FINAL REVIEW DRAFT

Baker Interchange Area Management Plan
Interchanges 302 and 306
Baker City and Baker County, Oregon

Prepared for
Oregon Department of Transportation, Region 5
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EXECUTIVE SUMMARY

The *I-84 Baker Interchange Area Management Plan* (IAMP) for the interchange areas surrounding Interstate 84 Interchanges 302 and 306 describe existing traffic and land use patterns in the interchange areas, identify potential safety and traffic congestion issues, and propose policies and implementing measures that will ensure safe and efficient operation of the interchanges over a 20-year planning horizon and for the life of the interchanges. They are planning-based IAMPs. No structural improvements to either interchanges are anticipated. The IAMPs are developed in partnership with the City of Baker, Baker County, the Oregon Department of Transportation (ODOT), property owners and other stakeholders, including interchange users.

BACKGROUND AND PURPOSE

The purpose of this IAMP is to ensure growth and development can occur in the interchange study areas without compromising the operation of the interchanges. The need for the study arose when a private party expressed interest in developing vacant property near Interchange 302. This development did not occur due to transportation access and other infrastructure issues. As a result, the City decided to initiate planning for the area around the interchanges in order to resolve transportation and land use issues while the area was still largely undeveloped. The area around Interchange 304 was not included in the study because it is largely urbanized and contains very little vacant land.

The interchange study areas are predominantly rural. More than two quadrants in both cases are outside of Baker City's Urban Growth Boundary (UGB), with some rural residential exception-area zoning. They contain and are surrounded by high value agricultural land zoned for exclusive farm use (EFU). There is state and local interest in preserving this land for continued farm use and to restrict higher density interchange-induced development that would compromise the safety and function of the interchange for all users. The urban (southern) quadrants of the Interchange 302 study area is zoned for a combination of residential, general commercial and industrial use.

FUNCTION OF THE INTERCHANGES

Interchange 302

Interchange 302 is principally a rural interchange that connects Interstate-84 (I-84) with Oregon 86 (OR 86). Its main purpose as a major freight route as defined in the Oregon Highway Plan is to provide mobility, safe and efficient high-speed traffic operation and connections to major cities, regions of the state, and other states while providing connections to cities and other destinations. OR 86 is an ODOT District-level Highway that serves as an east-west road providing access to Baker City, the Oregon Trail Interpretive Center, and cities to the west including Richland and Halfway. District Highways as defined in the Oregon Highway Plan are facilities of county-wide

significance and function largely as county arterials or collectors, providing connections and links between smaller urbanized areas, rural centers and urban hubs. OR 86 continues west to the Idaho border. The Baker Municipal Airport is located north of Interchange 302.

Interchange 302 provides dispersed access to the northern part of town and the industrial and commercial area along Best Frontage Road. It accommodates business travel coming into downtown from the west and provides access to the hospital. It is the portal to the Hells Canyon Scenic Byway, the Oregon Trail Interpretive Center, and various recreational opportunities to the east of town. The recent designation of the Hells Canyon Scenic Byway as an All–American Road will help to promote tourism in the area.

Interchange 306

Interchange 306 is a rural interchange that connects US 30, a District Highway that runs north-south, paralleling I-84 through Baker County. South of Interchange 306, US 30 has a common alignment with I-84. The main purpose of I-84 as defined in the Oregon Highway Plan is to provide mobility, safe and efficient high-speed traffic operation and connections to major cities, regions of the state, and other states while providing connections to cities and other destinations. North of the interchange, the route carries primarily farm/ranch and tourism/recreational traffic. The primary function of Interchange 306 is to provide another access to downtown, particularly for visitors coming from the east, as well as access to various regional visitor attractions such as Sumpter Lake.

OBJECTIVES

The objectives for the IAMP included:

- Involving affected property owners in the interchange area, the City of Baker, Baker County, the Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users.
- Evaluating local transportation, environmental, and land use conditions.
- Identifying needed transportation improvements within the Interchange Study Areas and proposing alternatives that conform to current design standards and accommodate the long-term capacity needs of the local transportation system.
- Developing the IAMP in accordance with the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.
- Including policies and implementing measures in the IAMP that preserve the functionality of the interchange areas.

PROCESS

Recognizing that the success of land use or transportation efforts depends in part on involvement of citizens and other affected stakeholders, the Project Management Team (PMT) kept property owners and other stakeholders informed at each stage of the planning effort. They were invited to provide comments as the plan developed. Key stakeholders and participants included the PMT, the general public, and other groups.

The PMT is an advisory group consisting of representatives from the Oregon Department of Transportation (ODOT), the City of Baker City and Baker County. The PMT is responsible for guiding the planning work of the Contractor (Cogan Owens Cogan, LLC (COC) and David Evans and Associates, Inc. (DEA)). A list of the PMT is included in Appendix A.

The PMT was responsible for providing input regarding the *I-84 Baker Interchange Area Management Plan* (IAMP) development including interchange area boundaries, goals and objectives, the level of public involvement and technical analysis. The PMT reviewed and commented on all work products and recommendations. Five meetings were held with the PMT in the course of developing the plan.

Other Stakeholder Groups

Other stakeholder groups included the Baker County Chamber of Commerce, the Baker County Visitor and Convention Bureau, Historic Baker City, groups representing businesses in north Baker City and along Campbell Street, the Baker County Emergency Management Agency and Road Master, the Baker City Fire Department and Sheriff's Department, the Baker 5J School District, the Cities of Richland, Halfway, Sumpter, and Unity, the Oregon Parks Department, and the U.S. Forest Service and Bureau of Land Management. Representatives of these stakeholder groups were encouraged to attend the public workshops and comment on the IAMP planning process.

General Public

All property owners, renters or businesses within the interchange areas, those who use the affected interchanges, or any individual who may have been directly or indirectly impacted by the project were also notified via direct mail and via articles in the newspaper. Two public workshops were held. The first workshop, held April 9, focused on the project background, preliminary findings and evaluation criteria. The second workshop, held April 28, gave the public an opportunity to review and comment on alternative management options for the interchange areas, particularly Interchange 302. Two workshop reports are available under separate cover.

A joint work session with the Baker County Board of Commissioners, the Baker County Planning Commission and the Baker City Planning Commission was held May 26. The

adoption hearings before the Baker City Council and Baker County Board of Commissioners are anticipated to begin in mid- June.

ALTERNATIVES CONSIDERED

Based on an analysis of the roadway network and function in the interchange study areas, 12 transportation options were developed in response to operational, mobility, safety and other issues. The transportation analysis was based on a future land use and transportation projection that is less than allowed by current zoning (full build out) but still considered optimistic for the area, considering historic growth trends. The options included:

- Two options for Best Frontage Road realignment to meet state access spacing standards for safe and efficient traffic movement.
- Two options for Airport Road realignment to meet state access spacing standards for safe and efficient traffic movement.
- Three options for left-turn lanes on Oregon 86 at the I-84 ramps; the Lindley/Atwood road intersection; and at the Hudson/realigned Best Frontage Road intersection to improve traffic safety when development occurs by separating turning traffic from through traffic volumes.
- Realigning Cedar Street from Hughes Lane to Old Trail Road for safe and efficient traffic movement on Cedar Street, a rural roadway.
- Connection with the Main Street Extension as identified in the City's Transportation System Plan.
- Three options for the Hughes Lane/Cedar Street intersection that is expected to face congestion as growth occurs.

A matrix of these options is included in the appendix. They are described in the IAMP report, Section Six, Transportation Alternatives.

At the public workshops and in subsequent communications, several property owners along Best Frontage Road, Airport Road and Hudson Street expressed concern regarding impacts to their property due to the proposed realignment. Refinements of these options are continued to be recommended to ensure that growth and development can occur while maintaining the function and capacity of Interchange 302. Several workshop participants questioned the need for these measures considering the historically low and stable growth in the area of 1% annual average growth. Workshop participants also expressed support for maintaining farmland and the rural residential character of particularly the northern portion of Interchange 302, north of OR 86. Several participants emphasized the importance of maintaining good, clear access to the Baker City Municipal Airport.

The Interchange 306 roadway system currently meets state access standards and is not expected to experience unmanageable traffic loads in the future. Therefore, no transportation alternatives are being evaluated for this interchange.

IAMP RECOMMENDATIONS

According to Oregon Administrative Rules 734-051-0200, IAMPs should contain short-, medium-, and long-range actions to improve and maintain safe and efficient roadway operations in interchange areas. Such actions may include roadway improvements, access management, traffic control devices, land use designations and policies. In response to the concerns raised associated with several of these options, and the skepticism around the growth scenarios, the Project Management Team recommended the use of average daily travel (ADT) traffic "trigger points" as a more appropriate means by which to measure the need for these improvements.

The existing Exclusive Farmland Use designation surrounding the majority of the northern quadrants of Interchange 302, and three of four quadrants of Interchange 306, combined with the Oregon Statewide Planning Goals and implementing Baker City and Baker County policies and regulations will be, if maintained, effective in protecting resource lands and will provide long-term protection for the agricultural lands and land uses surrounding the interchange.

This IAMP relies on the Oregon, Baker County and Baker City land use regulations but also calls for ODOT involvement in review of proposed land use actions in the vicinity of the interchanges.

ODOT will continue to control access along Interstate 84, Oregon 86 and Oregon 30 in the vicinity of the interchanges. With the recommended transportation options and land use policies, the interchanges are expected to operate acceptably for the 20-year planning horizon and beyond -- for the life of the interchanges (estimated at 40-50 years). Baker City and Baker County are expected to adopt the IAMPs as an element of their Comprehensive Plans and as part of their Transportation System Plans. ODOT will continue to coordinate with the city, county, and state agencies, through the plan amendment and development review processes, to support existing land use protections. In addition, ODOT will monitor and comment on any future actions that would amend the Baker City Urban Growth Boundary in the vicinity of the interchanges. Other actions will entail assisting Baker City and Baker County with roadway improvements at the interchange and in the interchange study areas.

The recommended action items fall into four general categories: roadway improvements, access management, other improvement projects and agency coordination.

Roadway Improvements

- Realign Best Frontage Road to meet state access spacing standards for safe and efficient traffic movement when traffic volumes on Best Frontage Road warrant this change (1,000 – 2,000 trips per day). Current volumes are approximately 200 per day.
- Realign Airport Road to meet state access spacing standards for safe and efficient traffic movement when traffic volumes on Airport Road warrant this change (1,000 – 2,000 trips per day). Current volumes are approximately 200 per day.
- Install left-turn lanes on Oregon 86 at the I-84 ramps; the Lindley/Atwood road intersection; and at the Hudson/realigned Best Frontage Road intersection to improve traffic safety when development occurs by separating turning traffic from through traffic.
- Install left turn lanes on Cedar Street at Old Trail Road.
- Add turn lanes and a 4-way STOP control to improve intersection operations as growth occurs.

Access Management Improvement Projects

- Improve the intersection of Old Trail Road and Cedar Street to consolidate the intersection connections into a single "T" intersection.
- Define the access to the RV Park on Cedar Street.
- Realigning Cedar Street from Hughes Lane to Old Trail Road for safe and efficient traffic movement on Cedar Street, a rural roadway.

Other Improvement Projects

- Reduce speed on Cedar Street from Hughes Lane to I-84 – to 45 mph or less.
- Reduce speed on OR 86 from I-84 to Lindley/Atwood Road

Agency Coordination

- Baker City, Baker County and ODOT, via the Oregon Transportation Commission, will all adopt the final IAMPs and associated plan policies and recommendations. Baker City and Baker County will coordinate with ODOT in the evaluation of any action, such as a comprehensive plan amendment, that would affect the function of the interchanges as described in the IAMP.

- ODOT, Baker City and Baker County will coordinate to prepare a funding plan for provision of any improvements described in the IAMP. Property owners would be expected to be responsible only for improvements associated with their property when development occurs.

The Main Street Extension north of Hughes Lane is not recommended as part of the IAMP due to property impacts and concern of the potential impacts on downtown businesses. It is still identified in the City of Baker City's Transportation System Plan.

IMPLEMENTATION OF THE IAMP

The steps that are anticipated to occur for implementation of the Baker IAMPs are:

- Following the actions by Baker City and Baker County, the Oregon Transportation Commission (OTC) will be requested to formally amend the Oregon Highway Plan to incorporate the IAMP.
- Baker County
    - June, 2005: Baker County Planning Commission (June 16) and Board of County Commissioners (June 29) will hold hearings and consider adoption of the IAMP and associated actions.
- Baker City
    - June, 2005: Baker City Planning Commission (June 15) and City Council (June 28) will hold hearings and consider adoption of the IAMP and associated actions.

AMENDMENTS TO LOCAL COMPREHENSIVE PLANS, DEVELOPMENT CODES AND TRANSPORATION SYSTEM PLANS

The specific elements Baker County is requested to include as amendments to its comprehensive plan and transportation system plan include:

- Adoption of the IAMP as an element of the Comprehensive Plan. Includes new findings, policies and, for Baker City - in keeping with the style of their comprehensive plan - implementation actions, to recognize the importance of the I-84 interchanges to move people and goods to and from the region, and provide access and a gateway travel option into Baker City, surrounding communities and areas of interest.
- Improvements described in Section 8 of the IAMP are adopted by reference as amendments to the City's Transportation System Plan and the County's draft Transportation System Plan.
- By adopting the IAMP, the City and County affirm their commitment to supporting the function of these interchanges as two of the three main access

points into Baker City, and commit to continuing lower-intensity land use designations for the urban portions of the interchange areas and to commit to applying lower intensity designations (industrial and residential) should land be added to the UGB in these areas. This direction will continue to support the vitality of downtown commercial businesses as well as transportation improvements and other investments in the downtown core. Includes new findings, policies and, for Baker City - in keeping with the style of their comprehensive plan - implementation actions.

- To monitor the impact of new development on the interchange facility, Baker City and Baker County will cooperate with ODOT to require a traffic impact analysis for uses that generate more than 200 trips per day within the interchange areas. For reference, a list of typical uses is included in the appendix.
- The *Urbanization* policy sections of the City and County Comprehensive Plans will include a statement that addresses coordinated review of future growth management planning, particularly in the case of Urban Growth Boundary (UGB) expansion. Includes new findings, policies and, for Baker City - in keeping with the style of their comprehensive plan - implementation actions.

1. INTRODUCTION

The *I-84 Baker Interchange Area Management Plan (IAMP)* for the interchange areas surrounding Interstate 84 Interchanges 302 and 306 describe existing traffic and land use patterns in the interchange areas, identify potential safety and traffic congestion issues and propose policies and implementing measures that will ensure safe and efficient operation of the interchanges over a 20-year planning horizon. This is a planning-based IAMP. No structural improvements to Interchanges 302 or 306 are anticipated. The IAMP is developed in partnership with the City of Baker, Baker County, the Oregon Department of Transportation (ODOT), property owners and other stakeholders, including interchange users.

1.1 BACKGROUND AND PURPOSE

The purpose for this IAMP is to ensure growth and development can occur in the interchange study areas (See Figures 1 and 2) without compromising the operation of the interchanges. The need for the study arose when a private party expressed interest in developing vacant property near Interchange 302. This development did not occur due to transportation access and other infrastructure issues. As a result, the City decided to initiate planning for the area around the interchanges in order to resolve transportation and land use issues while the area was still largely undeveloped. The area around Interchange 304 was not included in the study because it is largely urbanized and contains very little vacant land.

The interchange study areas contain and are surrounded by high value agricultural land zoned for exclusive farm use (EFU). There is state and local interest in preserving this land for continued farm use and to restrict higher density interchange-induced development that would compromise the safety and function of the interchange for all users.

1.2 FUNCTION OF THE INTERCHANGES

Interchange 302

Interchange 302 is principally a rural interchange that connects Interstate-84 (I-84) with Oregon 86 (OR 86). Its main purpose as a major freight route as defined in the Oregon Highway Plan is to provide mobility, safe and efficient high-speed traffic operation and connections to major cities, regions of the state, and other states while providing connections to cities and other destinations. OR 86 is an ODOT District-level Highway that serves as an east-west road providing access to Baker City, the Oregon Trail Interpretive Center, and cities to the west including Richland and Halfway. District Highways as defined in the Oregon Highway Plan are facilities of county-wide significance and function largely as county arterials or collectors, providing connections and links between smaller urbanized areas, rural centers and urban hubs. OR 86

continues west to the Idaho border. The Baker Municipal Airport is located north of Interchange 302.

Interchange 302 provides dispersed access to the northern part of town and the industrial and commercial area along Best Frontage Road. It accommodates business travel coming into downtown from the west and provides access to the hospital. It is the portal to the Hells Canyon Scenic Byway, the Oregon Trail Interpretive Center, and various recreational opportunities to the east of town. The recent designation of the Hells Canyon Scenic Byway as an All–American Road will help to promote tourism in the area.

Interchange 306

Interchange 306 is a rural interchange that connects I-84 to US 30, a District Highway that runs north-south, paralleling I-84 through Baker County. South of Interchange 306, US 30 has a common alignment with I-84. The main purpose of I-84 as defined in the Oregon Highway Plan is to provide mobility, safe and efficient high-speed traffic operation and connections to major cities, regions of the state, and other states while providing connections to cities and other destinations. North of the interchange, the route carries primarily farm/ranch and tourism/recreational traffic. The primary function of Interchange 306 is to provide another access to downtown, particularly for visitors coming from the east, as well as access to various regional visitor attractions such as Sumpter Lake.

1.3 OBJECTIVES

The objectives for the IAMP include:

- Involving affected property owners in the interchange area, the City of Baker, Baker County, the Oregon Department of Transportation (ODOT), and other stakeholders, including interchange users.
- Evaluating local transportation, environmental, and land use conditions.
- Identifying needed transportation improvements within the Interchange Study Areas and proposing alternatives that conform to current design standards and accommodate the long-term capacity needs of the local transportation system.
- Developing the IAMP in accordance with the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.
- Including policies and implementing measures in the IAMP that preserve the functions of the interchange areas.

1.4 PROCESS

Recognizing that the success of land use or transportation efforts depends in part on involvement of citizens and other affected stakeholders, the Project Management Team (PMT) kept property owners and other stakeholders informed at each stage of the planning effort. They were invited to provide comments as the plan developed. Key stakeholders and participants included the PMT, the general public, and other groups.

The PMT is an advisory group consisting of representatives from the Oregon Department of Transportation (ODOT), the City of Baker City and Baker County. They are responsible for guiding the planning work of the Contractor (Cogan Owens Cogan, LLC (COC) and David Evans and Associates, Inc. (DEA)). A list of the PMT is included in Appendix A.

The PMT was responsible for providing input regarding the *I-84 Baker Interchange Area Management Plan* (IAMP) development including interchange area boundaries, goals and objectives, the level of public involvement and technical analysis. They reviewed and commented on all work products and recommendations.

Five meetings were held with the PMT in the course of developing the plan.

Other Stakeholder Groups

Other stakeholder groups included the Baker County Chamber of Commerce, the Baker County Visitor and Convention Bureau, Historic Baker City, groups representing businesses in north Baker City and along Campbell Street, the Baker County Emergency Management Agency and Road Master, the Baker City Fire Department and Sheriff's Department, the Baker 5J School District, the Cities of Richland, Halfway, Sumpter, and Unity, the Oregon Parks Department, and the U.S. Forest Service and Bureau of Land Management.

Representatives of these stakeholder groups were encouraged to attend the public workshops and comment on the IAMP planning process.

General Public

All property owners, renters or businesses within the interchange areas, those who use the affected interchanges, or any individual who may have been directly or indirectly impacted by the project were also notified via direct mail and via articles in the newspaper. Two public workshops were held. The first workshop, held April 9, focused on the project background, preliminary findings and evaluation criteria. The second workshop, held April 28, gave the public an opportunity to review and comment on alternative management options for the interchange areas, particularly Interchange 302. The two workshop reports are available under separate cover. A joint work session with the Baker County Board of Commissioners, the Baker County Planning Commission and the Baker City Planning Commission was held May 26. The

adoption hearings before the Baker City Council and Baker County Board of Commissioners are anticipated to begin in mid-June.

2. STUDY AREA

The interchange study areas and transportation systems within those study areas are described below.

2.1.1 Interchange 302 Study Area

The study area for Interchange 302 is shown if Figure 1.

Roadways in the Interchange 302 study area include OR 86, Atwood Road, Lindley Road, Hudson Road, Airport Road, Best Frontage Road, Old Trail Road, North Cedar Street, and Hughes Lane.

OR 86, the Baker-Copperfield Highway, is a District Highway under ODOT jurisdiction. Running east-west, it travels from Interchange 302 in Baker City to the Idaho border. OR 86 carries local and regional traffic and serves the Oregon Trail Interpretive Center, just east of Baker City. OR 86 has a common alignment with I-84 between Interchange 302 and 304, at which point it travels west on Campbell Street until the junction with OR 7 at Main Street.

Atwood Road is a two-lane county road extending southward from OR 86 approximately 0.6 miles east of I-84.

Lindley Road is a two-lane road classified as a major collector in the Baker County Transportation System Plan (TSP). It extends northward from OR 86 directly opposite Atwood Road.

Hudson Road is a two-lane local road extending northward from OR 86 approximately 0.4 miles east of I-84.

Airport Road is a two-lane county road running north-south, parallel to I-84. It extends northward from OR 86 approximately 680 feet east of I-84 and 356 feet east of the northbound I-84 on-ramp. Airport Road primarily serves Baker Municipal Airport to the north of OR 86.

Best Frontage Road is also a two-lane county road running north-south, parallel to I-84. It extends southward from OR 86 through industrially and commercially zoned lands to connect with the Baker City street system and OR 7. Best Frontage Road connects with OR 86 approximately 790 feet east of I-84 and 466 feet east of the northbound I-84 off-ramp.

North Cedar Street was once designated as OR 86 but was turned over to city and county jurisdiction and is now classified as a collector street within Baker City and a county road outside of the UGB. It extends westward from Interchange 302 for approximately 900 feet before turning southward to run parallel to I-84. North Cedar

Street is a two-lane roadway throughout the study area with bike lanes south of Hughes Lane.

Old Trail Road is a two-lane county road extending northward from North Cedar Street where it transitions from a north-south roadway to an east-west roadway. It connects with North Cedar Street almost 1,000 feet west of I-84 and 653 feet west of the I-84 southbound off-ramp.

Hughes Lane is a two-lane collector roadway that runs along the northern Baker City UGB. It has shoulder bike lanes west of North Cedar Street.

2.1.2 Interchange 306 Study Area

The study area for Interchange 306 is shown in Figure 2. Roads in the interchange study area include US 30 and Old US 30.

US 30 is a District Highway traveling roughly north-south, paralleling I-84 through most of Baker County. Prior to the construction of I-84, US 30 was the primary route between Baker City and La Grande. The route carries primarily farm/ranch and tourism/recreation traffic in the region. Within the study area of the south Baker City interchange, the speed is 55 mph and travels through rural land. South of Interchange 306, US 30 has a common alignment with I-84.

Old US 30 is a two-lane major collector extending southward from US 30. It connects with US 30 approximately 1,370 feet north of the beginning of the Interchange 306 ramps.

Figure 1: Study Area – Interchange 302

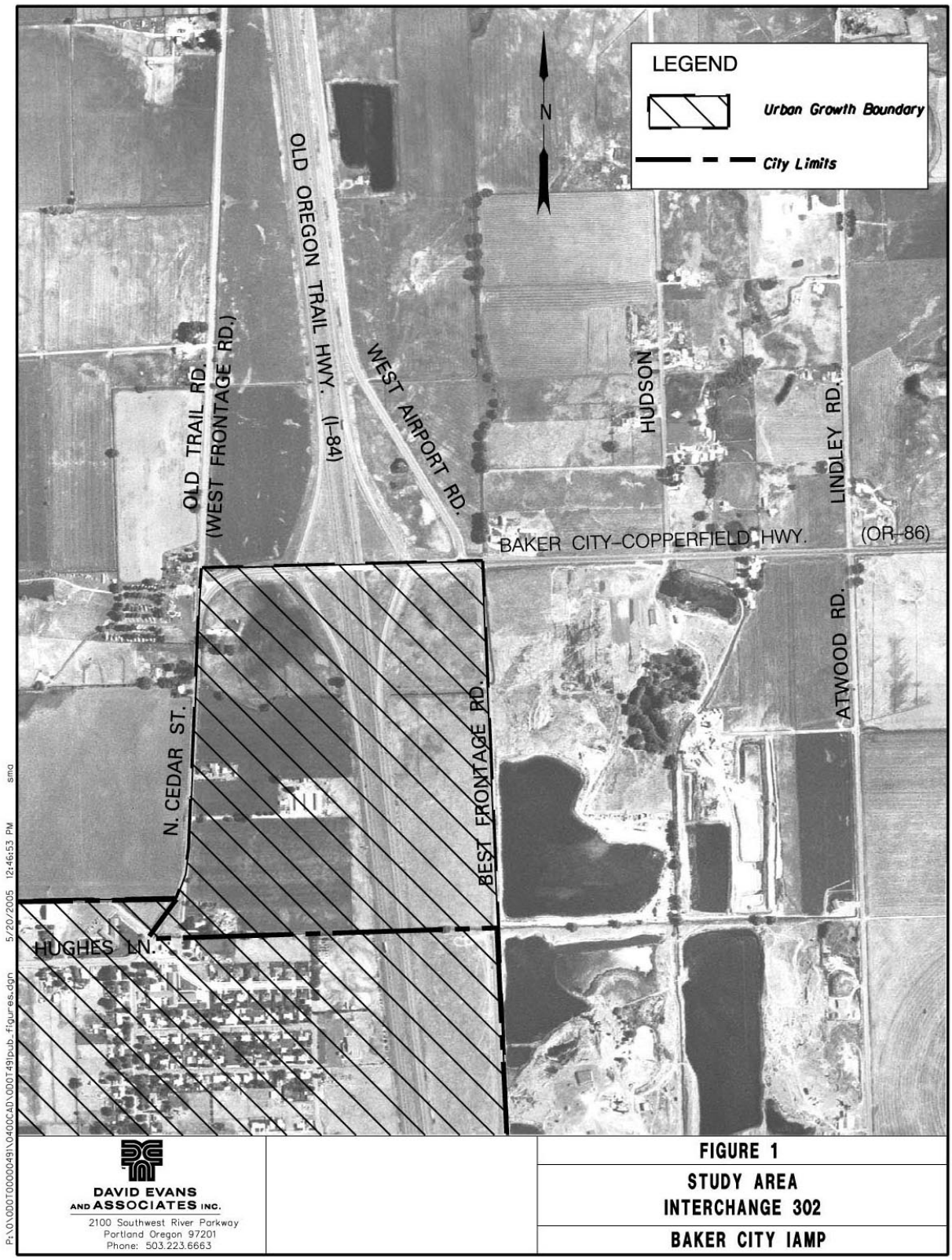
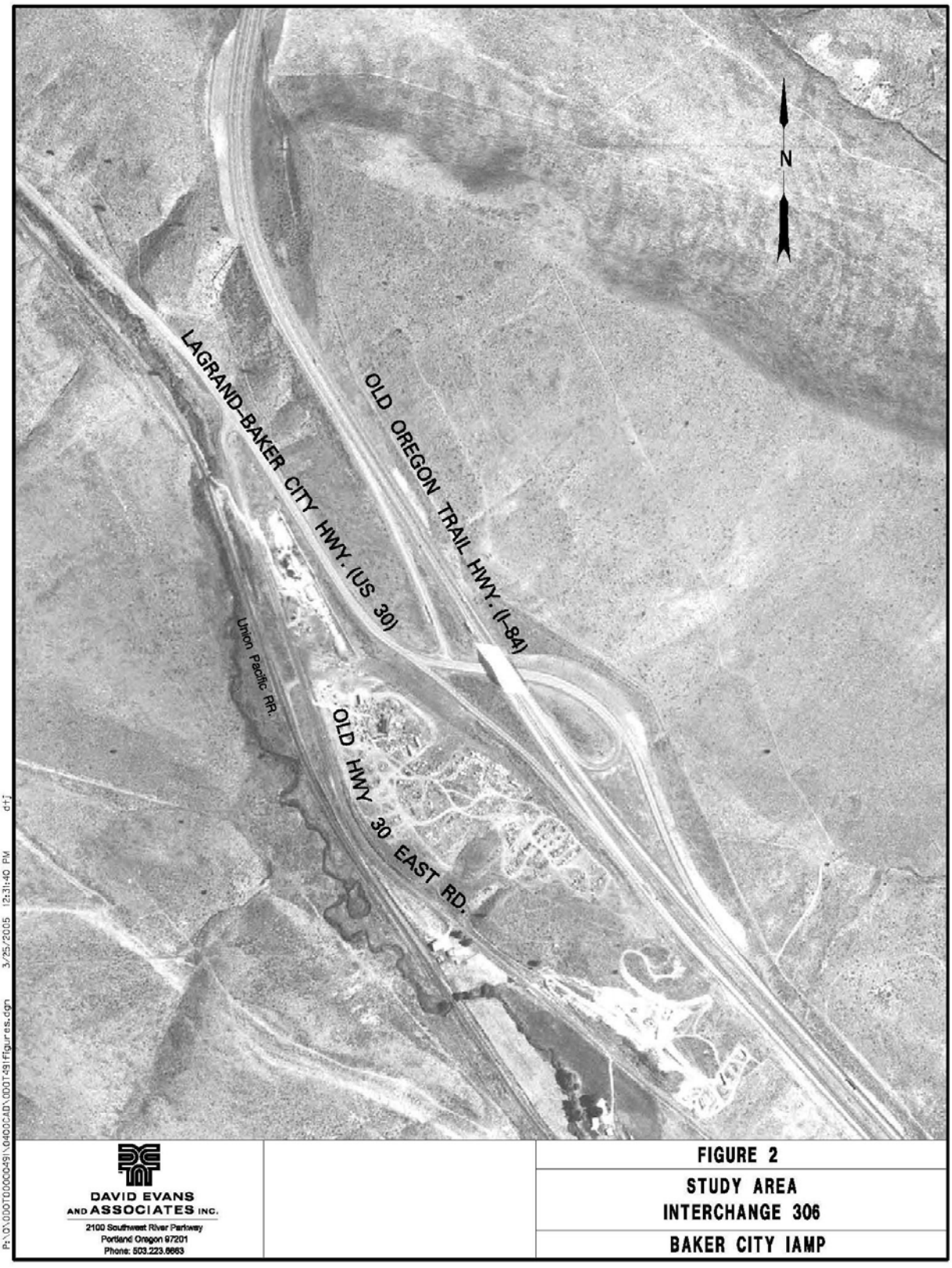


Figure 2: Study Area – Interchange 306



3. POLICY DIRECTION

The consultants and the PMT reviewed relevant plans and policies from Baker City, Baker County, and the State of Oregon. The documents establish the following policy guidelines for the management of transportation and land use in the interchange study areas:

- Statewide Planning Goals 1 (Citizen Involvement), 2 (Land Use Planning), 11 (Public Facilities Planning), and 12 (Transportation), and 14 (Urbanization)
- Oregon Transportation Plan (OTP) (1992)
- 1999 Oregon Highway Plan (OHP)
- Oregon Administrative Rule (OAR) 734-051 (ODOT Division 51 Interchange Area Access Management Spacing Standards for Approaches)
- Baker City Transportation System Plan (TSP) (1996)
- Draft Baker County Transportation System Plan
- City of Baker City Comprehensive Plan (1987)
- City of Baker City Development Code (2004)
- Baker County Comprehensive Plan (1984)
- Baker County Zoning and Subdivision Ordinance (1986)

3.1 STATEWIDE PLANNING GOALS

Five statewide planning goals help guide the planning of the Baker IAMP study areas: Goal 1, Citizen Involvement; Goal 2, Land Use Planning; Goal 11, Public Facilities Planning; Goal 12, Transportation; and Goal 14, Urbanization.

3.1.1 Statewide Planning Goal 1 (Citizen Involvement)

Goal 1 requires planning decisions to follow "a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the planning process." The Goal states that citizen involvement programs must be "appropriate to the scale of the planning effort," and must "[enable] citizens to identify and comprehend the issues." It specifically requires state agencies to coordinate their planning efforts with the affected local governing bodies and to utilize the local communities' existing citizen involvement programs whenever possible." Goal 1 requires these involvement programs to result in "Citizen Influence," meaning that the general public must have the opportunity to participate in and influence all aspects of

the planning effort, including data collection, plan preparation, adoption process, implementation, evaluation, and revision.

Like all planning projects in Oregon, the I-84 Baker IAMP must meet the citizen involvement requirements described in Goal 1. The project therefore includes five Planning Project Management Team (PMT) meetings, two public workshops, and additional opportunities for participation and comment before City and County Planning Commissions and decision-making bodies.

3.1.2 Statewide Planning Goal 2 (Land Use Planning)

Goal 2 requires that all land use actions and decisions be based an established land use policy framework. It includes five primary requirements that are important to the Baker IAMP project:

- Coordination between local governments and state agencies
- Inclusion of required plan elements and processes
- Consistency between land use decisions and local city or county comprehensive plans
- Preparation of specific implementation measures
- Adoption of plans and implementation measures by the applicable governing body(ies)

Goal 2 requires local governments to coordinate their planning efforts with those state agencies that "have programs, land ownerships, or responsibilities within the area included in the plan." Goal 2 is relevant to this project as it requires both Baker County and the City of Baker City to coordinate with the Oregon Department of Transportation (ODOT), the agency primary responsibility for state highways interchanges. Both the City and the County must be involved, as the interchange study areas include land both inside and outside of the City of Baker City Urban Growth Boundary (UGB). Baker City is responsible for the planning of land within the UGB, while Baker County is responsible for land outside the UGB. Coordination is particularly important because land use decisions by both the City and the County will affect growth and development in the study areas, which will in turn affect future use and operation of the interchanges.

