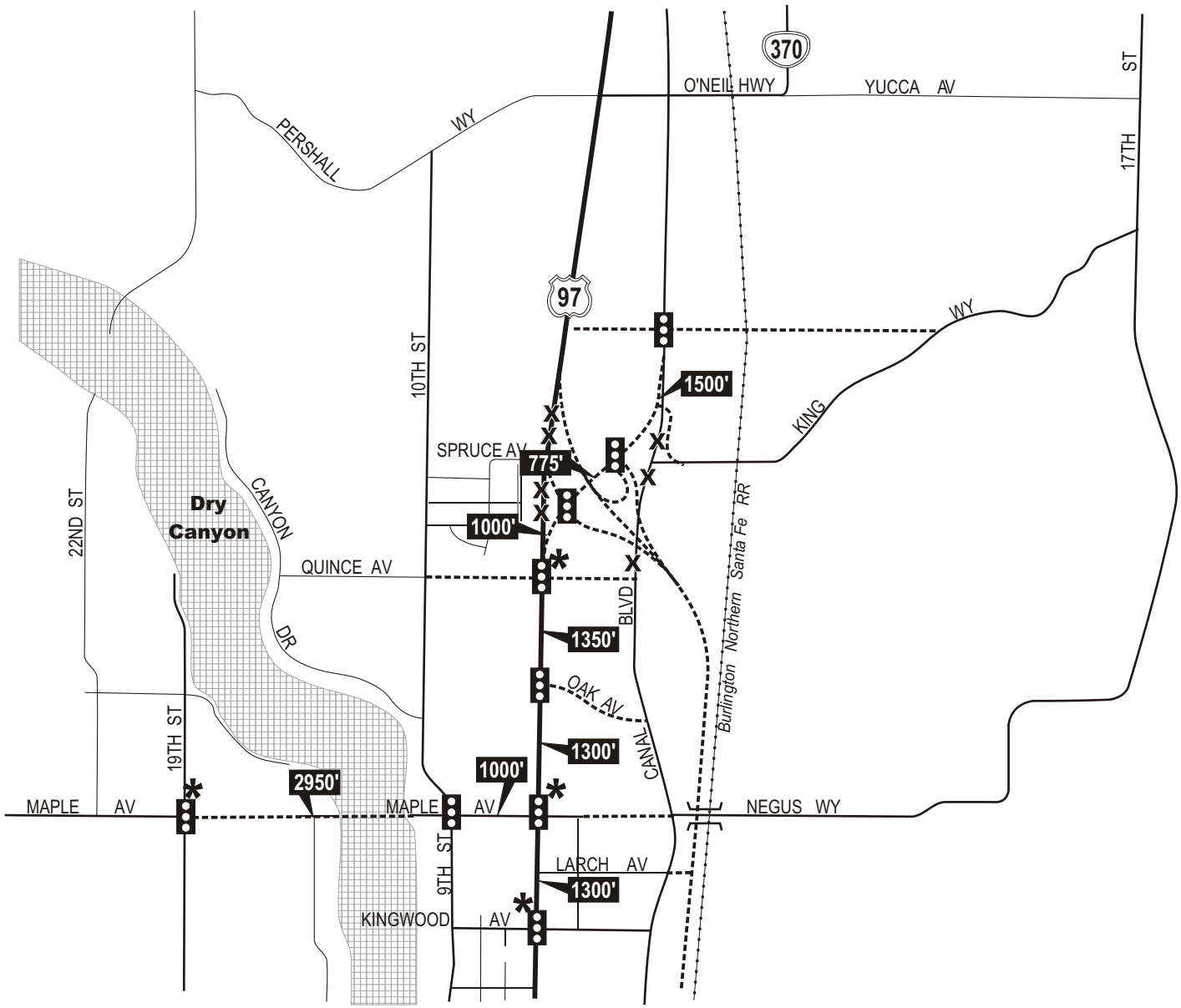
3. Meet, or move in the direction of meeting, the City of Redmond's adopted access management guidelines on US 97 (6th Street) from a point 1,320 feet from the southbound interchange ramp terminal to Kingwood Avenue (southern boundary of IAMP area). This would require access spacing of at least 800 feet between adjacent driveways and/or streets on the same side of the roadway and ½-mile between adjacent intersections.

4. In line with considering routing the O'Neil Highway down Canal Boulevard to the new North Redmond interchange, meet, or move in the direction of meeting ODOT's adopted access management spacing standards for access to District Highways.
    a. For the segment of roadway from a point 1,320 feet north of the northbound interchange ramp terminal to the urban growth boundary, the spacing standards for urban areas from OAR 734-051-0125(2), Table 4 would apply, which would require a minimum separation of 500 feet (assuming a posted speed of 40 or 45 mph) between approaches on the same side of the highway.
    b. For the segment of roadway outside the urban growth boundary, the spacing standards for rural areas from OAR 734-051-0125(2), Table 4 would apply, which would require a minimum separation of 500 feet (assuming a posted speed of 40 or 45 mph) between approaches on the same side of the highway.

5. Meet ODOT's adopted access management spacing standards for interchange mainlines.
    a. For US 97 between the interchange and O'Neil Highway (northern boundary of IAMP area), the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which would restrict all access to US 97.
    b. For the US 97 Reroute between the interchange and Kingwood Avenue (southern boundary of IAMP area), the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which would restrict all access to US 97. An exception to these standards may be allowed for a right-in/right-out approach at Larch Avenue, pending approval of a deviation by ODOT.

DKS Associates
TRANSPORTATION SOLUTIONS

NO SCALE



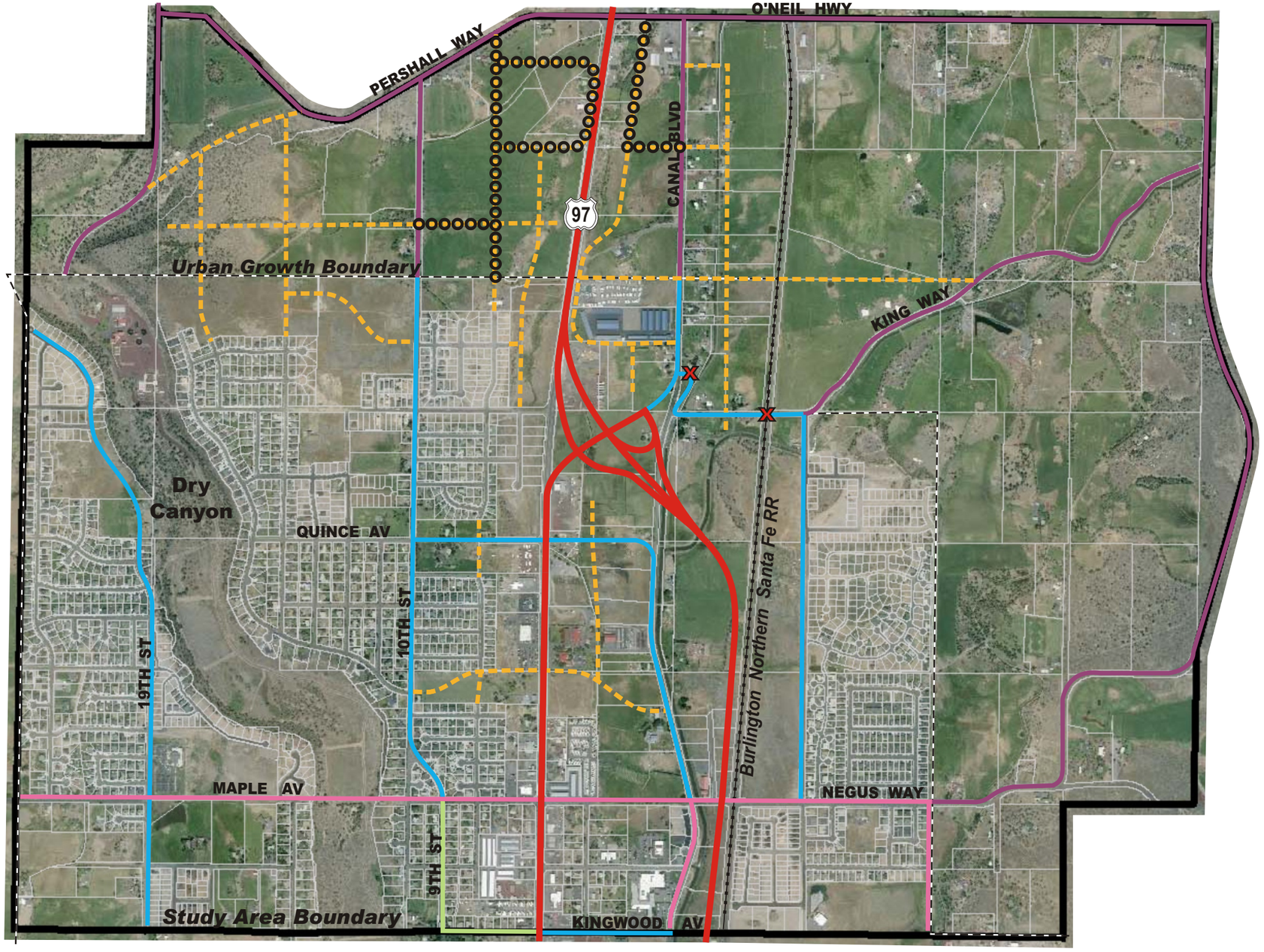
LEGEND

- Potential Location of Future Traffic Signal
- 0000' - Distance Between Traffic Signals
- * - Planned in City CIP
- ----- - Future Roadways
- X - Remove Roadway

Figure 5.3
TRAFFIC SIGNAL PLAN
North Redmond IAMP

DKS *Associates*
TRANSPORTATION SOLUTIONS

NO SCALE



LEGEND

- Major Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Rural Collector
- Proposed Street
- Proposed Street - ***High Priority***
- Close Street

Figure 5.4
LOCAL CONNECTIVITY PLAN
North Redmond IAMP

6. Purchase all abutting property access rights to US 97 (6th Street) and Canal Boulevard within 1,320 feet of the proposed interchange ramp terminals. Where accesses are allowed to remain within this area under the short-range action plan, access rights should be acquired with a temporary allowance to retain access until such time as reasonable alternate access becomes available.

7. In attempting to meet access management spacing standards, exceptions may be allowed to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints.

8. Replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties.

9. Ensure all properties impacted by the project are provided reasonable access to the transportation system.

10. Align approaches on opposite sides of roadways where feasible to reduce turning conflicts.

11. Short-range actions shall accommodate existing development needs, unless property is to be purchased by ODOT.

Using this strategy, an action plan for each approach to the interchange mainline and crossroad was developed, as shown below in Table 5.A. The short-range actions will be implemented during the construction of the interchange. The medium-range actions are to be completed within 5 to 10 years, while the long-range actions are to be implemented over the 20-year planning period as funding becomes available or as opportunities arise through property development. The action plan has also been illustrated in Figure 5.5 to aid in the interpretation of the actions in Table 5.A.
Detailed information regarding approach and property characteristics, as well as existing access rights, has been compiled into inventory lists. These databases will provide needed information to ODOT staff in determining the appropriate procedure for executing the recommended actions in Table 5.1. The inventory lists, included in the appendix, have been separated into an existing approach physical inventory (Appendix 3) and an existing property access rights list (Appendix 4).

Table 5.A: North Redmond Access Actions

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
1	(Kingwood Ave.) No action.	Same as Short Range.	Same as Short Range.
2	No action.	Same as Short Range.	Same as Short Range.
3	No action.	Same as Short Range.	Same as Short Range.
4	No action.	Same as Short Range. Approach to remain in current location, aligned opposite Larch Ave.	Same as Short Range. Approach to remain in current location, aligned opposite Larch Ave.
5	No action.	Same as Short Range.	Same as Short Range.
6	Close approach upon property redevelopment. Future access to be taken from new shared	Same as Short Range.	Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
	approach between tax lots 101 and 200 (see approach 7).		
7	Upon property redevelopment, approach to be relocated on or near property line between tax lots 101 and 200 to create a shared access between these properties. Easements shall be recorded to accommodate shared access. New approach shall align opposite the new combined approach between tax lots 1100 and 1000 (see approaches 72 and 73).	Same as Short Range.	Same as Short Range.
8	Close approach upon property redevelopment. Future access to be taken from Maple Ave. and/or shared approach with tax lot 200.	Same as Short Range.	Same as Short Range.
9	(Maple Ave.) No action.	Same as Short Range.	Same as Short Range.
10	No action.	Same as Short Range.	Same as Short Range.
11	Upon property redevelopment, approach to be relocated to abut northern property line of tax lot 500.	Same as Short Range.	Same as Short Range.
12	Close approach upon property redevelopment. Future access to be taken from approach 13.	Same as Short Range.	Same as Short Range.
13	No action.	Same as Short Range.	Same as Short Range.
14	Close approach upon property redevelopment. Future access to be taken from approach 15.	Same as Short Range.	Same as Short Range.
15	No action.	Same as Short Range.	Same as Short Range.
16	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
17	No action.	Acquire all access rights to US 97, with provision for temporary access to	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
		remain until such time as reasonable alternate access is made available.	easements).
18	No action.	Construct new public street.	Construct new public street.
19	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
20	No action.	Same as Short Range.	Approach to be relocated to abut northern property line of tax lot 600. Joint access to tax lots 600 and 500 shall be provided through easements. Access rights shall be modified to provide for joint access as described.
21	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
22	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
23	No action.	Close access. Alternate access available to Quince Ave.	Close access. Alternate access available to Quince Ave.
24	(Quince Ave.) No action.	Same as Short Range.	Same as Short Range.
25	(Spruce Ave.) Close access.	Same as Short Range.	Same as Short Range.
26	Close access. Alternate access available to Spruce & Teak.	Same as Short Range.	Same as Short Range.
27	Remain as right-in/right-out	Acquire all access	Close approach at such time as

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
	only, following construction of median barrier.	rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
28	Remain as right-in/right-out only, following construction of median barrier.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
29	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
30	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
31	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
32	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
33	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
34	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
35	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
36	(Pershall Way) No action.	Restrict turning movements to allow only right-ins and right-outs.	Close access and construct overpass of US 97.
37	(O'Neil Highway) No action.	Restrict turning movements to allow only right-ins and right-outs.	Close access and construct overpass of US 97.
38	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
39	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
40	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
41	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
42	No action.	Acquire all access rights to US 97, with provision for	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
		temporary access to remain until such time as reasonable alternate access is made available.	public roads or establishment of easements).
43	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
44	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
45	Close access. Alternate access available to Canal Blvd.	Same as Short Range.	Same as Short Range.
46	Close access. Alternate access available to Canal Blvd.	Same as Short Range.	Same as Short Range.
47	Close access. Alternate access available to Canal Blvd.	Same as Short Range.	Same as Short Range.
48	Close access. Alternate access available to Canal Blvd.	Same as Short Range.	Same as Short Range.
49	Close access. Retain all access rights to remainder property.	Same as Short Range.	Same as Short Range.
50	Close access. Retain all access rights to remainder property.	Same as Short Range.	Same as Short Range.
51	Close access. Retain all access rights to remainder property.	Same as Short Range.	Same as Short Range.
52	Close access. Retain all access rights to remainder property.	Same as Short Range.	Same as Short Range.
53	Close access. Retain all access rights to remainder property.	Same as Short Range.	Same as Short Range.
54	Close access. Alternate access available via other approaches.	Same as Short Range.	Same as Short Range.
55	Close access. Alternate access available via other approaches.	Same as Short Range.	Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
56	Close access. Alternate access available via other approaches.	Same as Short Range.	Same as Short Range.
57	Close access and relocate near southern property line.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
58	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
59	No action.	Construct new public street (Quince Ave. extension).	Construct new public street (Quince Ave. extension).
60	No action.	Close access upon construction of new public street (approach 59).	Close access upon construction of new public street (approach 59).
61	No action.	Close access. Alternate access available via other approaches.	Close access. Alternate access available via other approaches.
62	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
63	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
64	No action.	Approach to be relocated approximately 75 feet to the south to align with an opposing	Approach to be relocated approximately 75 feet to the south to align with an opposing approach on the west side of US 97 (6th Street), constructed on tax lot 600 and abutting

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
		approach on the west side of US 97 (6th Street), constructed on tax lot 600 and abutting the northern property line (see approach #19). Approach shall provide joint access to tax lots 600 & 1000, with easements provided accordingly.	the northern property line (see approach #19). Approach shall provide joint access to tax lots 600 & 1000, with easements provided accordingly.
65	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
66	No action.	Acquire all access rights to US 97, with provision for temporary access to remain until such time as reasonable alternate access is made available.	Close approach at such time as reasonable alternate access becomes available (e.g. through construction of public roads or establishment of easements).
67	No action.	Construct new public street.	Construct new public street.
68	No action.	Close access upon construction of new public street (approach 67).	Close access upon construction of new public street (approach 67).
69	Access to be restricted to right-in/right-out when property redevelops.	Same as Short Range.	Same as Short Range.
70	No action.	Same as Short Range.	Access to be closed when approach 66 is converted to right-in/right-out.
71	Close approach upon property redevelopment. Access to be taken from internal streets to the east.	Same as Short Range.	Same as Short Range.
72	Close approach upon property redevelopment. Access to be taken from internal streets to the east.		Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
73	(Maple Ave.) No action.	Same as Short Range.	Same as Short Range.
74	Close approach upon property redevelopment. Future access to be taken from Maple Ave.	Same as Short Range.	Same as Short Range.
75	Upon property redevelopment, approach to be relocated on or near property line between tax lots 1100 and 1000 and combined with approach 73 to create a shared access between these properties. Easements shall be recorded to accommodate shared access. New approach shall align opposite the new combined approach between tax lots 101 and 200 (see approach 7). Future access to be taken from Maple Ave. and the shared access between tax lots 1100 and 1000.	Same as Short Range.	Same as Short Range.
76	Upon property redevelopment, approach to be relocated on or near property line between tax lots 1100 and 1000 and combined with approach 72 to create a shared access between these properties. Easements shall be recorded to accommodate shared access. New approach shall align opposite the new combined approach between tax lots 101 and 200 (see approach 7).	Same as Short Range.	Same as Short Range.
77	Close approach upon property redevelopment. Future access to be taken from new shared approach between tax lots 1100 and 1000 (see approaches 72 and 73).	Same as Short Range.	Same as Short Range.
78	Close approach upon property redevelopment. Future access to be taken from Larch Ave.	Same as Short Range.	Same as Short Range.
79	(Larch Ave.) No action.	Same as Short Range.	Same as Short Range.
80	Upon redevelopment, reconstruct approach to align	Same as Short Range.	Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
	opposite approach 3 to tax lot 400.		
81	Close approach upon redevelopment. Future access to be taken from approach 77.	Same as Short Range.	Same as Short Range.
82	Close approach upon property redevelopment. Future access to be taken from Kingwood Ave.	Same as Short Range.	Same as Short Range.
83	(Kingwood Ave.) No action.	Same as Short Range.	Same as Short Range.
84	Close access and restrict all access rights along Canal Blvd./US 97.	Prohibit direct access to tax lot 700 from Canal Blvd./US 97. Future access to be provided by new local streets.	Prohibit direct access to tax lot 700 from Canal Blvd./US 97. Future access to be provided by new local streets.
85	Close approach. Access to be provided from approach 86.	Future access to be provided by new public streets providing reasonable alternate access.	Future access to be provided by new public streets providing reasonable alternate access.
86	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
87	No action.	No action.	Close approach upon construction of new public streets providing reasonable alternate access.
88	No action.	Construct new public street.	Construct new public street.
89	Approach may remain upon property redevelopment. New approach may be relocated along property frontage, with minimum approach spacing of 500 feet provided between adjacent approaches.	Same as Short Range.	Same as Short Range.
90	No action.	Construct new public street.	Construct new public street.
91	Approach may remain upon property redevelopment. New approach shall be relocated along property frontage, aligned opposite the future public street approach (see approach 96).	Same as Short Range.	Same as Short Range.
92	Close approach upon property	Same as Short Range.	Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
	redevelopment.		
93	(O'Neil Highway) No action.	Same as Short Range.	Same as Short Range.
94	(O'Neil Highway) No action.	Same as Short Range.	Same as Short Range.
95	Close approach upon property redevelopment. Future access to be provided by new public streets providing reasonable alternate access(see approach 96).	Same as Short Range.	Same as Short Range.
96	No action.	Construct new public street.	Construct new public street.
97	Approach may remain upon property redevelopment. New approach may be relocated along property frontage, with minimum approach spacing of 500 feet provided between adjacent approaches.	Same as Short Range.	Same as Short Range.
98	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
99	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
100	No action.	Construct new public street.	Construct new public street.
101	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
102	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
103	Approach may remain upon property redevelopment. New approach may be relocated along property frontage, with minimum approach spacing of 500 feet provided between adjacent approaches.	Same as Short Range.	Same as Short Range.
104	Approach may remain upon property redevelopment. New approach may be relocated along property frontage, with minimum approach spacing of 500 feet provided between adjacent approaches.	Same as Short Range.	Same as Short Range.

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
105	Close approach upon property redevelopment. Future access to be taken from approach 106 or new public streets providing reasonable alternate access.	Same as Short Range.	Same as Short Range.
106	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
107	Close approach upon property redevelopment. Future access to be taken from approach 109 or new public streets providing reasonable alternate access.	Same as Short Range.	Same as Short Range.
108	No action.	Construct new public street (King Way realignment).	Construct new public street (King Way realignment).
109	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
110	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
111	No action.	Same as Short Range.	Close approach upon construction of new public streets providing reasonable alternate access.
112	No action.	Close approach. Access to be provided from approach 111 or new public streets providing reasonable alternate access.	Close approach. Access to be provided from approach 111 or new public streets providing reasonable alternate access.
113	No action.	Close approach upon construction of new public streets providing reasonable alternate access.	Close approach upon construction of new public streets providing reasonable alternate access.
114	No action.	Close approach upon construction of new public streets providing reasonable alternate access.	Close approach upon construction of new public streets providing reasonable alternate access.
115	Close approach. Access to be provided from approach 114.	Same as Short Range.	Same as Short Range.
116	(King Way realignment)	Close approach. King	Close approach. King Way to be

Approach #	Short-Range Action	Medium-Range Action	Long-Range Action
	Construct new public street.	Way to be realigned to a location approximately 950 feet to the north (approach 108).	realigned to a location approximately 950 feet to the north (approach 108).

Notes: Refer to Figure 5.5a through 5.5c for location of state highway approaches cited in the above table.

Land Use Alternatives

Land use alternatives focus on controlling potential traffic demand for transportation facilities through the implementation of management techniques such as modification of zoning ordinances or requiring transportation demand management plans. Alternatives considered are described below.

Potential Development Density & Trip Generation

The analysis of future traffic conditions in the IAMP area was based on forecasts provided by the Redmond Area travel demand model developed by the Oregon Department of Transportation. In recognition of the buildable lands inventory that was included in the recently completed City of Redmond Urbanization Study5, the intensity of development assumed for the IAMP area in the Redmond Area travel demand model was compared to the projected development capacity from the buildable lands inventory to determine the reasonable maximum amount of trip generation resulting from future development. The buildable lands inventory concluded that sufficient land was available to support an additional 1,133 employees over what was assumed in the travel demand model in the area roughly bounded by Maple Avenue, NW 10th Street, Spruce Avenue, and NE 9th Street. Using a regression analysis on the travel demand model, inbound and outbound trip rates per employee were calculated, with the results shown below in Table 5.B.

Table 5.B: Estimated Trip Rates per Employee from the Redmond Area Travel Demand Model

Employment Type	Inbound Trip Rate	Outbound Trip Rate
Retail	0.98	1.66
Other	0.11	0.24

Assuming that all lands between NW 10th Street and the Burlington Northern Santa Fe railroad would produce predominantly retail employees and that all lands east of the railroad would produce predominantly other types of employees, the additional trips that would be generated would be approximately 2,060. These trips were added to the transportation system in the IAMP area according to the locations of the associated transportation analysis zones affected and the projected distribution of traffic in the future.

[5] *City of Redmond Urbanization Study*, ECONorthwest and Angelo Eaton & Associates, Inc., June 2005.

LEGEND

00 - Approach Number

X - Close Approach

▲ - Construct Approach

Ⓡ - Restricted Turn Movements

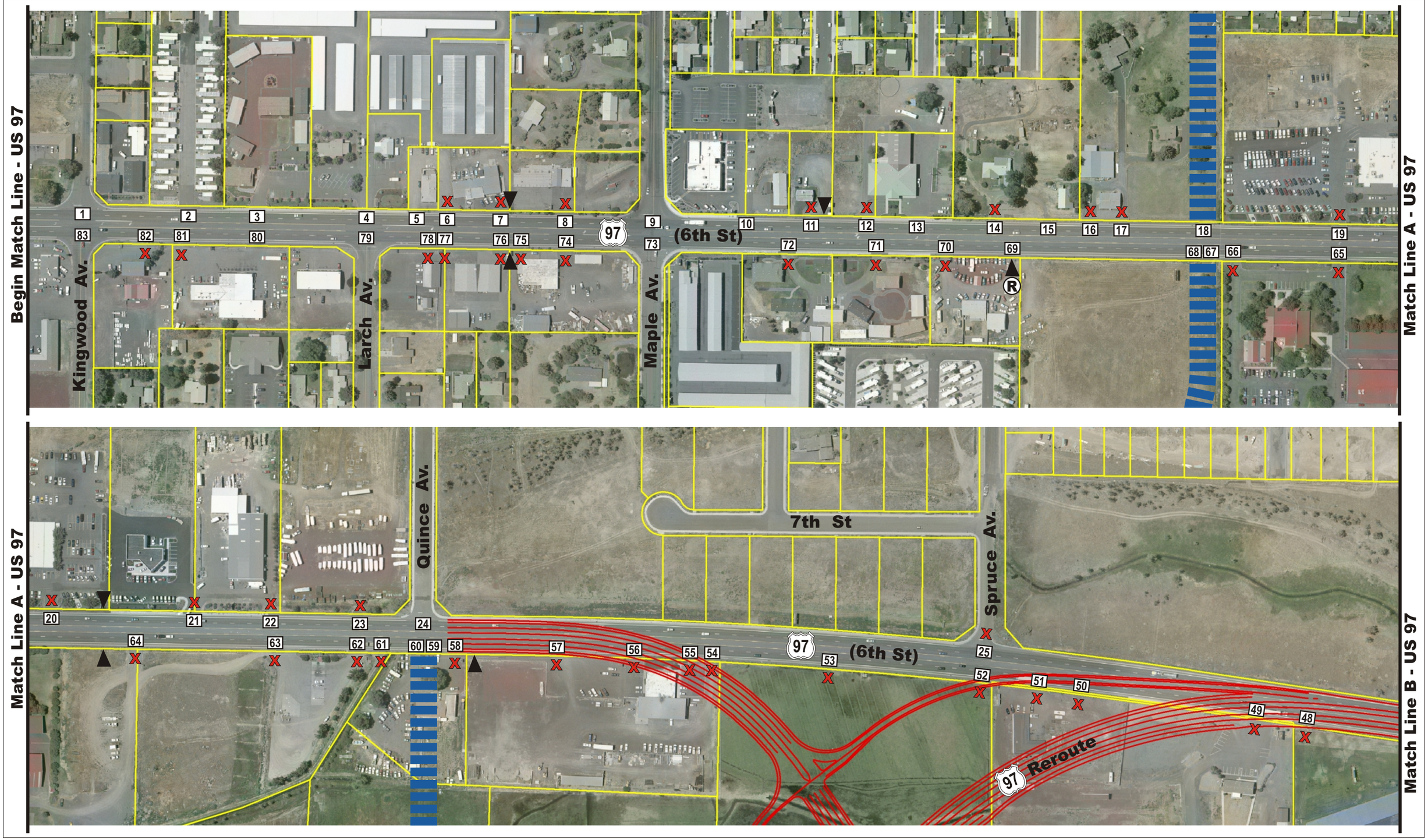
- New Public Street (See Figure 5.4 Local Connectivity Plan)

Note: For detailed information regarding individual approach treatment, see Table 5.1.

DKS Associates
TRANSPORTATION SOLUTIONS

SCALE 0 50 100 200 FEET

Figure 5.5b
LONG-RANGE ACTION PLAN
North Redmond IAMP Access Management Plan



LEGEND

00 - Approach Number

X - Close Approach

▲ - Construct Approach

Ⓡ - Restricted Turn Movements

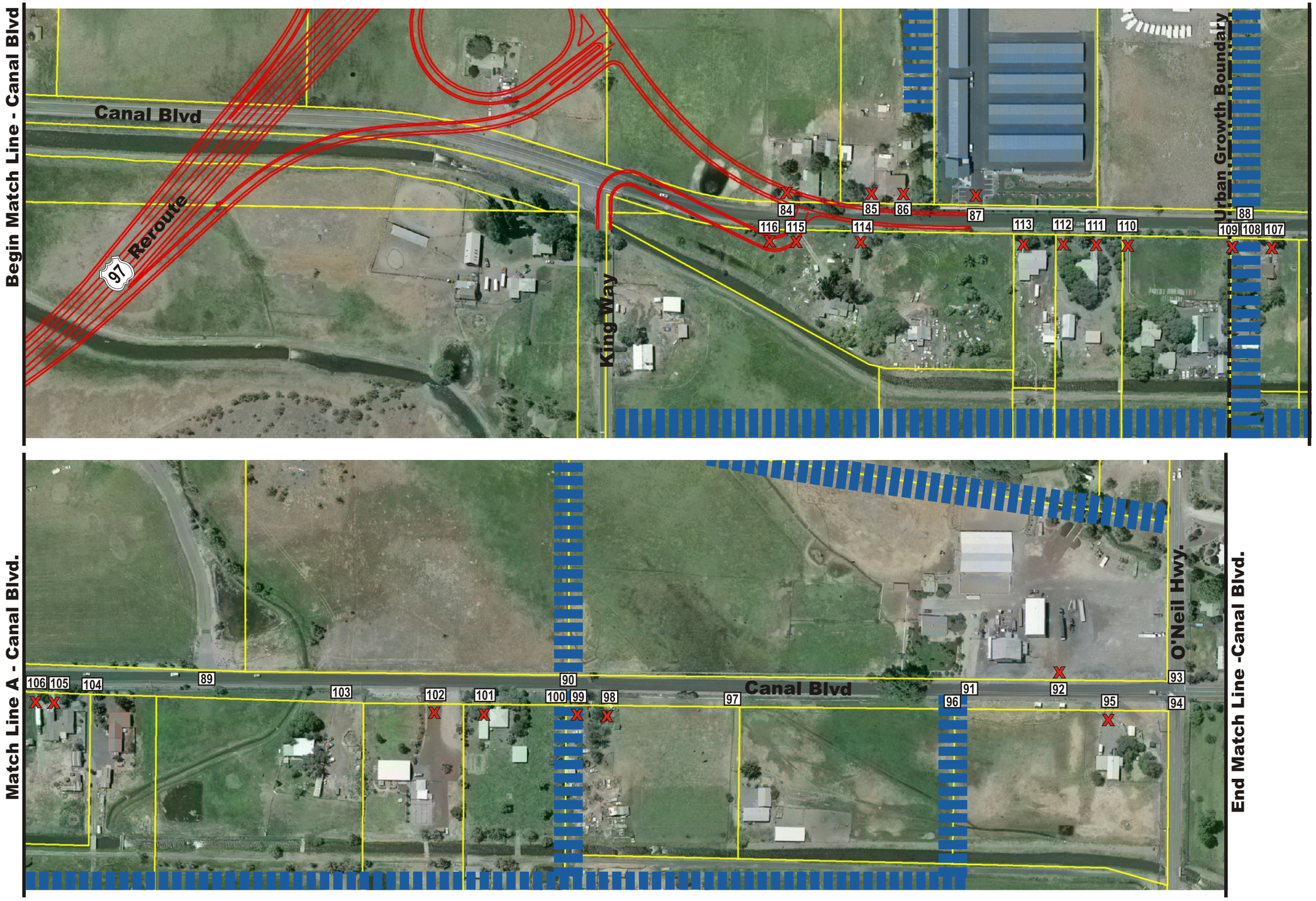
- New Public Street (See Figure 5.4 Local Connectivity Plan)

Note: For detailed information regarding individual approach treatment, see Table 5.1.

DKS Associates
TRANSPORTATION SOLUTIONS

SCALE 0 50 100 200 FEET

Figure 5.5a
LONG-RANGE ACTION PLAN
North Redmond IAMP Access Management Plan



LEGEND

00 - Approach Number

X - Close Approach

▲ - Construct Approach

Ⓡ - Restricted Turn Movements

- New Public Street (See Figure 5.4 Local Connectivity Plan)

Note: For detailed information regarding individual approach treatment, see Table 5.1.

DKS Associates
TRANSPORTATION SOLUTIONS

SCALE 0 50 100 200 FEET

Figure 5.5c
LONG-RANGE ACTION PLAN
North Redmond IAMP Access Management Plan

The capacity analysis of study area intersections was repeated under these new conditions to assess the impact of the higher trip generation potential, with the results shown in Table 5.3. It should be noted that the mitigation previously described for the intersections on US 97 at O'Neil Highway, US 97 at Kingwood Avenue, and Maple Ave at 9th Street that was needed under the original trip generation assumptions, was assumed to be in place under this scenario as well. At the intersection on US 97 at O'Neil Highway, the mitigation assumed included the long-range improvement to construct an overpass. In addition, the planned signal at the US 97/Quince Avenue intersection was found to be required under this scenario.

As shown in Table 5.C, all study intersections are able to accommodate the increased trip potential while operating within adopted performance standards, with the exception of the intersection on the US 97 Reroute at Larch Avenue (projected to fail by the year 2020). As this intersection is already planned to be limited to right-in/right-out movements only, there is little that can be done to mitigate operations. The recommended improvement would be to construct an acceleration lane in the southbound direction on the US 97 Reroute to allow a free right turn from Larch Avenue that would merge into mainline traffic. This movement was analyzed using the Highway Capacity Software6 for freeway merges and was found to operate well with a volume-to-capacity ratio of 0.42 and a level of service B. ODOT has developed criteria for the installation of acceleration lanes. A key component is access spacing. The installation of an acceleration lane will need to meet the spacing standards in ODOT's technical bulletin. However, it should be recognized that constructing an acceleration lane at this location could impact the ability to construct an interchange on the US 97 Reroute in the area of Evergreen Avenue and Highland Avenue, should it be desired in the future (approximately 6,000 feet of separation between Larch Avenue and Evergreen Avenue). Because of this, this improvement is not recommended. The City and ODOT close Larch if safety and operational problems develop as part of the annual review process outlined in the adopted MOU for the US 97 Redmond Reroute.

Another alternative would be to allow the intersection to operate as projected, under the assumption that the high delays for traffic waiting to enter the reroute from Larch Avenue would result in diversion of traffic to other routes experiencing less delay. To meet ODOT's adopted mobility standard, approximately 200 eastbound right turns would need to divert away from this intersection. By performing a sensitivity test of study intersections on potential diversion routes, it appears adequate capacity would be available to accommodate this traffic. However, even if traffic demand does self-regulate through a partial diversion to other routes, the drivers that continue to access the US 97 Reroute from Larch Avenue may be encouraged to accept smaller gaps in traffic than preferred when experiencing long delays. Because of this, this alternative is not recommended.

[6] *Highway Capacity Software*, McTrans Center, University of Florida, Gainesville, FL, 2003.

Table 5.C: 2025 Design Hour Intersection Operations with Worst Case Trip Generation

	Intersection	Volume-to-Capacity Ratio		Level of Service		Performance Standard Met?
		measured	required	measured	required	
ODOT Facilities – Volume-to-Capacity Ratio Determines Performance Standard						
S	US 97 / NB US 97 Reroute	0.46	0.85	B	E	Yes
S	US 97 / SB US 97 Reroute	0.44	0.85	A	E	Yes
U	US 97 Reroute / Larch Ave	>1.0 (EB)	0.80	F (EB)	E	No
U	O'Neil Hwy / Canal Blvd	0.51 (NB)	0.80	B (NB)	E	Yes
City of Redmond Facilities – Level of Service Determines Performance Standard						
S	US 97 / Quince Ave	0.79	-	D	E	Yes
S	US 97 / Wal-Mart Access	0.71	-	E	E	Yes
S	US 97 / Maple Ave	0.84	-	C	E	Yes
S	US 97 / Kingwood Ave	0.53	-	B	E	Yes
U	Canal Blvd / Kingwood Ave	0.43 (EB)	-	D (EB)	E	Yes
U	Canal Blvd / King Way	0.27 (NB)	-	B (WB)	E	Yes
U	Quince Ave / 10th St	0.56 (WB)	-	C (EB)	E	Yes
S	Maple Ave / 9th St	0.84	-	C	E	Yes
S	Maple Ave / 19th St	0.95	-	E	E	Yes
U	Kingwood Ave / 9th St	0.11 (NB)	-	B (WB)	E	Yes
U	Negus Way / 9th St	0.42 (NB)	-	C (NB)	E	Yes
Deschutes County Facilities – Level of Service Determines Performance Standard						
U	Yucca Ave / 17th St	0.08 (EB)	-	A (EB)	D	Yes
U	17th St / King Way	0.07 (EB)	-	A (EB)	D	Yes
U	Pershall Way /10th St	0.17 (NB)	-	A (NB)	D	Yes

Note: (XX) = critical movement
S = signalized intersection
U = unsignalized intersection

Expansion of the Redmond Urban Growth Boundary – Urban Reserve

The City of Redmond recently extended their Urban Growth Boundary (UGB) to include all properties north of its existing city boundary, west of US 97, to Pershall Way. Redmond also adopted an Urban Reserve Area (URA) that includes all land east of US 97 to O'Neil Way. In expanding its UGB, rather than annex and rezone the area being brought into the UGB for urban use, and having to do the TPR analysis for adequacy of the transportation system, Redmond opted to not annex the area and with the concurrence of Deschutes County had the UGB rezoned to a new Urban Holding Zone – 10 Acre Minimum (UH-10). This action first put a temporary hold on future development within the UGB until it was annexed and rezoned, and it also deferred the TPR analysis to a subsequent date. Redmond also adopted amendments to its development regulations requiring master plans be prepared for properties requesting annexation and rezoning to the City.

