I-5 Interchange 14 (Green Springs)
Interchange Area Managment Plan

June 2010 DRAFT

I-5 Interchange 14 (Green Springs) Interchange Area Management Plan

Prepared for

Oregon Department of Transportation

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List of Acronyms

ATMS	Advanced Traffic Management Systems
BLI	Buildable Lands Inventory
CIP	Capital Improvement Plan
CORP	Central Oregon and Pacific Railroad
EBR	Engineering Baseline Report
HDM	Highway Design Manual
IAMP	Interchange Area Management Plan
IC	Interchange Commercial
IGA	Intergovernmental Agreement
ITS	Intelligent Transportation Systems
LOS	Level of Service
MOU	Memorandum of Understanding
MPO	Metropolitan Planning Organization
MUTCD	Manual on Uniform Traffic Control Devices
OBDP	Oregon Bridge Delivery Partners
ODOT	Oregon Department of Transportation
OHP	Oregon Highway Plan
ORS	Oregon Revised Statutes
OTP	Oregon Transportation Plan
RTP	Regional Transportation Plan
RVCOG	Rogue Valley Council of Governments
RVITS	Rogue Valley Intelligent Transportation Systems
RVMPO	Rogue Valley Metropolitan Planning Organization
SDC	System Development Charge
SPIS	Safety Priority Index System
SPUI	Single Point Urban Interchange
TAR	Traffic Analysis Report
TAZ	Transportation Analysis Zones
TDM	Transportation Demand Management
TMA	Transportation Management Association
TOC	Traffic Operations Center
TOD	Transit Oriented Development
TPAU	Transportation Planning Analysis Unit
TPR	Transportation Planning Rule
TSM	Transportation System Management
TSP	Transportation System Plan
UGB	Urban Growth Boundary
V/C	Volume to Capacity

EXECUTIVE SUMMARY

The existing bridge at I-5 Interchange 14 will be repaired and improved with funding provided by the OTIA III State Bridge Delivery Program. The bridge repairs will consist of a rehabilitation of the deck and bridge rails. Traffic signals will be installed at the ramp terminal intersections, and the bridge will be widened to provide three traffic lanes, bicycle lanes, and 7-1/2-foot sidewalks on both sides. The construction is scheduled to begin in mid 2010 and be completed by mid 2012.

As outlined in Oregon Administrative Rule (OAR) 734-051-0155(7), an Interchange Area Management Plan (IAMP) should be developed when there are substantial modifications to interchanges. Public investments for major interchange improvements are very costly and it is in the interest of the State, local governments, citizens of Oregon, and the traveling public to ensure that the interchange functions as it was designed for as long a time period as possible.

Development of this IAMP is the planning process intended to assess existing and potential land use and transportation conditions, opportunities and limitations, identify long-range needs, and identify recommended improvements to the Green Springs Interchange (I-5 Interchange 14). This process includes identifying necessary improvements to the local street network in the vicinity of the interchanges to ensure consistency with operational standards.

Problem Statement

The bridge structure, constructed in 1961, has been deemed structurally and geometrically deficient due to cracked cross beams, poor deck condition, narrow bridge width, substandard bridge railing, and substandard vertical clearance. Additionally, there are currently no provisions for bicycle and pedestrian traffic.

Analysis of existing and projected future traffic volumes show that the existing bridge and ramps are functionally obsolete to adequately serve the long-range transportation needs. Significant queuing and delay currently exists on several unsignalized approaches. As the area grows and traffic volumes increase, queuing and delays are expected to increase if no improvements are made to the interchange and the transportation system in the vicinity. The crash rate at the interchange is higher than the statewide average rate for comparable facilities, and the site ranks in the top ten percent of ODOT Safety Priority Index System (SPIS) sites.

There are numerous public and private approaches to Ashland Street within a quarter-mile of the interchange ramp terminals. These approaches create potential vehicular conflicts and delay that may impact safety and traffic operations at the interchange.

IAMP Goals and Objectives

The goals of this IAMP are to develop a plan for improvements that can be implemented over time to improve safety and operations of Interchange 14, identify adequate local street network improvements, and protect the investment in I-5 and its interchanges by maintaining the function of the interchange.

The IAMP objectives include identification of necessary capacity improvements; the evaluation of several alternatives; the development of an access management plan; and the development of management measures to protect the long-term function of the interchange.

The IAMP goals and objectives acknowledge that the purpose of the interchange is to serve all modes of travel, not just automobiles.

Alternatives Analysis

The development of the IAMP included extensive traffic operations analysis of seven interchange alternatives (including no-build) under three different future land use scenarios. Traffic operations analysis was also performed for each of the scenarios at four intersections on Ashland Street within one quarter mile of the ramp terminal intersections. The analysis found that the existing interchange configuration would not adequately accommodate anticipated future traffic volumes. Each of the alternative configurations provided superior traffic operations compared to the existing configuration.

Although each of the interchange configurations would provide adequate traffic operations at the interchange, some improvements to nearby intersections, including capacity enhancements and access management measures, may be necessary to manage future traffic volumes. Additionally, improvements to local street connectivity in the management area are recommended to reduce the need for local trips to use Ashland Street and to provide options for alternative travel modes.

1. DEFINITION AND BACKGROUND

As outlined in OAR 734-051-0155(7), an Interchange Area Management Plan (IAMP) is "required for new interchanges and should be developed for significant modifications to existing interchanges." Public investments for new interchanges and major improvements to existing interchanges are very costly and it is in the interest of the State, local governments, citizens of Oregon, and the traveling public to ensure that the interchange functions as it was designed for as long a time period as possible.

The IAMP is intended to assess existing and potential land use and transportation conditions, opportunities and limitations, identify long-range needs, and identify recommended improvements to the Green Springs Interchange (I-5 Interchange 14). This process includes identifying necessary improvements to the local street network in the vicinity of the interchanges to ensure consistency with operational standards.

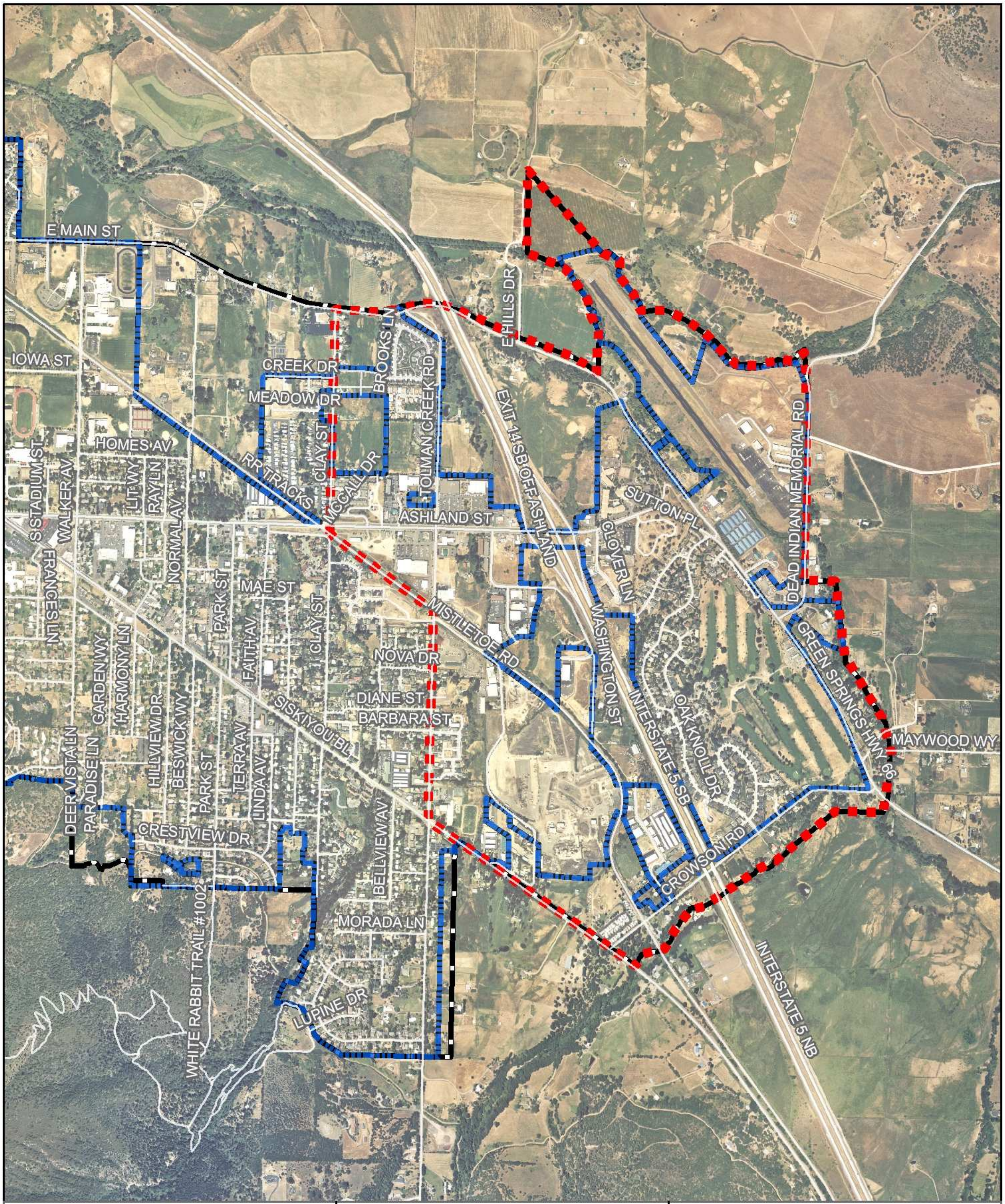
Strictly a planning document, the IAMP does not address aesthetic design associated with recommended improvements. For example, the report does not differentiate between a raised concrete median barrier and a landscaped median. One may be more appealing to the eye, but the IAMP does not differentiate between the two, since they would both perform the intended function. Aesthetic design issues are beyond the scope of the IAMP and are addressed through the design and construction process.

This IAMP follows detailed analyses conducted for preparation of the *Traffic Analysis Report for I-5 Interchanges 14 and 19* (TAR), dated August 22, 2006 and prepared by David Evans and Associates, Inc. The analyses summarized in the report were used to gain a better understanding of both the current and the future deficiencies of the two interchanges, and to examine the performance of a number of alternative interchange configurations under projected future traffic volumes. The TAR provides the basis for the Green Springs Interchange IAMP.

Planning and design for improvements to Interchange 14 began concurrently with IAMP development efforts. Although design and construction of these improvements may commence before the IAMP is complete, adoption of the IAMP by the OTC is still required under OAR 734-051-0155. Further, adoption of the IAMP by the City demonstrates a local commitment to the primary objective of this IAMP: the protection of the public investment in the interchange. Local adoption will also help justify additional management area improvements as they become necessary. The elements recommended for formal adoption as part of this IAMP are specified in Section 7 of this report.

Planning and Management Area

The Green Springs interchange, shown in Figure 1-1, is located within the Ashland city limits in the southeastern section of the city, although much of the land in the interchange vicinity lies outside the city limits but inside the Ashland UGB. The interchange is a standard diamond type.



1,000 500 0 1,000 Feet

GIS Data Source: Jackson County

Legend

- IAMP Management Area
- Ashland City Limits
- UGB

Interchange 14 (Green Springs)

Figure 1-1

Vicnity

Interchange Area Management Plan

Ashland Street (Green Springs Highway, OR 66) is the cross street, which connects with Siskiyou Boulevard (OR 99, Rogue Valley Highway) approximately one mile to the west. All four quadrants of the interchange area are developed.

The defined boundaries of the Interchange Area Planning and Management Area (Planning Area) include land where existing and future development has the potential to significantly affect the interchange function, capacity and performance standards. The Planning Area roughly coincides with existing transportation analysis zone (TAZ) boundaries. It also encompasses key roadways in the vicinity that relate to traffic operations at the interchange.

The west side of the Planning Area is bounded by Tolman Creek Road, Central Oregon and Pacific Railroad (CORP), and Clay Street to the west, Siskiyou Boulevard and the UGB to the south and the UGB to the north and east. The Planning Area consists of commercially zoned land on either side of the interchange. The remainder of the study area is composed of residential land; single and multi-family residential in the areas within Ashland city limits and rural residential in the areas outside city limits. Based on the existing density of development, it appears that a significant intensification could occur in the vicinity of the Planning Area.

Problem Statement

The bridge and interchange have a number of existing deficiencies.

Operational and Safety Deficiencies

The 2006 TAR provided traffic operations analyses at key intersections and freeway facilities in the planning area under both existing conditions (2006) and future no-build conditions (2010 and 2030). The TAR concluded that the existing bridge and ramps are functionally obsolete to adequately serve the long-range transportation needs.

An analysis of existing traffic operations showed that critical v/c ratios at both ramp terminal intersections exceed ODOT mobility standards. Queuing on both unsignalized exit ramps, and especially the southbound ramp, is significant because of limited gaps on Ashland Street for left turning vehicles, combined with substantial right turning volumes from the southbound ramp. The 95th percentile queue on the southbound exit ramp is calculated to extend into the deceleration area of the ramp. Left turning vehicles from eastbound Ashland Street to the northbound I-5 entrance ramp are delayed because of conflicts with high westbound through volumes. These delays result in queuing over the bridge that spills over into the southbound ramp terminal intersection.

An analysis of year 2030 no-build traffic operations showed that projected demand at both ramp terminal intersections would exceed the capacity of the intersections. Future operations are expected to be characterized by more delay and queuing on intersection and ramp approaches. Without mitigation, queuing on the southbound exit ramp will frequently extend into the deceleration area of the ramp, creating a safety problem. The increased demand for the eastbound left turn from Ashland Street to the I-5 northbound entrance ramp will generate queues that extend through and well beyond the adjacent southbound ramp terminal intersection.

Compounding the operational problems at the ramp terminal intersections are the presence of many public and private approaches to Ashland Street very close to the interchange ramp terminal intersections. These public streets (Clover Lane and Washington Street) and private driveways create potential vehicular conflicts and delay that are likely to impact operations at the interchange. ODOT interchange area access spacing standards, as stated in OAR 734-051 (Division 51), specify that the first right-in/right-out approach shall be no closer than 750 feet from ramp terminal intersections, and the first full-access approach shall be located no closer than 1320 feet (1/4 mile) of ramp terminal intersections along the cross street. While Division 51 standards may not be fully attainable in a developed area such as this, it is desirable to move in the direction of the standards through access management techniques such as consolidation or elimination of accesses and implementation of turn prohibitions. The purpose of these implementation measures is to ensure long-term public safety and operations of the interchange and associated immediate local street network.

Structural and Geometric Deficiencies

The bridge structure (ODOT Bridge No. 08745) is a reinforced concrete deck-girder span constructed in 1961. Bridge improvements since have been limited to guardrail upgrades. An Engineering Baseline Report (EBR) was prepared in 2003 that listed the deficiencies associated with the bridge. The EBR recommended that the bridge be replaced and listed the following structural and geometric deficiencies:

- Cracks in cross beams ranging from hairline to 0.060”
- Poor condition of deck
- Low sufficiency rating of 23.1
- Substandard bridge railing
- Narrow bridge roadway width (Two 12-foot lanes with 4-foot shoulders); urban area with no sidewalks or bike facilities.
- Presence of roadside hazards including substandard guardrail to bridge rail connections and guardrail terminals.
- Repair / replace cost estimate ratio exceeds 50%
- Existing vertical clearance is less than 17.5 feet

The EBR assumed that a feasible replacement structure would be a five-lane structure, and estimated the replacement cost at approximately $7 million.

Bicycle and Pedestrian Deficiencies

There are currently no provisions for bicycle and pedestrian traffic. As noted previously, the interchange has urban development in all four quadrants, and bicycle and pedestrian facilities will be provided as part of the bridge reconstruction.

Goals and Objectives

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

- Improve safety and operations of Interchange 14 for all modes of travel;
- Improve safety and operations of the I-5 mainline;
- Identify adequate local street network improvements for all modes of travel; and
- Protect the investment in I-5 and its interchanges and maintain the function of the interchange.

The objectives of the IAMP are to:

- Evaluate the need for capacity improvements based on the adopted, comprehensive land use plans of Ashland, the Regional Transportation Plan, and the mobility standards prescribed in the Oregon Highway Plan (OHP), Highway Design Manual (HDM) and the Ashland Transportation System Plan (TSP).
- Evaluate concepts to improve safety and increase capacity of the interchange and roadways to address existing and future needs. The concepts that will be evaluated consist of the following:
  - No Build
  - Three-Lane Standard Diamond Interchange
  - Three-Lane Standard Diamond Interchange with Northbound Loop Ramp
  - Four-Lane Standard Diamond Interchange
  - Five-Lane Standard Diamond Bridge
  - Diverging Diamond Interchange
  - Single-Point Urban Interchange (SPUI)
- Develop an access management plan that provides for safe and acceptable operations on the transportation network and that meet, or move in the direction of meeting the access spacing standards prescribed in Division 51.
- Develop and evaluate potential management actions that have the potential to protect the future function, capacity, and mobility of the interchange.
- Identify the need for bicycle and pedestrian facilities.

Interchange Function

The Green Springs Interchange provides the main link between the I-5 corridor and the southern end of Ashland via Ashland Street, also known as the Green Springs Highway and OR 66. This crossroad also provides one of the few interstate crossings in the vicinity and carries significant local vehicle, bicycle, and pedestrian traffic volumes that do not enter or exit the interstate. The interchange also provides interstate highway access for local residents and businesses in the interchange vicinity.

Interstate 5 is classified as an interstate highway, a designated freight route and is on the National Highway System. The primary function of interstate highways is to serve inter-regional and interstate passenger and freight traffic. OR 66 is classified by the OHP as a District Highway. According to the OHP, the function of District-level highways is to “provide connections and links between small urbanized areas, rural centers and urban hubs, and also serve local access and traffic.”

The intended function of the Green Springs Interchange 14 is to safely and efficiently accommodate future vehicle, bicycle, and pedestrian traffic demands generated by population and employment growth in the region and within the City of Ashland.

2. ADOPTED PLANS AND REGULATIONS

This section documents the relevant state, regional, and local transportation and land use plans and policies, and identifies how they influence planning for the Interchange 14 (Green Springs) area. The purpose of this review is to ensure the necessary compatibility, consistency and compliance required by state law and ODOT policy. This section reviews the following transportation and land use plans and regulations:

- Statewide Planning Goals 1 (Citizen Involvement), 2 (Land Use Planning), 11 (Public Facilities and Services), 12 (Transportation), and 14 (Urbanization);
- Oregon Transportation Plan, and amendments (OTP, Amended September 20, 2006);
- Oregon Highway Plan, and amendments (OHP 1999, Amended July 2006);
- Oregon Administrative Rule 734-051 (Highway Approaches, Access Control, Spacing Standards and Medians);
- Oregon Administrative Rule 660 Division 12 (TPR-including recent amendments);
- Rogue Valley Metropolitan Planning Organization 2009-2034 Regional Transportation Plan (Adopted 2009);
- Jackson County Transportation System Plan (2005);
- City of Ashland Transportation System Plan (2003);
- Jackson County Comprehensive Plan (Adopted 1972, Amended 2004 and 2006);
- Jackson County Land Development Ordinance (Adopted 2004, Amended 2007);
- City of Ashland Comprehensive Plan (1997);
- Ashland Land Use Ordinance (2004); and
- Ashland Buildable Lands Inventory (2005)

It also summarizes relevant information from Ashland Capital Improvement Plan (2007-2012), Ashland's System Development Charges, Interstate 5 State of the Interstate Report (2000), the Traffic Analysis Report I-5 Interchanges 14 and 19 (2006), and the Traffic Impact study for Clay Street Residential Complex (2005).

State of Oregon Goals and Plans

OAR 731-015-0065 requires IAMPs to be in compliance with applicable statewide planning goals.

Statewide Planning Goal 1 (Citizen Involvement) and OAR 660, Division 4

Goal 1, Citizen Involvement, ensures the opportunity for all citizens to be involved in all phases of the planning process. The citizen involvement program shall be appropriate to the scale of the planning effort. The program shall provide for continuity of citizen participation and of information that enables citizens to identify and understand the issues. Goal 1 requires federal, state, regional, and special districts agencies to coordinate their planning efforts with the City of Ashland and Jackson County and make use of existing local established citizen involvement programs.

Key components of Goal 1 include:

- *To provide for widespread citizen involvement*. This means that the program shall involve a cross section of affected citizens in the City of Ashland as well as Jackson County.
- *To provide effective two-way communication with citizens.* Mechanisms shall be established to provide effective communication between citizens and the elected and appointed officials for the Ashland and Jackson County area.
- *To provide the opportunity for citizens to be involved in all phases of the planning process.* All phases include the process set forth and defined in the goals and guidelines that the City of Ashland and Jackson County rely on for Land Use Planning.
- *To assure technical information is available and provided in a user-friendly manner*. Policy decisions that affect citizens within the City of Ashland and Jackson County shall be available in an easy to understand format that is made readily available to the public with assistance to interpret the technical information.
- *To assure that policy makers provide feedback to citizens.* All recommendations resulting from involving citizens from the Ashland and Jackson County area and the rationale used to reach land-use policy decisions shall be compiled and made available in the form of a written record.