Second, Goal 2 requires that land use plans be supported by an "adequate factual base" to support determinations of compliance with review standards. It requires all land use plans to include "identification of issues and problems, inventories and other factual information for each applicable statewide planning goal, [and] evaluation of alternative courses of action and ultimate policy choices," while also considering "social, economic, energy and environmental needs."

Third, the plans become the basis for specific implementation measures that must be consistent with and adequate to carry out plan policies. Plans and implementation measures must be coordinated with the plans of affected governmental units. For ODOT, this means that plans and implementation measures must take into consideration the Oregon Transportation Plan and the Oregon Highway Plan. Citizens and applicable governmental bodies must be provided the opportunity to review and comment on the process at each phase. ODOT and its contractors have prepared a work plan for the Baker IAMP project that includes research and opportunities for public comment that satisfy the Goal 2 requirements.

Fourth, Goal 2 requires that all land use plans be "consistent with the comprehensive plans of cities and counties and regional plans". This is relevant because the Baker IAMP ultimately will be adopted by both the county and city, and it may include recommendations that are inconsistent with the existing comprehensive plans. In such cases, the IAMP process will include recommended amendments to the comprehensive plans to ensure a consistent set of planning guidelines for the interchange study areas.

Finally, Goal 2 requires that all land use plans and implementation ordinances be "adopted by the governing body after public hearing and shall be reviewed and, as needed, revised on a periodic cycle." The Baker IAMP will be considered in at least four public hearings, one each before the Baker County Planning Commission, Baker County Board of Commissioners, Baker City Planning Commission, and Baker City Council. The IAMP must be adopted by the Baker County Board of Commissioners and the Baker City Council.

3.1.3 Statewide Planning Goal 11 and OAR 660, Division 11 (Public Facilities)

Statewide Planning Goal 11, Public Facilities Planning, is important to this project because it requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities (water, sewer, and transportation facilities) and services to support urban-level development. The goal requires that urban and rural development be guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to, the needs and requirements of the urban, urbanizable and rural areas to be served. It also requires that cost estimates for extending these services be described in both the short (1-5 years) and long (6-20 years) term.

3.1.4 Statewide Planning Goal 12 and OAR 660, Division 12 (Transportation)

Goal 12, Transportation, requires cities, counties, and ODOT to provide and encourage a safe, convenient and economic transportation system. This is accomplished through development of Transportation System Plans (TSPs), which are based on inventories of

local, regional and state transportation needs. Compliance with this goal is one of the fundamental purposes of any IAMP project.

The Baker City Transportation Plan was adopted by the Baker City Council in 1996. The Baker County TSP s being prepared at the same time as this IAMP.

Goal 12 is implemented through OAR 660, Division 12, the Transportation Planning Rule (TPR). The TPR contains numerous requirements governing transportation planning and project development, several of which warrant comment in this report.

The TPR requires local governments to adopt land use regulations consistent with state and federal requirements "to protect transportation facilities, corridors and sites for their identified functions" OAR 660-012-0045(2). This policy is achieved through a variety of measures, including:

- Access control measures that are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;
- Standards to protect future operations of roads;
- A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;
- A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;
- Regulations to provide notice to ODOT of land use applications that require public hearings, involve land divisions, or affect private access to roads; and
- Regulations assuring that amendments to land use designations, densities and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP. See also OAR 660-012-0060.

The Land Conservation and Development Commission's (LCDC) rules implementing Goal 12 do not regulate access management. ODOT adopted its Access Management Rule (OAR 734, Chapter 51) to address access management. This rule is described in greater detail in Section 4.

3.1.5 Statewide Planning Goal 14 (Urbanization)

Goal 14, Urbanization, requires an orderly and efficient transition from rural to urban land use. This is accomplished through the establishment of urban growth boundaries and unincorporated communities. Urban growth boundaries and unincorporated community boundaries separate urbanizable land from rural land. Land uses permitted within the urban areas are more urban and intensive in nature than those allowed in rural areas, which primarily include farm and forest uses. This helps contain the costs

of public facilities, including transportation, by reducing the need for such facilities outside of the UGB.

Goal 14 is important to this project because it focuses development within the Baker City UGB. The location, type, and intensity of development within the study areas will impact the future use and operation of the interchanges, which straddle the northern and southern edges of the UGB. The IAMP includes recommendations to ensure that the interchanges will be able to accommodate anticipated future growth.

3.2 OREGON TRANSPORTATION PLAN (1992)

The Oregon Transportation Plan (OTP) was adopted by the Oregon Transportation Commission (OTC) in 1992 and is intended to meet the requirements of ORS 184.618(1), which requires the development of a state transportation policy and a comprehensive long-range plan for a multi-modal transportation system that addresses economic efficiency, orderly economic development, safety, and environmental quality. The OTP consists of two elements: the Policy Element defines goals, policies, and actions for the state over the next 40 years; the System Element identifies a coordinated multi-modal transportation system and a network of facilities and services for different modes of transportation that are to be developed over the next 20 years to implement the goals and policies of the OTP.

The IAMP is consistent with the goals and policies of the OTP. The applicable OTP policies to the proposed interchange improvements are Policy 1B (Efficiency), Policy 1C (Accessibility), Policy 1G (Safety), Policy 2B (Urban Accessibility), and Policy 4G (Management Practices). Policy 4G has the most direct relation to the development of the IAMP because it identifies access management (Action 4G.2) as one of the management practices to be implemented.

3.3 1999 OREGON HIGHWAY PLAN

The 1999 Oregon Highway Plan (OHP) establishes policies and investment strategies for Oregon's state highway system over a 20-year period and refines the goals and policies found in the OTP. Policies in the OHP emphasize the efficient management of the highway system to increase safety and to extend highway capacity, partnerships with other agencies and local governments, and the use of new techniques to improve road safety and capacity. These policies also link land use and transportation, set standards for highway performance and access management, and emphasize the relationship between state highways and local road, bicycle, pedestrian, transit, rail, and air systems. The policies applicable to planning for the two Baker interchanges are described below.

Under Goal 1: System Definition, the following policies apply:

- Policy IA (State Highway Classification System) develops and applies the state highwya classification system to guide ODOT priorities for system investement and management. Highway functions are identified as part of the system.
- Policy 1B (Land Use and Transportation) recognizes the need for coordination between state and local jurisdictions. Coordination with local jurisdictions will occur throughout the preparation of the IAMP. A Project Management Team (PMT) has been formed to inform the IAMP. Members include representatives from ODOT, Baker County, and Baker City.
- Policy 1C (State Highway Freight System) states the need to balance the movement of goods and services with other uses.
- Policy 1D (State Highway Scenic Byways) states the need to consider aesthetic and design elements in addition to safety and performance elements in order to preserve and enhance the scenic byways. Oregon Highway 86 and US 30 are State Highway Scenic Byways within the study area.
- Policy 1F (Highway Mobility Standards) sets mobility standards for ensuring a reliable and acceptable level of mobility on the highway system by identifying necessary improvements that would allow the interchange to function in a manner consistent with OHP mobility standards. The purpose of the IAMP is to evaluate the operation of Interchanges 302 and 306, assess limitations, identify future long-range needs, and identify recommended improvements to ensure consistency with mobility standards.
- Policy 1G (Major Improvements) requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Under Goal 2: System Management, the following policies apply:

- Policy 2B (Off–System Improvements) helps local jurisdictions adopt land use and access management policies. The IAMP will include sections describing existing and future land use patterns, an access management plan, and implementation measures. A component of the IAMP will be an intergovernmental agreement between ODOT and the local jurisdictions to implement access management solutions.
- Policy 2F (Traffic Safety) improves the safety of the highway system. One component of the IAMP is to identify existing crash patterns and rates and to develop strategies to address safety issues.

Under Goal 3: Access Management, the following policies apply:

- Policy 3A (Classification and Spacing Standards) sets access spacing standards for driveways and approaches to the state highway system.
- Policy 3C (Interchange Access Management Areas) sets policy for managing interchange areas by developing an IAMP that identifies and addresses current interchange deficiencies and short, medium and long-term solutions.
- Policy 3D (Deviations) establishes general policies and procedures for deviations from adopted access management standards and policies.

The IAMP compares access spacing with adopted access standards. If proposed interchange improvements do not meet access spacing standards, findings for such a deviation are required.

3.4 OREGON ADMINISTRATIVE RULE 734, DIVISION 51 (HIGHWAY APPROACHES, ACCESS CONTROL, SPACING STANDARDS AND MEDIANS)

OAR 734-051 governs the permitting, management, and standards of approaches to state highways to ensure safe and efficient operation of the state highways. The OTC formally adopted the revisions to OAR 734-051 dated July 1, 2003 that became effective on March 1, 2004.

OAR 734-051 policies address the following:

- How to bring existing and future approaches into compliance with access spacing standards, and ensure the safe and efficient operation of the highway.
- The purpose and components of an access management plan.
- Requirements regarding mitigation, modification and closure of existing approaches as part of project development.

Section 734-051-0125, Access Management Spacing Standards for Approaches in an Interchange Area, establishes interchange management area access spacing standards. It also specifies elements that are to be included in IAMPs, such as short, medium, and long-range actions to improve and maintain safe and efficient roadway operations within the interchange area. The Access Management Plan component of this project compares access spacing with adopted access standards. If future proposed interchange improvements do not meet access spacing standards outlined in OAR 734-051-0125, deviation findings to interchange and roadway approach (public and private streets and driveways) access management spacing standards would be needed, per OAR 734-051-0135.

Section 734-051-0155, Access Management Plans, Access Management Plans for Interchange Areas, and Interchange Area Management Planning, sets out standards with which IAMPs must comply. Consistency with the Oregon Highway Plan is required.

3.5 BAKER CITY TRANSPORTATION SYSTEM PLAN (ADOPTED 2001)

The Baker City Transportation System Plan (TSP) guides the management of existing transportation facilities and the design and implementation of future facilities for a 20-year horizon. The TSP constitutes the transportation element of the City's Comprehensive Plan and satisfies the requirement of the Oregon Transportation Planning Rule.

The TSP is guided by four main goals and their related objectives. These goals include: 1) improve and enhance safety and traffic circulation of the local street system; 2) identify roadway system needs to accommodate the developing and undeveloped areas without undermining the character of existing neighborhoods; 3) increase the use of alternative modes of transportation, such as walking, bicycling, and use of transit, through improved access, safety and service; and 4) enhance the role of the Baker City Airport.

The Baker City TSP includes a transportation system inventory, which includes a list of street classifications. The following roadways are within the boundaries of the IAMP study area and classified by the TSP:

Arterials: Highway 30
Collectors: Cedar Street (south of Hughes Lane)
Local Streets: Best Frontage Road

The recommended street system includes two improvements within the northern interchange (302) study area. One improvement, identified as a medium priority, would be the extension of Birch Street to create a continuous collector roadway from Campbell Street (Highway 7) to Park Street at the southern edge of the study area. The other improvement is a two-stage, long-range project recommended near or after the 20-year planning horizon. Under the first phase of this project, Main Street would be extended northward to create a "parkway" connection with Hughes Lane. The second phase would further extend Main Street from Hughes Lane northward outside of the UGB to connect with Cedar Street near the interchange.

The recommended pedestrian system includes one project within the northern interchange (302) study area. The project would add sidewalks on Cedar Street within the Baker City limits extending from H Street to Hughes Lane. This project was identified as low priority.

The recommended bikeway system includes two projects within the northern interchange (302) study area. Adding shoulders on Hughes Lane west of Cedar Street was identified as a high-priority project. Adding shoulders on Cedar Street south of Hughes Lane was identified as a medium priority project.

There were no projects recommended within the southern interchange (306) study area.

3.6 DRAFT BAKER COUNTY TRANSPORTATION SYSTEM PLAN

The draft Baker County Transportation System Plan (TSP) includes a determination of future transportation needs for road, transit, bicycle, pedestrian, air, water, rail, and pipeline systems; and a transportation funding program.

Development of an IAMP for Interchanges 302 and 306 will be consistent with the goals and policies of the county's TSP, which will include goals to "provide and encourage a safe, convenient and economical transportation system." The IAMP should be adopted by reference into the County's TSP.

The TSP is guided by nine goals and their related objectives. These goals include: mobility, efficiency, safety, equity, environmental, alternative modes of transportation, maintain multi-jurisdiction coordination, roadway functional classification, and transportation financing.

The draft Baker County TSP includes a transportation system inventory, which includes a list of street classifications. The following roadways are within the boundaries of the IAMP study areas and classified by the TSP:

State Highways: OR 86, US 30
Major Collectors: Old US 30
County Roads: Old Trail Road (County Road 540), West Airport Road (County Road 739), Best Frontage Road, Atwood Road

Development of an IAMP for Interchanges 302 and 306 will be consistent with the goals and policies of the county's TSP. Projects identified in the IAMP may necessitate inclusion or changes to the county's TSP.

3.7 CITY OF BAKER CITY COMPREHENSIVE PLAN (1987)

The interchange study areas at I-84 Interchanges 302 and 306 lie partially within the Baker City UGB. A small portion of the northern interchange study area, to the south and west of Interchange 302, is inside the UGB, and an even smaller portion, in the southwest corner of the study area, is also within the Baker City limits. In the southern interchange study area, an area northwest of interchange 306 is within the both the UGB and the city limits. Baker City has the primary planning responsibility for areas within the UGB while Baker County has jurisdiction over areas outside the UGB.

The City of Baker City Comprehensive Plan was originally adopted in 1987 and was last amended in 2001. It provides the foundation for the city's economic development, land use, and transportation decisions. The following sections include goals, policies, or implementation measures relevant to the Baker IAMP project:

- The **Public Involvement and Procedures for Planning** section includes numerous policies describing the city's process for making land use and transportation decisions. It implements the requirements of State Land Use Planning Goals 1 and 2 by requiring the city to make "all reasonable efforts to publicize planning issues and meetings," and to "continue to undertake efforts to involve and inform the public of planning issues." It requires that planning decisions, particularly those involving amendments to the Comprehensive Plan, be consistent with the state planning goals. The planning process for the Baker IAMP must be consistent with these requirements.
- The **Public Facility Plan** section includes a policy that the city will provide urban services, including transportation, to residential, commercial and industrial lands within the UGB. These services are to be provided efficiently, in order to minimize costs. Additional policies require the city to maintain a prioritized list of needed public facility improvements and to periodically review and update its long-range master plans for the transportation and other public facility systems. The TSP and Public Facility Plan may need to be amended to address the transportation improvements, if any, recommended in the Baker IAMP.
- The **Transportation** section requires the city to provide adequate transportation services to the community, and to assure that the TSP and Public Facility Plan are consistent with one another, particularly with respect to their capital improvement recommendations. It also includes detailed requirements for the city's transportation system. Any transportation changes recommended in the Baker IAMP must be consistent with these Comprehensive Plan policies, or the Comprehensive Plan must be amended to achieve consistency between its policies and the recommendations from the IAMP.
- The **Land Suitability** section divides the land within the city into four land suitability categories: residential, high density residential, commercial, and industrial. The interchange study areas include land designated residential (both study areas) and commercial (north study area only). The residential designation "contemplates a gradual conversion of vacant parcels, large residential holdings, and agricultural lands to residential use of varying density." Little information is provided about the commercial designation, other than the statement that "the downtown should remain the heart of the city's commercial life."
- The **Economic Development** section says that the city shall "provide by zoning for development space suitable to the needs of industrial and commercial development" in areas with convenient transportation access. This is relevant as the northern study area includes land immediately adjacent to the interchange that is zoned General Commercial (CG).

3.8 CITY OF BAKER CITY DEVELOPMENT CODE (2004)

The City of Baker City Development Code provides zoning for the portions of the interchange study areas inside the UGB. The portion of the northern study area within the UGB is zoned General Commercial (CG) and Residential Low-Density (R-LD). The CG land is vacant. The R-LD area is mostly built-out, with some vacant lots close to the interchange. The portion of the southern study area within the UGB is also zoned R-LD. The area is largely undeveloped, with only a few homes.

Residential low-density is a subdistrict of the Residential (R) zoning district, which is described in Chapter 2.1 of the Development Code. The types of residences allowed within the R-LD subdistrict include: single-family detached housing (including zero-lot-line housing); accessory dwellings; manufactured homes on individual lots; and single-family attached townhomes, and residential care facilities. Duplexes and tri-plexes are allowed as conditional uses. Manufactured home parks and multi-family housing are not allowed. Other allowed uses include home occupations, and agriculture/horticulture. Public and institutional buildings and bed-and-breakfast inns are allowed as a conditional use. The minimum lot area is 7,500 square feet for detached single-family housing, manufactured homes, and duplexes/triplexes. There is no minimum or maximum lot area for public or institutional uses.

The General Commercial (CG) zoning district is described in Chapter 2.3 of the Development Code. Its purpose includes providing for efficient use of land and public services and providing transportation options for employees and customers. A wide variety of commercial, residential, and public/institutional uses are allowed in the CG zone, although many require a conditional use permit. No minimum or maximum lot sizes apply, and there are no transportation-related development standards described in the CG chapter of the Development Code.

Appendix B includes a complete list of allowed and conditional uses in these zones.

Vehicular access and circulation standards are described in Chapter 3.1 of the Development Code. These standards are intended to "manage vehicle access to development through a connected street system, while preserving the flow of traffic in terms of safety, roadway capacity, and efficiency." Any transportation improvements recommended in the IAMP must conform to these standards.

Public facilities standards are described in Chapter 3.4 of the Development Code. The purpose of that chapter is to "provide planning and design standards for public and private transportation facilities and utilities." This includes providing "standards for attractive and safe streets that can accommodate vehicle traffic from planned growth, and provide a range of transportation options." Specific requirements are included for rights-of-way, access easements, street locations, widths and grades, traffic signals and

traffic-calming features, street alignment and connections, etc. Any transportation improvements recommended in the IAMP must conform to these standards.

The IAMP includes an analysis of land uses and Baker City comprehensive plan and zoning designations within the study areas. Once adopted by the city, the IAMP will be a policy and regulatory document for the jurisdiction. Subsequent changes to the city's comprehensive plan and development code may be necessary to be consistent with the IAMP.

3.9 BAKER COUNTY COMPREHENSIVE PLAN (1984)

The Baker County Comprehensive Plan was originally adopted in 1984. It provides the foundation for the county's economic development, land use, and transportation decisions. The County Comprehensive Plan and Zoning and Subdivision Ordinance apply to the portions of the interchange study areas lying outside the Baker City UGB. In the northern study area these lands are designated Exclusive Farm Use (EFU), Industrial (I), and Rural Residential. The Comprehensive Plan designates Rural Residential lands as "RR-1," while Recreation Residential lands are designated "RR-2." However, the Zoning and Development Ordinance labels Recreation Residential lands as "RR-1," and Rural Residential lands as "RR-5."

Part 2 of the Comprehensive Plan, "Land Use Goals; Land Use Policies" include goals, policies, or implementation measures relevant to the Baker IAMP project. These are found in the Citizen Involvement, Land Use Planning, Economic Development, Transportation, and Urbanization sections of Part 2.

Section I: Citizen Involvement Goal, requires the county to "develop a citizen involvement program that ensures the opportunity for citizens to be involved in all phases of the Planning process." The Planning Commission is given the responsibility for implementing and evaluating the citizen involvement program. The section requires that all land use planning and zoning actions or decisions must take place in "open, public meetings," with adequate public notice of the "time, place and purpose," of each meeting.

Section II: Land Use Planning Goal, establishes a "land use planning process and policy framework" for the county, consistent with the requirements of Goal 2.

Section IX: Economic Development Goal, includes the following land use policies:

- "The agricultural land use economy can be improved and diversified by, among other things… discouraging encroachments of conflicting land uses into farmlands."
- "Interstate access is more desirable for new commercial and industrial development which need road access to distant markets. Industrially-zoned

property within the county which meets this transportation criteria is extremely limited. The county shall re-evaluate its industrial inventory to consider different modes of transportation. New sites shall ensure compatibility with Goal 12. As new industries develop, the cities and the county need to address local access opportunities."

Section XII: Transportation Goal, establishes the county's goal of providing and encouraging a "safe, convenient, and economic transportation system." It generally describes the county's transportation infrastructure and includes a list of recommended transportation improvements countywide to be considered by ODOT and other applicable public agencies. It includes the following policy related to local transportation planning: "It shall be county policy to plan, construct and maintain county roads to acceptable standards having first considered safety, use, and economics."

Section XIV: Urbanization Goal, has the goal of providing for an "orderly and efficient transition from rural to urban land use." This chapter's policies concern the administration of Urban Growth Boundaries and urbanizable land within the county.

Part 3 of the Comprehensive Plan describes each of the county's 14 Comprehensive Plan map designations. The designations that apply to lands within the Baker IAMP study areas are as follows:

I. **Exclusive Farm Use**. Includes all agricultural lands inventoried as soil capability classes I-VI and other lands that are suitable for farm/grazing use, except those lands designated as forested lands or lands for which an exception is proposed.

III. **Rural Residential Areas**. Refers to those areas already built and committed to non-resource use and for which an exception is taken.

XIV. **Industrial Areas**. Refers to those areas either built and committed or needed to foster economic development in the county and for which an exception is taken.

Part 4 describes each of the county's "exception areas," or areas not zoned for farm or forest use. There are no exception areas in the southern interchange study area. The exception areas lying within the northern interchange study area are described as follows, excerpted directly from the Comprehensive Plan:

- **Northeast Baker City - Frontage Road Industrial Site**

  This site includes 306 acres of Class II, III and IV soils in the western half of Section 10, Township 9 South, Range 40 East W.M. It is presently used for industrial sand and gravel operations, farming, a State of Oregon highway sand storage shed, and three residences. The area is bounded on all sides by paved

county and state highways, one of which is an industrial frontage road build in 1978 to serve this site as well as the adjacent land to the west that is zoned for industrial development within the City of Baker's Urban Growth Boundary.

The Oregon Trail Interpretive Center is located approximately 1-1/2 miles to the east of this industrial site. The Center is a tremendous tourist attraction, and is accessed via Highway 86, which forms the north boundary of the industrial site. As part of the development of the Interpretive Center, Baker County committed itself to promoting development compatible with the intent of the Center. That is, the county would prohibit commercial uses in the viewshed of the Center, and would limit development as much as possible to retain the rural character of the area. While the Northeast Baker - Frontage Road Industrial Site is located outside the viewshed, some concern has been expressed in the compatibility of tourist-related traffic and heavy industrial uses.

In addition, Baker City rezoned its industrial land on the west side of the frontage road to general commercial and tourist commercial uses in 1991. The Oregon State Department of Transportation commented that increased traffic potential as a result of the rezoning will require the realignment of the frontage road to avoid congestion at the Interstate 84-Interchange 302 exchange, Highway 86 and the frontage road.

Other potential limitations to the site include a high water table.

- **Richland Interchange Residential**:

  Lands located in Section 3 of Township 9 South, Range 40 East W.M. totaling 116 acres of Class II - IV soils. The entire area has developed as small acreage homesites since its designation in 1974 as rural residential.

In addition, the Comprehensive Plan identifies a portion of the EFU-zoned land within the north interchange study area as a proposed industrial site. An excerpt from the Comprehensive Plan follows:

- **302 Exchange West of Interstate 84**

  This area is currently zoned Exclusive Farm Use with predominantly Class III soils. Its assets include: proximity to a freeway interchange, and accessibility to city sewer and water. It is currently used for hay production. The site is limited by a high water table, and its proximity to residential uses to the south. The Economic Development Department considers this an optimal site for light industrial uses.

  Because industry has shifted to road transport, this site is more attractive to developers than an existing industrial site located in the Baker City Urban Growth Boundary. That site is located west of the Union Pacific Rail line. The current industrial site is in farm use and contains high-value farm soils.

3.10 BAKER COUNTY ZONING AND SUBDIVISION ORDINANCE (1986)

The Baker County Zoning and Subdivision Ordinance (Ordinance) was adopted in 1986 and most recently amended in 2000. It establishes zoning designations for the portions of the interchange study areas outside the Baker City UGB. The portion of the northern study area outside the UGB is zoned Exclusive Farm Use (EFU), Industrial (I), and Rural Residential (RR-5). The EFU land lying north and west of the interchange is in active farm use or fallow, as is the EFU land on the far eastern edge of the interchange study area. There is an RV park on EFU land in the southwest corner of the study area, which is allowed as a pre-existing, nonconforming use. The Industrial land southeast of the interchange has several gravel pits, including an ODOT gravel storage facility that may eventually be upgraded to an ODOT maintenance facility. The RR-5 land northeast of the interchange is not fully developed. All the homes in that area are on parcels of at least five acres.

The portion of the southern study area outside the UGB is zoned EFU. This area is entirely in farm use, with the exception of several pre-existing, non-conforming residences on the southwest side. The EFU area east of the interstate is rangeland, with no direct transportation access from the study area.

The EFU zone is described in Section 301 of the Ordinance. Farming and related uses, forestry, and limited residential uses are allowed in this zone. The construction and maintenance of transportation facilities is allowed, as follows:

G. Climbing and passing lanes within the right-of-way existing as of July 1, 1987.

H. Reconstruction or modification of public roads and highways, not including the addition of travel lanes, where no removal or displacement of buildings would occur, or no new land parcels result.

I. Temporary public road and highway detours that will be abandoned and restored to original condition or use at such time as no longer needed.

J. Minor betterment of existing public roads and highway-related facilities such as maintenance yards, weigh stations and rest areas, within the right-of-way existing as of July 1, 1987, and contiguous to publicly-owned property utilized to support the operation and maintenance of public roads and highways.

The following transportation facilities are allowed as conditional uses:

S. Construction of additional passing and travel lanes requiring the acquisition of right-of-way but not resulting in the creation of new land parcels.

T. Reconstruction or modification of public roads and highways involving the removal or displacement of buildings but not resulting in the creation of new land parcels.

U. Improvements of public roads and highway-related facilities, such as maintenance yards, weigh stations and rest areas, where additional property or right-of-way is required but not resulting in the creation of new land parcels.

Section 303 of the Ordinance describes the RR-5 zone. Allowed uses include single-family dwellings, duplexes, farm use, parks or playgrounds, local distribution utility facilities, and temporary mobile homes. There are numerous conditional uses, including subdivisions, planned unit developments, and mobile home developments. The minimum lot or parcel size is no less than five acres.

The Industrial zone is described in Section 314 of the Ordinance. The list of allowed uses includes manufacturing, warehousing, farming, heavy equipment sales and service, and utility facilities, among others. Section 314 includes the following statement under Limitations on Use:

> "The uses of this Section 314 shall be subject to a development proposal. A plan which proposes the use for the property shall be submitted to the Planning Office. The development proposal (plan) process shall be utilized to determine the lot size necessary to accommodate the proposed use. Particular attention shall be given to providing septic service, parking, and access."

Appendix B of Technical Memorandum #2 includes a complete list of allowed and conditional uses in these zones.

IAMP proposals will need to be consistent with the Baker County Comprehensive Plan and the Zoning and Subdivision Ordinance. The IAMP includes an analysis of comprehensive plan and zoning designations and land uses, as well as an access management plan. Upon completion, it is expected that the county will adopt the IAMP as a policy and implementation document. Subsequent changes to the county's comprehensive plan and development code to be consistent with the IAMP are described in Section 8.

4. EXISTING CONDITIONS

The existing conditions analysis includes an inventory of the transportation system, an evaluation of existing operating conditions, an inventory of existing public and private access points, a land use inventory, and identification of natural and cultural constraints.

4.1 PHYSICAL INVENTORY AND MAPPING

An inventory of the existing roadway facilities in the study areas (see Figures 1 and 2) was compiled and is contained in Technical Memorandum #3. The inventory includes roadway information such as street names, classifications, jurisdiction responsibility, number of travel lanes, posted (or non-posted speeds), parking, bicycle and pedestrian facilities, traffic control devices, and the type of pavement surface and its conditions. The general characteristics of the roadways are described below.

Interstate 84, Old Oregon Trail, is the main east-west highway through eastern Oregon and Baker County although the highway travels predominately north-south within the study areas of the IAMP. Within both study areas, I-84 is separated by a 40 to 60 foot median with two travel lanes in each direction. The posted speed is 55 mph for trucks and 65 mph for passenger vehicles.

4.1.1 Interchange 302 Study Area

Roadways in the Interchange 302 study area include OR 86, Atwood Road, Lindley Road, Hudson Road, Airport Road, Best Frontage Road, Old Trail Road, North Cedar Street, and Hughes Lane.

OR 86, the Baker-Copperfield Highway, is a District Highway under ODOT jurisdiction. Running east-west, it travels from Interchange 302 in Baker City to the Idaho border. OR 86 carries local and regional traffic and serves the Oregon Trail Interpretive Center, just east of Baker City. OR 86 has a common alignment with I-84 between Interchanges 302 and 304, at which point it travels west on Campbell Street until the junction with OR 7 at Main Street.

Atwood Road is a two-lane county road extending southward from OR 86 approximately 0.6 miles east of I-84.

Lindley Road is a two-lane road classified as a major collector in the Baker County Transportation System Plan (TSP). It extends northward from OR 86 directly opposite Atwood Road.

Hudson Road is two-lane local road extending northward from OR 86 approximately 0.4 miles east of I-84.

Airport Road is a two-lane county road running north-south, parallel to I-84. It extends northward from OR 86 approximately 680 feet east of I-84 and 356 feet east of the northbound I-84 on-ramp. Airport Road primarily serves Baker Municipal Airport to the north of OR 86.

Best Frontage Road also is a two-lane county road running north-south, parallel to I-84. It extends southward from OR 86 through industrially and commercially zoned lands to connect with the Baker City street system and OR 7. Best Frontage Road connects with OR 86 approximately 790 feet east of I-84 and 466 feet east of the northbound I-84 off-ramp.

North Cedar Street was once designated as OR 86 but was turned over to city and county jurisdiction and is now classified as a collector street within the Baker City UGB and a county road outside of the UGB. It extends westward from Interchange 302 for approximately 900 feet before turning southward to run parallel to I-84. North Cedar Street is a two-lane roadway throughout the study area with bike lanes south of Hughes Lane.

Old Trail Road is a two-lane county road extending northward from North Cedar Street where it transitions from a north-south roadway to an east-west roadway. It connects with North Cedar Street almost 1000 feet west of I-84 and 653 feet west of the I-84 southbound off-ramp.

Hughes Lane is a two-lane collector roadway that runs along the northern Baker City UGB. It has shoulder bike lanes west of North Cedar Street.

4.1.2 Interchange 306 Study Area

US 30 is a District Highway traveling roughly north-south, paralleling I-84 through most of Baker County. Prior to the construction of I-84, US 30 was the primary route between Baker City and La Grande. The route carries primarily farm/ranch and tourism/recreation traffic in the region. Within the study area of the south Baker City interchange, the speed is 55 mph and travels through rural land. South of Interchange 306, US 30 has an alignment common with I-84.

Old US 30 is a two-lane major collect or extending southward from US 30. It connects with US 30 approximately 1,370 feet north of the beginning of the Interchange 306 ramps.

4.2 OPERATIONAL INVENTORY AND BASELINE ANALYSIS

The operational inventory and baseline analysis includes existing study area traffic volumes and intersection operations, review and analysis of the crash history in the study areas, and existing access spacing and standards.

4.2.1 Existing Traffic Volumes

Existing traffic volumes for the roadways within the study areas were determined using several sources of information. Average daily traffic volumes were obtained for highways from the 2003 Oregon Department of Transportation (ODOT) Traffic Volume Tables, and intersection turning movement counts were taken at the study area intersections. These volumes were used to estimate daily traffic at intersections and design hourly volumes. The methods of determining the traffic volumes are described in detail in this segment of the report.

Turning Movement Counts

Manual traffic counts were conducted by ODOT at the following intersections:

- Best Frontage Road and OR 86 (Interchange 302)
- Airport Road and OR 86 (Interchange 302)
- I-84 Westbound ON/Off Ramps and OR 86 (Interchange 302)
- I-84 Eastbound ON/Off Ramps and OR 86 (Interchange 302)
- Frontage Road/Cedar road and OR 86 (Interchange 302)
- Hughes Lane and Frontage Road/Cedar Road (Interchange 306)
- Old Highway 30 and US 30 (Near Interchange 306)
- US 30 and Interchange Ramps (Interchange 306)
- I-84 Eastbound Off Ramp and I-84 Westbound On/Off-Ramps (Interchange 306)

The traffic counts were collected on Tuesdays, Wednesdays, and Thursdays over the course of several weeks in February and March of 2005. The data sheets for these counts can be found in Technical Memorandum #3.

Average Daily Traffic Volumes

The average daily traffic (ADT) volumes for each of the highways inside the study areas of the two interchanges were obtained from the 2003 ODOT Traffic Volume Tables, which is the most recent volume table available. The ADT volumes for these highways are listed in Table 1.

Table 1: ADT Volumes for Study Area Highways

Highway Segment	2003 ADT	Estimated 2005 ADT
I-84: MP 302.41 (0.30 miles north of OR 86)	9,500	9,800
I-84: MP 303.74 (0.40 miles north of Campbell Street Interchange)	9,200	9,500
I-84: MP 306.23 (0.30 miles north of South Baker City Interchange)	7,900	8,400
OR 86: MP 2.75 (0.01 miles east of West Airport Road)	1,600	1,600
US 30: MP 53.14 (0.01 miles northwest of S. Bridge Street – outside study area)	1,200	1,200
US 30: MP 54.06 (0.40 mile west of I-84)	1,100	1,100

Source: ODOT 2003 Volume Tables

For non-highway roadways, the ADT was established using an industry accepted approximation of ADT, which is ten times the PM peak hour volume of traffic. The estimated ADT volumes for other roadways in the study area are listed in Table 2.