Consequently, by the City expanding its UGB without designating the urban zoning for the area and doing the required TPR analysis, a significant amount of land was added to the UGB that could, in the future, be annexed to the city and developed with urban intensity uses. And without a land use plan for

the area, it is impossible to determine the magnitude of this action on the proposed US 97 Redmond Reroute Interchange.

To address this unknown within the context of the IAMP, the City of Redmond is required to amend its development regulations to require master plans prepared for properties adjacent to US 97 show as an element of their plan no direct access to US97 (Appendix 7). In addition, for an area defined as the "Highway Area Plan", or HAP (Appendix 8), adjacent to US97, the City is to prepare an area plan (aka master plan) that will establish a land use plan along US 97 that based on traffic analysis of the plan will not result in the planned land use exceeding the capacity of the interchange during the plan period.

Policies, Rules, & Ordinances

As land develops to urban densities within the interchange area, compliance will be required with the access management and circulation plans developed through the IAMP process. As part of the adoption of the IAMP, a number of amendments will be made to the City of Redmond Comprehensive Plan, Transportation System Plan (TSP) and development codes to reflect the amendments contained in Appendix 7 and actions outlined in the Memorandum of Understanding (MOU) in Appendix 8. In brief, they are as follows:

Comprehensive Plan Chapter 14 (Urbanization) –

- *Master plans to be consistent with the Local Street Connectivity Plan (Figure 5.4),*
- *Property annexed to relinquish all direct access rights to the highway, and*
- *Incorporate access management strategy for US 97 (6th Street) and North Canal Boulevard.*

Transportation System Plan –

- *Identify phased improvement at US 97 and O'Neil Highway to include right-in/right-out and a grade separated overcrossing,*
- *Identify need for signals at US 97 (6th Street) and Kingwood Avenue, and NW Maple and 9th Street,*
- *Access spacing requirements for US 97 (6th Street) and North Canal Boulevard,*
- *Local Street connectivity (Figure 5.6) and access closures (Table 5.A and Figures 5.5a-5.5c), and*
- *Signal Plan for US 97 Business (6th Street) and North Canal Boulevard (Figure 5.3).*

Development Codes –

- *Master plans shall show direct access to local street, not the State highway, be consistent with the Local Street Connectivity Plan, and relinquish all direct access to the highway, and*
- *Adopt access management spacing standards for US 97 (6th Street) and North Canal Boulevard consistent with the Oregon Highway Plan for highways classified as "Statewide" and "District" within an urban area.*

Memorandum of Understanding

In moving the US 97 Reroute into the construction phase, it was determined that the original agreement between ODOT and the City needed to be revised to incorporate changes to the project, and consummate in an MOU their agreement on long-term transportation and land use issues as they relate to the US 97

Reroute. This agreement, No. 23704, has been incorporated into the IAMP by reference and is included as Appendix 8. In general the MOU between ODOT and the City of Redmond:

- *Identifies the US 97 Reroute, Phase 1, as the first phase of a long-term solution for US 97 through Redmond;*
- *Sets forth that US 97 through Redmond will be managed as an Expressway facility from the O'Neil Junction through the Reroute Phase 1, and future phases consistent with the recommendations of the US 97 Redmond Refinement Plan;*
- *Requires the City to adopt the Access Management Plan for the US 97 Reroute and all the recommendations contained in the IAMP including amendments to Redmond's comprehensive Plan, TSP, and development codes as enumerated above.*
- *For an area defined as the "Highway Area Plan", or HAP (Appendix 8), adjacent to US97, the City is to prepare an area plan (A.K.A master plan) that will establish a land use plan along US 97 that based on traffic analysis of the plan will not result in planned land use exceeding the capacity of the interchange during the plan period.*

Cost Estimates

Planning-level cost estimates for all recommended improvement alternatives were calculated to aid in the identification of needed funding. Cost estimates included the fundamental elements of roadway construction projects, such as the roadway structure, bridge structures, curb and sidewalk, earthwork, retaining walls, right of way, pavement removal, and traffic signals. The estimated costs are shown below in Table 5.D, with work sheets showing assumed unit costs for construction elements provided in the appendix. For the purposes of providing these estimates, it was assumed that 40% of the road-miles within the County and City would be classified as collectors, with the remaining 60% classified as local streets. All costs are in 2006 dollars and do not reflect the added cost of inflation. Note that the recommended installation of a traffic signal at the US 97/Kingwood Avenue intersection has not been included as it is already listed in the City's CIP to be constructed when warranted, with an estimated cost of $375,650. When considering needed funding to construct the identified improvements below, it should be recognized that local streets are typically constructed by land owners as development occurs.

Table 5.D: Planning-level cost estimates for recommended improvement alternatives

Alternative	Estimated Cost
US 97/O'Neil Highway	
Restrict turn movements to r-in/r-out	$225,000
Offset intersection approaches	$1.4 million
Construct overpass	$3.2 million
Maple Ave/9th St signalization*	$220,000
Expanded Public Street Network	
City collectors	$9.9 million
City local streets	$13.4 million
County collectors**	$13.4 million
County local streets***	$21.2 million

* Assumes intersection geometry will be improved through projects already planned in the City CIP.
** Includes $5.9 million in "High-Priority" Streets.
*** Includes $3.8 million in "High-Priority" Streets.

Alternative Evaluation and Prioritization

With improvement alternatives identified, an evaluation of their ability to achieve the project goals will be provided, followed by a prioritization of successful alternatives into short, medium, and long-range plans to guide implementation.

Alternative Evaluation

Using the objectives for the North Redmond IAMP outlined in Chapter 2, the alternatives proposed were evaluated to ensure the goals established at the outset of the project would be met. The objectives used included criteria related to public involvement, addressing local issues, provision of transportation improvement alternatives, conformity with statewide plans and policies, and inclusion of policies and implementing measures to preserve the functionality of the interchange. The results of this evaluation have been provided in the Appendix 6.

Prioritization of Improvements

The improvement alternatives recommended as part of the IAMP have been prioritized into short, medium, and long-range actions, as shown in Table 5.E, to provide guidance for future implementation and funding. Short-range actions represent immediate needs and are proposed to be implemented at the time of interchange construction. Medium-range actions represent improvements that are not required immediately, but should be given priority over improvements identified as long-range actions. Assuming all improvements are planned for construction within a 20-year period, medium-range actions should be considered for implementation within 5 to 10 years. Long-range actions typically represent improvements of lower priority or requiring higher levels of funding. These improvements should be planned for construction within 10 to 20 years. The improvements listed in Table 5.E have also been illustrated in a Transportation Improvements Map (Figure 5.6) for the IAMP area.

It should be recognized that this prioritization of projects is not intended to imply that projects of higher priority must be implemented before projects of lower priority. Should opportunities arise, through private land development or other means, to construct specific projects earlier than the estimated time frame provided by this list, those resources should be utilized.

Table 5.E: Transportation Improvement Prioritization

Short-Range Improvements
· Short-range actions from access management plan.
Medium-Range Improvements
· Construct "High-Priority" public streets according to adopted Local Connectivity Plan.
· US 97/O'Neil Highway intersection improvements (right-in/right-out restrictions).
· US 97 (6th St.)/Kingwood Ave.: Construct separate left turn lanes on Kingwood Ave. and install traffic signal.
· Maple Ave./9th St.: Construct separate left turn lanes on Maple Ave. and install traffic signal.
· Medium-range actions from access management plan.
Long-Range Improvements
· Construct remainder of new public streets according to adopted Local Connectivity Plan.
· Long-range actions from access management plan.
· US 97 (6th St.)/Quince Ave.: Construct separate left turn lanes on Quince Ave. and install traffic signal.
· US 97/O'Neil Highway intersection improvements (grade-separated crossing over US 97).
· King Way Realignment (grade-separated crossing over BNSF).

Note: Medium and long-range improvements could be constructed sooner than anticipated as opportunities arise through private property development or other means.

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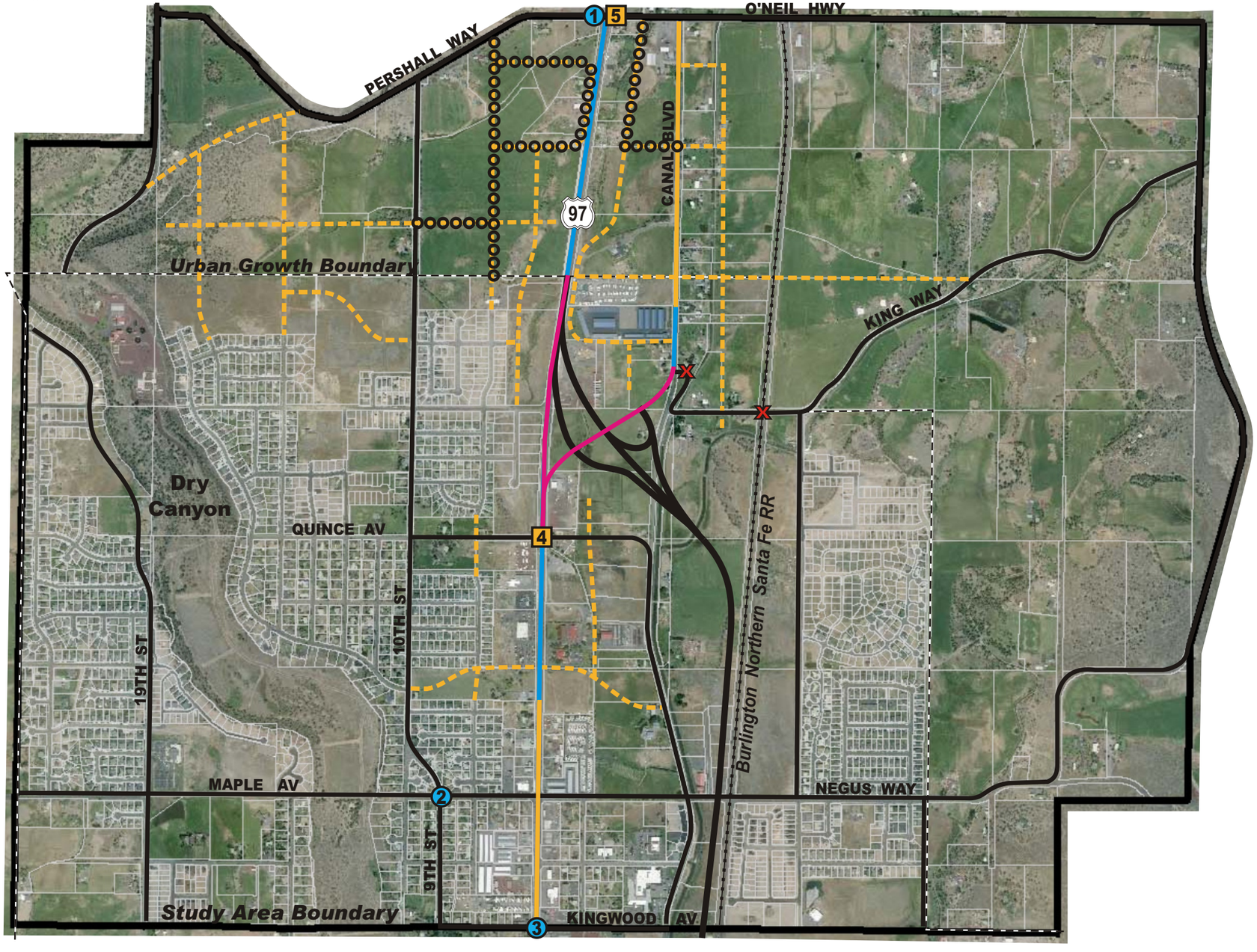
NO SCALE



Improvement Prioritization

Short-Range

- Access Management Short-Range Actions

Medium-Range

- Construct *"High Priority"* Public Streets
- Access Management Medium-Range Actions
- (1) US 97/O'Neil Hwy Improvements (Right-in/Right-out)
- (2) Maple Ave./9th St. Improvements
- (3) US 97 (6th St.)/Kingwood Ave. Improvements

Long-Range

- Construct Public Streets
- Access Management Long-Range Actions
- [4] US 97 (6th St.)/Quince Ave. Improvements
- [5] US 97/O'Neil Hwy Improvements (Overpass)

- Significant Existing & Planned Study Area Streets
- X Close Street

Figure 5.6
TRANSPORTATION IMPROVEMENTS MAP
North Redmond IAMP

Project Participants

Project Advisory Committee

Mark Usselman	Interim ODOT Region 4 Manager
Alan Unger	City of Redmond Mayor
Dennis Luke	Deschutes County Board

Project Management Team

Ray Thwaits	ODOT Region 4 Tech Center Sr. Roadway Designer
Peter Schuytema	ODOT Transportation Planning Analysis Unit (TPAU)
Nick Lelack	Redmond Planning Manager
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Steve Jorgensen	Deschutes County Community Development Dept.
Tom Blust	Deschutes County Road Dept Director
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James Bryant	ODOT Region 4 Program and Planning Manager
David Boyd	ODOT Region 4 Access Management Engineer
Mary Lauzon	ODOT Region 4 Sr. Right-of-Way Agent
Pat Creedican	ODOT District 10 Manager
Bill Hilton	ODOT District 10 Operations Engineer (Alternate)
Joel McCarroll	ODOT Region 4 Traffic Manager
Dan Serpico	ODOT Region 4 Traffic (Alternate)
Don Webber	Deschutes Co. Sheriff Emergency Services
Ron Oliver	Redmond Fire and Rescue
Karen Green	ODOT Freight Mobility Unit

Project Staff

Ed Moore	ODOT Project Manager
Carl Springer	DKS Project Manager
John Bosket	DKS Senior Engineer
Julianne Repman	ODOT Region 4 Communications
Tom Armstrong	Winterbrook Planning

Appendices

1. BACKGROUND PLAN REVIEW
2. MEMORANDUM COMPARING FUTURE GROWTH AND TRAVEL DEMAND ALLOCATIONS
3. US 97 EXISTING APPROACHES PHYS ICAL INVENTORY
4. US 97 EXISTING APPROACH ACCESS RIGHTS
5. PLANNING-LEVEL COST ESTIMATES
6. ALTERNATIVES EVALUATION
7. RECOMMENDED CODE AMENDMENTS FOR CITY OF REDMOND
8. US 97 REDMOND REROUTE MEMORANDUM OF UNDERSTANDING
9. PLA-01
10. SAC NOTICE
11. OTC FINDINGS

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1 BACKGROUND PLAN REVIEW

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Appendix 1: Relevant Planning Documents Policies and Regulations

This document presents the relevant planning documents, policies, and regulations applicable to the North Redmond US 97 Interchange Area Management Plan (IAMP). The information provided was used to guide the establishment of goals, objectives, and evaluation criteria for the IAMP, addressed in Chapter 2 and 3.

State Plans & Regulations

Oregon Transportation Plan (April 1997)

The Oregon Transportation Plan guides the State's transportation facility and mode plans by setting the general direction for transportation development statewide for the next twenty years and providing overall direction for allocation of resources and coordination of modes of transportation. It provides policies to increase livability in the State of Oregon by emphasizing alternative forms of transportation to the single occupant vehicle. The plan seeks to develop public transit, rail lines, bicycling and pedestrian facilities, airports and pipelines, while also emphasizing the maintenance and improvement of highways, roads and bridges. Thus, the plan calls for a transportation system that has a modal balance, is both efficient and accessible, provides connectivity among rural and urban places and between modes, and is environmentally and financially stable.

1999 Oregon Highway Plan

The *1999 Oregon Highway Plan* (OHP) defines policies and investment strategies for Oregon's state highway system for the next 20 years by further refining the goals and policies of the *Oregon Transportation Plan* (OTP). One of the key goals of the OHP is to maintain and improve safe and efficient movement of people and goods, while supporting statewide, regional, and local economic growth and community livability. The implementation of this goal occurs through a number of policies and actions that guide management and investment decisions by defining a classification system for state highways, setting standards for mobility, employing access management techniques, supporting intermodal connections, encouraging public and private partnerships, addressing the relationship between the highway and land development patterns, and recognizing the responsibility to maintain and enhance environmental and scenic resources.

ODOT's management objectives for US 97 through this area vary, as the highway passes through both rural and urban areas, experiences a posted speed change, and maintains an expressway designation north of the urban growth boundary. The management objectives for various segments of US 97 through the study area, as adopted in the OHP, are described below.

Statewide Highways (NHS): Rural Expressways (Existing US 97 MP 118.52 – MP 119.02)

- Provide for safe and efficient high-speed and high-volume traffic movements with the primary objective of connecting larger urban areas, ports, and major recreation areas with minimal interruptions;

- Discourage private access by eliminating approaches as opportunities occur or alternate access becomes available, purchasing access rights, and developing local road networks;
- Control public road connections to provide appropriate spacing and grade separated crossings where needed;
- Discourage traffic signals;
- Prohibit parking; and
- Construct non-traversable medians through modernization projects.

Statewide Highways (NHS): Urban Other (Existing US 97 MP 119.02 – MP 123.60 and New US 97 Reroute Alignment)

- Provide high to moderate speed operations with limited interruptions in traffic flow;
- Direct access to abutting properties is a minor objective;
- Purchase access rights as opportunities arise, with a preference for purchasing rights in full; and
- Provide connections to larger urban areas, ports, and major recreation areas not served by freeways or expressways.

In addition, the new US 97 alignment created by the Reroute is intended to be access controlled and could become an extension of the expressway that currently terminates at the northern Redmond urban growth boundary. If a future expressway designation for this highway section is desired, the following management objectives would apply.

Statewide Highways (NHS): Urban Expressways (New US 97 Reroute alignment)

- Provide for safe and efficient high-speed and high-volume traffic movements with the primary objective of connecting larger urban areas, ports, and major recreation areas with minimal interruptions;
- Discourage private access by eliminating approaches as opportunities occur or alternate access becomes available, purchasing access rights, and developing local road networks;
- Control public road connections to provide appropriate spacing and grade separated crossings where needed;
- Discourage traffic signals. Where traffic signals are allowed, their impact on through traffic must be minimized by ensuring that efficient progression of traffic is achieved;
- Prohibit parking; and
- Consider median treatments in accordance with criteria in Action 3B.3 of the *1999 Oregon Highway Plan* (see discussion of Policy 3B below).

US 97 has also been designated as a Freight Route by ODOT, which places added emphasis on efficient operation to ensure the timely and dependable movement of goods. To support this function, special management objectives for freight routes were developed. Key objectives relating to this IAMP include:

- Application of higher highway mobility standards than other Statewide Highways (see "Performance & Design Standards" section of this memorandum);
- Examine options to treat designated freight routes as expressways where the routes are outside of urban growth boundaries and unincorporated communities and continue to treat freight routes as expressways within urban growth boundaries where existing facilities are limited access or where corridor or transportation system plans indicate limited access; and

- Consider the importance of timeliness in freight movements in developing and implementing plans and projects.

While the construction of non-traversable medians is specifically addressed among the management objectives for some classifications of highways, Policy 3B describes ODOT's overall policies regarding medians. Actions under this policy pertaining to the North Redmond IMAP include:

- Action 3B.2: Design and construct non-traversable medians for all new multi-lane highways constructed on completely new alignment and modernization of all rural, multi-lane Expressways, including Statewide (NHS), Regional and District;
- Action 3B.3: Consider construction of non-traversable medians for modernization of all urban, multi-lane Statewide (NHS) Highways. Where the forecasted average daily traffic is anticipated to be 28,000 vehicles per day during the 20-year planning period, reasons for not using non-traversable medians must be documented and reviewed and approved by the Region Manager; and
- Action 3B.4: Full and directional median openings shall be restricted to locations that conform to ODOT's spacing standards as shown in Appendix C and designed with a left-turn bay and deceleration lane. Full median openings will be given preference to a public road connection which is part of a continuous and comprehensive public road network.

Policy 3C in the OHP also provides specific direction for management of access in interchange areas. Significant actions related to this project include:

- Action 3C.2: To improve an existing interchange or construct a new interchange:
  - Necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place;
  - Access to cross streets shall be consistent with established standards for a distance on either side of the ramp connections so as to reduce conflicts and manage ramp operations. The Interchange Access Management Spacing Standards supersede the Access Management Classification and Spacing Standards (Policy 3A), unless the latter distance standards are greater (see "Performance & Design Standards" section of this memorandum);
  - The design of urban interchanges must consider the need for transit and park-and-ride facilities, along with the interchange's effect on pedestrian and bicycle traffic;
  - When possible, access control shall be purchased on crossroads for a minimum distance of 1320 feet (400 meters) from a ramp intersection or the end of a free flow ramp terminal merge lane taper; and
  - Interchanges on Statewide, Regional or District Highways may connect to state highways, major or minor arterials, other county or city roads, or private roads, as appropriate.
- Action 3C.3: Establish criteria for when deviations to the interchange access management spacing standards may be considered.
- Action 3C.6: Plan for and operate traffic controls within the Interchange Access Management Area with a priority of moving traffic off the main highway, freeway or Expressway and away from the interchange area. Within the Interchange Access Management Area, priority shall be given to operating signals for the safe and efficient operation of the interchange.

- Action 3C.7: Use grade-separated crossings without connecting ramps to provide crossing corridors that relieve traffic crossing demands through interchanges.

For this IAMP, consideration must also be given to the policies and actions pertaining to mobility standards associated with the Statewide Highway classification in urban and rural areas and the effect of the freight route and expressway designations. This discussion can be found in the "State Performance & Design Standards" section of this memorandum, along with ODOT's access management spacing standards.

2001 Oregon Rail Plan

This plan serves as a combination of the State's rail planning, freight rail and passenger rail systems and contains three elements:

- Summary of the state's goals and objectives related to passenger and freight rail;
- Quantification and measurement of the state's performance to-date; and
- Identification of projected costs, revenues and investment needs for rail transportation of people and goods.

The plan also establishes a system of integration between freight and passenger elements (there currently is no passenger rail service to Redmond) into the land use and transportation planning processes and calls for cooperation between state, regional and local jurisdictions in completing the plan.

The policies established in this plan for managing the state rail system will be used to evaluate alternatives that impact the Burlington Northern Santa Fe freight rail line that parallels US 97 to the east through the study area.

1995 Oregon Bicycle and Pedestrian Plan

The provision of safe and accessible bicycling and walking facilities in an effort to encourage increased levels of bicycling and walking is the goal of the Oregon Bicycle and Pedestrian Plan. The Plan provides actions that will assist local jurisdictions in understanding the principals and policies that ODOT follows in providing bike and walkways along state highways. In order to reach the plan's objectives, the strategies for system design are outlined, including:

- Providing bikeway and walkway systems that are integrated with other transportation systems;
- Providing a safe and accessible biking and walking environment; and
- Development of education programs that improve bicycle and pedestrian safety.

The document includes two sections, including the *Policy & Action Plan* and *Bikeway & Walkway Planning Design, Maintenance & Safety*. The first section contains background information, legal mandates and current conditions, goals, actions, and implementation strategies ODOT proposes to improve bicycle and pedestrian transportation. The second section assists ODOT, cities and counties in designing, constructing and maintaining pedestrian and bicycle facilities. Design standards are recommended and information on safety is provided.

Transportation alternatives developed through the study process will need to provide for bicycle and pedestrian travel as recommended in this plan.

Statewide Transportation Improvement Program (ODOT)

The Statewide Transportation Improvement Program (STIP) is Oregon's four-year transportation capital improvement program. It is the document that identifies the funding for, and scheduling of,

transportation projects and programs. It includes projects on the federal, state, city, and county transportation systems, multimodal projects (highway, passenger rail, freight, public transit, bicycle and pedestrian), and projects in the National Parks, National Forests, and Indian tribal lands. Oregon's STIP covers a four-year construction period, but is updated every two years in accordance with federal requirements. The currently approved program is the *2004-2007 STIP*. The *Draft 2006-2009 STIP* is currently under development, and is available for public viewing and comment.

The *2004-2007 and Draft 2006-2009 STIP's* were reviewed for projects that should be considered during the development of the North Redmond IAMP for complimentary or conflicting traffic impacts. No projects, other than the US 97 Reroute and North Redmond interchange, were found within the study area.

Operational Notice PD-03: Project Development Access Management Sub-teams

This ODOT Operational Notice provides detailed guidance and structure for staff responsible for access management decisions in the development of highway projects. It indicates when Access Management Sub-teams (AMS) should be formed, AMS member roles and responsibilities, and recommended actions. According to this notice, the formation of an AMS will be required for this project because it is categorized as a modernization project and will create an Interchange Management Area. Therefore, Operational Notice PD-03 will be used to guide AMS decisions regarding access management during the development of the IAMP.

Freight Moves the Oregon Economy (July 1999)

The movement of freight has a far-reaching effect on the Oregon economy. This report attempts to identify some of the concerns and needs about maintaining and enhancing current and future freight mobility. The report simply reports information about freight from numerous federal, state, regional, local, and other sources. Therefore, it serves as an overview of these documents rather than an independent document that develops new data or ideas. It provides an overview of:

- Importance of freight to the national and Oregon economy
- Freight transportation planning and programming
- Oregon's freight transportation system
- Freight performance, concerns and needs
- Possible future directions for freight capacity

Many different issues affect the movement of freight. The issues discussed in detail within this document include: accessibility, capacity, connectivity, environmental sensitivity, land use compatibility, safety and reliability. Additionally, performance measures have been developed that provide quantitative or qualitative threshold values that indicate whether or not there are capacity, safety and time delay deficiencies on freight routes throughout Oregon.

US 97 is defined as a freight system route and has been described as the most important north/south corridor east of the Cascade Mountains. The southern part of that route serves as an important alternative for freight movement between Northern California and the Willamette Valley. Congestion is perceived as the major problem concerning freight mobility in the Bend/Redmond area.

Transportation Planning Rule (OAR 660-12-060)

The purpose of OAR 660-12 is to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient, and economic transportation systems that are designed to reduce reliance on the automobile. Key elements include direction for preparing, coordinating, and implementing Transportation System Plans. In particular, rule 660-12-060 addresses amendments to

plans and land use regulations and includes measures to be taken to ensure allowed land uses are consistent with the identified function and capacity of existing and planned transportation facilities. This rule includes criteria for identifying significant effects of plan or land use regulation amendments on transportation facilities, actions to be taken when a significant effect would occur, identification of planned facilities, and coordination with transportation facility providers.

The North Redmond US 97 IAMP will help to maximize the investment in the transportation infrastructure by planning for land development, supporting transportation facility construction, and existing transportation facility management in a manner that will sustain adequate operation of the proposed interchange through the planning horizon year. This will not only include amending the City of Redmond Comprehensive Plan and Transportation System Plan, but will rely on future regulation of land use proposals to ensure the function and capacity of facilities planned through this effort are maintained.[1]

Access Management Rules (OAR 734-051)

ODOT has adopted the identified administrative rules to establish procedures and criteria used to govern highway approaches, access control, spacing standards, medians and restriction of turning movements in compliance with statewide planning goals and in a manner compatible with acknowledged comprehensive plans and consistent with Oregon Revised Statutes, Oregon Administrative Rules, and the *1999 Oregon Highway Plan*. Any new street or driveway connections, as well as any changes to existing street or driveway connections to US 97 or OR 370 within the IAMP study boundary must be found to be in compliance with these rules by ODOT.

OAR 734-051-0155 (*Access Management Plans, Access Management Plans for Interchanges, and Interchange Area Management Plans*) provides a description of what IAMP's are intended to do and when they are needed, as well as outlining key characteristics. According to this rule, the IAMP for the North Redmond Interchange will:

- Be developed no later than the time an interchange is designed or is being redesigned;
- Identify opportunities to improve operations and safety in conjunction with roadway projects and property development or redevelopment and adopt strategies and development standards to capture those opportunities;
- Include short, medium, and long-range actions to improve operations and safety in the interchange area;
- Consider current and future traffic volumes and flows, roadway geometry, traffic control devices, current and planned land uses and zoning, and the location of all current and planned approaches;
- Provide adequate assurance of the safe operation of the facility through the design traffic forecast period, typically 20 years;
- Consider existing and proposed uses of the all property in the interchange area consistent with its comprehensive plan designations and zoning;
- Be consistent with any adopted Transportation System Plan, Corridor Plan, Local Comprehensive Plan, or Special Transportation Area or Urban Business Area designation,

[1] The ability to successfully regulate future land use proposals may be affected by Measure 37, however the extent to which this would occur is unknown.

or amendments to the Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055[2];

- Be consistent with the 1999 Oregon Highway Plan; and
- Be approved by the Department through an intergovernmental agreement and adopted by the local government, and adopted into a Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.

The access management component of the IAMP will also be developed in accordance with this rule, which requires:

- Preparation for a logical segment of the state highway and include sufficient area to address highway operation and safety issues and development of adjoining properties including local access and circulation.
- Description of the roadway network, right-of-way, access control, and land parcels in the analysis area.
- Development in coordination with local governments and property owners in the affected area.
- Consistency with any applicable adopted Transportation System Plan, Local Comprehensive Plan, Corridor Plan, or Special Transportation Area or Urban Business Area designation, or amendments to the Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.
- Consistency with the 1999 Oregon Highway Plan.
- Containing short, medium, and long-range actions to improve operations and safety and preserve the functional integrity of the highway system.
- Considering whether improvements to local street networks are feasible.
- Promoting safe and efficient operation of the state highway consistent with the highway classification and the highway segment designation.
- Considering the use of the adjoining property consistent with the comprehensive plan designation and zoning of the area.
- Providing a comprehensive, area-wide solution for local access and circulation that minimizes use of the state highway for local access and circulation.
- Approval by the Department through an intergovernmental agreement and adopted by the local government, and adopted into a Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.
- Use for evaluation of development proposals.
- Potential for use in conjunction with mitigation measures.

Applicable spacing standards for interchange areas and statewide highways are also included as a part of these rules and are described in the "State Performance & Design Standards" section of this memorandum.

[2] The City of Redmond is not exempt from state transportation system planning requirements as outlined in OAR 660-012-0055.

Traffic Control (OAR 734-020):

Accommodating future traffic volumes in 2025 may require modifications to highway traffic controls such as street signing, pavement markings, and installation or modification of traffic signals. These administrative rules outline the processes and decision-making criteria for such modifications and will be used by ODOT to evaluate proposed mitigation.

Railroad Regulations

The US 97 Reroute and North Redmond interchange are proposed to be located east of the existing US 97 alignment and nearly adjacent to the west side of the Burlington Northern Santa Fe (BNSF Railway) freight rail line that parallels the highway. Should the alignment of the reroute or any supporting local street improvements create or modify railroad crossings (at, above, or below grade), the affected road authority must apply for authority to alter the crossing from the ODOT Rail Division. ODOT, through its Rail Division, has exclusive jurisdiction over all public railroad-highway crossings in the state. The following are key requirements and considerations that may affect proposed improvement alternatives:

- Per ORS 824.202, authority to control and regulate the construction, alteration and protection of public railroad-highway crossings is vested exclusively in the state, and in ODOT.
- ODOT's Rail Division works cooperatively with all road authorities (including ODOT) and all railroads to address crossing safety matters in conformance with federal and state laws, rules and regulations.
- A crossing Order is required for the construction of a new public railroad-highway crossing (at-grade or grade-separated), or the alteration of an existing public crossing. Alterations are defined in OAR 741-100-0020(1) and include any change to the roadway or railroad tracks at a crossing that materially affects use of the crossing by railroad equipment, vehicles, or pedestrians. Changes in the roadway configuration roadway widening or construction of sidewalks within 500 feet of a crossing, installing or removing protective devices at a crossing, changing the direction of traffic flow, or closing a crossing (removal of track or roadway) may be alterations. Information on obtaining an Order is available from the ODOT Rail Division (http://www.oregon.gov/ODOT/RAIL/).
- An application for a crossing Order involves an administrative process that typically takes6 to 8 months from design completion to the authorization of construction. If the application for an Order is contested a formal hearing may be required to resolve the contested application. The Order resulting from the hearing may be appealed under state law. Contested cases may take 12 to 18 months or longer.
- Prior to seeking a crossing Order, the Department highly recommends the parties involved work together during project development/preliminary design. Experience has shown that dialogue between the railroad, road authority and Rail Division can significantly reduce formal application processing time. The Rail Division encourages crossing Order applicants to submit a draft application for review and comment.

US 97 Corridor Strategy (Madras – California Border), 1995

This document is the outcome of the initial strategy development phase of corridor planning, intended to set the stage for more detailed analysis of modal trade offs and improvement priorities. The Corridor Strategy evaluates long-term transportation requirements, multimodal issues and recommends general improvement objectives to address corridor-wide requirements. The strategy developed is then used in the second phase of corridor planning, which specifically addresses the objectives set forth in the Corridor Strategy by identifying and prioritizing specific transportation improvements.

The strategy development process for the US 97 Corridor included surveys and interviews with stakeholders, several public meetings and workshops where corridor issues, concerns and opportunities were discussed. Based on the input received from these meetings and relevant technical information on transportation trends, congestion, travel time and safety, the overall goal for the US 97 Corridor was:

> *"To promote commerce by efficiently distributing good and services, while enhancing travel safety, maintaining environmental integrity and preserving regional quality of life."*

In addition, the following six underlying corridor strategy themes were identified during the strategy development process:

- Enhancing Safety;
- Facilities Management and Improvement;
- Intermodal Connections;
- Interpretive Opportunities and Preservation of Environmental Quality;
- Economic Development; and
- Partnering.

While this document provides insight to early corridor planning efforts and stakeholder interests, its significance is diminished with the adoption of the City of Redmond and Deschutes County TSP's, which eliminate the need to develop a corridor plan for this area.

State Performance & Design Standards

Highway Classifications

US 97 (The Dalles – California Highway) and OR 370 (O'Neil Highway), are both owned and operated by ODOT, which has established management objectives and operational standards for each of these facilities based on the assigned classifications and segment designations shown below and illustrated in Figure 1.1.

US 97 (The Dalles – California Highway) — Within the study area, US 97 is classified as a Statewide Highway on the National Highway System and is a designated Freight Route. In addition, the segment of US 97 north of the Redmond UGB has been designated as an expressway.

OR 370 (O'Neil Highway) — The O'Neil Highway is classified as a District Highway.

It should be noted that operational standards for any given classification or special designation will change as a highway crosses over urban growth boundaries and passes through different speed zones, as shown below.

Mobility Standards

ODOT has adopted standards for mobility for state facilities through the *1999 Oregon Highway Plan* (OHP) and the *Highway Design Manual*[3]. The OHP mobility standards are be used for identifying needs, while the *Highway Design Manual* standards represent the level of operation for which state facilities are to be designed. For this study, the OHP standards will be applied to existing and future no-build analysis, while the future build alternatives will be compared to the standards in the *Highway Design Manual*.

[3] Highway Design Manual, Oregon Department of Transportation, 2003, p. 10-38.

Table 6 in Policy 1F of the OHP displays the maximum allowable volume to capacity ratios for the 30th highest annual hour of traffic in areas outside of the Portland Metropolitan Area. Sections from that table relevant to the study area are presented below in Table 1.A.

At signalized intersections, these standards are to be applied to the intersection as a whole. At unsignalized intersections, these standards are applicable only to movements that are not required to stop. For other movements at unsignalized intersections that are required to stop or otherwise yield the right of way, the standards for District/Local Interest Roads shall be applied for areas within urban growth boundaries and a maximum volume to capacity ratio of 0.80 shall be applied for areas outside of urban growth boundaries. However, when an intersection acts as an interchange ramp terminal, the applicable volume to capacity ratio will be the smaller of the values of the volume to capacity ratio for the crossroad or 0.85.