Statewide Planning Goal 2 (Land Use Planning) and OAR 660, Division 4

Goal 2, Land Use Planning, requires that a land use planning process and policy framework be established as a basis for all decisions and actions relating to the use of land. This Goal is one of five statewide planning goals that play a key role in management planning for the Interchange 14 (Green Springs) Interchange area. The other goals are Goals 11 (Public Facilities and Services), 12 (Transportation), and 14 (Urbanization).

Goal 2 is important for three reasons. First, Goal 2 requires planning coordination between those local governments and state agencies "which have programs, land ownerships, or responsibilities within the area included in the plan." In this case, Goal 2 will require that ODOT coordinate with Jackson County, the City of Ashland, and the Rogue Valley MPO. Most of the study area is within the City of Ashland UGB, which would have planning authority over the area, although there are also some pockets of land within the study area that remain under Jackson County planning authority. Coordination is particularly important because development within both the City of Ashland and Jackson County will impact use of the proposed interchange, and land use decisions in the area could affect future use and operation of the interchange.

A second important element of Goal 2 is its provision that land use decisions and actions are supported by an "adequate factual base." This requirement applies to both legislative and quasi-judicial land use actions and requires that such actions be supported by "substantial evidence." In essence, it requires that there be evidence that a reasonable person would find to be adequate to support findings of fact that a land use action complies with the applicable review standards.

Third, Goal 2 requires that city, county, state and federal agency and special district plans and actions related to land use be "consistent with the comprehensive plans of cities and counties and regional plans adopted under Oregon Revised Statutes (ORS) Chapter 268." This section of the IAMP reviews relevant adopted plans in order to ensure that the interchange improvements are consistent with the plans. This provision is important because elements of an IAMP developed for Interchange 14 (Green Springs) will need to be adopted by the City of Ashland.

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

Statewide Planning Goal 11, Public Facilities and Services, requires cities and counties to plan and develop a timely, orderly and efficient arrangement of public facilities and services to serve as a framework for urban and rural development. The goal requires that urban and rural development be "guided and supported by types and levels of urban and rural public facilities and services appropriate for, but limited to the needs and requirements of the urban, urbanizable and rural areas to be served."

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

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

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

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

- Access control measures, which are consistent with the functional classification of roads and consistent with limiting development on rural lands to rural uses and densities;
- Standards to protect future operations of roads;
- A process for coordinated review of future land use decisions affecting transportation facilities, corridors or sites;

- A process to apply conditions to development proposals in order to minimize impacts and protect transportation facilities, corridors or sites;
- Regulations to provide notice to ODOT of land use applications that require public hearings, involve land divisions, or affect private access to roads; and
- Regulations assuring that amendments to land use designations, densities and design standards are consistent with the functions, capacities and performance standards of facilities identified in the TSP. See also OAR 660-012-0060.

The Oregon Land Conservation and Development Commission's rules implementing Goal 12 do not regulate access management. ODOT adopted OAR Chapter 734, Division 51 to address access management.

Statewide Planning Goal 14 (Urbanization), and OAR 660, Divisions 14 and 22

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

Goal 14 is important because it focuses development within relatively compact boundaries of the UGB and to a lesser degree in unincorporated communities. This compact development helps contain the costs of public facilities such as transportation by reducing the need for facilities further out and helping jurisdictions better anticipate where growth will occur. The location, type, and intensity of development within the study area will impact use of the interchange and could affect future use and operation of the interchange.

Oregon Transportation Plan

The Oregon Transportation Plan (OTP) is the state's long-range multi-modal transportation plan. The OTP is the overarching policy document among a series of plans that together form the state transportation system plan (TSP). The OTP considers all modes of Oregon's transportation system as a single system and addresses the future needs of Oregon's airports, bicycle and pedestrian facilities, highways and roadways, pipelines, ports and waterway facilities, public transportation and railroads. The current OTP assesses state, regional, and local public and private transportation facilities through 2030. The OTP establishes goals, policies, strategies and initiatives that address the core challenges and opportunities facing Oregon. It also provides the framework for prioritizing transportation improvements based on varied future revenue conditions.

This Plan supersedes the 1992 Oregon Transportation Plan. The 1992 OTP established a vision of a balanced, multi-modal transportation system and called for an expansion of ODOT's role in funding non-highway investments. The current OTP further these policy objectives with emphasis on maintaining the assets in place, optimizing the existing system performance, creating sustainable funding and investing in strategic capacity enhancements. Development of IAMPs is integral to maintaining assets and optimizing system performance.

An IAMP must be consistent with the applicable OTP goals and policies. Findings of compatibility will be part of the basis for IAMP approval. The most pertinent OTP goals and policies for interchange planning are as follows:

Goal 1 - Mobility and Accessibility

- Policy 1.3 – Relationship of Interurban and Urban Mobility

Goal 2 - Management of the System

- Policy 2.1 - Capacity and Operational Efficiency
- Policy 2.2 - Management of Assets

Goal 3 - Economic Vitality

- Policy 3.1 – An Integrated and Efficient Freight System
- Policy 3.2 – Moving People to Support Economic Vitality

Goal 4 – Sustainability

- Policy 4.1 – Environmentally Responsible Transportation System
- Policy 4.2 – Creating Communities

Goal 5 – Safety and Security

- Policy 5.1 – Safety and Security

Goal 7 – Coordination, Communication and Cooperation

- Policy 7.1 - A Coordinated Transportation System
- Policy 7.3 – Public Involvement and Consultation
- Policy 7.4 – Environmental Justice

Findings to the effect that all of the above pertinent policies are consistent with the adopted OTP need to be developed as part of an adoption package presented to the OTC.

Oregon Highway Plan

OAR 734-051-0155 requires IAMPs to be consistent with the OHP. The 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 interchange improvements are described below, with impacts to interchange planning shown in italic.

Goal 1. System Definition, the following policies are applicable to the project:

- Policy 1B (Land Use and Transportation), which recognizes the need for coordination between state and local jurisdictions;

  Coordination with local jurisdictions will occur throughout the preparation of the IAMP. A Technical Advisory Committee (TAC) has been formed to inform the IAMP. Members include representatives from the Department of Land Conservation and Development, Rogue Valley Council of Governments, the City of Ashland, Jackson County, the City of Talent, the Rogue Valley MPO, the Federal Highway Administration, the Oregon Bridge Delivery Partners, and the Oregon Department of Transportation.

- Policy 1C (State Highway Freight System), which states the need to balance the movement of goods and services with other uses;

  The traffic operations analysis will account for freight movement as well as passenger vehicle movement. Interstate 5 is a designated freight route.

- Policy 1F (Highway Mobility Standards), which 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; and

  The purpose of the IAMP is to understand the relationship between land uses and traffic in the areas of the new interchange, and to enable land uses to be planned so that the public investment in the facility is best protected.

- Policy 1G (Major Improvements), which requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

  Reconstruction of Interchange 14 (Green Springs) is intended to reduce congestion while improving operations and safety, not to add capacity.

Goal 2. System Management, the following policies are applicable to the project:

- Policy 2B (Off–System Improvements), which helps local jurisdictions adopt land use and access management policies; and

  The IAMP will include sections describing existing and future land use patterns and implementation measures as well as a summary of the Traffic Analysis Report for Interchange 14 and 19 (2006). Implementation of the IAMP may require an intergovernmental agreement between ODOT, the City of Ashland, and Jackson County and may require amendments to city, county, and MPO plans and ordinances.

- Policy 2F (Traffic Safety), which improves the safety of the highway system.

  The purpose of the reconstructed interchange will be to improve safety as well as traffic operations.

Goal 3. Access Management, the following policies are applicable to the project:

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

  Section 6 of this IAMP document contains an access management plan that identifies approaches to the interchange crossroad that do not meet the OHP spacing standards and will require deviations.

Oregon Bicycle and Pedestrian Plan

The purpose of the Oregon Bicycle and Pedestrian plan is to implement the Actions recommended by the OTP; guide ODOT and local governments in developing bikeway and walkway systems; explain the laws pertaining to the establishment of bikeways and walkways; fulfill the requirements of the TPR; and provide standards for planning, designing and maintaining bikeways and walkways.

Highway Design Manual (HDM)

The purpose of the HDM is to establish mobility standards when evaluating potential design configurations. As the configuration for interchange 14 will likely change, the HDM standards will need to be met for year 2030 analysis.

OAR 660 Division 12 (TPR—including recent amendments)

The purpose of the Transportation Planning Rule (TPR) is “to implement Statewide Planning Goal 12 (Transportation) and promote the development of safe, convenient and economic transportation systems that are designed to reduce reliance on the automobile so that the air pollution, traffic and other livability problems faced by urban areas in other parts of the country might be avoided.” A major purpose of the Transportation Planning Rule (TPR) is to promote more careful coordination of land use and transportation planning, to assure that planned land uses are supported by and consistent with planned transportation facilities and improvements.

This rule identifies transportation facilities, services and improvements which may be permitted on rural lands consistent with Goals 3, 4, 11, and 14 without a goal exception. These include replacement of an intersection with an interchange, channelization, and medians. The local government must identify reasonable build design alternatives, assess their impacts, and select the alternative with the least impact.

The Land Conservation and Development Commission adopted amendments to the TPR in March 2005 that clarify how plan amendments and zoning changes impact to transportation facilities are assessed. The amendments stipulate that a significant effect occurs only if a plan amendment or zone change affects the facility by the end of the planning period, not if the effect occurs at any point during the planning period. The primary focus of this rule is keeping land use and transportation in balance. The current amendments include new provisions that pay particular attention to proposed plan or land use regulation amendment within one-half mile of interstate interchanges. The concern here is to protect the state's significant investments in interchanges and in the interstate system.

Oregon Administrative Rule Chapter 734, Division 51 (Highway Approaches, Access Control, Spacing Standards and Medians)

OAR 734-051-0155 requires IAMPs to be consistent with applicable access management plans. OAR 734-051 governs the permitting, management, and standards of approaches to state highways to ensure safe and efficient operation of the state highways and 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; and
- 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. Section 734-051-0155 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.

An access management has been developed as a part of this IAMP effort (see Section 6) to address the standards set forth in Division 51. It includes an inventory of existing public and private approaches and documents constraints and considerations that are factored into findings for compliance with Division 51. The access management plan provides short, medium and long-term actions that are intended to move in the direction of meeting the Division 51 access management spacing standards.

Transportation Plans

Rogue Valley Metropolitan Planning Organization 2009-2034 Regional Transportation Plan

The Rogue Valley Council of Governments (RVCOG), the designated metropolitan planning organization (MPO) for Jackson County and the seven cities (Ashland, Talent, Phoenix, Jacksonville, Medford, Central Point, and the unincorporated community of White City,) prepared the Regional Transportation Plan (RTP) as one of its transportation planning responsibilities. The RTP is a multi-modal transportation plan designed to meet the anticipated 25 year transportation needs within the MPO planning area boundary. The RTP serves as a guide for the management of existing transportation facilities and for the design and implementation of future transportation facilities through the year 2034. The Rogue Valley Metropolitan Planning Organization updated and adopted the current Regional Transportation Plan for 2009-2034 on March 24, 2009. The RTP provides a summary of the regional transportation actions anticipated to occur in the planning area through 2034. The actions presented are in the context of the respective modes and planning issues and include: multi-modal safety and security; transportation system management; transportation demand management; street system; bicycle and pedestrian facilities; transit system; parking; future conditions; and plan consistency. The RTP goals are:

Goal 1. Plan for, develop, and maintain a balanced multi-modal transportation system that will address existing and future needs.

Goal 2. Optimize safety and security on the transportation system.

Goal 3. Use transportation investments to foster compact, livable communities. Develop a plan that builds on the character of the community, is sensitive to the environment, and enhances quality of life.

Goal 4. Develop a plan that can be funded and that reflects responsible stewardship of public funds.

Goal 5. Maximize the efficient use of transportation infrastructure for all users and modes.

Goal 6. Use incentives and other strategies to reduce reliance on single-occupant vehicles.

Goal 7. Provide an open, balanced, credible process for planning and developing the transportation system.

Goal 8. Encourage use of cost-effective emerging technologies to achieve regional transportation goals.

Goal 9. Use transportation investments to foster economic opportunities.

Each goal has several associated policies.

The land use element designates the City of Phoenix, approximately 8 miles north of the IAMP study area in Ashland, as the nearest Transit Oriented Development (TOD) high-growth area. The TODs were originally developed in the Transit Oriented Development and Transit Corridor Design Strategies Final Report (August 1999).

The interchange is identified as part of Bridge Bundle 314 on the list of ODOT street system projects in the RTP as a bridge targeted for replacement. Among a list of Ashland street system projects in the RTP that are situated within the IAMP study area are signalized off-ramps and bridge widening at the interchange as well as extension of Normal Avenue to E. Main Street.

Jackson County Transportation System Plan

Jackson County and ODOT began updating the transportation element of the comprehensive plan in 2001 and completed the adopted Jackson County TSP in March of 2005. The primary study area for the TSP consists of all areas of Jackson County located outside the UGBs of incorporated cities, although it does include issues identified in local TSPs or the RTP that affect state and county facilities inside UGBs. The proposed improvements are required to be compatible with Jackson County TSP goals and policies.

The plan and policy review, technical background and needs analysis, goals and policies, and TSP sections of the TSP will replace the transportation element in the County Comprehensive Plan. The technical background and needs section describes the road, public transit, bicycle and pedestrian, air, rail, marine, pipeline/transmission systems. The TSP also includes a financing section.

The TSP has livability, modal components, and integration goals with associated policies and strategies to implement each goal. The livability goal is "to develop and maintain a safe and multi-modal transportation system capable of meeting the diverse transportation needs of Jackson County while minimizing adverse impacts to the environment and to the County's quality of life." There are no policies or strategies related to this goal specifically applicable to the interchange project.

The TSP includes bicycle and pedestrian-related policies applicable to the project area. Policy 4.2.4-A(d) states: "Provide bicycle lanes in urban areas and adequate shoulders in rural areas, in addition to parallel bikeways, as part of arterial and collector roadway improvement projects." This policy illustrates Jackson County's desire to provide bicycle facilities and connections to make cycling an attractive alternative to driving. Pedestrian related policies are addressed in the TSP under Policy 4.2.3-A "The County will include pedestrian facilities and connections as a fundamental component in the maintenance and development of the overall County transportation system. The County transportation system will promote a safe, linked pedestrian system that connects residential areas to schools, recreation, commercial centers, employment centers, and other activity centers." The proposed improvements will address these policies by including pedestrian and bicycle amenities on the cross road for the new interchange.

The goal of the modal component is "to plan an integrated transportation system that maintains existing facilities and responds to the changing needs of Jackson County by providing effective multi-modal transportation options." One of the strategies under the vehicular system policies is that improvement projects should attempt to reduce conflicts between traffic generated by logging, agriculture, and aggregate and other traffic (4.2.1-B, b.). There are also policies to support freight mobility and coordination between the County and ODOT. The integration goal is "to achieve the livability and modal elements goals by integrating land use planning, system financial planning, environmental planning and application of policies to address transportation needs in specific locations. The TSP does not identify any Interchange 14 (Green Springs) improvements in its project list.

City of Ashland Transportation System Plan

The City of Ashland Transportation System Plan (TSP) addresses Oregon Statewide Planning Goal 12 and the Oregon TPR, which directs cities and counties to develop balanced transportation systems addressing all modes of travel including motor vehicles, transit, bicycles and pedestrians. The purpose of the Ashland TSP is to define the modal system, and outline and prioritize specific modal improvements which embody the City's vision for "modal equity". An update to the Ashland TSP, currently underway, includes a review of the existing conditions and constraints of the current transportation system, developing recommendations and basis for needed improvements, and developing a prioritized 20-year Capital Improvements Project list. No adoption date has yet been set by the City to date.

The TSP is intended to summarize the results of the public involvement process, the analysis of existing policies and conditions, the impact of future growth on the transportation system, and the identification of alternatives that can address the local transportation system needs in the City of Ashland. In addition to providing information on the existing conditions and constraints of Ashland's transportation system, the TSP focuses on recommended design standards, identification of system problems, pedestrian and bicycle amenities, recommended access management plan, needed transportation improvements, a financial plan, and an alternatives evaluation and project prioritization.

The City of Ashland TSP provides a list of TPR recommendations and requirements that the City of Ashland expects to be in compliance with. The most applicable sections are:

> **Inventory Existing Transportation System:** Chapter 4 of the TSP includes an inventory of the existing street network, traffic volumes, traffic control devices, accident history, level of service, a summary of the existing bicycle route system, a summary of existing sidewalks on boulevards and a summary of the existing transportation system.
>
> **Determine Transportation Needs:** Chapter 6 of the TSP includes a summary of forecast population and employment, a determination of transportation capacity needs, and an ongoing assessment of other roadway needs (safety, bridges, reconstruction, and operation/maintenance) by City of Ashland staff through the maintenance program.

The TSP describes OR 66 (Green Springs Highway/Ashland Street) as one of the primary east-west boulevards within the City of Ashland. Ashland Street operates as a five-lane facility between Siskiyou Boulevard and the western approaches to Interstate 5 and then as a two-lane facility approximately 600 feet east of the interstate ramps. OR 66 provides immediate access to retail businesses as well as connection to avenues, neighborhood collectors, and neighborhood streets throughout Ashland.

The goals of the IAMP are to preserve the function of the interchange for passenger and freight inter-regional, regional, and local traffic and balance those needs. The purpose of the IAMP is to evaluate how changes to existing land uses would impact the facility and propose effective controls through coordinated ODOT, City, and County efforts. The interchange project will include improvements to the street network including bike lane and sidewalk facilities.

Chapter 8 of the TSP provides the City of Ashland with recommendations for access management and neighborhood traffic control policies. These policies will serve to better manage and protect the intended function and capacity of the City's street system. A key relevant policy includes Policy 8.1 (Recommended Access Management Policy), which claims that the Ashland TSP will serve as the land use and transportation plan that defines how highways and arterials will function in, maintain/and or improve, the existing system over the next 20 years. Appendix D of the TSP includes a sample ordinance to support the access management policy.

Chapter 9 of the TSP identifies Ashland Street (Siskiyou Boulevard to East Main Street) as a needed improvement to best meet the City's existing and future transportation needs. The Ashland Street overcrossing of Interstate 5 is currently substandard for vehicle, bicycle and pedestrian travel. The TSP states that Ashland Street between Siskiyou Boulevard and the interstate overcrossing will need to be upgraded within the next 20 years. Specific recommendations will be determined through a design study conducted within five years of the completed TSP. The TSP also recognizes the need for improving bicycle and pedestrian facilities on an additional 0.2 miles of Ashland Street east of the overcrossing. The 1998 TSP states that this particular overcrossing section should be improved within 6 to 10 years. The 1998 TSP estimates costs for the Interstate 5 overcrossing will be approximately $5,000,000, which is in addition to the estimated $544,000 for the segment between Interstate 5 and East Main Street.

The TSP also identifies a 0.7 mile section of Green Springs Highway (Ashland Street to Crowson Road) as substandard and should be upgraded to urban standards in the "latter 10 years of the TSP."

The installation or replacement of traffic signals to improve traffic operations and safety, as well as providing needed capacity improvements, is also addressed in Chapter 9 of the TSP. Two signals identified at the Ashland Street/ Interstate 5 northbound and southbound ramps locations are recommended to be installed in conjunction with the Interstate 5 overcrossing project to improve both operation and safety for vehicles, bicycles, and pedestrians.

Comprehensive Plans and Zoning Ordinances

OAR 731-015-0065 requires IAMPs to be compatible with the acknowledged comprehensive plans of affected cities and counties.

Jackson County Comprehensive Plan

The Board of Commissioners approved amendments to the Jackson County Comprehensive Plan on January 12, 2004, which became effective March 12, 2004. The Jackson County Comprehensive Plan is the official long-range land use policy document for Jackson County. The plan sets forth general land use planning policies and allocates land uses to resource, residential, commercial and industrial categories. The plan serves as the basis for the coordinated development of physical resources and the development or redevelopment of the county based on physical, social, economic and environmental factors. The comprehensive plan establishes the purpose, map designation criteria, and the basis for determining the appropriate zoning district for each land use.

The Transportation Element provides findings, policies and implantation measures that aim to maintain and improve the County's transportation system.

The most recent County TSP, was adopted March 16, 2005. The IAMP includes an analysis of comprehensive plan designations and land uses. The three land use scenarios evaluate various levels of build-out of vacant and under-utilized land.

Jackson County Land Development Ordinance

The IAMP includes an analysis of zoning designations and land uses. Various levels of build-out of vacant and under-utilized land will be evaluated based on the land development/traffic volume scenario and two Land Use Intensification Scenarios.