Table 2: ADT Volumes for Study Area Intersections

Intersection	Total Entering Volume (TEV)[1]	Estimated ADT (10 x TEV)
OR 86 at Best Frontage Road	25	250
OR 86 at Airport Road	20	200
Old Trail Road	25	250
Cedar St. north of Hughes Lane	265	2,650
Cedar Street South of Hughes Lane	265	2,650
Hughes Lane	290	2,900
Old Highway 30	75	750

1. Based on ODOT manual turning movement counts, February and March, 2005
Source: David Evans and Associates, Inc.
* Current ADT volumes on Airport Road and Best Frontage Road is approximately 200. This table also reflects turns off of OR 86.

Design Hourly Volumes

The traffic analysis for the IAMPs is based on design hourly volumes (DHVs) rather than average turning movement volumes. These volumes are assumed to represent the 30th highest hour of traffic during the year. ODOT's Transportation Planning Analysis Unit (TPAU) has developed procedures for calculating current and future year DHVs.

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

4.2.2 Seasonal Adjustment Factors

The seasonal adjustment factor is found by using the automatic traffic recorder (ATR) closest to the location of interest with similar traffic flows, area type, and lane configuration. To find the seasonal factor, the ADT from the highest month reported by the ATR is divided by the ADT listed by the ATR representing the month project counts were taken.

For I-84, the Old Oregon Trail, the nearest ATRs with similar characteristics are 01-011 (I-84 – Old Oregon Trail north of N. Powder) and 23-016 (I-84 – Old Oregon Trail south of Baker City near Huntington). Seasonal factors of 1.41 and 1.40, respectively, were calculated, yielding an average seasonal factor of 1.41 for the interstate.

The ATR most closely representing OR 86 within the study area is 01-010, located on OR 86 just west of Richland, approximately 25 miles east of Baker City. A seasonal factor of 1.72 was calculated from the ATR data. The high seasonal variance is due to the tourism/recreational traffic traveling to Hells Canyon near the Oregon/Idaho Border. Although located considerably to the east of the Interchange 302 study area, this factor was used for the volumes on OR 86. The seasonal nature of traffic in the region is indicated by the 1.41 factor on I-84. Compounded with the seasonal fluctuations in activity of the tourism/recreational attractions along OR 86, including Oregon Trail Interpretive Center just east of Baker City, a higher seasonal factor on OR 86 east of Interchange 302 is reasonable.

West of Interchange 302, determining seasonal fluctuations is more difficult because there is no annual traffic data available. Traffic using North Cedar Street between Baker City and I-84 is expected to have less seasonal variation than OR 86 east of the interchange. Because so much of the traffic in the study area is destined for I-84 and because there is no other data available, the seasonal adjustment factor of 1.41 was applied to all of the turning movements in the Interchange 302 study area except those going to and from OR 86.

There is no ATR located on US 30 near Interchange 306. Seasonal variance was investigated at several other ATR counters in the region, including OR 7 approximately two miles west of US 30, US 30 16.8 miles north of Baker City, and OR 203, 6.3 miles northeast of I-84 Interchange 302. The counter on OR 7 yielded a seasonal adjustment factor of 1.85. This factor seems too high on US 30 because OR 7 carries traffic to recreational areas in central and eastern Oregon while US 30 carries traffic primarily into Baker City. The seasonal factor on the US 30 counter north of Baker City was 1.31. This lower factor reflects less seasonal tourist/recreational traffic using this rural section of highway. A similar factor of 1.30 was found on OR 203, which serves the community of Medical Springs but does not carry much seasonal tourist/recreational traffic.

Therefore, because all of the traffic on US 30 in the Interchange 306 study area is related to I-84 and because other data available does not reflect the same traffic characteristics, the seasonal adjustment factor of 1.41 from I-84 was applied to all of the turning movements on US 30.

4.2.3 Existing 2005 Traffic Volumes

The morning (AM) and evening (PM) traffic volumes collected in February and March were multiplied by their appropriate seasonal factors, rounded to the nearest five vehicles and balanced (since the counts were collected on different days). The resulting peak-hour volumes for the north and south study area interchanges can be found in Figures 3 and 4, respectively. Although the PM peak-hour is generally assumed to most closely represent the DHV condition, the AM peak-hour volumes are nearly as high but reflect different traffic flow patterns.

4.2.4 Traffic Operations Analysis

Intersection operations were examined as part of the existing traffic conditions analysis of the IAMP study area. The procedures and results are described in this section.

Operational Criteria

ODOT has established policies in the 1999 Oregon Highway Plan (OHP) that set standards for projects on ODOT facilities. Goal 1, Policy 1F (Highway Mobility Standards) details the volume-to-capacity (v/c) ratio standards for peak-hour operating conditions. The v/c ratio represents the ratio of measured traffic demand (volume) divided by the maximum carrying volume for the roadway or intersection (capacity). When the v/c ratio approaches 0.0, traffic conditions are generally good with free-flow travel conditions present. As the v/c ratio approaches 1.0, traffic becomes more congested along roadways and "platoons" of traffic are formed while at intersections, and traffic conditions become more unstable with longer delays. Table 6 of the OHP specifies that v/c standards be maintained for ODOT facilities through a 20-year horizon.

According to the OHP, I-84 (Oregon Highway 006) is under the following classifications: Interstate Highway, on the National Highway System (NHS), Freight Route, Scenic Byway (with shared alignment with US 30), located inside and outside the Urban Growth Boundary (UGB), and Rural Lands outside UGB. The following OHP requirements apply to this highway:

- Maximum v/c ratio of 0.70 for highways inside the UGB with non-freeway speeds greater than or equal to 45 mph.
- Maximum v/c ratio of 0.70 for highways outside the UGB located in Rural Lands.

- For unsignalized intersections, state highway movements that do not have to stop must meet the v/c requirements of Table 6. For intersections outside the UGB, the movement that must stop or yield right-of-way must not exceed a v/c ratio of 0.80. Inside the UGB, the movement must not exceed the v/c ratios of 0.80 for the District/Local Interest roads as shown in Table 6.

OR-86 (Oregon Highway 012) is classified as a District Highway (Interstate where common with I-84, also on NHS), a Scenic Byway, both inside and outside of the UGB within the study area. The following OHP requirements apply to this highway:

- Maximum v/c ratio of 0.85 for highways inside the UGB with non-freeway speeds less than 45 mph.
- Maximum v/c ratio of 0.80 for highways inside the UGB with non-freeway speeds greater than or equal to 45 mph.
- Maximum v/c ratio of 0.75 for district highways outside the UGB in Rural Lands.
- For segments common with I-84, use standards as required for I-84.
- For unsignalized intersections, state highway movements that do not have to stop must meet the v/c requirements of Table 6. For intersections outside the UGB, the movement that must stop or yield right-of-way must not exceed a v/c ratio of 0.80. Inside the UGB, the movement must not exceed the v/c ratio of 0.80 for the District/Local Interest roads as shown in Table 6.

US-30 (Oregon Highway 066) is classified as a District Highway and a Scenic Byway, and is both inside and outside of UGB within the study area. The following OHP requirements apply to this highway:

- Maximum v/c ratio of 0.80 for highways inside the UGB with non-freeway speeds equal to or greater than 45 mph.
- Maximum v/c ratio of 0.75 for district highways outside the UGB in Rural Lands.
- For unsignalized intersections, state highway movements that do not have to stop must meet the v/c requirements of Table 6. For intersections outside the UGB, the movement that must stop or yield right-of-way must not exceed a v/c ratio of 0.80. Inside the UGB, the movement must not exceed the v/c ratio of 0.80 for the District/Local Interest roads as shown in Table 6.

Although the OHP v/c ratio Standards are the overriding design standard for Oregon Highways, level of service (LOS) is a widely recognized and accepted measure of traffic operations. Transportation engineers have established various standards for measuring traffic operations at intersections. Each standard is associated with a particular LOS. Six standards have been established to define LOS. They range from LOS A, where

traffic is relatively free-flowing, to LOS F, where the intersection is totally saturated and traffic movement is very difficult. Both LOS and v/c ratios are reported in this report.

Table 3 summarizes the LOS criteria for both signalized and unsignalized intersections based on the Synchro manual's criteria.

Table 3: Level of Service Criteria

Level of Service	Control Delay (seconds/vehicle) Signalized Intersections	Unsignalized Intersections
A	≤10	≤10
B	>10 and ≤20	>10 and ≤15
C	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Note: The LOS criteria are based on control delay, which includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay.

Source: Transportation Research Board, Highway Capacity Manual, 2000, p. 16-2 for signalized intersections and p. 17-2 for unsignalized intersections.

Note that the LOS criteria for unsignalized intersections are somewhat different than the criteria used for signalized intersections. The primary reason for this difference is that drivers expect different levels of performance from different kinds of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an unsignalized intersection. Additionally, there are a number of driver behavior considerations that combine to make delays at signalized intersections less onerous than at unsignalized intersections. For example, drivers at signalized intersections are able to relax during the red interval, while drivers on the minor street approaches to two-way stop-controlled (TWSC) intersections must remain attentive to the task of identifying acceptable gaps and vehicle conflicts. Also, there is often much more variability in the amount of delay experienced by individual drivers at unsignalized intersections than signalized intersections. For these reasons, it is considered that the total delay threshold for any given LOS is less for an unsignalized intersection than for a signalized intersection. Because LOS accounts for driver expectations, while v/c ratios do not, unsignalized intersections can often have a very poor approach LOS while maintaining a relatively good approach v/c ratio.

Traffic Operations Software

For intersection analysis, the Synchro analysis software package was chosen to evaluate intersection operations for the closely spaced study area intersections. Synchro is a macroscopic model similar to the Highway Capacity Software (HCS), and like the HCS, is based on the methodologies outlined in the *2000 Highway Capacity Manual*. Per ODOT standard, the ideal saturation flow was set at 1,800 vehicles per hour for all traffic analysis.

The Synchro model explicitly evaluates traffic operations under coordinated and uncoordinated systems of signalized and unsignalized intersections. Synchro calculates traffic arrival types, calculates right-turn-on-red capacity, and determines queue lengths.

Intersection Operations

The intersection operations of the intersections surrounding Interchanges 302 and 306 are summarized in Table 4. The intersections currently operate very well, operating at extremely low v/c ratios and LOS B or better for all intersections. The results of the intersection operation analysis are consistent with low-volume intersections. The LOS A and B indicate these intersections experience little or no delay or queuing.

Table 4: Summary of Existing 2005 Intersection Operations

Intersection		Movement	AM Peak Hour		PM Peak Hour	
			LOS	V/C Ratio	LOS	V/C Ratio
1	OR 86 at Best Frontage Rd	WB Through, Left	A	0.01	A	0.01
		NB Left, Right	A	0.01	A	0.04
2	OR 86 at Airport Rd	EB Left, Through	A	0.01	A	0.01
		SB Left, Right	A	0.02	A	0.01
3	OR 86 at I-84 NB on/off-ramps	EB Left, Through	A	0.03	A	0.02
		NB Left, Right	A	0.03	A	0.04
4	OR 86 at I-84 SB on/off-ramps	WB Through, Right	A	0.01	A	0.01
		SB Left, Right	A	0.06	A	0.06
5	OR 86 at N Cedar St/Old Trail Rd	SE Left	A	0.00	A	0.01
		SB Through	A	0.01	B	0.01
		NE Left, Through	A	0.01	A	0.12
6	Hughes at Cedar St.	EB Left, Through, Right	B	0.15	B	0.19
		WB Left, Through, Right	B	0.05	B	0.04
		NB Left, Through, Right	A	0.05	A	0.06
7	US 30 at Old Hwy. 30	EB Left, Right	A	0.03	A	0.05
		SE Through, Right	A	0.01	A	0.02
8	US 30 at I-84 ramp split	No Stopped Movements	na	na	na	na
9	US 30 at I-84 SB off-ramp	SB Left, Right	A	0.01	A	0.01

na = not applicable
Source: David Evans and Associates, Inc.

4.2.5 Safety Analysis

A safety analysis was performed for the roadways within the study areas of the IAMP. The analysis included a review of the ODOT-supplied Planning Research Corporation (PRC) crash listings (1999 to 2003), the ODOT Safety Priority Index System data, and a comparison of calculated crash rates to statewide averages. The procedures used for the safety analysis are described in this section.

Crash data is analyzed for three primary reasons: 1) to identify any crash patterns that may exist; 2) to determine the probable causes of crashes with respect to drivers, highways, and vehicles; and 3) to develop measures that will reduce the rate and severity of crashes.

PRC Reports

The crash listings were obtained from ODOT personnel in the Crash Analysis and Reporting Unit from statewide crash databases. Reports were generated for the five most recent complete years of crash data. It should be noted that crashes listed in the reports only represent those crashes that were reported. The analysis is broken into two parts, Interchange 302 (Richland Interchange) and Interchange 306 (South Baker Interchange). The PRC reports are located in Technical Memorandum #3.

Interchange 302 Study Area

Crash data was collected for the following roadway segments within the Interchange 302 study area:

- I-84 (ODOT highway #6): MP 301.0 - MP 304.5
- OR 86 (ODOT highway #12): MP 1.7 - MP 3.5
- Best Frontage Road: "H" Street to OR 86
- Cedar Street (also N. Cedar Road): "H" Street to OR 86
- Old Trail Road: OR 86/Cedar Road to one mile north of OR 86
- All connections listed in the Richland Interchange connection

From the review of the PRC reports, the type, date, location, and severity of each accident was analyzed. During the five analysis years no crashes were reported along Best Frontage Road, Old Trail Road, or on any of the Richland Interchange (Interchange 302) connections and ramps. The crashes that were reported on the remaining roadway segments are summarized in Table 5. The crashes were distributed fairly evenly among the five study years. For the purposes of this report, crashes reported within 100 feet of the intersection were considered to be intersection crashes.

As shown in Table 5, the majority of crashes on I-84 in the Interchange 302 study area are fixed-object-type crashes. Of the 14 fixed-object crashes, 10 involved icy roadway conditions and vehicles traveling too fast for the conditions. Rear-end-type crashes were reported most frequently along Cedar Road.

Table 5: Interchange 302 Area Crash Summary

Crash Type	No.	Road Conditions		Time of Day		Crash Severity		
		Wet	Dry	Day	Night	PDO	Injury	Fatal
I-84: MP 301.0 to MP 304.5								
Fixed Object	14	10	4	6	8	10	4	-
Sideswipe – Overtake	1	-	1	-	1	1	-	-
Rear End	1	-	1	1	-	-	1	-
Other (animal involved)	1	-	1	1	-	1	-	-
OR 86: MP 1.70 to MP 3.5								
Fixed Object	1	1	-	1	-	1	-	-
Cedar Street: "H" Street to OR 86								
Rear End	4	1	3	4	-	4	-	-
Angle	1	-	1	1	-	1	1	1

Note: Wet road conditions include ice and snow conditions.
Source: David Evans and Associates, Inc. analysis of ODOT-supplied PRC reports.

Interchange 306 Study Area

Crash data was collected for the following roadway segments within the Interchange 306 study area:

- I-84 (ODOT highway #6): MP 305.0 - MP 307.5
- US-30 (ODOT highway #66): MP 53.5 - MP 54.64 (I-84 Interchange 306)
- Old Hwy. 30 East Road: US-30 to approximately one mile south of US 30
- All connections listed in the South Baker Interchange Connection

No crashes were reported during the five analysis years along the South Baker Interchange connections, nor along US 30 within the study area (MP 53.5 to MP 54.46). The crashes that were reported on the remaining roadway segments are summarized in Table 6.

Table 6: Interchange 306 Area Crash Summary

Crash Type	No.	Road Conditions		Time of Day		Crash Severity		
		Wet	Dry	Day	Night	PDO	Injury	Fatal
I-84: MP 305.0 to 307.5								
Fixed Object	18	14	1	13	5	15	3	0
Sideswipe – Overtake	2	2	-	2	-	1	1	-
Other (animal involved)	1	-	1	1	-	1	-	-
Old Highway 30: US 30 to approximately 1 mile south of US 30								
Fixed Object	1	-	1	-	1	-	-	1

Note: Wet road conditions include ice and snow conditions.
Source: David Evans and Associates, Inc. analysis of ODOT-supplied PRC reports.

As displayed in Table 6, the majority of the crashes along I-84 in the south interchange area were crashes involving fixed objects. The majority of the crashes (14 of 18)

involved icy road conditions and drivers driving too fast for the road conditions. The fatality crash on Old Highway 30 was the result of the vehicle traveling too fast, losing control, and rolling down an embankment. Three people died in the crash.

Crash Rates

The crash rates were calculated from the PRC crash reports. Crash information collected represents only those crashes that were reported. In Oregon, legally reportable crashes are those involving death, bodily injury or damage to any one person's property in excess of $1,000 as of August 31, 1997.

Intersection crash rates were calculated using the following equations.

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

$Rate_{int}$ = Crash rate per Million Entering Vehicles (MEV)
$Rate_{segment}$ = Crash rate per Million Vehicle Miles Traveled (MVMT)
Crashes = Number of crashes during the time segment
Years = Number of years being studied
ADT = Average Daily Traffic volumes
Length = Length of roadway segment being studied (for segment rates)

The number of crashes was determined from the PRC reports. The ADT for each intersection was determined using 10 times the PM Peak-Hour Volume. The ODOT Transportation Volume Tables contain volumes for highway segments, but do not include the minor street volumes. The ADTs for the segment crash rates were taken from the ODOT volume tables.

Interchange 302 Study Area

The intersection crash rates in the Interchange 302 study area are summarized in Table 7. Roadway segment crash rates are summarized in Table 8.

Table 7: Intersections Crash Rates - Interchange 302

Intersection	Estimated ADT[1]	No. of Crashes	Crash Rate
OR 86 at Best Frontage Road	1,800	0	0.00
OR 86 at Airport Road	1,900	0	0.00
OR 86 at I-84 NB on/off-ramps	2,350	0	0.00
OR 86 at I-84 SB on/off-ramps	2,600	0	0.00
OR 86 at N. Cedar St/Old Trail Road	2,500	0	0.00
Hughes Lane at Cedar St.	4,000	2	0.54

[1] Based on ODOT manual turning-movement counts, February and March, 2005
Source: David Evans and Associates, Inc.

As shown in Table 8, the five-year crash rate is well below the statewide crash rate for similar roadway facilities.

Table 8: Roadway Segment Crash Rates – Interchange 302

Segment	Length (miles)	ADT	Crashes	5 Year Crash Rate	Statewide Crash Rate[1]
I-84: MP 301.0 to 304.5	3.5	9,500	18	0.30	0.50
OR 86: MP 1.70 to MP 3.5	1.8	1,600	1	0.19	0.82

[1] From 2003 ODOT State Highway Crash Rate Tables, Table II
Source: David Evans and Associates, Inc. analysis of ODOT-supplied PRC reports.

Interchange 306 Study Area

No crashes were reported within 100 feet of the intersections in the Interchange 306 study area. Segment crash rates are shown in Table 9.

Table 9: Roadway Segment Crash Rates - Interchange 306

Segment	Length (miles)	ADT	Crashes	5 Year Crash Rate	Statewide Crash Rate[1]
I-84: MP 305.0 to 307.5	2.5	7,900	21	0.58	0.50
US 30: MP 53.5 to 54.20	No crashes reported during study period				
Old Highway 30: US 30 to approximately 1 mile south of US 30	No crashes reported during study period				
Interchange 306 connections	No crashes reported during study period				

[1] From 2003 ODOT State Highway Crash Rate Tables, Table II
Source: David Evans and Associates, Inc. analysis of ODOT-supplied PRC reports.

As shown in Table 9, the five-year crash rate for I-84 is close to the statewide crash rate for similar roadway facilities. This particular segment of I-84 is on a long descending grade that often experiences icy road surface conditions. Fourteen of the 21 crashes on that segment of I-84 occurred during icy conditions.

SPIS Data

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

There are no SPIS locations reported in the top 10% in either of the IAMP study areas.

4.2.6 Access Management

Access Management is the careful planning of the location, design, and operation of driveways, median openings, interchanges, and street connections. Roads serve two primary purposes. One is mobility and the other is access. Mobility is the efficient movement of people and goods. Access is getting those people and goods to specific properties. A roadway designed to maximize mobility typically does so in part by managing access to adjacent properties. A good example of this is a freeway. A motorist can typically expect interruption-free, efficient travel over a long distance using a freeway. The number of access points is restricted to only freeway interchanges every few miles because this type of roadway primarily serves a mobility function. At the other extreme are local residential streets that provide easy and plentiful access to adjacent properties. This type of roadway primarily serves an access function.

Most state roads serve a function somewhere between the freeway and the local road. One of the responsibilities of ODOT is to ensure that the design of each state road properly balances access and mobility. Access Management is a primary means used to provide this balance. Access Management is also a means of increasing safety along street corridors. Allowing more access locations along streets increases the number of potential conflict points between vehicles entering or exiting the approach and vehicle traveling along the main street. This can lead to increased vehicle delay and a corresponding decrease in level of service, as well as a reduction in roadway safety.

Applicable Access Management Standards

The 1999 OHP outlines the requirements for access management for state facilities and the surrounding roadways. The standards apply to distances between the centerlines of adjacent public or private accesses onto the highway (on the same side of the road).

Table 10 tabulates the requirements for statewide and district highways.

Table 10: Access Spacing Standards for Statewide and District Highways

Posted Speed	Rural		Urban			
	Expressway	Other	Expressway	Other	Urban Business Area	Special Transp. Area
STATEWIDE HIGHWAYS[1, 2]						
≥ 55	5,280	1,320	2,640	1,320		
50	5,280	1,100	2,640	1,100		
40 & 45	5,280	990	2,640	990		
30 & 35		770		770	720	[3]
≤ 25		550		550	520	[3]
DISTRICT HIGHWAYS[4, 5]						
≥ 55	5,280	700	2,640	700		
50	5,280	550	2,640	550		
40 & 45	5,280	500	2,640	500		
30 & 35		400		400	350	[6]
≤ 25		400		400	350	[6]

References:
1,2 Notes 1 and 2 accompanying Table 13 of the OHP
3 Note 4 accompanying Table 13 of the OHP
4,5 Notes 1 and 2 accompanying Table 15 of the OHP
6 Note 4 accompanying Table 15 of the OHP
All measurements are presented in feet
Source: 1999 OHP Table 13, Appendix C, page 193 and Table 15, Appendix C, page 194.

Table 11 summarizes the access spacing standards for interchanges where the mainline is a freeway. Exhibit 1 illustrates the measurement of spacing standards for Table 11.

For the Interchange 302 and 306 study areas, the distance from the interchange ramps to the next intersection should be 1,320 feet or ¼ mile.

Procedures of Application for Variance

The Oregon Administrative Rules (OAR) Chapter 734 Division 51, commonly referred to simply as Division 51, governs the permitting, management, and standards of approaches to state highways to ensure safe and efficient operation of the state highways. Section 734-051-0135 directs how requests for deviations from the access management spacing standards are submitted and the process of review of those requests.

Table 11: Standards for Freeway Interchanges with Two-Lane Crossroad

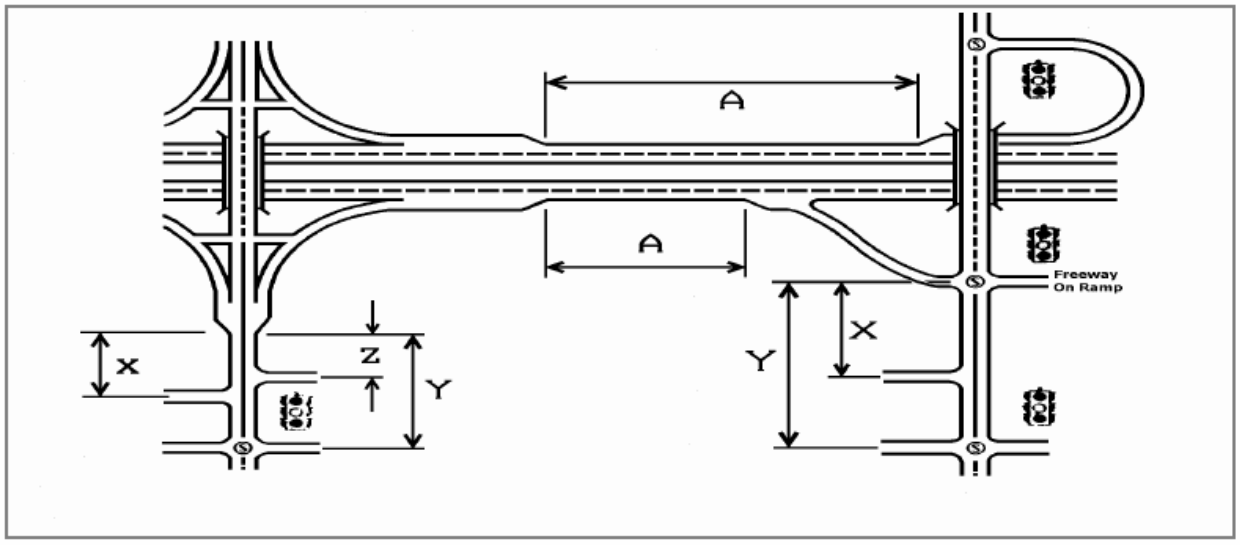
Category of Mainline	Type of Area	Spacing Dimension			
		A[1]	X	Y	Z
FREEWAY	Fully Developed Urban	1 mile	750 ft	1,320 ft	1,320 ft
	Urban	1 mile	1,320 ft	1,320 ft	990 ft
	Rural	2 mile	1,320 ft	1,320 ft	1,320 ft

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.
No four-legged intersections may be placed between ramp terminals and the first major intersection.

A = Distance between the start and end of tapers of adjacent interchanges
X = Distance to the first approach on the right; right-in / right-out only
Y = Distance to first major intersection; no left turns allowed in this roadway section
Z = Distance between the last right-in/right-out approach road and the start of the taper from the on-ramp
See Figure Z for illustration of measurements.

Source: 1999 OHP Table 16, Appendix C, page 196.

Exhibit 1: Measurements of Spacing Standards for Table 11



Source: 1999 OHP Figure 18, Appendix C, page 196.

Existing Access Points

As part of this technical report, a general comparison of the access spacing with the adopted access standards was performed. The existing accesses in the vicinity of Interchange 302 are presented in Figure 7 and those in the vicinity of Interchange 306 are shown in Figure 8.

Interchange 302 Study Area

Neither the public roads nor the private accesses in the Interchange 302 study area currently meet ODOT access spacing standards.

East of I-84, two public accesses and one private access are located within ¼ mile of Interchange 302. On the north side of OR 86, Airport Road is only 356 feet from the I-84 northbound on-ramp and a residence/ranch is 635 feet east of the I-84 ramp. On the south side of OR 86, Best Frontage Road is only 466 feet from the I-84 northbound off-ramp.

West of I-84, one public access and three private accesses are located within ¼ mile of Interchange 302. Old Trail Road connects from the north with North Cedar Street 653 feet west of the I-84 southbound off-ramp. A private access serving an RV park with services is located 956 feet west and south of the I-84 southbound off-ramp. This access is especially wide at 150 feet. A residential driveway is located 1,317 feet west and south of the ramp. Only one gated access is located on the east side of North Cedar Street, approximately 1,100 feet west and south of the I-84 southbound on-ramp.

Interchange 306 Study Area

There are no public or private accesses that are within ¼ mile of the Interchange 306 ramps. The closest access is Old US 30 extending southward from US 30 approximately 1,500 feet north of the I-84 southbound on-ramp.

4.3 LAND USE INVENTORY

The existing land use inventory includes a discussion of existing policies and zoning and existing land uses within the study areas.

4.3.1 Existing Planning Policies and Zoning Designations

Baker City has the primary planning responsibility for areas within the Urban Growth Boundary (UGB) while Baker County has jurisdiction over areas outside the UGB. Land use and planning decisions within the Baker City UGB are governed by the City of Baker City Comprehensive Plan (adopted in 1987, last amended in 2001), and the City of Baker City Development Code (adopted 2004). Outside the UGB, these decisions are governed by the Baker County Comprehensive Plan (adopted 1984) and the Baker County Zoning and Subdivision Ordinance (adopted in 1986, last amended in 2000).

Two zoning designations from the City of Baker City Development Code apply within the interchange study areas: General Commercial (CG) and Residential Low-Density (R-LD).

Residential low-density is a subdistrict of the Residential (R) zoning district, which is described in Chapter 2.1 of the Development Code. The types of residences allowed within the R-LD subdistrict include: single-family detached housing (including zero-lot-line housing); accessory dwellings; manufactured homes on individual lots; single-family attached townhomes; and residential care facilities. Duplexes and tri-plexes are allowed as conditional uses. Manufactured home parks and multi-family housing are

not allowed. Other allowed uses include home occupations, and agriculture/horticulture. Public and institutional buildings and bed-and-breakfast inns are allowed as a conditional use. The minimum lot area is 7,500 square feet for detached single-family housing, manufactured homes, and duplexes/triplexes. There is no minimum or maximum lot area for public or institutional uses.

The General Commercial (CG) zoning district is described in Chapter 2.3 of the Development Code. Its purpose includes providing for efficient use of land and public services and providing transportation options for employees and customers. A wide variety of commercial, residential, and public/institutional uses are allowed in the CG zone, although many require a conditional use permit. No minimum or maximum lot sizes apply, and there are no transportation-related development standards described in the CG chapter of the Development Code.

The Baker County Zoning and Subdivision Ordinance includes three zoning designations that apply to portions of the study areas lying outside the UGB: Exclusive Farm Use (EFU); Rural Residential – Five-Acre Minimum Lot Size (RR-5); and Industrial (I).

The EFU zone allows farming and related uses, forestry, and limited residential uses. The construction and maintenance of transportation facilities is allowed under certain conditions.

Allowed uses in the RR-5 zone include single-family dwellings, duplexes, farm use, parks or playgrounds, local distribution utility facilities, and temporary mobile homes. There are numerous conditional uses, including subdivisions, planned unit developments, and mobile home developments. The minimum lot or parcel size is no less than five acres.

The list of allowed uses in the Industrial zone includes manufacturing, warehousing, farming, heavy equipment sales and service, and utility facilities, among others.

Technical Memorandum #2 provides further detail about all the zoning designations that apply within the interchange study areas. Appendix A to Technical Memorandum #2 includes a complete list of allowed and conditional uses for these zoning designations.

Interchange 302 Study Area

The zoning and tax lot information for the Interchange 302 study area is included in Figure 9.

A small portion of the northern interchange study area, to the south and west of Interchange 302, is inside the UGB, and an even smaller portion, in the southwest corner of the study area, is also within the Baker City limits. The portion within the UGB is zoned General Commercial (CG) and Residential Low-Density (R-LD) by the City of Baker City Development Code.

The portion of the northern study area outside the UGB is zoned Exclusive Farm Use (EFU), Industrial (I), and Rural Residential (RR-5).

The Baker County Comprehensive Plan describes each of the county's "exception areas," or areas not zoned for farm or forest use. The exception areas lying within the northern interchange study area are described as follows, excerpted from the Comprehensive Plan for reference:

- **Northeast Baker City - Frontage Road Industrial Site**

  This site includes 306 acres of Class II, III and IV soils in the western half of Section 10, Township 9 South, Range 40 East W.M. It is presently used for industrial sand and gravel operations, farming, a State of Oregon highway sand storage shed, and three residences. The area is bounded on all sides by paved county and state highways, one of which is an industrial frontage road build in 1978 to serve this site as well as the adjacent land to the west that is zoned for industrial development within the City of Baker's Urban Growth Boundary.

  The Oregon Trail Interpretive Center is located approximately 1-1/2 miles to the east of this industrial site. The Center is a major tourist attraction, and is accessed via Highway 86, which forms the north boundary of the industrial site. As part of the development of the Interpretive Center, Baker County committed itself to promoting development compatible with the intent of the Center. That is, the county would prohibit commercial uses in the viewshed of the Center, and would limit development as much as possible to retain the rural character of the area. While the Northeast Baker - Frontage Road Industrial Site is located outside the viewshed, some concern has been expressed in the compatibility of tourist-related traffic and heavy industrial uses.

  In addition, Baker City rezoned its industrial land on the west side of the frontage road to general commercial and tourist commercial uses in 1991. The Oregon State Department of Transportation commented that increased traffic potential as a result of the rezoning will require the realignment of the frontage road to avoid congestion at the Interstate 84-Interchange 302 exchange, Highway 86 and the frontage road.

  Other limitations to the site include a high water table.

- **Richland Interchange Residential**:

  Lands located in Section 3 of Township 9 South, Range 40 East W.M. totaling 116 acres of Class II - IV soils. The entire area has developed as small acreage homesites since its designation in 1974 as rural residential.

In addition, the Comprehensive Plan identifies a portion of the EFU-zoned land within the north interchange study area as a proposed industrial site. For reference, an excerpt from the Comprehensive Plan follows:

- **302 Exchange West of Interstate 84**

  This area is currently zoned Exclusive Farm Use with predominantly Class III soils. Its assets include: proximity to a freeway interchange, and accessibility to city sewer and water. It is currently used for hay production. The site is limited by a high water table, and its proximity to residential uses to the south. The Economic Development Department considers this an optimal site for light industrial uses.

  Because industry has shifted to road transport, this site is more attractive to developers than an existing industrial site located in the Baker City Urban Growth Boundary. That site is located west of the Union Pacific Rail line. The current industrial site is in farm use and contains high-value farm soils.

Interchange 306 Study Area

The zoning and tax lot information for the Interchange 302 study area is included in Figure 10.