Table 1.A: Maximum Volume to Capacity Ratios from the 1999 Oregon Highway Plan

Highway Category	Land Use Type/Speed Limits		
	Inside Urban Growth Boundary		Outside Urban Growth Boundary
	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit >= 45 mph	Rural Lands
Interstate Highways and Statewide (NHS) Expressways	0.70	0.70	0.70
Statewide (NHS) Freight Routes	0.75	0.70	0.70
District/Local Interest Roads	0.85	0.80	0.75

Table 10-1 in the *Highway Design Manual* displays the maximum allowable volume to capacity ratios for the 30th highest annual hour of traffic for use in the design of highway projects. These standards are to be applied to conditions forecasted to exist 20 years after completion of the proposed improvement. If the applicable mobility standard cannot be met, a design exception should be sought. Sections from that table relevant to the study area are presented below.

Table 1.B: Maximum Volume to Capacity Ratios from the 2003 Highway Design Manual

Highway Category	Land Use Type/Speed Limits		
	Inside Urban Growth Boundary		Outside Urban Growth Boundary
	Non-MPO outside of STAs where non-freeway speed limit <45 mph	Non-MPO where non-freeway speed limit >= 45 mph	Rural Lands
Interstate Highways and Statewide (NHS) Expressways	0.70	0.65	0.60
Statewide (NHS) Freight Routes	0.70	0.70	0.60
District/Local Interest Roads	0.80	0.75	0.75

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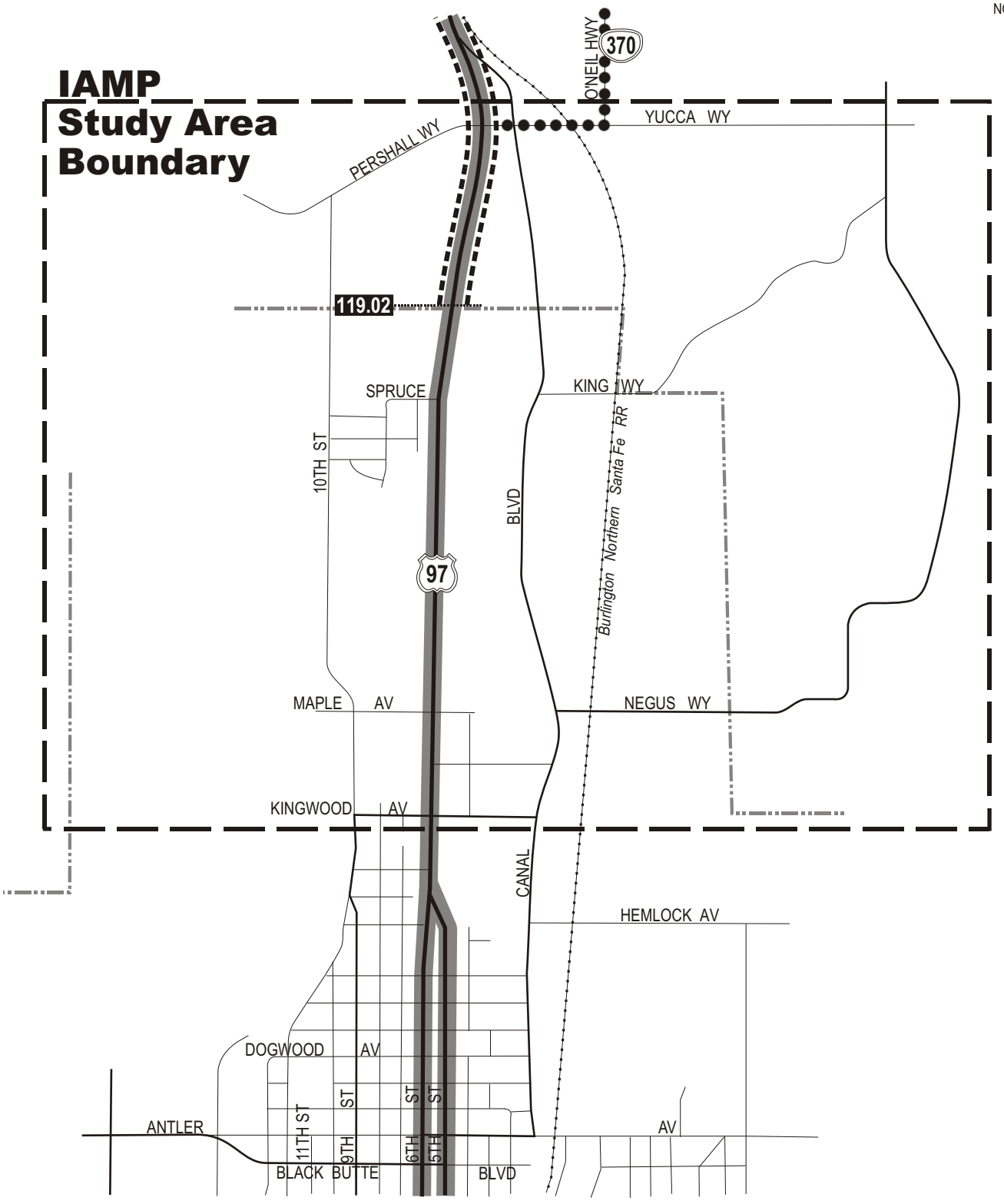


LEGEND

- ●●●● - District
- ▬▬ - Statewide NHS with Freight Route
- ▬ ▬ ▬ - Expressway
- ·-·-· - Urban Growth Boundary (UGB)
- ····· 000.00 - Milepost Indicator

Figure 1.1
STATE HIGHWAY FUNCTIONAL CLASSIFICATIONS AND SEGMENT DESIGNATIONS

Access Management Spacing Standards

Policies 3A and 3C of the *1999 Oregon Highway Plan* establish access management objectives for state highways and interchange areas based on facility type and set standards for spacing of approaches. As previously discussed, these standards have also been adopted as part of OAR 734-051, which provides the regulatory basis for implementation. Tables 1.C and 1.D below show the applicable access management spacing standards for state facilities in the study area. In Table 1.C, the spacing standards shown are applicable only to approaches on the same side of the roadway, with measurement of approach spacing taken from the centers of adjacent approaches. Also, when using this table, US 97 within the UGB is by default designated "Urban Other" for purposes of access spacing.

Table 1.C: Access Spacing Standards for Statewide Highways (measured in feet)

Posted Speed (mph)	Rural		Urban	
	Expressway (at-grade only)	Other	Expressway (at-grade only)	Other
≥ 55	5280	1320	2640	1320
50	5280	1100	2640	1100
40 & 45	5280	990	2640	990
30 & 35		770		770[4]
≤ 25		550		550[3]

With some design elements of the proposed project still unknown, it is assumed the North Redmond interchange will resemble a non-freeway interchange with a two-lane crossroad. Table 1.D and Figure 1.2 provide ODOT's interchange area access management spacing standards for such a configuration. The proposed locations of any new street connections within interchange areas shall be evaluated in accordance with the applicable standards. It should be noted that the spacing standards for interchange areas shown in Table 1.D would supersede the spacing standards shown in Table 1.C unless the latter requires a greater distance of separation.

Oregon Highway Design Manual (2003)

This manual contains standards for the design of state highways and various highway elements. While detailed design drawings will not be created as part of this study, elements such as the general alignments, roadway widths, and criteria for installation of turn lanes will be considered for evaluating the feasibility of construction and determination of right of way needs for the alternatives developed.

[4] Access spacing standards in urban areas for facilities with posted speeds of 35 mph or less may be reduced pending OTC approval of proposed *Oregon Highway Plan* amendments. Proposed spacing standards would be 720 feet (30 & 35 mph) and 520 feet (≤25 mph).

Table 1.D: ODOT's Minimum Spacing Standards Applicable to Non-Freeway Interchanges with Two-Lane Crossroads

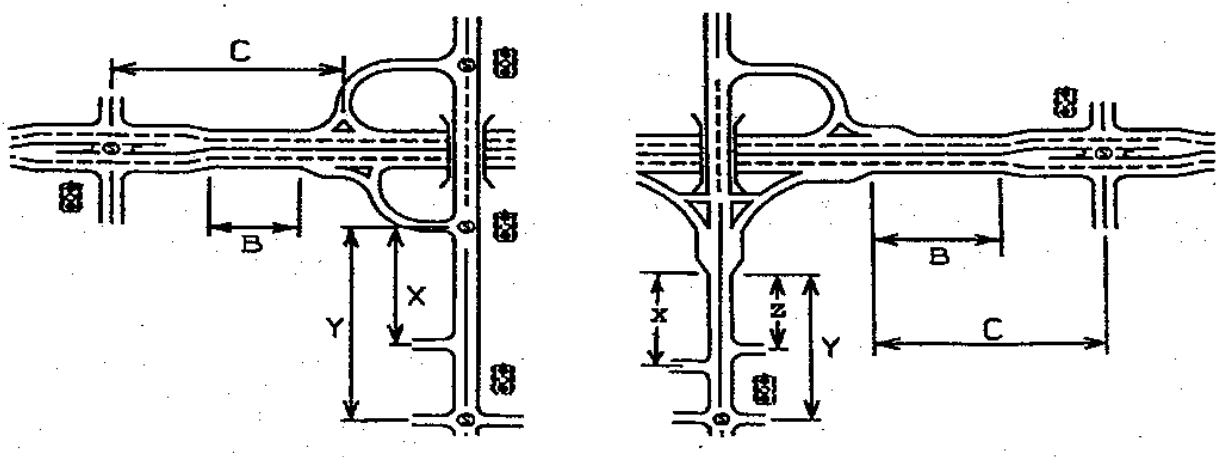
Category of Mainline	Type of Area	Speed of Mainline	Spacing Dimension				
			B	C	X	Y	Z
Expressways, Statewide, Regional and District Highways	Fully Developed Urban*	45 mph (70 kph)	2640 ft (800 m)	1 mile (1.6 km)	750 feet (230 m)	1320 feet (400 m)	750 feet (230 m)
	Urban	45 mph (70 kph)	2640 ft (800 m)	1 mile (1.6 km)	1320 feet (400 m)	1320 feet (400 m)	990 feet (300 m)
	Rural	55 mph (90 kph)	1 mile (1.6 km)	2 miles (3.2 km)	1320 feet (400 m)	1320 feet (400 m)	1320 feet (400 m)

Notes: 1) If the crossroad is a state highway, these distances may be superseded by the Access Management Spacing Standards, providing the distances are greater than the distances listed in the above table.
2) No four-legged intersections may be placed between ramp terminals and the first major intersection.
3) No application shall be accepted where an approach would be aligned opposite a freeway or expressway ramp terminal (OAR 734-051-0070(4)(a)).
4) Use four-lane crossroad standards for urban and suburban locations that are documented to be widened in a Transportation System Plan or corridor plan.
5) No at-grade intersections are allowed between interchanges less than 5 miles apart.

B = Distance between the start and end of tapers
C = Distance between nearest at-grade and ramp terminal intersections or the end/start of the taper section
X = Distance to the first approach on the right; right in/right out only
Y = Distance to first intersections where left turns are allowed
Z = Distance between the last right in/right out approach road and the start of the taper for the on-ramp

* Fully Developed Urban Interchange Management Area: Occurs when 85% or more of the parcels along the influence area are developed at urban densities and many have driveways connecting to the crossroad. See the definition in the 1999 Oregon Highway Plan at page 181.

Figure 1.2: Measurement of Spacing Standards for Table 1.D.[2]



City of Redmond Plans & Regulations

City of Redmond Comprehensive Plan

The City of Redmond Comprehensive Plan, which is currently being updated, acts as a guide for future growth and development within the urban area using a framework of goals and policies that respond to current needs and conditions in addition to guiding future City programs, major capital projects, and other funding decisions through the year 2020. The updated plan will extend this period through 2025.

The key goals and policies for consideration during this project will be those pertaining to transportation. Policies of particular interest include:

- The reduction of through traffic and congestion and the improvement of circulation along US 97, especially along the 5th and 6th Street couplet; and
- Enhancing east/west circulation.

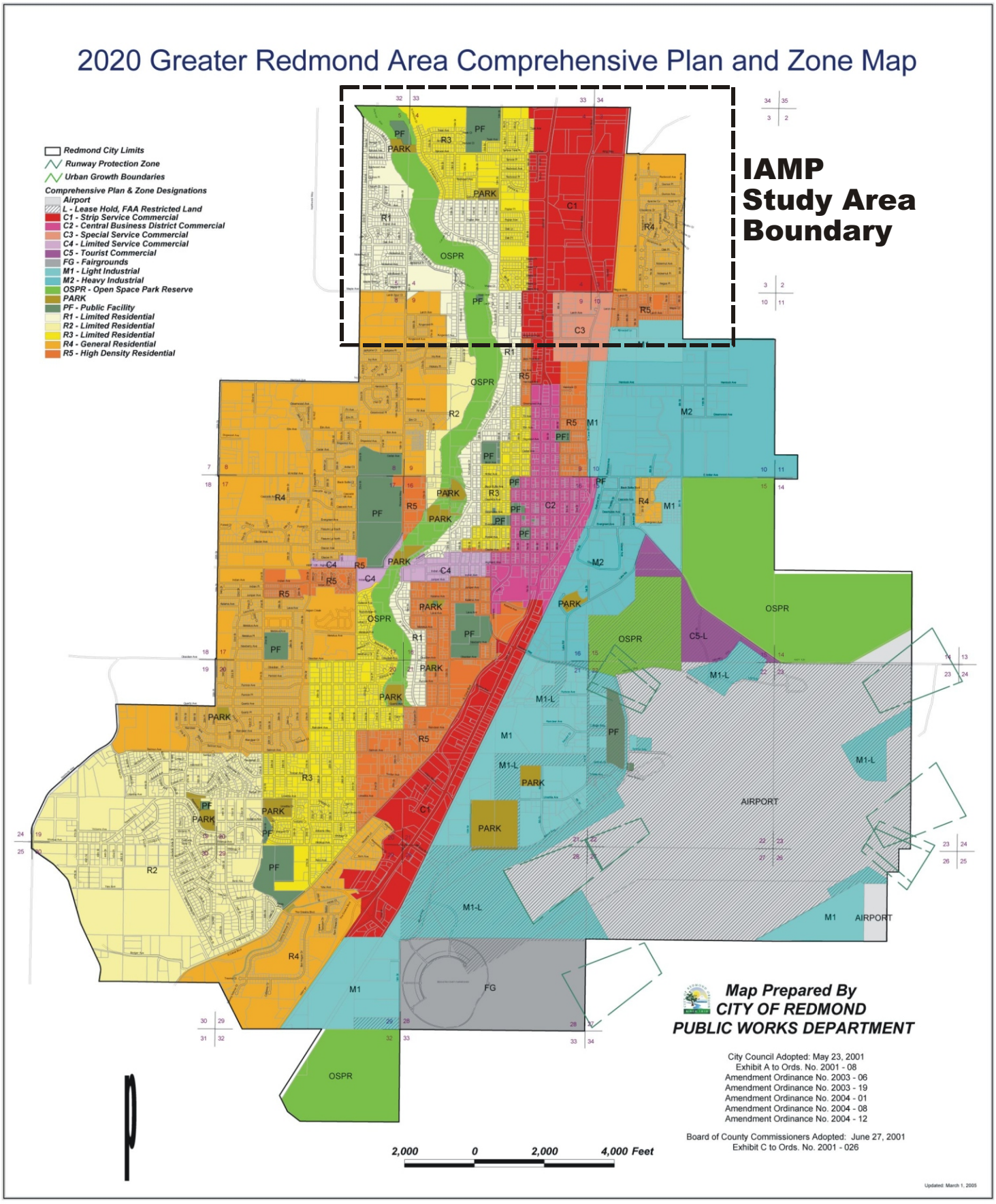
Based on these goals, policies were designed for implementation through the Redmond Urban Area Transportation Plan addressing transportation system management, treatment of state highways, development of local street systems, street design, and other transportation elements.

In addition, the City of Redmond Comprehensive Plan and Zone Map (see Figure 1.3) shows the type, location, and density of land development and redevelopment permitted in the future. The City of Redmond Development Code (Chapter 8 – Development Regulations), which was written to implement the comprehensive plan, provides descriptions of zone designations and allowable uses within those zones. Descriptions for zone designations found within the IAMP study area have been provided in Table 1.E for comparison with the zoning identified in the zone map.

Table 1.E : Redmond Zoning Designations in IAMP study area

Zone Designations		Purpose of Zone	Common Uses
C-1	Strip-Service Commercial	To create and preserve areas suitable for commercial uses and services primarily oriented towards automobile traffic, requiring extensive outdoor display and storage, and support of the central business district or principal downtown shopping area.	● service stations ● auto sales ● motels ● restaurants ● general retail ● banks ● professional offices
C-3	Special-Service Commercial	To create and preserve areas suitable for special commercial uses and services and compatible non-commercial uses, and on a broad basis to serve as a center for emergency services such as medical-health care for the City.	● medical/dental clinics ● hospitals ● retirement homes ● convalescent care ● government offices
M-1	Light Industrial	To provide for light industrial uses such as light manufacturing, research, transportation facilities and similar uses which have a limited impact on surrounding properties and are compatible with clean non-polluting industries.	● electronics firms ● research/development ● wholesale distribution ● corporate headquarters ● light equip. manufacture
R-1	Limited Residential	To encourage, promote, and protect the character of neighborhood residential areas having a suitable environment for urban and suburban family life.	● single family dwellings ● guest houses ● farming w/restrictions ● manufactured homes
R-3	Limited Residential -	To recognized the existing residential character of the	● single family dwellings

Zone Designations		Purpose of Zone	Common Uses
	Planned	area and provide compatible types of new residential development. In the undeveloped areas, it is the intent of the R-3 Zone to provide some flexibility of housing types where community services are or will be available.	● guest houses ● farming w/restrictions ● manufactured homes ● two family dwellings ● duplexes
R-4	General Residential - Planned	To recognize and enhance areas of scenic quality and view amenities and to allow some flexibility in housing types to provide view amenities to all income levels.	● single family dwellings ● two family dwellings ● farming w/restrictions ● manufactured homes ● duplexes
R-5	Urban High Density Residential	To provide for high density multi-family developments in locations close to shopping service, transportation or public open space, and in appropriate locations to provide a transitional use area between residential areas and other less restrictive districts.	● single family dwellings ● two family dwellings ● manufactured homes ● duplexes ● condominiums ● multi-family dwellings
PARK	Park	To provide for public park uses.	● playgrounds ● ball fields ● reserve areas
PF	Public Facility	To provide for public facility uses.	● wastewater treatment ● water storage reservoirs ● well sites ● public schools ● public works admin.
OSPR	Open Space Park Reserve	To preserve and provide for open space areas of natural, scenic, historical, or geological significance.	● livestock grazing ● crop production ● public parks & trails



DKS Associates
TRANSPORTATION SOLUTIONS

Source: City of Redmond - Public Works Department

Figure 1.3
2020 GREATER REDMOND AREA COMPREHENSIVE PLAN AND ZONE MAP

City of Redmond Transportation System Plan

The City's Transportation System Plan (TSP) provides a plan for the development of the City's transportation infrastructure, addressing improvements to existing roadways, new pedestrian and bicycle facilities, improvements in public transit service, and transportation demand management strategies. It also includes a capital improvement program (CIP), listing projects required to address the City's transportation needs for a 20-year planning period. The projects in the CIP are prioritized based on current needs and the expected growth of the city. Projects planned in the city are displayed in Figure 1.4, with specific projects of interest that could affect traffic circulation in the IAMP study area listed below.

Planning year 2000 – 2005

- US 97 Reroute (currently under construction);
- Maple Avenue connection between North Canal Boulevard and Highway 97 (including traffic signal at Highway 97) (currently under construction); and
- NW Maple Avenue Bridge Project (Dry Canyon Crossing) (currently under construction).

Planning year 2006 – 2010

- Quince Avenue construction from NW 10th Street to North Canal Boulevard.

Planning year 2016 – 2020

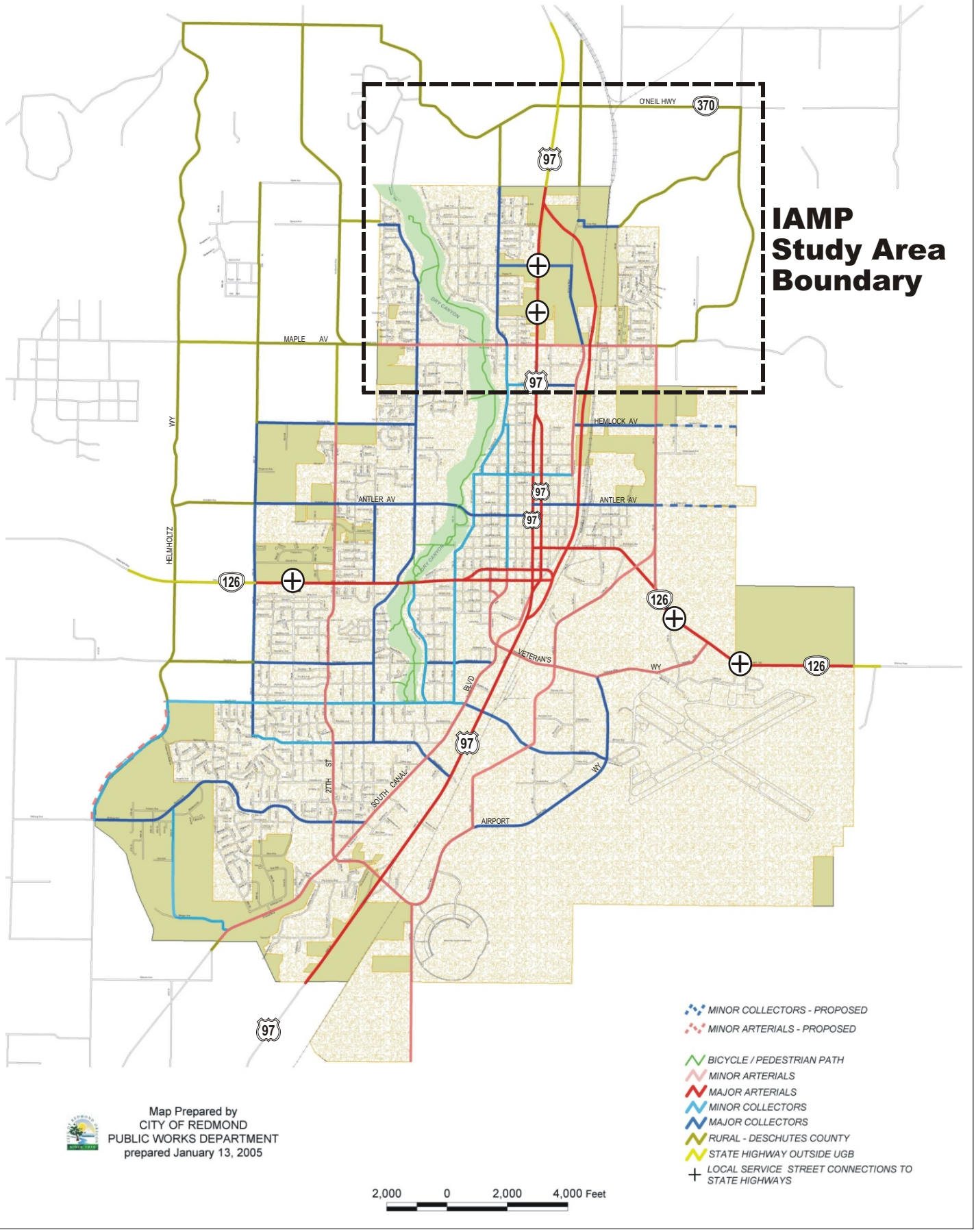
- 27th Street extension from Antler Avenue to Maple Avenue; and
- East 9th Street improvements from Highway 126 to Maple Avenue.

When Warranted

- Traffic Signal at Kingwood Avenue at Highway 97.

New transportation facilities proposed as a result of this study that will be owned by the City of Redmond must be designed in accordance with the City's TSP, incorporating the appropriate characteristics (cross-section design, treatment of pedestrian and bicycle facilities, etc…) for any applicable street functional classification. Recognition of needed street cross-sections for different functional classifications should be monitored closely, as it will affect the amount of right of way required. In addition, transportation improvements proposed to accommodate future traffic will need to be reviewed for compatibility with the identified projects in the City's Capital Improvement Program.

The City's TSP also maintains guidelines for access spacing on City streets that are discussed in the "City of Redmond Performance & Design Standards" section of this memorandum.



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TRANSPORTATION SOLUTIONS

Source: City of Redmond - Public Works Department

Figure 1.4
REDMOND URBAN AREA TRANSPORTATION PLAN

City of Redmond Code: Chapter 8 – Developmental Regulations

These regulations have been adopted for the purpose of promoting the health, safety, peace, comfort, convenience, economic well-being, and general welfare and to carry out the City of Redmond Comprehensive Plan and Statewide Planning Goals. They are intended to promote an orderly use of land within the city to avoid detrimental effects to other land uses and City facilities. Any uses of land within the city considered through the North Redmond IAMP must be in compliance with these ordinances.

The Development Regulations establish and define the zoning designations for the City of Redmond, which are assigned to individual properties as shown on the City's Comprehensive Plan and Zone Map. The map was previously displayed in Figure 1.3 and descriptions of zone designations of interest to the IAMP area were provided in Table 1.5.

Article III of the Development Regulations includes standards for subdividing and partitioning land within the city. These include regulations pertaining to the location and design of future streets, procedures for street dedications, and requirements for the sizes, shapes, and orientation of individual lots.

City of Redmond System Development Charges (2004 Update)

The transportation system development charge (SDC) for the City of Redmond is $2,722 per PM peak hour trip. This SDC is a function of the PM peak hour trip generation of the proposed development, as calculated per the Institute of Transportation Engineers (ITE) manual, Trip Generation, 6th Edition or by an approved Trip Generation study performed by a registered professional engineer. Pass-by trips are excluded. The yearly inflation factor for this area was determined to be 6.4%.

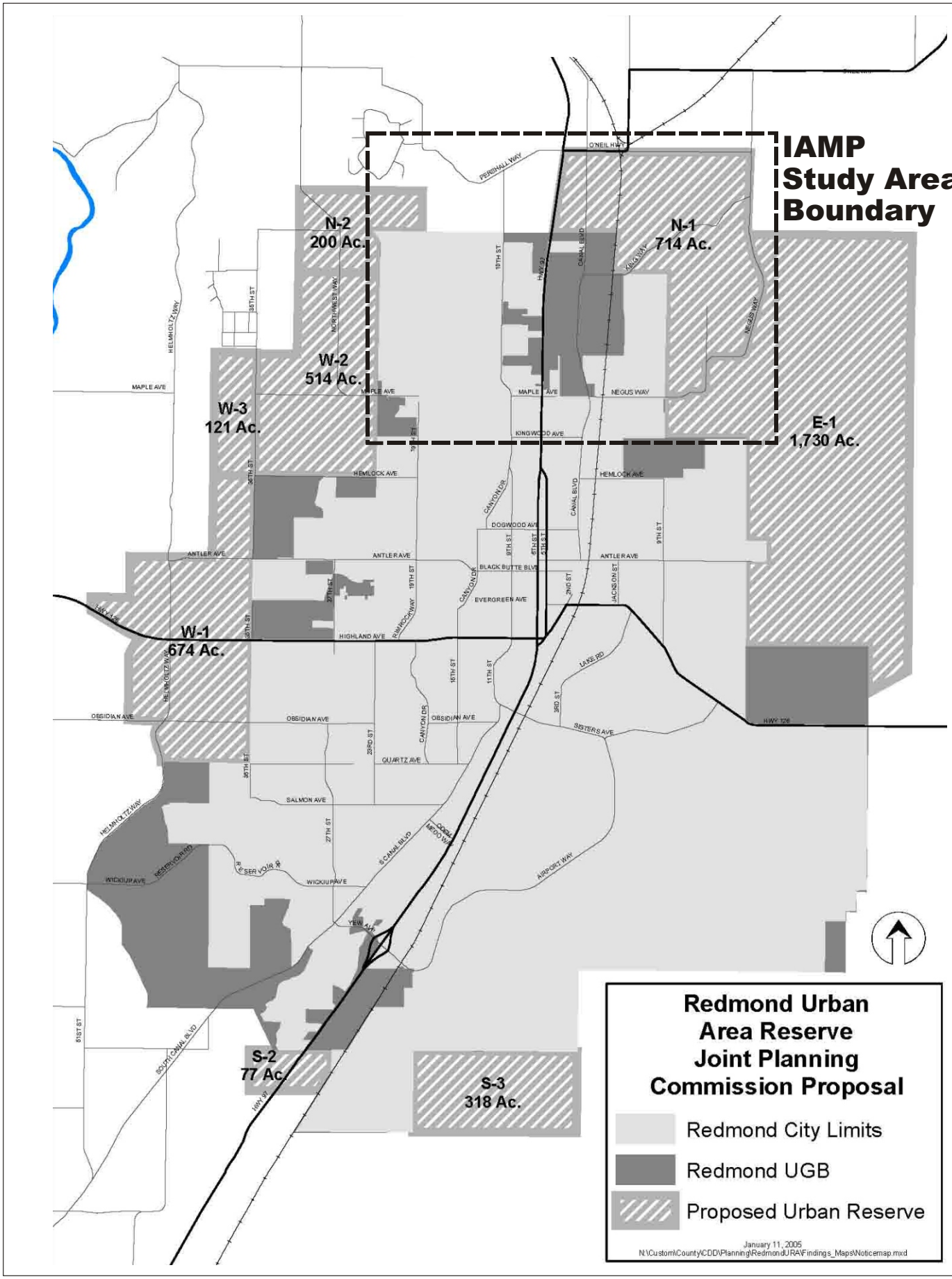
Redmond Urban Reserve Studies

Deschutes County and the City of Redmond have jointly agreed to establish an urban reserve area (currently including 4,348 acres, but subject to change) surrounding the City of Redmond's UGB as shown in Figure 1.5. Creating an urban reserve area achieves four objectives:

- Designates lands outside Redmond's UGB to be reserved for eventual inclusion in the UGB;
- Protects lands outside the UGB from patterns of development that would impede urbanization;
- Provides Redmond with the greatest protection of its fringe area by designating up to a 30-year supply of land as urban reserve; and
- Enables the City to plan for cost-effective public facilities and services when these lands are finally incorporated into the UGB.

Both the City and County have proposed amendments to their Transportation System Plans to incorporate additional roadways to serve the urban reserve areas, which have been shown in Figures 1.4 and 1.7. Future roadway alignments should accommodate the urban reserve areas as well as the future roadways planned to serve them.

The Urban Reserve Area designations are expected in the summer of 2005. Upon completion, the City is anticipating to begin the process of expanding the UGB. For the purposes of this plan, the land within the IAMP boundaries that is anticipated to be included in the UGB expansion should be considered developable in accordance with assumed urban zoning designations within the 20-year planning horizon.



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TRANSPORTATION SOLUTIONS

Source: Deschutes County

Figure 1.5
REDMOND URBAN AREA RESERVE

City of Redmond Performance & Design Standards

All non-state roadways within the Redmond UGB are under the jurisdiction of the City of Redmond. The City has adopted standards for performance of City streets requiring operation of level of service E or better during the peak 15 minutes of the peak hour of the average weekday. A lesser standard is allowed at unsignalized intersections with low volume minor street approaches, requiring operation at a volume to capacity ratio less than 0.90 and a 95th percentile vehicle queue less than four vehicles during the peak hour. The City has also adopted access spacing guidelines for various classes of streets, which are displayed in the following table taken from the City of Redmond Transportation System Plan.

Table 1.F : City of Redmond Access Management Guidelines

Functional Classification	Minimum Posted Speed	Minimum Spacing between Driveways and/or Streets	Minimum Spacing between Intersections
Arterial Streets			
Major Arterial - Downtown Grid System	15-25 mph	165 feet	330 feet
Major Arterial - Other Areas	35-50 mph	800 feet	½ mile
Minor Arterial	30-45 mph	330 feet	¼ mile
Collector Streets			
Major Collector	25-35 mph	165 feet	330 feet
Minor Collector	25-35 mph	80 feet	330 feet
Industrial Collector	25-35 mph	165 feet	330 feet
Local Streets			
Local Industrial	20-25 mph	access to each lot	330 feet
Local Residential	20-25 mph	access to each lot	330 feet

Note: The minimum spacing shown for each category is a desirable design spacing; existing spacing will vary.

The City of Redmond Public Works Department maintains street design standards that shall be incorporated in the design or construction of any facilities intended to be owned by the City.

Deschutes County Plans & Regulations

Deschutes County Comprehensive Plan

The Comprehensive Plan for Deschutes County acts as a guide for future growth and development through the formation of goals and policies that respond to current and future needs over a 20-year planning period. Goals and policies pertaining to land use are implemented through zoning ordinances that are used to define various land use designations and create zone maps for the county identifying where these land use designations will be applied. The zoning of lands in Deschutes County surrounding the project area will be described in the discussion of the county's zoning and subdivision ordinances found later in this memorandum.

The Transportation chapter focuses on developing a transportation system that meets the needs of Deschutes County residents, while also considering regional and state needs at the same time. The plan addresses a balanced transportation system that includes automobile, bicycle, rail, transit, air, pedestrian and pipelines and reflects existing land use plans, policies and regulations that affect the transportation system. The Deschutes County Transportation System Plan implements these goals and policies and

provides a Transportation Project List to address deficiencies. Management policies for State Highways are also developed in the Transportation Chapter and carried forward through the Transportation System Plan.

Deschutes County Transportation System Plan

The Deschutes County Transportation System Plan (TSP) addresses both short and long-term transportation needs. In the short-term, the study identifies and provides recommended solutions to immediate safety and congestion problems. For the future, the study looks at the next 20 years in Deschutes County, and identifies through goals and policies, how best to efficiently move people and goods throughout the County. Long-term projects are identified and prioritized. Planning for the transportation needs within the Bend, Redmond and Sisters urban growth boundaries is covered by those cities' respective transportation system plans, which are adopted by the County inside those areas. Long-term projects planned in the County's Transportation Project List that were identified within the study area are listed below, with additional proposed projects displayed in Figures 1.6 and 1.7.

- 27th Street: New Arterial between Hemlock Avenue and Maple Avenue; and
- Maple Avenue: New Collector between 27th Street and Helmholtz Way.

With respect to management of state highways, Deschutes County supports an ODOT policy to develop highways through a "four-phased" approach, taking place incrementally as traffic volumes increase and levels of service decrease. Beginning with a standard two-lane highway, the improvement phases are as follows:

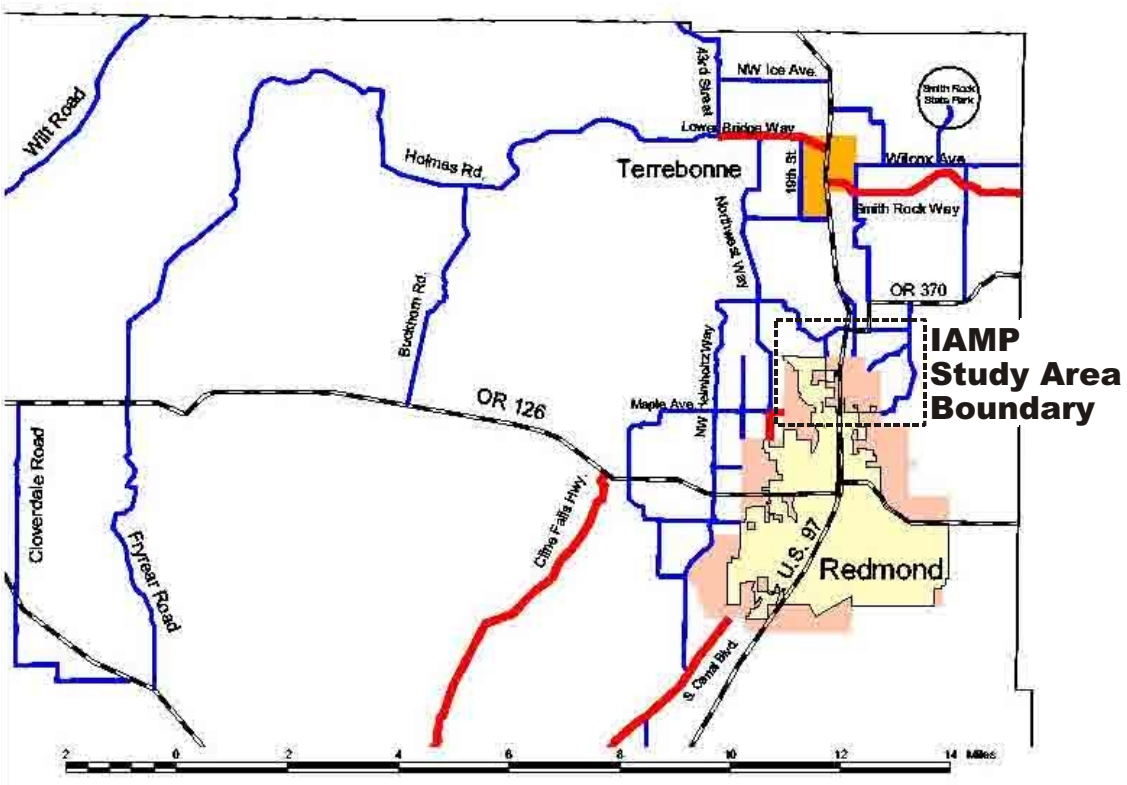
- Addition of passing or climbing lanes;
- Widening to a four-lane section;
- Adding grade-separated interchanges and raised medians; and

Develop full grade-separated interchanges and frontage roads.