City of Ashland Comprehensive Plan

The City of Ashland Comprehensive Plan identifies goals and policies that help guide development within Ashland. Figure 2-1 displays the City of Ashland Comprehensive Plan Map. The majority of the IAMP study area is within the City of Ashland jurisdiction. The IAMP includes an analysis of zoning designations and land uses. The three land use scenarios evaluate various levels of build-out of vacant and under-utilized land. The City of Ashland Comprehensive Plan was adopted by City Council in 1982 with a planning period target date of 2000. The City of Ashland is in the process of developing a work plan for updating the Comprehensive Plan, and has preliminarily targeted FY 08-09 for the update of various elements. The current plan is divided into 13 chapters. Policies within the Chapter 3, Citizen Participation and Involvement, Chapter 4, Environmental Resources, Chapter 10, Transportation System, Chapter 11, Energy, Air, and Water Conservation, and Chapter 12, Urbanization. The plan provides goals and policies for each of these elements as well as overall goals and policies in Chapter 13, Comprehensive Plan Policies and Their Implementation.

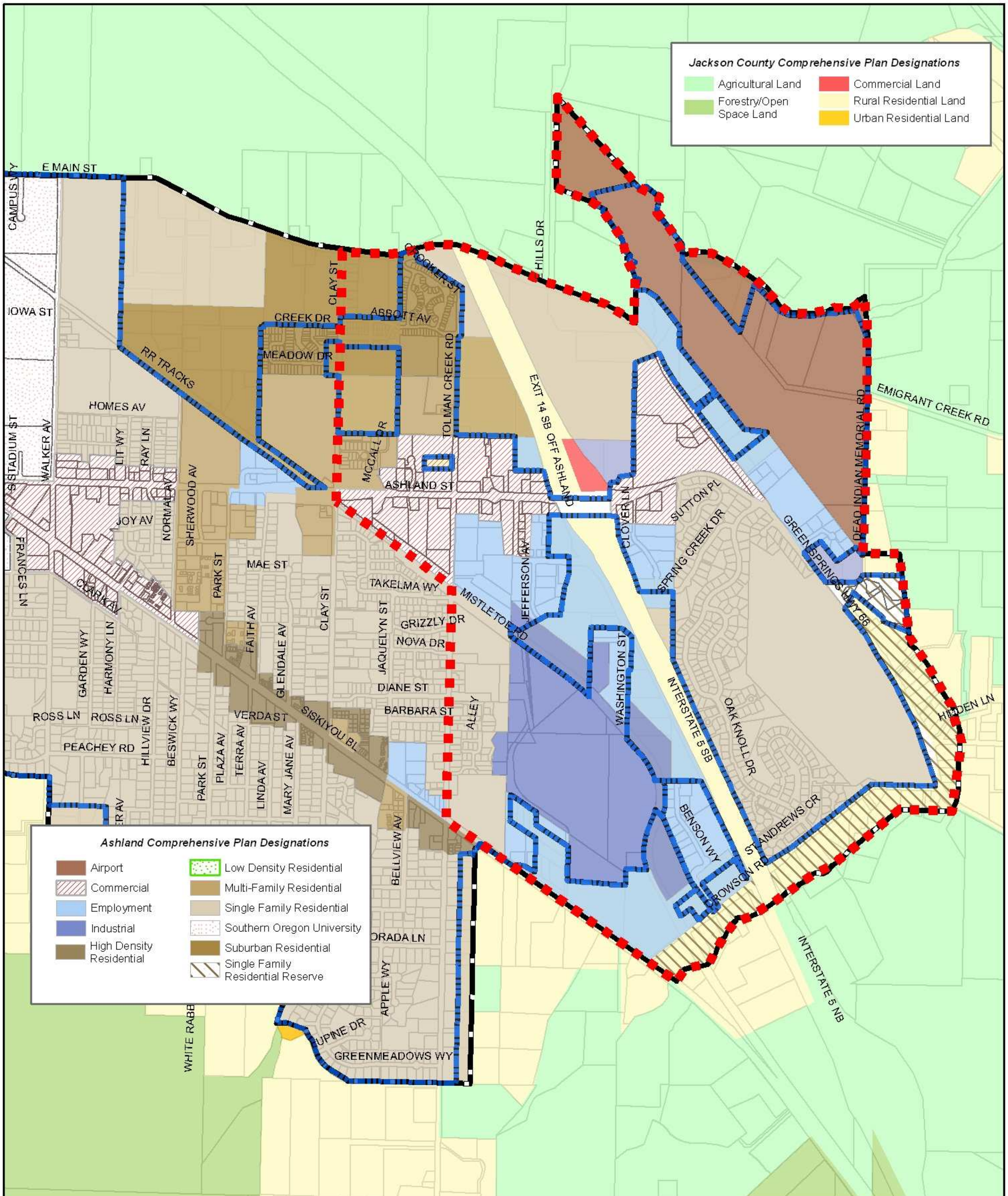


Figure 2-1
Comprehensive Plan Designations

Interchange 14 (Green Springs) Area Management Plan

The Transportation Element (Chapter 10) of the Comprehensive Plan outlines issues related to freeway access and access management. Relevant transportation policies are addressed in the goals, policies, and implementation element. There are sixteen transportation related policies identified in the Transportation Element (Chapter 10) that refer to automobile, street hierarchy and development, public transportation, bicycle transportation, and pedestrian access. It is important to note that Ashland Street is designated as a "boulevard" throughout the Transportation Element. While many of the policies adopted in the Comprehensive Plan apply to the proposed project, the following would be most directly applicable:

Goal: Section 10.03.04 Transportation Element

To Provide all Citizens with Safe and Convenient Transportation While Reinforcing the Recognition of Public Rights-of-Way as Critical Public Spaces.

- Policy 3: Design streets as critical public spaces where creating a comfortable and attractive place that encourages people to walk, bicycle, and socialize and is balanced with building an efficient travel corridor. Design streets with equal attention to all right-of-way users and to promote livability of neighborhoods.
- Policy 7: Design the Land Use Ordinance to ensure Ashland Street is developed as a multi-modal corridor including attractive landscaping, sidewalks, bike lanes and controlled access. Development along Ashland Street shall be compatible with and support a multi-modal orientation.
- Policy 10: When designing and funding facilities, consider all the costs of automobile use compared with using other forms of transportation. These costs include social costs, and air, noise and water pollution.
- Policy 11: Advocate regional land-use patterns that support multi-modal transportation.
- Policy 12: Encourage the use of all modes of travel that contribute to clean air and energy efficiency.
- Policy 14: Develop a process for traffic control management for the systematic treatment of traffic problems in the existing and future street network. Traffic control includes general laws and ordinances, traffic control devices and traffic calming techniques. The process should include a regular inventory of neighborhood traffic problems, at both intersection and other locations on the street, throughout Ashland, and standards to identify conditions, which need attention.
- Policy 15: Develop a process for identifying and addressing areas prone to traffic accidents.
- Policy 16: Maintain carrying capacity, safety and pedestrian, bicycle, public transit and motor vehicle movement on boulevards, avenues and neighborhood collectors through driveway and curb cut consolidation or reduction.
- Policy 17: Direct driveway access onto streets designated as boulevards and avenues should be discouraged whenever an alternative exists or can be made available.

- Policy 18: Require design that combines multiple driveway accesses to a single point in residential and commercial development.
- Policy 26: Consider environmental impacts when developing new street projects. Require new street projects to reduce impact on terrain and natural vegetation.
- Policy 27: Acquire or control parcels of land that may be needed in the future for any transportation purpose when the opportunity arises through sale, donation or land use action.
- Policy 28: Periodically assess the future travel demand and corresponding capacity requirements of street network. Choose a comprehensive transportation system approach to address any capacity insufficiencies that is consistent with the goals, policies and philosophy of the Transportation Element of the Comprehensive Plan.
- Policy 29: Coordinate land use planning with transportation planning. Integrate transportation-related functions that involve several City departments so that the goals, policies and philosophy of the Transportation Element of the Comprehensive Plan are consistently pursued in the transportation project development process.
- Policy 30: Coordinate City transportation planning with county, regional, state and federal plans.
- Policy 31: Coordinate City transportation planning efforts of the adopted Ashland Downtown Plan with the goals and policies of the Transportation Element of the Comprehensive Plan, including the provision of parking lots and parking structures.

Goal: Section 10.06.07 Commercial Freight and Passenger Transportation Goals and Policies

To Provide Efficient and Effective Movement of Goods, Services and Passengers by Air, Rail, Water, Pipeline, and Highway Freight Transportation while Maintaining the High Quality of Life of Ashland.

- Policy 5: Coordinate with county, regional, state and federal jurisdictions to maintain and develop inter-modal hubs, which allow goods and passengers to move from truck or automobile to rail to ship or plane.

The Comprehensive Plan Policies and Their Implementation (Chapter 13) section lists implementation policies related to street conditions, accidents, street dedications and design, access, growth, pedestrians and bikeways, railroads, mass transit, fuel consumption and air pollution and parking. Most policies refer to specific sections of Chapter 18 in the City of Ashland Zoning Ordinance. The following summarizes the overall goal for all the above policies:

Goal: Section 13.10 Transportation

Provide a transportation system which is safe, diversified, cost and environmentally efficient, emphasizes alternative modes of transport, meets the needs of the transportation disadvantaged, and enhances the local economy, scenery and neighborhoods.

The IAMP for Exit 14 includes provisions for multi-modal transportation facilities and address the individual transportation policies relevant to this project. Future transportation projects currently planned and funded in the Comprehensive Plan are listed in Appendix A titled Committed Facilities. Two identified projects most relevant to the IAMP for Exit 14 include:

Sidewalk Installation throughout the City. This project includes design and construction of sidewalk facilities throughout Ashland. The purpose is to provide greater continuity in the sidewalk system.

Ashland Street Redesign. This project includes sidewalk expansion and landscape improvements beginning at the intersection of Siskiyou Boulevard and Ashland Street. The purpose of this project is to increase pedestrian and bicycle use of the area.

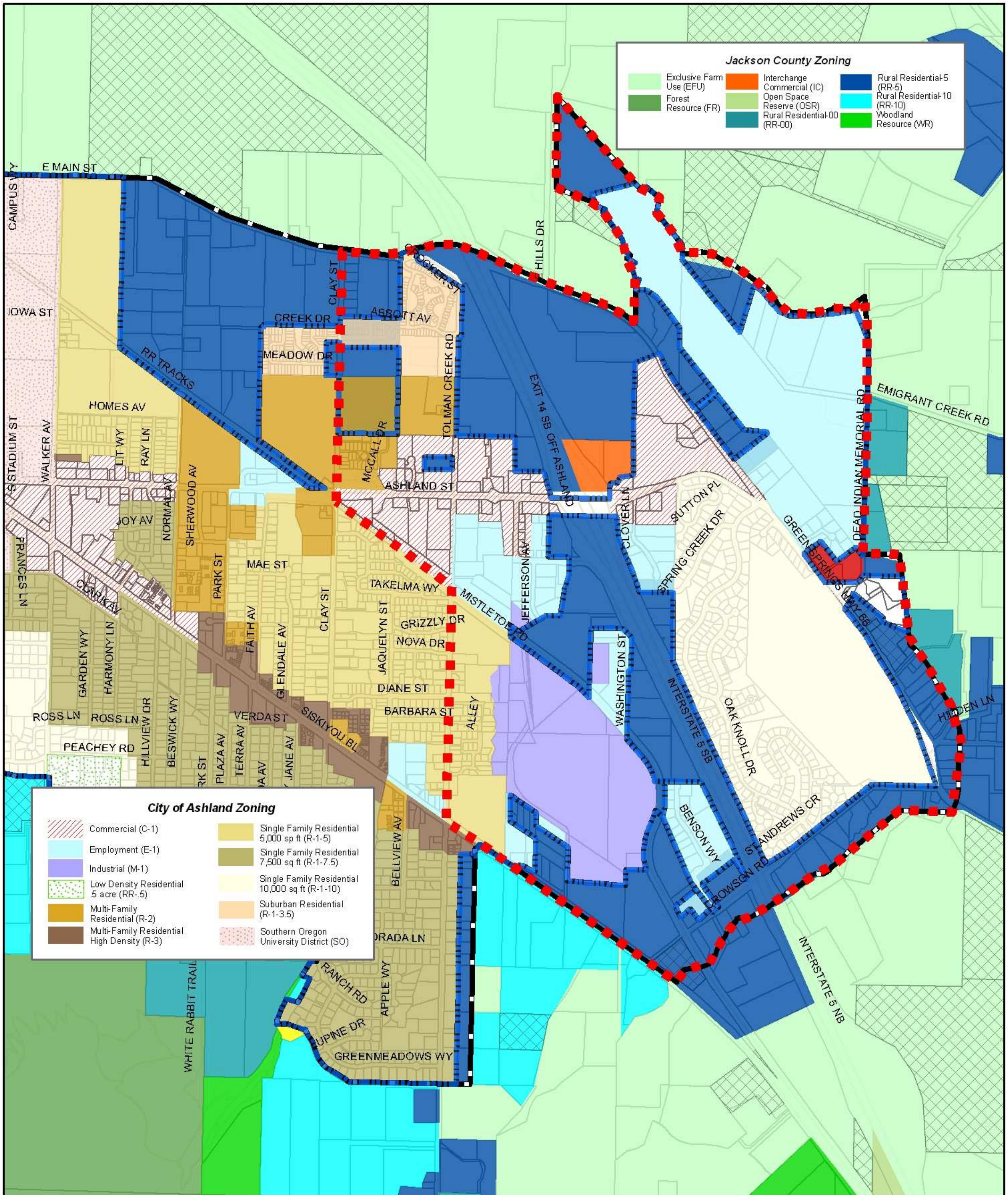
Ashland Land Use Ordinance

The three land use scenarios evaluate various levels of build-out of vacant and under-utilized land. The majority of the IAMP study area is located with the southeastern portion of Ashland's city limits, although pockets of land are outside of the city limits but within the UGB and retain county zoning. Overall, four separate zoning districts are found within the study area and inside of the city limits (see Figure 2-2).

Within the city limits and north of Ashland Street, the zoning district is predominately commercial (C-1). Commercial uses are also located along the portion of the southeast and southwest Interstate 5 corridor that is just south of Ashland Street and within the city limits.

The southwestern portion of the study area that lies between the railroad tracks and Interstate 5 is a mix of employment (E-1) and manufacturing (M-1) zoning. The southeastern portion, between the interstate and the Oak Knoll Golf Course, is a mix of employment (E-1) and residential (R-1-10) zoning.

There are parcels adjacent to Interchange 14 outside the City of Ashland limits, which retain county zoning. A portion just east of Interchange 14 is designated Interchange Commercial (IC) and is discussed under the Jackson County Land Development Ordinance section of the memorandum.



1,000 500 0 1,000 Feet

GIS Data Sources:
City of Ashland and Jackson County

Legend

- IAMP Management Area
- Ashland City Limits
- UGB
- Taxlots
- Measure 37 Cases

Figure 2-2

Zoning

Interchange 14 (Green Springs) Area Management Plan

Ashland Buildable Lands Inventory

By inventorying vacant and underdeveloped (partially vacant) properties, a community can determine whether an adequate supply of buildable land exists within their Urban Growth Boundary (UGB). In 2005, The City of Ashland updated their Buildable Lands Inventory (BLI) using the 1999 and 2000 data bases as primary references. A Buildable Lands Inventory Map is also available at the City's website. The Ashland BLI is divided into two components, a land component and housing needs analysis. Assuming development continues at the average density that has recently occurred in Ashland, the land component involves assessing whether the UGB contains enough land to satisfy Ashland's 20 year housing need. Through an analysis of past development trends, population projections, and local demographic information, the housing needs analysis can estimate the quantity and types of housing units likely to be needed within the planning period.

In addition to the data base information, permit data was collected, aerial photos, and the City of Ashland Geographic Information System were used to closely examine properties remaining as available to identify physical constraints to development.. The analysis indicates that within the UGB, but outside the City limits, there exists a considerable amount of buildable land that is not currently zoned to urban densities. There is approximately 580 net acres of land within Ashland's UGB that is considered buildable. There is only 338 acres within the City limits that is currently available.

A comprehensive housing needs analysis or a projection of needed housing types was not conducted at the time the 2005 Ashland BLI was completed. However, the Ashland BLI notes that together the Buildable Lands Inventory and housing needs projection can be useful tools in evaluating the appropriate distribution of units by housing type. The document concludes by highlighting how with this information, policy decisions necessary to equate the percentage of units by housing type with the limited amount of land available and zoned appropriately to satisfy that need, are possible.

Other Plans

Ashland Capital Improvement Plan (2007-2012)

The City of Ashland's Capital Improvement Plan (CIP) for identified projects from 2007 to 2012 is included in the city's 2006-2007 Budget. There is one transportation/public safety improvement project identified in the CIP located near the IAMP study area for Interchange 14. This project is titled the Clay Street Local Improvement District and is located on Clay Street north of Siskiyou Boulevard. This area is located approximately a half-mile west of Interchange 14 and would address improvements between Siskiyou Boulevard and Ashland Street. This area is currently under the jurisdiction of Jackson County. Improvements would include construction of curb and gutters, paving, sidewalks on both sides, parking bays, storm drainage facilities and traffic calming features. Improvement of this street to full City of Ashland standards would require a transfer of jurisdiction requiring the City of Ashland to maintain this section.

Ashland System Development Charges (SDCs)

The purpose of the SDC is to impose an equitable share of the public costs of capital improvements upon those developments that create the need for or increase the demands on capital improvements. A Transportation SDC is collected to help pay for growth related to improvements related to the transportation network within the City of Ashland urban area. In Ashland, the Transportation SDC is based on the land use category for each individual project. The figure is calculated by multiplying the average vehicle trips count for each use category by the local trip cost. Local trip cost is based on the Ashland Transportation System Plan (TSP) and is charged only for the creation of new units within residential, institutional, and business/commercial, office, and industrial categories.

Interstate 5 State of the Interstate Report

The Interstate 5 State of the Interstate Report (2000) describes the existing and forecasted operating, geometric, safety, and physical conditions for the Interstate 5 mainline and interchanges within Oregon. The existing Green Springs Interchange 14 is located in rolling terrain and was originally configured as a standard diamond-type interchange in the middle of three interchanges that serve Ashland.

The State of the Interstate Report does not provide information on geometric or safety conditions as a geometric assessment was not conducted for vehicle crash data collected at the Green Springs Interchange for the 2000 study.

The State of the Interstate Report states that during peak hours, the southbound on-ramp carries about 100 vehicles and the northbound off-ramp carries about 60 vehicles.

The report notes that the northbound on-ramp serves almost 600 vehicles, while the southbound off-ramp serves about 500 vehicles during the PM peak hour. These volumes are somewhat lower than the traffic volumes collected in 2006. Both ramp terminals are currently unsignalized. According to Interstate Report, the stop sign-controlled left turns from the southbound off-ramp are approaching congestion, with a peak hour volume-to-capacity (v/c) ratio of 0.80. Recent analysis associated with the IAMP effort indicates that the peak hour v/c is closer to 1.00 for this approach.

The structure was evaluated as a part of the *Interstate 5 State of the Interstate Report* and found that the structure has a sufficiency rating of 64.0. Anything above a sufficiency rating of 80 precludes the structure for rehabilitation. The rating also indicates that several features of the structure are deficient or becoming deficient, which should be addressed within the planning horizon.

The 1997 ODOT Pavement Condition Report classifies the highway segment between mile point 11.3 and 20 as having a fair conditions rating, which indicates: a generally stable pavement with moderate cracking, minor areas of structural weakness, and acceptable ride quality. According to the Interstate Report, action may be needed to ensure the highway segment does not fall below the fair category.

Traffic Analysis Report Interstate 5 Interchanges 14 and 19

This report focuses on the design of the bridges, ramp terminals, and roadway sections immediately adjacent to the interchange. The purpose of the TAR is: 1) to provide the Oregon Department of Transportation (ODOT) and the Oregon Bridge Delivery Partners (ODBP) with adequate safety and operations analysis information to select appropriate bridge improvements for the Bundle #314 projects, and 2) for subsequent use in the IAMP projects at the Green Springs and North Ashland Interchanges.

This report provides an inventory of existing roadways, provides existing and future traffic operations analyses, safety analysis, and evaluates several build options at each interchange designed to address existing or projected transportation needs.

Traffic Impact Study Clay Street Residential Complex

The 2004 traffic impact study analyzed the potential traffic impacts from a proposed mixed-use residential development off of Clay Street. The development includes 26 single family dwelling units, 48 duplex units, and 56 four-plex units. Access to the site is from E. Main Street to the north, Ashland Street to the south, and Abbott Ave. to the east. The four intersections within the study area near the site include the following:

- East Main Street and Clay Street
- Ashland Street (OR 66) and Clay Street
- Abbott Ave. and Tolman Creek Road
- Ashland Street (OR 66) and Tolman Creek Road.

Analysis indicates that three of the four study area intersections will meet applicable mobility standards given year 2004 traffic volumes and will continue to meet the standards in the year 2024 with the project. The study recommends the construction of a right turn only lane for southbound Clay Street at Ashland Street. This improvement should keep the year 2024 P.M. peak hour operating conditions at the year 2006 “No Build” level which is level of service “E”. After checking the projected traffic conditions in the year 2024 indicate that a traffic signal at this location is not warranted.