The northwest portion of the southern study area is within both the UGB and the Baker City city limits, and is zoned R-LD. The remainder of the southern study area is outside the UGB, and is zoned EFU. There are no county exception areas in the southern interchange study area.

4.3.2 Existing Land Uses

The existing tax lot information is shown in Figure 9 for the Interchange 302 study area and Figure 10 for the Interchange 306 study area.

Interchange 302 Study Area

The northern study area includes 2,103 acres comprised of 173 tax lot parcels (see Figure 9). According to the Baker County Assessor's office records, approximately three-quarters of the parcels have some level of improvement. The remaining 46 parcels appear to be completely vacant, without improvement. Table 12 below summarizes the acreage and number of parcels within each zoning district.

Table 12: Study Area Zoning and Land Use – Interchange 302

Zoning	Legal Acres	Total Parcels	Vacant Parcels
Within Baker City UGB			
General Commercial (CG)	107.17	11	7
Residential Low-Density (R-LD)	114.28	101	14
Total Within UGB	*221.45*	*112*	*21*
Outside Baker City UGB			
Exclusive Farm Use (EFU)	1,477.36	30	11
Industrial (I)	290.78	16	11
Rural Residential (RR-5)	113.74	15	3
Total Outside UGB	*1,881.88*	*63*	*27*
Total Study Area	**2,103.33**	**173**	**46**

Sources: Baker County Assessor's Office; Oregon Department of Revenue; David Evans and Associates; Cogan Owens Cogan.

Within the City's Urban Growth Boundary, the General Commercial (CG) land lies south of the interchange, on either side of I-84. It is bounded on the west by Hwy. 86/ Cedar Lane and on the east by Best Frontage Road. The seven vacant parcels account for 54.41 acres. This includes three parcels of a half-acre or less, one of roughly 2.5 acres, and three between 11 and 24 acres. The improved parcels include an 18-acre tract in rural residential use, a 23-acre farm, and a church. There is one commercial use located at 42393 N. Cedar.

The City's residential low-density (R-LD) area is mostly built-out, with a total of 83 residences and four non-residential uses. The vast majority of the developed residential parcels are one acre or smaller, and the largest is 4.34 acres. There are 14 vacant residential lots, of which eight are 1.5 acres or smaller. Three vacant residential lots are between three and six acres and three are larger, between 18 and 22 acres.

Outside of the UGB, approximately 1,477 acres of Exclusive Farm Use (EFU) land lie north and west of the interchange and on the far eastern edge of the interchange study area. Most of this land is in active farm use or fallow. There are 19 existing residences, including a 19-acre RV park, along N. Cedar Lane near the southwest corner of the study area. The RV Park is allowed as a pre-existing, non-conforming use.

The 291 acres of Industrial land lying southeast of the interchange is comprised of 16 tax lots, 11 of which are vacant. The five improved lots include several gravel pits, one of which is an ODOT gravel storage facility that may eventually be upgraded to an ODOT maintenance facility. There also is a 69-acre farm, with one residence. There are five vacant parcels of less than 1.5 acres in size, five between four and seven acres, and one 11.75-acre parcel.

The 114 acres of RR-5 land northeast of the interchange includes a mix of farms and rural residential tracts. There are 12 residences, most of which are on parcels of slightly less than five acres. The three vacant parcels are all between 4.5 and five acres.

Interchange 306 Study Area

The southern study area includes 2,364 acres, comprised of 19 tax lot parcels. There are 10 vacant parcels. The vast majority of the study area is undeveloped or underdeveloped. Table 13 below summarizes the acreage and number of parcels within each zoning district.

Table 13: Study Area Zoning and Land Use – Interchange 306

Zoning	Acres	Total Parcels	Vacant Parcels
Within Baker City UGB			
Residential Low-Density (R-LD)	340.73	2	1
Outside Baker City UGB			
Exclusive Farm Use (EFU)	2,023.30	17	10
Total Study Area	**2,364.03**	**19**	**11**

Sources: Baker County Assessor's Office; Oregon Department of Revenue; David Evans and Associates; Cogan Owens Cogan.

The portion of the southern study area within the UGB is zoned R-LD. This 341-acre area is divided into two parcels, both of which are being farmed. One of the parcels includes a home.

The portion of the southern study area outside the UGB is zoned EFU. This area is entirely in farm use, with the exception of six pre-existing, non-conforming residences on the southwest side. The EFU area east of the interstate is rangeland, with no direct transportation access from the study area.

4.4 NATURAL AND CULTURAL RESOURCES CONSTRAINTS

To assess natural and cultural resources constraints in the interchange study areas, archaeological resources, historic properties, wetlands, flood plains, and wildlife inventories were searched. The location of potential hazardous materials was also researched.

4.4.1 Archaeological Resources

Baker City's and Baker County's Comprehensive Plans do not address archaeological resources. The ODOT Geo-Environmental Section was contacted for further inquiry. To date, ODOT does not have any archaeological data for projects in the study areas.

Depending on the scope of future projects, ODOT will contact the State Historic Preservation Office (SHPO) to verify the presence of archeological sites or surveys in the project vicinity, and conduct an archeological survey/field reconnaissance before work is to take place within the project area.

4.4.2 Cultural Resources-Historic Properties

Baker City's Comprehensive Plan dated 1987 (with updates from 1999, 2000, and 2001) indicates no historical properties exist within the Interchange 302 study area. No cultural or historical properties inventory exists for the Interchange 306 study area.

If any archaeological, cultural, or historical material were found during ground disturbance or construction, the construction contractor would cease operations and notify the State Historic Preservation Office Archeologist to ensure proper identification, evaluation, and disposition.

4.4.3 Wetlands

The National Wetlands Inventory Maps (1995) identify were used to identify wetlands in the study areas. The maps identify many different wetland areas within the Interchange 302 study area, as shown in Figure 11. A number of these areas are a result of man made ditches (Estes, Corral, and Baldock) or rock quarry pits. A few wetland areas, primarily in the vicinity of Sutton Creek, were identified in the Interchange 306 study area (see Figure 11).

4.4.4 Floodplains-(FEMA maps)

The floodplain maps prepared by the Federal Emergency Management Agency (FEMA) were examined to identify floodplains in the study areas. Improvements to either interchange must consider floodplain protection needs, including permits, proper erosion control and scour protection, and habitat protection needs and constraints.

Floodplains for the Powder River, west of the interchange, and the Baldock Ditch, east of Hudson Road, are within the Interchange 302 study area. FEMA has not established the 100-year floodplain for the Baldock Ditch. Flood depths of 1 to 3 feet have been determined for the Powder River and range from ponding to sheet flow depending on the terrain.

Floodplains for Sutton Creek, which runs parallel to US 30, have been identified within the Interchange 306 study area. FEMA has not established the 100-year floodplain for Sutton Creek.

4.4.5 Natural Resources and Wildlife

The natural resources and wildlife inventories were checked to determine the resources in the study areas. Baker City has no inventory for natural resources or wildlife within

the city limits. Baker County has no natural resources inventory but does have a wildlife inventory. This inventory lists Big Game animals, which are not present near the interchanges.

4.4.6 Hazardous Materials

Several databases were checked to identify potentially hazardous sites within the interchange study areas. The Oregon State Fire Marshal Hazardous Substance Incident Search did not identify any hazardous material sites within either the Interchange 302 or 306 study areas. Likewise, the United States Environmental Protection Agency's National Priorities List Sites in Oregon and Department of Environmental Equality's Superfund and The National Priorities List do not identify hazardous material sites within either of the study areas. The Right-To-Know (RTK NET) database provides the following hazardous material information:

- Toxic Release Inventory (TRI)-none in study area
- Permit Compliance System (PCS)-one possible location (could be near north interchange area)
- Resource Conservation Recovery Act (RCRA) Biennial Reporting System (BRS)-one possible location
- Integrated Compliance Information System (ICIS) formerly Docket Data -one docket case, unknown if in study area
- Emergency Response Notification System (ERNS)-3 potential locations, incidents occurred 6 or more years ago
- Resource Conservation Recovery Information System (RCRIS)-one potential location
- National Pollutant Release Inventory(NPRI)-none
- Accidental Release Information Program (ARIP)-none
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-none
- Records of Decision(RODs)-none
- Chemical Update System (CUS)-none
- National Priorities List (NPL)-none
- Superfund Enforcement Tracking System (SETS) Potentially Responsible Parties (PRPs)-none

Figure 3: Existing 2005 Peak-Period Volumes – Interchange 302

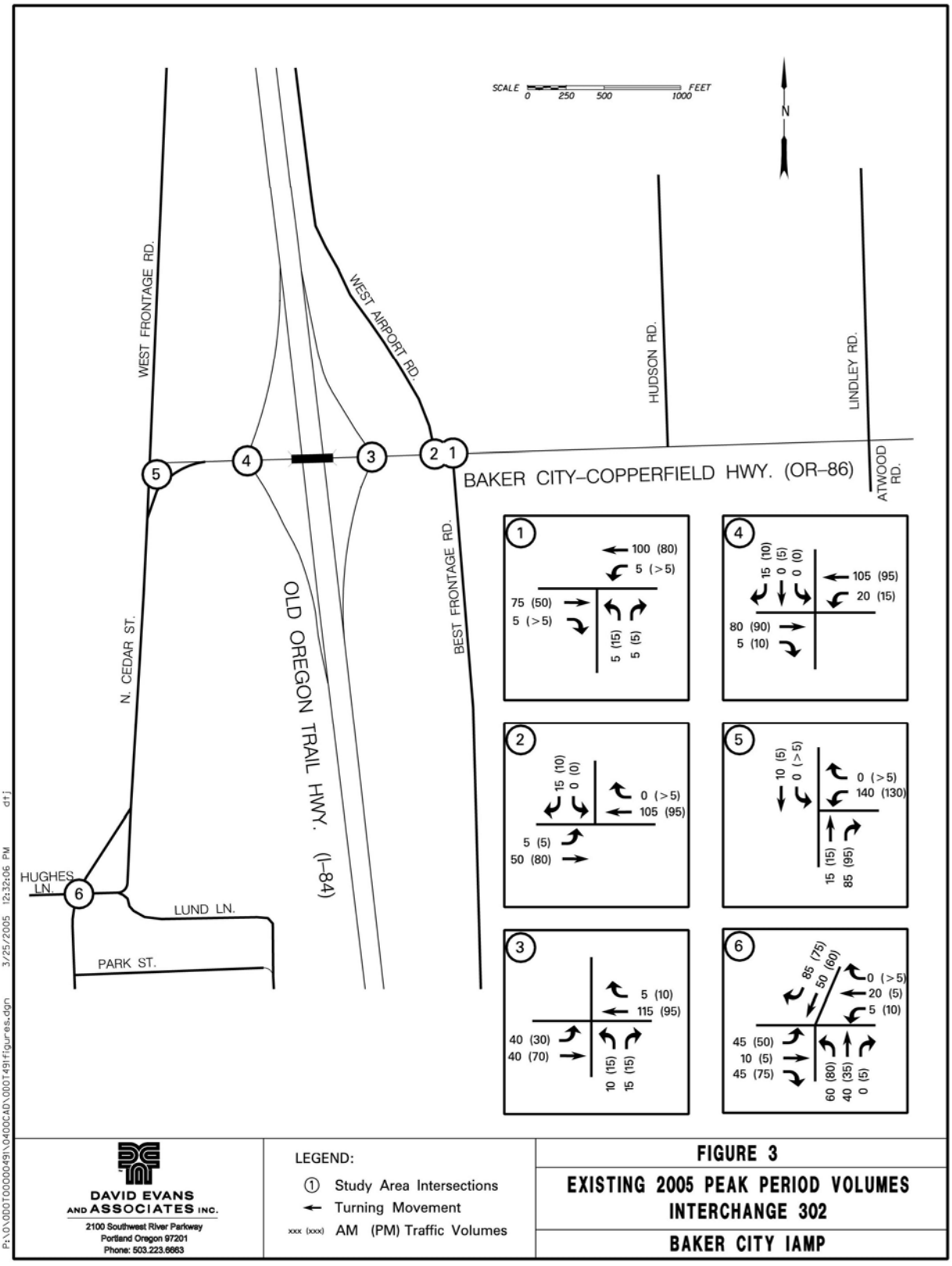


Figure 4: Existing 2005 Peak-Period Volumes – Interchange 306

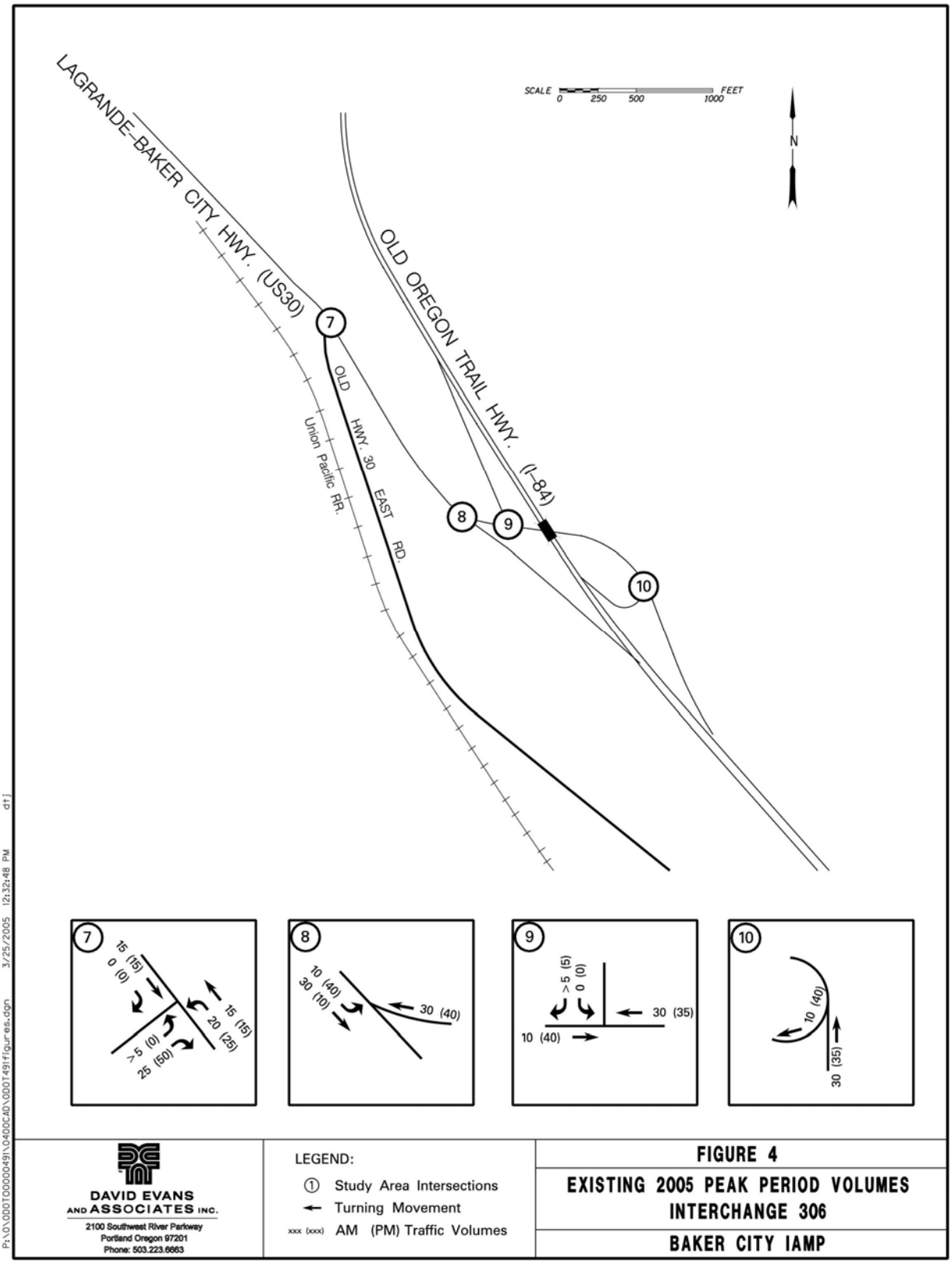


Figure 5: Existing Lane Configuration and Traffic Control – Interchange 302

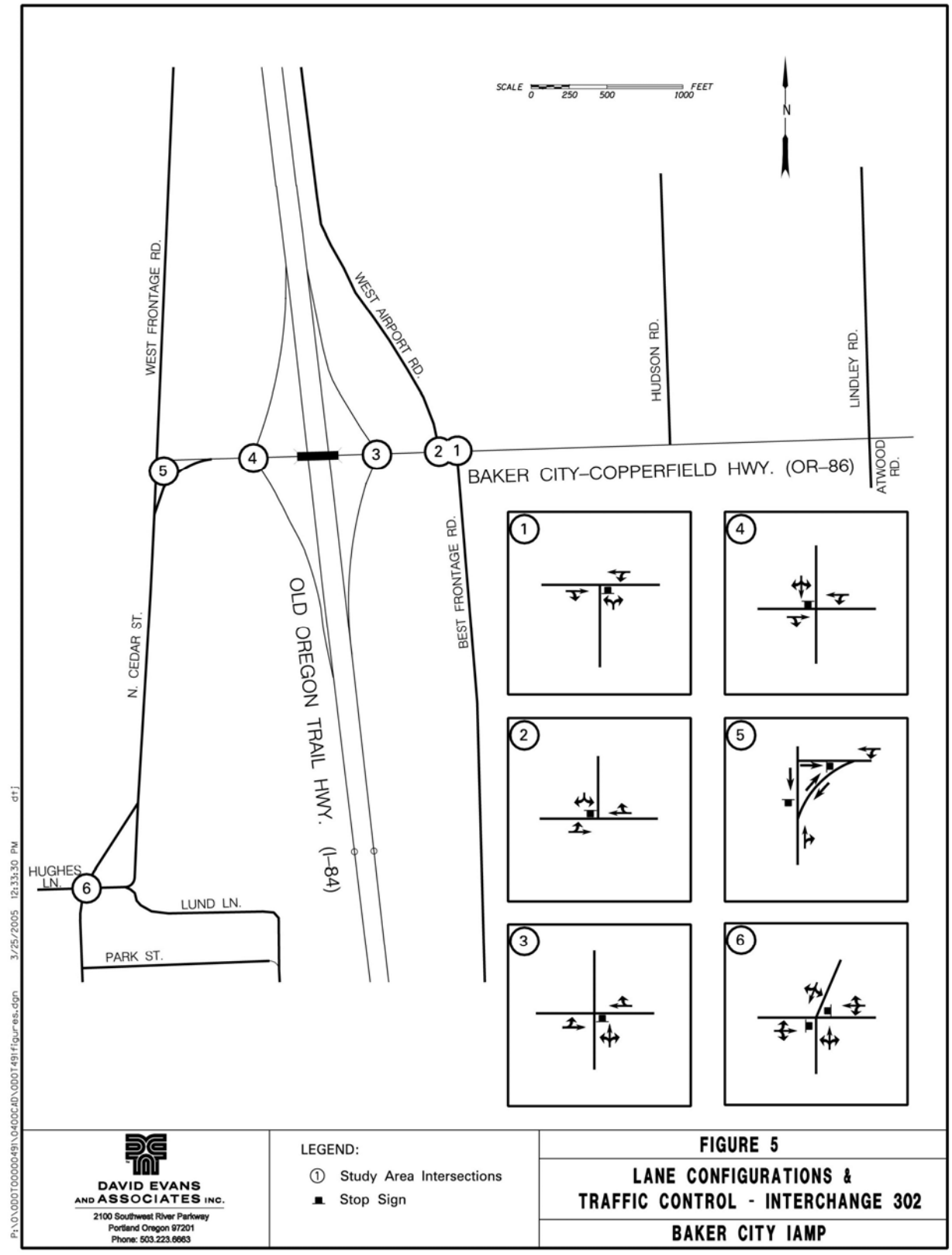


Figure 6: Existing Lane Configuration and Traffic Control – Interchange 306

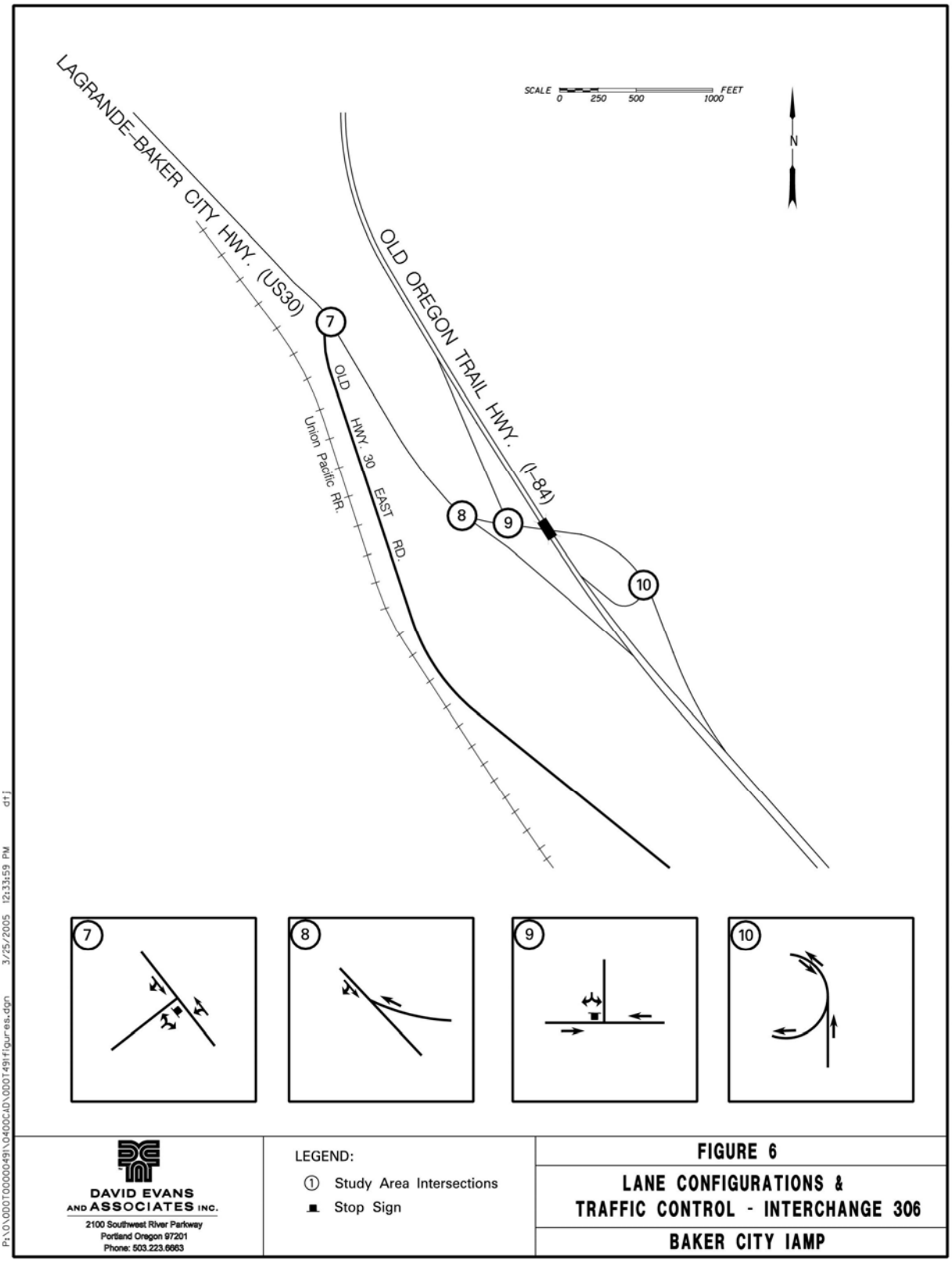
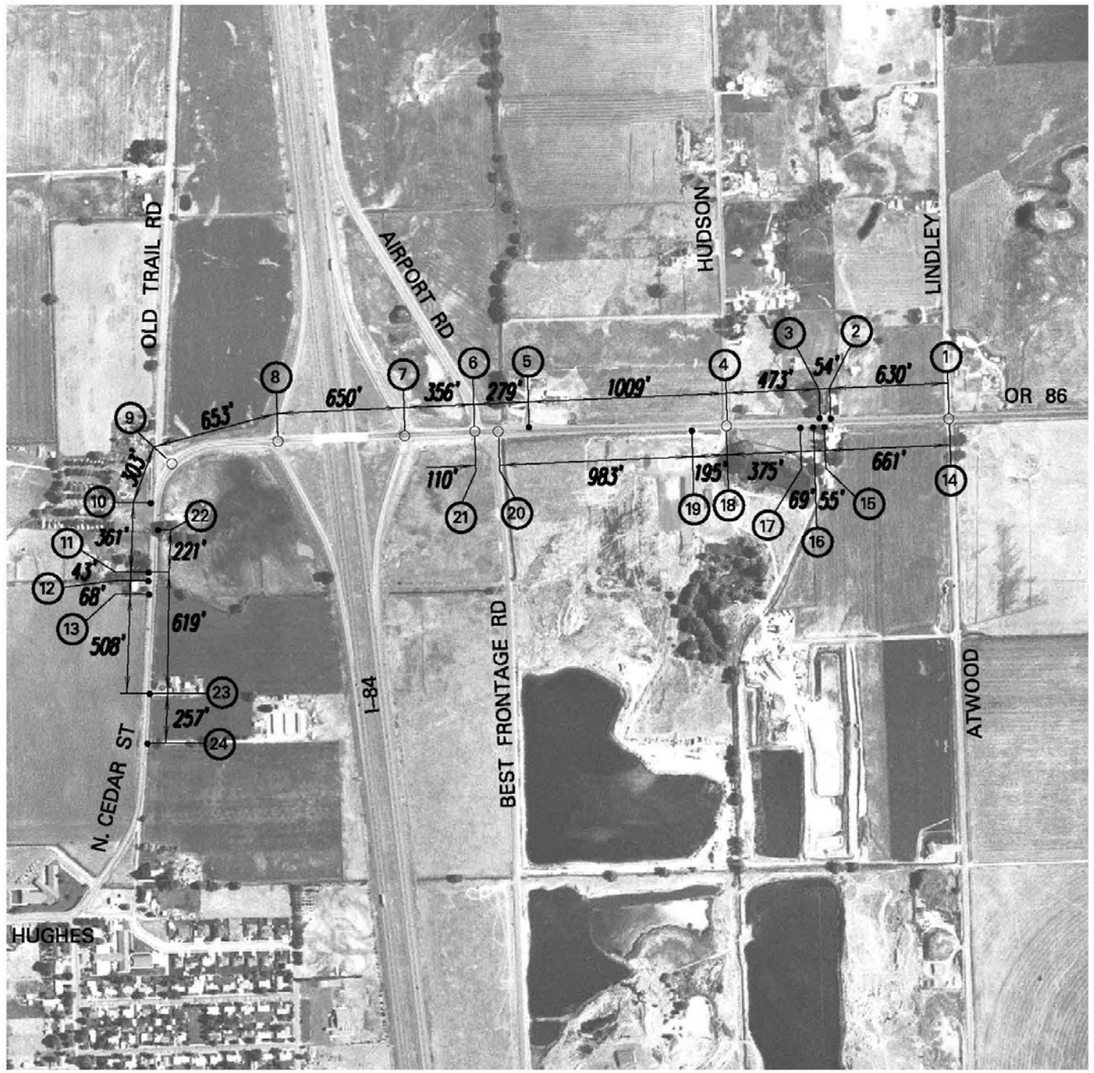


Figure 7: Existing Access Inventory – Interchange 302



Existing Roadway Access Inventory
Accesses Near Interchange 302

Access Number	Access Type	Roadway	Side of Road	Approach Width (ft)	Between Accesses (ft)	Tax Lot Map	Tax Lot Number
	Along OR 86						
1	Public: Lindley Road	OR 86	North	20	-	-	-
2	Private: Residential	OR 86	North	21	630	09S40E03	1601
3	Private: Residential	OR 86	North	19	54	09S40E03	1601
4	Public: Hudson Road	OR 86	North	20	473	-	-
5	Private: Residential	OR 86	North	18	1009	09S40E03	2500
6	Public: Airport Road	OR 86	North	29	279	-	-
7	Public: I-84 NB on/off ramps	OR 86	North	86	356	-	-
8	Public: I-84 SB on/off ramps	OR 86	North	55	650	-	-
9	Public: Old Trail Road	OR 86	North	40	653	-	-
14	Public: Atwood Road	OR 86	South	23	-	-	-
15	Private: Residential	OR 86	South	16	661	09S40E10	400
16	Private: Residential	OR 86	South	22	55	09S40E10	400
17	Private: Residential	OR 86	South	20	69	09S40E10	400
18	Public: ODOT sand/gravel facility	OR 86	South	40	375	09S40E10	600
19	Public: ODOT sand/gravel facility	OR 86	South	47	195	09S40E10	600
20	Public: Best Frontage Road	OR 86	South	24	983	-	-
21	Public: Airport Road (on north side)	OR 86	South	50	110	-	-
	Along N. Cedar St						
9	Old Trail Road	N Cedar St	East	40	-	-	-
10	Commercial	N Cedar St	East	150	303	09S40E09	100
11	Private: Residential	N Cedar St	East	23	361	09S40E09	200
12	Private: Residential	N Cedar St	East	51	43	09S40E09	800
13	Private: Residential	N Cedar St	East	19	68	09S40E09	800
22	Private: Farmland	N Cedar St	West		-	-	-
11	Private: Residential (for reference only)	N Cedar St	East	23	361	09S40E09	200
23	Private: Residential	N Cedar St	West	24	619	09S40E09A	900
24	Commerical	N Cedar St	West	24	257	09S40E09A	1000

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

LEGEND:
① Approach Number
◯ Public Approach
• Private Approach

FIGURE 7
EXISTING ACCESS INVENTORY
INTERCHANGE 302
BAKER CITY IAMP

$(getvar, "dwgprefix")$(getvar, "dwgname") $(edtime,$(getvar,DWGTIM),MM/DD/YYYY H:MMam/pm)

Figure 8: Existing Access Inventory – Interchange 306

Existing Roadway Access Inventory
Accesses Near Interchange 306

Access Number	Access Type	Roadway	Side of Road	Approach Width (ft)	Distance Between (ft)	Tax Lot Map	Tax Lot Number
	Along US 30						
25	Public: I-84 SB on ramp	US 30	North	-	-	-	-
26	Public: Old Highway 30	US 30	North	105	1500	-	-

DAVID EVANS AND ASSOCIATES INC.
2100 Southwest River Parkway
Portland Oregon 97201
Phone: 503.223.6663

LEGEND:
① Approach Number
◯ Public Approach
• Private Approach

FIGURE 8
EXISTING ACCESS INVENTORY
INTERCHANGE 306
BAKER CITY IAMP

$(getvar, "dwgprefix")$(getvar, "dwgname") $(edtime,$(getvar,DATE),"MM/DD/YY H:MMam/pm)