In general, traffic signals are not deemed appropriate on state highways outside of UGB's. Rather, as intersections develop safety or operational problems, they shall be grade-separated, restricted, or closed (where alternate access is available).

The Deschutes County TSP identifies US 97 as the principal north-south route through central Oregon and recognizes that congestion on US 97 has mostly been a problem within the communities of Bend and Redmond due to a combination of increasing truck traffic and local traffic resulting from rapid growth experienced in recent years. The ultimate plan is for a continuous four-lane section to be built throughout the corridor, except through unincorporated communities. In addition to this, specific issues identified within the project area needing to be addressed include:

- Managing local road and direct driveway access onto the highway;
- Developing north and south connections to the Redmond "bypass"; and
- Finding opportunities to enhance the parallel local road network to redistribute local trips that would otherwise need to use the highway.



Redmond Area Road Plan

Principal Arterial (highway)
Rural Arterial
Rural Collector
Future Rural Collector
Redmond City Limits
Redmond UGB
Terrebonne Unincorporated Community
County Line

N
W E
S

Map Created: 2/17/98
By
Deschutes County Long-range Planning

Deschutes County TSP

DKS Associates
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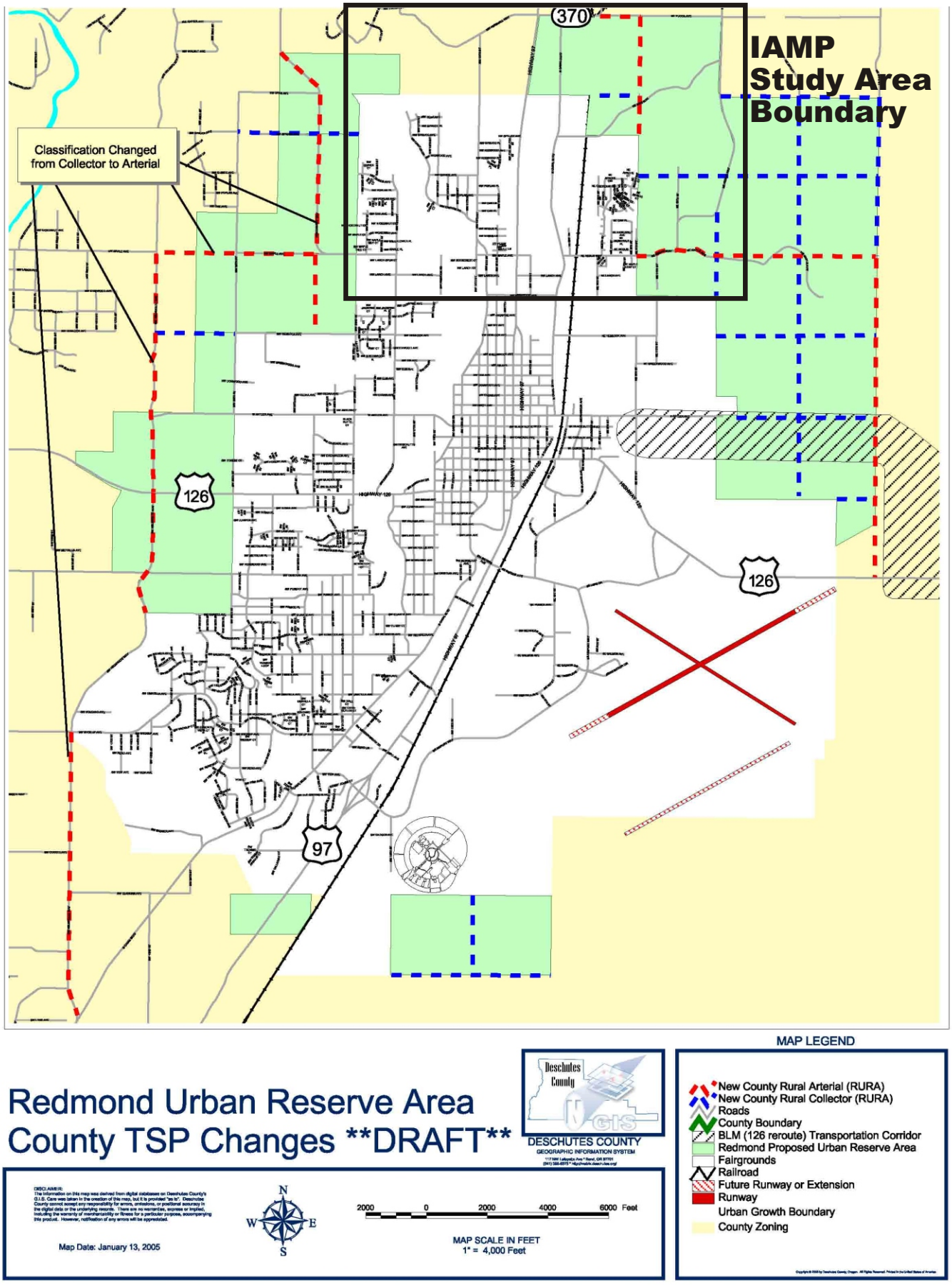
Source: Deschutes County Long-range Planning

Figure 1.6
DESCHUTES COUNTY TRANSPORTATION SYSTEM PLAN: REDMOND AREA



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Source: Deschutes County

Figure 1.7
DESCHUTES COUNTY TRANSPORTATION SYSTEM PLAN: REDMOND URBAN RESERVE AREA

Deschutes County Code

These regulations have been adopted for the purpose of promoting the health, safety, peace, comfort, convenience, economic well-being, and general welfare and to carry out the Deschutes County Comprehensive Plan and Statewide Planning Goals. They contain zoning and subdivision ordinances intended to promote an orderly use of land within the county to avoid detrimental effects to other land uses and County facilities. Any uses of land within the county considered through the North Redmond IAMP must be in compliance with these ordinances.

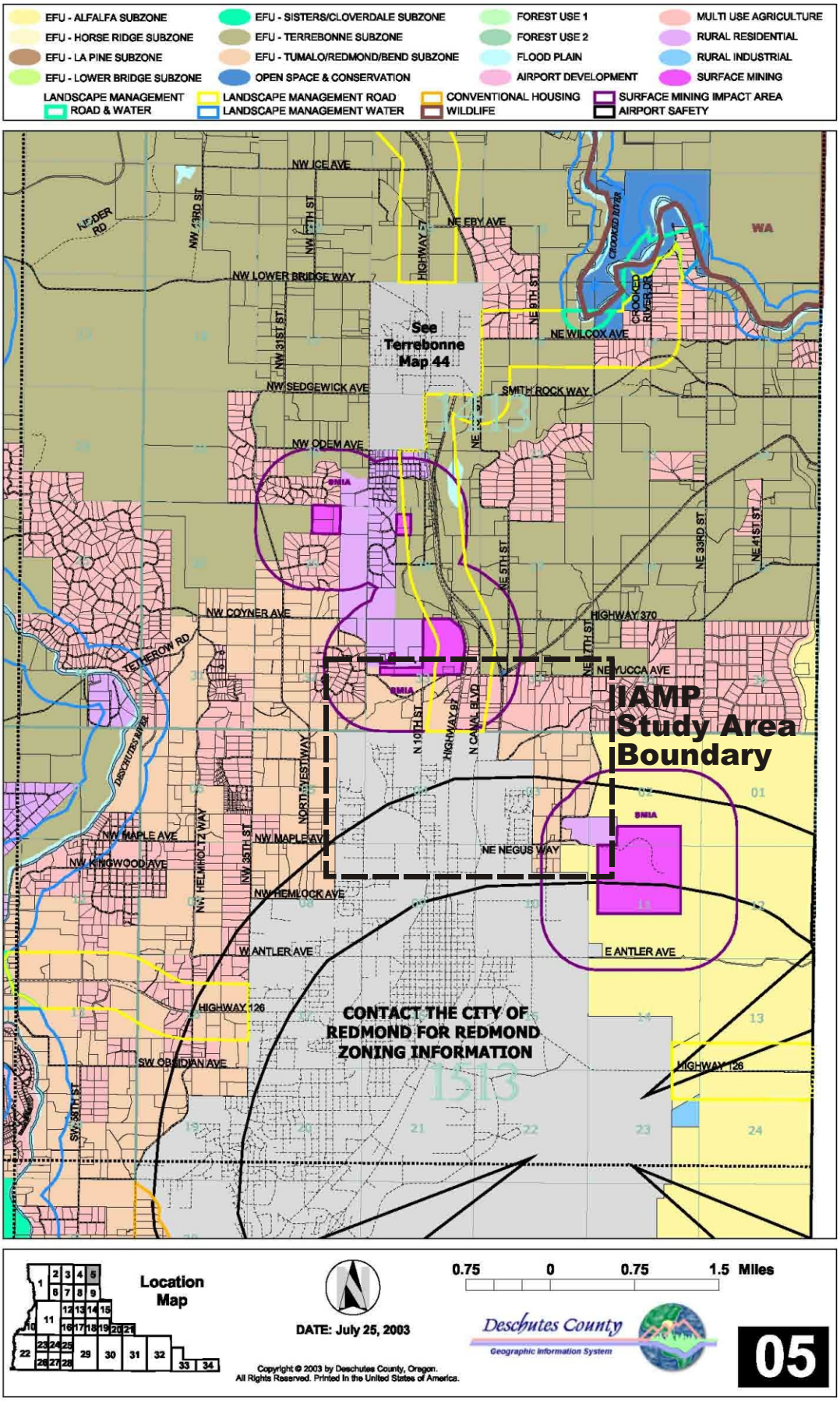
The zoning ordinances establish zoning districts and regulations governing the development and use of land within portions of the county. Figure 1.8 displays an adopted zone map for lands outside of the Redmond UGB surrounding the IAMP area and Table 1.7 provides descriptions of significant zone designations.

The County Code also includes ordinances governing the subdivision and partition of lands within the county. These include regulations pertaining to the location and design of future streets, procedures for street dedications, and requirements for subdividing and partitioning lots.

Table 1.G: Deschutes County Zoning Designations in North Redmond IAMP Area

Zone Designations	Purpose of Zone	Common Uses
EFU - Alfalfa Subzone	To preserve and maintain agricultural lands and to serve as a sanctuary for farm uses. The Alfalfa Subzone requires a proposed farm division result in parcels maintaining a minimum of 36 acres of irrigated land.	● farming ● forest harvesting ● mineral exploration ● wetlands ● minor highway improvements
EFU - Tumalo/Redmond/Bend Subzone	To preserve and maintain agricultural lands and to serve as a sanctuary for farm uses. The Tumalo/Redmond/Bend Subzone requires a proposed farm division result in parcels maintaining a minimum of 23 acres of irrigated land.	● farming ● forest harvesting ● mineral exploration ● wetlands ● minor highway improvements
Multi-Use Agriculture	To preserve the rural character of various areas of the County while permitting development consistent with that character and with the capacity of the natural resources of the area, maintain agricultural lands not suited to full-time commercial farming for diversified or part-time agricultural uses, conserve forest lands, conserve open spaces and protect natural and scenic resources, and maintain and improve the quality of the air, water and land resources of the County.	● agricultural uses ● single family dwellings ● manufactured homes ● forest harvesting ● some highway improvements ● non-commercial horse stables ● limited horse events
Rural Residential	To provide rural residential living environments, provide standards for rural land use and development consistent with desired rural character and the capability of the land and natural resources, manage the extension of public services, provide for public review of nonresidential uses, and balance the public's interest in the management of community growth with the protection of individual property rights through review procedures and standards.	● single family dwellings ● manufactured homes ● utility facilities ● community centers ● agricultural uses ● some highway improvements ● non-commercial horse stables ● limited horse events

Zone Designations	Purpose of Zone	Common Uses
Surface Mining	To allow the development and use of identified deposits of mineral and aggregate resources, protect the health and safety of the public and of residents of property adjoining surface mines, and provide that all land and water resources affected by surface mining operations within the County receive the protection and reclamation necessary for their intended subsequent use.	● farm uses ● forest uses ● land disposal sites ● extraction of minerals ● stockpiling of minerals ● sale of minerals
Surface Mining Impact Area Combining Zone	To protect the surface mining resources of Deschutes County from new development which conflicts with the removal and processing of a mineral and aggregate resource while allowing owners of property near a surface mining site reasonable use of their property.	● includes noise and dust-sensitive use setbacks ● includes noise and dust-sensitive use limitations



DKS Associates
TRANSPORTATION SOLUTIONS

Source: Deschutes County

Figure 1.8
DESCHUTES COUNTY ZONE MAP: REDMOND-TERREBONNE AREA

Deschutes County ITS Plan

The Deschutes County Intelligent Transportation System (ITS) Plan was collectively developed by ODOT, the City of Bend, the City of Redmond, Deschutes County, the Bend Metropolitan Planning Organization, Deschutes County 9-1-1, and the Federal Highway Administration. It represents a 20-year deployment plan of ITS projects, which includes advanced technologies and management techniques aimed to improve the safety and efficiency of the transportation system. This effort is consistent with plans put together in other regions statewide to ensure that ITS strategies used are integrated and complementary.

Within the study area, planned projects over the next 20 years include installation of video monitoring cameras on US 97 between Redmond and Bend, and video monitoring cameras, electronic message signs, count stations, advanced signal timing improvements, advanced rail warning systems, and a weather station throughout the Redmond area.

Deschutes County Performance & Design Standards

In the project area, Deschutes County owns and maintains non-state facilities located outside of the Redmond UGB. All of these roads are classified as rural collectors. According to the Deschutes County Transportation System Plan, the County has adopted a goal to maintain a level of service of "D" or better during the peak hour throughout the County arterial and collector road system over the next 20 years.

The County does not maintain adopted access management spacing standards for application to public transportation improvement projects, but does have general policies indicating that access points to arterials and collectors should be limited.

Deschutes County also maintains design standards for rural roads that shall be applied to any proposed County-owned facilities.

Federal Plans & Regulations

Bureau of Land Management Upper Deschutes Resource Management Plan

The Proposed Upper Deschutes Resource Management Plan and Final Environmental Impact Statement is rooted in a planning effort that began in the 1990's. The Bureau of Land Management (BLM) team that produced this document assembled in the fall of 2000. The first document produced, the Analysis of the Management Situation (AMS), published in the fall of 2001, was based on scoping that took place in the mid-1990's and a review of existing management, condition, and uses of BLM administered lands in Central Oregon. In order to assess the social and economic conditions that could be impacted by the plan, the BLM contracted the Upper Deschutes Resource Management Plan Social Values Survey. The team took information from these two documents and public comments on the AMS and partnered with a group of private, governmental, and tribal stakeholders to identify significant issues and a range of alternatives for addressing these issues. The first product of this partnership was the Upper Deschutes Draft Resource Management Plan and Environmental Impact Statement (UDRMP/EIS), published in the fall of 2003.

After a 90-day comment period, the planning partners reconvened and considered the comments. The BLM and its partners then modified the Preferred Alternative/Proposed Management Plan and changed other parts of the draft, including a more extensive Environmental Consequences Analysis. The result is the Proposed Upper Deschutes Resource Management Plan and Final Environmental Impact Statement. The Record of Decision for the UDRMP/FEIS and the new Upper Deschutes Resource Management Plan will be published in early summer of 2005, after all protests are resolved.

The purpose of the Upper Deschutes Resource Management Plan is to guide the use, protection, and enhancement of resources on public land in the planning area through detailed descriptions of management goals, visions, objectives, allocations and allowable uses, and guidelines. The objectives for Alternative 7 (Preferred Alternative) pertaining to transportation are listed below. Any alternatives considered as part of the North Redmond IAMP that impact public lands would need to address these objectives and their corresponding guidelines.

Objective 1: Provide new or modified rights-of-way for transportation/utility corridors and communication/energy sites to meet expected demands and minimize environmental impacts.

Objective 2: Provide an integrated, functional, safe, efficient, transportation system to:

- Support approved land uses that cannot be met on private, state, or county lands;
- Provide links between local communities;
- Reduce or minimize conflicts with adjacent landowners;
- Support approved common guidelines of joint jurisdictions; and
- Balance public access needs with resource protection.

Objective 3: During the design and application process for proposed new or expanded rights-of-way, incorporate mitigating measures in the plan of development for land restoration, habitat improvement, recreation opportunities, and visual resources.

Objective 4: Identify and develop a long-term transportation system for military training use that meets specific training objectives, maximizes benefits to other users, including recreation use of public lands, and minimizes impact to natural resources.

Objective 5: Consolidate transportation and utility systems with consideration for ecological and recreational values, while providing for regional transportation systems and meeting regional objectives.

Objective 6: Provide motorized access to facilitate reasonable entry and operations for administrative purposes.

Other Documents

Area Traffic Studies

Previously completed traffic studies in the project area were obtained from ODOT to review findings and utilize any current traffic count data. Traffic studies obtained include:

- "Redmond US 97 Reroute Project", ODOT (2001);

The "US 97 Reroute Project" grew out of the concept for a truck route around downtown and was initiated to address the high traffic volumes and through truck traffic on US 97 through downtown Redmond, as well as congestion experienced at the Highland Avenue intersections with West 6th and West 5th Streets (US 97 Couplet) resulting from insufficient capacity and queue storage. The resulting alternative recommended from this project included a four-lane alternate alignment of US 97 located about four blocks to the east of the current US 97 alignment with connections to the existing highway at the City UGB or Quince Avenue to the north and just south of the proposed Highland/Glacier couplet and South Canal Boulevard on the south.

DKS Associates
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2 MEMORANDUM COMPARING FUTURE GROWTH AND TRAVEL DEMAND ALLOCATIONS

MEMORANDUM

To: Carl Springer, DKS Associates

From: Tom Armstrong

Date: July 21, 2005

Re: North Redmond IAMP –Land Use Analysis (Task 3.3)

The following table is a comparison of the future growth and development assumptions in the TAZs from the current transportation model with the development capacity based on the buildable land inventory recently completed by EcoNorthwest.

The EcoNorthwest Buildable Land Inventory (June 2005) was allocated to individual TAZs in the north Redmond study area. EcoNorthwest's density assumptions for zoning designations were used to determine future development capacity, in terms of dwelling units and employees. The transportation model TAZ households and employment allocation was analyzed to determine the growth increment between the Base Year and Future Year.

In general, the transportation model assumptions for residential development are significantly higher, 30% or nearly 800 dwelling units, in the study area. This difference is mainly found in TAZs that include the outer edge of the UGB. This is likely due in part to a deficit of buildable land to meet future housing needs and the TAZs were over allocated to reflect the potential for future UGB expansions.

In general, the differences in the employment allocations can be attributed to differences in the employment density assumptions (jobs per acre) and the impact of the bypass right-of-way on buildable lands. Underlying assumptions for the transportation model allocation were unavailable at this time to cross check the assumptions.

With respect to the pending proposal for a Wal-Mart near the intersection of Highway 97 and Maple Avenue, the transportation model does include a significant amount of retail, service and other employment (408 employees) in TAZ 208, which is a relatively small TAZ that encompasses the proposed main building. The proposed parking area is located in TAZ 110 and a proposed fuel station with frontage on Highway 97 is located in TAZ 207.

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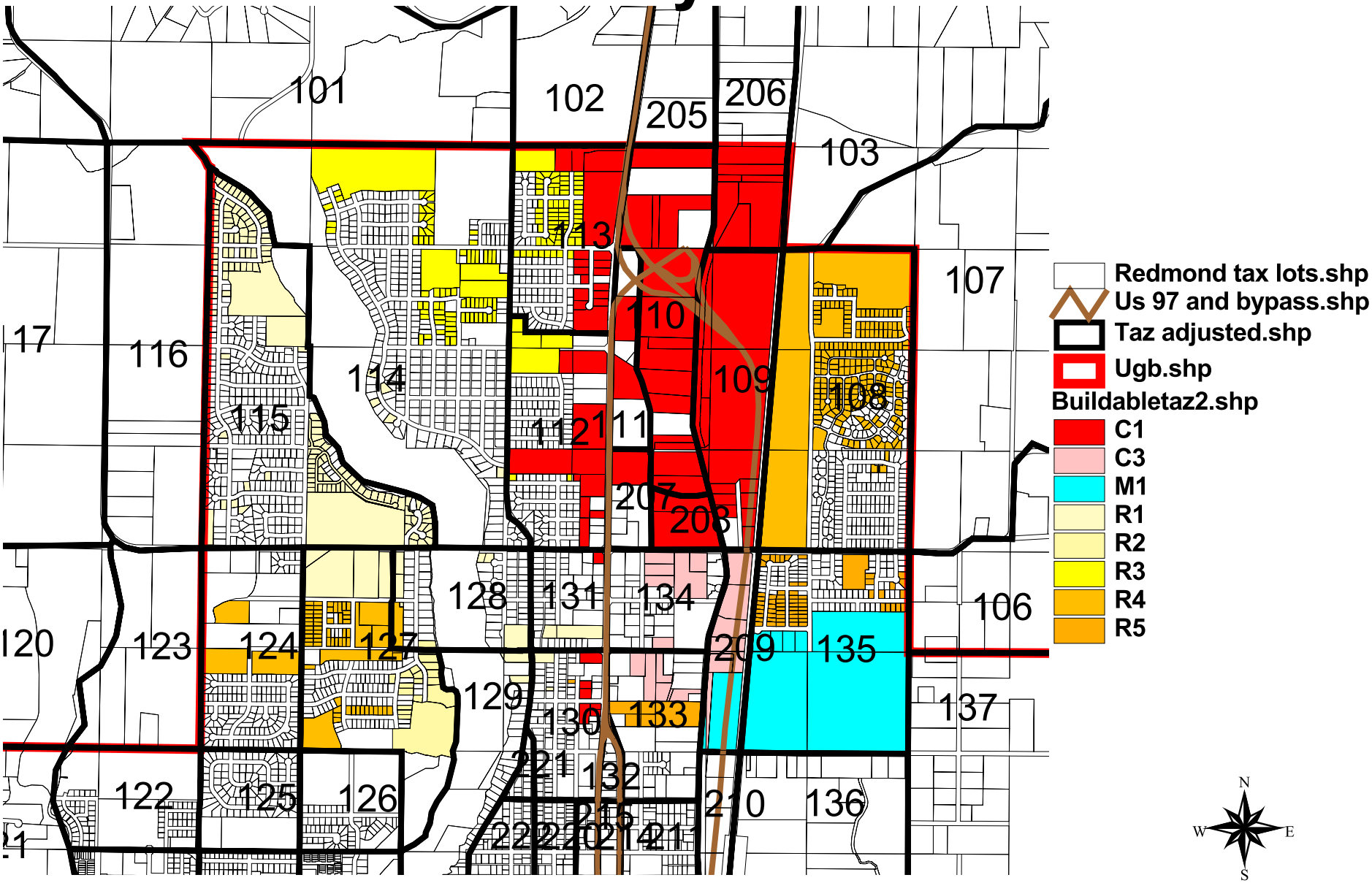
tom@winterbrookplanning.com

North Redmond Interchange Area Management Plan
Future Growth Analysis

TAZ	Residential			Employment			Comments
	BLI Capacity	TAZ Households	Difference	BLI Capacity	TAZ EMP	Difference	
108	634	448	186				Difference due to density assumptions
109				750	691	59	Minor difference
110				676	402	274	Interchange Impact Area, Wal-Mart
111				79	143	-64	Interchange Impact Area
112	45	208	-163	240	275	-35	Residential difference, employment okay
113	92	104	-12	407	296	111	Res okay, employment density assumptions
114	256	427	-171				UGB edge
115	299	649	-350				UGB edge
124	79	169	-90				UGB edge
127	328	428	-100				Density assumptions
128	33	0	33				Minor difference
129	5	0	5				Minor difference
130	5	0	5	39	10	29	Minor difference
131	3	38	-35	8	165	-157	Employment difference unknown
134				108	70	38	Minor difference, density assumptions
135	86	171	-85	230	150	80	UGB edge, employment density assumptions
206				326	173	153	Density assumptions
207				87	138	-51	Density assumptions, Wal-Mart
208				228	402	-174	Density assumptions, Wal-Mart
209				162	316	-154	Bypass impact, large industrial site assumption
Total	1865	2642	-777	3340	3231	109	

Key Assumptions and Notes:
TAZ totals are incremental growth between Base Year and Future Year.
BLI Capacity based on assumptions in EcoNorthwest Land Needs Analysis

North Redmond IAMP
Future Land Use Analysis



DKS Associates
TRANSPORTATION SOLUTIONS

3 US 97 EXISTING APPROACHES PHYSICAL INVENTORY

Table A.5.1: US 97 Existing Approach Physical Inventory

Approach #	Side of Hwy	Eng. Station	Hwy Milepoint	Width	Material	Public/Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
US 97											
1	west	41+40	120.27	40'	AC	public	-	-	-	-	NW Kingwood Avenue
2	west	43+75	120.23	35'	AC	private	151309AB00500	Bart & Judith Kirk	1241 NW 6th Street	4-Wheel Mobile Court	mobile home park
3	west	45+40	120.19	40'	CDP	private	151309AB00400	High Desert Trading, Inc.	1357 N Hwy 97	Palm Harbor Village	manufactured home sales
4	west	47+90	120.15	40'	CDP	private	151309AB00417, 300, 318, 319	Warren Family Properties LLC	1401 NW 6th Street	Redmond Mini Storage	mini-storage
5	west	49+10	120.12	30'	AC	private	151309AB00317	Joe & Samuel Burns	1421 N Hwy 97	The Boss's Office	tavern
6	west	49+60	120.11	30'	AC	private	151309AB00317	Joe & Samuel Burns	1421 N Hwy 97	The Boss's Office	tavern
							151309AB00200	Norman & Tamara Faulkner	1485 NW 6th Street	Auto Express Automotive	auto repair
7	west	51+10	120.09	30'	AC	private	151309AB00200	Norman & Tamara Faulkner	1485 NW 6th Street	Auto Express Automotive	auto repair (also shared w/TL 101)
8	west	52+60	120.06	35'	AC	private	151309AB00101, 102	Arthur Willett & N. Faulkner	1515 N Hwy 97	Redmond Body Shop / Above & Beyond	auto body & interior design (also shared w/TL 108)
9	west	54+62	120.02	50'	AC	public	-	-	-	-	NW Maple Avenue
10	west	56+72	119.98	35'	AC	private	151304DC00700	Moore Investments LLC & K. Bond	1655 N Hwy 97	Papa's Pizza	restaurant (also shared to north)
							151304DC00600	James Carpenter	1695 NW 6th Street	John's Affordable Furniture	furniture store (also shared to south)
11	west	57+22	119.97	35'	AC	private	151304DC00500	B. Lousignont & C. Ross	1707 N Hwy 97	Certified Personnel Service	employment agency
12	west	59+62	119.93	40'	CDP	private	151304DC00300, 400, 800	1785 NW 6th Street	1785 NW 6th Street	Redmond Vet Clinic	Veterinary Clinic
13	west	60+82	119.90	40'	CDP	private	151304DC00300, 400, 800	1785 NW 6th Street	1785 NW 6th Street	Redmond Vet Clinic	Veterinary Clinic
14	west	62+52	119.87	10'	AC	private	151304DC00200	W. Lehnertz	1847 NW 6th Street	-	Single Family Residence
15	west	63+72	119.85	15'	AC	private	151304DC00200	W. Lehnertz	1847 NW 6th Street	-	Single Family Residence
16	west	64+77	119.83	35'	AC	private	151304DC00100	K. & B. Newton	1921 NW 6th Street	Newton Pump, Inc.	
17	west	65+47	119.81	20'	AC	private	151304DC00100	K. & B. Newton	1967, 1995 NW 6th St	(Also serves Newton Pump, Inc.)	2 Single Family Residences
18	-	-	-	-	-	-	-	-	-	-	Future Street (Oak Ave.)
19	west	70+52	119.72	30'	AC	private	151304DB00600	Dave Hamilton Properties LLC	2067 N Hwy 97	Dave Hamilton Chevrolet	Auto sales
20	west	72+42	119.68	35'	AC	private	151304DB00600	Dave Hamilton Properties LLC	2067 N Hwy 97	Dave Hamilton Chevrolet	Auto sales
21	west	75+62	119.62	40'	AC	private	151304DB00500	Dave Hamilton Properties LLC	2109 N Hwy 97	Dave Hamilton Chevrolet	Auto sales
							151304DB00400	Feed Barn Properties LLC	2215 N Hwy 97	The Feed Barn	Trailer & Tack Shop
22	west	77+62	119.58	30'	AC	private	151304DB00400, 100	Feed Barn Properties LLC	2215 N Hwy 97	The Feed Barn	Trailer & Tack Shop
23	west	79+52	119.55	25'	Dirt	private	151304DB00100	Feed Barn Properties LLC	2375 N Hwy 97	The Feed Barn	Trailer & Tack Shop (storage yard)
24	west	81+02	119.52	40'	AC	public	-	-	-	-	NW Quince Avenue
25	west	94+02	119.27	30'	AC	public	-	-	-	-	NW Spruce Avenue
26	west	104+42	119.08	40'	Dirt	private	151304AB00100	Watson Family Limited Partnership	3181 N Hwy 97	-	not used - curb cut infront of field
27	west	105+72	119.05	40'	Dirt	private	151304AB00100	Watson Family Limited Partnership	3181 N Hwy 97	-	not used - curb cut infront of field
28	west	107+82	119.01	25'	AC	private	151304AB00101	unknown	3199 N Hwy 97	Moose Lodge 323	meeting place (also shared w/TL 1800)
							1413330001800	Robert Hershey	3211 N Hwy 97	-	Single Family Residence (also shared w/TL 101)
29	west	121+77	118.75	30'	AC	private	1413330002001	Patrick & Teresa Schaffner	3265 N Hwy 97	Teresa's Tack Wash & Repair	Trailer & Tack Shop
30	west	123+22	118.72	30'	AC	private	1413330002000	Brent Woodward	3635 N Hwy 97	-	Single Family Residence

Table A.5.1 (continued): US 97 Existing Approach Physical Inventory

Approach #	Side of Hwy	Eng. Station	Hwy Milepoint	Width	Material	Public/Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
31	west	126+22	118.66	35'	AC	private	1413330002000	Brent Woodward	3743 N Hwy 97	B. Woodward Inc.	heavy equipment (also shared w/TL 1902)
32	west	127+22	118.65	25'	AC	private	1413330001902	Vance Fortenberry	3791 N Hwy 97	Whittle Shop	Chainsaw Sculpture
33	west	128+17	118.63	30'	AC	private	1413330001901	unknown	3833 NW 6th Street	-	Single Family Residence
34	west	129+72	118.60	20'	AC	private	1413330001901	unknown	3833 NW 6th Street	-	Single Family Residence
35	west	132+12	118.55	20'	Dirt	private	1413330001801	unknown	-	-	field access
36	west	134+17	118.52	40'	AC	public	-	-	-	-	NW Pershall Way
37	east	134+17	118.52	40'	AC	public	-	-	-	-	O'Niel Hwy (OR 370)
38	east	130+97	118.58	35'	AC	private	1413330002300	Michael W Kirchnavy ETAL	3864 N Hwy 97	O'Neil Junction Feed	feed shop
39	east	128+87	118.62	35'	AC	private	1413330002300	Michael Kirchnavy ETAL	3864 N Hwy 97	O'Neil Junction Feed	feed shop
40	east	126+47	118.67	35'	Dirt	private	1413330002300	Michael Kirchnavy ETAL	3864 N Hwy 97	-	field, not in use
41	east	124+52	118.70	30'	AC	private	1413330002200	Robert W Kirchnavy	3690 N Hwy 97	Grande Valley Ornament Iron	retail sales
42	east	122+47	118.74	30'	AC	private	1413330002100	Violet Green	3614 N Hwy 97	-	Single Family Residence
43	east	120+67	118.78	12'	AC	private	1413330002100	Violet Green	3614 N Hwy 97	-	Single Family Residence
44	east	119+67	118.79	40'	Dirt	private	1413330002600	Gurtrude Morgan	3435 NW Canal Blvd	-	field access
45	east	107+42	119.03	35'	Dirt	private	1413330002601	John & Juanita Ryan	3315 N Canal Blvd	-	not used
46	east	105+97	119.05	35'	AC	private	151304AA00200	Gary Craven	3190 N Hwy 97	Big Country RV	RV sales/service
47	east	104+57	119.08	30'	AC	private	151304AA00200	Gary Craven	3190 N Hwy 97	Big Country RV	RV sales/service
48	east	101+17	119.15	30'	AC	private	151304AA00100	MDK Investments & Donald Rogers	3001 NW Canal Blvd	Secure Storage	not in use
49	east	100+37	119.16	50'	AC	private	151304AA00400	ODOT	2830 N Hwy 97	-	parking lot (formerly Alpine Mtn. Homes)
50	east	94+97	119.26	45'	AC	private	151304AA00400	ODOT	2830 N Hwy 97	-	dirt lot
51	east	94+17	119.27	12'	Dirt	private	151304AA00400	ODOT	2830 N Hwy 97	-	dirt lot
52	east	93+52	119.28	25'	Dirt	private	151304AD00200	Watson Family Limited Partnership	2723 NW Canal Blvd	-	field, not in use
53	east	90+62	119.34	15'	AC	private	151304AD00200	Watson Family Limited Partnership	2723 NW Canal Blvd	-	gated field access
54	east	87+72	119.39	30'	AC	private	151304AD00300	C.O.I.D & US National Bank	2598 N Hwy 97	Central Oregon Irrigation District	business
55	east	87+32	119.40	25'	AC	private	151304AD00300	C.O.I.D & US National Bank	2598 N Hwy 97	Central Oregon Irrigation District	business
56	east	86+02	119.43	35'	AC	private	151304AD00300	C.O.I.D & US National Bank	2598 N Hwy 97	Central Oregon Irrigation District	business
57	east	84+22	119.46	40'	AC	private	151304AD00300	C.O.I.D & US National Bank	2598 N Hwy 97	Central Oregon Irrigation District	business
58	east	81+52	119.51	20'	AC	private	151304DA00900	A. Milone & R. Rossi	2422 N Hwy 97	Approve Auto Sales	auto sales
59	-	-	-	-	-	-	-	-	-	-	Future Street (Quince Ave.)
60	east	80+92	119.52	20'	AC	private	151304DA00900	A. Milone & R. Rossi	2422 N Hwy 97	Approve Auto Sales	auto sales
61	east	80+12	119.54	10'	Dirt	private	151304DA01000	M. Mills & Moss Group LLC	2310 N Hwy 97	-	multi-property backage road
62	east	79+62	119.55	50'	AC	private	151304DA01000	M. Mills & Moss Group LLC	2310 N Hwy 97	Pacific Pride	Commercial Fueling
63	east	77+62	119.58	60'	AC	private	151304DA01000	M. Mills & Moss Group LLC	2310 N Hwy 97	Pacific Pride	Commercial Fueling
64	east	74+52	119.64	35'	AC	private	151304DA00600	unknown	2098 N Hwy 97	-	dirt lot
65	east	70+62	119.72	35'	AC	private	151304DA00600	unknown	2098 N Hwy 97	Cental Electric Cooperative, Inc.	office/maintenance yard