3. SUMMARY OF EXISTING CONDITION ANALYSES

This section provides a summary of existing traffic operations analysis findings related to I-5 Interchange 14 (Green Springs Interchange). Analysis of existing and future conditions was originally conducted for the *Traffic Analysis Report* (TAR) for I-5 Interchanges 14 and 19 (Green Springs and North Ashland Interchanges), dated August 22, 2006. This IAMP effort focuses specifically on Interchange 14. A separate IAMP addressing Interchange 19 was prepared concurrently with the Interchange 14 IAMP project.

Although the TAR analyzed future traffic operations, this section reviews only the sections of the TAR pertaining to existing conditions. The analysis performed for this IAMP project developed revised future traffic volume projections that were based on a new regional travel demand model. This memorandum also provides an inventory of existing roadways and safety analyses presented in the TAR.

Analysis Area

The Green Springs Interchange consists of a standard diamond interchange in the southeastern area of Ashland. Ashland Street (OR 66, Green Springs Highway) is the cross street, which connects with OR 99 (Siskiyou Boulevard) approximately one mile to the west. An inventory of analysis area roadways is presented in Table 3-1 and lane configurations are illustrated in Figure 3-1.

The existing interchange comprises a two lane bridge (OR 66) over I-5 with unsignalized ramp terminals at both ends. The bridge and ramps are functionally obsolete to serve long-range transportation needs.

The Green Springs Interchange analysis area stretches along OR 66 between its intersections with Tolman Creek Road and Oak Knoll Drive/East Main Street. The overall length of this roadway segment is close to one mile and is characterized by suburban commercial development with multiple closely-spaced private accesses.

Traffic Counts

Traffic counts, conducted on May 16, 2006, consisted of 16-hour and 3-hour AM and PM peak period counts at analysis area intersections, and a 24-hour count on the I-5 mainline. The counts included full FHWA 13-class vehicle classifications. Table 3-2 below provides a list of all intersection count locations including the count type.

Traffic volumes are typically subject to seasonal variation. Therefore, the traffic counts conducted in May needed to be seasonally adjusted to roughly correspond to traffic volumes that are seen in the peak month, which is typically July or August. The ODOT Transportation Planning Analysis Unit (TPAU) has developed procedures to convert traffic volumes taken at any time of the year to peak month volumes. The TAR employed the TPAU methodology to adjust the May 2006 volumes. Year 2006 seasonally adjusted PM peak hour volumes are shown in Figure 3-2.

Table 3-1. Analysis Area Roadway Inventory

Roadway/ Highway Name	Jurisdiction	ODOT Functional Classification	City Functional Classification	Posted Speed	No. of Lanes	Operational Standard (V/C Ratio)		
						OHP[1]	HDM[2]	City[4]
I-5 (Pacific Highway No. 1)	ODOT	Interstate Hwy, NHS, FR[5]	-	65	4	0.80	0.75	-
I-5 Ramp terminal Intersections	ODOT	Interstate Hwy, NHS, FR[5]	-	-	1	0.85	0.75	-
Ashland Street (OR 66, Green Springs Highway)	ODOT	District Hwy	Boulevard	35	2,3,5[3]	0.90	0.85	0.90
Tolman Creek Road	City of Ashland	-	Avenue	30	2	-	-	0.90
Washington Street	City of Ashland	-	Neighborhood Collector	25	2	-	-	0.90
Clover Lane	City of Ashland	-	Local Street	-	2	-	-	0.90
Oak Knoll Drive	City of Ashland	-	Avenue	-	2	-	-	0.90
East Main Street	City of Ashland	-	Avenue	-	2	-	-	0.90

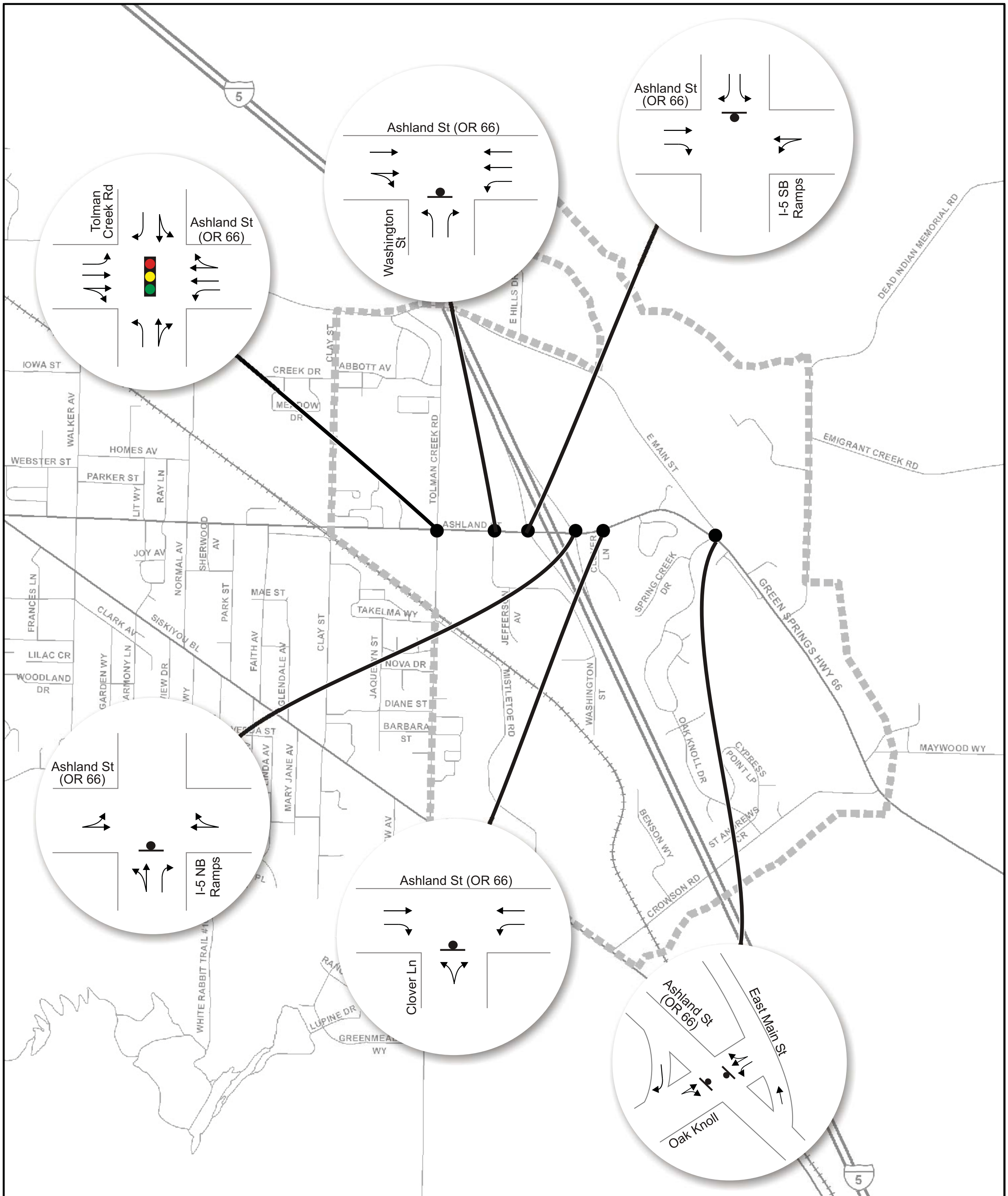
Notes:

1. 1999 Oregon Highway Plan (OHP), Table 6. Standards apply to planning and design projects of existing and no-build conditions through the planning horizon (2030).
2. 2003 Highway Design Manual (HDM), Table 10-1. Standards apply to planning and project design projects of build conditions through the planning horizon (2030).
3. Five lanes west of I-5, 3 lanes between I-5 and Sutton Place, 2 lanes on I-5 overcrossing and between Sutton Place and Oak Knoll Drive/East Main Street
4. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT standards for intersections with State highways within the City. OHP District Highway mobility standard is shown.
5. NHS: National Highway System; FR: Freight Route

Table 3-2. Intersection Turning Movement Count Locations and Types

Location	Type of Count
I-5 mainline, both directions, North of Green Springs Interchange	24 hour
OR 66 (Ashland Street) at Tolman Creek Road	16-hour (6 AM – 10 PM)
Ashland Street at Washington Street	3-hour AM and PM
Green Springs Interchange 14: Southbound Ramps at Ashland Street	16-hour (6 AM – 10 PM)
Green Springs Interchange 14: Northbound Ramps at Ashland Street	16-hour (6 AM – 10 PM)
Ashland Street at Clover Lane	3-hour AM and PM
Ashland Street at Main Street / Oak Knoll Drive	3-hour AM and PM

Note: All 16-hour and 3-hour counts conducted May 16, 2006. 24-hour I-5 mainline count conducted from 22:00 May 15 to 22:00 May 16, 2006.



1,200 600 0 1,200
Feet

GIS Data Sources:
City of Ashland and Jackson County

Legend

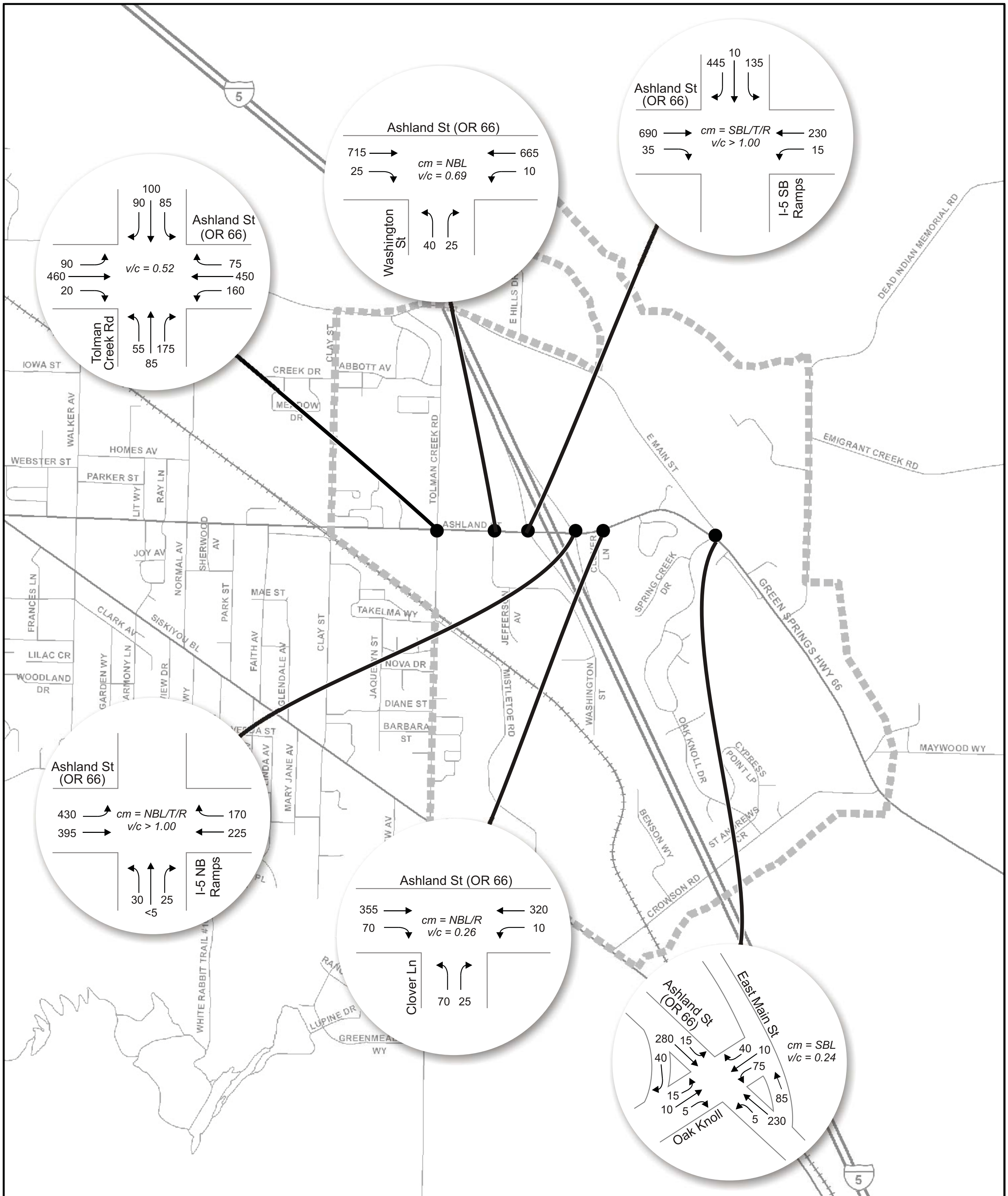
IAMP Management Area

Traffic Signal

Stop Sign

Figure 3-1
Existing Lane Configurations and Traffic Control Devices

Interchange 14 (Green Springs) Area Management Plan



1,200 600 0 1,200 Feet	**Legend**	**Figure 3-2**
GIS Data Sources: *City of Ashland and Jackson County*	IAMP Management Area	*Existing (2006) PM Peak Hour Traffic Volumes and Intersection Operations*
	cm = Critical Movement (stop controlled intersections) v/c = Intersection Volume Capacity (signalized intersections) Critical Movement Volume to Capacity (stop controlled intersections)	**Interchange 14 (Green Springs) Area Management Plan**

Existing Traffic Operations

Intersection Analyses

Table 3-3 summarizes the results for all analysis area intersections and also presents agency operational standards to enable comparison with intersection results. Table 3-4 summarizes queuing on critical approach legs at the same intersections. Critical movements at unsignalized intersections are typically the minor street left turns or, in the case of single-lane approaches, the minor street approaches. These movements are required to yield to all other movements at the intersection and thus are subject to the longest delays and have least capacity. Left turns from the major street are also subject to delays since motorists making these maneuvers must also yield to on-coming major street traffic.

Table 3-3. Existing (Year 2006) PM Peak Hour Traffic Operations Analysis Results

Intersection	Critical Movement	V/C Ratio	LOS	Operational Standard (V/C Ratio)		
				OHP[1]	HDM[2]	City[3]
Ashland St (OR 66) & Tolman Creek Rd	n/a[4]	0.52	C	0.90	0.85	0.90
Ashland St (OR 66) & Washington St	NBL	0.69	C	0.90	0.85	0.90
Ashland St (OR 66) & I-5 SB Ramps	SBL/T/R	>1.00	F	0.85	0.75	-
Ashland St (OR 66) & I-5 NB Ramps	NBL/T/R	>1.00	F	0.85	0.75	-
Ashland St (OR 66) & Clover Lane	NBL/R	0.26	A	0.90	0.85	0.90
Ashland St (OR 66) & E. Main/Oak Knoll	SBL[5]	0.24	B	0.90	0.85	0.90

Notes:

1. 1999 Oregon Highway Plan Mobility Standards (Table 6).
2. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1)
3. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT standards for intersections with State highways within the City. OHP District Highway mobility standard is shown.
4. Signalized intersection. LOS and v/c are for overall intersection.

Under seasonally adjusted volume conditions, analysis shows that critical v/c ratios at both ramp terminal intersections exceed mobility standards and also that demand exceeds available capacity. Queuing on both exit ramps, and especially the southbound ramp, is significant because of limited gaps on Ashland Street for left turning vehicles, combined with substantial right-turning volumes from the southbound exit ramp. The 95^{th} percentile queue on the southbound exit ramp is calculated to extend into the deceleration area of the ramp. Left turning vehicles from eastbound Ashland Street to the northbound I-5 entrance ramp are delayed because of conflicts with high westbound through volumes. These delays result in queuing over the bridge that is calculated to spill over into the southbound ramp terminal intersection.

Table 3-4. Existing (Year 2006) PM Peak Hour 95th Percentile Queues

Intersection	Movement	95% Queue
Ashland St (OR 66) & Tolman Creek Rd	EBL	125
	WBL	150[1]
	NBL	100[1]
	SBL	100[1]
Ashland St (OR 66) & Washington St	WBL	25
	NBL	75[1]
Ashland St (OR 66) & I-5 SB Ramps	WBL/T	50
	SBL/T/R	675[2]
Ashland St (OR 66) & I-5 NB Ramps	EBL/T	600[3]
	NBL/T/R	375
Ashland St (OR 66) & Clover Ln	WBL/T	50
	NBL/R	75
Ashland St (OR 66) & E. Main/Oak Knoll	NBL/T/R	50
	SBL	75[1]

Notes:
1. Storage bay at or above capacity.
2. Queue extends into ramp deceleration area.
3. Queue extends into adjacent intersection(s)

It should be noted that it is impossible to *measure* existing intersection operating conditions at a v/c of greater than 1.00, even though Table 3-3 appears to indicate otherwise. Volume to capacity ratios in excess of 1.00 cannot occur, but rather represent conditions where demand exceeds capacity. For existing conditions, v/c ratios in excess of 1.00 result from the application of seasonal adjustment factors to existing volumes. The v/c ratios greater than 1.00 shown in Table 3-3 resulted from analysis based on seasonally adjusted volumes.

Freeway Ramp Merge/Diverge Analysis

Analyses were conducted for each of the merge and diverge segments for the entrance and exit ramps at the interchange under existing 30th highest hour traffic volume conditions. The analyses showed that traffic operations at each of the ramp merge and diverge sections meet the OHP mobility standard for interstate freeways.

Safety Analysis

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

The safety analysis included a review of crash history data supplied by the ODOT Crash Analysis and Reporting Unit for the period between January 1, 2002 and December 31, 2004, which were the three most recent full years for which crash data was available at the time. The analysis also examined ODOT Safety Priority Index System (SPIS) data and compared calculated crash rates from analysis area roadways with statewide averages.

Overall, analysis found no apparent crash patterns at any of the study area intersections or freeway segments, and no single intersection demonstrated a significant safety problem. However, taken together, the crashes on Ashland Street between the I-5 northbound and southbound ramps warranted a SPIS score ranking in the top 10% statewide. Eleven crashes were reported during the three-year study period on Ashland Street between Clover Lane and the I-5 southbound ramps. These crashes resulted in six injuries. The primary types of crashes documented along this segment were turning and rear end. Rear end crashes are often caused by driver inattention in congested conditions, while the turning crashes may be a symptom of drivers accepting small gaps at unsignalized intersections.

The TAR identified three actions that could contribute to greater nominal safety along the Ashland Street corridor:

- Installation of traffic signals at the ramp terminals
- Consolidation or elimination of access points in the vicinity of the ramp terminals
- Geometric improvements to roadway associated with construction of new interchange overcrossing of I-5 at Ashland Street.

Future Conditions

The TAR provided traffic operations analysis of interchange area roadways for no-build and various build alternatives under future traffic conditions: 2010 year of build and 2030 plan horizon year. The analysis was prepared prior to completion of the new Rogue Valley MPO Transportation Demand Model (RVMPO model), which did not include data for the Ashland area. Consequently, future traffic volumes were developed using a TPAU-approved methodology that involved determination of growth factors based on historical growth. In the intervening months, the RVMPO model has come online. Therefore, the analysis performed for this IAMP and discussed in the following section used revised future traffic volume projections based on the projected population, household and employment data used in the RVMPO model.

Access Management

The TAR provided an assessment of existing public and private accesses along Ashland Street within the interchange influence area, as well as a review of access management standards as listed in the 1999 Oregon Highway Plan (OHP).

According to the OHP Table 16: Minimum spacing standards applicable to freeway interchanges with two-lane crossroads specifies the following minimums for fully developed urban area type:

- 750 feet distance to the first approach on the right; right in/right out;
- 1320 feet distance to the first intersection where left turns are allowed; and
- 750 feet distance between the last right in/right out approach and the start of taper for the entrance ramp.

The TAR noted, however, that increasing the number of lanes on Ashland Street over I-5 may cause stricter spacing standards to apply. OHP Table 17: Minimum spacing standards applicable to freeway interchanges with multi-lane crossroads specifies a longer distance (990 feet, instead of 750 feet) as the minimum distance between the last approach road and the start of the taper for the entrance ramp.

The TAR listed the following non-conforming accesses in the vicinity of Green Springs Interchange 14:

- The intersection of Tolman Creek Road is less than 1320 feet from the southbound ramp terminal. The distance is estimated to be approximately 1100 feet.
- The intersection of Washington Street is less than 1320 feet from the southbound ramp terminal. The distance is estimated to be approximately 350 feet.
- The intersection of Clover Lane is less than 1320 feet from the northbound ramp terminal. The distance is estimated to be approximately 250 feet.
- The intersection of Sutton Place is less than 1320 feet from the northbound ramp terminal. The distance is estimated to be approximately 750 feet.
- Driveways serving high-volume commercial establishments on both sides of Ashland Street to the east and west of I-5 are less than 1320 feet from the ramp terminals.

No determination was made as to which public and private approaches have valid access permits.

Specific access management actions are identified in Section 6 of the IAMP.