Figure 9: Zoning and Tax Lots – Interchange 302

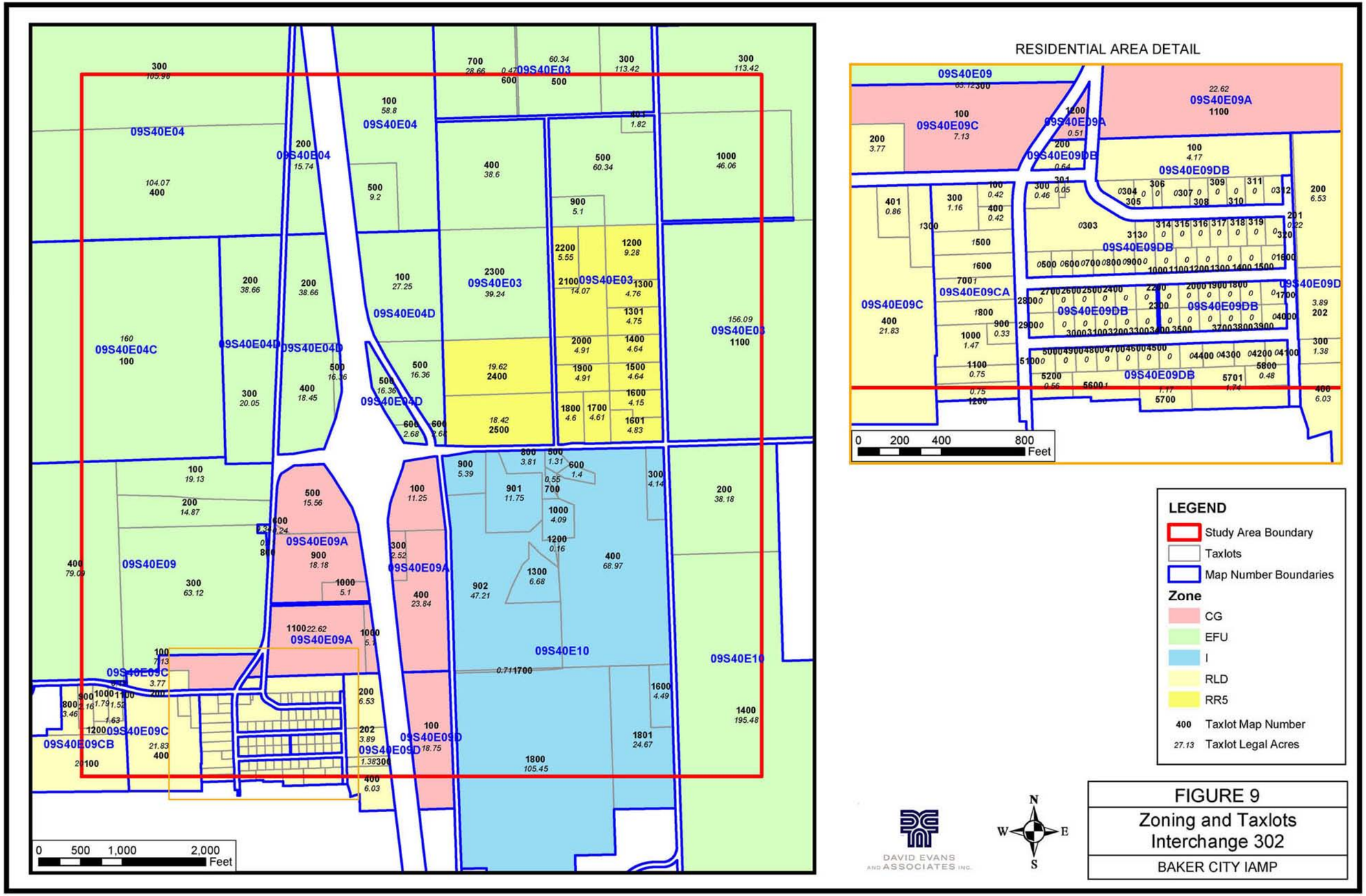


Figure 10: Zoning and Tax Lots – Interchange 306

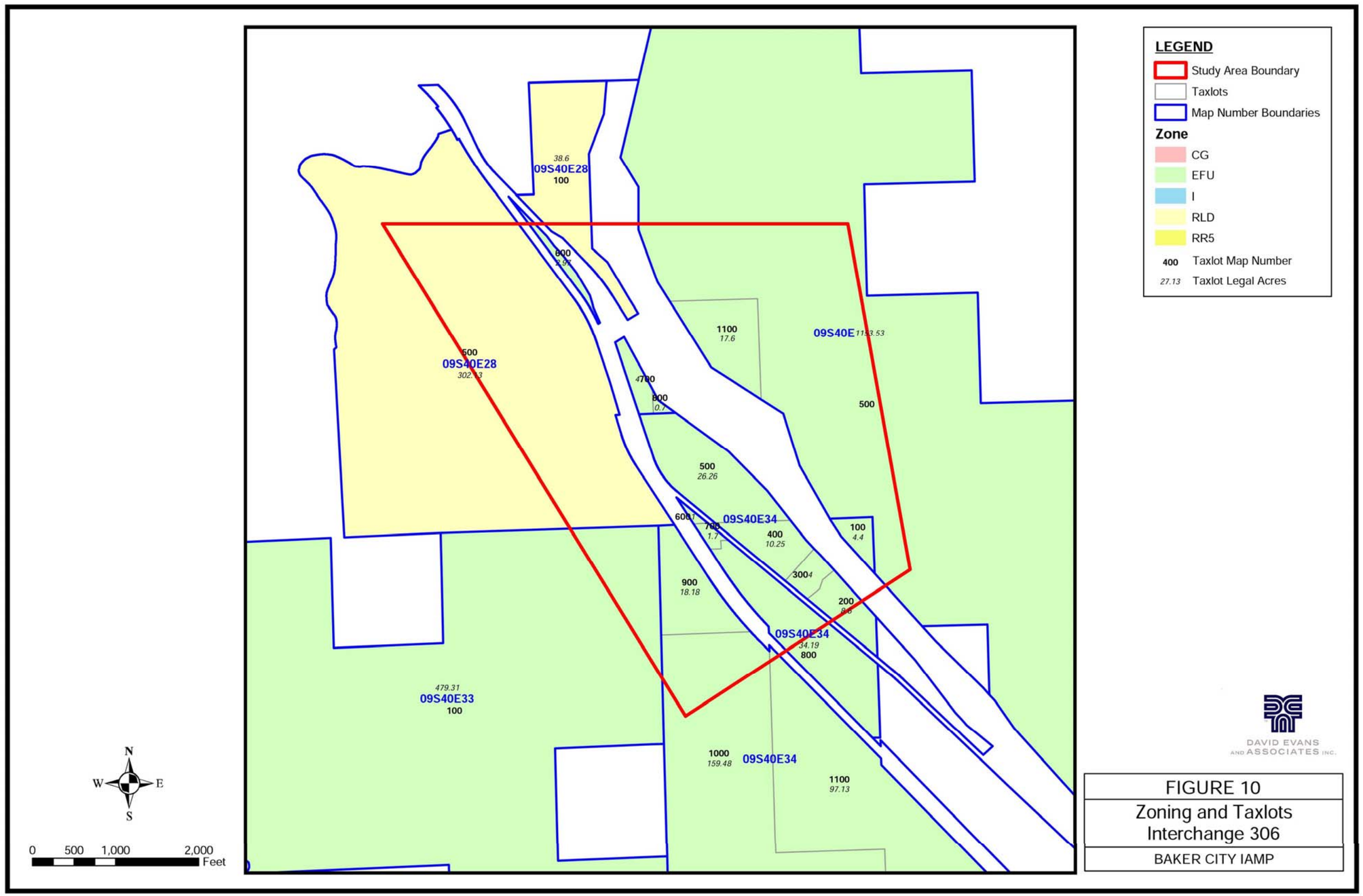
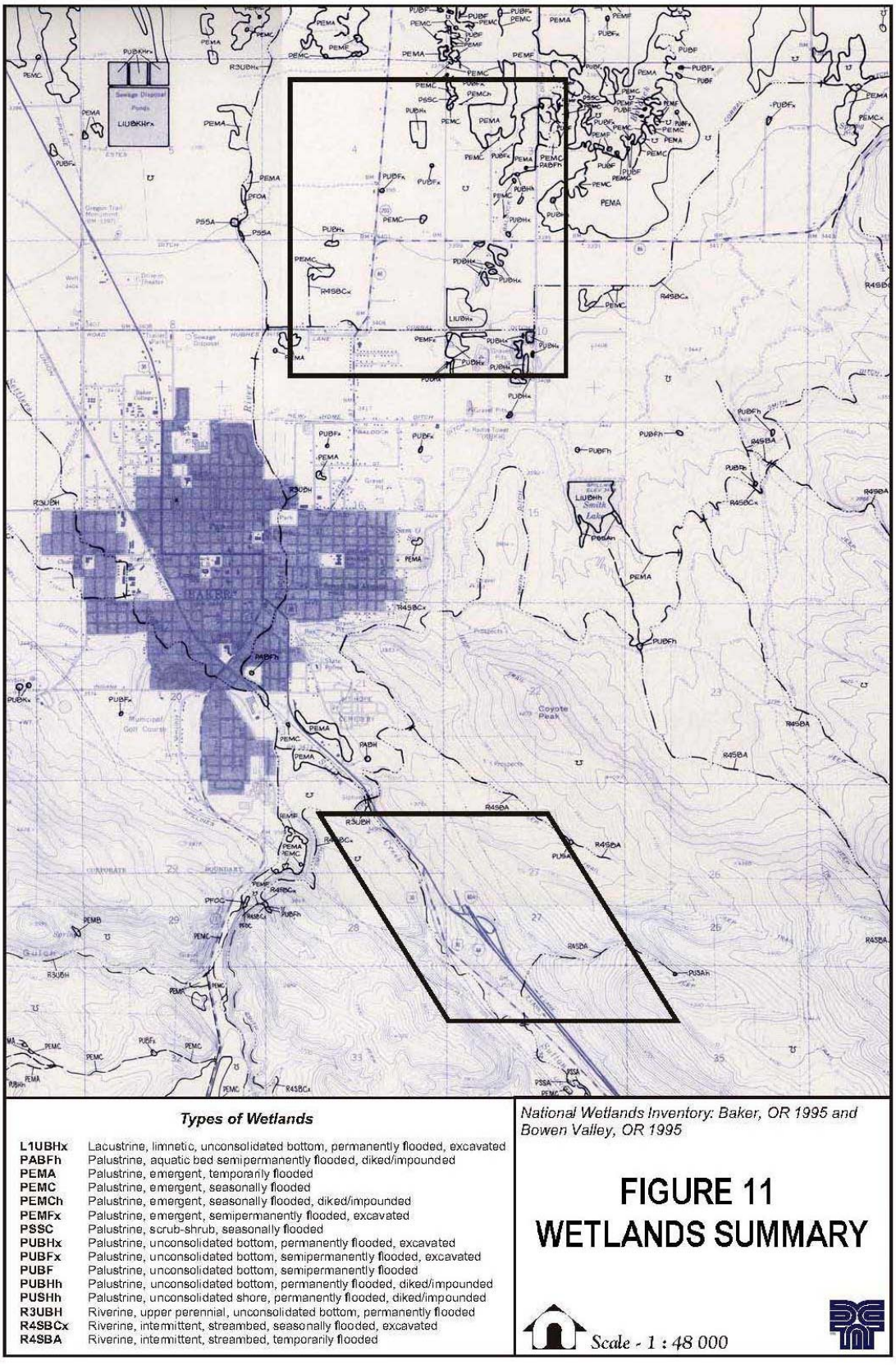


Figure 11: Wetlands Summary



5. FUTURE CONDITIONS ANALYSIS

The future conditions analysis presents the land use analysis and forecasts, the future traffic forecasts derived from the land use, and the future operating conditions analysis.

5.1 RESIDENTIAL BUILD-OUT ANALYSIS

5.1.1 Current Residences

Data from the Baker County Assessor's office indicates that there are 117 residences in the northern interchange study area, and seven in the southern study area. In the northern study area, 95 of these are on residentially zoned land (R-LD or RR-5), with the majority of the remaining residences found on EFU land. In the southern study area one residence is on land zoned R-LD, and the remainder are on EFU land.

5.1.2 Residential Build-Out Potential

Many of the residentially zoned parcels within the study areas are vacant or underdeveloped. The underdeveloped parcels are those that contain a residence, but are large enough to subdivide and create new residential parcels given their zoning. In making these calculations, 30% of the total acreage of each parcel was considered undevelopable, to allow for the construction of roads and other public facilities.

A parcel-by-parcel analysis reveals that current zoning would allow a "full build-out" of 533 residential parcels in the northern study area, and 1,384 in the southern study area. These totals include the existing residences on residentially-zoned land within each study area. The total number of potential new residences is 438 in the northern study area and 1,383 in the southern study area, for a total of 1,821. These "full build-out" calculations are summarized below in Table 14. Table 14 also shows the number of "Buildable Parcels" within each study area, by zoning designation. This includes both vacant parcels and those that could accommodate additional residence(s) because they are more than twice the minimum lot size given their zoning. For example, a 17-acre parcel in the RR-5 zone could subdivide into three residential parcels. The "Potential New" column represents the number of additional new residences that could be constructed if all buildable residential parcels were to be subdivided to the maximum extent possible.

Table 14: Full Build-Out of Residentially Zoned Land

Zoning	Total Parcels	Buildable Parcels	Residences		
			Existing	Potential New	Total
Northern Study Area					
Residential Low-Density (R-LD)	101	34	83	433	516
Rural Residential (RR-5)	15	4	12	5	17
Northern Study Area Total	116	38	95	438	533
Southern Study Area					
Residential Low-Density (R-LD)	2	2	1	1,383	1,384
Southern Study Area Total	*2*	*2*	*1*	*1,383*	*1,384*
All Residential Lands	**118**	**40**	**96**	**1,821**	**1,917**

Sources: Baker County Assessor's Office; Oregon Department of Revenue; David Evans and Associates; Cogan Owens Cogan.

However, it should be noted that other factors, such as slopes and other building constraints, might prevent some of the residentially-zoned parcels from developing to the extent allowed by the zoning code. This is particularly true in the southern study area, parts of which are heavily sloped.

Various types of residential uses, including multi-family housing, are allowed as conditional uses in the General Commercial (CG) zone. There are currently two residences in the portion of the northern study area zoned CG. There also is one non-conforming residence in the area zoned Industrial. Given the location of the CG parcels on the outskirts of the UGB and adjacent to I-84, those properties are likely better suited for commercial rather than residential use. It is not likely that significant residential development will take place in the CG portion of the study area within the IAMP's 20-year planning horizon.

The Baker County Zoning and Subdivision Ordinance and state land use laws allow for the construction of new residences within the EFU zone under certain limited circumstances. The number of residences that could be built within the EFU zone represent only a small fraction of those that could be built, under existing zoning laws, in the R-LD and RR-5 portions of the study areas.

In addition, the approval of Ballot Measure 37 in November of 2004 creates uncertainty in the application of existing zoning restrictions based on the date the owner acquired the property. Some EFU-zoned parcels within the study areas may be eligible for Measure 37 claims, which could require Baker County to deny a claim, compensate the landowners, or waive the restrictions limiting development on those properties.

5.1.3 Projected Population Growth

While the above analysis indicates that a full build-out scenario would allow approximately 1,821 new residences in the interchange study areas, this does not seem to be a realistic estimate of future growth. In fact, population projections for the city and county, based on the most recent available population data, anticipate far less housing growth than would be allowed through full build-out under existing zoning.

David Evans and Associates conducted a Buildable Lands Inventory (BLI) for Baker City in 1999. Based on information from the 1990 US Census and the State of Oregon Office of Economic Analysis, this report estimated that in the year 2000 Baker City would have a population of 10,200, with 4,380 households. Estimates for the year 2020 were 11,960 residents in 5,200 households. Projecting this average annual growth out to the end of the IAMP's planning horizon results in totals of 12,448 residents and 5,426 households in the year 2025. This reflects an average annual growth rate (AAGR) of 0.80% for the population and 0.86% for the number of households.

As for the county, the 1999 BLI anticipated a population of 17,349 in the year 2000 and 19,893 in the year 2020. The 2000 US Census found the county's average household size to be 2.35 persons, a figure which is not expected to increase or decrease significantly over the next 20 years. Based on that average household size, the countywide population growth anticipated in the BLI would result in a total of 8,465 households in the year 2020. The projected totals for the year 2025 are 20,583 residents and 8,759 households. These numbers indicate that Baker City was anticipated to account for approximately 60% of the county's population and 62% of its households. These calculations are shown in Table 15.

Table 15: Population Projections from Baker City Buildable Lands Inventory (1999)

	Population				Households[1]			
	2000	**2020**	**2025**	**Increase**	**2000**	**2020**	**2025**	**Increase**
Baker City	10,200	11,960	12,448	**2,248**	4,380	5,200	5,426	**1,046**
Baker County	17,349	19,893	20,583	**3,234**	7,383	8,465	8,759	**1,376**
City/ County Ratio	59%	60%	60%	NA	59%	61%	62%	NA

Sources: Baker City Buildable Lands Inventory, David Evans and Associates, 1999. Cogan Owens Cogan.

[1] Baker City estimates are from the 1999 Buildable Lands Inventory (David Evans and Associates). Baker County estimates are based on the population projections from the 1999 BLI, assuming an average of 2.35 persons per household as found in the 2000 US Census.

The projected increase from Table 15 of 1,046 households within Baker City and 1,376 households in Baker County are both significantly less than the 1,821 new residences that could be accommodated based on existing zoning. However, newer, more recent population projections anticipate even less population and housing growth.

The Oregon Office of Economic Analysis (OEA) prepared long-range population forecasts for all of Oregon's counties in April, 2004. This more recent forecast offers a different estimate of future population growth in Baker County through the year 2025. The consultants used OEA's Baker County population forecast, which is based on the results of the 2000 US Census, to produce an estimate of the population and number of households in Baker City in the year 2025. This estimate assumes that Baker City will contain 59% of the county's population and households. This is the city/county population ratio found in the 2000 US Census, and is similar to the ratio found in the 1999 BLI. These calculations are shown in Table 16.

Table 16: Population Projections from Oregon Office of Economic Analysis and 2000 US Census

	Population			Households[2]		
	2000	**2025**	**Increase**	**2000**	**2025**	**Increase**
Baker City	9,860	10,110	**250**	4,196	4,294	**98**
Baker County	16,741	17,135	**394**	7,064	7,230	**166**
City/County Ratio	59%	59%	NA	59%	59%	NA

Sources: Oregon Office of Economic Analysis, 2004, www.oea.das.state.or.us/DAS/OEA/demographic.shtml. 2000 US Census. Cogan Owens Cogan.

This analysis, based on the most recent available population projections for Baker County, results in an anticipated increase of only 98 households in Baker City, and 166 households in all of Baker County, by the year 2025. These numbers are far less than the housing growth anticipated in the 1999 BLI, and represent only a small fraction of the 1,821 new residences that could be built given the existing zoning.

5.1.4 Conclusions

The PMT concluded that the IAMP analysis be based on an aggressive population growth projection, allowing the future travel demand forecasts to err on the side of caution regarding transportation facility capacity. Therefore, the projected growth rate from the 1999 BLI forecast was used as the basis for the IAMP's future residential, employment, and travel demand forecasts. This growth rate was applied starting with the actual Baker City population and households from the 2000 US Census, rather than the estimated 2000 population from the BLI.

[2] Baker City and Baker County figures for the year 2000 are from the 2000 US Census. Year 2025 estimates are based on the average household sizes from the 2000 US Census of 2.35 persons in Baker City and 2.37 persons in the county.

Table 17: Recommended Population Projection for Baker IAMP

	Population				Households			
	2000	**2025**	**AAGR[3]**	**Increase**	**2000**	**2025**	**AAGR**	**Increase**
Baker City	9,860	12,033	**0.80%**	**2,173**	4,196	5,198	**0.86%**	**1,002**

Sources: Baker City Buildable Lands Inventory, David Evans and Associates, 1999. Cogan Owens Cogan.

This projection anticipates 1,002 new households in all of Baker City between the years 2000 and 2025. Most of this growth can be anticipated to take place on the outskirts of the Baker City area, rather than in the center city area, which is largely built-out. Given this, the consultants, along with the Project Management Team members representing Baker City and Baker County, recommend an assumption that 100% of these new households will be captured within the two IAMP study areas. This represents the "worst-case scenario," as far as traffic impacts on the interchanges are concerned.

To allocate anticipated growth among the two study areas one might assume that the northern study area, around Interchange 302, would receive the bulk of the new housing. This area is already more developed than the southern study area, and has seen more growth in recent years. However, our worst-case scenario of 1,002 new residences far exceeds the northern study area's "full build-out" potential of 438 new residential parcels. Therefore, we must assume that approximately 40% of the new growth will take place in the northern study area, nearly reaching its full build-out potential, while the remainder of the growth takes place in the southern study area. This equals 401 new residences in the northern study area and 608 in the southern study area. These totals are shown in Table 18.

Table 18: Recommended Growth Projections for Baker IAMP Study Areas

	Existing Residences	**Potential New Residences (Full Build-out)**	**20-Year Growth Projection**	
			New Residences	**Total Residences**
Northern Study Area	117	438	401	518
Southern Study Area	7	1,383	601	608
Total	124	1,821	1,002	1,126

Sources: Baker County Assessor's Office; Oregon Department of Revenue; Baker City Buildable Lands Inventory, David Evans and Associates, 1999. Cogan Owens Cogan.

5.2 EMPLOYMENT LANDS ANALYSIS

The northern interchange study area includes just under 400 acres of employment land, or land zoned for commercial or industrial use. This is made up of approximately 107 acres of commercial land and 291 acres of industrial land. While some of the properties

[3] AAGR is the average annual growth rate between 2000 and 2025 from the 1999 BLI population projection, as calculated by Cogan Owens Cogan.

in these zones have improvements on them, none is developed in a way that maximizes their employment-generating capacity. Many of these parcels are developed with non-commercial or industrial uses such as farms or residences that generate a low level of employment.

To account for the need for future roads, public facilities, and environmental constraints, 30% of the acreage must be considered "unbuildable," and subtracted from the total. This generates the total number of "developable acres," as shown in Table 19. The developable acres figures were then multiplied by an employee-per-acre ratio for each zoning district. These ratios were taken from the Oregon Department of Land Conservation and Development's *Draft Goal 9 Economic Development Guidebook*. The guidebook suggests a range of 14-20 employees-per-acre for commercial lands and 8-12 for industrial lands. We use the midpoint of each range, 17 employees-per-acre for commercial land and 10 for industrial land, to determine that the northern study area could eventually accommodate up to 3,311 employees. These calculations are shown in Table 18. There is no commercial or industrially-zoned land located in the southern study area.

Table 19: Northern Interchange Study Area Employment Lands Analysis

	Total Parcels	Acres	Developable Acres	Potential Employees	
				Per Acre[4]	Total
General Commercial (CG) Land					
Vacant Commercial Land	7	54.14	37.90	17	644
Improved Commercial Land	4	53.03	37.12	17	631
Total Commercial Land	11	107.17	75.02	17	1,275
Industrial (CG) Land					
Vacant Industrial Land	11	40.67	28.47	10	285
Improved Industrial Land	5	250.11	175.08	10	1,751
Total Industrial Land	16	290.78	203.55	10	2,035
All Employment Lands	**27**	**397.95**	**278.57**	**NA**	**3,311**

Sources: Baker County Assessor's Office; Oregon Department of Revenue; Draft Goal 9 Economic Development Guidebook, Department of Land Conservation and Development; David Evans and Associates; Cogan Owens Cogan.

However, as in the Residential Lands Analysis section of this memo, the full build-out employment projections should be compared to the city's anticipated population growth. The 1999 BLI estimates a "total persons per employee" ratio of 2.41 for Baker City in 1998, for a total employment of 4,215 workers. Applying this ratio to the BLI's

[4] Employee per acre ratios from Draft Goal 9 Economic Development Guidebook, Department of Land Conservation and Development.

population projections for Baker City results in estimates of 4,232 jobs in the year 2000 and 5,165 in the year 2025. This increase of 933 jobs is much less than the potential 3,311 jobs that could be generated within the northern study area based on zoning alone.

Future employment in the northern study area has been estimated with an approach similar to that used in the Residential Lands Analysis, which is based on an optimistic growth assumption for the IAMP study areas. The Residential Lands Analysis uses the projected average annual growth rate from the 1999 BLI to estimate Baker City's population growth between 2000 and 2025, starting with the city's population from the 2000 US Census. It then assumes that 100% of the city's projected growth between 2005 and 2025 will be captured within the two study areas.

Considering that the northern study area includes a high percentage of the undeveloped commercial and industrial land in the Baker City area, it is assumed that all of the city's projected employment growth will also take place within the northern study area. Baker City's population from the 2000 US Census is used as the baseline for this analysis. Using this approach, shown as the "COC/DEA Projection" in Table 20, 902 new jobs would be generated in the study area within the IAMP's 20-year planning horizon.

Table 20: Baker City Employment Projections

	2000 Pop.	2025 Pop.	Persons-per-Employee Ratio	Est. 2000 Jobs	Est. 2025 Jobs	2000-25 Increase
1999 BLI	10,200	12,448	2.41	4,232	5,165	933
COC/ DEA Projection	9,860	12,033	2.41	4,091	4,993	902

Sources: Baker City Buildable Lands Inventory, David Evans and Associates, 1999. 2000 US Census. Cogan Owens Cogan.

It should be noted that the US Census Bureau's County Business Patterns Data[5] shows that Baker County had a total of 3,781 jobs in the year 1998. The total in 2000 was 3,910. However, by the year 2002 this number had dropped to 3,661. These numbers indicate that the number of jobs in the county may be declining, and future employment could actually be lower than the estimates generated above. However, Baker City officials indicate that the city has experienced an increase in employment between 2003 and 2004.[6]

[5] http://censtats.census.gov/cbpnaic/cbpnaic.shtml
[6] Watkins, Jennifer. Baker City Director of Community Development. Personal Communication. 4/1/05.

5.3 FUTURE TRAVEL DEMAND FORECAST

The future travel demand forecasts are based on the land use forecasts described above, existing traffic volumes, and trendline projections of background traffic growth.

5.3.1 Background Traffic Growth

Although specific growth is planned for the study area, background growth associated with through traffic and traffic from outside of the Baker City area also is expected to occur. This background growth was estimated from trendline forecasts on I-84, OR 86, and US 30 as prepared by the Oregon Department of Transportation's (ODOT) Transportation Planning and Analysis Unit (TPAU). The trendline growth rates are summarized in Table 21.

Table 21: Trendline Traffic Forecasts from Historical Data

		Average Daily Traffic (ADT)			
		2003[1]	2023[2]	2025[3]	AAGR[4]
Traffic Volume Forecasts on I-84					
286.65	ATR 01-011 – Baker Valley	9,100	13,900	14,380	2.1%
302.41	0.30 miles north of OR 86 - Baker-Copperfield	9,500	14,500	15,000	2.1%
303.74	0.40 miles north of OR 86 - Baker -Copperfield	9,200	13,900	14,370	2.0%
306.23	0.30 miles north of US 30 - La Grande - Baker	7,900	11,800	12,190	2.0%
313.24	0.40 miles north of Encina Interchange	8,400	12,500	12,910	2.0%
Traffic Volume Forecasts on US 86					
2.75	0.01 miles west of Airport Rd.	1,600	2,000	2,040	1.1%
Traffic Volume Forecasts on US 30					
53.14	0.01 miles northwest of Bridge St.	1,200	1,200	1,800	1.9%
54.06	0.40 miles west of I-84 - Old Oregon Trail	1,100	1,600	1,650	1.9%

Notes:
1. Historical traffic counts from ODOT Traffic Volumes Tables, 2003.
2. Forecasts for the year 2023 are based on the trendline forecasts prepared by the ODOT's Transportation Planning and Analysis Unit.
3. Forecasts for the year 2025 were extrapolated by DEA from the straight-line growth from 2003 through 2023.
4. The AAGR is the average annual growth rate from 2003 to 2025.

Sources. Oregon Department of Transportation. David Evans and Associates, Inc.

The trendline growth rates shown in Table 21 were applied to the highways in the study areas based on the following assumptions. At Interchange 302, all movements to and from OR 86 were increased with an AAGR of 1.1 percent per year and all remaining traffic movements at the interchange were increased with an AAGR of 2.1 percent to reflect the highway growth on I-84. At Interchange 306, all movements in the study area were increased with an AAGR of 1.9 percent per year.

Outside of the interchange ramps, background traffic volumes were estimated by balancing the volumes between intersections and prorating the turning movements according to existing traffic patterns.

5.3.2 Land-Use-Based Traffic Forecasts

The land-use-based traffic forecasts were generated in several steps based on the land use forecasts recommended by the PMT for transportation purposes. First, the land use was allocated into subareas based on available acreage and roadway network. Then, trip generation estimates for the different subareas were calculated using average trip rates for the different land uses. Lastly, the trips for each subarea were distributed and assigned to the roadway network in each study area.

Subarea Land Use Calculations

These general forecasts for the north and south study areas were divided into subareas according to the available acreage and the roadway network. The subareas and land use assumptions in 2025 are summarized in Table 22.

Table 22: Subarea Land Use Assumptions

Subarea	Land Use
Interchange 302	
Residential	Dwelling Units
North of Hughes & West of Cedar	13
South of Hughes & West of Cedar	215
South of Hughes & East of Cedar	98
East of I-84 & South of OR 86	70
West of Hudson & North of OR 86	2
East of Hudson & North of OR 86	1
West of Lindley & North of OR 86	2
Industrial	Employees
East of Best Frontage	315
West of Atwood	202
Other	59
Commercial[1]	Employees/GSF
East of I-84	120/108,000
West of I-84	206/185,000
Interchange 306	
Residential	Dwelling Units
Southwest of US 30	533
North of US 30	68
Total	
Residential (Dwelling Units)	1002
Industrial (Employees)	576
Commercial (Employees/GSF)	326/293,000

Note:
1. Building gross square footage (GSF) was estimated for the commercial subareas because most commercial trip generation is based on building size rather than employment. GSF was estimated assuming 17 employees per acre and 35% of acreage used for buildings.

Source. David Evans and Associates, Inc.

An estimate of building gross square footage (GSF) was prepared for the commercial land use subareas because most trip generation for commercial uses is based on building size rather than the number of employees. This reflects the varying nature of employment in the retail industry. Building GSF was estimated assuming 17 employees per acre and 35 percent building coverage.

Trip Generation

Once the land use was allocated to the different subareas, daily, AM peak-hour, and PM peak-hour trips were estimated for each subarea using average trip rates from the Institute of Transportation Engineers' (ITE) report *Trip Generation, 6th Edition, 1997.* For the residential subareas, ITE land use category Single-Family Residential (210) was used. For the industrial subareas, ITE land use category General Light Industrial (110) was used. For the commercial subareas, ITE land use category Shopping Center (820) was used. This latter category can include a variety of uses including "big box" anchors with smaller outbuildings such as banks, restaurants, gas stations, etc. The resulting trip generation is summarized in Table 23.

Table 23: Subarea Trip Generation

			AM Peak-Hour Traffic		PM Peak-Hour Traffic	
Subarea	**Land Use**	**Daily Traffic**	**In**	**Out**	**In**	**Out**
Interchange 302						
Residential (Dwelling Units)[1]						
North of Hughes & West of Cedar	13	120	0	5	10	5
South of Hughes & West of Cedar	215	2,060	40	120	140	80
South of Hughes & East of Cedar	98	940	20	55	65	35
East of I-84 & South of OR 86	70	670	15	40	45	25
West of Hudson & North of OR 86	2	20	0	0	0	0
East of Hudson & North of OR 86	1	10	0	0	0	0
West of Lindley & North of OR 86	2	20	0	0	0	0
Industrial (Employees)[2]						
East of Best Frontage	315	950	115	25	30	105
West of Atwood	202	610	75	15	20	65
Other	59	180	20	5	5	20
Commercial (Gross Square Footage)[3]						
East of I-84	108,000	4,640	70	45	195	210
West of I-84	185,000	7,940	115	75	330	360
Total Interchange 302		***18,160***	***470***	***385***	***840***	***905***
Interchange 306						
Residential (Dwelling Units)[1]						
Southwest of US 30	533	5,100	100	300	345	195
North of US 30	68	650	15	40	45	25
Total Interchange 306		***5,750***	***115***	***340***	***390***	***220***

Table 23 Note:
1. Residential trip generation is calculated based on number of dwelling units using rates from ITE Land Use Single-Family Residential (210)
2. Industrial trip generation is calculated based on number of employees using rates from ITE Land Use General Light Industrial (110).
3. Commercial trip generation is calculated based on building gross square footage using rates from ITE Land Use Shopping Center (820).

Source. Institute of Transportation Engineers, Trip Generation, 6th Edition, 1997. David Evans and Associates, Inc.

Trip Distribution and Assignment

Trip distribution patterns for each subarea were developed and applied to the trip generation in Table 23 to create trip assignments to the roadway network. The trip distribution patterns were based on the following assumptions:

Interchange 302

- Traffic to I-84 was assumed to be 15 percent of total residential and industrial trip generation based on Table 6-1 in the 1996 Baker City Transportation System Plan (TSP). Ten percent was assigned to I-84 to and from the north and five percent was assigned to I-84 to and from the south.
- Traffic to I-84 was assumed to be 40 percent of total commercial trip generation to account for potentially interchange-oriented land uses, such as fast-food restaurants and gas stations. Twenty-five percent was assigned to I-84 to and from the north and 15 percent was assigned to I-84 to and from the south.

Interchange 306

- Traffic to I-84 was assumed to be 15 percent of total residential trip generation based on Table 6-1 in the 1996 Baker City TSP. Trip assignments to the ramps was based on the existing ramp distribution patterns for the AM and PM peak hours.

5.3.3 Future Traffic Forecasts

The 2025 background traffic volumes estimated from the trendlines and the land-use-based traffic forecasts were combined to calculate 2025 future traffic volumes in the study areas. The resulting traffic volume forecasts are shown in Figures 12 and 13.

5.4 FUTURE CONDITIONS ANALYSIS/RESULTS

Operations of the intersections surrounding Interchanges 302 and 306 are summarized in Table 24. Conditions in 2025 would be more congested than existing conditions primarily because of the growth in land use assumed with the future development scenario. However, all of the intersections would still operate with v/c ratios less than 0.50 (meeting ODOT's standards) except for the Hughes Lane/Cedar Street intersection

in the Interchange 302 study area. The Hughes Lane eastbound approach is expected to have a v/c ratio of 0.73 in the AM peak hour and 1.97 during the PM peak hour. A v/c ratio over 1.0 indicates that demand is expected to exceed the capacity of the single-lane eastbound approach. Options to address this capacity deficiency were considered as part of the alternatives analysis.

Table 24: Summary of Future 2025 Intersection Operations

Intersection		Movement	AM Peak Hour		PM Peak Hour	
			LOS	V/C Ratio	LOS	V/C Ratio
1	OR 86 at Best Frontage Rd	WB Through, Left	A	0.01	A	0.01
		NB Left, Right	B	0.10	C	0.40
2	OR 86 at Airport Rd	EB Left, Through	A	0.01	A	0.01
		SB Left, Right	A	0.03	B	0.02
3	OR 86 at I-84 Northbound on/off-ramps	EB Left, Through	A	0.08	A	0.14
		NB Left, Right	B	0.17	D	0.48
4	OR 86 at I-84 Southbound on/off-ramps	WB Through, Right	A	0.03	A	0.06
		SB Left, Right	B	0.19	C	0.46
5	OR 86 at N. Cedar St/Old Trail Rd	SE Left	A	0.01	C	0.01
		SB Through	A	0.02	B	0.01
		NE Left, Through	A	0.02	B	0.42
6	Hughes Ln. at Cedar St	EB Left, Through, Right	D	0.73	F	1.97
		WB Left, Through, Right	C	0.30	F	0.53
		NB Left, Through, Right	A	0.09	A	0.19
		SB Left, Through, Right	A	0.01	A	0.01
7	US 30 at Old Hwy. 30	EB Left, Right	B	0.46	B	0.45
		SE Through, Right	A	0.03	A	0.02
8	US 30 at I-84 ramp split	No Stopped Movements	na	na	Na	na
9	US 30 at I-84 SB off-ramp	SB Left, Right	A	0.01	A	0.01

na = not applicable
Source: David Evans and Associates, Inc.