Table A.5.1 (continued): US 97 Existing Approach Physical Inventory

Approach #	Side of Hwy	Eng. Station	Hwy Milepoint	Width	Material	Public/Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
66	east	68+27	119.76	30'	AC	private	151304DA00600	unknown	2098 N Hwy 97	Cental Electric Cooperative, Inc.	office/maintenance yard
67	-	-	-	-	-	-	-	-	-	-	Future Street (Oak Ave.)
68	east	67+62	119.77	35'	AC	private	151304DD00600	Gurtrude Morgan	1938 N Hwy 97	-	empty lot with billboard
69	east	63+32	119.86	35'	AC	private	151304DD00700	W. Gray & S. Zitek	1826 N Hwy 97	Wally's Auto Sales	auto sales
70	east	61+52	119.89	25'	AC	private	151304DD00700	W. Gray & S. Zitek	1826 N Hwy 97	Wally's Auto Sales	auto sales
71	east	60+12	119.92	40'	AC	private	151304DD00800	Michael Ivancovich	1690 N Hwy 97	Oakwood Homes	manufactured home sales
72	east	57+82	119.96	35'	AC	private	151304DD00900	Michael Ivancovich	1690 N Hwy 97	Oakwood Homes	manufactured home sales
73	east	54+62	120.02	45'	AC	public	-	-	-	-	NW Maple Avenue
74	east	52+62	120.06	35	AC	private	151309AA01100	E. Cordes & B. Santucci	1520 N Hwy 97	Action Rental	party supplies sales
75	east	51+42	120.08	20'	AC	private	151309AA01100	E. Cordes & B. Santucci	1520 N Hwy 97	Mailbox Alternatives	business
76	east	51+07	120.08	35'	AC	private	151309AA01000	William Park	1492 NW 6th Street	SAT PAK Corp.	office
77	east	49+82	120.11	30'	AC	private	151309AA01000	William Park	1492 NW 6th Street	SAT PAK Corp.	office
78	east	49+42	120.12	35'	Dirt	private	151309AA00900	Autumn Funerals & Highlakes Inv.	485 NW Larch Ave	Autumn Funerals	not in use; fenced off
79	east	48+03	120.15	40'	AC	public	-	-	-	-	NW Larch Avenue
80	east	45+43	120.20	35'	AC	private	151309AA01601	J. Gunzner & K. Eby	1344 N Hwy 97	Redmond Auto Care	auto parts store
							151309AA01601	J. Gunzner & K. Eby	1280 N Hwy 97	The Buggy Stop Market	mini-mart
							151309AA01601	J. Gunzner & K. Eby	-	Rainbow Laundry	laundromat
81	east	43+53	120.24	35'	AC	private	151309AA01601	J. Gunzner & K. Eby	1280 N Hwy 97	The Buggy Stop Market/Rainbow Laund.	mini-mart & laundary
							151309AA01600	Frances Hahn Investments LLC	515 NW Kingwood	Creative Exhaust Works	auto shop
82	east	42+83	120.25	35'	AC	private	151309AA01600	Frances Hahn Investments LLC	515 NW Kingwood	Creative Exhaust Works	auto shop
83	east	41+40	120.27	40'	AC	public	-	-	-	-	NW Kingwood Avenue
N. Canal Boulevard											
84	west					private	151304AA00700		2931 NW Canal Blvd.	-	Single Family Residence
85	west					private	151304AA00600	Hayden Watson	2983 NW Canal Blvd.	-	Single Family Residence
86	west					private	151304AA00600	Hayden Watson	2983 NW Canal Blvd.	-	Single Family Residence
87	west					private	151304AA00100	MDK Investments & Donald Rogers	3001 NW Canal Blvd	Secure Storage	Rental storage facility
88	-	-	-	-	-	-	-	-	-	-	Future Street (King Way)
89	west					private	1413330002601	John & Juanita Ryan	3315 NW Canal Blvd.	-	Single Family Residence
90	-	-	-	-	-	-	-	-	-	-	Future Street
91	west					private	1413330002500	Morgan & Lavonne Smith	3861 NW Canal Blvd.		business
92	west					private	1413330002500	Morgan & Lavonne Smith	3861 NW Canal Blvd.		business
93	west					public	-	-	-	-	O'Neil Highway
94	east					public	-	-	-	-	O'Neil Highway
95	east					private	1413340001200	Colleen Mullaney	3990 NW Canal Blvd.	-	Single Family Residence
96	-	-	-	-	-	-	-	-	-	-	Future Street

Table A.5.1 (continued): US 97 Existing Approach Physical Inventory

Approach #	Side of Hwy	Eng. Station	Hwy Milepoint	Width	Material	Public/Private	Tax Lot #	Property Owner(s)	Address	Business Name	Use
97	east					private	1413340001202	Wassa Starr	3750 NW Canal Blvd.	-	Single Family Residence
98	east					private	1413340001201	Carlos Miller	3620 NW Canal Blvd.	-	Single Family Residence
99	east					private	1413340001201	Carlos Miller	3620 NW Canal Blvd.	-	Single Family Residence
100	-	-	-	-	-	-	-	-	-	-	Future Street
101	east					private	1413340001300	Robert & Betty Anderson	3546 NW Canal Blvd.	-	Single Family Residence
102	east					private	1413340001400	Robert Perry	3488 NW Canal Blvd.	-	Single Family Residence
103	east					private	1413340001500	Hart Family LP & Deborah Schmidt	3430 NW Canal Blvd.	-	Single Family Residence
104	east					private	1413340001602	Jack Owen & Jeffrey Defreest	3310 NW Canal Blvd.	-	Single Family Residence
105	east					private	1413340001601	Chani & Bradley Haynes	3276 NW Canal Blvd.	-	Single Family Residence
106	east					private	1413340001601	Chani & Bradley Haynes	3277 NW Canal Blvd.	-	Single Family Residence
107	east					private	1413340001700		3218 NW Canal Blvd.	-	Single Family Residence
108	-	-	-	-	-	-	-	-	-	-	Future Street (King Way)
109	east					private	1413340001700		3218 NW Canal Blvd.	-	Single Family Residence
110	east					private	1513030000900		3148 NW Canal Blvd.	-	Single Family Residence
111	east					private	1513030000800	Jim Stroup	3106 NW Canal Blvd.	-	Single Family Residence
112	east					private	1513030000800	Jim Stroup	3106 NW Canal Blvd.	-	Single Family Residence
113	east					private	1513030000801	George Addington	3070 NW Canal Blvd.	-	Single Family Residence
114	east					private	1513030001000		2956 NW Canal Blvd.	-	Single Family Residence
115	east					private	1513030001000			-	Single Family Residence
116	-	-	-	-	-	-	-	-	-	-	Future Street (King Way)

4 US 97 EXISTING APPROACH ACCESS RIGHTS

Table A4: US 97 Existing Approach Access Rights

Approach #	Permit No.	Hwy Station	Permitted Width	Surface Type	Permitted Use	R/W File No.	Reservation Station	Reservation Width
1					Kingwood Ave	-	-	-
2						57551	abutter's rights	-
3						57553	abutter's rights	-
4						57555	abutter's rights	-
5						57556	abutter's rights	-
6						57557	abutter's rights	-
7						57557	abutter's rights	-
8						57559	52+64	35'
9					Maple Ave	-	-	-
10						57563 / 57565	56+79	35'
11						57566	58+27	35'
12						57567	59+67	35'
13						57567	60+76	35'
14						57568	62+50	35'
15						57568	63+73	35'
16						57569	64+73	35'
17						57569	65+52	35'
18	(future Oak Avenue)							
19	-	-	-	-	-	57571	70+52	35'
20	-	-	-	-	-	57571	72+41	35'
21	-	-	-	-	-	57573 / 57574	75+65	35'
22	-	-	-	-	-	57574 / 57575	77+63	35'
23	-	-	-	-	-	57575	79+47	35'
24	10A35549	80+98	40'	paved	Quince Ave	-	-	-
25	10A35493	94+01	27.5'	paved	Spruce Ave	-	-	-
26	-	-	-	-	-	57583	104+20	35'

Approach #	Permit No.	Hwy Station	Permitted Width	Surface Type	Permitted Use	R/W File No.	Reservation Station	Reservation Width
27	27019	105+90	24'	gravel	residence	57583	105+50	35'
28	-	-	-	-	-	57583	107+63	35'
29	-	-	-	-	-	57589	121+48	35'
30	-	-	-	-	-	57591	122+89	35'
31	-	-	-	-	-	57591 / 57593	125+81	35'
32	-	-	-	-	-	57593	126+85	35'
33	18918	125+92	35'	paved	business office	57595	127+84	35'
34	18918	126+64	24'	paved	business office	57595	129+04	35'
35	-	-	-	-	-	57595	131+95	35'
36	21813	88+70	24'	gravel	residence	-	-	-
37	-	-	-	-	O'Neil Highway	-	-	-
38	14700	130+90	20'	gravel	second hand furn.	57592	131+35	35'
39	14700	130+30	20'	gravel	second hand furn.	57592	129+29	35'
40	-	-	-	-	-	57592	126+85	35'
41	-	-	-	-	-	57590	124+87	35'
42	13036	123+90	30'	gravel	machine shop	57588	122+89	35'
43	-	-	-	-	-	57588	121+12	35'
44	-	-	-	-	-	57586	120+00	35'
45	-	-	-	-	-	57585	107+69	35'
46	22565	106+20	30'	paved	commercial	57585	106+17	35'
47	22565	105+05	30'	paved	commercial	57584 / 57585	104+80	35'
48	-	-	-	-	-	57584	102+40	35'
49	10A35391	100+45	30'	paved	man. home sales	ODOT Purchased	-	-
50	15154	98+00	35'	cinder	serv. station, bulk	ODOT Purchased	-	-
51	12878	95+20	30'	gravel	bulk gas	ODOT Purchased	-	-
52	-	-	-	-	-	57580	93+50	35'
53	-	-	-	-	-	57580	90+57	35'
54	-	-	-	-	-	57578	87+66	35'
55	20181	87+27	3 @ 25'	-	Mann Const. Co.	57578	87+27	35'

Approach #	Permit No.	Hwy Station	Permitted Width	Surface Type	Permitted Use	R/W File No.	Reservation Station	Reservation Width
56	-	-	-	-	-	57578	85+93	35'
57	-	-	-	-	-	57578	83+06	35'
58	15896	81+48	18'	paved	business	6983061	'US97' 2+483.5	10.6 m
59	(future Quince Avenue)							
60	15896	(MP 119.5)	24'	paved	business	6983061	'US97' 2+463.4	10.6 m
61	-	-	-	-	-	57576	80+07	35'
62	-	-	-	-	-	57576	79+47	50'
63	-	-	-	-	-	57576	77+50	50'
64	-	-	-	-	-	57572 / 57576	74+36	35'
65	-	-	-	-	-	57572	70+52	35'
66	-	-	-	-	-	57572	68+12	35'
67	(future Oak Avenue)							
68						57570	67+44	35'
69						57570	63+13	35'
70						57528	61+35	35'
71						57564	59+83	35'
72						57564	57+75	35'
73					Maple Ave	-	-	-
74						57560	access restricted	-
75						57560	access restricted	-
76						57558	abutter's rights	-
77						57558	-	-
78						57554	-	-
79					Larch Ave	-	-	-
80						57550	-	-
81						57550	-	-
							-	-
82						57548	-	-
83					Kingwood Ave	-	-	-

5 PLANNING-LEVEL COST ESTIMATES

Construction of Public Streets (City Collector Streets Only)					
		Unit Cost	Pay Quantity	Quantity	
Pavement Removal	$	0.50	per FT2		
Access near interchange			FT^2	60,000	
				60,000	**FT^2**
				$30,000	
Bridge Structure	$	175.00	per FT2		
North Canyon				35,100	
South Canyon				56,700	
				91,800	**FT^2**
				$16,065,000	
Roadway Structure	$	10.00	per FT2		
City Minor Collector			FT^2	256,000	
				256,000	**FT^2**
				$2,560,000	
Curb & Sidewalk	$	3.00	per FT2		
City Minor Collector			FT^2	64,000	
				64,000	**FT^2**
				$192,000	
ROW	$	10.00	per FT2		
City Minor Collector			FT^2	380,400	
				380,400	**FT^2**
				$3,804,000	
			Total Unadjusted Cost Est.	$22,651,000	
			E&C Factor	1.5	
			Adjusted Estimated Cost	**$33,976,500**	

Construction of Public Streets (City Local Streets Only)					
		Unit Cost	Pay Quantity	Quantity	
Pavement Removal	$	0.50	per FT2		
			FT^2		
				0	**FT^2**
				$0	
Bridge Structure	$	175.00	per FT2		
				0	**FT^2**
				$0	
Roadway Structure	$	10.00	per FT2		
City Local Residential			FT^2	325,800	
				325,800	**FT^2**
				$3,258,000	
Curb & Sidewalk	$	3.00	per FT2		
City Local Residential			FT^2	90,300	
				90,300	**FT^2**
				$270,900	
ROW	$	10.00	per FT2		
City Local Residential			FT^2	541,800	
				541,800	**FT^2**
				$5,418,000	
			Total Unadjusted Cost Est.	$8,946,900	
			E&C Factor	1.5	
			Adjusted Estimated Cost	**$13,420,350**	

Construction of Public Streets (County Collector Roads Only)					
		Unit Cost	Pay Quantity	Quantity	
Pavement Removal	$	0.50	per FT2		
			FT^2		
				0	**FT^2**
				$0	
Bridge Structure	$	175.00	per FT2		
				0	**FT^2**
				$0	
Roadway Structure	$	10.00	per FT2		
County Collector			FT^2	297,000	
				297,000	**FT^2**
				$2,970,000	
Curb & Sidewalk	$	3.00	per FT2		
				0	**FT^2**
				$0	
ROW	$	10.00	per FT2		
County Collector			FT^2	594,000	
				594,000	**FT^2**
				$5,940,000	
			Total Unadjusted Cost Est.	$8,910,000	
			E&C Factor	1.5	
			Adjusted Estimated Cost	**$13,365,000**	

Construction of Public Streets (County Local Roads Only)					
		Unit Cost	Pay Quantity	Quantity	
Pavement Removal	$	0.50	per FT2		
			FT^2		
				0	**FT^2**
				$0	
Bridge Structure	$	175.00	per FT2		
North Canal				1,600	
Central Canal				1,600	
South Canal				1,900	
				5,100	**FT^2**
				$892,500	
Roadway Structure	$	10.00	per FT2		
County Local			FT^2	379,200	
				379,200	**FT^2**
				$3,792,000	
Curb & Sidewalk	$	3.00	per FT2		
				0	**FT^2**
				$0	
ROW	$	10.00	per FT2		
County Local			FT^2	946,500	
				946,500	**FT^2**
				$9,465,000	
			Total Unadjusted Cost Est.	$14,149,500	
			E&C Factor	1.5	
			Adjusted Estimated Cost	**$21,224,250**	

Capacity Improvements at Maple Ave / 9th St (Does not include capacity improvements already in City CIP)				
	Unit Cost		Pay Quantity	Quantity
Traffic Signals	$ 175,000.00	EA		1
Interconnect	$ 45.00	per FT		1000
			$	**220,000.00**
	Total Unadjusted Cost Est.			$220,000
	E&C Factor			1
	Adjusted Estimated Cost			**$220,000**

US 97/O'Neil Highway Alt. 1: Turn Restrictions				
	Unit Cost		Pay Quantity	Quantity
Pavement Removal	$ 0.50	per FT2		
		FT^2		
				0 FT^2
				$0
Bridge Structure	$ 175.00	per FT2		
				0 FT^2
				$0
Roadway Structure	$ 10.00	per FT2		
				0 FT^2
				$0
Traffic Control/ Median Separator				
				$150,000.00
Retaining Walls	$ 55.00	per FT2		
		FT^2		
				0 FT^2
				$0
ROW	$ 10.00	per FT2		
		FT^2		
				0 FT^2
				$0
	Total Unadjusted Cost Est.			$150,000
	E&C Factor			1.5
	Adjusted Estimated Cost			**$225,000**

US 97/O'Neil Highway Alt. 2: Offset Approaches				
	Unit Cost		Pay Quantity	Quantity
Pavement Removal	$ 0.50	per FT2		
		FT^2		4,000
				4,000 FT^2
				$2,000
Bridge Structure	$ 175.00	per FT2		
				0 FT^2
				$0
Roadway Structure	$ 10.00	per FT2		
		FT^2		35,000
				35,000 FT^2
				$350,000
Earthwork	$10.00	YD^3		
		YD^3		**0 YD^3**
				$0.00
Retaining Walls	$ 55.00	per FT2		
		FT^2		**0 FT^2**
				$0
ROW	$ 10.00	per FT2		
		FT^2		55,000
				55,000 FT^2
				$550,000
	Total Unadjusted Cost Est.			$902,000
	E&C Factor			1.5
	Adjusted Estimated Cost			**$1,353,000**

US 97/O'Neil Highway Alt. 3: Construct Overpass				
	Unit Cost		Pay Quantity	Quantity
Pavement Removal	$ 0.50	per FT2		
		FT^2		25,000
				25,000 FT^2
				$12,500
Bridge Structure	$ 175.00	per FT2		
				6,000
				6,000 FT^2
				$1,050,000
Roadway Structure	$ 10.00	per FT2		
		FT^2		36,000
				36,000 FT^2
				$360,000
Earthwork	$10.00	YD^3		
		YD^3		23,705
				23,705 YD^3
				$237,050.00
Retaining Walls	$ 55.00	per FT2		
		FT^2		**0 FT^2**
				$0
ROW	$ 10.00	per FT2		
		FT^2		49,000
				49,000 FT^2
				$490,000
	Total Unadjusted Cost Est.			$2,149,550
	E&C Factor			1.5
	Adjusted Estimated Cost			**$3,224,325**

6 ALTERNATIVES EVALUATION

Alternative Evaluation

Using the objectives for the North Redmond IAMP outlined in Chapter #2, the alternatives proposed were evaluated to ensure the goals established at the outset of the project would be met. The results of this evaluation are shown below.

Objective 1: The preparation of the IAMP shall involve affected property owners in the interchange area, the City of Redmond, Deschutes County, The Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users.

Evaluation Criteria

a. The IAMP incorporates input and guidance from the Project Management Team (PMT).

   The PMT formed provides opportunities for participation from ODOT, the City of Redmond, Deschutes County, the Department of Land Conservation and Development, the Bureau of Land Management, the Redmond Airport, the Deschutes County Fairgrounds, Deschutes County Sheriff Emergency Services, Redmond Fire and Rescue, the Oregon National Guard, and Burlington Northern Santa Fe Railroad. In addition to distribution of materials for review, four meetings with the PMT have been incorporated into the project schedule, including input provided at the project outset to assist in forming the project goals and objectives, review of the operating conditions analysis, participation in the selection of alternatives, and review and comment on the draft IAMP.

b. The IAMP reflects, to the extent possible, the input of local property owners, interchange users, and other stakeholders, as gathered through public comments.

   In addition to input received from the PMT, ODOT, the City of Redmond, and Deschutes County will accept input from property owners impacted by the access management plan prior to implementation.

Objective 2: The IAMP shall evaluate local transportation, environmental, and land use conditions.

Evaluation Criteria

a. The IAMP identifies and addresses existing and foreseeable issues related to land use, mobility, accessibility, and safety within the analysis area of the planned interchange.

   Technical Memoranda #3 and #4 examined land use, operational, and safety conditions under existing (2005) and future (2025) conditions within the IAMP

boundary, with deficiencies needing to be addressed clearly identified. Chapter #5 provides alternatives for addressing noted deficiencies.

b. The IAMP describes the roadway network, right-of-way, access control and land parcels in the Interchange Study Area. It also evaluates local street access, circulation, connectivity, and the potential effect of local land use designations on the interchange.

The roadway network, right of way, and land parcels have been identified in figures included in Technical Memoranda #3, #4, and #5, with detailed physical descriptions of each existing approach to US 97 and Canal Boulevard provided in Table A.5.1 and the access rights associated with individual properties provided in Table A.5.2. Local street access, circulation, and connectivity were evaluated in Chapter #4, with a recommended local connectivity plan to improve conditions included in Chapter #5. Chapter #5 also evaluated the impact on the IAMP area transportation system resulting from potential increased development intensity on lands surrounding the interchange.

c. The IAMP includes inventory maps summarizing the existing conditions within the Interchange Study Area.

Inventory maps identifying existing zoning, transportation facilities, access points, traffic controls, geometrics, and traffic volumes are provided in Chapter #3. Additional maps showing state highway classifications, planned transportation facilities, and urban reserve areas are provided in Chapter #1.

d. The IAMP identifies and either complies with or amends the policy direction from the City and County comprehensive plans, zoning codes, Transportation System Plans, and any relevant corridor plans.

A review of planning documents, policies, and regulations was undertaken in Chapter #1 to provide an understanding of applicable requirements and policies and to guide the development of project goals and objectives. Compliance with the direction in the documents is described below.

Deschutes County Comprehensive Plan, Transportation System Plan, and County Code – The recommended actions in the IAMP affecting Deschutes County include the jurisdictional transfer of Canal Boulevard to the Oregon Department of Transportation, the implementation of the access management plan for Canal Boulevard, and the local connectivity plan outside of the Redmond urban growth boundary (all roads proposed within Deschutes County jurisdiction will be constructed to Deschutes County design standards). The improvement of the intersection on US 97 at O'Neil Highway may also affect the County, with the ability to comply with County policies and plans depending on the final alternative selected. The County Transportation System Plan does not currently maintain access management spacing standards or plan for future streets as shown in the proposed local connectivity plan. Therefore, the IAMP and proposed

actions must be adopted as an amendment to the Deschutes County Transportation System Plan.

City of Redmond Comprehensive Plan, Transportation System Plan, and City Code: Chapter 8 – Developmental Regulations – The recommended actions in the IAMP affecting City of Redmond include the jurisdictional transfer of Canal Boulevard to the Oregon Department of Transportation, the implementation of the access management plan for US 97 and Canal Boulevard, the local connectivity plan inside the Redmond urban growth boundary (all roads proposed within Redmond jurisdiction will be constructed to City of Redmond design standards), the proposed improvements at the intersections of Maple Avenue/9th Street and US 97 (6th Street)/Kingwood Avenue, and the traffic signal plan. Among these actions, only the improvements at US 97 (6th Street)/Kingwood Avenue are currently included in the City's Transportation System Plan. Therefore, the IAMP and proposed actions must be adopted as an amendment to the City of Redmond Transportation System Plan.

US 97 Corridor Strategy (Madras – California Border), 1995 - The overall goal developed in this plan for the US 97 Corridor was to, "promote commerce by efficiently distributing good and services, while enhancing travel safety, maintaining environmental integrity and preserving regional quality of life." From this goal, six underlying corridor strategy themes were identified, including: safety enhancement, facilities management and improvement, intermodal connectors, preservation of environmental quality, economic development, and partnering. Following the completion of this document, the Deschutes County and City of Redmond Transportation System Plans were developed and adopted, incorporating the strategies from this plan. Therefore, the focus will be on compliance with theses subsequent City and County plans.

Objective 3: The IAMP shall identify needed transportation improvements within the Interchange Study Area and propose alternatives that conform to current design standards and accommodate the long-term capacity needs of the local transportation system.

Evaluation Criteria

a. The IAMP identifies and prioritizes the transportation improvements, land use, and access management plans needed to maintain acceptable traffic operations in the Interchange Study Area for the 20-year planning horizon, with the potential for remaining capacity to serve beyond the planning horizon.

The development of the IAMP included an analysis of existing and future (20-year horizon) transportation conditions, with recommendations for mitigating identified deficiencies included to ensure State, County, and City mobility standards will be met. Identified improvements were subsequently prioritized to guide future planning.

b. The IAMP includes a Transportation Improvements Map showing the opportunities to improve operations and safety within the Interchange Study Area.

   A Transportation Improvements Map is provided in Figure 5.6.

c. The IAMP identifies and describes up to three alternatives for the Interchange Area and evaluates how each would protect the safe and efficient operation of the interchange. The evaluation identifies how each alternative meets the provisions of OAR 734-051-0155 and other applicable state laws. A preferred alternative is selected and recommended for adoption.

   Alternatives for providing safe and efficient operation of the interchange included the implementation of an access management plan, the enhancement of local connectivity through an expanded public street system, capacity improvements to address poorly functioning intersections, and the development of a traffic signal plan to promote the orderly planning and implementation of traffic controls through the IAMP area. Selected alternatives were included in a Transportation Improvements Map and prioritized to identify timing of implementation. For a discussion on compliance with OAR 734-051-0155, see Objective 4 below.

Objective 4: The IAMP shall be developed in accordance with the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.

Evaluation Criteria

a. The IAMP meets the minimum level of service / mobility standards and other requirements identified in state transportation plans, such as the Oregon Transportation Plan, 1999 Oregon Highway Plan (OHP).

   The future (2025) operating conditions were analyzed and compared to ODOT, City, and County mobility standards. Where mobility standards were not shown to be met, mitigation was proposed that would restore operations such that applicable mobility standards would be met.

b. The IAMP implements the OHP's Policy 3C criteria, which requires the planning and management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.

   Policy 3C of the 1999 Oregon Highway Plan includes seven actions for implementation purposes. Compliance with these actions is demonstrated below.

Action 3C.1: *Develop interchange area management plans to protect the function of interchanges to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges.* – The adoption of this IAMP will fulfill the requirements of this action.

Action 3C.2: *To improve an existing interchange or construct a new interchange:*

- *The interchange access management spacing standards are shown in Tables 16-19 in Appendix C.* – These spacing standards have been applied to the interchange area in this IAMP.
- *These standards do not retroactively apply to interchanges existing prior to adoption of this Oregon Highway Plan, except or until any redevelopment, change of use, or highway construction, reconstruction or modernization project affecting these existing interchanges occurs. It is the goal at that time to meet the appropriate spacing standards, if possible, but, at the very least, to improve the current conditions by moving in the direction of the spacing standards.* – The proposed interchange does not already exist. However, area developments and roadways do exist, requiring a phased approach to move in the direction of the adopted access spacing standards.
- *Necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place.* – Supporting improvements are identified in the IAMP and will be adopted in the City of Redmond and Deschutes County Transportation System Plans, with funding sources identified.
- *Access to cross streets shall be consistent with established standards for a distance on either side of the ramp connections so as to reduce conflicts and manage ramp operations. The Interchange Access Management Spacing Standards supersede the Access Management Classification and Spacing Standards (Policy 3A), unless the latter distance standards are greater (see Appendix C).* – The interchange access management spacing standards have been applied to US 97 (6th Street) and Canal Boulevard as part of this plan.
- *Where possible, interchanges on Freeways and Expressways shall connect to state highways, major or minor arterials.* – The proposed interchange is not on a freeway, but is located at the southern terminus of an expressway. One of the crossroads (US 97/6th Street) is classified as a major arterial. Following the recommended jurisdictional transfer of Canal Boulevard to the Oregon Department of Transportation, O'Neil Highway would be rerouted to become the other crossroad.
- *Interchanges on Statewide, Regional or District Highways may connect to state highways, major or minor arterials, other county or city roads, or*

private roads, as appropriate. – US 97 is classified as a Statewide Highway. The proposed interchange will provide a direct connection to a major arterial (US 97/6th Street). Following the recommended jurisdictional transfer of Canal Boulevard to the Oregon Department of Transportation and the rerouting of O'Neil Highway, the proposed interchange would also connect directly to a state highway.

- *The design of urban interchanges must consider the need for transit and park-and-ride facilities, along with the interchange's effect on pedestrian and bicycle traffic.* – There is no transit service in the City of Redmond. The interchange will include bike lanes and sidewalk to provide a connection between bicycle and pedestrian facilities (existing and planned) on US 97/6th Street and Canal Boulevard.
- *When possible, access control shall be purchased on crossroads for a minimum distance of 1320 feet (400 meters) from a ramp intersection or the end of a free flow ramp terminal merge lane taper.* – The IAMP includes a recommendation that access control be purchased on US 97/6th Street and Canal Boulevard for a distance of at least 1,320 feet from the interchange ramp terminals. It is further recommended that access control be purchased for the full length of US 97 and the US 97 Reroute within the IAMP area.

Action 3C.3: *Establish criteria for when deviations to the interchange access management spacing standards may be considered. The kinds of considerations likely to be included are: location of existing parallel roadways, use of traffic controls, potential queuing, increased delays and safety impacts, and possible use of non-traversable medians for right-in/right-out movements.* – Deviations from the interchange access management spacing standards were considered primarily on the locations of existing public streets.

Action 3C.4: *When new approach roads or intersections are planned or constructed near existing interchanges, property is redeveloped or there is a change of use, wherever possible, the following access spacing and operation standards should be applied within the Interchange Access Management Area (measurements are from ramp intersection or the end of a free flow ramp terminal merge lane taper).* – The proposed interchange does not currently exist. The access management plan included as part of the IAMP will direct future access decisions.

Action 3C.5: *As opportunities arise, rights of access shall be purchased on crossroads around existing interchanges. Whenever possible, this protective buying should be for a distance of 1320 feet (400 meters) on the crossroads.* – A recommendation has been included in this IAMP to purchase access rights to the interchange crossroads for a distance of at least 1,320 feet from the interchange ramp terminals.

Action 3C.6: *Plan for and operate traffic controls within the Interchange Access Management Area with a priority of moving traffic off the main highway, freeway or Expressway and away from the interchange area. Within*

the Interchange Access Management Area, priority shall be given to operating signals for the safe and efficient operation of the interchange. – A traffic signal plan has been included as part of the IAMP to promote the orderly planning and implementation of traffic controls through the IAMP area. This plan includes a recommendation that timing plans for all future signals place a priority on the efficient operation of the interchange ramp terminals and the ability of the interchange crossroads to carry traffic away from the interchange.

Action 3C.7: *Use grade-separated crossings without connecting ramps to provide crossing corridors that relieve traffic crossing demands through interchanges.* – As part of the US 97 Reroute project, a grade separated crossing without connecting ramps will be constructed over the Reroute on Maple Avenue/Negus Way. In addition, the recommended alternative for improving operations at the intersection on US 97 at O'Neil Highway includes replacing the intersection with a grade separated crossing without connecting ramps.

c. The IAMP satisfies the requirements for interchange area management plans in OAR 734-051-0155 and other state rules, including OHP policies and standards, ODOT Division 51 interchange spacing standards, the 2003 Highway Design Manual and the Oregon Transportation Commission's OTIA conditions for interchanges.

According to OAR 734-051-0155(6), IAMPs should be consistent with the following:

- *Should be developed no later than the time an interchange is designed or is being redesigned.* – The IAMP is being developed concurrently with the interchange design.
- *Should identify opportunities to improve operations and safety in conjunction with roadway projects and property development or redevelopment and adopt strategies and development standards to capture those opportunities.* – Recommended improvements have been coordinated with planned projects in the State, County, and City adopted transportation improvement plans. The IAMP implementation plan will identify opportunities to implement the recommended improvements through roadway projects and property development.
- *Should include short, medium, and long-range actions to improve operations and safety in the interchange area.* – The IAMP includes a prioritization of improvement recommendations including short, medium, and long-range actions.
- *Should consider current and future traffic volumes and flows, roadway geometry, traffic control devices, current and planned land uses and zoning, and the location of all current and planned approaches.* – An analysis of existing (2005) and future (2025) conditions was conducted for the IAMP that accounted for current and future traffic volumes, roadway geometry, traffic control devices, land uses, and planned projects.

- *Should provide adequate assurance of the safe operation of the facility through the design traffic forecast period, typically 20 years.* – Transportation improvements are included in the IAMP to provide for operation of the interchange area and surrounding streets in accordance with adopted State, County, and City operational standards through the year 2025.
- *Should consider existing and proposed uses of the all property in the interchange area consistent with its comprehensive plan designations and zoning.* – The transportation demand modeling used for the future year analysis included development assumptions for lands within the IAMP area consistent with the County and City comprehensive plans.
- *Are consistent with any adopted Transportation System Plan, Corridor Plan, Local Comprehensive Plan, or Special Transportation Area or Urban Business Area designation, or amendments to the Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.* – As discussed previously, the IAMP actions are consistent with local plans and designations and will be adopted in the Deschutes County and City of Redmond Transportation System Plans.
- *Are consistent with the 1999 Oregon Highway Plan.* – As previously discussed, the IAMP actions are consistent with the 1999 Oregon Highway Plan.
- *Are approved by the Department through an intergovernmental agreement and adopted by the local government, and adopted into a Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055.* – The IAMP will be approved by ODOT through an intergovernmental agreement and adopted by the City of Redmond and Deschutes County, and adopted into the County and City Transportation System Plans.

All proposed improvements on State facilities were evaluated using the mobility standards in the 2003 Highway Design Manual and are intended to be constructed according to the design standards contained within that document.

Objective 5: The IAMP shall include policies and implementing measures that preserve the functionality of the interchange areas.

Evaluation Criteria

a. The IAMP identifies future land use conditions and induced effects, and identifies needed land protection measures.

An analysis of future (2025) conditions consistent with comprehensive plan zoning was performed, including a sensitivity test to examine conditions under a reasonable maximum development density on lands surrounding the

proposed interchange. From this analysis, it was found that adequate capacity was available on the area transportation system to support traffic generated by existing zoning, even when land is developed at high densities. Therefore, it has been determined that using the Transportation Planning Rule (OAR 660-12-060) to regulate proposed comprehensive plan and zoning changes in the future will be adequate to provide for protection of the interchange.

b. The IAMP includes short, medium and long-range actions to improve and maintain roadway operations and safety in the Interchange Study Area. These actions may include local street network improvements, driveway consolidations, shared roadways, access management, traffic control devices, and / or local land use actions.

   The IAMP includes a prioritization of improvement recommendations including short, medium, and long-range actions. Improvement alternatives include access management techniques, enhancement of local connectivity, and installation of traffic signals.

c. The IAMP includes amendments to Redmond and Deschutes County's Comprehensive Plans, Zoning Ordinances, Transportation System Plans, and other official documents as necessary to implement the recommended alternative for the Interchange Study Area.

   The IAMP and recommended alternatives will be adopted as part of the Deschutes County and City of Redmond Transportation System Plans.

d. The IAMP identifies likely funding sources and requirements for the construction of the infrastructure and facility improvements as new development is approved.

   Funding sources and requirements for construction of infrastructure and facility improvements will be addressed in the next steps of the IAMP development.

e. The IAMP identifies partnerships for the cooperative management of future projects and establishes a process for coordinated review of land use decisions affecting transportation facilities.

   Identification of partnerships for the cooperative management of future projects and the establishment of a process for coordinated review of land use decisions will be addressed in the next steps of the IAMP development.

f. A draft version of the IAMP is reviewed by the Redmond and Deschutes County Planning Commissions, as well as the Redmond City Council and the Deschutes County Board of Commissioners. A final draft of the IAMP is adopted by the City Council and Board of Commissioners.

   The draft IAMP will be reviewed by the Redmond and Deschutes County Planning Commissions, as well as the Redmond City Council and the Deschutes County Board of Commissioners. The final draft of the IAMP will be adopted by the City Council and Board of Commissioners.

7. CITY OF REDMOND PLAN AND CODE AMENDMENTS

North Redmond IAMP
Proposed Development Code Changes

The following is a list of decision-making items for the Interchange Area Management Plan (IAMP) for the US 97 Redmond Reroute North Interchange, to be adopted by the Oregon Transportation Commission (OTC) and the Cit of Redmond.

1. PERSHALL WAY/O'NEIL HIGHWAY (HWY 370) @ US 97 –

A. At time of development or redevelopment the City of Redmond, with concurrence from ODOT, shall restrict turning movements to right-in and right-out (RIRO) after local connectivity has been established to provide parallel routes to US 97 for properties adjacent to US 97 north of the US 97 Reroute interchange and south of Pershall Way/O'Neil Highway.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update a RIRO improvement when needed as determined by traffic analysis at US 97 and Pershall Way/O'Neil Highway. The TSP Update shall identify this improvement in the list of ***2011 – 2015 Projects***.

B. At the time the US 97 at O'Neil Highway intersection is converted to RIRO movements only, ODOT, shall evaluate rerouting the O'Neil Highway (Hwy. 370) south on North Canal Blvd. to the US 97 Reroute interchange.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update North Canal Blvd. as a possible future location of the O'Neil Highway (Hwy. 370). The TSP Update shall identify the possible relocation of Hwy 370 to North Canal Blvd. in the list of ***2011 – 2015 Projects***.

C. ODOT, the City of Redmond and Deschutes County commit to the long-term improvement to disconnect Pershall Way/O'Neil Way (Hwy 370) from US 97 and construct an overpass.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update identify disconnecting Pershall Way/O'Neil Way from US 97 and construction of an overpass as the long term improvement for this intersection. The TSP Update shall identify this improvement in the list of ***2016 – 2020 Projects***.

2. KINGWOOD AVENUE @ US 97 –

A. Redmond shall install when warranted a signal with separate left turn lanes on the Kingwood Avenue approaches to US 97 (6th Street).

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update the installation of a signal and left-turn lanes on Kingwood Avenue in the list of ***2011 – 2015 Projects,*** or when otherwise meet traffic warrants.

3. MAPLE AVENUE @ NW 9TH STREET –

A. The City of Redmond shall construct a traffic signal at this intersection when warranted.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update the installation of a signal at Maple Avenue and NW 9th Street in the list of ***2011 – 2015 Projects,*** or when otherwise meet traffic warrants.

4. TRAFFIC SIGNAL PLAN –

A. The City of Redmond shall adopt a future traffic signal plan for US Highway 97 (6th Street) and North Canal Blvd., as shown in Figure 5.3 in the IAMP, to create a guide for the orderly installation of traffic signals along US 97 and North Canal Boulevard north of the proposed US 97 Reroute interchange.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update a traffic signal plan as shown in Figure 5.3 in the IAMP.

5. LOCAL CONNECTIVITY PLAN –

A. The City of Redmond shall adopt a Local Street Connectivity Plan, Figure 5.6 of the IAMP, as a refinement plan to the Redmond TSP. The Local Street Connectivity Plan will provide local street access to all properties that abut US Highway 97 (6th Street) north of Kingwood Avenue and south of Pershall Way/O'Neil Highway. Figure 5.6 shall remain in-force until such time as ODOT and the City of Redmond agree on a revised Local Street Connectivity Plan.

IMPLEMENTING ACTION:
The City of Redmond shall incorporate where appropriate in their on-going TSP Update a Local Street Connectivity Plan for all properties that abut US Highway 97 (6th Street) north of Kingwood Avenue and south of Pershall Way/O'Neil Highway.