Bicycle and Pedestrian Facilities

The TAR provided a discussion of the provision of pedestrian and bicycle facilities as a component of the interchange improvement project. This section provides a summary of this discussion.

Oregon Revised Statues (ORS) govern the provision of bicycle and pedestrian facilities. ORS 366.514 (Use of highway fund for footpaths and bicycle trails) specifies, in part, that "…reasonable amounts shall be expended as necessary to provide footpaths and bicycle trails, including curb cuts or ramps as part of the project. Footpaths and bicycle trails, including curb cuts or ramps as part of the project, shall be provided wherever a highway, road or street is being constructed, reconstructed or relocated."

ORS 366.514 does provide for exceptions. ORS 366.514 (2) states:

> "Footpaths and trails are not required to be established under subsection (1) of this section:
>
> (a) Where the establishment of such paths and trails would be contrary to public safety;

(b) If the cost of establishing such paths and trails would be excessively disproportionate to the need or probable use; or

(c) Where sparsity of population, other available ways or other factors indicate an absence of any need for such paths and trails."

There are numerous examples of interchanges being designed with specific facilities for pedestrians and bicyclists. The South Medford Interchange, which is scheduled for construction during 2006 through 2010, is one example near Ashland. No evidence has been presented to suggest that improvements designed to accommodate pedestrians and bicyclists at the Green Springs Interchange would be contrary to public safety.

The cost of providing bicycle and pedestrian facilities was not estimated. The cost of building the project without bicycle and pedestrian facilities also was not estimated. Such cost estimates were beyond the scope of the TAR, so no judgment was made as to whether the cost of providing such facilities would be "excessively disproportionate."

The Ashland area is well known for outdoor activities, including bicycling and walking. Additionally, the TSP and Comprehensive Plan emphasize that the transportation system should accommodate all travel modes, including walking and biking. Pedestrian and bike facilities are located along Ashland Street on both sides of the interchange. The narrow roadway width on the interchange overcrossing roadway presents a significant barrier to use by pedestrians and cyclists. The TAR noted that it would be unlikely that the "absence of any need" criterion could be met to justify elimination of facilities for bicyclists and pedestrians at the interchange.

ODOT's usual signal plans provide for preformed detector loops in bicycle lanes and pushbuttons for actuation by pedestrians. The design for the South Medford Interchange used these features. Low volumes of bicycle and pedestrian activity during the peak hour are unlikely to have any measurable impact on traffic signal operations when actuated signals are used. Actuation by pedestrians may cause more time to be given to a particular movement than would be required for the vehicles for that cycle. Pedestrians and bicyclists may also cause motorists to be delayed when making certain turning movements, such as right turns. Potential conflicts between motorists and pedestrians and bicyclists were judged to be so low at both intersections that no adjustments were considered in the TAR when evaluating peak hour traffic operations.

4. INTERCHANGE ALTERNATIVES AND FUTURE YEAR TRAFFIC ANALYSIS

This section presents analysis of traffic conditions of seven interchange configurations, including no-build, under year 2010 and 2030 conditions. To gauge the potential consequences of rapid development in excess of what is planned for in the regional travel demand model; two land use intensification scenarios were developed. The results of the analysis of these scenarios are presented below.

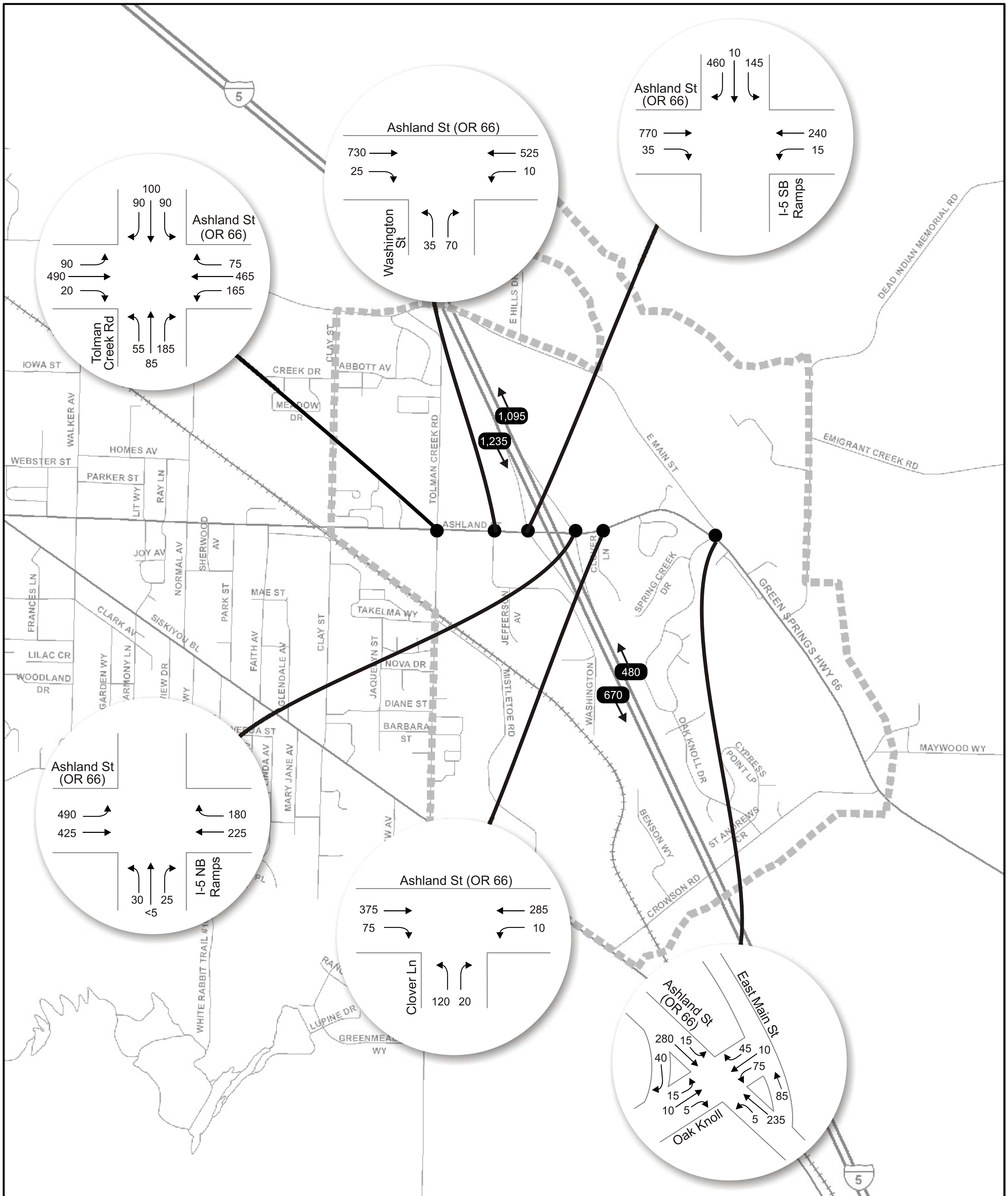
Future Traffic Volume Development

Baseline Traffic Growth

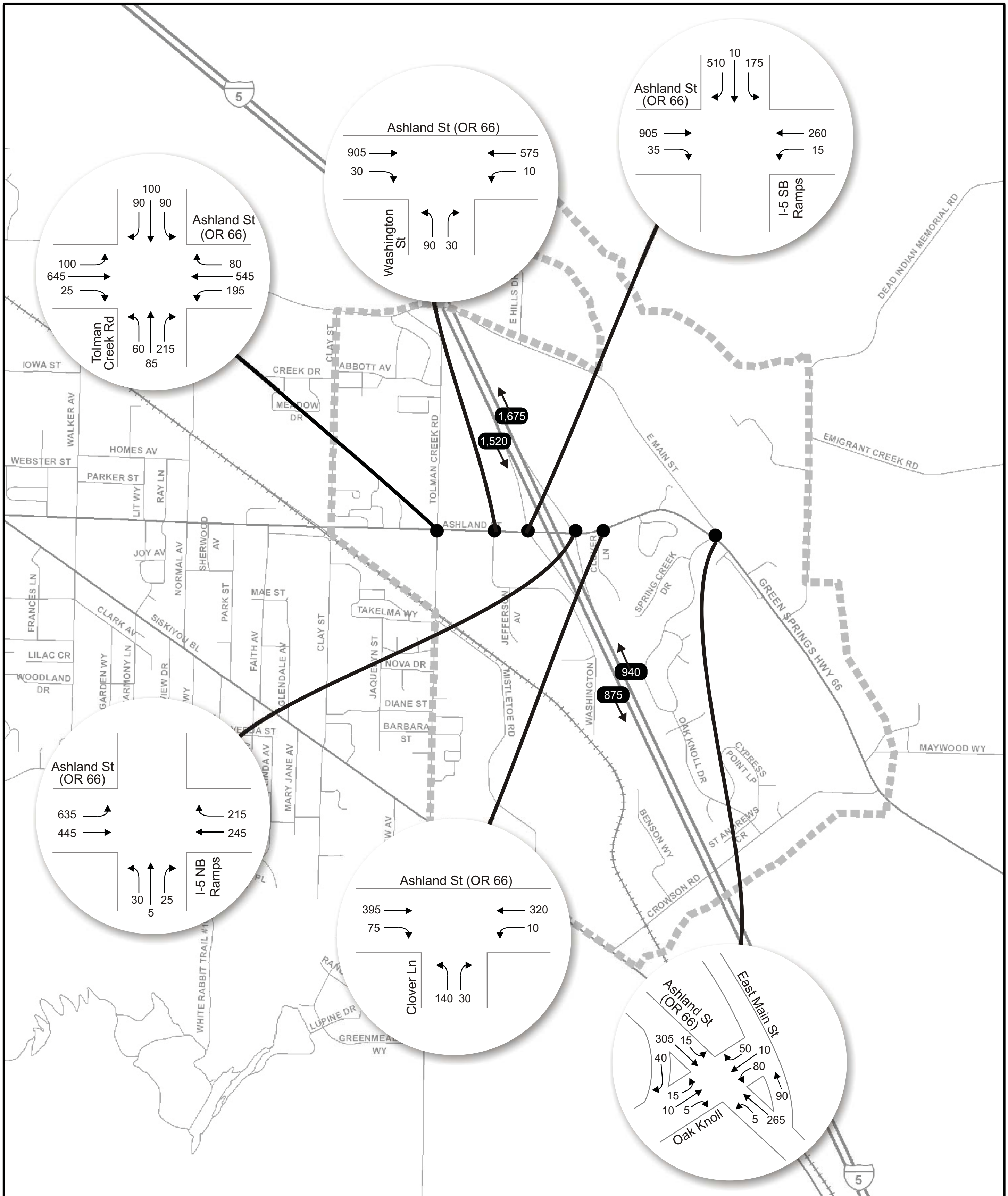
The Rogue Valley Travel Demand Model (RVMPO model) was used to determine future traffic volumes in the interchange 14 study area. Traffic volumes and traffic analysis based on RVMPO model data is referred to as the Baseline scenario, and it will form the basis of design decisions for the future interchange.

The 2006 Traffic Analysis Report for Interchanges 14 and 19 (TAR) was prepared prior to the completion of the RVMPO model, and the future growth rate was based on historical traffic volumes on area highway facilities. This methodology resulted in an average annual growth rate (AAGR) for traffic volumes of 2.1% that was applied to all movements at all intersections.

The now-complete RVMPO model provides greater precision because future vehicle trips are based on existing and projected population, household and employment by zone as well as network attributes and driver behavior, rather than a blanket growth rate such as that used in the TAR. Therefore, the trip distribution from a travel demand model is often more representative of actual conditions. However, in this case the model traffic growth rates are lower than what was predicted in the 2006 TAR. Year 2010 and 2030 Baseline traffic volumes are shown in Figure 4-1 and Figure 4-2, respectively. The figures show a volume imbalance in the westbound direction between Washington Street and Tolman Creek Road. This imbalance reflects the May 2006 traffic counts and is presumed to be associated with a series of driveways on the north side of Ashland Street.



1,200 600 0 1,200 Feet GIS Data Sources: *City of Ashland and Jackson County*	**Legend** IAMP Management Area	**Figure 4-1** *2010 Baseline Land Use* *PM Peak Hour Traffic Volumes* **Interchange 14 (Green Springs) Area Management Plan**



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GIS Data Sources:
City of Ashland and Jackson County

Legend

IAMP Management Area

Figure 4-2
2030 Baseline Land Use
PM Peak Hour Traffic Volumes

Interchange 14 (Green Springs)
Area Management Plan

Land Use Intensification Scenario Rationale

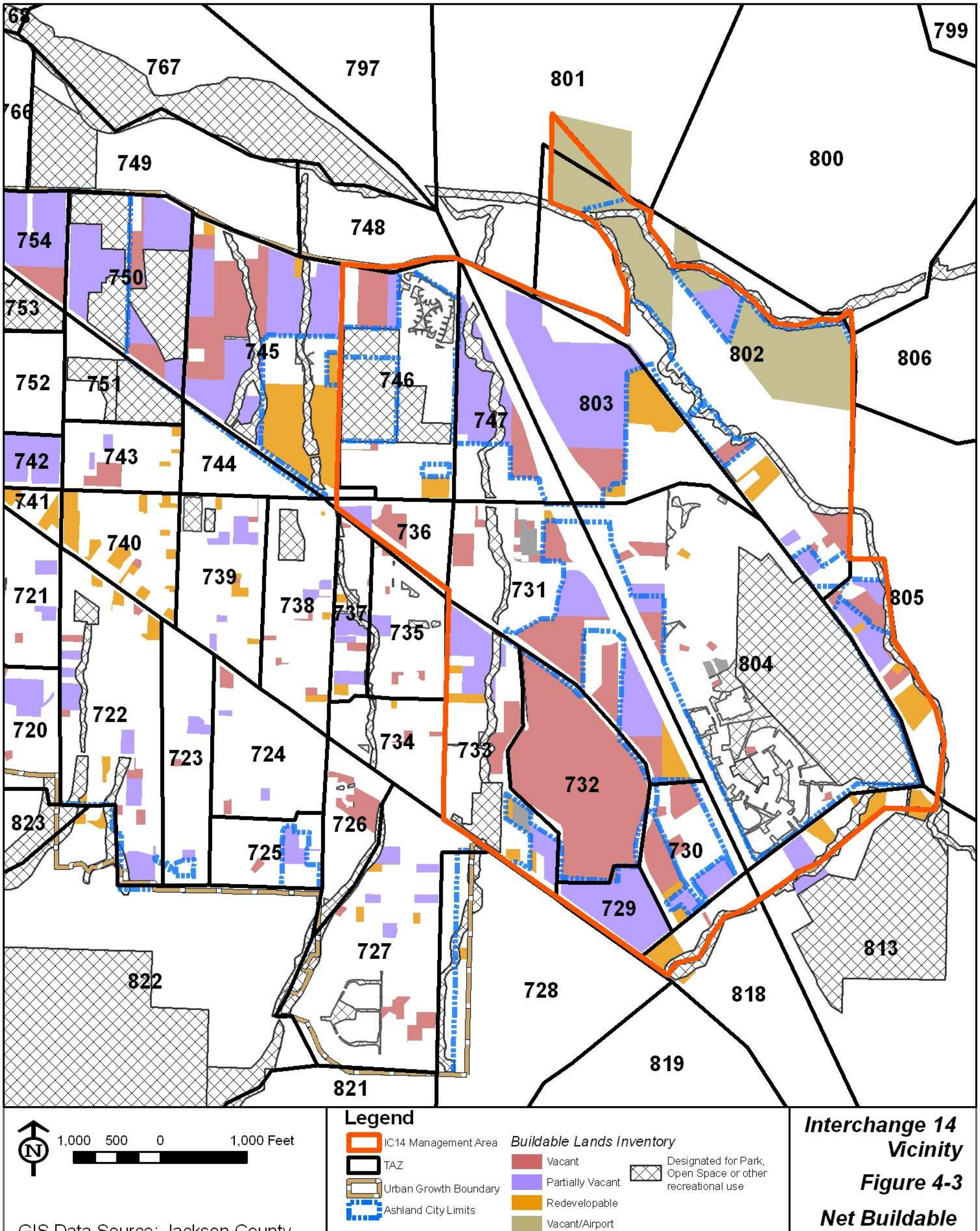
In addition to the Baseline land development/traffic volume scenario, two Land Use Intensification Scenarios were developed for the purpose of evaluating the impacts of potential future development in excess of that predicted by the RVMPO model. Both Land Use Intensification Scenarios reflect highly generalized assumptions about future land development. They are intended to be used only as a basis for evaluation of various potential management measures, which could include local system improvements, access management, transportation system management measures, transportation demand management measures, or land use and development actions. Potential management measures are discussed in greater detail in Sections 5 and 6.

Land Use Intensification Scenario #1

Land Use Intensification Scenario #1 assumes that remaining available buildable land within the Interchange 14 study area is fully built to the maximum allowable intensity designated in the Ashland Comprehensive Plan and the Buildable Lands Inventory. For the purposes of this study, the analysis focuses on transportation analysis zones (TAZ) within the study area that have the majority of buildable acres. Figure 4-3 shows TAZ boundaries overlaid on the City of Ashland Buildable Lands Inventory Map. Vacant land that is designated as parks and open spaces is shown with a cross-hatched pattern. This land area is assumed to remain vacant through the year 2030 horizon year.

After accounting for parks and open space land, six TAZs were identified as containing the greatest amount of remaining buildable sites: 731, 732, 745, 747, 803, and 804. As Figure 2-1 from Section 2 indicates, within the targeted TAZs there are three primary employment-based land designations: Commercial, Employment, and Industrial; and three household based land designations: Single Family, Suburban Residential, and Multi-Family Residential.

Total acreages within the three employment-based and three household-based land uses were then calculated. Assumed employment densities (employees/acre) are based on the *Ashland Economic Opportunities Analysis* report by ECONorthwest whereas residential densities (dwelling unit/acre) are based on the *Buildable Lands Inventory, City of Ashland 2005.* The resulting employment and household projections are displayed in Table 4-1 and Table 4-2. In both tables, column 'C' shows the total additional employees and households in excess of those assumed in the RVMPO transportation demand model.



Interchange 14 Vicinity

Figure 4-3

Net Buildable Lands

Interchange 14 Area Management Plan

Table 4-1. Land Use Intensification Scenario #1: Employment Growth

TAZ	Commercial		Employment		Industrial		(A) RVMPO Model Employment Growth 2002-2030	(B) Intensified Employment Growth 2002-2030	(C) Difference (B-A)
	Assumed Density (Employees/Acre) *								
	15.7		9.2		12.1				
	Buildable Acres	Employ-ment	Buildable Acres	Employ-ment	Buildable Acres	Employ-ment			
747	0.0	0	2.2	20	0.0	0	17	20	3
803	8.2	129	5.1	47	0.0	0	65	176	111
804	0.0	0	6.6	61	0.0	0	20	61	41
731	1.3	20	24.3	224	6.3	76	155	320	165
732	0.0	0	0.0	0	58.8	711	104	711	607
Total		**149**		**351**		**788**	**361**	**1,288**	**927**

* Employment Density by Plan Designation. Based on *Ashland Economic Opportunities Analysis* by ECONorthwest, Ashland

Table 4-2. Land Use Intensification Scenario #1: Household Growth

TAZ	Single Family		Suburban		Multi-Family		(A) RVMPO Model HH Growth 2002-2030	(B) Intensified HH Growth 2002-2030	(C) Difference (B-A)
	Assumed Density (Dwelling Units/Acre) *								
	5.0		7.0		10.0				
	Buildable Acres	New & Redev. HHs	Buildable Acres	New & Redev. HHs	Buildable Acres	New & Redev. HHs			
745	19.9	100	39.3	275	20.3	203	135	578	443
747	3.0	15	0.0	0	15.3	153	55	168	113
803	34.3	172	0.0	0	0.0	0	40	172	132
Total		**286**		**275**		**356**	**230**	**917**	**687**

* Assumptions based on Buildable Lands Inventory, City of Ashland 2005

Additional PM peak hour trips were determined based on average trip rates from *ITE Trip Generation* for each land use type as follows:

Industrial. The average PM peak hour trip generation from lands with the Industrial designation was calculated to be 0.43 trips per employee. This rate is based on average trip rates for the General Light Industrial, Industrial Park, Manufacturing and Warehousing uses.

Commercial. The Commercial designation was assumed to consist of 50% retail and 50% service uses, resulting in an average PM peak hour trip rate of 3.41 trips per employee.

Employment. The average trip rate was calculated to be 1.10 per employee for the array of land uses within the Employment designation. For this study, the Employment designation was assumed to consist of 15% lodging, 60% office and 25% retail uses.

Households. Average PM peak hour trip rates were applied to additional households using 1.02 trips per household for Single Family and Suburban Residential and 0.52 trips per household for Multi-Family Residential. These are the *ITE Trip Generation* trip rates for Single-Family Residential and Residential Condominium/ Townhouse land uses, respectively.