Figure 12. Future 2025 Peak-Period Volumes – Interchange 302

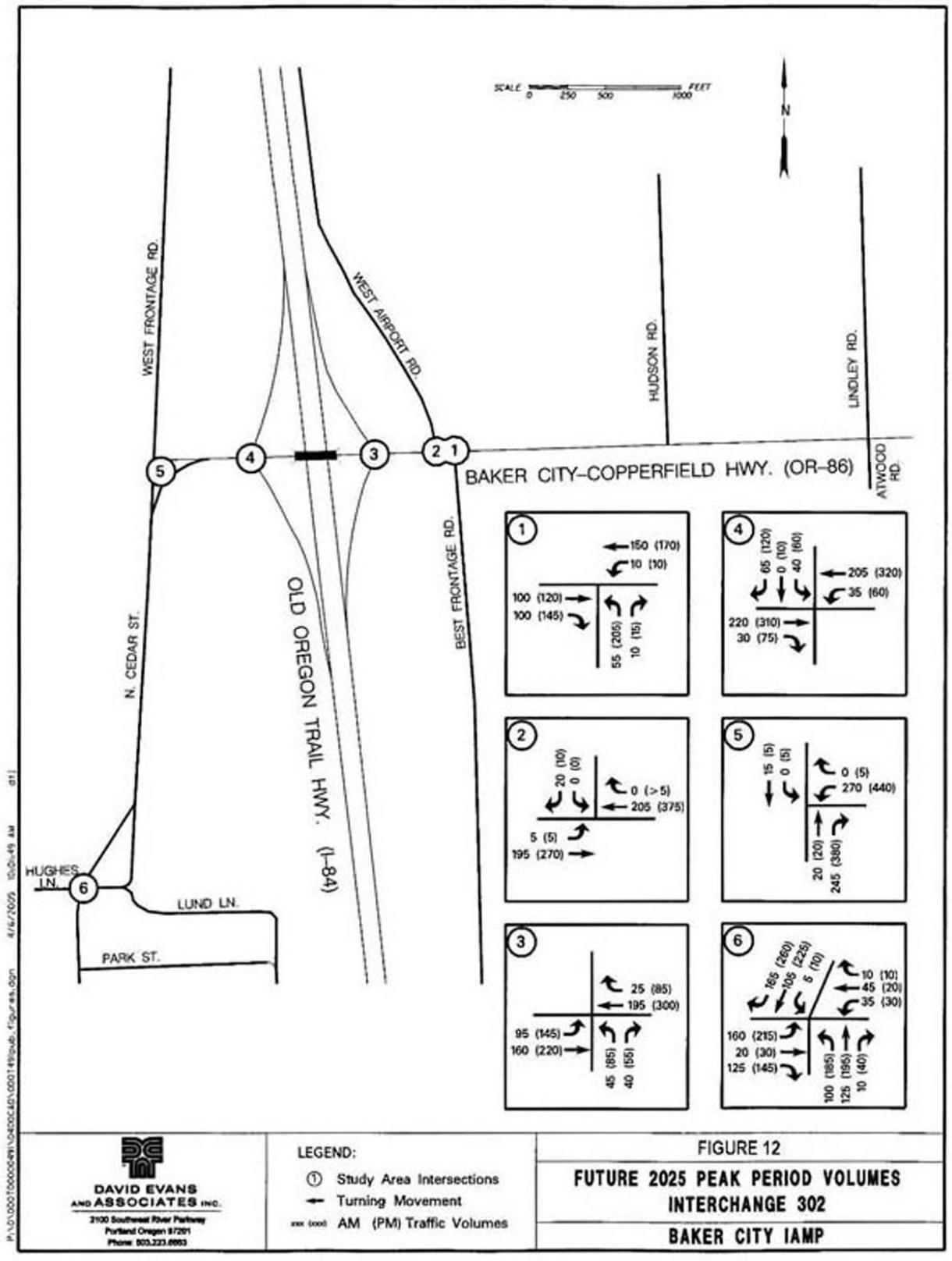
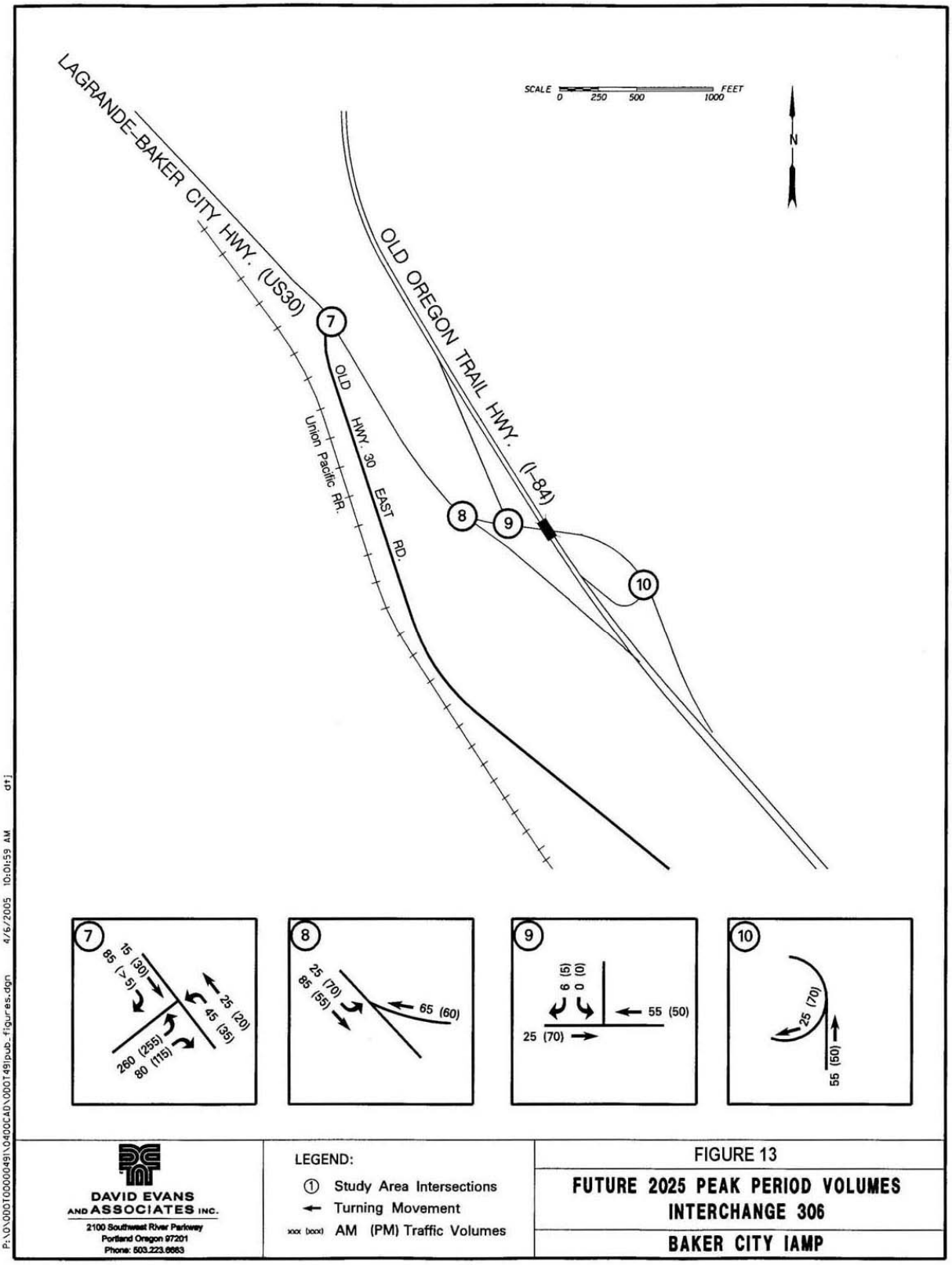


Figure 13. Future 2025 Peak-Period Volumes – Interchange 306



6. TRANSPORTATION ALTERNATIVES

6.1 EVALUATION CRITERIA

The following criteria were used to evaluate the alternatives under consideration for the IAMPs:

- Traffic Projections – How the alternative would change the 2025 traffic forecasts in the study area
- Operations Analysis – How the alternative would impact future intersections in the study area
- Access Spacing – Whether the alternative meets access spacing standards
- Traffic Circulation – How the alternative would change traffic circulation patterns in the study area
- Safety – Whether the alternative improves safety within the study area
- Impact to Adjacent Lands – Potential impacts to adjacent lands and property owners
- Goal Exceptions – Whether an aspect of the project would require exceptions to any of the statewide planning goals
- Cost – Estimated costs of each of the alternatives

6.2 ALTERNATIVES ANALYSIS

The alternatives and options were developed to address specific deficiencies or access concerns. General concepts were discussed at both a Planning Project Management Team (PMT) meeting and at the second public meeting.

6.2.1 Interchange 302

The transportation alternatives in the Interchange 302 study area focus on meeting state access spacing standards and geometric design requirements as well as addressing future operational deficiencies and safety. Options that address access spacing include realigning Best Frontage Road, realigning Airport Road, modifying the Old Trail Road intersection, and reviewing private access configurations. An option to modify the Cedar Street alignment east of the interchange to provide a curve that meets highway design guidelines also is under consideration. Modifications to the Hughes Lane/Cedar Street intersection and left-turn lanes on OR 86 are included to address operations and safety. The impact of an extension of Main Street northward to connect into the interchange, as identified in the transportation system plan, also is assessed. The alternatives evaluated are presented below.

Some of these options could be implemented together. They are not necessarily mutually exclusive.

Option 1A

Option 1A would realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. The existing Best Frontage Road connection with OR 86 would be closed but the roadway would remain open to provide access to the adjacent parcel. Option 1A is illustrated in Figure 14.

Purpose: This alternative is under consideration because it would meet the state interchange access spacing standard on the south side of OR 86.

Traffic Projections: The alternative is not expected to substantially change the traffic projection for the Best Frontage Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Best Frontage Road alignment.

Operations Analysis: Operations at the Best Frontage Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition.

Access Spacing: This alternative would meet the state interchange access management spacing standards on the south side of OR 86. In addition to closing the Best Frontage Road access, it would eliminate the existing direct access of the ODOT parcel on OR 86 by connecting it to the realigned Best Frontage Road. It also would provide an access alternative for other parcels that otherwise would have no other option but direct access to OR 86 when developed.

Traffic Circulation: The realignment of Best Frontage Road would increase travel distances for many drivers traveling through the study area because it would increase the length of Best Frontage Road and increase the distance from the interchange.

Safety: Realigning Best Frontage Road would move turning traffic volumes further from the interchange and eliminate two access points on the south side of OR 86. It also would eliminate other potential access points by providing an access alternative for currently undeveloped properties.

Impact to Adjacent Lands: The realignment would make access to the commercially-zoned land east of the freeway less convenient because it would require drivers to travel past the property and circle around through the industrially-zoned land. This travel inconvenience could deter potential businesses from locating in the study area if commercial property with more direct access were available elsewhere.

Five industrial parcels (Tax Map 09S40E10 Lots 500, 700, 800, 901, and 902) would be impacted by the realignment of Best Frontage Road. Some of these parcels are small

and could become undevelopable with the new roadway. One of the parcels is already owned by ODOT and is currently used for maintenance activities.

Although there are some wetlands and natural areas nearby, the realignment of Best Frontage Road would be designed to minimize impacts to those resources.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 1A is estimated at $3.1 million.

Option 1B

Option 1B is the same as Option 1A except that the existing section of Best Frontage Road would remain connected to OR 86 with traffic movements limited to eastbound right turn from OR 86 onto Best Frontage Road. Option 1B is illustrated in Figure 15.

Purpose: Although this alternative would not meet the state access spacing standard for interchanges, it would focus the majority of the intersection movement more than ¼-mile from the interchange and only allow a right turn from OR 86 in the vicinity of the interchange. This right-turn movement was considered with this alternative to maintain the convenient connection of the commercial and industrial properties south of OR 86 for traffic exiting the freeway.

Traffic Projections: The alternative is not expected to substantially change the traffic projection for the Best Frontage Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Best Frontage Road alignment. The only movement that would remain at the existing Best Frontage Road intersection would be the eastbound right turn from OR 86 to Best Frontage Road.

Operations Analysis: Operations at the Best Frontage Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition. The right-in movement that would remain at the current alignment of Best Frontage Road would not be stopped and a deceleration lane could be considered to further reduce the impact of traffic slowing for the right-turn movement.

Access Spacing: This alternative would not meet the state interchange access management spacing standards on the south side of OR 86; however, this right-turn movement has the fewest number of potential conflicts within any intersection since it does not require any interaction between cross-traffic flows.

Option 1B would eliminate the existing direct access of the ODOT parcel on OR 86 by connecting it to the realigned Best Frontage Road. It would also provide an access alternative for other parcels that otherwise would have no other option but direct access to OR 86 when developed.

Traffic Circulation: The realignment of Best Frontage Road would increase travel distances for many drivers traveling through the study area because it would increase the length of Best Frontage Road and increase the distance from the interchange. The increase in travel distances would be less than with Option 1A because the right-turn access to existing Best Frontage Road would remain.

Safety: Realigning Best Frontage Road would move most turning traffic volumes further from the interchange. Safety on the remaining right-turn movement could be improved with the addition of a right-turn lane.

Option 1B would eliminate one access point on the south side of OR 86 and also eliminate other potential access points by providing an access alternative for currently undeveloped properties.

Impact to Adjacent Lands: The realignment would make access to the commercially-zoned land east of the freeway less convenient because it would require drivers to travel past the property and circle around through the industrially-zoned land. Exiting traffic from the commercial land would have to travel the longer distance. Less travel inconvenience is considered desirable by the commercial property owners since it potentially increases the viability of developing the land.

Five industrial parcels (Tax Map 09S40E10 Lots 500, 700, 800, 901, and 902) would be impacted by the realignment of Best Frontage Road. Some of these parcels are small and could become undevelopable with the new roadway. One of the parcels is already owned by ODOT and is currently used for maintenance activities.

Although there are some wetlands and natural areas nearby, the realignment of Best Frontage Road would be designed to minimize impacts to those resources.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 1B is the same as 1A, estimated at $3.1 million.

Option 2A

This alternative would realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. The existing Airport Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel. The curves on the realigned Airport Road would not permit travel at 55 mph but would allow for speeds up to 35 mph. The remaining section of Hudson Street would also be realigned to connect into the relocated Airport Road. Option 2A is illustrated in Figure 16.

Purpose: This alternative is under consideration because it would meet the state interchange access spacing standard on the north side of OR 86 with the exception of one private residential access approximately 635 feet from the I-84 northbound ramps.

Traffic Projections: Traffic volumes on the southernmost section of Hudson Road, where Airport Road would overlap, would increase over the baseline condition. While traffic volumes on Airport Road – Hudson Road are expected to be less than 300 vehicles per day, this would still be an increase over existing traffic volumes. The traffic projection for the Airport Road – Hudson Road/OR 86 intersection is expected to be similar to the 2025 baseline projection for the Airport Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Airport Road alignment.

Operations Analysis: Operations at the Airport Road – Hudson Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition at the current Airport Road/OR 86 alignment.

Access Spacing: This alternative would meet the state interchange access management spacing standards on the north side of OR 86 with the exception of one private residential access approximately 635 feet east of the I-84 northbound on-ramp.

Traffic Circulation: The realignment of Airport Road would increase travel distances for some drivers traveling through the study area because it would increase the length of Airport Road and increase the distance from the interchange.

The increased distance and more circuitous route for Airport Road may encourage more drivers to use Lindley Road to travel to the Baker City Airport. This route is already used an alternate to Airport Road by many drivers.

Safety: Realigning Airport Road would move turning traffic volumes further from the interchange and eliminate one access point on the north side of OR 86.

Impact to Adjacent Lands: The rural residential development adjacent to Hudson Road would experience a substantial increase in traffic due to the addition of the Airport Road traffic from the realignment. Baseline 2025 traffic volumes were not forecast for Hudson Road but are expected to be less than 200 vehicles per day. The traffic from Airport Road would increase traffic to 400-500 vehicles per day where it overlaps Hudson Road.

The rerouting of Airport Road would follow property lines to minimize impacts to adjacent lands but one rural residential property (Tax Map 09S40E03 Lot 2400) would be substantially impacted by the realignment of Airport Road with Option 2A.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 2A is estimated at $5.3 million.

Option 2B

Option 2B is the same as Option 2A except that instead of realigning the remaining section of Hudson Street to connect into the relocated Airport Road, as with Option 2A, this option would bring Airport Road into a "T" intersection with Hudson Road. Option 2B is illustrated in Figure 17.

Purpose: This alternative is under consideration because it would meet the state interchange access spacing standard on the north side of OR 86 with the exception of one private residential access approximately 635 feet from the I-84 Northbound Ramps.

Traffic Projections: Traffic volumes on the southernmost section of Hudson Road, where Airport Road would overlap, would increase over the baseline condition. While traffic volumes on Airport Road – Hudson Road are expected to be less than 3000 vehicles per day, this would still be an increase over existing traffic volumes. The traffic projection for the Airport Road – Hudson Road/OR 86 intersection is expected to be similar to the 2025 baseline projection for the Airport Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Airport Road alignment.

Operations Analysis: Operations at the Airport Road – Hudson Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition at the current Airport Road/OR 86 alignment.

Access Spacing: This alternative would meet the state interchange access management spacing standards on the north side of OR 86 with the exception of one private access approximately 635 feet east of the I-84 northbound on-ramp.

Traffic Circulation: The realignment of Airport Road would increase travel distances for some drivers traveling through the study area because it would increase the length of Airport Road and increase the distance from the interchange.

The increased distance and more circuitous route for Airport Road may encourage more drivers to use Lindley Road to travel to the Baker City Airport. This route is already used an alternate to Airport Road by many drivers.

Safety: Realigning Airport Road would move turning traffic volumes further from the interchange and eliminate one access point on the north side of OR 86.

The "T" intersection formed by connecting Airport Road into Hudson Street would require vehicles to slow more than the curve shown in Option 2A. While slower traffic may be considered a benefit by the adjacent residents, some drivers, particularly at night or with winter driving conditions, could overshoot the turn at the intersection.

Impact to Adjacent Lands: The rural residential development adjacent to Hudson Road would experience a substantial increase in traffic due to the addition of the Airport Road traffic from the realignment. Baseline 2025 traffic volumes were not forecast for Hudson Road but are expected to be less than 200 vehicles per day. The traffic from Airport Road would increase traffic as high as 2,000 vehicles per day where it overlaps Hudson Road.

The impacts to the rural residential property (Tax Map 09S40E03 Lot 2400) would be less with Option 2B than with Option 2A.

The rerouting of Airport Road would follow property lines to minimize impacts to adjacent lands and the "T" intersection with Hudson Road would lessen the impacts (compared to Option 2A) to the one rural residential property (Tax Map 09S40E03 Lot 2400) because Airport Road would not cut across the property.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 2B is estimated at $5.2 million.

Option 3A

Option 3A would widen OR 86 (including the bridge structure) to a three-lane section from the I-84 southbound ramps to the Atwood Road – Lindley Road intersection. This would provide left-turn lanes at all access points along OR 86, separating turning traffic from through traffic. Option 3A is illustrated in Figure 18.

Purpose: This alternative is under consideration because it would improve traffic safety by separating turning traffic from through traffic volumes.

Traffic Projections: Traffic volumes would not change from the 2025 baseline projections.

Operations Analysis: Operations at each of the intersections with the left-turn lanes would be improved because the left turns would not slow the through-traffic movements.

Access Spacing: This alternative does not preclude other options to improve access spacing.

Traffic Circulation: This alternative would not change traffic circulation patterns within the study area.

Safety: This alternative would improve safety by separating the left-turning traffic from the through traffic, which would reduce the likelihood of rear-end collisions on OR 86.

Impact to Adjacent Lands: This alternative would improve the safety of all access points between I-84 and Atwood Road – Lindley Road by separating turning movement from through movements.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 3A is estimated at $5.7 million.

Option 3B

Option 3B is the same as Option 3A but would also include realigning Airport Road slightly to the east to connect with OR 86 opposite Best Frontage Road. Option 3B is illustrated in Figure 19.

Purpose: This alternative is under consideration because it would improve traffic safety by separating turning traffic from through traffic volumes. The realignment of Airport Road would create a single intersection rather than two offset intersections. It would also increase the distance between the Airport Road and the I-84 northbound ramps, which would provide more storage and deceleration space for left-turning vehicles.

Traffic Projections: Traffic volumes would not change from the 2025 baseline projections.

Operations Analysis: Operations at each of the intersections with the left-turn lanes would be improved because the left turns would not slow the through-traffic movements. The realignment of Airport Road would not substantially change the operations of the combined intersection over the two separate intersections.

Access Spacing: This alternative assumes that no other improvements would be made to meet access spacing standards.

Traffic Circulation: This alternative would not change traffic circulation patterns within the study area.

Safety: This alternative would improve safety by separating the left-turning traffic from the through-traffic, which would reduce the likelihood of rear-end collisions on OR 86. It also would provide more storage and deceleration space between the Airport Road and I-84 northbound on-ramp intersections.

Impact to Adjacent Lands: This alternative would improve the safety of all access points between I-84 and Atwood Road – Lindley Road by separating turning movement from through movements.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 3B is estimated at $6.9 million.

Option 4

Option 4 would extend Cedar Street directly northward from Hughes Lane rather than the current skew, which would enable the curvature of the road to be improved to meet the American Association of State Highway and Transportation Officials (AASHTO) recommendations for roadway geometry of a 55-mph road. Option 4 is illustrated in Figure 20.

Purpose: This alternative is under consideration because it would eliminate the need for traffic traveling at rural roadway speeds (55 mph) to slow to go around the curve west of the I-84 interchange.

Traffic Projections: Traffic volumes would not change from the 2025 baseline projections.

Operations Analysis: Intersection operations would not change from the 2025 baseline projections.

Access Spacing: Option 4 would not improve the access along Cedar Street. Although the existing section of roadway could continue to provide access to some of the adjacent parcels, others would require new access. Connecting the old section of Cedar Street with the new alignment would also be an issue.

This alternative does not preclude other options to improve access spacing in the study area east of I-84.

Traffic Circulation: This alternative would change traffic circulation patterns by creating a new roadway through the study area.

Safety: This alternative would improve safety by increasing the turning radius of the curve from Cedar Street to the I-84 interchange to meet the AASHTO design guidelines for a 55-mph roadway. Improving the curve could prevent potential crashes due to loss of control, particularly during winter driving conditions.

Impact to Adjacent Lands: This alternative would realign Cedar Street through several parcels. The driveway to the church (Tax Map 09S40E09C Lot 100) on the northwest corner of Hughes Lane and Cedar Street would be shortened and the new alignment would be closer to the building itself. Three EFU parcels (Tax Map 09S40E09 Lots 100, 200, 300) would be split by the realigned roadway. The northernmost of these parcels has an RV Park which would lose several sites and the parking lot in front of the store and gas pumps, potentially eliminating this use on the parcel.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 4 is estimated at $4.1 million.

Option 5

Option 5 examines the potential impact of extending Main Street from its current terminus at D Street northward across Hughes Lane to connect with OR 86 and Interchange 302. This project was identified in the Baker City TSP. Option 5 is illustrated in Figure 21. Several alternative alignments are shown in this figure. One would use College Street between D Street and Hughes Lane. The other would use Elm Street.

Purpose: This alternative is under consideration because it would provide a direct connection from downtown Baker City to I-84. It was a project identified in the Baker City TSP although it was planned for beyond the 20-year planning horizon, which at that time was 2015.

Traffic Projections: The Main Street extension would attract traffic that currently uses Campbell Street to access I-84 as well as traffic on Cedar Street. For analysis purposes, background traffic on the I-84 ramps between the areas west of the interchange and north of the interchange was assumed to be triple the baseline projected volume, but the traffic generated by the study area development was assumed to remain the same. Twenty percent of all traffic was assumed to shift from Cedar Street to the Main Street extension with the exception of the traffic generated by parcels directly accessing Cedar Street. The resulting traffic volumes are shown in Figure 22.

Operations Analysis: The changes in intersection operations that would result from the extension of Main Street to Interchange 302 are shown in Table 25. There would be some minor increases in delay and v/c ratio at the interchange ramps but the operations would still meet ODOT standards. The Main Street extension would change travel patterns at the location because the through movement to Main Street would become the major travel movement and Cedar Street would become stop-controlled. Although longer delays would be experienced at this location, it would still meet ODOT standards. The Main Street extension would divert some of the traffic from the Hughes Lane/Cedar Street intersection, and intersection operations are forecast to improve over the 2025 baseline forecast, but the eastbound approach would still be over capacity in the PM peak hour without additional improvements.

Table 25: Summary of Future 2025 Intersection Operations with Option 5

Intersection		Movement	AM Peak Hour LOS	AM Peak Hour V/C Ratio	PM Peak Hour LOS	PM Peak Hour V/C Ratio
1	OR 86 at Best Frontage Rd	WB Through, Left	A (A)	0.01 (0.01)	A (A)	0.01 (0.01)
		NB Left, Right	B (B)	0.12 (0.10)	C (C)	0.48 (0.40)
2	OR 86 at Airport Rd	EB Left, Through	A (A)	0.01 (0.01)	A (A)	0.01 (0.01)
		SB Left, Right	A (A)	0.03 (0.03)	B (B)	0.02 (0.02)
3	OR 86 at I-84 Northbound on/off-ramps	EB Left, Through	A (A)	0.18 (0.08)	A (A)	0.15 (0.14)
		NB Left, Right	C (B)	0.27 (0.17)	D (D)	0.54 (0.48)
4	OR 86 at I-84 Southbound on/off-ramps	WB Through, Right	A (A)	0.03 (0.03)	A (A)	0.06 (0.06)
		SB Left, Right	B (B)	0.30 (0.19)	C (C)	0.56 (0.46)
5	OR 86 at N. Cedar St/Old Trail Rd & Main Street Extension	WB Left	A (A)	0.18 (0.01)	A (C)	0.27 (0.01)
		NB Left, Through, Right	B (A)	0.35 (0.02)	B (B)	0.51 (0.42)
		SB Left, Through, Right	C (A)	0.06 (0.02)	E (B)	0.11 (0.01)
6	Hughes Ln. at Cedar St	EB Left, Through, Right	C (D)	0.56 (0.73)	F (F)	1.55 (1.97)
		WB Left, Through, Right	C (C)	0.27 (0.30)	E (F)	0.46 (0.53)
		NB Left, Through, Right	A (A)	0.08 (0.09)	A (A)	0.18 (0.19)
		SB Left, Through, Right	A (A)	0.01 (0.01)	A (A)	0.01 (0.01)

Note: For comparison, the LOS and v/c ratio for the 2025 baseline condition are shown in () next to the operations with Option 5.

Source: David Evans and Associates, Inc.

Access Spacing: Option 5 would not improve the access spacing in the study area but would not preclude other options to improve access spacing in the study area east of I-84.

Traffic Circulation: This alternative would change traffic circulation patterns by creating a new roadway through the study area. The Main Street extension would extend due west from OR 86 and Cedar Street would connect into the new roadway opposite Old Trail Road. The influence of this project would also extend throughout the northeast quadrant of Baker City.

Safety: This alternative would not change the safety of the study area, although there could be more crashes because traffic volumes in the area would be higher.

Impact to Adjacent Lands: This alternative would impact numerous parcels of land but most of this project would lie outside of the IAMP study area. Four EFU parcels within the study area could be affected by the alternative. One (Tax Map 09S40E09 Lot 400) would be divided by the new roadway. The new roadway would run along the northern edge of the RV Park (Tax Map 09S40E09 Lot 100) and could possibly impact the operations of this business. A rural residence (Tax Map 09S40E04C Lot 300) could be a total loss because of the new roadway. The last parcel (Tax Map 09S40E04C Lot 100) would be nominally affected by the new roadway.

Goal Exceptions: This alternative would lie outside of the Baker City UGB and could require goal exceptions to implement.

Cost: The construction cost of Option 5 is estimated at $13.4 million. This estimate was prepared for the Main Street alignment and would vary in cost if a College Street or Elm Street alignment was used instead.

Option 6A

Option 6A would improve the operations of the Hughes Lane/Cedar Street intersection with a four-way stop and the addition of northbound and eastbound left-turn lanes and a southbound right-turn lane. These are the minimal improvements needed to achieve functional intersection operations. Option 6A is illustrated in Figure 23.

Purpose: This alternative is under consideration because the eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition.

Traffic Projections: Traffic volumes would not change from the 2025 baseline projections.

Operations Analysis: The operations of the intersection would improve substantially over the baseline condition with all movements having volume-to-capacity (v/c) ratios less than 0.6 and delays of LOS C or better.

Access Spacing: Option 6A would not change access spacing within the study area but would not preclude other options to improve access spacing.

Traffic Circulation: This alternative would not change traffic circulation patterns in the study area.

Safety: The four-way stop would require all vehicles to stop before entering the intersection, which could result in more rear-end collisions but there would likely be fewer angle or turning collisions.

Impact to Adjacent Lands: The roundabout would require some additional right-of-way in the vicinity of the intersection and could impact any structures on adjacent parcels. Properties that could be affected are the parcels on the four corners of the intersection (Tax Map 09S40E09C Lot 100, Tax Map 09S40E09CA Lot 100, Tax Map 09S40E09DB Lots 200, 300).

Goal Exceptions: This alternative would lie within the Baker City UGB and would not require goal exceptions to implement.

Cost: The construction cost of Option 6A is estimated at $1.9 million.

Option 6B

Option 6B would improve the operations of the Hughes Lane/Cedar Street intersection with a Roundabout. Option 6B is illustrated in Figure 24.

Purpose: This alternative is under consideration because the eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition.

Traffic Projections: Traffic volumes would not change from the 2025 baseline projections.

Operations Analysis: The operations of the intersection would improve substantially over the baseline condition with all movements having volume-to-capacity (v/c) ratios less than 0.6 and delays of LOS B or better.

Access Spacing: Option 6B would not change access spacing within the study area but would not preclude other options to improve access spacing.

Traffic Circulation: This alternative would not change traffic circulation patterns in the study area.

Safety: Roundabouts generally have lower crash rates than other types of intersections because they have fewer conflict points between vehicles.

Impact to Adjacent Lands: The roundabout would require some additional right-of-way in the vicinity of the intersection and would impact any structures on adjacent parcels. Properties that could be affected are the parcels on the four corners of the intersection (Tax Map 09S40E09C Lot 100, Tax Map 09S40E09CA Lot 100, Tax Map 09S40E09DB Lots 200, 300).

Goal Exceptions: This alternative would lie within the Baker City UGB and would not require goal exceptions to implement.

Cost: The construction cost of Option 6B is estimated at $1.3 million.

Option 6C

Option 6C would improve the operations of the Hughes Lane/Cedar Street intersection by constructing a new section of Hughes Lane north of its current alignment and creating a new intersection with Cedar Street. The new Hughes Lane/Cedar Street intersection would be designed to accommodate the projected traffic demand and could include turn lanes with stop control or a roundabout. The existing section of Hughes Lane between the beginning of the realignment and Cedar Street would become a local street. Option 6C is illustrated in Figure 25.

Purpose: This alternative is under consideration because the eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition. Realigning Hughes Lane to the north would allow a new Hughes Lane/Cedar Street intersection to be constructed with fewer impacts to the adjacent residential properties.

Traffic Projections: The majority of the traffic on Hughes Lane would be rerouted along the new section of roadway; therefore, traffic volumes would not change significantly from the 2025 baseline projections.

Operations Analysis: The operations of the intersection would improve substantially over the baseline condition with all movements having volume-to-capacity (v/c) ratios less than 0.6 and delays of LOS C or better.

Access Spacing: Option 6C would add another access point to Cedar Street with the new alignment of Hughes Lane. This additional access would be located just north of the existing city roadway grid and would be consistent with the grid spacing for the area.

Traffic Circulation: This alternative would relocate the majority of the traffic on Hughes Lane to a new roadway segment just north of the current alignment. It would not significantly increase travel distances for most traffic passing through this area.

Safety: The realignment of Hughes Lane to the north would move traffic out of a residential area, eliminating conflicts with nearby driveways. The creation of a new Hughes Lane/Cedar Street intersection north of the current connection would allow the intersection to safely accommodate the large trucks and agricultural vehicles that use Hughes Lane.

Impact to Adjacent Lands: The new roadway section could impact several adjacent properties but would be aligned to travel along property lines where possible. When the project is developed, additional study of alignment options may be able to minimize impacts.

With the alignment shown in Figure 25, three parcels would be affected by the new roadway. One of these parcels (Tax Map 09S40E09C Lot 100) is currently zoned for commercial use and is fully occupied by a church. The new section of Hughes lane would run along the northern boundary of this property and is not expected to impact the existing structures. Two of these parcels (Tax Map 09S40E09 Lots 300 and 400) are currently zoned EFU. The new roadway alignment could potentially separate the farmed sections of these properties from the areas currently containing structures. Additional study of alignment options may result in lesser impacts to these properties.

Goal Exceptions: This alternative could extend outside the Baker City UGB and could potentially require goal exceptions to implement.

Cost: The construction cost of Option 6C is estimated at $2.5 million.

6.2.2 Interchange 306

The interchange and roadway systems currently meet state access standards and is not expected to experience operational deficiencies in the future; therefore, no transportation alternatives are being evaluated at this interchange.

The southeast connector between OR 7 and US 30 that was identified in the Baker City TSP has been identified as a priority by some of the PMT members, stakeholders, and public meeting attendees. Although this project lies outside of the IAMP study area and was not specifically evaluated as part of this project, the IAMP would not preclude the development of the connector, which is not expected to substantially increase traffic volumes in the study area. The interchange and surrounding roadway system currently have considerable available capacity because existing volumes are so low. Even with the development of some of the adjacent residential lands, the interchange is anticipated to have adequate capacity should this southeast connector be constructed.