B. The City of Redmond shall adopt a development policy requiring all property to be developed within the IAMP area to: 1) Have immediate direct access to a local public street other than a state highway; 2) Comply with the Local Street Connectivity Plan, by extending abutting local streets to and through the area being developed; and, 3) Relinquish all direct access rights to a state highway.

IMPLEMENTING ACTION:
The City of Redmond shall –

1) Amend ***Chapter 14 (Urbanization)*** of the Redmond Comprehensive Plan, Policies section, to include within the "Master Planning" section, with the following policies:
    a) Any property to be master planned within newly annexed land within the IAMP area, shall have direct access to a local public street other than a state highway prior to development for all or part of the Master Planned Area consistent with the Local Street Connectivity Plan;
    b) Any property to be annexed to the City shall relinquish all direct access rights to a state highway as a condition of development approval.

2) Amend ***Section 8.0367, Public Works Standards and Specifications****, of the Redmond* Code to include a new paragraph (3) to read as follows: All property within the IAMP area, and annexed into the City, shall have a Master Plan that stipulates the area, as a condition of development approval, shall: (a) Have immediate direct access to a local public street other than a state highway; (b) Comply with the adopted Local Street Connectivity Plan; and, (c) Relinquish all direct access rights to a state highway.

3) ~~Amend the ***Joint Management Agreement*** with Deschutes County for the Urban Growth Boundary, Section 12, sub-section "A" to add a new item (6) to read as follows: All property within the IAMP area, and annexed into the City, shall have a Master Plan that stipulates the area, as a condition of development approval, shall: (a) Have immediate direct access to a local public street other than a state highway, (b) Comply with the adopted Local Street Connectivity Plan; and, (c) Relinquish all direct access rights to a state highway.~~

6. ACCESS MANAGEMENT PLAN FOR NORTH INTERCHANGE –

A. In addition to the Traffic Signal Plan discussed in number 4 above and described in Figure 5.3, the City of Redmond shall meet, or move in the direction of meeting, ODOT's adopted access management spacing standards for access to interchange crossroads.

1) For US 97 (6th Street) from the southbound interchange ramp terminal to a distance of 1,320 feet to the south, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which would restrict all access for the full distance of 1,320 feet. This would require processing and approval of a deviation of spacing standards.

2) *For Canal Boulevard from the northbound interchange ramp terminal to a distance of 1,320 feet to the north, the spacing standards from OAR 734-051-0125(2), Table 7 and Figure 3 apply, which would restrict all access for the full distance of 1,320 feet, with a right-in/right-out access allowed on the southbound side of Canal Boulevard no closer than 990 feet from the interchange ramp terminal.*

3) *For US 97 between the interchange and Pershall Way/O'Neil Highway, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which shall restrict all access to US 97.*

4) *For the US 97 Reroute between the interchange and Kingwood Avenue, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which shall restrict all access to US 97. An exception to these standards may be allowed for a RIRO approach at Larch Avenue, pending approval of a deviation by ODOT.*

IMPLEMENTING ACTION:

1) City of Redmond shall amend ***Chapter 12***, ***Policies*** Section, sub-section ***State Highways (Policies 20 – 24)*** of the adopted Comprehensive Plan to incorporate an access management strategy for US 97 (6th Street) and North Canal Blvd.

2) City of Redmond shall amend the Development Code to incorporate an access management strategy for US 97 (6th Street) and North Canal Blvd. The following article require amendments:

a) Article III, Subdivision and Partition Standards Section 8.2120, Master Development Plan, Sub-Section 4 (reference applicable Local Street Connectivity Plan)

b) Section 8.2135, Required Findings for Tentative Subdivision Approval, Sub-section (a) (specific reference to the TSP)

c) *Section 8.2310, Requirements for Tentative Partition Approval, Sub-Section (a) (specific reference to the TSP)*
d) *Section 8.2400, Compliance Required, Sub-section (b) (proposed streets and alleys shall comply with City of Redmond Access Management Standards)*
e) *Section 8.2405, Streets, Sub-section (1) (specific reference to local street connectivity plans in the TSP)*
f) *Section 8.2465, City of Redmond Access Management Standards Article IV, Site and Design Review Standards Section 8.3035, Design Review Criteria, Sub-Section 9 (City of Redmond Access Management Standards)*

8. US 97 REDMOND MEMORANDUM OF UNDERSTANDING

MEMORANDUM OF UNDERSTANDING
US 97 Reroute Phase 1 relating to Long Range Planning for US 97 in Redmond

This Memorandum of Understanding is made and entered into by and between the STATE OF OREGON, by and through its Department of Transportation, hereinafter referred to as "ODOT" and THE CITY OF REDMOND, by and through its elected officials, hereinafter referred to as "CITY".

BACKGROUND and PURPOSE:

1. Whereas ODOT and the CITY plan to complete construction of the US 97 Reroute Phase 1 Project, hereinafter referred to as "Project" and described in Exhibit A, attached hereto and by this reference made a part hereof, and;

2. Whereas, the purpose of the Project is to construct a new US 97 alignment parallel to the existing highway, increasing north-south US 97 traffic capacity, and reducing traffic congestion and heavy truck usage in the Redmond downtown area along the 5th/6th Street couplet (which is currently part of existing US 97), and;

3. Whereas ODOT and the CITY have an executed Cooperative Improvement Agreement in place (#18,338 as amended), providing for the roles and responsibilities of Project delivery;

4. Whereas, beyond delivery of the Project, ODOT and the CITY agree it is a priority to maximize and protect the public's investment in the Project for the longest practical time. In order to achieve this priority, ODOT and the CITY are developing long-term transportation and land use measures (e.g., policies, regulations, procedures) associated with the Project, for which they have yet to complete the expected public process, and then their respective approvals and/or adoptions, and implementation.

THEREFORE, THE CITY AND ODOT AGREE TO THE FOLLOWING:

1. The Project is the first phase of needed modernization improvements for all of US 97 through Redmond, and therefore the completed Project will be integrated into a long-term new alignment of US 97 from Redmond's north Urban Growth Boundary (UGB) to Redmond's south UGB. It is also important to note that the preferred US 97 alignment through Redmond may extend outside the UGB, for example to Quarry Road.

2. Work cooperatively to complete, approve, adopt through the appropriate public process as required, and implement the following:

   A. An Access Management Plan (AMP) for the Project (outside of the Project's north interchange area), consistent with the decision-making outlined in Exhibit B, attached hereto and by this reference made a part hereof. The Parties are

committed to begin in November 2006 the adoption of changes to local ordinances and policies which implement this AMP.

B. An Interchange Area Management Plan (IAMP) for the north end of the Project (including an AMP for the north interchange), where adoption of this IAMP will be consistent with the decision-making outlined in Exhibit C, attached hereto and by this reference made a part hereof. Both parties recognize that construction of the interchange ramps may be delayed until this IAMP is adopted. The Parties are committed to begin in November 2006 the adoption of changes to local ordinances and policies that implement this IAMP, and to complete the adoption process prior to construction contracting of the Project's interchange ramps.

C. A Refinement Plan for future phases of US 97 improvements in Redmond, where adoption of this Refinement Plan will be consistent with the decision-making outlined in Exhibit D, attached hereto and by this reference made a part hereof. The Parties are committed to begin in January 2007 the adoption process for this Refinement Plan, and to complete the adoption process by May 2007.

D. A US 97 Area Plan as the master plan for the north end of Redmond, as defined in the Redmond Zoning Ordinance, for land use and local street connectivity for the area described in Exhibit D. The Parties are committed to adoption of this Area Plan prior to annexation and development of the affected property.

The four above referenced plans will provide land use and transportation policies for inclusion into Redmond's Comprehensive Plan which will, at a minimum, help protect the completed Project to ensure that it continues to meet the identified function and mobility standards for its classification as set by the *Oregon Highway Plan*. The land use and transportation policies will guide the CITY in development and review of proposed land uses within the Project area.

3. Amend Cooperative Improvement Agreement #18,338 (as amended) as needed to reflect any notable changes in Project status, such as roles and responsibilities, cost estimate, financing.

4. ODOT will conduct a *US 97 Crooked River to O'Neil Highway Refinement Plan*, which they expect to begin in 2008, and they will closely involve the CITY in this work as it relates to the junction of US 97 and the O'Neil Highway (370).

SIGNATURE PAGE TO FOLLOW

IN WITNESS WHEREOF, the parties hereto have executed this Memorandum of Understanding as of the day and year hereinafter written.

CITY OF REDMOND

By Alan Unger

Mayor

Date December 1, 2006

Oregon Department Of Transportation

By Robert W Bryant

Region 4 Manager

Date 12-07-06

List of Exhibits & Attachments:

Exhibit A:	Project Description and Map
Exhibit B:	Key Decision-making for the Access Management Plan (AMP) (outside of the North Interchange Area)
Exhibit C:	Key Decision-making for the North Interchange Area Management Plan (IAMP)
Exhibit D:	Key Long-Term Decision-making for entire length of US 97 through Redmond (Refinement Planning)
Attachment 1:	Traffic Signal Plan (Map)
Attachment 2:	Local Street Connectivity Plan (Map)
Attachment 3:	Highway Area Plan (Map)
Attachment 4:	Refinement Plan (Map)

EXHIBIT A
Project (US 97 Reroute Phase 1) Description and Map

The Project (US 97 Reroute Phase 1) creates a new north-south route for a portion of US 97 through Redmond, from Milepost (MP) 119.0 to Milepost 121.79, including improvements to the intersection of US 97 and OR 126. The project's southern terminus is south of Redmond's downtown near Veteran's Way (MP 121.79), and the northern terminus will be at Redmond's Urban Growth Boundary (UGB, MP 119.0). Rerouting US 97 will increase north-south US 97 traffic capacity, and reduce traffic congestion and heavy truck usage in Redmond's downtown, along the 5th/6th Street couplet (which is part of existing US 97). The new alignment will become a new section of US 97, and the existing section of US 97 between MP 119.0 and MP 121.79 will become the responsibility of the CITY, no longer a part of the State highway system.

Features of the project include (see map below):

- Moving the alignment of US 97 to the east, out of the downtown core area and along the west side of the Burlington Northern Santa Fe (BNSF) rail line (connecting back into the existing US 97 at Mileposts 119.0 and 121.79).
- A grade-separated interchange with ramp connections at the north terminus, including traffic signals at two of the ramp terminals.
- A new bridge crossing of the Maple-Negus city street alignment over the BNSF rail line, Central Oregon Irrigation District (COID) Pilot Butte Canal, North Canal Boulevard, and the Project's new US 97 alignment; and including roadway improvements on Maple-Negus east from the bridge to NE 5th Street, and west from the bridge to NW 4th Street.
- A new signalized 4-way intersection on the new US 97 alignment at the OR 126 Glacier-Highland couplet's east terminal.
- Re-aligning the existing portion of OR 126 currently between Highland Avenue (existing OR 126) and Evergreen Avenue (existing OR 126), to overlap with the new US 97 alignment between the Glacier-Highland Couplet and Evergreen.
- A new signalized 4-way intersection on the new US 97 alignment at Evergreen (also OR 126).
- Improvements to Evergreen (OR 126) east of the signalized intersection with the new US 97 alignment to OR 126 MP 0.42, including pavement resurfacing, a west-bound right turn lane at the US 97 intersection, access management, drainage, new bicycle and pedestrian features, improved rail crossings at Burlington Northern mainline and the Union Pacific spur track with new crossing warning devices.

- A non-traversable (raised) median from for the length of the new US 97 alignment, with openings at the two OR 126 signalized intersections.

- Connection of the new US 97 alignment with the city street Antler Avenue to the east and west, where no cross traffic or left turns will be allowed with the raised median.

- Connection of the new US 97 alignment with the city street Hemlock Avenue to the east, where no cross traffic or left turns will be allowed with the raised median.

- Connection of the new US 97 alignment with the city street Larch Avenue to the west, where not cross traffic or left turns will be allowed with the raised median.

- Significant Utility impact mitigation (e.g., Central Oregon Irrigation District canal piping and bridge crossings, Pacific Power substation relocation).

- Many city street improvements to support access management along the new US 97 alignment, and for local traffic circulation both during construction and opening of the new US 97 alignment to traffic, examples include:
  - A new roadway alignment to connect NE 9th Street from its current terminus at Hemlock Avenue northward to a new intersection with Negus Avenue.
  - The build out of NE 2nd Street, and a connection from the current cul-de-sac on NW 7th Street southward to a new connection with Quince Street.

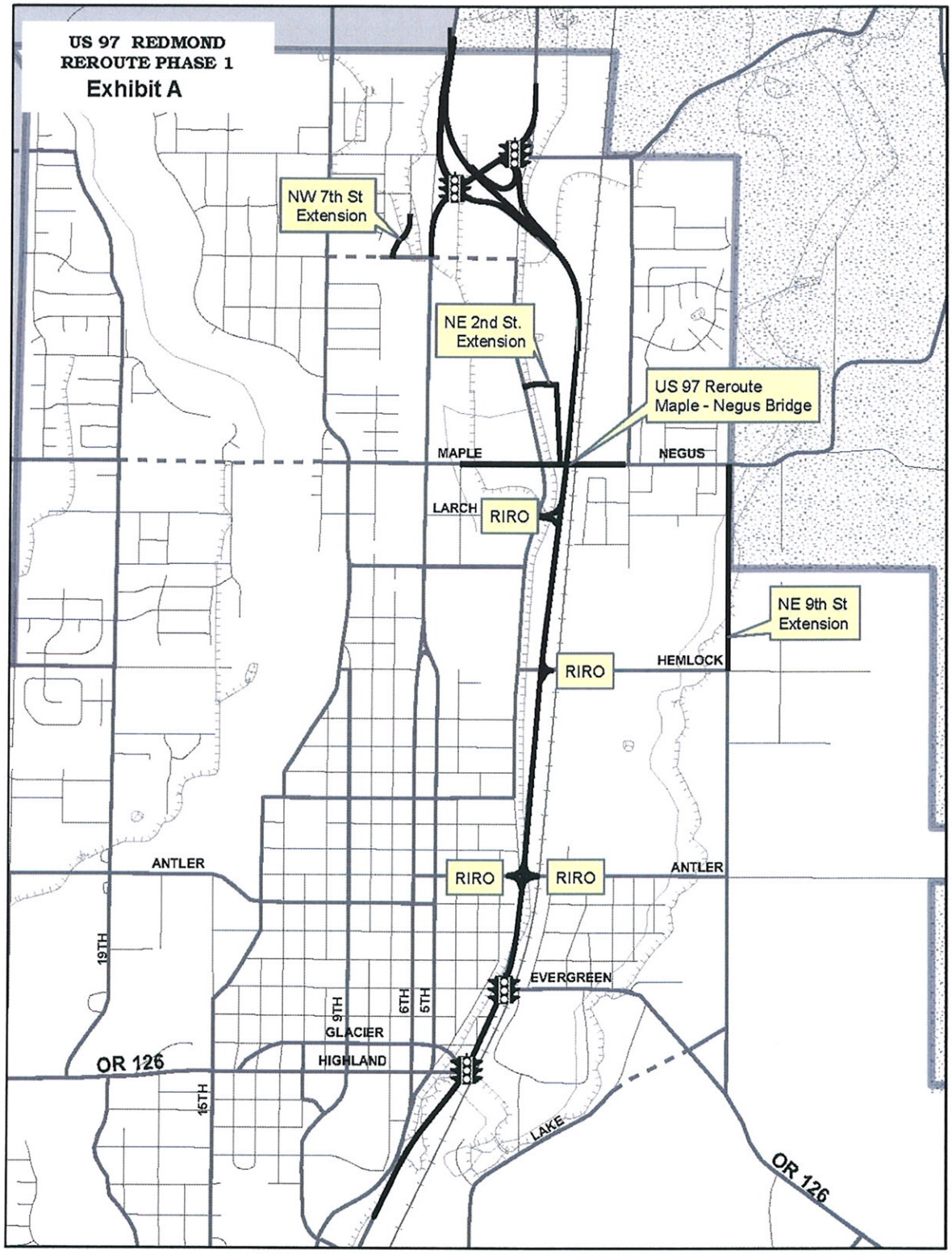

US 97 REDMOND
REROUTE PHASE 1
Exhibit A
NW 7th St
Extension
NE 2nd St.
Extension
US 97 Reroute
Maple - Negus Bridge
MAPLE
NEGUS
LARCH
RIRO
NE 9th St
Extension
RIRO
HEMLOCK
ANTLER
RIRO
RIRO
ANTLER
19TH
EVERGREEN
9TH
6TH
5TH
GLACIER
HIGHLAND
OR 126
16TH
LAKE
OR 126

EXHIBIT B
US 97 Reroute Phase 1
Key Decision-making for the Access Management Plan (AMP)
(outside of the North Interchange Area)

The following is a list of decision-making items which will be included in the final Access Management Plan (AMP) for the Project (US 97 Reroute Phase 1), not including the North Interchange area (which is addressed in Exhibit C).

In the event of a conflict between Exhibit B and the final ODOT approved AMP, the approved AMP will control over Exhibit B.

New US 97 Alignment – From North Interchange Area to Highland Ave
Since US 97 will be on a new alignment for the Project, there will be no private access constructed nor access rights provided to the highway. To keep east to west connectivity in Redmond, some at grade public street connections to the Project's new US 97 alignment will be provided as part of the Project. Larch will be connected as a Right-in – Right-out only on the westside of the new US 97 alignment. Hemlock Ave will be connected as a Right-in – Right-out only on the eastside of the new US 97 alignment, and Antler Ave will be connected as a Right-in – Right-out only on both the east and west sides of the new US 97 alignment. A signal will be installed at the intersection of the new US 97 alignment and Evergreen (OR 126 to the east), and a new signalized intersection will be constructed at the intersection of the new US 97 alignment and the Glacier-Highland Couplet (OR 126 to the west).

OR 126 east (Evergreen Ave, US 97 new alignment to Warsaw St)
Construction of the new traffic signal at the intersection of OR 126 (Evergreen Ave) and the new US 97 alignment will require and include reconstruction of OR 126 from the new US 97 alignment eastward, crossing the BNSF and UP railroads to a point between Franklin and Warsaw Streets. This new construction on Evergreen will include the installation of sidewalks, a raised center median and access management treatments.

City Streets Intersecting the US 97 new alignment
Connections of some local streets to/or over the Project's new US 97 alignment are a necessary condition to ensure adequate access to and from Redmond's industrial zone and downtown core. Project construction will include connections of Antler Avenue, Hemlock Avenue, and Larch Street to the Project's new US 97 alignment. It is also necessary to manage the long-term function of the new US 97 alignment as an Expressway, including the management of any potential operational and safety issues following completion of the Project. Accordingly, the CITY and ODOT will conduct an annual review of the operational and safety performance of city street connections to the Project's new US 97 alignment, including evaluation of each at-grade intersection of the new alignment and city streets against ODOT's mobility and safety standards. As operational or safety problems are discovered, ODOT and the CITY will develop and

initiate immediate, intermediate, and long-term actions, which could include a range of changes or improvements such as additional channelization, a reduction of allowed intersection turning movements, or disconnecting and/or grade separating a local street from the Project's new US 97 alignment. Such decision-making will also follow the process outlined in Exhibit D.

The following is an outline of specific actions which will be taken to existing city streets directly impacted by construction of the Project:

Maple Ave / Negus Way

- An overcrossing of Maple/Negus is being constructed to span the Project's new US 97 alignment, the BNSF, the COID Pilot Butte Canal and North Canal Boulevard. East of the Railroad right-of-way there will be no change to existing access east of the bridge touch-down point. The intersection of NE 5th Street and Negus will be elevated approximately one meter.
- NE Second Street will be disconnected from the north side of Negus Way. A new city street connection has been constructed from the north end of NE Second to N. Canal Blvd.
- N. Canal Blvd will remain in-tact by passing under the Maple/Negus overcrossing, providing a north/south route for local traffic, and there will be no access changes with the exception of the disconnection of the North Canal/Negus intersection.
- On Negus Way there will be no access connections west of N. Canal Blvd.

Larch Ave

- Larch Ave will connect to the Project's new US 97 alignment as a Right-in – Right-out only on the western side of the Project's new US 97 alignment via a new bridge which will be constructed as a part of the Project.
- As operational or safety problems are discovered, ODOT and the CITY will develop and initiate immediate, intermediate, and long-term actions, which could include a range of changes or improvements such as additional channelization, a reduction of allowed intersection turning movements, or disconnecting and/or grade separating a local street from the Project's new US 97 alignment. Such decision-making will also follow the process outlined in Exhibit D.

Hemlock Ave

- Hemlock Ave will connect to the Project's new US 97 alignment as a Right-in – Right-out only on the eastern side of the Project's new US 97 alignment. There will be no connection between Hemlock Ave and the Project's new US 97 alignment, on the western side of the new US 97 alignment.
- No change in access Hemlock to the east side of the BNSF Railroad right-of-way.
- No access will be provided to private property abutting Hemlock Ave between BNSF Railroad right-of-way and the Project's new US 97 alignment, nor between the new US 97 alignment and N. Canal Blvd.

- N. Canal Blvd will remain connected to Hemlock Ave on the western side of the Project's new US 97 alignment, serving as access to a private property located on the north side of Hemlock Ave.
- As operational or safety problems are discovered, ODOT and the CITY will develop and initiate immediate, intermediate, and long-term actions, which could include a range of changes or improvements such as additional channelization, a reduction of allowed intersection turning movements, or disconnecting and/or grade separating a local street from the Project's new US 97 alignment. Such decision-making will also follow the process outlined in Exhibit D.

Antler Ave

- Antler Ave will connect to the Project's new US 97 alignment as a Right-in – Right-out only on both the east and west sides of the new US 97 alignment. No cross-traffic will be allow given Project construction of a raised median.
- There will be no change to existing access on Antler east of the BNSF Railroad right-of-way.
- Through the section of BNSF Railroad right-of-way - no change in access on Antler Ave. BNSF will continue to have access from Antler Ave to their right-of-way, for their operations only.
- On Antler Ave between the BNSF Railroad right-of-way and N. Canal Blvd, there will be no access to private property abutting Antler Ave.
- On Antler Ave between Canal Blvd and 2nd St, the ODOT and CITY future goal is to have no access to abutting private parcels on Antler Ave. Existing accesses that remain with the Project are listed below:
    - North side – Parking lot of seven-unit apartment complex. Parking lot is adjacent to public alley.
    - South side – Second property at SE corner of Antler Ave and 2nd St. Property has an additional access on 2nd St. side of lot.

  These accesses will be subject to disconnection in the future.
- As operational or safety problems are discovered, ODOT and the CITY will develop and initiate immediate, intermediate, and long-term actions, which could include a range of changes or improvements such as additional channelization, a reduction of allowed intersection turning movements, or disconnecting and/or grade separating a local street from the Project's new US 97 alignment. Such decision-making will also follow the process outlined in Exhibit D.

Evergreen (west of the BNSF Railroad right-of-way)

- On the south side of Evergreen Ave, no access will be provided or allowed between the Railroad right-of-way to 4th St.
- On the north side of Evergreen Ave, no access will be provided or allowed between the BNSF Railroad right-of-way to 3rd St. First access west of 3rd street will be closed as part of the Project.
- The South Canal Blvd connection to Evergreen will be closed.
- Access into parking area at SE corner 4th and Evergreen Ave will be closed as part of the Project. The parking area has alternate access from 4th St.

- Street parking between 4th St. and the Project's new US 97 alignment will be eliminated as part of the Project.
- Street parking along the west side of 3rd St. between Deschutes Ave and Evergreen Ave will be eliminated as part of the Project.

Canal Blvd (between Maple Ave and Antler)

- The west side of Canal Blvd will have no change to city streets or private property connections as part of the Project.
- As Project construction of the new alignment of US 97 is completed, the south end of Canal Blvd will continue to Cedar Ave, with the remaining portion of Canal Blvd to the south, between Cedar Ave and Antler Ave, terminating at the alleyway one-half block north of Antler Ave. (This design at the south end will provide for continued access to properties along the west side of N. Canal Blvd as well as to the alleyway located one-half block north of Antler Ave.)
- East side of N. Canal Blvd will have access to three property remnants via two existing private bridges across the COID Canal and access to a fourth property via Hemlock Ave. Access control will be a part of the Project's right-of-way acquisitions, allowing for no access from these private properties to the Project's new alignment of US 97.

Canal Blvd / 2nd Street (between Antler Ave and Evergreen Ave)

- South end of Canal Blvd used for through movement of traffic will end at Deschutes Ave. The remaining portion of Canal Blvd will terminate at Evergreen. This design will serve as access to property along its west side on Canal Blvd as well as accommodate truck circulation for milk delivery for dairy.

EXHIBIT C
US 97 Reroute Phase 1
Key Decision-making for the North Interchange Area Management Plan (IAMP)

The following is a list of decision-making items which have been summarized from the Final Draft Interchange Area Management Plan (IAMP) for the Project's North Interchange, to be adopted by the Oregon Transportation Commission (OTC). The purpose of the IAMP is to provide a management plan for the interchange to meet Oregon Highway Plan (OHP) operational standards for at least the next 20 years.

In the event of a conflict between Exhibit C and the final OTC adopted IAMP, the adopted IAMP will control over Exhibit C.

1. **PERSHALL WAY/O'NEIL HIGHWAY (HWY 370) @ US 97 –**

   a. **At time of development or redevelopment the CITY, with concurrence from ODOT, will restrict turning movements to right-in and right-out (RIRO) after local connectivity has been established to provide parallel routes to US 97 for properties adjacent to US 97 north of the Project's new north interchange and south of Pershall Way/O'Neil Highway.**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update a RIRO improvement when needed as determined by traffic analysis at US 97 and Pershall Way/O'Neil Highway. The TSP Update will identify this improvement in the list of ***2011 – 2015 Projects***.

   b. **At the time the US 97 at O'Neil Highway intersection is converted to RIRO movements only, ODOT will reroute the O'Neil Highway (370) south on North Canal Blvd to the Project's new US 97 north interchange.**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update North Canal Blvd as the future location of the O'Neil Highway (370). The TSP Update will identify the relocation of Hwy 370 to North Canal Blvd in the list of ***2011 – 2015 Projects***.

   c. **ODOT and the CITY will work with Deschutes County to commit to the long-term improvement to disconnect Pershall Way/O'Neil Way (Hwy 370) from US 97 and construct an overpass.**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update identify disconnecting Pershall Way/O'Neil Way from US 97 and construction of an overpass as the long-term improvement for this intersection. The TSP Update will identify this improvement in the list of ***2016 – 2020 Projects***.

2. **KINGWOOD AVENUE @ US 97 –**

   a. **The CITY will install when warranted a signal with separate left turn lanes on the Kingwood Avenue approaches to US 97 (6th Street).**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update the installation of a signal and left-turn lanes on Kingwood Avenue in the list of ***2011 – 2015 Projects,*** or when otherwise meet traffic warrants.

3. **MAPLE AVENUE @ NW 9TH STREET –**

   a. **The CITY will construct a traffic signal at this intersection when warranted.**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update the installation of a signal at Maple Avenue and NW 9th Street in the list of ***2011 – 2015 Projects,*** or when otherwise meet traffic warrants.

4. **TRAFFIC SIGNAL PLAN FOR US 97 (6TH STREET) –**

   a. **The CITY will adopt a future traffic signal plan for US Highway 97 (6th Street) and North Canal Blvd, to create a guide for the orderly installation of traffic signals along US 97 (6th Street) and North Canal Boulevard north of the Project's new US 97 north interchange, see Attachment 1.**

      IMPLEMENTING ACTION: the CITY will incorporate where appropriate in their on-going TSP Update a traffic signal plan as shown in Attachment 1.

5. **LOCAL CONNECTIVITY PLAN –**

   a. **The CITY will adopt a Local Street Connectivity Plan, Attachment 2, that provides local street access to all properties that abut US 97 (6th Street) north of Kingwood Avenue and south of Pershall Way/O'Neil Highway. Attachment 2 will remain in-force until such time as ODOT and the CITY agree on a revised Local Street Connectivity Plan.**

      IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update a Local Street Connectivity Plan for all properties that abut US 97 (6th Street) north of Kingwood Avenue and south of Pershall Way/O'Neil Highway.

b. The CITY will adopt a development policy requiring all property to be developed within the IAMP area to: 1) Have immediate direct access to a local public street other than a state highway; 2) Comply with the Local Street Connectivity Plan, by extending abutting local streets to and through the area being developed; and, 3) Relinquish all direct access rights to a state highway.

IMPLEMENTING ACTION: The CITY will –

1. Amend ***Chapter 14 (Urbanization)*** of the Redmond Comprehensive Plan, Policies section, to include within the "Master Planning" section, with the following policies:
   - Any property to be master planned within newly annexed land within the IAMP area, shall have direct access to a local public street other than a state highway prior to development for all or part of the Master Planned Area consistent with the Local Street Connectivity Plan;
   - Any property to be annexed to the CITY will relinquish all direct access rights to US 97 and O'Neil Highway (370) in the IAMP area, as a condition of development approval.

2. Amend ***Section 8.0367, Public Works Standards and Specifications***, of the Redmond Code to include a new paragraph (3) to read as follows: All property within the IAMP area, and annexed into the CITY, shall have a Master Plan that stipulates the area, as a condition of development approval, shall: (a) Have immediate direct access to a local public street other than a state highway; (b) Comply with the adopted Local Street Connectivity Plan; and, (c) Relinquish all direct access rights to a state highway.

3. Amend the ***Joint Management Agreement*** with Deschutes County for the Urban Growth Boundary, Section 12, sub-section "A" to add a new item (6) to read as follows: All property within the IAMP area, and annexed into the CITY, shall have a Master Plan that stipulates the area, as a condition of development approval, shall: (a) Have immediate direct access to a local public street other than a state highway, (b) Comply with the adopted Local Street Connectivity Plan; and, (c) Relinquish all direct access rights to a state highway.

6. ACCESS MANAGEMENT PLAN FOR PROJECT'S NORTH INTERCHANGE –

a. In addition to the Traffic Signal Plan discussed in number 4 above and described in Attachment 1, the CITY will meet, or move in the direction of meeting, ODOT's adopted access management spacing standards for access to interchange crossroads.

1. *For US 97 (6th Street) from the Project's southbound interchange ramp terminal to a distance of 1,320 feet to the south, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which would restrict all access for the full distance of 1,320 feet.* This would require processing and approval of a deviation of spacing standards.

2. *For Canal Boulevard from the Project's northbound interchange ramp terminal to a distance of 1,320 feet to the north, the spacing standards from OAR 734-051-0125(2), Table 7 and Figure 3 apply, which would restrict all access for the full distance of 1,320 feet, with a right-in/right-out access allowed on the southbound side of Canal Boulevard no closer than 990 feet from the interchange ramp terminal.* This would require resolution of King Way and other related existing accesses.

b. The CITY will meet, or move in the direction of meeting, the CITY's adopted access management guidelines on US 97 (6th Street) from a point 1,320 feet from the Project's southbound interchange ramp terminal to Kingwood Avenue. This will require access spacing of at least 800 feet between adjacent driveways and/or streets on the same side of the roadway and ½-mile between adjacent intersections.

c. The CITY will meet, or move in the direction of meeting ODOT's adopted access management spacing standards for access to District Highways in line with the recommendation to transfer jurisdiction of North Canal Boulevard from O'Neil Highway to the Project's new interchange from Deschutes County, and the CITY to ODOT.

1. *For the segment of roadway from a point 1,320 feet north of the Project's northbound interchange ramp terminal to the urban growth boundary, the spacing standards for urban areas from OAR 734-051-0125(2), Table 4 shall apply, which shall require a minimum separation of 500 feet (assuming a posted speed of 40 or 45 mph) between approaches on the same side of the highway.*

2. *For the segment of roadway outside the urban growth boundary, the spacing standards for rural areas from OAR 734-051-0125(2), Table 4 shall apply, which shall require a minimum separation of 500 feet (assuming a posted speed of 40 or 45 mph) between approaches on the same side of the highway.*

d. The CITY will meet ODOT's adopted access management spacing standards for interchange mainlines, in relation to the Project's new US 97 interchange.

1. *For US 97 between the Project's new interchange and Pershall Way/O'Neil Highway, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which shall restrict all access to US 97.*

2. *For the Project's new US 97 alignment between the interchange and Kingwood Avenue, the spacing standards from OAR 734-051-0125(2), Table 8 and Figure 4 apply, which shall restrict all access to US 97. An exception to these standards may be allowed for a right-in/right-out approach at Larch Avenue, pending approval of a deviation by ODOT.*

e. ODOT will either purchase all abutting property access rights to US 97 (6th Street) and Canal Boulevard within 1,320 feet of the Project's US 97 interchange ramp terminals, or accesses may be allowed to remain until such time as reasonable alternate access becomes available.

f. ODOT and/or the CITY may allow exceptions to access management spacing standards outlined in this IAMP, to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints.

g. Within the IAMP area, ODOT and/or the CITY will replace private approaches with public streets, where feasible, to provide consolidated access to multiple properties.

h. ODOT and/or the CITY will ensure all properties impacted by the Project's new US 97 interchange are provided reasonable access to the local transportation system.

i. **Within the IAMP area, ODOT and/or the CITY will align approaches on opposite sides of roadways where feasible to reduce turning conflicts.**

j. **Within the IAMP area, ODOT and/or CITY short-range actions will accommodate existing development needs, unless property is intended to be purchased by ODOT.**

IMPLEMENTING ACTION: The CITY will incorporate where appropriate in their on-going TSP Update an ***Access Management Strategy for US 97 (6th Street) and North Canal Blvd.*** (Attachment 3) and Figures 5.5a – 5.5c (Attachment 4). The TSP Update will state that in Table 5-1, the short-range actions are intended to be implemented during the construction of the Project's US 97 interchange. The medium-range actions are intended to be completed within 5 to 10 years, while the long-range actions are to be implemented over the 20-year planning period as funding becomes available or as opportunities arise through property development.

IMPLEMENTING ACTION: The CITY will amend ***Chapter 12***, ***Policies*** Section, sub-section ***State Highways (Policies 20 – 24)*** of the adopted Comprehensive Plan to incorporate an access management strategy for US 97 (6th Street) and North Canal Blvd.

IMPLEMENTING ACTION: The CITY will amend ***Article IV***, ***Site and Design Review Standards, Section 8.3035, Design Review Criteria, Sub-Section 9 (City of Redmond Access Management Standards)*** to incorporate an access management strategy for US 97 (6th Street) and North Canal Blvd.

EXHIBIT D
Key Long-Term Decision-making for entire length of US 97 through Redmond (Refinement Planning)

The following is a list of decision-making items which will be included in the final US 97 Redmond Refinement Plan for future Phases of US 97, representing the long term range of improvements for US 97 through Redmond, from the O'Neil Highway Junction (MP 118.52) to Quarry Avenue (MP 126.20). The following decision-making items are either consistent with or in addition to those items enumerated in Exhibits B (Access Management Plan) and C (Interchange Area Management Plan).

In the event of a conflict with Exhibit D and the final US 97 Redmond Refinement Plan, the approved or adopted Refinement Plan will control over Exhibit D.

1. The entire length of US 97 through Redmond will be planned to eventually function as an Expressway.

2. The long-term plan for improvements to US 97 through Redmond include the Project (US 97 Reroute Phase 1); a southerly extension of US 97 from the Project (as shown on Attachment 4); and future proposed US 97 interchange improvements to be determined through a Transportation System Plan (TSP) level analysis, associated with a new Interchange Area Management Plan (IAMP) effort for US 97 in the central area of Redmond. The new IAMP effort will be conducted by ODOT in partnership with the CITY, scheduled to begin in 2007. The new IAMP effort will also address at a minimum the long term plans and strategies for the Project (US 97 Reroute Phase 1) at-grade intersections of US 97 and Antler Avenue, Hemlock Avenue and Larch Street.

3. To ensure the Project (US 97 Reroute Phase 1) will meet Oregon Highway Plan (OHP) and CITY operational and safety standards through the planning period (2026), prior to completion of the Project's US 97 new alignment construction, ODOT and the CITY will form an Access Management Committee (AMC). The AMC will:

   a. Consist of the following representatives from ODOT and the CITY: ODOT's Region 4 Manager, Access Management Engineer, and Traffic Engineer; and Redmond's City Manager, Public Works Director, and Community Development Director.

   b. Conduct an annual review of the operational and safety performance of local connections to the Project's new US 97 alignment, including evaluation of each at-grade intersection of the new US 97 alignment and the city streets. As operational or safety problems are discovered, the AMC will develop and initiate immediate, intermediate, and long-term actions,

which could include a range of changes or improvements such as additional channelization, a reduction of allowed intersection turning movements, or disconnecting and/or grade-separating a local street from the Project's new US 97 alignment.

c. Conduct reviews and decision-making consistent with the strategies identified in the Project's new US 97 Interchange IAMP, as well as strategies which will be identified in the new IAMP effort identified in above item number 2 of this Exhibit (D).

d. With an understanding that ODOT will closely involve the CITY as illustrated in Items 3a, b, and c above, recognize the ODOT Region 4 Manager as having final decision-making authority regarding the modification or closure of intersections between the Project's new US 97 alignment and city streets.