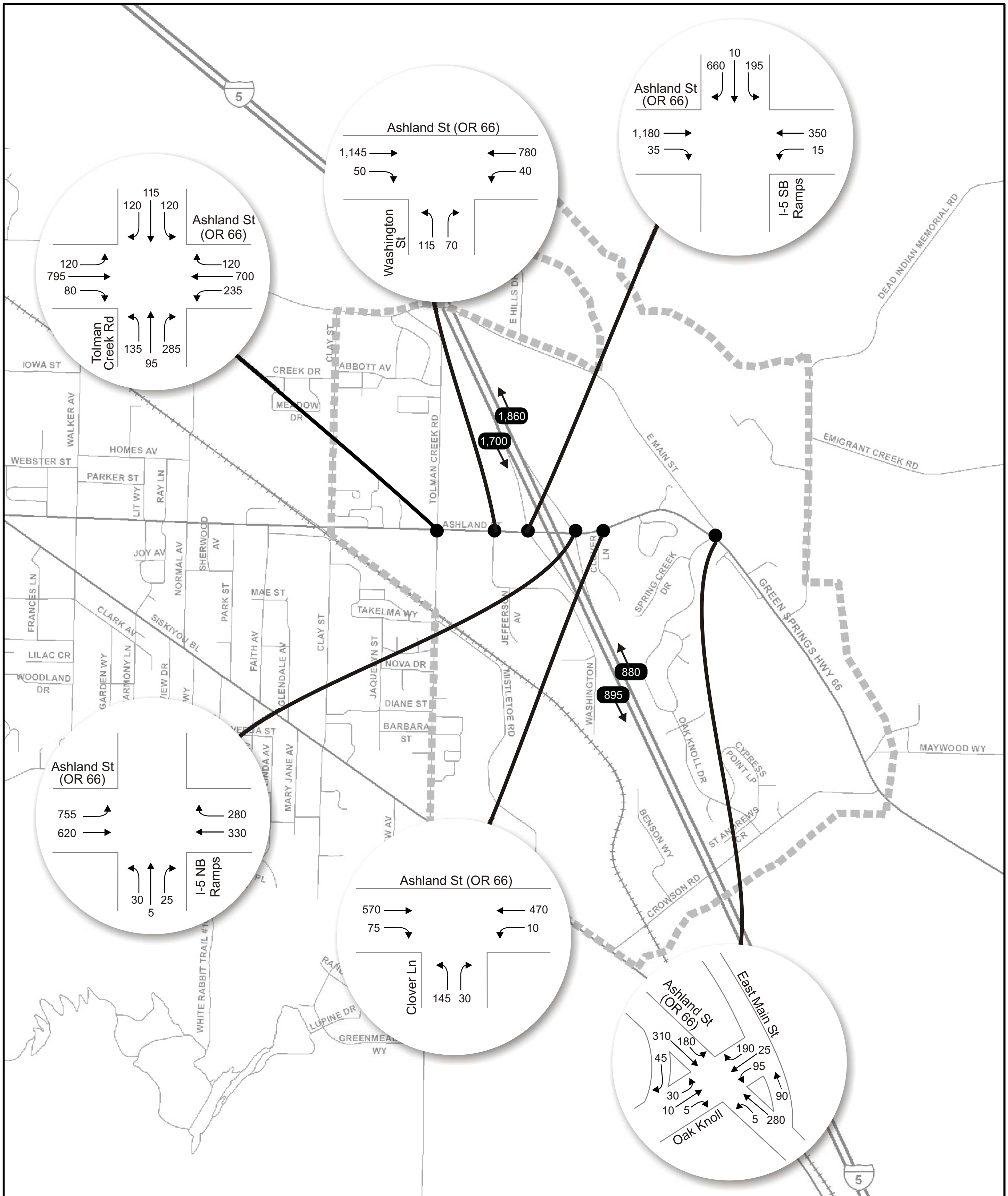
Land Use Scenario #1 results in 1520 PM peak hour trips (763 employment trips and 757 household trips) to the transportation network in excess of the Baseline volumes from the RVMPO model. These trips were added to the transportation network based on select-zone analyses performed for each of the subject TAZs from the RVMPO travel demand model. A select zone shows the directional distribution of trips that originate or terminate within an individual TAZ on key network links. Traffic operations at the interchange ramp terminals were then analyzed with the increased traffic volumes for each interchange alternative. Year 2030 traffic volumes for Land Use Scenario #1 are shown in Figure 4-4. The figure shows a volume imbalance in the westbound direction between Washington Street and Tolman Creek Road. This imbalance reflects the May 2006 traffic counts and is presumed to be associated with a series of driveways on the north side of Ashland Street.

Land Use Intensification Scenario #2

Land Use Intensification Scenario #2 consists of a hypothetical build-out scenario of the Croman Mill site. The site is currently zoned M-1 (Industrial District) and has traditionally been used as a heavy industrial wood products facility. Industrial uses were discontinued in the mid 1990’s and the site has been largely vacant since that time. The site is approximately 65 acres and is located southwest of Interchange 14, roughly bound by Siskiyou Boulevard to the south, Mistletoe Road to the west, and the UP railroad tracks to the east and north.

A set of assumptions for Land Use Scenario #2 was developed based on discussions with City of Ashland planning staff and the TAC. For the purposes of this IAMP, Land Use Scenario #2 assumed that the Croman Mill site would develop with land uses consistent with the E-1 zoning. According to the City Zoning Code, the E-1 district is “designed to provide for a variety of uses such as office, retail, or manufacturing in an aesthetic environment and having a minimal impact on surrounding uses.” Allowed uses include the following:

- Professional, financial, and business and medical offices, and personal service establishments;
- Stores, shops and offices supplying commodities or performing services, except that retail uses shall be limited to no greater than 20,000 sq. ft. of gross leasable floor space per lot;
- Restaurants;
- Electrical, furniture, plumbing shop, printing, publishing, lithography or upholstery;
- Light manufacturing, assembly, fabricating, or packaging of products from previously prepared materials, such as cloth, plastic, wood (not including saw, planing, or lumber mills or molding plants), paper, cotton, precious or semi-precious metals or stone;
- Manufacture of electric, electronic, or optical instruments and devices;
- Administrative or research establishments;
- Motion picture, television, or radio broadcasting studios operating at an established or fixed location;
- Mortuaries and crematoriums;



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GIS Data Sources:
City of Ashland and Jackson County

Legend

IAMP Management Area

Figure 4-4
2030 Land Use Intensification Scenario #1 PM Peak Hour Traffic Volumes

Interchange 14 (Green Springs) Area Management Plan

- Building material sales yards, but not including concrete or asphalt batch or mixing plants;
- Kennels and veterinary clinics, with all animals housed within structures;
- Bakeries;
- Public and quasi-public utility and service buildings and yards, structures, and public parking lots, but excluding electrical substations; and
- Manufacture of pharmaceutical and similar items.

Allowed land uses in the E-1 district tend to be more intensive trip generators than those allowed in the M-1 district, but less intensive than commercial zoning districts.

It should be noted that Land Use Scenario #2 is not intended to represent any actual proposed development in the area, nor is this analysis intended to take the place of master planning or the requisite planning and transportation impact analyses for future development proposals as they occur. For these reasons the scenario is intentionally broad and non-specific. The purpose of this land use scenario is primarily to provide an evaluation of the impacts to interchange operations that would result from a higher intensity of development on the Croman Mill site, and to provide a basis for potential management actions and/or system improvements.

Land Use Scenario #2 assumes that development on the 65 acres Croman Mill site will mostly consist of land dedicated to light/specialty manufacturing. Ten acres of the site is assumed to develop as high-density residential for workforce housing. The E-1 district does allow some retail uses, but limits their size to 20,000 square feet, which precludes land-intensive uses that generate a large number of vehicle trips, such as big box retailers.

Vehicle trip generation rates for Land Use Scenario #2 were estimated based on the following assumptions:

> *Residential Trips.* Ten acres were assumed to be developed as multi-family residential. Ashland planning staff have indicated that residential density in a mixed-use format could be as high as 30 per acre in this area, which assumes that much of the housing would be in multi-story buildings. A trip rate of 0.52 peak hour trips per household was applied, which is the average trip rate in ITE Trip Generation for the Residential Condominium/Townhouse land use. This resulted in 156 peak hour trips from residential uses.
>
> *Commercial Trips.* Some level of commercial and restaurant uses to support the surrounding area is incorporated into this land use scenario. A dense, five-acre mixed-use core with small retail and restaurant spaces was assumed, consisting of 75,000 square feet of gross leasable commercial space and 10,000 square feet of restaurant space. Estimated PM peak hour vehicle trips for the commercial space was based on ITE average trip rates for the Specialty Retail land use at 2.71 peak hour trips per 1000 square feet, and trips for the restaurant use were estimated based on the High-Turnover (Sit Down) Restaurant land use at 10.92 peak hour trips per 1000 square feet. These two uses are estimated to generate 312 peak hour trips from commercial uses.

<u>Employment Trips.</u> Average trip rates published in *ITE Trip Generation* are typically based on building square footage. A general rule of thumb for general employment or commercial zones is that buildings occupy 25% of the gross land area. However, development at the Croman Mill site is anticipated to develop at a higher level of intensity, potentially with shared, structured and underground parking and multi-story buildings to achieve the City's desires to maximize employment growth capacity. Consistent with these objectives, buildings were assumed to cover 40% of the remaining 50 acres (total land area minus residential and commercial uses), which amounted to approximately 875,000 square feet of gross floor area. The average PM peak hour vehicle trips, calculated from the average of the land uses displayed in Table 4-3, were 1.20 trips per 1,000 square feet. The average trip rate (1.20) was then applied to the square feet of gross floor area (875,000) to arrive at 1,050 peak hour trips from the employment uses.

Table 4-3. Land Use Intensification Scenario #2: Trip Rates for Potential Land Uses

ITE Code	Land Use	Average Trip Rate per 1000 sf
110	General Light Industrial	0.98
130	Industrial Park	0.86
710	General Office Building	1.49
750	Office Park	1.50
760	Research and Development Center	1.08
770	Business Park	1.29
Average Trip Rate		**1.20**

Typically reductions are made for pass-by or internally-captured vehicle trips in recognition that many trips to complementary land uses are either shared among different uses within an area or represent incidental vehicle trips that are already on the roadway network. The calculation of trip reductions is based on methodologies drawn from empirical studies of actual developments, and are published in the *ITE Trip Generation Handbook*. Calculating such reductions implies a level of certainty with respect to type and scale of development that does not exist for this highly conceptual scenario. Therefore, no reductions were taken. It should be noted that the City of Ashland has demonstrated a commitment to compact urban form and alternative modes of transportation. Therefore, a large-scale redevelopment of the Croman Mill site, which represents the largest area zoned for employment generation in Ashland, would likely incorporate features that would result in lower trip generation rates than those contained in *ITE Trip Generation*

Land Use Scenario #2 is estimated to generate <u>1518 PM peak hour trips</u> in excess of the Baseline volumes from the RVMPO model. All of the trips from this land use scenario originate or terminate in the concentrated area around the Croman Mill site. To analyze the impacts these trips were added to the transportation network according to the same methodology that was employed for Land Use Scenario #1: A select-zone analysis was performed for TAZ 732 (Croman Mill site) from the RVMPO travel demand model. The select zone showed the directional distribution of trips that originate or terminate within the TAZ on key network links. Traffic operations at the interchange ramp terminals were then analyzed with the increased traffic volumes for each interchange alternative. Year 2030 traffic volumes for Land Use Scenario #2 are shown in Figure 4-5. The figure shows a volume imbalance in the westbound direction between Washington Street and Tolman Creek Road. This imbalance reflects the May 2006 traffic counts and is presumed to be associated with a series of driveways on the north side of Ashland Street.

Interchange Alternatives

Traffic operations analyses were performed on seven interchange alternatives, including the existing configuration consisting of a two-lane bridge and unsignalized ramp terminals (No-build). As a result of this analysis and other considerations, the interchange bridge will be reconstructed as a three-lane standard diamond interchange, with bicycle and pedestrian facilities on both sides. This section provides a brief description and accompanying diagram of each interchange alternative. Note that the diagrams are for illustration purposes only and are not to scale. The diagrams are intended to illustrate intersection control, lane configurations and allowable turning movements for each interchange type.

Three-Lane Standard Diamond Interchange

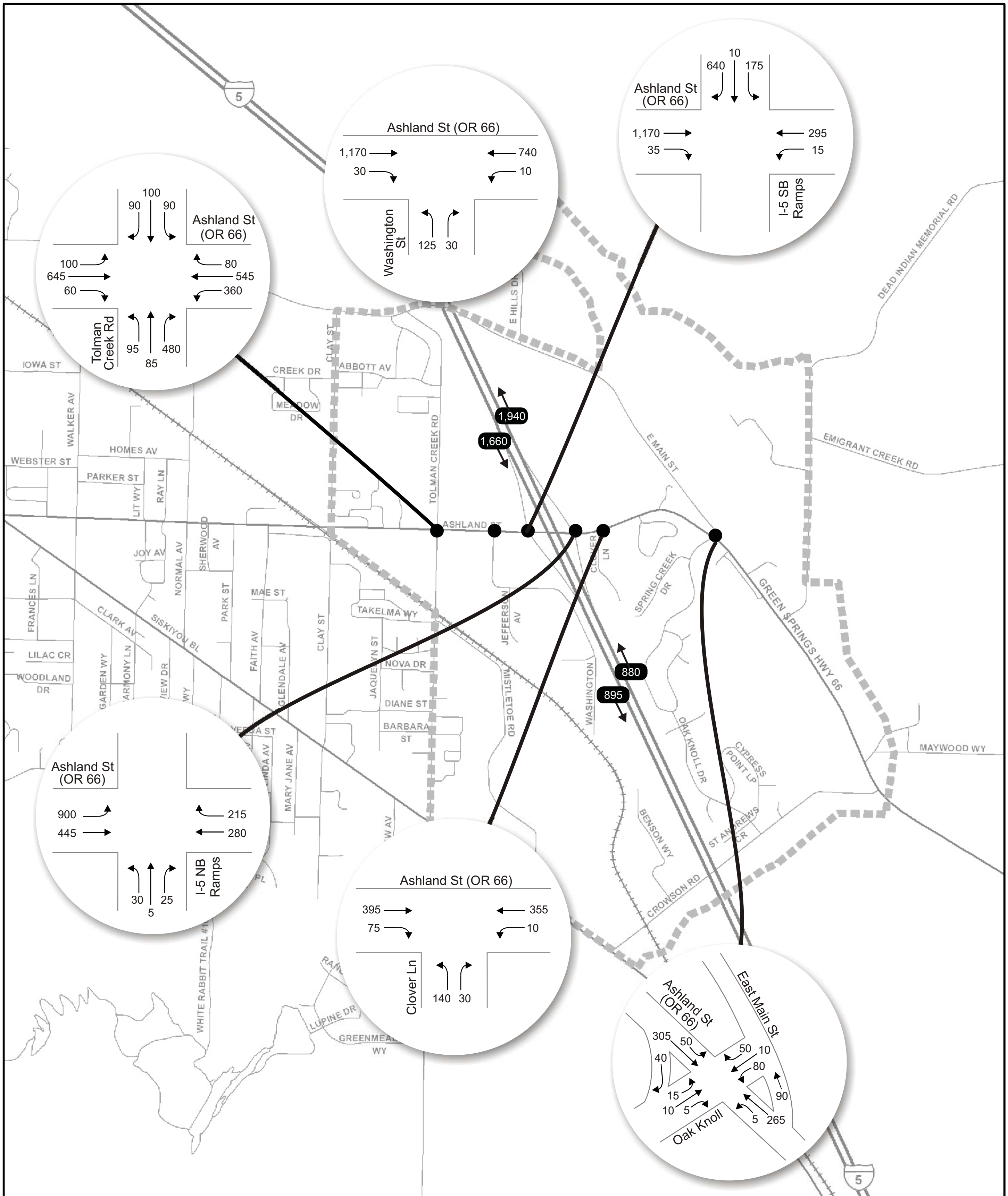
This interchange, shown in Figure 4-6, consists of a three-lane bridge with signals at the northbound and southbound ramp terminals. To handle the heavy eastbound left-turning movement at the northbound ramp terminal, the eastbound approach contains a dedicated left-turn lane plus a shared left/through lane. This configuration would require that the signal at this intersection operate with split-phasing. In other words, eastbound and westbound traffic would never have green lights at the same time. The westbound approach to the southbound ramp terminal is a single shared through/left-turn lane because of the dual eastbound lanes at the northbound ramp terminal.

Three-Lane Standard Diamond with Northbound Loop Ramp

This alternative provides a loop ramp for the heavy eastbound Ashland Street-to-northbound I-5 movement. The loop ramp eliminates the conflict between westbound vehicles and eastbound left-turning vehicles, and thus negates the need for a signal at the northbound ramp terminal. The southbound ramp terminal is signalized. This alternative is shown in Figure 4-7.

Four-Lane Standard Diamond Interchange

In this alternative, the Ashland Street bridge has four lanes: three eastbound lanes and one westbound lane. The eastbound approach at the northbound ramp terminal has dual left-turn lanes to accommodate the high left-turning volumes from eastbound Ashland Street to northbound I-5. Unlike the three-lane standard diamond interchange, the signal at the northbound ramp terminal would not need to operate with split phasing. This provides some added operational efficiency. The lane configurations at the southbound ramp terminal are identical to those for the three-lane standard diamond interchange with a single shared westbound lane for through and left-turning movements. Both ramp terminals are signalized. This alternative is shown in Figure 4-8.



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GIS Data Sources:
City of Ashland and Jackson County

Legend

IAMP Management Area

Figure 4-5
2030 Land Use Intensification Scenario #2 PM Peak Hour Traffic Volumes