Figure 14: Option 1A – Realignment of Best Frontage Road

Figure 15: Option 1B – Realignment of Best Frontage Road with Right-In Remaining

Figure 16: Option 2A – Realignment of Airport Road

Figure 17: Option 2B – Realignment of Airport Road with "T" Intersection at Hudson

Figure18: Option 3A – Widen OR 86 to 3 lanes from I-84 Southbound Ramps to Atwood Road

Figure 19: Option 3B – Widen OR 86 to 3 lanes from I-84 Southbound Ramps to Atwood Road and Realign Airport Road opposite Best Frontage Road

Figure 20: Option 4 – Realign Cedar Street to Meet Highway Design Guidelines

Figure 21: Option 5 – Construct Main Street Extension to Interchange 302

Figure 22: Option 5 – Traffic Volume Projections

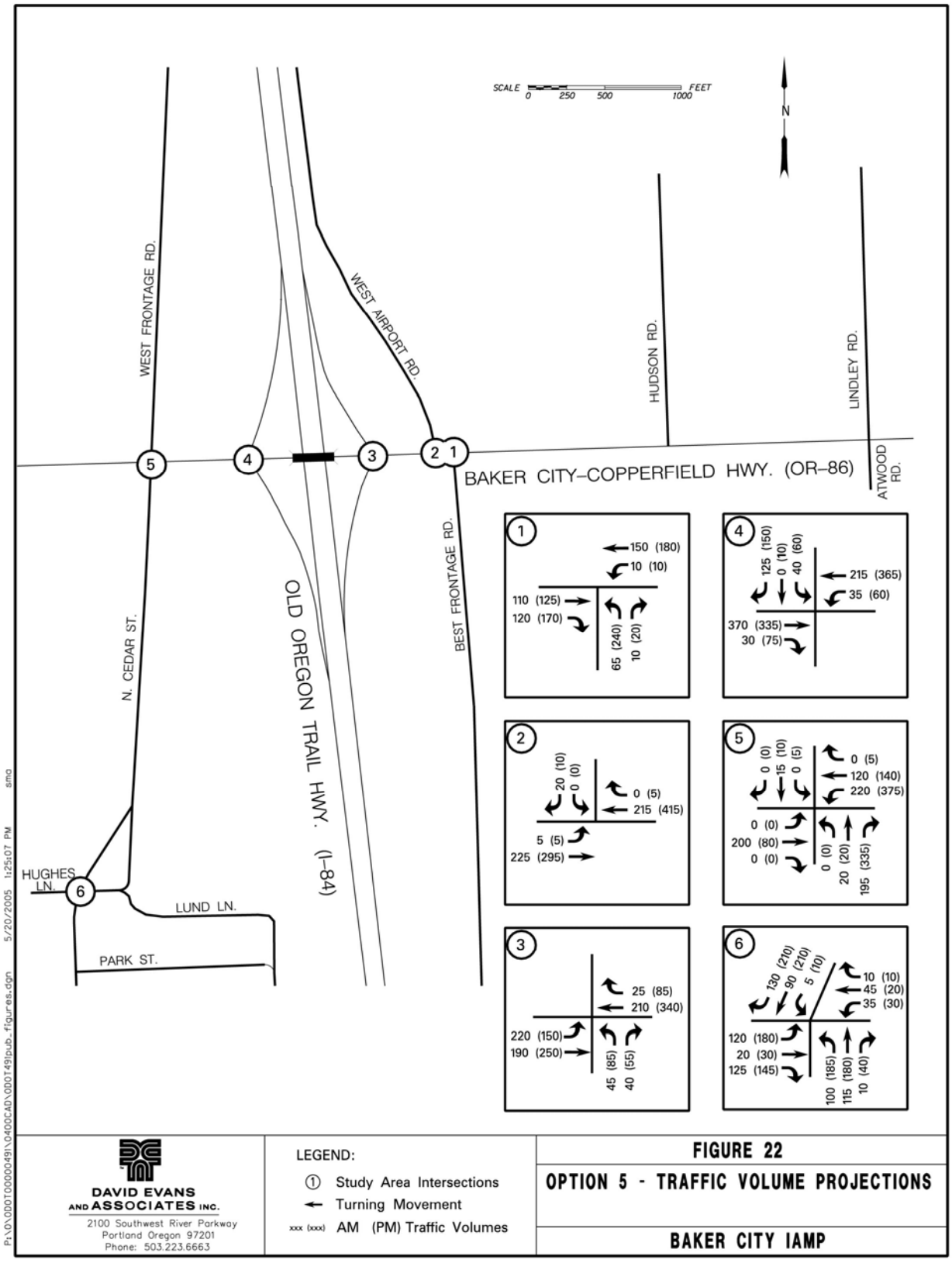
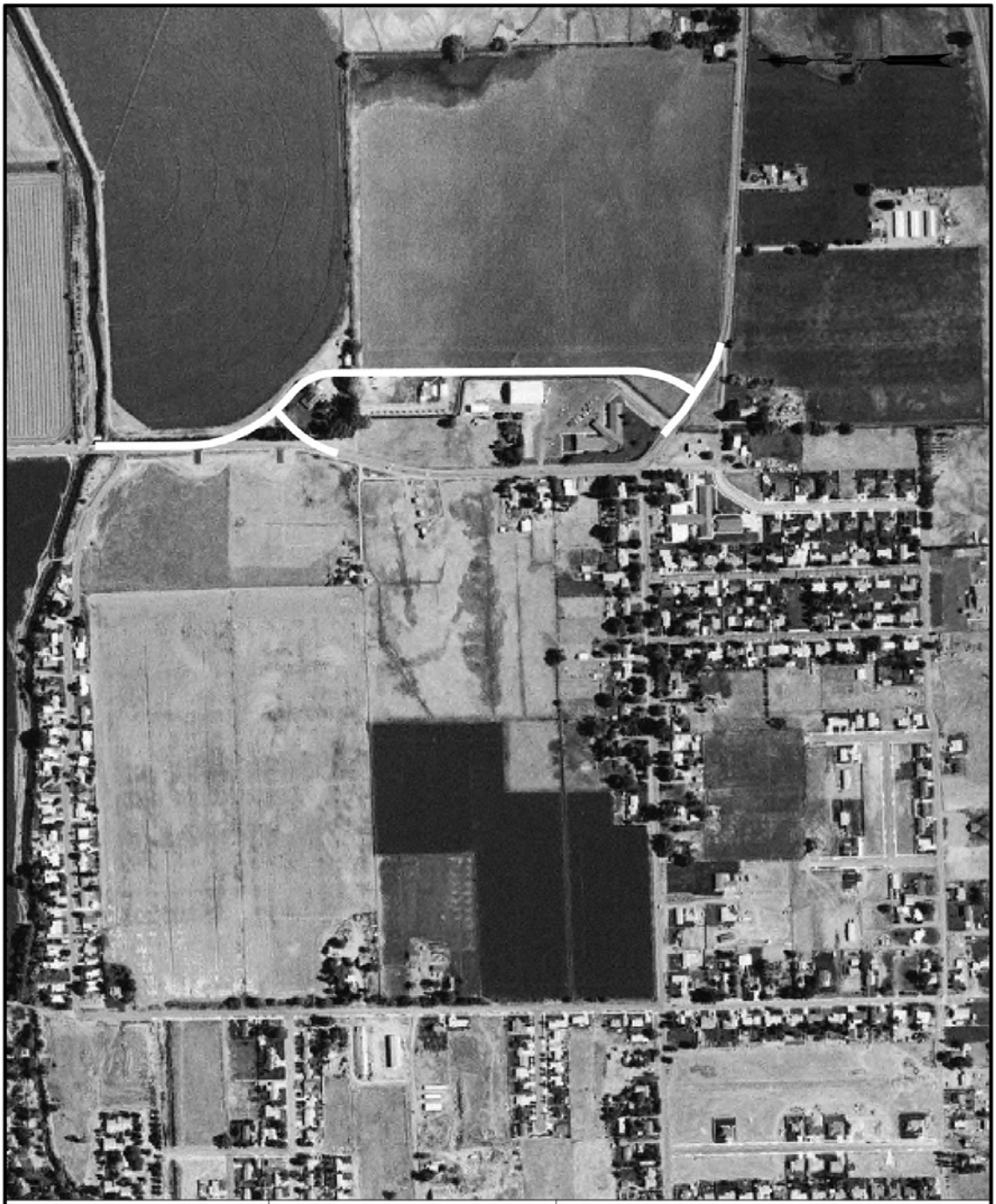


Figure 23: Option 6A – Improve Hughes Lane/Cedar Street Intersection with a 4-Way Stop and Turn Lanes

Figure 24: Option 6B – Improve Hughes Lane/Cedar Street Intersection with a Roundabout

Figure 25: Option 6C – Re-align Hughes Lane to the North with a New Intersection at Cedar Street



7. EVALUATION/SCORING OF ALTERNATIVES

The transportation options described in Chapter 6 were scored considering the benefits and costs of each project along with the purpose for implementing the project. From this scoring, a set of recommended transportation system improvements has been developed.

7.1 SCORING SYSTEM

A scoring system was developed to take into account the benefits and impacts of each of the alternatives. Different factors were given different weights to reflect their relative importance in determining which alternatives should be included in the IAMP.

Five factors were considered as benefits of the alternatives. The focus of these factors is on maximizing the benefits provided by the improvement. The benefit factors include:

- Traffic Volume – The option maximizes benefits if it is expected to serve traffic volumes greater than 1,000 vehicles per day. This factor was given a value of between one and two stars. Options that would serve less than 1,000 vehicles per day were given one star and those would serve more were given two stars.

- Capacity – The option maximizes benefits if it increases capacity of the roadway system to meet forecast demand. This factor was given a value of between two and three stars. Those options that provide additional capacity to meet forecast demand were given three stars while those that provide additional capacity for lower volume roadways were given two stars.

- Access – The option maximizes benefits the closer it comes to meeting ODOT's access spacing standards. This factor was given a value between zero and three stars. Those improvements that meet access spacing standards were given three stars. Those that improved access spacing but did not fully meet standards were given one or two stars. Those that did not improve access were given no stars.

- Circulation – The option maximizes benefits if it retains or improves traffic circulation options. This factor was given a value between zero and two stars. Those improvements that improve traffic circulation were given two stars. Those that provide less convenient circulation options while meeting other goals (access and capacity) were given one star. Those that did not improve traffic circulation were given no stars.

- Safety – The option maximizes benefits if it improves safety of the roadway system. This factor was given a value between one and three stars. Those improvements that provide the greatest safety improvement were given three stars while those that had fewer safety benefits were given one or two stars.

Two factors were considered as impacts of the alternatives. The focus of these factors was on minimizing the impacts of the improvements. The two factors include:

- Adjacent Properties – The option minimizes impacts if it protects the use of and access to adjacent properties. This factor was given a value between zero and two stars. Those improvements that minimized physical property impacts and access to properties were given two stars while those that had some physical and access impacts were given one star. If an improvement had significant physical and access impacts to adjacent properties, it was given no stars.

- Goal Exceptions – The option minimizes impacts if it is not likely to require a goal exception for implementation. This factor was given a value between zero and one star. Those improvements that were less likely to require a goal exception were given one star while those that were likely to require an exception were given no stars.

One additional factor was developed to reflect the benefits of the improvement relative to the cost. This factor is:

- Benefit/Cost – The option maximizes benefit/cost when it maximizes benefits for the estimated cost. This factor was given a value between zero and three stars. Those improvements that would provide the most benefit for the estimated cost were given three stars while those that provided little benefit for the cost were given no stars. A project that had a high benefit but also a high cost was given two stars and those which had lower benefits but lower costs were given one star.

7.2 ALTERNATIVES SCORING

Table 26 presents the scoring of the transportation options described in Chapter 6.

Table 26: Scoring of Alternatives

Option No.	Title/Location	Description	Project Cost in 2005 Dollars	Option Maximizes Benefits: Traffic Volume	Capacity	Access	Circulation	Safety	Option Minimizes Impacts: Adjacent Properties	Goal Exceptions	Benefit/Cost	Total (*)
		Maximum Weight Factor ==>		**	***	***	**	***	**	*	***	**19**
1A	Best Frontage Road Realignment and OR 86 Intersection Closure	Realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. The existing Best Frontage Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel.	$3,100,000	**	***	***	*	***	*	*	***	**17**
1B	Best Frontage Road Realignment and OR 86 Intersection Turn Limitations	Realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. The existing section of Best Frontage Road would remain connected to OR 86 with traffic movements limited to eastbound right turn from OR 86 onto Best Frontage Road	$3,100,000	**	***	*	**	**	**	*	**	**15**
2A	Airport Road Realignment and OR 86 Intersection Closure	Realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. The existing Airport Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel. The curves on the realigned Airport Road would permit continous travel on Airport Road with no stops until OR 86.	$5,300,000	*	**	***	*	***		*	**	**13**
2B	Airport Road Realignment and OR 86 Intersection Closure with Minimized Property Impacts	Realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. The existing Airport Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel. To minimize property impacts some stopping by Airport Road traffic may be required.	$5,200,000	*	**	***	*	***	*	*	**	**14**
3A	OR 86 Widening to Three Lanes from I-84 to Lindley/Atwood Road	Widen OR 86 (including the bridge structure) to a three-lane section from the I-84 Southbound Ramps to the Lindley/Atwood Road intersection. This would provide left-turn lanes at all access points along OR 86, separating turning traffic from through traffic.	$5,700,000	**	***			**	**	*	*	**11**
3B	OR 86 Widening to Three Lanes from I-84 to Lindley/Atwood Road and Airport Road Realignment opposite Best Frontage Road	Widen OR 86 (including the bridge structure) to a three-lane section from the I-84 Southbound Ramps to the Lindley/Atwood Road intersection. This would provide left-turn lanes at all access points along OR 86, separating turning traffic from through traffic. Realigning Airport Road would increase the distance between the Airport Road and the I-84 Northbound Ramps to provide more storage and deceleration space for left-turning vehicles.	$6,900,000	**	***			*	**	*	*	**10**
4	Cedar Street Realignment from Hughes Lane to Old Trail Road	Extend Cedar Street directly northward from Hughes Lane to enable the curvature of the road to be improved to meet the American Association of State Highway and Transportation Officials (AASHTO) recommendations for roadway geometry of a 55-mph road.	$4,100,000	**	**			**				**6**
5	Main Street Extension from D Street to Interchange 302	Extend Main Street from its current terminus at D Street northward across Hughes Lane to connect with OR 86 and Interchange 302. This project was identified in the Baker City TSP.	$13,400,000	**	***	**	**	***				**12**
6A	Hughes Lane/Cedar Street Intersection Improvements	Improve the Hughes Lane/Cedar Street intersection with a four-way STOP and the addition of northbound and eastbound left-turn lanes and a southbound right-turn lane. These are the minimum improvements needed to achieve functional intersection operations.	$1,900,000	**	**		*	**	**	*	**	**12**
6B	Hughes Lane/Cedar Street Intersection Roundabout	Improve the Hughes Lane/Cedar Street intersection with a roundabout .	$1,300,000	**	***		*	***		*	***	**13**
6C	Hughes Lane Realignment and Intersection Improvements	Realign Hughes Lane along the UGB to create a new intersection with Cedar Street north of the existing junction.	$2,500,000	**	***		*	**		*	**	**11**

Evaluation Criteria

Traffic Volume: Option maximizes benefits if it is expected to serve traffic volumes greater than 1,000 vehicles per day.
Capacity: Option maximizes benefits if it increases capacity of the roadway system to meet forecast demand.
Access: Option maximizes benefits the closer it comes to meeting ODOT's access spacing standards.
Circulation: Option maximizes benefits if it retains or improves traffic circulation options.
Safety: Option maximizes benefits if it improves safety of the roadway system.
Adjacent Properties: Option minimizes impacts if it protects the use and access to adjacent properties.
Goal Exceptions: Option minimizes impacts if it is not likely to require a goal exception for implementation.
Benefit/Cost: Option maximizes benefit/cost when it maximizes benefits for the estimated cost.

7.3 COMPARISON OF ALTERNATIVES AND RECOMMENDATIONS

The transportation alternatives were developed to address different capacity, safety, and access issues identified through inventories, operational analysis, and public input. The alternatives, either individually or grouped by purpose, are discussed below, comparing the purpose of the improvement and the scoring results. Recommendations based on the scoring and PMT discussions are identified.

7.3.1 Options 1A and 1B

Options 1A and 1B both involve the realignment of Best Frontage Road to a new connection with OR 86 opposite Hudson Road; however, Option 1A would close the existing OR 86/Best Frontage Road intersection while Option 1B would keep the connection open but permit only right-in movements.

These options were developed to meet the state interchange access spacing standard on the south side of OR 86. Option 1A would achieve this goal and scored highest in the evaluation of alternatives. Option 1B would require a variance from the state standard which would allow a right-in/right-out access 750 feet from the interchange ramps because Best Frontage Road connects to OR 86 approximate 450 feet from the interchange. As a result, Option 1B scored slightly lower than Option 1A.

Recommendation: Based on the scoring of alternatives and discussion with the PMT, Option 1A is recommended for the IAMP with the provision that an additional right-in/right-out access point could be needed to serve property that would not have a direct connection to the realigned Best Frontage Road. This access point could be located 750 feet east of the interchange ramps, which would allow direct access into one of the industrial sites, or a deviation could be pursued to locate the access closer to the interchange.

This project should be implemented when the land along Best Frontage Road begins to develop and traffic volumes increase. It could be constructed incrementally with the first phase occurring with development of the ODOT maintenance station on OR 86. A traffic volume of 1,000 vehicles per day on Best Frontage Road is recommended as the trigger point for the improvement.

To identify when the trigger point is met, traffic impact studies for developments that are expected to generate more than 200 vehicles per day should be required by the city and/or county.

7.3.2 Options 2A and 2B

Options 2A and 2B both involve the realignment of Airport Road to connect into Hudson Road and thus access OR 86. Option 2A would realign Airport Road with two

curves that permit travel at 35 mph while Option 2B would bring Airport Road into a "T" intersection with Hudson Road resulting in a slightly slower trip. Both options assume that Hudson Road would also be improved from Airport Road to OR 86.

These options were developed to meet the state interchange access spacing standard on the north side of OR 86. Both Options 2A and 2B would achieve this goal but Option 2A would have greater impacts to adjacent properties than Option 2B and thus scored lower in the evaluation of alternatives.

Recommendation: Based on the scoring of alternatives and discussion with the PMT, Option 2B is recommended for the IAMP.

This project should be implemented when traffic volumes on Airport Road begin to increase because of more activity at the airport or development of land. A traffic volume of 1,000 vehicles per day on Airport Road is recommended as the trigger point for the improvement.

To identify when the trigger point is met, traffic impact studies for developments that are expected to generate more than 200 vehicles per day should be required by the city and/or county.

7.3.3 Options 3A and 3B

Options 3A and 3B both create a continuous left-turn lane on OR 86 from the I-84 southbound ramps to the Atwood Road/Lindley Road intersection. Option 3B would also realign Airport Road opposite Best Frontage Road to create a single intersection and increase the distance from the ramps.

These options were developed to improve safety along OR 86 by separating turning traffic from through traffic volumes. Option 3A would meet this goal but would involve widening the road unnecessarily on sections where no access would be permitted. Option 3B would also meet the goal but the realignment of Airport Road would do nothing to meet the state access spacing standards. These options scored moderately in the evaluation because of the safety improvements, but would do nothing to improve access spacing along the highway, so the benefits of the improvements compared to the cost did not score well.

Recommendation: Based on the scoring of the alternatives and discussion with the PMT, neither of these alternatives is recommended as identified in Chapter 6. Instead, left-turn lanes should be added on OR 86 at the interchange ramps, the realigned Best Frontage/Hudson Road intersection, and the Atwood Road/Lindley Road intersection. In addition to these improvements on OR 86, left-turn lanes should be added on Cedar Street at the Old Trail Road intersection and at future access points as development occurs. Lastly, as development in the area occurs, a reduction in travel speed on both Cedar Street and OR 86 should be sought, particularly as the area starts to develop.

The left-turn lanes should be implemented as individual projects when traffic volumes meet ODOT's left-turn-lane criteria. These criteria are a function of both the turning volume and the highway traffic volume. At a minimum, the left-turn volume would need to be 10 vehicles per hour.

To identify when the trigger point is met, traffic impact studies for developments that are expected to generate more than 200 vehicles per day should be required by the city and/or county.

7.3.4 Option 4

Option 4 would extend Cedar Street directly northward from Hughes Lane rather than the current skew, which would enable the curvature of the roadway to be improved to allow for travel at 55 mph.

This option was developed to improve the safety along Cedar Street by eliminating the need for traffic traveling at rural roadway speeds (55 mph) to slow around the curve west of the I-84 interchange. While this improvement would allow for higher speed travel, the impacts to adjacent properties would be severe and the benefits minimal; thus it scored poorly in the evaluation of alternatives.

Recommendation: Based on the scoring of the alternatives and discussion with the PMT, Option 4 is not recommended as part of the IAMP. Instead, a reduction in travel speed on Cedar Street and OR 86 should be sought, particularly as the commercial parcels east of Cedar Street start to develop.

7.3.5 Option 5

Option 5 examined the potential effects on Interchange 302 operations of creating an extension of Main Street or some other parallel roadway from D Street across Hughes Lane to connect with OR 86 and Interchange 302.

This project was evaluated because it is included in the Baker City TSP (1996), although it is identified as occurring beyond the 20-year planning horizon, which at that time was 2015. It scored moderately well because it would have long-term circulation, capacity, and safety benefits, but it would also have a high cost. Impacts to adjacent lands would occur primarily within the city limits, although it would impact some farmland near Interchange 302 within the Baker IAMP study area.

Recommendation: Although this alternative is part of the Baker City Transportation System Plan (TSP), it is a very long-term project (more than 20 years) with some potential benefits to the local transportation system but more limited benefits to interchange operations. Based on the scoring of the alternatives and discussion with the PMT, Option 5 is not recommended as part of the Baker IAMP.

7.3.6 Options 6A, 6B, and 6C

Options 6A, 6B, and 6C focus on future capacity deficiencies identified for the Hughes Lane/Cedar Street intersection. Option 6A would address those capacity deficiencies by adding turn lanes on several of the intersection approaches and using four-way-stop control. This improvement didn't score as well as the roundabout because it would not add as much capacity or improve safety and circulation. Option 6B would address those capacity deficiencies by constructing a roundabout (designed to accommodate large trucks and agricultural vehicles) at the intersection. This improvement scored slightly better than 6A because it would both add capacity and improve the safety of the intersection but would have greater impacts to the adjacent properties. Option 6C would realign Hughes Road to the north creating a new intersection with Cedar Street that would be designed to meet future traffic demand. This improvement scored most poorly because it had the greatest impact to adjacent lands and the highest cost for the benefit.

Recommendation: Based on the scoring of alternatives and discussion with the PMT, Option 6A is recommended for the IAMP.

This project should be implemented in the next five to ten years, but could be needed earlier should the commercial land along Cedar Street develop quickly. To identify when the trigger point is met, traffic impact studies for developments that are expected to generate more than 200 vehicles per day should be required by the city and/or county.

8. LAND USE RECOMMENDATIONS

Land use recommendations for the interchange study areas are described below. These recommendations are preliminary and are under review by the Project Management Team.

8.1 CURRENT SITUATION AND FUTURE LAND NEEDS

Current zoning in the city of Baker City is expected to accommodate projected growth over the 20-year planning horizon. Urban Growth Boundary expansions are not anticipated in the 20-year period. Population growth has been very stable over the last 30 years. While change is always possible, future growth is expected to continue at a relatively slow pace. With the access management strategies recommended in the IAMP, Interchanges 302 and 306 will have sufficient capacity under current zoning to accommodate an aggressive level of growth for at least the 20-year planning horizon. The city has sufficient land to accommodate projected growth within the urban growth boundary for at least the 20-year planning horizon, and likely for the design-life of the interchange (40-50 years). Therefore, land use zone changes outside of the current UGB were not evaluated as part of this IAMP.

A full discussion of land use trends and employment projections is included in Technical Memorandum #4. In summary, the buildable lands inventory projects 400 new residences in the Interchange 302 study area and 600 in the Interchange 306 study area over the next 20 years. Only the Interchange 302 study area contains areas zoned for employment (commercial and industrially zoned) land, with approximately 900 total employees expected in this area under an aggressive growth scenario.

One of the primary functions of both interchanges is to help disperse and direct travel into the city of Baker City. Even with UGB expansion, the function could be maintained by establishing a trip cap "trigger" on uses in the area, by defining the uses to those that would not be likely to compromise the function of the interchange (residential or industrial), or a combination of both. If the EFU or Rural Residential areas to the northwest and northeast of Interchange 302 were to be added to the UGB and city limits, and commercial uses that generate high volumes of traffic authorized, the integrity and the function of the interchanges could be compromised.

Both interchanges are classified as rural interchanges (at least two quadrants outside of a UGB). Even for rural interchanges, ODOT's draft Transportation Planning Guidance for IAMPs recommends that the IAMP include policies that prevent UGB expansions and growth-induced development on exception lands, as well as address protection of resource lands.

County lands in the study areas are zoned primarily Exclusive Farm Use (EFU). It is the stated policy of Baker County (Comprehensive Plan Section III) to preserve and

maintain agricultural lands for agricultural and economic values. It is county policy not to convert agricultural lands to other uses as long as they remain within the jurisdiction of the county. The rural residential (RR-5) area is an exception area and, as such, would be a priority area for UGB expansion.

The conclusion of the IAMP is that maintaining current and allowed land use designations within the IAMP study areas sufficiently protects the function of the interchanges, with the following recommendations.

8.2 RECOMMENDATIONS

1. The IAMP is adopted by Baker City and Baker County by reference as amendments to their Comprehensive Plan.

   For Baker City, this would include new findings, policies, and implementation actions as amendments to the *Transportation* section, such as:

   > New Finding 13: The city of Baker City recognizes the importance of I-84 in the movement of people and goods to and from the region and is committed to protecting the function of Interchanges 302 and 306 to provide access to I-84. These interchanges are important gateways into Baker City. The function of these interchanges, as defined in the *I-84 Baker Interchange Area Management Plan*, is to safely and efficiently provide dispersed access into Baker City and the surrounding area, and to accommodate future traffic demands associated with current urban and rural land uses.
   >
   > New Policy 11: The city concurs with the analysis and findings of the *I-84 Baker Interchange Area Management Plan,* and will support the land use designations described in the IAMP, and will coordinate with ODOT prior to amending its transportation system plan or proposing transportation improvements that could affect the function of the interchanges.
   >
   > New Implementation Item 8: The *I-84 Baker Interchange Area Management Plan* is adopted by reference as part of the Comprehensive Plan and Transportation System Plan.

   For Baker County, this would include additional findings and policies in Section XII, *Transportation Goal*. Suggested language follows in underlined text.

   > <u>New Finding 8: Baker County recognizes the importance of I-84 in the movement of people and goods to and from the region and is committed to protecting the function of Interchanges 302 and 306 to provide access to I-84. The function of these interchanges as defined in the IAMP, is to safely and efficiently provide dispersed access into Baker City and the surrounding area, and to</u>

accommodate future traffic demands associated with current urban and rural land uses.

New Policy 3: The *I-84 Baker Interchange Area Management Plan* is adopted by reference as part of the county's Comprehensive Plan and shall be incorporated as part of the Transportation System Plan.

2. Planned improvements as described in Section 9 of the draft IAMP are adopted by reference as amendments to the city Transportation System Plan and incorporated into the county's draft Transportation System Plan.

3. By adopting the IAMP, the city and county affirm their commitment to supporting the function of these interchanges as two of the three main access points into Baker City, and commit to continuing lower-intensity land use designations for the urban portions of the study areas, and commit to applying lower-intensity designations should land be added to the UGB in these areas. This direction would support commercial businesses and transportation investments in the downtown core.

   For reference, these uses are shown in Table 27.

Table 27: Existing Land Use Designations in the Interchange Study Areas

	Comp Plan Designations	Zoning Designations
Interchange 302 Study Area		
Baker City	Residential, Commercial	Residential Low-Density (R-LD), General Commercial (CG)
Baker County	Exclusive Farm Use, Industrial, Rural Residential	Exclusive Farm Use (EFU), Industrial (I), and Rural Residential (RR-5)
Interchange 306 Study Area		
Baker City	Residential	Residential Low-Density (R-LD)
Baker County	Exclusive Farm Use	Exclusive Farm Use (EFU)

An associated policy is recommended for adoption as part of the city and county Comprehensive Plans, as follows:

City of Baker City Comprehensive Plan, Urbanization Section:

New Finding 3: The *I-84 Baker Interchange Area Management Plan for* Interchanges 302 and 306 is an appropriate mechanism to preserve the function and capacity of these interchanges while accommodating planned growth and development in the urban area.

New Finding 4: By allowing and supporting lower-intensity (less traffic-generating) uses in the interchange areas, the city supports the public and private investment in the downtown core.

New Policy 2: The city of Baker City will support existing land uses and will focus high-intensity commercial development away from the interchange areas should urban growth be necessary in these areas over the long term.

New Implementation Item 2: Upon urban growth expansion, the city shall adhere to a policy of not rezoning agricultural or rural residential lands in the study areas to commercial uses within the interchange areas. When and if necessary, less-intensive designations such as residential and industrial uses shall be considered.

Baker County:

New Agricultural Land Goal Finding A 18: In order to preserve agricultural lands, and help maintain the function and capacity of Interchanges 302 and 306, the county will maintain agricultural, industrial and rural residential zoning in the interchange study areas.

New Agricultural Land Policy 16: The county will limit conversion of lands in the Interchange 302 and 306 areas to uses other than exclusive farm use, industrial or rural residential. If other uses are considered, Baker County will coordinate review with the City of Baker City and ODOT.

4. The Oregon Transportation Commission (OTC) adopts the *I-84 Baker Interchange Area Management Plan* as an amendment to the Oregon Highway Plan.

5. To monitor the impact of new development on the interchange facility, Baker City and Baker County will cooperate with ODOT to require a traffic impact analysis for uses that generate more than 200 trips per day within the interchange areas. We recommend this coordinated review process be adopted as part of Baker City's Development Code, section 2.4.160, Special Standards for Certain Uses, or Section 3.4.100, Transportation Standards. The city already has this authority in its Transportation System Plan, Section 3.1.200, Vehicular Access and Circulation, which states: "The City or other agency with access jurisdiction may require a traffic study prepared by a qualified professional to determine access, circulation and other transportation requirements."

6. The Urbanization sections of the city and county Comprehensive Plans include a statement that addresses coordinated review of future growth management planning, particularly in the case of urban growth boundary (UGB) expansion, such as:

New Finding 5: I-84 interchanges are important gateways into Baker City. Land use and transportation changes in the Interchange 302 and 306 study areas should be carefully reviewed as future urban growth expansion in the areas will affect the interchange facilities.

New Policy #3: Baker City and Baker County will coordinate review, through the plan amendment and development review process, to maintain land use protections that ensure the continued functionality of the interchanges. ODOT will monitor and comment on any future actions that would amend the UGB in the vicinity of Interchanges 302 or 306. Land uses approved through future plan amendments and zone changes shall be consistent with the function of the interchanges.

New Implementation Item #3: Baker City will coordinate with ODOT in evaluating land use and transportation actions that could affect the function of I-84 and Interchanges 302 and 306.

New Implementation Item #4: The *I-84 Baker Interchange Area Management Plan* shall be reviewed every five to ten years or as needed, such as in the case of urban growth boundary expansions or zone changes.

For Baker County, new findings and policies in the Urbanization Section XIV are recommended, such as:

New Urbanization Finding A4: Coordinated review of urban development in the Interchange 302 and 306 study areas is an appropriate mechanism to support growth and development while preserving the function and capacity of the I-84 interchanges.

New Urbanization Land Use Policy 4: Any change in Baker City's urban growth boundary, or land use or transportation changes in the Interchange 302 and 306 study areas shall be cooperatively reviewed by ODOT, Baker City and Baker County.

New Urbanization Land Use Policy 5: The *I-84 Baker Interchange Area Management Plan* shall be reviewed every five to ten years or as needed, such as in the case of urban growth boundary expansions or zone changes.

9. PLANNED IMPROVEMENTS

The Baker IAMPs is composed of three elements: an access management plan, a roadway improvement plan, and a land use plan. The land use strategy was addressed in Section 8.

9.1 ACCESS MANAGEMENT PLAN

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

The access management strategy must balance the competing needs of traffic capacity and safety for I-84 and the study area and local access needs. The OHP devotes an entire section to the discussion of access management. More detailed requirements and the access spacing standards for state highways are specified in OAR 734, Division 51. Ideally, a project will include provisions by which access within the project limits can be made fully compliant with Division 51. In many instances, however, access needed for current parcels will not allow these standards to be met. When the requirements and standards cannot be met, the access management strategy must demonstrate progress toward meeting the applicable standards.

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

9.1.1 Spacing Standards

OAR 734-051 and the OHP contain standards for private driveway and public road approach spacing based on highway classifications and speeds. According to these standards, the first full intersection on the crossroad at an interchange should be no closer than 1,320 feet for rural interchanges with two-lane crossroads. This region is

referred to as the interchange influence area. Requests for deviations from these standards can be made, and the process is outlined in OAR 734-051-0135.