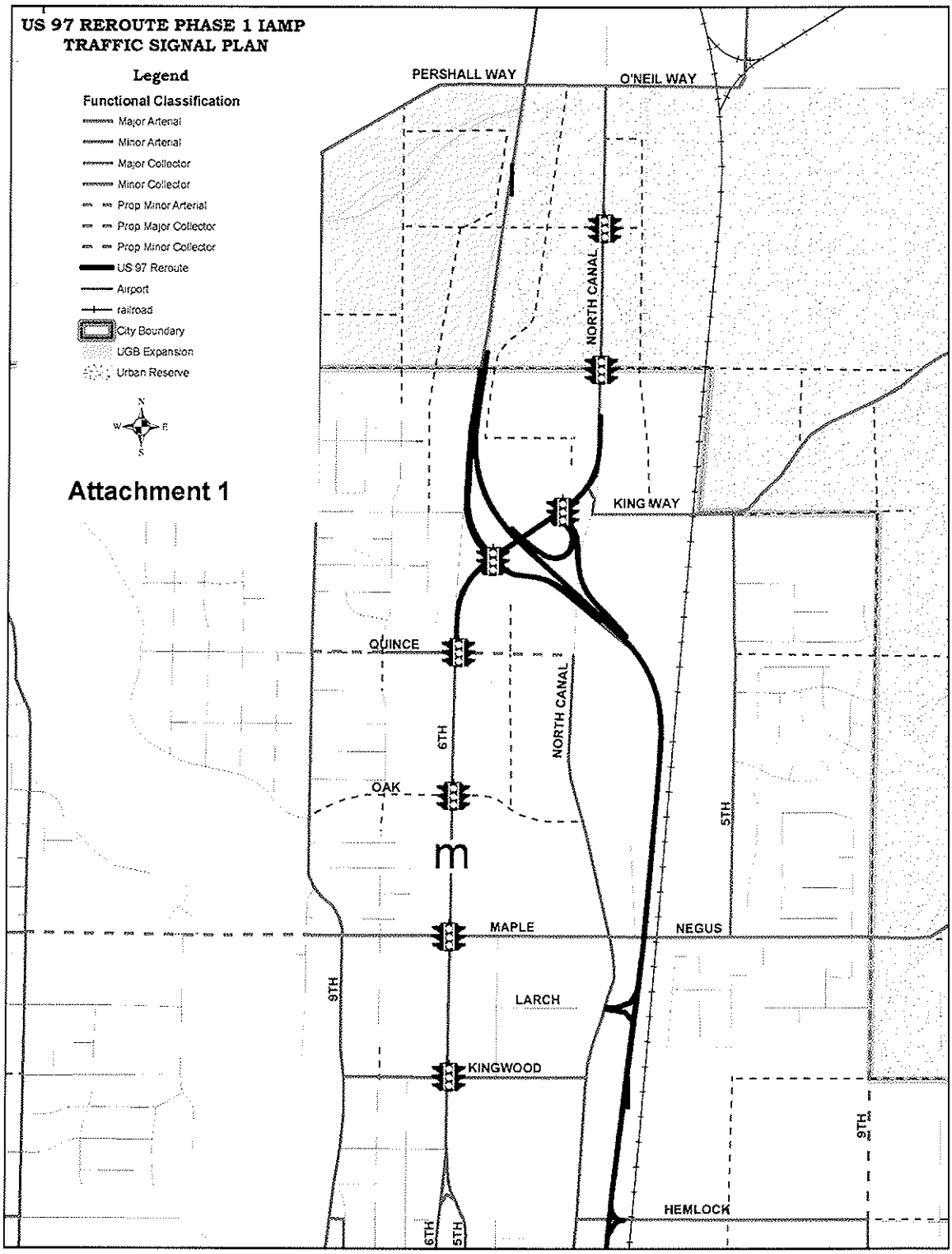
4. The final US 97 Redmond Refinement Plan will include a requirement for the CITY, in cooperation with ODOT, to develop and adopt a land use and transportation plan for the area (Area Plan, see Attachment 3) north of the Project's new US 97 interchange, south of Pershall Way/O'Neil Highway, east of North Canal Blvd, and west of NW 10th Street. The outcome is to adopt, as part of the Redmond Comprehensive Plan, Redmond TSP, and implementing ordinances, a land use and local street network plan that will:

   a. Establish the type, location and intensity of development to be allowed in the Area Plans's study area, to avoid adversely effecting the operations of the local street system, US 97, and the Project's new US 97 interchange, through 2026;
   b. Establish a network of local streets, including frontage/backage roads on both sides of US 97 that will adequately serve the proposed land uses and eliminate all direct access to US 97; and
   c. Identify a grade separated crossing of Pershall Way/O'Neil Way with US 97 as the long-term solution for this intersection.

ATTACHMENT 1

US 97 REROUTE PHASE 1 IAMP

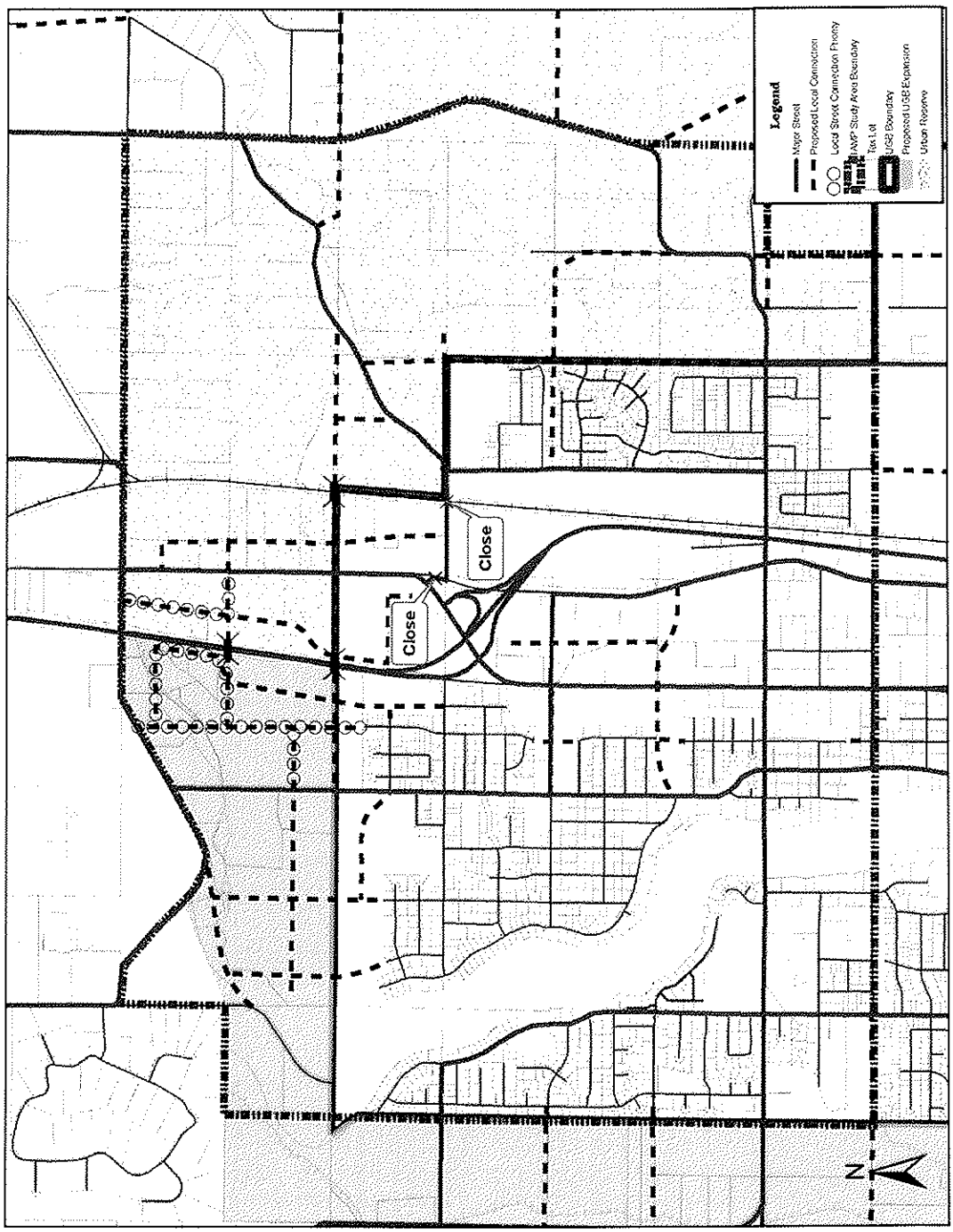
Traffic Signal Plan



ATTACHMENT 2

US 97 REROUTE PHASE 1 IAMP

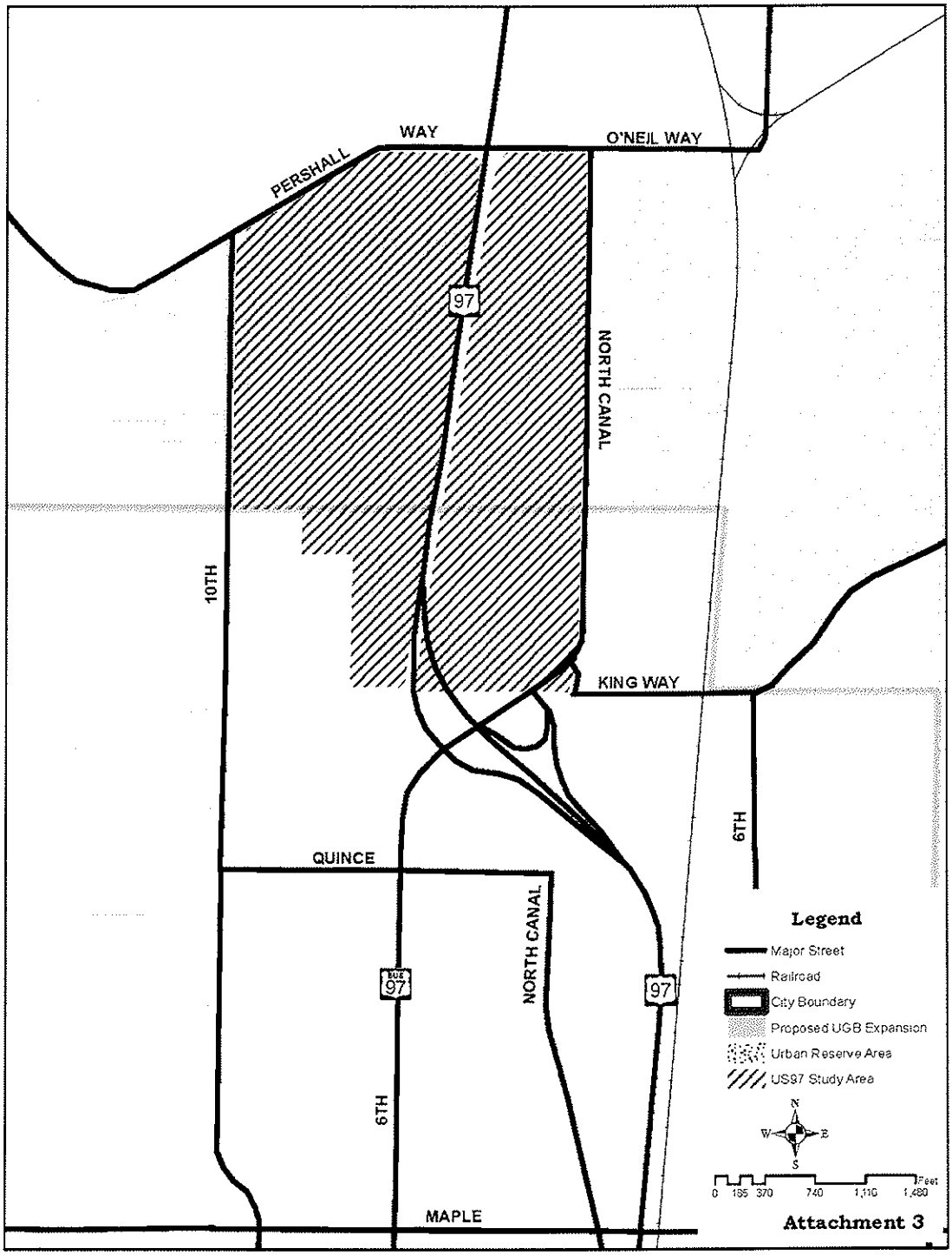
Local Street Connectivity Plan



ATTACHMENT 3

US 97 REROUTE PHASE 1

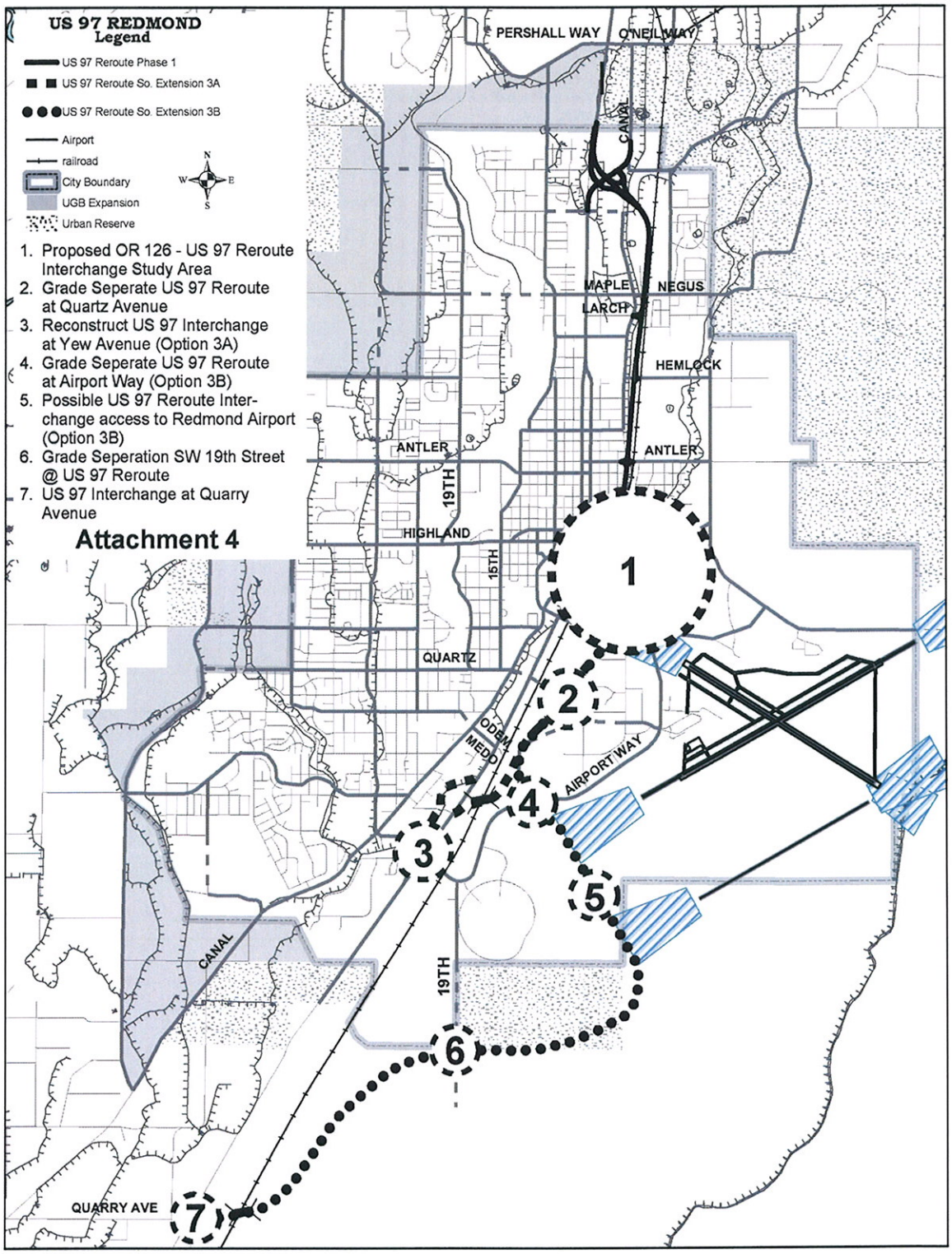
Area Plan - North US 97 Interchange to O'Neil Junction



ATTACHMENT 4

US 97 REROUTE PHASE 1

US 97 Redmond Refinement Plan



9. PLA-01

Oregon Department of Transportation **PROCEDURE**	NUMBER PLA 01	SUPERSEDES NEW
	EFFECTIVE DATE 10/12/06	PAGE NUMBER 01 OF 12
	VALIDATION DATE	
	REFERENCE OAR 731-015-0065 (1)	
SUBJECT **ODOT TRANSPORTATION FACILITY PLAN ADOPTION PROCESS**	APPROVED SIGNATURE	

PURPOSE

The purpose of this procedure is to establish the process and requirements that the Oregon Department of Transportation (Department) shall use in the adoption of transportation facility plans. The procedure lays out the steps to seek adoption of a facility plan by the Oregon Transportation Commission (OTC). This procedure is designed to improve coordination, better define roles and responsibilities, and clarify work components completed by the Region Planners and local governments.

Attachment A defines facility plans, provides additional information on the facility plan adoption process, and lists acronyms. Attachment B is a diagram of procedure steps. This procedure does not address the specific development of facility plans (which is typically done by the local government) including technical and environmental issues, input from stakeholders, and coordination with affected agencies.

BACKGROUND

The purpose of facility plans is to identify the function and existing and future needs for using the transportation facility. Facility plans also include plans for managing the existing transportation facilities and plans for improving the facilities so that the facilities continue to operate at acceptable levels for twenty years. The policies and investment priorities identified in the Oregon Transportation Plan (OTP) and mode/topic plans are further refined in facility plans. The adoption of facility plans affecting the Oregon Highway Plan (OHP) shall be processed as amendments to the OHP. When a facility plan goes before the OTC for adoption there are two primary amendments to the OHP. The first are those facility plans that amend and implement the OHP. This occurs primarily when a facility plan adoption leads to a designation change (highway segment designations, freight routes, scenic byways, and functional class) or new proposed alignments. The second type of amendment is for facility plans that are developed to implement the OHP that do not change policy, make or change a designation, or include new alignment

Department Region Planners develop most of the facility plans affecting state facilities in conjunction with local governments. There are numerous types of facility plans that shall follow this procedure. The typical ones include corridor plans, refinement plans, specific area refinement plans, access management plans, access management plans for interchanges, interchange area management plans, expressway management plans, scenic byway plans, intersection plans, and safety corridor plans. This procedure shall also be followed when highway segment designations require a management plan. If a management plan is not required, this procedure is not applicable. Policy 1.B of the OHP outlines when highway segment designations and/or management plans are required. *(See Attachment A – Facility Plans)*

This procedure also does not apply to access management strategies, conditions reports, and environmental documents as they are not facility plans. Local Transportation System Plans (TSP) are also not Department facility plans and are not adopted by the OTC. While TSPs may address state transportation facilities, they do so only in the context of guidance, policies, and standards provided through the OHP and other modal plans in light of a local government's vision and direction.

PRIOR TO OTC ADOPTION PROCESS

The preferred process for facility plan adoption is to have local government approval or adoption of a facility plan before it goes to the OTC. Therefore, while working with local governments on development of a facility plan, the local government needs to understand the established process for the OTC's adoption of the plan. An intergovernmental agreement (IGA) or memorandum of understanding (MOU) may help guide development of the plan. *(See Attachment A – IGAs and MOUs)*

Prior to adoption by local government, some facility plans may need to go to the OTC for review and guidance on such issues as the proposed design alternatives being considered and community impacts and tradeoffs. The Region Planning Manager and Region Manager need to work in concert with the Deputy Director and the Chief of Staff to determine whether a facility plan issue needs to go before the OTC for review and guidance. This "OTC check-in" shall be handled either as a one-on-one discussion with each of the commissioners or placed on the OTC agenda for informational purposes. This procedure assumes that the appropriate Region review and support by the Region Manager of the facility plan occurs prior to the Region Planning Manager bringing the plan to Planning Business Line Team (PBLT).

Prior to submitting the facility plan for OTC approval, complete the following steps as indicated:

- Development of a draft plan in collaboration with jurisdiction(s).
- Review by appropriate Department staff and Department of Justice (DOJ).
- The ODOT Chief Engineer and/or designee approval of facility plans affecting state highways if they include planned designs for the facility. In addition, the Access Management Engineer and District Manager (or designee) shall approve facility plans if

they include aspects that could impact access management and/or maintenance. http://intranet.odot.state.or.us/ssb/bss/del/d_sub-04.pdf

- Depending on the complexity and/or controversial nature of the facility plan, prior discussions with OTC may be appropriate (as mentioned above).
- Fulfillment of the required public review process *(See Attachment A – Facility Plan Development)* recognizing that the primary stakeholder involvement has occurred during the development of the draft plan.
- PBLT coordination. PBLT reviews the draft plan and listens to the proposed OTC presentation to provide comments and support for bringing the plan to the OTC.

OTC ADOPTION PROCEDURE

Location on OTC Agenda

The recommendation whether the facility plan should be a regular agenda item or on the consent calendar shall be made by Region and Transportation Development Division (TDD) staff working together with PBLT on a case-by-case basis. This recommendation will typically occur during the PBLT meeting described in the Prior to OTC Adoption Process section above.

This determination depends on several issues including complexity of the plan, level of controversy, multiple actions associated with the facility plan (change in functional class or a jurisdictional transfer), number of times the facility plan has been to the OTC, and whether there are parties who wish to testify.

Agenda huddle by executive staff shall be the forum for the final decision for where the item shall be placed on the agenda. The facility plan packet that goes to the OTC remains the same, whether it is located on the regular agenda or on the consent calendar.

Submittal to the OTC

The appropriate Region staff person shall prepare the cover memo, staff report, and other attachments in accordance with the Highway Finance Office (HFO) requirements for OTC packets. The following need to be included within the packet:

Cover Memo

The cover memo shall contain a summary of the issues, requested action, and motion language. The summary of issues needs to be clear about what the OTC is adopting and how it affects the State and local TSPs. (*See Attachment A - Relationship to the OTP, SAC, and TPR)* The requested action is adoption of the facility plan and any amendment of the OHP or any other modal and/or topic plan as necessary.

When developing the motion language, care needs to be taken that the Department does not exceed its authority when adopting a facility plan. The motion language shall be based on the requested action section of the cover memo. The motion includes

adoption of findings and the components of the plan for which the Department has responsibility. The findings shall specifically state how the existing local plan, policy, code provisions, and the facility plan are consistent.

Staff Report

The staff report, which is typically Attachment A of the OTC packet, shall briefly identify:

- A description of the public involvement process including notification (if applicable);
- The components of the plan for which the local governments are responsible for;
- The components of the plan for which the Department is responsible for;
- How the facility plan implements the subject modal system plan;
- If necessary, what policies, standards, actions, appendices, maps, and other exhibits are being amended with this action;
- A summary of the draft findings that are proposed in support of the adoption; and
- A Requested Action that frames the proposed motion language that:
    - Summarizes what is proposed to be adopted;
    - The OTC is accepting and agreeing to the conclusions and decisions of the plan that shall guide future Department and local government's actions; and
    - Includes language to the effect that the findings in the packet are adopted as part of the OTC action.

Findings

The findings are typically Attachment B of the OTC packet. The findings adopted by the OTC shall highlight those actions for which it has the authority to approve, such as issues related to highway operations, mobility standards, access management, etc. *(See Attachment A of this procedure – Findings)* The OTC packet for the facility plan shall make findings to address the following State Agency Coordination Program (SAC) (Oregon Administrative Rules (OAR) 731-15-065) findings:

- Compatibility with acknowledged comprehensive plans of affected counties and cities;
- Compatibility with Statewide Planning Goals which specifically apply; see OAR 660-030-0065(3) (d); and
- Compliance with all provisions of other statewide planning goals that can be clearly defined if local plan does not include general or specific provisions affected by the facility plan.

In addition, the findings shall address the following:

- Compatibility with affected modal plans and the OTP
- Adequate coordination with local governments during plan preparation
- Adequate public involvement during plan preparation
- Statement that the Department is not exceeding its authority
- Compatibility with Metropolitan Planning Organization Regional Transportation Plans
- Consistency with the Highway Design Manual if the facility plan includes planned designs

The Facility Plan

The plan itself is typically Attachment C of the OTC packet.

THE STEPS

The steps listed below outline the facility plan adoption process before the OTC. The actual development of the facility plan and the outreach process to stakeholders and the local jurisdiction(s) needs to have occurred prior to beginning the OTC approval process. *(See Attachment A of this procedure – Facility Plan Development – Local Process)* The actions below are also shown in a diagram format. *(See Attachment B)*

RESPONSIBILITY	STEP	ACTION *
Region Planning Manager	1	After obtaining Region Manager approval of the facility plan, inform PBLT of OTC agenda item at least three months prior to anticipated OTC meeting. Discuss with PBLT Team Leader and together determine if a presentation before PBLT is needed and decide on the adoption process. A draft of the proposed OTC action (motion) needs to be included in the presentation to PBLT. (This step shall occur before the local government approves the facility plan.) It may be appropriate for DOJ to review the draft findings.
	2	PBLT and TDD staff recommendations are relayed to Executive staff via the Region Planning Manager. The recommendations include the level of OTC participation, location on agenda, and clarification of requested action. (If the facility plan includes a functional classification change, it needs to follow that procedure as well.)
	3	Comply with public review and public notice requirements. The OTC hearing for the facility plan shall occur after the 45-day review period which is required by federal regulations for amendments to the plan. The 30-day SAC review

RESPONSIBILITY	STEP	ACTION *
		requirement can run concurrently. The notice establishing the start date for both review periods shall include key stakeholders such as Department of Land Conservation and Development (DLCD). The plan findings shall be included as part of the SAC notice requirements to address plan consistency expectations. The scheduling for the OTC meeting can occur earlier, which includes providing copies of the recommended plan to stakeholders. *(See Attachment A – Outreach)* Follow the HFO submittal schedule for getting on the OTC agenda – http://intranet.odot.state.or.us/highwaybudget/Program%20and%20Funding%20Svcs/index.htm
	4	Provide packets to HFO Coordinator for review at least one month prior to OTC meeting.
	5	Determine how many copies of facility plan packet are needed to complete adoption process and produce copies, if necessary. Packet includes cover memo, staff report, plan document, and SAC findings. *(See OTC Adoption Procedure Section)* The staff report shall include appropriate motion language. The adoption language may differ if amending the OHP versus implementing the OHP.
	6	Present locally adopted or approved facility plan at OTC meeting. OTC adopts facility plan as an amendment to a modal plan.
Region Planner	7	Provide copies of final facility plan and findings to DLCD, affected agencies, TDD, and others who request to receive a copy. Depending on the circumstances, if the OTC revises the facility plan, the local government may need to amend their adopted facility plan.
	8	Work with OHP Plan Manager on updating the OHP registry of amendments and providing access to the facility plan. *(See After OTC Adoption Process Section)* If facility plan involves other modes, then work with other Modal Plan Managers to coordinate access of the adopted facility plan for individuals that would like to read or have a copy of the plan.

* There are multiple steps in these processes. This procedure focuses only on the Department's facility planning adoption process.

AFTER OTC ADOPTION PROCESS

A significant change to an adopted facility plan requires an action by the OTC. It may be appropriate for the PBLT to determine if the amendment is significant enough to require OTC action.

All amendments to the OHP are listed in the registry of amendments on the Department's webpage by the OHP Plan Manager which helps the Department maintain a more accurate and accessible database of these facility plans.

ATTACHMENT A

Facility Plans

A facility plan may address issues for one transportation mode, such as pipeline, aviation, rail, public transit, or bike/ped; or it may address issues for multiple modes, such as a highway corridor plan, a downtown plan, or Special Transportation Area management plan that includes components for access management, public transit, traffic safety, and/or bike/ped improvements. Facility plans consider specific geographic issues and affect the application of specific Statewide Planning Goals and, therefore, contain land use decisions.

The State Agency Coordination Rule (OAR 731-015-0015) defines "*facility plan*" in a similar light, "*a plan for a transportation facility such as a highway corridor or airport master plan*."

Statewide Planning Goal 2 also provides guidance as to what any plan shall include, such as:

A. An adequate factual basis for the plan,
B. Inventories and other forms of data as needed to support the policies of the plan,
C. Applicable statewide planning goals, and
D. Elements that establish policies and implementation measures that address any special needs or desires of the people in the area and specify time periods for implementation of the plan.

With respect to highways, there are numerous types of facility plans and the typical ones include corridor plans, refinement plans, specific area refinement plans, access management plans, access management plans for interchanges, interchange area management plans, expressway management plans, scenic byway plans, intersection plans, and safety corridor plans.

As defined in OAR 734-051-0010, an access management plan is a plan for a designated section of highway that identifies the location and type of approaches and necessary improvements to the state highway or local roads and that is intended to improve current conditions of the section of highway by moving in the direction of the access management spacing standards. An access management plan for an interchange is an access management plan developed to manage the influence area of an interchange. An access management strategy is a project delivery strategy that identifies the location and type of approaches and other necessary improvements to the highway and that is intended to improve current conditions of the section of highway by moving in the direction of the access management spacing standards

IGAs and MOUs

The Department and the local government may enter into an IGA or MOU at the commencement of the facility plan process that describes the anticipated planning and adoption process, outlines issues to be addressed, and serves as a statement of good faith to work through the process to a mutually agreeable conclusion. The purpose of the agreement

is to establish an understanding and not to commit either agency to a predetermined outcome of facility plan adoption. The agreement shall include a schedule for Department and local government implementation. The agreement, addressing general processes and explanations, is not a land use action. Local jurisdictions may choose to adopt the facility plan as an amendment to their TSP when the facility plan is complete, or they may choose to defer adoption until their next scheduled TSP or Regional Transportation Plan update. While the agreement is not mandatory, it is useful to clarify Department and local government expectations. The Department Region Planner leading the facility plan process shall determine whether an agreement will increase the effectiveness of the process before investing the time and resources to enter into one.

Facility Plan Development – Local Process

The table below identifies the major steps associated with the required public review process and the coordination with the Region Planner that needs to take place prior to the OTC adoption process.

Facility Plan Development – Local Process	
1	Develop facility plan draft work scope. DOJ review required.
2	Prepare draft facility plan. Provide copy to TDD for comments if TDD indicates interest. DOJ review required.
3	Submit request to be on Planning Commission and/or City Council agenda and notify affected agencies and stakeholders.
4	Hold the public hearing at local level and adopt the facility plan. Local governments identify any specific or general plan requirements which apply and determine whether the draft facility plan is compatible with the acknowledged TSP.
5	Prior to adoption by local government, some facility plans may need to go to the OTC for review and guidance (such as comment on or support of an alternative). Facility plan is reviewed by PBLT and coordinated with the Chief of Staff before OTC review.

Relationship to the OTP, SAC, and Transportation Planning Rule (TPR)

This procedure is framed around the relationship between the OTP, the SAC, and the TPR. It was developed using the definition of a facility plan in the SAC and definition of a refinement plan in the TPR.

The State TSP is comprised of the OTP, modal plans, and facility plans. The SAC and Oregon Revised Statutes (ORS) 184.618 require consideration of the following modal elements: aviation, highways, mass transit, pipelines, rail, waterways, and ports. The modal plans further develop policy guidance specific to their topic areas. Facility plans are the first level of refinement in the modal system plans. The term “facility plan” as used in this procedure is consistent with the definition of refinement plan in the TPR and facility plan in the SAC.

The TPR (OAR 660-012-0005) defines “*Refinement Plan*" as, *“an amendment to the transportation system plan, which resolves, at a systems level, determinations on function,*

mode or general location which were deferred during transportation system planning because detailed information needed to make those determinations could not reasonably be obtained during that process."

The SAC rule allows for both a major and minor amendment process that applies to any changes to facility plans or modal plans. The major amendment process for a facility plan is articulated in the SAC (OAR 731-15-065 (1) Coordination Procedures for Adopting Final Facility Plans). The process outlined in this procedure is for major amendments. Facility plans that are amending and/or implementing the OHP are considered major amendments. OAR 731-015-0055 provides direction on facility level issues that may be included in amendments to modal system plans (i.e. designating a new facility) as major amendments to those plans.

Minor amendments are considered technical adjustments as outlined in the delegated authority given to the Director. Delegation Order No. 2 was revised on June 13, 2001, to add the authority from the OTC to the Director to make technical corrections to the OHP (paragraph 4). The revision authorized the Director to add or remove designated portions of highway from the state highway system under limited circumstances and make these technical corrections to the OHP. The fourth paragraph of Delegation Order No. 2 states:

> *"The statutory duty of OTC to make technical corrections to the Oregon Highway Plan including, but not limited to, corrections to the highway designations and classifications."*

These technical corrections are declared not to be amendments under the coordination procedures of OAR 731-015-0005 *et seq.* However, the Department shall provide notice of the proposed corrections and provide the public an opportunity to review. This involvement may take the form of press releases, mailings, meetings, or other means that the Department determines are appropriate for the circumstances.

After the Director signs the order that makes the technical corrections to the OHP, the Director shall post the technical corrections in the Registry of Amendments on the Department website and maintain an official record of the action in the General Files of the Department.

Findings

Findings are written statements adopted by an agency to explain why a decision is made. They assure that the applicable legal standards have been addressed and show that the decision complies with the applicable law. The SAC (OAR 731-015-0075(7)) says that the Department shall make findings concerning compatibility with comprehensive plans. To be upheld on appeal to the Land Use Board of Appeals, the Department's findings shall be supported by substantial evidence in the whole record (evidence that a reasonable prudent person would rely on in reaching a decision). They can not be mere conclusions and generalizations and shall contain a sufficient statement of facts on which they are based. Findings shall establish a causal or other relationship between the basic facts and the conclusions of law and fact.

The findings for the OTC shall be complete and definitive in support of the OTC's action. Development of the findings includes showing compatibility with the OHP, OTP, and other

modal plan policies as appropriate. In addition, development of the findings includes extracting appropriate elements of the local findings and editing them as necessary to make them appropriate for the OTC action. Incorporation by reference is not appropriate. The level of detail of the findings may vary according to the complexity of the plan. The language shall be carefully worded, paying close attention to timing, tense, facts, and conclusion summaries.

From a process standpoint, the main change in the way we adopt facility plans is the content of the findings and the motion before the OTC. The OTC's motion language is slightly different if amending a facility plan. However, the type of action being approved does not change the public process, the determination as to whether or not the facility plan belongs on the regular or the consent agenda, or modify the packet that is prepared for the OTC. Some of the findings can be simplified for facility plans that are only implementing existing modal system plans.

Outreach

Before the OTC hearing occurs, there is a 45-day review period required by federal regulations and a minimum 30-day review period required by the SAC which includes providing copies of the recommended plan to stakeholders including the local governments, DLCD, other affected agencies, and freight interests. The 45-day and 30-day review periods can run concurrently. Notice to DLCD shall be directed to Robert Cortright, Transportation Planning Coordinator. At that time he shall receive a copy of the plan. Department Region staff shall include DLCD's comments in response to the plan in the OTC packet. If the Region has been working with the DLCD field representative, the representative shall be provided a courtesy copy of the notice and copy of the plan.