Interchange 14 (Green Springs) Area Management Plan

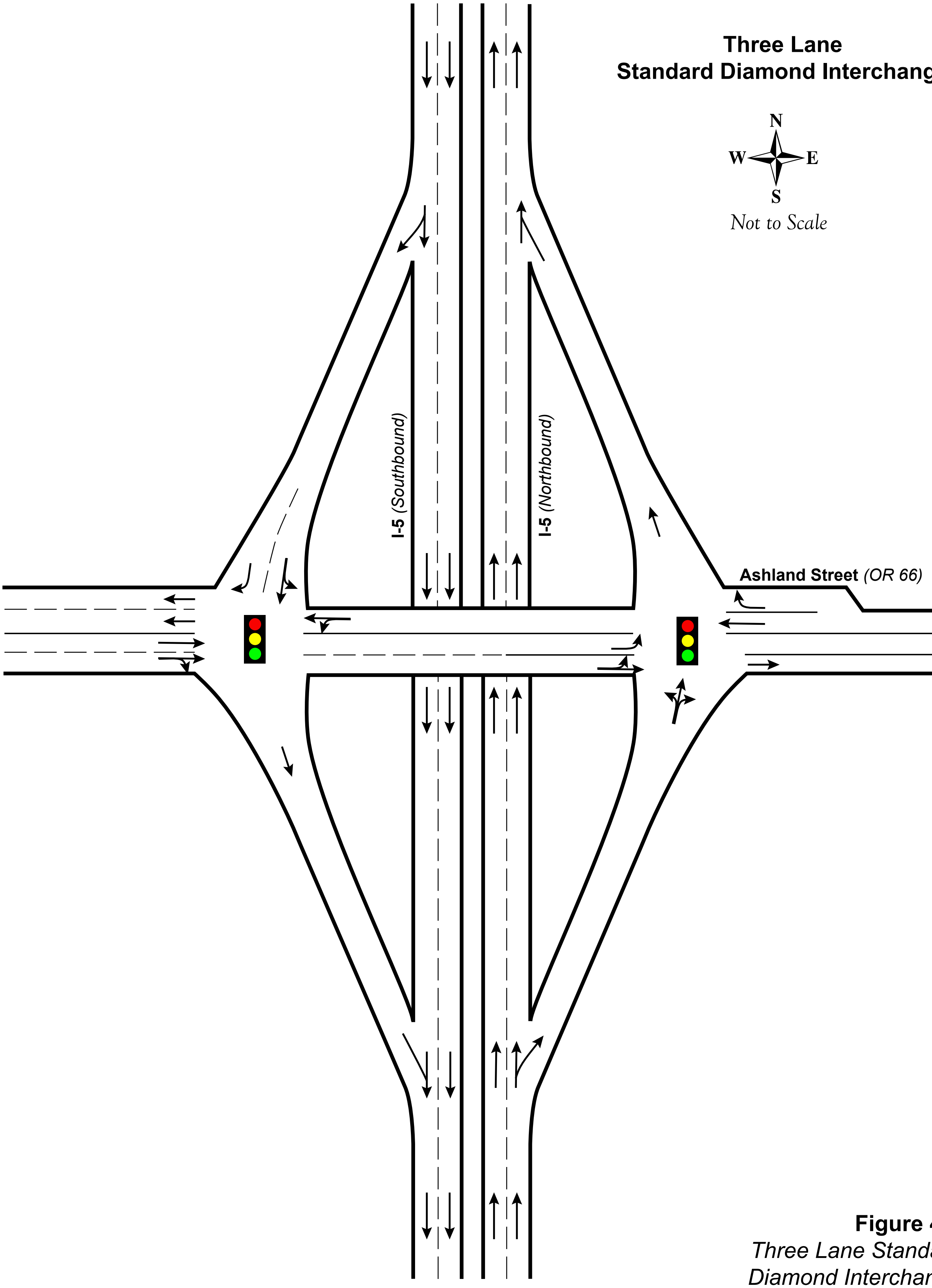

Figure 4-6
Three Lane Standard Diamond Interchange

Three Lane Standard Diamond with Northbound Loop Interchange

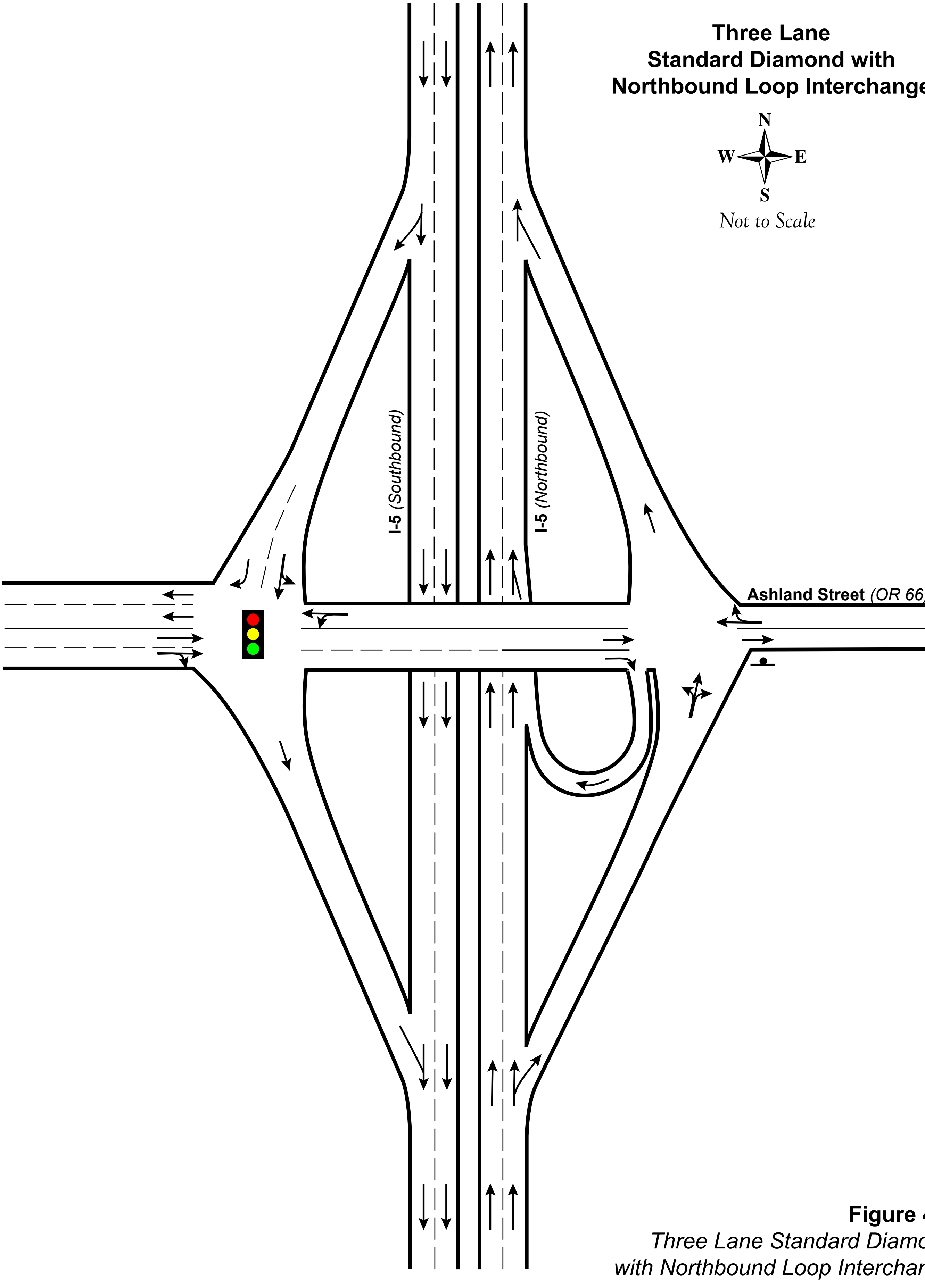

Figure 4-7
Three Lane Standard Diamond with Northbound Loop Interchange

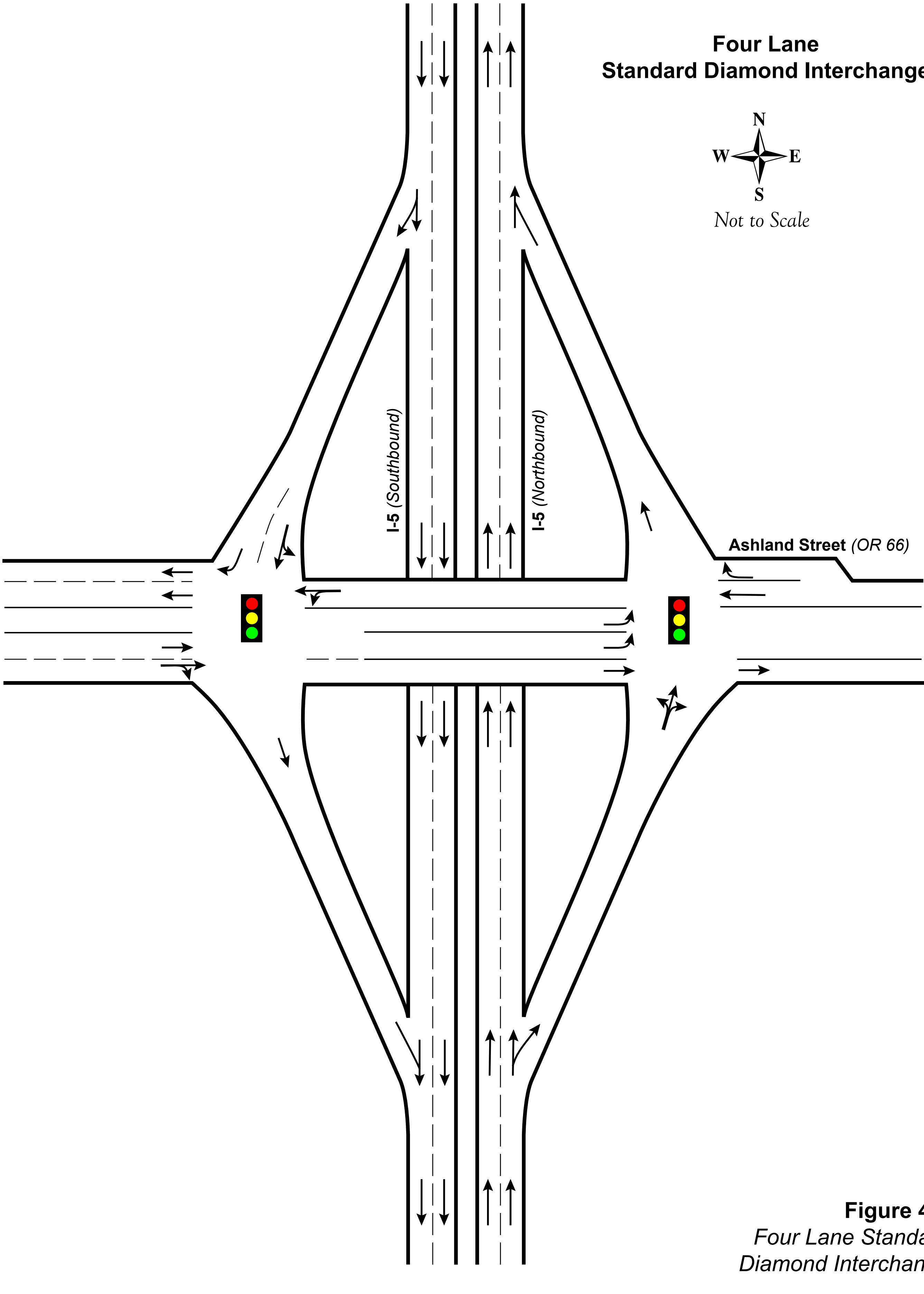

Figure 4-8
Four Lane Standard Diamond Interchange

Five-Lane Standard Diamond Interchange

This alternative, shown in Figure 4-9, consists of a five-lane bridge. The lane configurations at the northbound ramp terminal are identical to those of the four-lane standard diamond interchange, with dual eastbound left-turn lanes and a single eastbound through lane. However, this configuration allows for two westbound approach lanes at the southbound ramp terminal. Both ramp terminals are signalized.

Diverging Diamond Interchange

The diverging diamond interchange is an exceptionally rare interchange type, with a handful in planning and construction, but only one, in Versailles, France, currently in operation. In a diverging diamond interchange, a two-phase signal at each ramp terminal diverts each direction on the crossroad to the opposite side. While on the crossroad between the ramp terminals, motorists drive on the left side of the road.

Although highly unconventional and unfamiliar to most, a diverging diamond interchange increases left-turn capacity and can provide improved nominal safety compared to a traditional interchange by reducing the conflict points. Figure 4-10 shows a conceptual diagram of a diverging diamond as it was modeled for Interchange 14.

Single-Point Urban Interchange (SPUI)

In contrast to a standard diamond interchange, a single-point urban interchange, known as a SPUI, brings the entrance and exit ramps for both freeway directions into a single signalized intersection with the interchange crossroad.

SPUIs have several advantages. The compact interchange form does not require a large amount of right of way, and often is compatible with developed urban areas. Also, a SPUI allows opposing left turns to proceed simultaneously, which can result in operational efficiencies. Finally, because a SPUI is controlled by a single signal, traffic can clear the interchange more quickly than a standard diamond interchange.

SPUIs also have some disadvantages. They require much larger structures than a standard diamond, and structure costs are typically significantly higher for SPUIs than for standard diamonds. A SPUI typically has a very large area of uncontrolled pavement area. This requires longer yellow and all-red signal phases to allow vehicles to clear the intersection. Cyclists entering on green or yellow may not have adequate time to clear intersection before opposing traffic gets a green phase. A SPUI is shown in Figure 4-11.

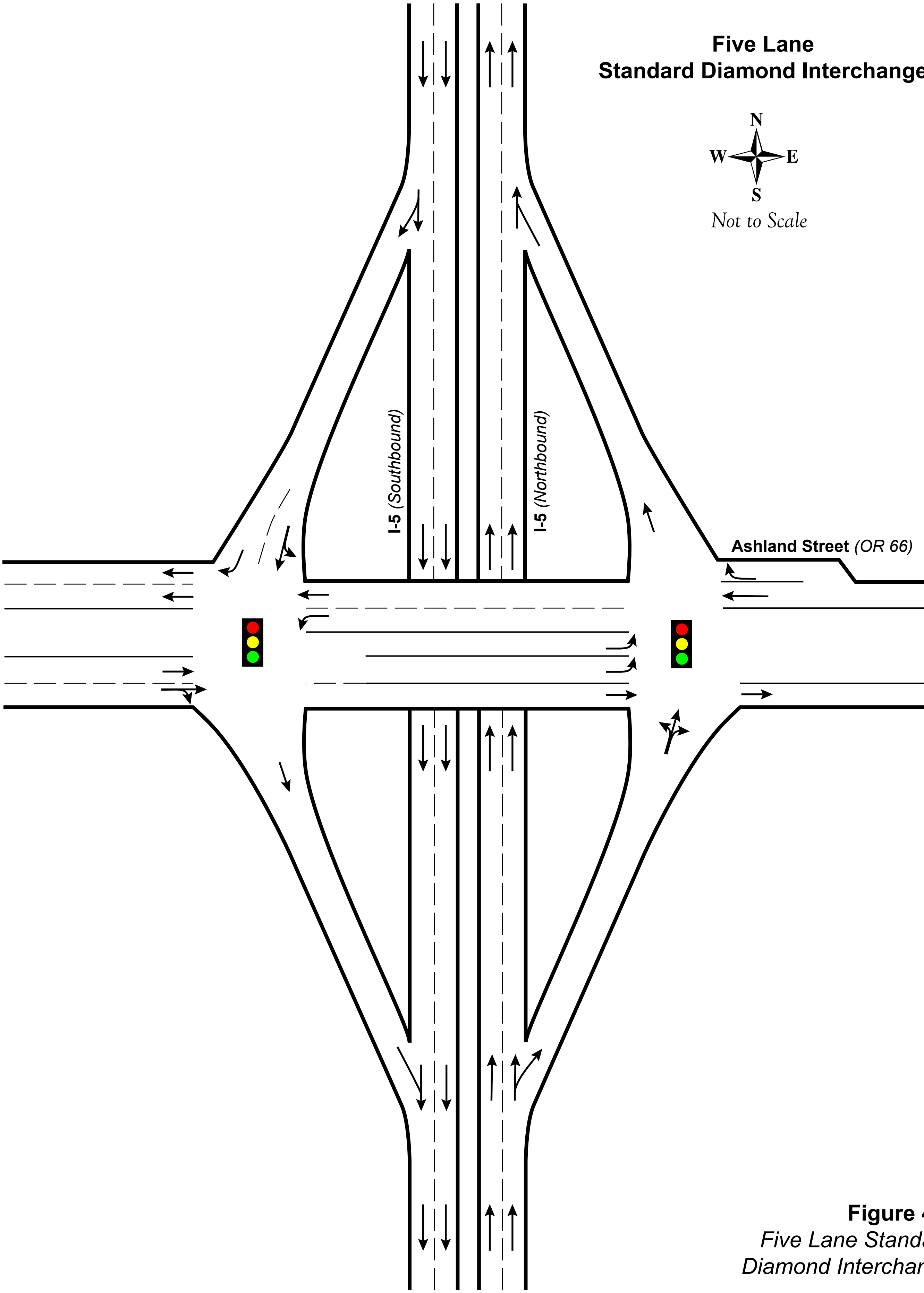

Figure 4-9
Five Lane Standard Diamond Interchange

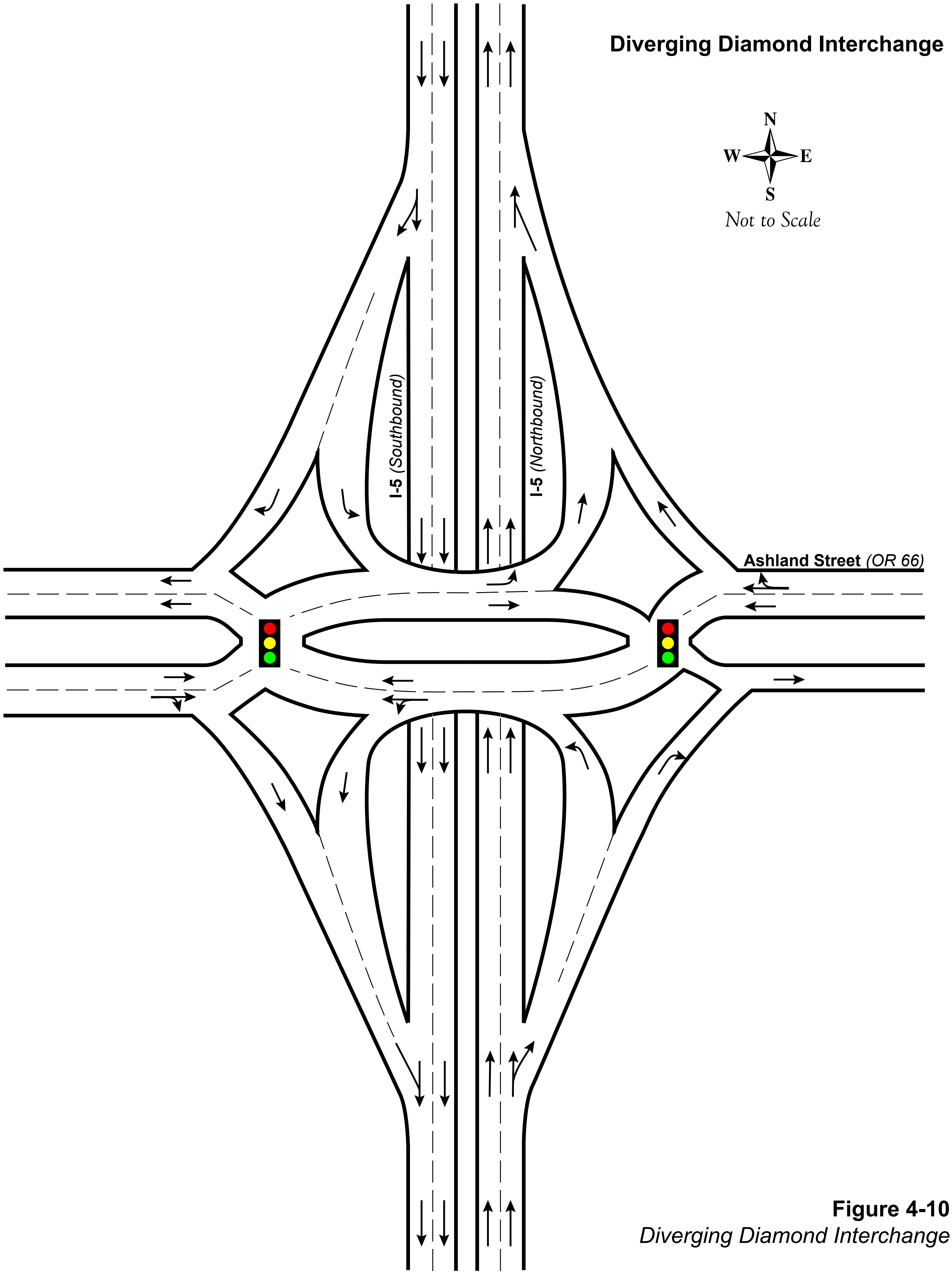

Figure 4-10
Diverging Diamond Interchange

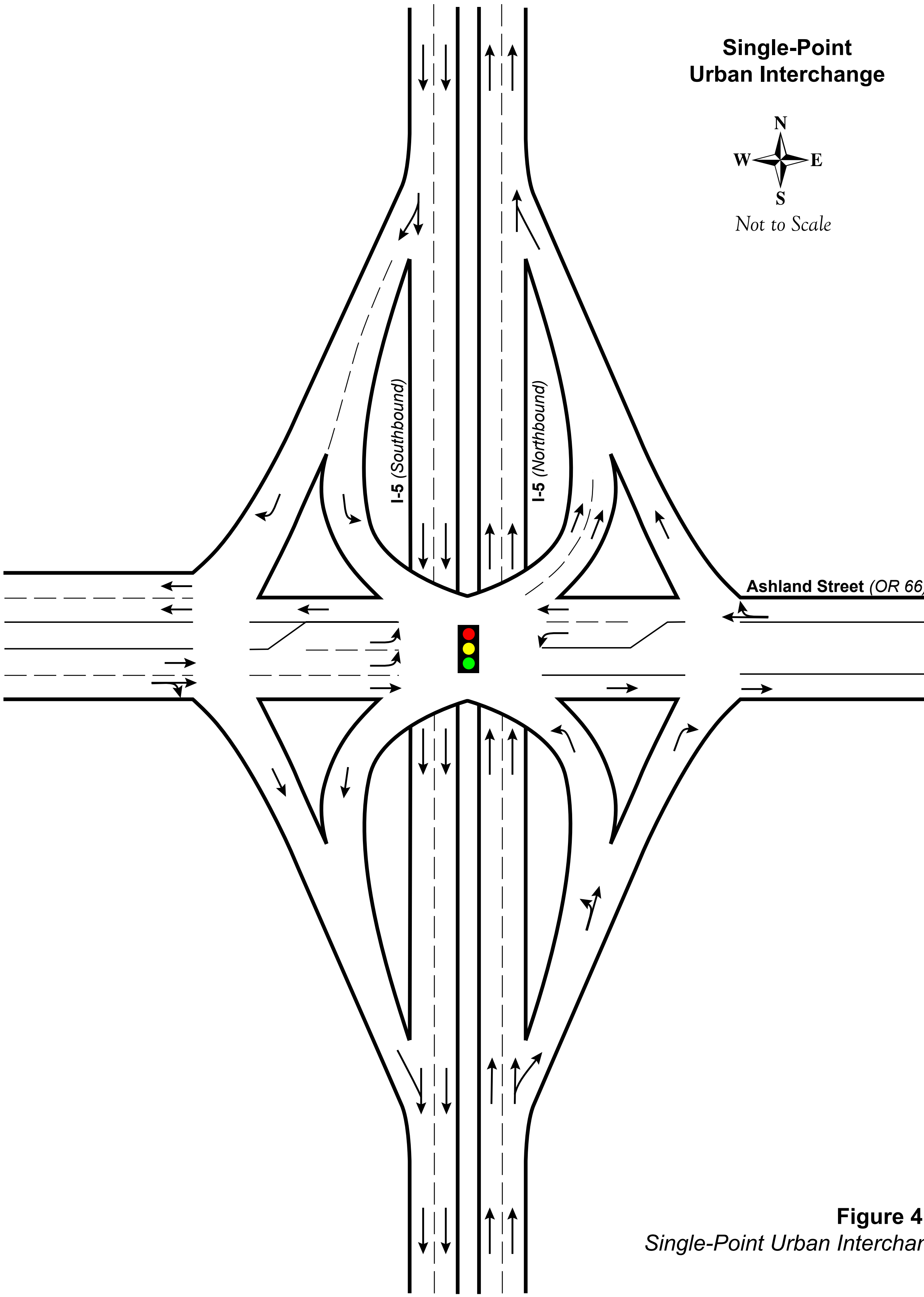

Figure 4-11
Single-Point Urban Interchange

Traffic Operations Analysis

This section summarizes the future year traffic operations analysis for no-build conditions plus the six interchange alternatives described in the previous section. Analysis of all study area intersections was performed for year 2010 baseline conditions (assumed year of build) and for year 2030 baseline conditions for each of the interchange alternatives. In addition, each interchange build alternative plus no-build alternative was analyzed under both of the year 2030 land use intensification scenarios. Analysis results are described below.