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

9.1.2 Access Management Strategy and Actions

The overall strategy of this access management plan is to protect traffic safety and operations within the interchange influence area. This section identifies actions to be implemented consistent with the IAMP goals. These actions are recommended as land use changes and redevelopment occurs, or in concurrence with other future roadway improvement projects.

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

When a proposed approach cannot meet the spacing standards, it is referred to as a deviation from the spacing standard. As part of the approach permit approval process, deviation findings will be prepared, if necessary, to explain why the approach cannot meet the standards as required by OAR 734-051-0135 (Deviations from Access Management Spacing Standards). Deviation findings will identify OAR 734-051-0135 (3)(a) as a rationale for approval of public approach deviations. As per OAR 734-051-0135 (7), the Region Access Management Engineer may require that a plan identify measures to reduce the number of approaches to the highway in order to approve a deviation for a public approach. This access management strategy identifies measures to reduce the number of approaches near Interchanges 302 and 306, and therefore would fulfill this potential requirement.

Access Control within Interchange Influence Area

As supported by Policy 3C of the OHP, ODOT will acquire access control on intersecting roadways in the vicinity of the interchanges. At Interchange 302, ODOT

will acquire access control along OR 86/N. Cedar Street for at least 1,320 feet to the east of the I-84 northbound ramp terminals and 1,320 feet to the west of the I-84 southbound ramp terminals. At Interchange 306, ODOT will acquire access control along US 30 for at least 1,320 feet north of the I-84 southbound ramps.

Issue Reservations of Access

Since alternative access for some parcels is not practical at this time, reservations of access will be issued for existing approaches within the interchange influence area. A reservation of access gives a property owner the common law right of access to the state highway only at specific locations. The property owner must still submit an Application for State Highway Approach at these locations when the property is developed, redeveloped, or a change of use occurs. A reservation of access may contain use restrictions and does not guarantee approval of the approach or the location of the approach. Reservations of access will be recorded in the property deeds.

Summary of Actions

The access management actions to be implemented in the IAMP are summarized in Table 28 for Interchange 302 and Table 29 for Interchange 306.

Table 28: Access Management Actions Summary - Interchange 302

Access No.	Type Use	Side of Road	Approach Width (ft)	Tax Map	Tax Lot No.	Action
Along OR 86						
1	Public: Lindley Road	North	20	-	-	No Action.
2	Private: Residential	North	21	09S40E03	1601	Consolidate with redevelopment of property.
3	Private: Residential	North	19	09S40E03	1601	Consolidate with redevelopment of property.
4	Public: Hudson Road	North	20	-	-	No Action.
5	Private: Residential	North	18	09S40E03	2500	Relocate with redevelopment of property.
6	Public : Airport Road	North	29	-	-	Close with Airport Road realignment.
7	Public: I-84 Northbound on/ off-ramps	North	86	-	-	No Action.
8	Public: I-84 Southbound on/ off-ramps	North	55	-	-	No Action.
9	Public: Old Trail Road	North	40	-	-	Consolidate to a single connection.
14	Public: Atwood Road	South	23	-	-	No Action.
15	Private: Residential	South	16	09S40E10	400	Consolidate with redevelopment of property.
16	Private: Residential	South	22	09S40E10	400	Consolidate with redevelopment of property.
17	Private: Residential	South	20	09S40E10	400	Consolidate with redevelopment of property.
18	Public: ODOT sand/ gravel facility	South	40	09S40E10	600	Close and connect to Best Frontage Road realignment.
19	Public: ODOT sand/ gravel facility	South	47	09S40E10	600	Close and connect to Best Frontage Road realignment.
20	Public: Best Frontage Road	South	24	-	-	Close with Best Frontage Road realignment.
21	Public: Airport Road (on north side)	South	50	-	-	Close with Airport Road realignment.
Along N. Cedar St						
10	Private: Commercial	West	150	09S40E09	100	Narrow driveway to 40 feet with curbs and landscaping.
11	Private: Residential	West	23	09S40E09	200	Consolidate with redevelopment of property.
12	Private: Residential	West	51	09S40E09	800	Consolidate with redevelopment of property.
13	Private: Residential	West	19	09S40E09	800	Consolidate with redevelopment of property.
22	Private: Farmland	East	12	09S40E09A	500	Relocate with redevelopment of property.
23	Private: Residential	East	24	09S40E09A	900	Consolidate with redevelopment of property.
24	Private: Commercial	East	24	09S40E09A	1000	Consolidate with redevelopment of property.

Table 29: Access Management Actions Summary - Interchange 306

Access No.	Type	Use	Side of Road	Approach Width (ft)	Tax Map	Tax Lot No.	Action
Along US 30							
25	Public: I-84 Southbound on-ramp		North	-	-	-	No Action.
26	Public: Old Highway 30		North	105	-	-	No Action.

9.2 ROADWAY IMPROVEMENT PLAN

As part of the process for developing the IAMP, alternative transportation improvements within the interchange study areas were developed to enhance the capacity, access, circulation, and safety of the transportation system while conforming to the provisions and the policies of the Oregon Highway Plan and other relevant state transportation laws.

Through a technical evaluation and a public involvement process, a list of roadway improvement projects was developed for the IAMP.

Interchange 302

These projects are summarized in Table 30 and the locations are identified in Figure 26.

The transportation improvement project list identifies the location of the project and describes the type of improvement to be implemented. It summarizes the justification for the project. Planning-level cost estimates are included along with potential financial partners. Lastly, it recommends project phasing.

The recommended projects include:

1. Realign Best Frontage Road to a new connection with OR 86 opposite Hudson Road with the provision that an additional right-in/right-out access point could be needed to serve property that would not have a direct connection to the realigned Best Frontage Road. This access point could be located 750 feet east of the interchange ramps, which would allow direct access into one of the industrial sites, or a deviation could be pursued to locate the access closer to the interchange. The existing connection of Best Frontage Road would be closed at OR 86 but the roadway would remain to serve adjacent parcels. This improvement would meet the state interchange access spacing standard on the south side of OR 86.

   This project should be implemented when the land along Best Frontage Road begins to develop and traffic volumes increase. It could be constructed incrementally with the first phase occurring with development of the ODOT maintenance station on OR 86. A traffic volume of 1,000 vehicles per day on Best Frontage Road is recommended as the trigger point for the improvement.

2. Realign Airport Road to connect into Hudson Road and thus access OR 86. The existing connection of Airport Road would be closed at OR 86 but the roadway would remain to serve adjacent parcels. This improvement would help to meet the state interchange access spacing standard on the north side of OR 86.

   This project should be implemented when traffic volumes on Airport Road begin to increase because of more activity at the airport or development of land. A traffic volume of 1,000 vehicles per day on Airport Road is recommended as the trigger point for the improvement.

3. Construct left-turn lanes on OR 86 at the I-84 interchange ramps. This project could be constructed by restriping the existing pavement on the bridge structure to provide left-turn lanes, but would result in narrower shoulders (4 feet) than state standard, although they could still accommodate bicycles.

   This project should be implemented when traffic volumes meet ODOT's left-turn lane criteria. These criteria are a function of both the turning volume and the highway traffic volume. At a minimum, the left-turn volume would need to be 10 vehicles per hour.

4. Construct left-turn lanes on OR 86 at the intersection with Hudson Road and the realigned Best Frontage Road. This project would involve widening OR 86 to accommodate the left-turn lanes.

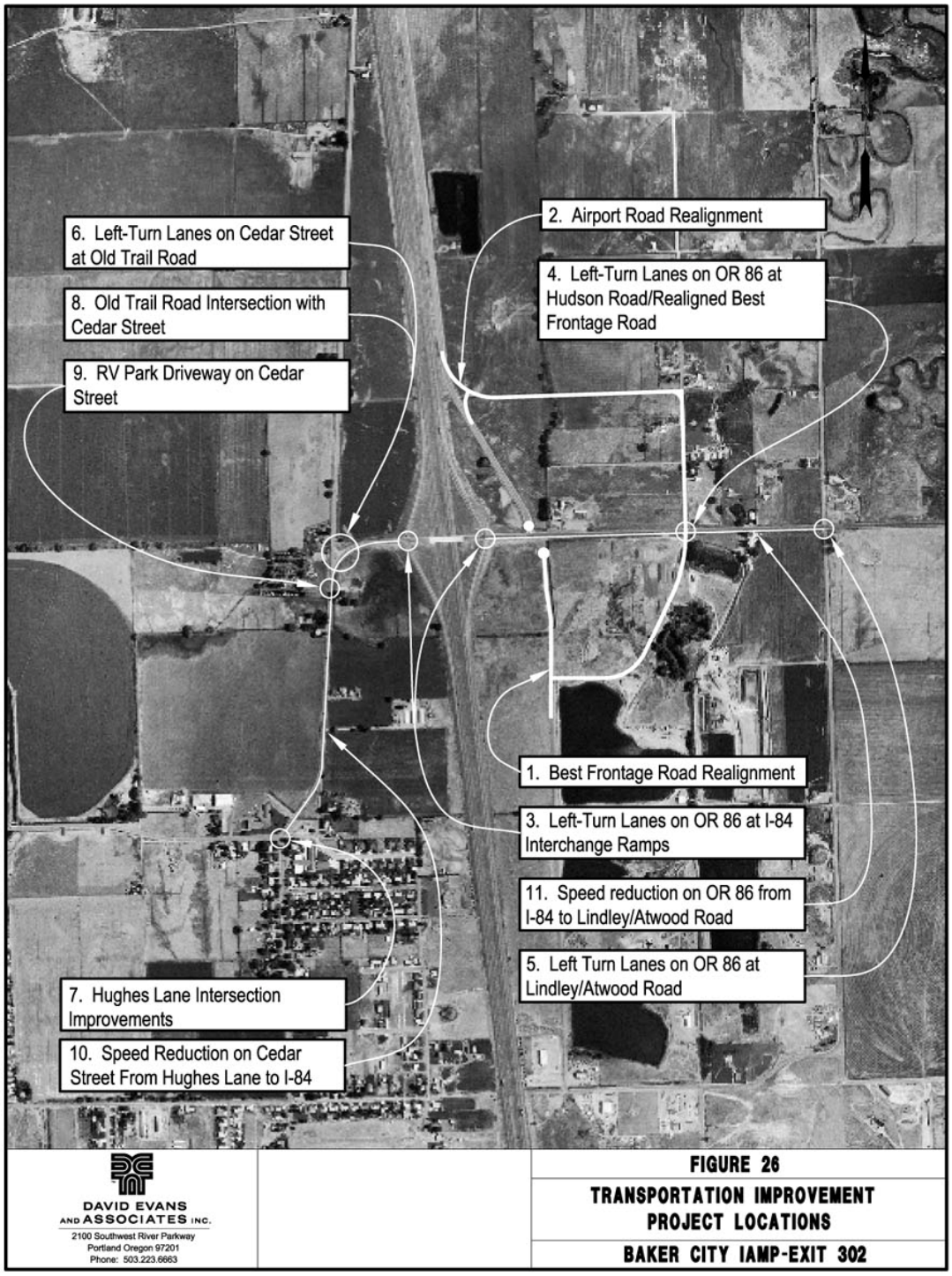
   This project should be implemented when traffic volumes meet ODOT's left-turn lane criteria. These criteria are a function of both the turning volume and the highway traffic volume. At a minimum, the left-turn volume would need to be 10 vehicles per hour.

Table 30: Transportation Improvement Project List

New No.	Project Location	Project Description	Project Justification				Potential Financial Partners				Project Cost	Implementation
			Capacity	Access	Circulation	Safety	ODOT	Baker County	Baker City	Other		
Roadway Improvement Projects												
1	Best Frontage Road Realignment	Realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. Close the existing Best Frontage Road connection with OR 86 but keep the remaining roadway open to provide access to adjacent parcels. An additional right-in/right-out access onto OR 86 may be sought to serve property without access to the realigned Best Frontage Road.	✓	✓		✓	◆	◆	◆	◆	$3,100,000	Project should be constructed when traffic volumes on Best Frontage Road exceed 1,000 vehicles per day. Portions of the realignment could be constructed with adjacent development.
2	Airport Road Realignment	Realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. Close the existing Airport Road connection with OR 86 but keep the remaining roadway to provide access to the adjacent parcels.	✓	✓		✓	◆	◆			$5,200,000	Project should be constructed when traffic volumes on Airport Road exceed 1,000 vehicles per day.
3	Left-Turn Lanes on OR 86 at I-84 Interchange Ramps	Stripe left-turn lanes on OR 86 at the I-84 interchange ramps.	✓			✓	◆				$100,000*	Install when traffic volumes meet ODOT's left-turn lane criteria
4	Left-Turn Lanes on OR 86 at Hudson Road/Realigned Best Frontage Road	Construct left-turn lanes on OR 86 at the intersection with Hudson Road and the realigned Best Frontage Road.	✓			✓	◆				$1,000,000*	Install when traffic volumes meet ODOT's left-turn lane criteria
5	Left-Turn Lanes on OR 86 at Lindley/Atwood Road	Construct left-turn lanes on OR 86 at the intersection with Lindley/Atwood Road.	✓			✓	◆				$1,000,000*	Install when traffic volumes meet ODOT's left-turn lane criteria
6	Left-Turn Lanes on Cedar Street at Old Trail Road	Construct left-turn lanes on Cedar Street at the intersection with Old Trail Road.	✓			✓	◆	◆			$1,000,000*	Install when traffic volumes meet ODOT's left-turn lane criteria
7	Hughes Lane/Cedar Street Intersection Improvements	Add turn lanes (northbound left, eastbound left, and southbound right) and 4-way STOP control to improve Hughes Lane/Cedar Street intersection operations.	✓		✓	✓		◆	◆		$1,900,000	5 to 10 years
Access Management Improvement Projects												
8	Old Trail Road Intersection Cedar Street	Consolidate the Old Trail Road intersection connections with Cedar Street into a single "T" intersection.	✓	✓		✓	◆	◆			$200,000*	Within next 5 years
9	RV Park Driveway Cedar Street	Narrow the width of the RV Park driveway to 40 feet	✓	✓		✓	◆	◆		◆	$10,000*	Within next 5 years
Other Improvement Projects												
10	Speed Reduction on Cedar Street from Hughes Lane to I-84	Reduce the posted speed on Cedar Street to 45 mph or less from Hughes Lane to I-84			✓	✓	◆	◆	◆		$5,000*	Speed Study could be requested within next 5 years
11	Speed Reduction on OR 86 from I-84 to Lindley/Atwood Road	Reduce the posted speed on OR 86 to 45 mph or less from I-84 to Lindley Road/Atwood Road			✓	✓	◆				$5,000*	Dependent on results of Speed Study

*** These cost estimates are being refined and may change in the final IAMP**

Figure 26: Transportation Improvement Project Locations – Interchange 302



5. Construct left-turn lanes on OR 86 at the intersection with Lindley Road/ Atwood Road. This project would involve widening OR 86 to accommodate the left-turn lanes.

   This project should be implemented when traffic volumes meet ODOT's left-turn lane criteria. These criteria are a function of both the turning volume and the highway traffic volume. At a minimum, the left-turn volume would need to be 10 vehicles per hour.

6. Construct left-turn lanes on N. Cedar Street at the intersection with Old Trail Road. This project would involve widening N. Cedar Street to accommodate the left-turn lanes.

   This project should be implemented when traffic volumes meet ODOT's left-turn-lane criteria. These criteria are a function of both the turning volume and the highway traffic volume. At a minimum, the left-turn volume would need to be 10 vehicles per hour.

7. Add turn lanes (northbound left, eastbound left, and southbound right) and 4-way STOP control to improve Hughes Lane/Cedar Street intersection operations. This improvement would address future capacity and safety concerns at the Hughes Lane/Cedar Street intersection.

   This project should be implemented in the next five to ten years but could be needed earlier should the commercial land along Cedar Street develop quickly.

8. Consolidate the Old Trail Road intersection connections with N. Cedar Street into a single "T" intersection. This improvement would simplify the intersection and reduce the number of connections to N. Cedar Street within the interchange influence area.

   This project should be implemented in the next five years.

9. Narrow the RV Park driveway from its current width of approximately 150 feet to 40 feet using curbs and landscaping. This improvement would clarify the location of the driveway and concentrate turn movements at one location.

   This project should be implemented in the next five years.

10. Reduce the posted speed on N. Cedar Street to 45 mph or less from Hughes Lane to I-84. This project will require application to the state speed board for a speed study and would be subject to the results of that study.

This project should be implemented in the next five years or when the commercial parcels east of Cedar Street start to develop.

11. Reduce the posted speed on OR 86 to 45 mph or less from I-84 to Lindley Road/ Atwood Road. This project will require application to the state speed board for a speed study and would be subject to the results of that study.

    This project should be implemented when more development activity east of the freeway occurs.

Interchange 306

The interchange and roadway systems currently meet state access standards and are not expected to experience operational deficiencies in the future; therefore, no transportation alternatives are being evaluated at this interchange.

The southeast connector between OR 7 and US 30 that was identified in the Baker City TSP has been identified as a priority by some of the PMT members, stakeholders, and public meeting attendees. Although this project lies outside of the IAMP study area and was not specifically evaluated as part of this project, the IAMP would not preclude the development of the connector, which is not expected to substantially increase traffic volumes in the study area. The interchange and surrounding roadway system currently have considerable available capacity because existing volumes are so low. Even with the development of some of the adjacent residential lands, the interchange is anticipated to have adequate capacity should this southeast connector be constructed.

10. ADOPTION AND IMPLEMENTATION

The Baker County Planning Commission will hold its first hearing on the draft IAMP June 16, 7 pm.

The City of Baker City Planning Commission will hold its first hearing on the draft IAMP on June 15, 2005.

The Oregon Department of Transportation (ODOT) Transportation Commission (OTC) is expected to adopt the IAMP after the local adoption processes.

APPENDIX A

Project Management Team (PMT) Members:

Mike Barry, ODOT District 13 Assistant Manager

Shawn Berry, Planner, Baker County Planning Department.

Terry Drever-Gee, Baker County Planning Commissioner

Wes Elder, Baker City Planning Commissioner

Patrick Knight, ODOT Region 5 Contract Manager

Tom Kuhlman, ODOT Region 5 Traffic Engineer

Ken Rockwell, Baker City Planning Commissioner

Thomas Wallace, ODOT Region 5 Roadway Manager

Jennifer Watkins, Baker City Director of Community Development

APPENDIX B

Alternatives Considered

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
	Best Frontage Road										
1A	Best Frontage Road Realignment and OR 86 Intersection Closure	Realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. The existing Best Frontage Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel.	Under consideration because it would meet the state interchange access spacing standard on the south side of OR 86.	Not expected to substantially change the traffic projection for the Best Frontage Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Best Frontage Road alignment.	Operations at the Best Frontage Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition	Would meet the state interchange access management spacing standards on the south side of OR 86. It would eliminate the existing direct access of the ODOT parcel on OR 86 by connecting it to the realigned Best Frontage Road and provide an access alternative for other parcels that otherwise would no other option but direct access to OR 86 when developed.	Would increase travel distances for many drivers traveling through the study area because it would increase the length of Best Frontage Road and increase the distance from the interchange.	Would move turning traffic volumes further from the interchange and eliminate two access points on the south side of OR 86. It would also eliminate other potential access points by providing an access alternative for currently undeveloped properties.	Would make access to the commercially-zoned land east of the freeway less convenient because it would require drivers to travel past the property and circle around through the industrially zoned land. This travel inconvenience could deter potential businesses from locating in the study area if commercial property with more direct access were available elsewhere.	Outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 1A is estimated at $3.1 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
1B	Best Frontage Road Realignment and OR 86 Intersection Turn Limitations	Realign Best Frontage Road from its current connection with OR 86 just east of the I-84 northbound off-ramp to intersect opposite Hudson Road. The existing section of Best Frontage Road would remain connected to OR 86 with traffic movements limited to eastbound right turn from OR 86 onto Best Frontage Road	Although this alternative would not meet the state access spacing standard for interchanges, it would focus the majority of the intersection movement more than ¼-mile from the interchange and only allow a right-turn from OR 86 in the vicinity of the interchange. This right-turn movement was considered with this alternative to maintain the convenient connection of the commercial and industrial properties south of OR 86 for traffic exiting the freeway.	Not expected to substantially change the traffic projection for the Best Frontage Road/OR 86 intersection since all of the existing and future traffic would be rerouted along the new Best Frontage Road alignment. The only movement that would remain at the existing Best Frontage Road intersection would be the eastbound right turn from OR 86 to Best Frontage Road.	Operations at the Best Frontage Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition. The right-in movement that would remain at the current alignment of Best Frontage Road would not be stopped and a deceleration lane could be considered to further reduce the impact of traffic slowing for the right-turn movement.	Would not meet the state interchange access management spacing standards on the south side of OR 86; however, this right-turn movement has the fewest number of potential conflicts within any intersection since it does not require any interaction between cross-traffic flows.	Would increase travel distances for many drivers traveling through the study area because it would increase the length of Best Frontage Road and increase the distance from the interchange. The increase in travel distances would be less than with Option 1A because of the right-turn access to existing Best Frontage Road would remain.	Would move most turning traffic volumes further from the interchange. Safety on the remaining right-turn movement could be improved with the addition of a right-turn lane.	Would make access to the commercially-zoned land east of the freeway less convenient because it would not require drivers to travel past the property and circle around through the industrially zoned land but exiting traffic from the commercial land would have to travel the longer distance.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 1B is the same as 1A, estimated at $3.1 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
	Airport Road										
2A	Airport Road Realignment and OR 86 Intersection Closure	Realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. The existing Airport Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel. The curves on the realigned Airport Road would permit continuous travel on Airport Road with no stops until OR 86.	Would meet the state interchange access spacing standard on the north side of OR 86 with the exception of one private residential access approximately 635 feet from the I-84 Northbound Ramps.	Traffic volumes on the southernmost section of Hudson Road, where Airport Road would overlap, would increase over the baseline condition. While traffic volumes on Airport Road – Hudson Road are expected to be less than 2,000 vehicles per day, this would still be a substantial increase over existing traffic volumes.	Operations at the Airport Road – Hudson Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition at the current Airport Road/OR 86 alignment.	Would meet the state interchange access management spacing standards on the north side of OR 86 with the exception of one private residential access approximately 635 feet east of the I-84 Northbound On-Ramp.	Would increase travel distances for some drivers traveling through the study area because it would increase the length of Airport Road and increase the distance from the interchange. The increased distance and more circuitous route for Airport Road may encourage more drivers to use Lindley Road to travel to the Baker City Airport.	Would move turning traffic volumes further from the interchange and eliminate one access point on the north side of OR 86.	The rural residential development adjacent to Hudson Road would experience a substantial increase in traffic due to the addition of the Airport Road traffic from the realignment. The traffic from Airport Road would increase traffic as high as 2,000 vehicles per day where it overlaps Hudson Road.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 2A is estimated at $5.3 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
2B	Airport Road Realignment and OR 86 Intersection Closure with Minimized Property Impacts	Realign Airport Road from its current connection with OR 86 just east of the I-84 northbound on-ramp to intersect and use part of Hudson Road to connect to OR 86. The existing Airport Road connection with OR 86 would be closed but the roadway would remain to provide access to the adjacent parcel. To minimize property impacts some stopping by Airport Road traffic may be required.	Under consideration because it would meet the state interchange access spacing standard on the north side of OR 86 with the exception of one private residential access approximately 635 feet from the I-84 Northbound Ramps.	Traffic volumes on the southernmost section of Hudson Road, where Airport Road would overlap, would increase over the baseline condition. While traffic volumes on Airport Road – Hudson Road are expected to be less than 2,000 vehicles per day, this would still be a substantial increase over existing traffic volumes.	Operations at the Airport Road – Hudson Road/OR 86 intersection are expected to be similar to those forecast for the future baseline condition at the current Airport Road/OR 86 alignment.	Would meet the state interchange access management spacing standards on the north side of OR 86 with the exception of one private access approximately 635 feet east of the I-84 northbound on-ramp.	Would increase travel distances for some drivers traveling through the study area because it would increase the length of Airport Road and increase the distance from the interchange. The increased distance and more circuitous route for Airport Road may encourage more drivers to use Lindley Road to travel to the Baker City Airport. This route is already used an alternate to Airport Road by many drivers.	Would move turning traffic volumes further from the interchange and eliminate one access point on the north side of OR 86. The "T" intersection formed by connecting Airport Road into Hudson Street would require vehicles to slow more than the curve shown in Option 2A.	The rural residential development adjacent to Hudson Road would experience a substantial increase in traffic due to the addition of the Airport Road traffic from the realignment. The traffic from Airport Road would increase traffic as high as 2,000 vehicles per day where it overlaps Hudson Road.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 2B is estimated at $5.2 million.
	OR 86										
3A	OR 86 Widening to Three Lanes from I-84 to Lindley/Atwood Road	Widen OR 86 (including the bridge structure) to a three-lane section from the I-84 Southbound Ramps to the Lindley/Atwood Road intersection. This would provide left-turn lanes at all access points along OR 86, separating turning traffic from through traffic.	Would improve traffic safety by separating turning traffic from through traffic volumes.	Traffic volumes would not change from the 2025 baseline projections.	Operations at each of the intersections with the left-turn lanes would be improved because the left turns would not slow the through-traffic movements.	Does not preclude other options to improve access spacing.	Would not change traffic circulation patterns within the study area.	Would improve safety by separating the left-turning traffic from the through traffic, which would reduce the likelihood of rear-end collisions on OR 86.	Would improve the safety of all access points between I-84 and Atwood Road – Lindley Road by separating turning movement from through movements.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 3A is estimated at $5.7 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
3B	OR 86 Widening to Three Lanes from I-84 to Lindley/Atwood Road and Airport Road Realignment opposite Best Frontage Road	Widen OR 86 (including the bridge structure) to a three-lane section from the I-84 Southbound Ramps to the Lindley/Atwood Road intersection. This would provide left-turn lanes at all access points along OR 86, separating turning traffic from through traffic. Realigning Airport Road would increase the distance between the Airport Road and the I-84 Northbound Ramps to provide more storage and deceleration space for left-turning vehicles.	Would improve traffic safety by separating turning traffic from through traffic volumes. The realignment of Airport Road would create a single intersection rather than two offset intersections. It would also increase the distance between the Airport Road and the I-84 Northbound Ramps, which would provide more storage and deceleration space for left-turning vehicles.	Traffic volumes would not change from the 2025 baseline projections.	Operations at each of the intersections with the left-turn lanes would be improved because the left turns would not slow the through-traffic movements. The realignment of Airport Road would not substantially change the operations of the combined intersection over the two separate intersections.	Assumes that no other improvements would be made to meet access spacing standards.	Would not change traffic circulation patterns within the study area.	Would improve safety by separating the left-turning traffic from the through-traffic, which would reduce the likelihood of rear-end collisions on OR 86. It would also provide more storage and deceleration space between the Airport Road and I-84 Northbound On-Ramp intersections.	Would improve the safety of all access points between I-84 and Atwood Road – Lindley Road by separating turning movement from through movements.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 3B is estimated at $6.9 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
	Realign Cedar Street										
4	Cedar Street Realignment from Hughes Lane to Old Trail Road	Extend Cedar Street directly northward from Hughes Lane to enable the curvature of the road to be improved to meet the American Association of State Highway and Transportation Officials (AASHTO) recommendations for roadway geometry of a 55-mph road.	Under consideration because it would eliminate the need for traffic traveling at rural roadway speeds (55 mph) to slow to around the curve west of the I-84 interchange.	Traffic volumes would not change from the 2025 baseline projections.	Intersection operations would not change from the 2025 baseline projections.	Option 4 would not improve the access along Cedar Street. Although the existing section of roadway could continue to provide access to some of the adjacent parcels, others would require new access. Connecting the old section of Cedar Street with the new alignment would also be an issue.	Would change traffic circulation patterns by creating a new roadway through the study area.	Would improve safety by increasing the turning radius of the curve from Cedar Street to the I-84 interchange to meet the AASHTO design guidelines for a 55-mph roadway. Improving the curve could prevent potential crashes due to loss of control, particularly during winter driving conditions.	Would realign Cedar Street through several parcels.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 4 is estimated at $4.1 million.
	Main Street Extension										
5	Main Street Extension from D Street to Interchange 302	Extend Main Street from its current terminus at D Street northward across Hughes Lane to connect with OR 86 and Interchange 302. This project was identified in the Baker City TSP.	Would provide a direct connection from downtown Baker City to I-84. It was a project identified in the Baker City TSP although it was planned for beyond the 20-year planning horizon, which at that time was 2015.	Would attract traffic that currently uses Campbell Street to access I-84 as well as traffic on Cedar Street. The resulting traffic volumes are shown in Figure 19 of the report.	The changes in intersection operations that would result from the extension of Main Street to Interchange 302 are shown in Table 24 of the report.	Option 5 would not improve the access spacing in the study area but would not preclude other options to improve access spacing in the study area east of I-84.	Would change traffic circulation patterns by creating a new roadway through the study area. Main Street extension would extend due west from OR 86 and Cedar Street would connect into the new roadway opposite Old Trail Road.	Would not change the safety of the study area although there could be more crashes because traffic volumes in the area would be higher.	Would impact numerous parcels of land but most of this project would lie outside of the IAMP study area.	Would lie outside of the Baker City UGB and could require goal exceptions to implement.	The construction cost of Option 5 is estimated at $13.4 million.

Option		*See individual alternatives and options sections in Chapter 6 for more detail.*									
No.	**Title/Location**	**Description**	**Purpose**	**Traffic Projections**	**Operational Analysis**	**Access Spacing**	**Traffic Circulation**	**Safety**	**Impact to Adjacent Lands**	**Goal Exceptions**	**Cost**
	Cedar/Hughes Street Intersection										
6A	Hughes Lane/Cedar Street Intersection Improvements	Improve the Hughes Lane/Cedar Street intersection with a four-way STOP and the addition of northbound and eastbound left-turn lanes and a southbound right-turn lane. These are the minimum improvements needed to achieve functional intersection operations.	Eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition.	Traffic volumes would not change from the 2025 baseline projections.	The operations of the intersection would improve substantially over the baseline condition with all movements having volume-to-capacity (v/c) ratios less than 0.6 and delays of LOS C or better.	Option 6A would not change access spacing within the study area but would not preclude other options to improve access spacing.	This alternative would not change traffic circulation patterns in the study area.	The four-way stop would require all vehicles to stop before entering the intersection, which could result in more rear-end collisions but there would likely be fewer angle or turning collisions.	The roundabout would require some additional right-of-way in the vicinity of the intersection but would impact any structures on adjacent parcels. Properties that could be affected are the parcels on the four corners of the intersection.	Would lie within the Baker City UGB and would not require goal exceptions to implement.	The construction cost of Option 6A is estimated at $1.9 million.
6B	Hughes Lane/Cedar Street Intersection Roundabout	Improve the Hughes Lane/Cedar Street intersection with a roundabout .	The eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition.	Traffic volumes would not change from the 2025 baseline projections.	The operations of the intersection would improve substantially over the baseline condition with all movements having volume-to-capacity (v/c) ratios less than 0.6 and delays of LOS B or better.	Would not change access spacing within the study area but would not preclude other options to improve access spacing.	Would not change traffic circulation patterns in the study area.	Roundabouts generally have lower crash rates than other types of intersections because they have fewer conflict points between vehicles.	The roundabout would require some additional right-of-way in the vicinity of the intersection but would impact any structures on adjacent parcels. Properties that could be affected are the parcels on the four corners of the intersection.	Would lie within the Baker City UGB and would not require goal exceptions to implement.	The construction cost of Option 6B is estimated at $1.3 million.
6C	Hughes Lane Realignment and Intersection Improvements	Realign Hughes Lane along the UGB to create a new intersection with Cedar Street north of the existing junction.	**Eastbound approach of Hughes Lane at Cedar Street is expected to fail in the baseline 2025 condition.**	**Majority of traffic would be rerouted along new section of roadway.**	**Operations would improve substantially with all movements having a v/c ration less than .6 and LOS C or better.**	**Would add another access point to Cedar with the new alignment of Hughes Lane**	**Relocate the majority of traffic on Hughes Lane to a new roadway segment north of the current alignment**	**Would move traffic out of residential areas, eliminating conflicts with driveways.**	**Could impact several adjacent properties. When developed, additional study may be able to minimize impacts.**	**Would be a realignment of an existing road adjacent to UGB. Goal exception may be required.**	The **construction cost of Option 6C is estimated at $2.5 million.**

APPENDIX C

Average Trip Generation – Daily Trip Rates

gsf = gross square footage

gla = gross leasable area

Residential – Single-Family – 9.55 trips per dwelling unit

Industrial – General Light – 3.02 trips per employee

Commercial – Fast Food with Drive-Thru – 496.12/1,000 gsf (average size 3,000 gsf)

Gas station – 168.36/vehicle fueling position (average 8 positions)

Gas station with Convenience Market – 162.78/vehicle fueling position (average 12 positions)

Shopping Center – 42.94/1,000 gla (average 328,000 gla)

Free-standing Discount Store – 56.02/1,000 gsf (80-100,000 gsf)

Free-standing Superstore – 49.21/1,000 gsf (>100,000 gsf)

Building Materials/Lumber (not a Home Depot) – 45.16/1,000 gsf (average 9,000 gsf)

_____

Uses that would be likely to generate more than 1,000 trips per day:

Residential ~ 100 dwelling units

Industrial ~ 330 employees

Fast-Food with Drive-Thru ~ 2,000 gsf (buildings generally 150-200% greater than 2,000 gsf)

Gas Station ~ 6 vehicle fueling positions (smaller than average)

Shopping Center ~ 25,000 gla

Discount Store ~ 20,000 gsf (stores generally 100,000 gsf)

Discount Superstore ~ 20,000 gsf

Source: Institute of Transportation Engineers Trip Generation. 7th edition. 2003.