ACRONYMS

DLCD	Department of Land Conservation and Development
DOJ	Department of Justice
HFO	Highway Finance Office
IGA	Intergovernmental Agreement
MOU	Memorandum Of Understanding
OAR	Oregon Administrative Rules
OHP	Oregon Highway Plan
ORS	Oregon Revised Statutes
OTC	Oregon Transportation Commission
OTP	Oregon Transportation Plan
PBLT	Planning Business Line Team
SAC	State Agency Coordination Program
TDD	Transportation Development Division
TPR	Transportation Planning Rule
TSP	Transportation System Plan

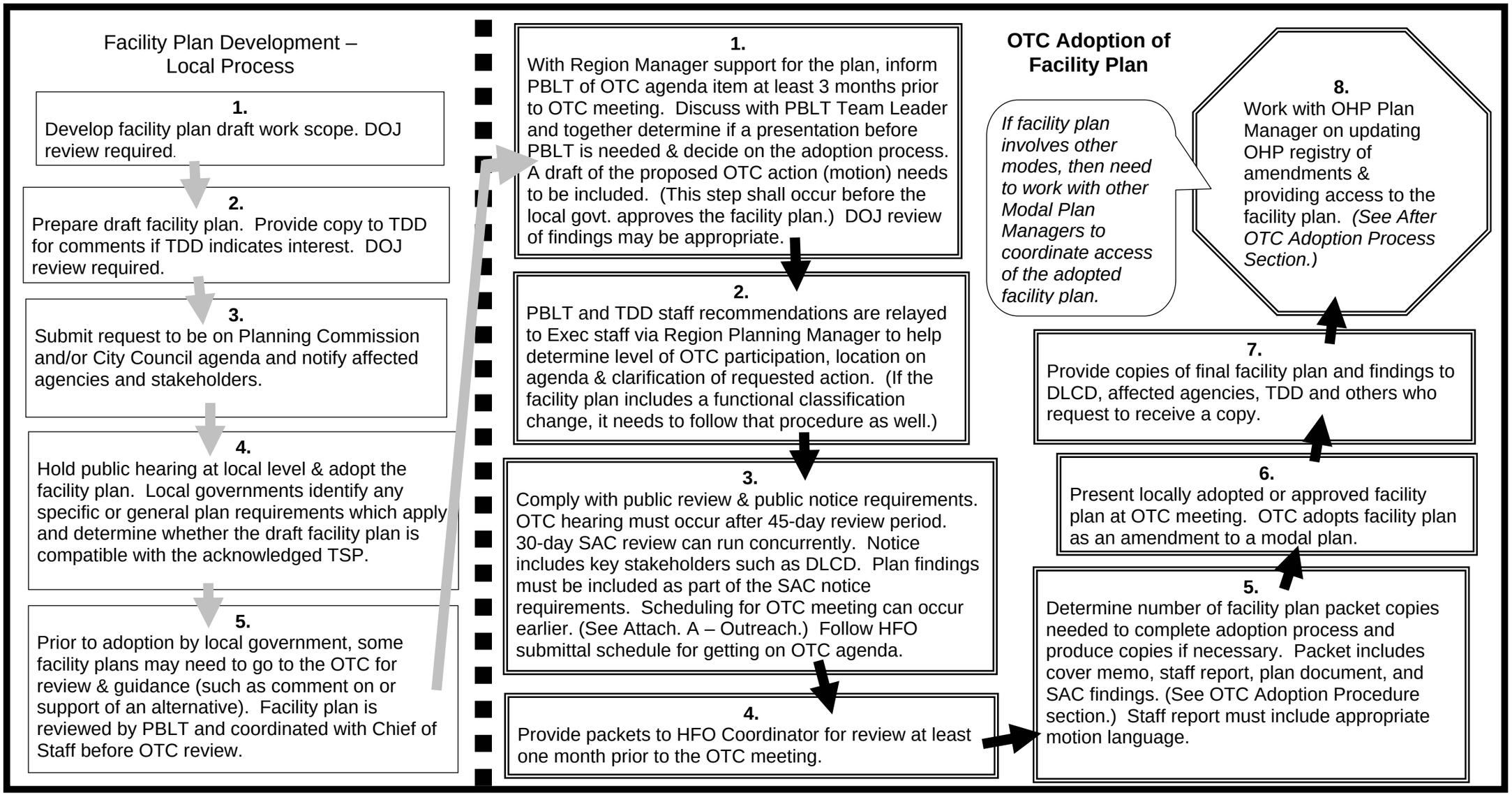
Attachment B: Diagram of procedure steps

Note: Document requires 8-1/2 x 14 size paper

Attachment B

Facility Plan Adoption Procedure Diagram

September 25, 2006



10. SAC Notice

Oregon
Theodore R. Kulongoski, Governor

Oregon Department of Transportation
73000
Program and Planning Unit
63034 O.B. Riley Rd
Bend, OR 97701

NOTICE OF INTENT TO ADOPT

45 DAY NOTICE

PROJECT TITLE: North Redmond US 97 Interchange Area Management Plan

NOTICE DATE: 31 January 2007

As required by Oregon Department of Transportation (ODOT) Administrative Procedure PLA 01 for the adoption of facility plans by the Oregon Transportation Commission (OTC), ODOT Region 4 Program and Planning Unit is hereby providing the required 45 days notice of the Departments' intent to take the North Redmond US 97 Interchange Area Management Plan for adoption by the OTC at their regular meeting scheduled for 22 March 2007. This notice is also intended to satisfy its requirement under the State Agency Coordination requirement *731-015-0065* of the required 30 day notice for adoption of a facility plan.

Enclosed with this notice is a copy of the draft North Redmond US 97 Interchange Area Management Plan. By this notice ODOT hereby requests that you identify any specific plan requirements which apply, any general plan requirements which apply and whether the draft North Redmond US 97 Interchange Area Management Plan is compatible with the acknowledged comprehensive plan.

If no reply is received from an affected city, county or metropolitan planning organization within 30 days of the Department's request for a compatibility determination, the Department shall deem that the draft plan is compatible with that jurisdiction's acknowledged comprehensive plan.

Please direct all correspondence to this notice to:

Ed Moore, AICP
Sr. Region Planner
Area 5, District 5
644 North "A" Street
Springfield, OR 97477
541.747.1354 (Voice)
541.726.2509 (Fax)
ed.w.moore@odot.state.or.us

11. OTC Findings

North Redmond US 97 Interchange Area Management Plan

Findings of Compliance with Existing Plans and Policies

Overview

Interchange Area Management Plan (IAMP) development involves close cooperation between ODOT and local government agencies. Management of the US 97 Redmond Reroute interchange at the north end of Redmond involves coordination between ODOT and the City of Redmond. State and federal policies and rules, as well as local policies and codes and a history of public involvement, play a key part in the development, adoption, and implementation of IAMPs. Policies and code language from local documents form a policy framework and serve as provisions to manage transportation and land use in the interchange influence area with the goals of protecting interchange function, providing for safe and efficient operations, and minimizing the need and expense for additional major improvements to the interchange through the 2025 planning horizon.

The review of state and local planning documents can be found in Appendix 1. Appendix 7 presents local policies and code provisions that effectively support management of the US 97 Redmond Reroute interchange.

The following sections summarize the analysis of how the proposed interchange complies with federal, state, and local plans, policies, goals, and regulations.

State Plans, Policies, and Regulations

Oregon Transportation Plan (2006)

The goal of the Oregon Transportation Plan (OTP) is to promote a safe, efficient, and convenient transportation system that improves livability and facilitates economic development for residents of the state. The OTP sets out seven goals with numerous policies and strategies to support their achievement. Many of these policies do not apply to the US 97 Redmond Reroute Interchange Project, but relate more to the establishment of regional transportation plans. Those elements that do apply are addressed below.

Goal 1 – Mobility and Accessibility

To enhance Oregon's quality of life and economic vitality by providing a balanced, efficient, cost effective and integrated multimodal transportation system that ensures appropriate access to all areas of the state, the nation and the world, with connectivity among modes and places.

Policy 1.1 – Development of an Integrated Multimodal System

Strategy 1.1.4 - *In developing transportation plans to respond to transportation needs, use the most cost-effective modes and solutions over the long term, considering changing conditions and based on the following:*

- *Managing the existing transportation system effectively.*
- *Improving the efficiency and operational capacity of existing transportation infrastructure and facilities by making minor improvements to the existing system.*
- *Adding capacity to the existing transportation system.*
- *Adding new facilities to the transportation system.*

Finding: The US 97 Redmond Reroute Interchange Project is identified in the Redmond Comprehensive Plan and the Redmond TSP as a means to address traffic congestion and safety problems that currently affect US 97.

Policy 1.3 – Relationship of Interurban and Urban Mobility

Strategy 1.3. - *In coordination with affected jurisdictions, develop and manage the transportation network so that local trips can be conducted primarily on the local system and the interstate and statewide facilities can primarily serve intercity movement and interconnect the systems. Develop, maintain and improve parallel roadways, freight rail, transit, bus rapid transit, commuter rail and light rail to provide alternatives to using intercity highways for local trips where possible.*

Finding: The IAMP contains a Local Connectivity Plan that identifies a local streets plan that will allow for access to local business and other activities so that ODOT can restrict access to US 97 and allow US 97 to operate as a through route. This will minimize local trips on the statewide facility to maintain and improve longer distance mobility.

Goal 2 - Management of the System - To improve the efficiency of the transportation system by optimizing the existing transportation infrastructure capacity with improved operations and management.

Policy 2.1 - Capacity and Operational Efficiency - *It is the policy of the State of Oregon to manage the transportation system to improve its capacity and operational efficiency for the long term benefit of people and goods movement.*

Strategy 2.1.2 - *Protect the integrity of statewide transportation corridors and facilities from encroachment by such means as managing access to state highways, limiting interchanges, creating safe rail crossings and controlling incompatible land use around airports, ports, pipelines and other intermodal passenger and freight facilities.*

Findings: The US 97 Redmond Reroute Interchange Project builds a new interchange as part of the US 97 Redmond Reroute that will eliminate direct access to commercial properties that currently have direct access to US 97. The IAMP contains an access

management plan that protects the integrity of US 97, a statewide transportation facility and the important long-term function of the new interchange. The US 97 Redmond Reroute Interchange Project will provide controlled access to US 97. As part of the US 97 Redmond Reroute project, access to US 97 will be restricted to right-in/right-out at Larch Ave, Hemlock Ave, and Antler Ave. (Turn movements controlled through the installation of a non-traversable center median), and signal controlled intersection of OR 126-Evergreen Ave and Highland/Glacier Couplet. These changes will improve safety along the highway and meet state access control guidelines. The plan additionally addresses the concerns for minimizing rail crossings while maintaining east-west access through Redmond.

Goal 3 - Economic Vitality - To promote the expansion and diversification of Oregon's economy through the efficient and effective movement of people, goods, services and information in a safe, energy-efficient and environmentally sound manner.

Policy 3.1 – An Integrated and Efficient Freight System - *It is the policy of the State of Oregon to promote an integrated, efficient and reliable freight system involving air, barges, pipelines, rail, ships and trucks to provide Oregon a competitive advantage by moving goods faster and more reliably to regional, national and international markets.*

Finding: The IAMP provides for more efficient freight movement through the north end of the Redmond Reroute by reducing congestion, separating conflicting movements and limiting accesses to the statewide highway. As part of the reroute of trucks out of the Redmond downtown, the IAMP identifies the facilities and management mechanisms that will increase the efficiency of the freight system in this area.

Goal 5 – Safety and Security - To plan, build, operate and maintain the transportation system so that it is safe and secure.

> ***Strategy 5.1.3 -*** *Ensure that safety and security issues are addressed in planning, design, construction, operation and maintenance of new and existing transportation systems, facilities and assets.*

Findings: The new interchange is designed and will be constructed to enhance safety for the traveling public. Meeting design standards and applying management considerations for an expressway classification of facility through access controls will minimize the conflicts around the interchange.

Goal 7 - Coordination, Communication and Cooperation - To pursue coordination, communication and cooperation among transportation users, providers and those most affected by transportation activities to align interests, remove barriers and bring innovative solutions so the transportation system functions as one system.

Policy 7.3 – Public Involvement and Consultation - *It is the policy of the State of Oregon to involve Oregonians to the fullest practical extent in transportation planning*

and implementation in order to deliver a transportation system that meets the diverse needs of the state.

Findings: The IAMP was developed in partnership with affected property owners in the interchange area, the City of Redmond, Deschutes County and ODOT. Other stakeholders including interchange users were also included. The general public and local businesses within the study area were notified of public meetings regarding the plan and were provided opportunities to participate outside of the formal project committees.

Oregon Highway Plan (1999)

The 1999 Oregon Highway Plan (OHP) is a modal element of the 2006 OTP and defines policies and investment strategies for Oregon's state highway system over the next 20 years. The plan contains three elements: a vision element that describes the broad goal for how the highway system should look in 20 years; a policy element that contains goals, policies, and actions to be followed by state, regional, and local jurisdictions; and a system element that includes an analysis of needs, revenues, and performance measures.

The OHP is a modal element of the OTP. It addresses the following issues:

- Efficient management of the system to increase safety, preserve the system, and extend its capacity
- Increased partnerships, particularly with regional and local governments
- Links between land use and transportation
- Access management
- Links with other transportation modes
- Environmental and scenic resources

The OHP classifies US 97 as a Statewide highway and is incorporated as part of the National Highway System and as a designated freight route between the California and Washington borders.

The policy element contains several policies and actions that are relevant to the US 97 Redmond Reroute Interchange Project, described in the following subsections.

Policy 1A: State Highway Classification System

It is the policy of the state of Oregon to develop and apply the state highway classification system to guide ODOT priorities for system investment and management.

Action 1A.1 categorizes state highways for planning and management decisions. Under this policy, US 97 is classified as an Statewide Highway, which typically provides inter-urban and inter-regional mobility and provides connections to larger urban areas, ports, and major recreation areas that are not directly served by Interstate Highways. A secondary function is to provide connections for intra-urban and intra-regional trips.

The operational objective for Statewide Highways is to provide safe and efficient, high-speed, continuous-flow operation

Finding: The IAMP supports the US 97 Redmond Reroute Interchange Project and the existing highway classification and will enhance the ability of US 97 to serve its defined functions. Furthermore, by addressing capacity and safety issues, the IAMP will preserve the highway's ability to serve its defined function and support the operational objective for safe and efficient high-speed travel on US 97.

Policy 1B: Land Use and Transportation

This policy recognizes the role of both State and local governments related to the state highway system:

- ***State and local government must work together to provide safe and efficient roads for livability and economic viability for all citizens.***
- ***State and local government must share responsibility for the road system.***
- ***State and local government must work collaboratively in planning and decision-making relating to transportation system management.***

It is the policy of the State of Oregon to coordinate land use and transportation decisions to efficiently use public infrastructure investments to:

Action 1B.4 requires ODOT to work with local governments to develop plans and zoning regulations that are consistent with the Transportation Planning Rule and this policy.

Findings: ODOT has worked with the City of Redmond to develop and adopt a TSP that is consistent with state and local plans, goals and policies. The IAMP is a joint effort that is compatible with the city and county TSPs and comprehensive plans and therefore meet the direction of policy 1B.

Action 1B.6 *requires ODOT to protect the state highway function by working with local jurisdictions in developing land use and subdivision ordinances, specifically:*

- *A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;*
- *A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;*
- *Regulations assuring that amendments to land use designations, densities and design standards are consistent with the functions, capacities and highway mobility standards of facilities identified in transportation system plans including the Oregon Highway Plan and adopted highway corridor plans;*

- *Refinement of zoning and permitted and conditional uses to reflect the effects of various uses on traffic generation;*
- *Standards to protect future operation of state highways and other roads; and*
- *Access control measures, for example, driveway and public road spacing, median control and signal spacing standards which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities.*

Finding: The IAMP specifies that as land develops to urban densities within the interchange area, compliance with the IAMP will be required with the access management and circulation plans associated with development. In conjunction with the adoption of the IAMP, a number of amendments will be made to the City of Redmond Comprehensive Plan, Transportation System Plan and development codes to reflect the amendments contained in Appendix 7 and actions outlined in the Memorandum of Understanding in Appendix 8.

Action 1B.8 *directs ODOT to work with local governments to maintain the highway mobility standards on state highways by creating effective development practices through the following means:*

- *Develop an adequate local network of arterials, collectors and local streets to limit the use of the state highway or interchanges for local trips;*

- *Reduce access to the state highway by use of shared accesses, access from side or back roads and frontage roads, and by development of local street networks as redevelopment along state highways occurs;*

- *Cluster development in compact development patterns off of state highways;*

- *Develop comprehensive plan, zoning and site plan review provisions that address highway mobility standards; and*

- *Avoid the expansion of urban growth boundaries along Interstate and Statewide Highways and around interchanges unless ODOT and the appropriate local governments agree to an interchange management plan to protect interchange operation or an access management plan for segments along non-freeway highways.*

Findings*:* The IAMP includes a Local Connectivity Plan that provides for improved circulation in the area around the interchange and facilitate the implementation of the IAMP access management plan that will ultimately eliminate direct access to US 97 from private approaches. Accesses will be removed from the state highway when the local roads are constructed.

Policy 1C: State Highway Freight System

It is the policy of the State of Oregon to balance the need for movement of goods with other uses of the highway system, and to recognize the importance of maintaining efficient through movement on major truck freight routes.

Action 1C.3 requires ODOT to treat designated freight routes as Expressways where the routes are outside of urban growth boundaries and unincorporated communities. Continue to treat freight routes as Expressways within urban growth boundaries where existing facilities are limited access or where corridor or transportation system plans indicate limited access.

Finding: US 97 is a part of the statewide freight system. From north of Madras to the Redmond UGB, Milepost 119.98, US 97 is designated as an Expressway. The IAMP recommends, as a separate action by the OTC, that US 97 be re-designated from Urban to an Expressway from Milepost 119.98 to the point where the US 97 Reroute connects back to its original alignment (approximately Milepost 121.66). The US 97 Redmond Reroute and Interchange Project will build a new interchange from the US 97 Reroute mainline to the local arterial road system and be managed as an Expressway. The interchange was designed to meet the demand of vehicles accessing US 97 at this location, including commercial vehicles.

Policy 1F: Highway Mobility Standards

It is the policy of the State of Oregon to use highway mobility standards to maintain acceptable and reliable levels of mobility on the state highway system. These standards shall be used for:

- ***Identifying state highway mobility performance expectations for planning and plan implementation;***
- ***Evaluating the impacts on state highways of amendments to transportation plans, acknowledged comprehensive plans and land use regulations pursuant to the Transportation Planning Rule (OAR 660-12-060); and***
- ***Guiding operations decisions such as managing access and traffic control systems to maintain acceptable highway performance.***

Action 1F.1 requires that highways operate at a certain level of mobility, depending on their location and classification. Part of this action requires that interchanges on Statewide Highways and Freight Routes be managed to maintain safe and efficient operation of the highway through the interchange area. The OHP directs that the maximum volume-to-capacity (V/C) ratio for the ramp terminals of interchange ramps be the smaller of the values of the V/C ratio for the crossroad or 0.85.

Finding: US 97 within the project area and the ramp termini of the proposed project will meet or exceed the OHP and HDM V/C ratio standards. For more detail on V/C ratios, see Chapter 4.

Policy 1G: Major Improvements

It is the policy of the State of Oregon to maintain highway performance and improve safety by improving system efficiency and management before adding capacity. ODOT will work in partnership with regional and local governments to address highway performance and safety needs.

Action 1G.1 *directs agencies to make the fewest number of structural changes to a roadway system to address its identified needs and deficiencies through the 20-year planning horizon, and to protect the existing highway system before adding new facilities to it. The action ranks four priorities of projects, as follows:*

- *Preserving the functionality of the existing system;*
- *Making minor improvements to improve the efficiency and capacity of the existing system;*
- *Adding capacity to the existing system; and finally*
- *Building new transportation facilities.*

Finding: As described below, the US 97 Redmond Reroute Interchange Project falls under the last priority. The project is needed as part of the US 97 Redmond Reroute to achieve adopted OHP mobility standards on US 97 based on forecast growth in traffic. Without the improvement, US 97 would not meet the OHP mobility standard.

Action 1G.2 requires that major improvement projects to state highway facilities go through a planning process that involves coordination between state, regional, and local stakeholders and the public, and that there is substantial support for the proposed improvement.

Finding*:* The US 97 Redmond Reroute Interchange Project includes a local contribution of $11,400,000 and a federal earmark of $12,180,000 which clearly demonstrate regional and local support for the project.

Action 1G.3 encourages the use of an intergovernmental agreement to implement a cost-sharing agreement when a project has major benefits to the local system, especially when local sponsors of the project envision purposes beyond those needed to meet state transportation objectives.

Finding: ODOT and the City of Redmond have entered into a Memorandum of Understanding (MOU) to establish their agreement on long-term transportation and land use issues in regard to the US 97 Reroute. It identifies the shared responsibilities for the provision of state and local roads that are necessary to carry out the management plan for the interchange area.

Action 1G.4 requires that major improvements be designed for limited access to protect through traffic movements. Develop and implement an access management

intergovernmental agreement and require the local jurisdiction to adopt supporting actions in the local comprehensive plan.

Finding: The IAMP contains an access management plan that protects the through traffic movement by eliminating all accesses to US 97 during the planning horizon. ODOT and the City of Redmond entered into a MOU that makes joint commitment to the plan and requires the city to make changes to their comprehensive plan and ordinances to implement the plan.

Action 1G.5 directs the state to negotiate an intergovernmental agreement with the local jurisdiction affected by a major improvement such as a bypass and transfer the ownership of the state routes that are bypassed to the local jurisdiction at the completion of the project.

Finding: The Memorandum of Understanding between ODOT and the City of Redmond regarding the US 97 Reroute stipulates that when the new highway is constructed the responsibility for the preexisting section of US 97 between MP119 and 121.79 will transfer to the city.

Policy 2D: Public Involvement

It is the policy of the State of Oregon to ensure that citizens, businesses, regional and local governments, state agencies, and tribal governments have opportunities to have input into decisions regarding proposed policies, plans, programs, and improvement projects that affect the state highway system.

Action 2D.1 requires that an effective public involvement program be conducted as part of improvement projects that create opportunities for citizens, businesses, regional and local governments, and state agencies to comment on proposed policies, plans, programs, and improvement projects.

Finding: The IAMP was developed in partnership with affected property owners in the interchange area, the City of Redmond, Deschutes County, and ODOT and other stakeholders, including interchange users. The general public and any interested local business operations within the study area were notified of public meetings related to the IAMP and they were provided opportunities to participate.

Policy 3A: Classification and Spacing Standards

It is the policy of the State of Oregon to manage the location, spacing and type of road and street intersections and approach roads on state highways to assure the safe and efficient operation of state highways consistent with the classification of the highways.

Action 3A.1 directs access management along state highways based on access management guidelines.

Finding*:* US 97 is classified as an statewide highway, and the proposed project complies with adopted policies in the OHP and OAR 734.0051. An access management plan (AMP) was developed as part of the IAMP. The AMP is implemented through the design of the US 97 Reroute and locally adopted plans and development regulations. The Access and circulation issues are addressed in detail in the IAMP.

Action 3A.2 relates to establishing spacing standards on state highways. The spacing standard for non-interstate interchanges is 3 miles in rural areas and 1.9 mile in urban areas. For other private (driveway) and/or public (street) approaches, the spacing standard is 990 and 1320 feet respectively

Finding: The US 97 Redmond Reroute Interchange Project complies with ODOT and the FHWA minimum spacing standards. Deviations have been approved as part of the Short-Term action items. There is no existing or planned interchange within one mile of the US 97 Redmond Reroute Interchange Project. See Chapter 5 of the IAMP for the AMP. All Deviations have been approved by the Engineer of Record (EOR).

Policy 3B: Medians

It is the policy of the State of Oregon to plan for and manage the placement of medians and the location of median openings on state highways to enhance the efficiency and safety of the highways, and influence and support land use development patterns that are consistent with approved transportation system plans.

Action 3B.2 requires the design and construction of non-traversable medians for all new multi-lane highways constructed on completely new alignment;

Finding: A non-traversable median will be constructed as part of the US 97 Reroute project for the entire length of the project. Breaks in the median will only occur at signalized intersection on the Reroute.

Policy 3C: Interchange Access Management Areas

It is the policy of the State of Oregon to plan for and manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.

Action 3C.1 requires that an IAMP be developed to protect the function of interchanges and provide safe and efficient operations between connecting roadways.

Finding: The US 97 Redmond Reroute IAMP was developed for the project. The intent of the IAMP is to manage the facility and adjacent land use to protect the function of the interchange to ensure safe and efficient operations between US 97 and North Canal Blvd. and NW 6th Street (Business 97). An access management plan is included as an integral component of the IAMP.

Action 3C.2 addresses spacing, access, and other supporting requirements for an interchange improvement project.

Finding: The requirements of this policy are discussed below:

Necessary supporting improvements such as road networks, channelization, medians, and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source or must be in place. The Redmond Comprehensive Plan, TSP, Development Code and Public Improvement Standards, commit to a network of future local road improvements that have been demonstrated to reduce demand for state highway travel in the interchange management area. These facilities will largely be constructed as a requirement of new development. The proposed US 97 Redmond Interchange project does include channelization, medians and access control as described in the IAMP.

ODOT's minimum spacing standards require that full access to cross streets be no closer than 1,320 feet from an interchange ramp when possible.

Quince Avenue

The nearest full access cross streets to the US 97 Redmond interchange are Quince Avenue approximately 1,000 feet to the south on NW 6th Street and King Way approximately 600 feet to the north. While Quince Avenue exist today as a "T" intersection and is closer to the US 97 ramps than called for by the ODOT spacing standards, not allowing Quince Avenue in order to meet ODOT spacing standards would negatively affect land use and traffic operations. The Quince Avenue connection is essential to maintain local access and total transportation system circulation in the area. Quince Ave is called to be a "Four-Legged" intersection in the TSP.

King Way

King Way connects to North Canal Boulevard in the immediate area of the interchange. In conjunction with the construction of the interchange, North Canal Boulevard will be relocated to connect with NW 6th Street at the US 97 Reroute interchange. As a result, King way will be relocated to the north to connect with North Canal Boulevard. While King Way will be closer to the US 97 ramps than called for by the ODOT spacing standards, not allowing the connection of King Way in order to meet ODOT spacing standards would negatively affect land use and traffic operations. In the long-term, the Local Connectivity Plan developed as part of the IAMP will have this connection closed and King Way relocated north 1,320 feet to the future location of a signalized intersection.

Larch Avenue

The US 97 Reroute Project has incorporated a US 97 southbound right-in/right-out at Larch Avenue. Larch Avenue is located approximate 3600 feet from the end of the US 97

southbound on-ramp. While Larch Avenue will be closer to the US 97 ramps than called for by the ODOT spacing standards, not allowing the connection of Larch Avenue in order to meet ODOT spacing standards would negatively affect land use and traffic operations. In the near-term, the Larch Avenue connection will not cause the operation of US 97 or the interchange to not meet adopted ODOT mobility standards. To ensure that the Larch Avenue connection does not negatively affect the operation of US 97 or the interchange, an operational review will be conducted annually by ODOT and the City of Redmond. At such time as the Larch Avenue connection does not meet ODOT mobility standards, either improvements will be made to the local street system to bring the Larch Avenue connection into compliance with ODOT standards, or the Larch Avenue connection to US 97 will be closed.

While these access locations do not meet the full spacing standards, they do improve on the current condition, will operate adequately, and have been approved through a deviation by the EOR. This IAMP and supporting traffic analysis serve as the documentation to support the deviations from the ODOT spacing standards required for these connections.

Road Classification

The US 97 Redmond interchange connects a Statewide Highway with a major arterial road, NW 6th Street (formerly US 97), which complies with the request that statewide highways connect with state highways, or major or minor arterials.

Alternative Transportation Modes

The US 97 Redmond Interchange Project will create bicycle lanes and sidewalks on both sides to facilitate bicycle and pedestrian movement.

Policy 4A: Efficiency of Freight Movement

It is the policy of the State of Oregon to maintain and improve the efficiency of freight movement on the state highway system and access to intermodal connections. The State shall seek to balance the needs of long distance and through freight movements with local transportation needs on highway facilities in both urban areas and rural communities.

Policy 4B, Action 4B.4

Action 4B.4 requires that highway projects encourage the use of alternative passenger modes to reduce local trips.

Finding: The US 97 Redmond Interchange Project that relates to NW 6th Street would add one bicycle lane and 6-foot sidewalks on both sides of the roadway, where bicycle and pedestrian facilities do not exist today.

Oregon's Statewide Planning Goals

The State of Oregon has established 19 statewide planning goals to guide local and regional land use planning. The goals express the state's policies on land use and related topics. The Oregon Department of Land Conservation and Development (DLCD) has acknowledged that the Redmond Comprehensive Plan is in compliance with the statewide planning goals. Because the US 97 Redmond Reroute Interchange Project is consistent with the City comprehensive plans (as discussed in the Local Plans, Policies, and Codes subsection below), the project is thus consistent with the statewide planning goals. No exceptions to statewide planning goals are needed.

Transportation Planning Rule

The Transportation Planning Rule (TPR) implements Oregon Statewide Planning Goal 12, which encourages construction of transportation facilities that are safe and efficient and designed to reduce automobile reliance. The objective of the TPR is to reduce air pollution, congestion, and other livability problems found in urban areas. Its relation to the proposed interchange project is described in the following subsections.

660-012-0010—Transportation Planning

Section 660-012-0010 discusses the two phases of transportation planning: transportation system planning, where land use controls are established, and transportation project development, where specific projects are designed to implement the TSP.

Finding: The construction of the US 97 Redmond interchange is recommended in the 2000 Redmond TSP.

660-012-0035 – Evaluation and Selection of Transportation System Alternatives

Section 660-012-0035 describes standards and alternatives available to entities weighing and selecting transportation projects, including benefits to different modes, land use alternatives, and environmental and economic impacts.

Finding: The primary users of the US 97 Redmond Reroute interchange are personal and commercial vehicles. The objective of the proposed project is to improve mobility and safety. A portion of this project would be constructing a new North Canal Blvd. to connect with NW 6th Street and adding bicycle and pedestrian facilities where currently there are none.

660-012-0050—Transportation Project Development

Section 660-012-0050 prescribes that transportation projects be reviewed for compliance with local and regional plans and, where applicable, undergo a NEPA process.

Finding: The EA prepared for the US 97 Reroute documents how the proposed project complies with applicable acknowledged comprehensive plan policies and land use regulations.

ODOT Access Management Rules OAR 734-051

The intention of ODOT's Access Management Rule is to balance the safety and mobility needs of travelers along state highways with the access needs of property and business owners. ODOT's rule sets guidelines for managing access to the state's highway facilities in order to maintain highway function, operations, safety, and the preservation of public investment consistent with the policies of the 1999 OHP.

Finding: This OAR is relevant to the US 97 Redmond Reroute Interchange Project because the project proposes to consolidating approaches to improve safety and mobility along the US 97 corridor. In Appendix D of the OHP, US 97 is classified as a Statewide Highway. As described in the IAMP, all intersections within the area will meet the level of service standards specified in the OHP except for the intersection of US 97 and Larch Avenue. This intersection is projected to fail by the year 2020. As this intersection is planned for limited right-in/right-out movements only, there is little that can be done to mitigate operations. ODOT and the city have committed in the plan to close Larch Avenue if safety and operational problems develop as part of the annual review process outlined in the adopted MOU for the Redmond Reroute (Appendix 8).

734-051-0115, Access Management Spacing Standards for Approaches

Section 734-051-0115 states that access management spacing standards depend on highway classification, type of area, and posted speed, and are to be applied to reconstruction as well as new construction projects.

Finding: The proposed project includes widening North Canal Blvd from roughly 750 feet north of US 97 Redmond Reroute interchange ramp terminals, and south to NW 6th Street, a stretch of roughly 0.45-mile. The project will close or consolidate access from more than 6 businesses to the state highway. Deviations to the access management spacing standards are being requested as part of the project. Section 734-051-0115 allows deviations in cases where a right of access exists, the designated access management standards cannot be accomplished, and where the property(ies) do not have reasonable access. The proposed access management spacing deviation locations at Larch Avenue (right-in, right-out only) and Kings Way, are in areas where development has largely occurred, have proposed modifications to close access, and provide the only reasonable access for many adjacent properties to the public street system.

734-051-0125, Interchange Access Management Area Spacing Standards for Approaches

Section 734-051-0125 calls for a plan to be developed for the management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.

Finding: This IAMP addresses access management for the area of the US 97 Redmond Reroute interchange that will provide for improved operations that meet OHP and HDM mobility standards, the proposed interchange and access management elements ensure the safe and efficient operation between the highway and connecting local streets.

734-051-0155, Access Management Plans, Access Management Plans for Interchanges and Interchange Area Management Plans

Section 734-051-0155 encourages the development of highway segment access management plans and interchange area management plans, especially for facilities with high traffic volumes and/or that provide important statewide or regional connectivity, and have the following characteristics: where existing developments do not meet spacing standards, existing development patterns and plans would result in a deviation request, or an access management plan would preserve or enhance the safe and efficient operation of a state highway.

Finding: An access management plan and strategy were developed as part of the IAMP, as part of the US 97 Redmond Reroute and Interchange construction project and addresses this provision of Division 51.

734-051-0165, Design of Approaches

Section 734-051-0165 stipulates access control measures related to the construction or improvement of roads and/or interchanges. In accordance with 734-051-0165, approaches may be mitigated, modified, or closed pursuant to an adopted access management plan or IAMP.

Finding: The proposed plan identifies roughly 17 driveways along the US 97 corridor, North Canal Blvd, and NW 6th Street that will be either closed or consolidated. The plan calls for closing driveways where multiple driveways exist and, where possible, combining driveways to serve multiple businesses. Three accesses would be modified from full access to right-in, right-out only.

A right-in/right-out approach to Larch Street is not consistent with established access management standards. A deviation to authorize this project with lesser spacing is described in this IAMP and has been approved by the Engineer of Record.

State Agency Coordination Program (December 1990) (OAR 731-0015)

State agency coordination programs describe what agencies will do to comply with Oregon's land use planning program. Specifically, they describe how an agency (that is, ODOT) will meet its obligations under ORS 197.180 to carry out its programs affecting land use in compliance with the statewide planning goals and in a manner compatible with acknowledged comprehensive plans. Any needed local agency coordination not already accomplished or underway would occur before or as part of final project design.

The ODOT State Agency Coordination Rule (OAR 731-0015) required the Oregon Transportation Commission to adopt IAMPs as part of and consistent with the adopted policies and direction of the state TSP. These plans must comply with the Statewide Planning Goals and be compatible with local government comprehensive plans.

Finding: The City of Redmond has determined that the IAMP will be consistent with its comprehensive plans with adoption of amendments to existing plans as described in an MOU with ODOT (Appendix 8) and thereby establishing compliance with the statewide planning goals. The IAMP will be adopted as part of the state TSP. The review of the proposed alternatives with local plans and documented herein meets the stipulations of the state agency coordination program.

Freight Moves the Oregon Economy (1999)

As indicated in this publication, "Freight plays a major role in moving the Oregon economy. Most freight moves by truck, rail, waterway, air, and pipeline with truck accounting for the greatest volume of freight."

Finding: By constructing the US 97 Redmond Reroute Interchange to better serve truck and freight traffic (both geometrically and operationally), the US 97 Redmond Reroute interchange is consistent with proposed strategies in this document to reduce delay and eliminate travel barriers. The IAMP is consistent with this plan because it seeks to accommodate the safe and efficient movement of freight.

Local Plans, Policies, and Ordinances

City of Redmond Transportation System Plan (updated 2001)

The Redmond TSP identifies transportation needs to support planned land uses in the city over a 20-year time horizon as defined by the 2000 Redmond Comprehensive Plan. The TSP was created in accordance with the TPR (Oregon Administrative Rule [OAR] 660-012-045) and the Comprehensive Land Use Planning Statute (Oregon Revised Statutes [ORS] 197.712).

Finding: The Redmond TSP identifies the US 97 Redmond Reroute and Interchange Project as the preferred alternative for accommodating through traffic in Redmond. The City of Redmond will be incorporating into their on-going TSP update the required

amendments identified in the IAMP which included a Traffic Signal Plan (Figure 5.3), a Local Street Connectivity Plan (Figure 5.4), and an Access Spacing Standards for NW 6th Street (Business 97) and North Canal Boulevard. The City of Redmond will also be incorporating into their TSP update the local facility improvements identified in the IAMP needed to protect the interchange through the plan period.

City of Redmond Comprehensive Plan (1978, amendments through 2005)

The City of Redmond Comprehensive Plan, which is currently being updated, acts as a guide for future growth and development within the urban area using a framework of goals and policies that respond to current needs and conditions in addition to guiding future City programs, major capital projects, and other funding decisions through the year 2020. The updated plan will extend this period through 2025.

The Comprehensive Plan goals, policies were designed for implementation through the Redmond Urban Area Transportation Plan addressing transportation system management, treatment of state highways, and development of local street systems, street design, and other transportation elements.

Finding: The City of Redmond will be incorporating into their comprehensive plan the required amendments identified in the IAMP which included the requirement that master plans be consistent with the Local Street Connectivity Plan (Figure 5.4), that property annexed to the city must relinquish all direct access rights to the highway, and incorporate the IAMP access management strategy for NW 6th Street (Business 97) and North Canal Boulevard.

Redmond Development Code

These regulations have been adopted for the purpose of promoting the health, safety, peace, comfort, convenience, economic well-being, and general welfare and to carry out the City of Redmond Comprehensive Plan and Statewide Planning Goals. They are intended to promote an orderly use of land within the city to avoid detrimental effects to other land uses and City facilities. Article III of the Development Regulations includes standards for subdividing and partitioning land within the city. These include regulations pertaining to the location and design of future streets, procedures for street dedications, and requirements for the sizes, shapes, and orientation of individual lots.

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Finding: The City of Redmond will be incorporating into their development regulations the required amendments identified in the IAMP which included the requirement that master plans show direct access to local streets, not the State highway, be consistent with the Local Street Connectivity Plan (Figure 5.4), and property going through the master

planning process relinquish all direct access rights to the highway, US 97. Redmond will also be amending their development regulations to adopt access management standards for 6th Street (Business 97) and North Canal Boulevard consistent with the OHP classification for "Statewide" and "District" highways in urban areas (See Appendix 7 and 8).