2010 Baseline Conditions

Under no-build conditions, as displayed in Table 4-4, the calculated v/c ratio at the southbound ramp terminal is calculated to be 1.09, and the calculated v/c ratio at the northbound ramp terminal is 0.92[1]. Both exceed the mobility standard. The analysis shows that each of the interchange alternatives would adequately accommodate the increased traffic volumes associated with four years of traffic growth.

Table 4-4. Intersection Traffic Operations - 2010 Baseline Conditions

	Interchange Alternative[1]							Mobility Standard V/C Ratio[2]		
	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI			
Intersection	**V/C (LOS)**	**V/C (LOS)**	**V/C (LOS)**	**V/C (LOS)**	**V/C (LOS)**	**V/C (LOS)**	**V/C (LOS)**	**OHP[3]**	**HDM[4]**	**City[5]**
Tolman Creek Rd & Ashland St (OR 66)	0.54 (B)	0.52 (C)	0.52 (C)	0.52 (C)	0.52 (C)	0.56 (C)	0.52 (C)	0.90	0.85	0.85
Washington St & Ashland St (OR 66)	0.37 (C)	0.37 (C)	0.37 (C)	0.37 (C)	0.37 (C)	0.37 (C)	0.40 (C)	0.90	0.85	0.85
I-5 SB Ramps & Ashland St (OR 66)	**1.09** (F)	0.39 (A)	0.39 (A)	0.39 (A)	0.39 (A)	0.48 (B)	0.46 (A)	0.85	0.75	-
I-5 NB Ramps & Ashland St (OR 66)	**0.92** (F)	0.54 (B)	0.10 (A)	0.37 (B)	0.38 (A)		0.38 (A)	0.85	0.75	-
Clover Ln & Ashland St (OR 66)	0.35 (B)	0.38 (B)	0.35 (B)	0.36 (B)	0.36 (B)	0.35 (B)	0.35 (B)	0.90	0.85	0.85
E. Main St/Oak Knoll & Ashland St (OR 66)	0.22 (B)	0.25 (C)	0.22 (B)	0.22 (A)	0.22 (A)	0.22 (A)	0.22 (A)	0.90	0.85	0.85

Notes:

1. For unsignalized intersections, the v/c and LOS are for the critical movement, which is typically a stopped side street movement. For signalized intersections the v/c and LOS are for the overall intersection.
2. Intersections with v/c ratios that do not meet the applicable mobility standard are shaded in black.
3. 1999 Oregon Highway Plan Mobility Standards (Table 6); applies to No-Build only.
4. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1): applies to build alternatives.
5. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT mobility standards (HDM shown) for intersections with State highways within the City.

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[1] The analysis described in Section 3 of the IAMP indicated that the demand at the northbound ramp terminals exceeds its capacity under existing conditions. The analysis results shown in Table 4-4 indicate that the 2010 v/c will be less than 1.00. This discrepancy can be attributed to the use of different peak hour factors (PHF) for the existing and 2010 analysis. A PHF of 0.90 was used for existing conditions based on observed traffic characteristics. However, in accordance with the ODOT Analysis Procedures Manual, a PHF of 0.95 was used at all intersections for future conditions. A higher PHF can be expected to result in a lower v/c ratio.

As summarized in Table 4-5, no-build queuing on the exit ramp approaches is expected to worsen. Analysis shows that each interchange alternatives is expected to result in significantly reduced queues on the ramp approaches compared to the no-build alternative.

Table 4-5. 95th Percentile Queues (in feet) - 2010 Baseline Conditions

Intersection	Movement	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI
Tolman Creek Rd & Ashland St (OR 66)	EBL	150	125	150	125	150	150	125
	EBT/R	175	175	175	175	175	175	175
	WBL	150	175	175	175	175	175	175
	WBT/R	175	200	200	175	200	175	200
	NBL	100	100	100	100	100	100	100
	NBT/R	225	225	275	275	275	225	225
	SBL	125	125	125	125	125	125	125
	SBT/R	200	225	250	225	225	200	175
Washington St & Ashland St (OR 66)	NBL	75	75	75	75	75	75	75
	WBL	25	25	25	25	50	25	25
I-5 SB Ramps & Ashland St (OR 66)	SBL	425	150	150	150	150	150	100
	SBR	75	125	125	125	125	0	100
	WBL	75	150	100	150	50	50	25
	WBT					50	150	100
	EBT		100	150	75	125	125	125
	EBT/R		125	100	125	100	25	25
I-5 NB Ramps & Ashland St (OR 66)	NBL	300	75	50	75	75	75	25
	NBR		50	50	50	50	25	50
	EBL	625[2]	125		175	150	175	50
	EBT		200		50	75	125	125
	WBT		250		125	200	150	75
	WBR		175		100	150	75	25
Clover Ln & Ashland St (OR 66)	NBL/R	100	125	125	100	100	100	100
	WBL	25	25	25	25	25	25	25
E. Main/Oak Knoll & Ashland St (OR 66)	NBL/T/R	50	50	50	50	50	50	50
	SBL	75	75	75	75	75	75	75
	SBT/R	50	75	50	50	50	75	75
	WBL/T/R	25	25	25	25	25	50	25
	EBL/T/R	25	50	50	50	50	50	50

Notes:
1. Shaded cells indicate either free or nonexistent movements where queues are not generated.
2. Queue spills into downstream intersection.

The analysis results show that traffic operations and queuing at the non ramp-terminal intersections in the study area are effectively the same regardless of which interchange alternative is selected, and all are expected to operate acceptably under 2010 baseline conditions.

2030 Baseline Conditions

The analysis showed that the existing interchange could not adequately accommodate increased traffic volumes projected for year 2030. As displayed in Table 4-6, the calculated v/c ratios are in excess of 2.00 at both the southbound and northbound interchange ramp terminals. Eastbound queues from the interchange are expected to extend along Ashland Street to several hundred feet beyond the intersection of Tolman Creek Road (see Table 4-7). All intersections and driveways within this range will experience degraded operations as a result of queuing from the interchange.[2]

Table 4-6. Intersection Traffic Operations - 2030 Baseline Conditions

	Interchange Alternative[1]							Mobility Standard V/C Ratio[2]		
	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI			
Intersection	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	OHP[3]	HDM[4]	City[5]
Tolman Creek Rd & Ashland St (OR 66)	0.62 (C)	0.61 (C)	0.61 (C)	0.61 (C)	0.61 (C)	0.62 (C)	0.61 (C	0.90	0.85	0.85
Washington St & Ashland St (OR 66)	1.53 (F)	1.53 (C)	1.53 (E)	1.53 (D)	1.53 (D)	1.56 (E)	1.56 (E)	0.90	0.85	0.85
I-5 SB Ramps & Ashland St (OR 66)	>2.00 (F)	0.46 (A)	0.46 (A)	0.46 (A)	0.46 (A)	0.57 (C)	0.51 (A)	0.85	0.75	-
I-5 NB Ramps & Ashland St (OR 66)	>2.00 (F)	0.63 (B)	0.13 (A)	0.45 (B)	0.45 (B)		0.40 (A)	0.85	0.75	-
Clover Ln & Ashland St (OR 66)	0.45 (B)	0.50 (B)	0.46 (B)	0.47 (B)	0.47 (C)	0.46 (C)	0.46 (B)	0.90	0.85	0.85
E. Main St/Oak Knoll & Ashland St (OR 66)	0.25 (C)	0.25 (B)	0.25 (B)	0.25 (A)	0.25 (A)	0.26 (A)	0.26 (A)	0.90	0.85	0.85

Notes:

1. For unsignalized intersections, the v/c and LOS are for the critical movement, which is typically a stopped side street movement. For signalized intersections the v/c and LOS are for the overall intersection.
2. Intersections with v/c ratios that do not meet the applicable mobility standard are shaded in black.
3. 1999 Oregon Highway Plan Mobility Standards (Table 6); applies to No-Build only.
4. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1): applies to build alternatives.
5. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT mobility standards (HDM shown) for intersections with State highways within the City.

2 The V/C Ratio results for the intersection of Ashland Street with Tolman Creek Road as reported in Table 6 do not reflect the operational impacts of long queues from the interchange. Actual no-build operations will be worse. Table 7 shows that EB queuing at the intersection will extend several hundred feet under no-build conditions. This queue is caused by spillback from the interchange.

Table 4-7. 95th Percentile Queues (in feet) - 2030 Baseline Conditions

Intersection	Movement	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI
Tolman Creek Rd & Ashland St (OR 66)	EBL	150	175	150	150	175	175	150
	EBT/R	650	250	225	250	250	250	250
	WBL	125	175	175	175	175	175	175
	WBT/R	150	200	225	225	225	225	250
	NBL	125	125	125	125	125	100	125
	NBT/R	275	350	300	300	325	275	275
	SBL	125	125	125	125	125	125	125
	SBT/R	200	225	225	225	225	175	175
Washington St & Ashland St (OR 66)	NBL	125	100	100	100	100	125	100
	WBL	25	25	50	25	25	25	50
I-5 SB Ramps & Ashland St (OR 66)	SBL	650	175	175	175	175	175	125
	SBR	875	150	150	150	150	0	125
	WBL	50	150	200	200	25	50	25
	WBT					75	100	100
	EBT		150	175	100	200	150	150
	EBT/R		150	150	175	150	0	50
I-5 NB Ramps & Ashland St (OR 66)	NBL	825	100	75	75	75	75	25
	NBR		50	50	50	50	25	50
	EBL	2200[2]	150		225	150	200	100
	EBT		200		50	75	150	150
	WBT		225		200	200	75	75
	WBR		175		150	150	100	0
Clover Ln & Ashland St (OR 66)	NBL/R	125	125	125	150	150	125	125
	WBL	25	25	25	25	25	25	25
E. Main/Oak Knoll & Ashland St (OR 66)	NBL/T/R	50	50	50	50	50	50	50
	SBL	75	75	75	75	75	75	75
	SBT/R	50	50	75	50	50	75	75
	WBL/T/R	25	25	25	25	25	25	25
	EBL/T/R	50	50	25	50	50	50	50

Notes:
1. Shaded cells indicate either free or nonexistent movements where queues are not generated.
2. Queue spills into downstream intersection.

A three-lane bridge with a northbound loop ramp would result in a lower v/c ratio at the northbound ramp terminal compared to a standard three-lane diamond interchange with no loop ramp (v/c of 0.39 for a loop ramp design versus 0.63 for a three-lane standard diamond). A loop ramp design also eliminates the need for signalization at the northbound ramp terminal.

A four-lane bridge would result in a lower v/c ratio at the northbound ramp terminal compared to a three-lane design due to the provision of a separate eastbound through lane. This lane would provide improved intersection operations because it would allow conventional phasing rather than the split phasing that would be necessary with a three-lane bridge configuration.

Analysis indicates that a five-lane bridge provides no operational benefit at either ramp terminal intersection compared to a four-lane bridge. The lane configuration at the northbound ramp terminal would be identical to the four-lane configuration. At the southbound ramp terminal, a five-lane bridge would allow for a westbound left-turn lane. However, analysis indicates that a left-turn lane would not provide any improvement in overall intersection v/c ratio due to the low westbound left-turning volume. Furthermore, the projected turning volumes are not sufficient to warrant a left turn signal.

Each of the interchange alternatives would provide acceptable traffic operations at both ramp terminal intersections. The calculated v/c ratio at the southbound ramp terminal is the same for all of the conventional diamond interchange configurations at 0.46. The calculated v/c ratio for the central SPUI intersection is 0.57, and the calculated v/c ratios for the DDI are 0.51 and 0.40 for the southbound and northbound ramp terminals, respectively.

The intersection of Ashland Street with Washington Street is expected to operate at a calculated v/c in excess of 1.50 for the critical northbound left-turn movement under all interchange alternatives. All of the remaining intersections within the study area are expected to operate with acceptable v/c ratios and queuing under 2030 baseline conditions. Like Washington Street, the intersection of Ashland Street with Clover Lane is unsignalized and located in close proximity to the interchange. However, analysis shows that the intersection will operate acceptably under future baseline conditions. This is primarily due to the significantly lower traffic volumes on Ashland Street to the east of the interchange compared with those to the west. If land on the east side of the interchange develops to a greater intensity than what is predicted in the RVMPO model (e.g., Land Use Scenario #1), then future operations at this intersection may fail to meet the applicable operational standards and mitigation such as turn restrictions may be necessary.

2030 Land Use Intensification Scenario #1

Table 4-8 and Table 4-9 show the operations and queuing results for Land Use Intensification Scenario #1. This scenario consists of a theoretical maximum development of parcels in the IAMP management area in excess of what is predicted in the RVMPO model. The analysis shows that the existing interchange is not adequate to accommodate the increased traffic volumes associated with this land use scenario, with calculated v/c ratios at both ramp terminals in excess of 2.00. In contrast, the calculated v/c ratios at each ramp terminal were well below 1.00 for each interchange design. However, the calculated v/c ratios at the southbound ramp terminal would marginally exceed the HDM mobility standard of 0.75 for each of the conventional interchange designs. The calculated v/c ratio at the northbound ramp terminal marginally exceeds the HDM mobility standard under the three-lane bridge design. Operational differences between the various interchange types are consistent with those described for the 2030 baseline scenario in the previous section.

Table 4-8. Intersection Traffic Operations (in feet) – 2030 Land Use Scenario #1 Conditions

	Interchange Alternative[1]							Mobility Standard V/C Ratio[2]		
	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI			
Intersection	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	OHP[3]	HDM[4]	City[5]
Tolman Creek Rd & Ashland St (OR 66)	0.76 (F)	0.76 (D)	0.76 (D)	0.76 (D)	0.76 (D)	0.78 (D)	0.75 (D)	0.90	0.85	0.85
Washington St & Ashland St (OR 66)	**>2.00 (F)**	**>2.00 (F)**	**>2.00 (F)**	**>2.00 (F)**	**>2.00 (F)**	**>2.00 (F)**	**>2.00 (F)**	0.90	0.85	0.85
I-5 SB Ramps & Ashland St (OR 66)	**>2.00 (F)**	**0.77 (B)**	**0.77 (B)**	**0.77 (B)**	**0.77 (B)**	0.69 (C)	0.53 (A)	0.85	0.75	-
I-5 NB Ramps & Ashland St (OR 66)	**>2.00 (F)**	**0.80 (C)**	0.27 (A)	0.69 (B)	0.54 (B)		0.53 (B)	0.85	0.75	-
Clover Ln & Ashland St (OR 66)	0.74 (B)	0.74 (F)	0.74 (D)	0.74 (D)	0.74 (D)	0.74 (F)	0.74 (D)	0.90	0.85	0.85
E. Main St/Oak Knoll & Ashland St (OR 66)	0.62 (D)	0.62 (D)	0.62 (D)	0.62 (C)	0.62 (C)	0.63 (D)	0.63 (C)	0.90	0.85	0.85

Notes:

1. For unsignalized intersections, the v/c and LOS are for the critical movement, which is typically a stopped side street movement. For signalized intersections the v/c and LOS are for the overall intersection.
2. Intersections with v/c ratios that do not meet the applicable mobility standard are shaded in black.
3. 1999 Oregon Highway Plan Mobility Standards (Table 6); applies to No-Build only.
4. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1): applies to build alternatives.
5. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT mobility standards (HDM shown) for intersections with State highways within the City.

The calculated v/c for the unsignalized Washington Street approach is greater than 2.00 under this land use scenario. The projected traffic volumes on Ashland Street would provide very few acceptable gaps for northbound traffic exiting from Washington Street, resulting in excessive delays for this movement. A potential result of v/c ratios far in excess of capacity is reduced safety because some drivers grow impatient and tend to accept smaller gaps in the traffic stream. This can increase the potential risk of collisions. If land develops to the extent projected by Land Use Scenario #1, some mitigation at Washington Street may be necessary. A possible mitigation could include turn restrictions through installation of a non-traversable median along Ashland Street. Ultimately, the Washington Street approach to Ashland Street should be closed and traffic routed to Tolman Creek Road.[3]

All other study area intersections are expected to operate with acceptable v/c ratios under this land use scenario. Long queuing on the northbound approach at the Tolman Creek intersection indicates the potential future need for intersection improvements, such as an additional northbound approach lane, if the pace of development significantly surpasses what is projected in the RVMPO model.

3 Signalization would reduce delays for vehicles on Washington Street. However, projected intersection traffic volumes do not meet volume-based signal warrants. Furthermore, a signal at Washington Street would not comply with ODOT access management and signal spacing standards. Therefore, signalization does not appear to be a viable mitigation measure.

Table 4-9. 95th Percentile Queues (in feet) – 2030 Land Use Scenario #1 Conditions

Intersection	Movement	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI
Tolman Creek Rd & Ashland St (OR 66)	EBL	200	175	175	175	175	175	175
	EBT/R	2450[2]	350	325	400	350	475	400
	WBL	125	200	175	175	175	175	200
	WBT/R	150	325	325	350	350	525	450
	NBL	150	125	125	125	125	125	125
	NBT/R	825	800	900	875	875	700	525
	SBL	125	125	125	125	125	125	125
	SBT/R	1575	350	350	375	300	250	300
Washington St & Ashland St (OR 66)	NBL	100	125	125	125	125	125	125
	WBL	50	75	75	75	75	50	75
I-5 SB Ramps & Ashland St (OR 66)	SBL	650	175	175	175	175	200	175
	SBR	750	225	275	225	200	0	150
	WBL	100	450	350	250	50	75	125
	WBT					150	250	125
	EBT		255	275	200	300	175	175
	EBT/R		275	250	275	275	25	100
I-5 NB Ramps & Ashland St (OR 66)	NBL	800	75	75	100	75	75	50
	NBR		50	50	50	50	25	50
	EBL	3550[2]	400		225	225	225	200
	EBT		475		350	75	175	150
	WBT		325		200	225	250	100
	WBR		225		150	200	125	50
Clover Ln & Ashland St (OR 66)	NBL/R	125	350	200	200	250	125	200
	WBL	25	25	25	25	25	25	25
E. Main/Oak Knoll & Ashland St (OR 66)	NBL/T/R	75	75	75	75	75	75	75
	SBL	100	100	100	100	125	125	100
	SBT/R	175	175	175	125	125	150	125
	WBL/T/R	25	25	25	25	25	25	25
	EBL/T/R	150	150	150	150	150	175	175

Notes:
1. Shaded cells indicate either free or nonexistent movements where queues are not generated.
2. Queue spills into downstream intersection.

The potential improvements associated with this land use scenario do not constitute recommendations, but merely potential future needs. The potential needs are based on the projections of a speculative land use scenario and neither on the RVMPO model nor any proposed development. Future analysis will be required to determine appropriate mitigation as land use changes occur and as new development are proposed.

2030 Land Use Intensification Scenario #2

This land use scenario concentrates significant employment, commercial and residential development at the former Croman Mill site, which lies in the southwest quadrant of the interchange. The growth associated with this land use scenario is compounded with the growth projected in the RVMPO model. The calculated v/c ratios at the interchange ramp terminals and at all study area intersections east of the intersection are generally lower than those for Land Use Scenario #1 as displayed in Table 4-10, and the operational differences between interchange types remain consistent with those described for the baseline land use scenario. This land use scenario causes the calculated v/c ratio at the northbound ramp terminal to marginally exceed the HDM mobility standard of 0.75 under the three-lane bridge design.

Table 4-10. Intersection Traffic Operations – Land Use Scenario #2 Conditions

	Interchange Alternative[1]							Mobility Standard V/C Ratio[2]		
	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI			
Intersection	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	V/C (LOS)	OHP[3]	HDM[4]	City[5]
Tolman Creek Rd & Ashland St (OR 66)	0.85 (F)	0.85 (F)	0.85 (E)	0.85 (E)	0.85 (D)	**0.87** (E)	**0.86** (E)	0.90	0.85	0.85
Washington St & Ashland St (OR 66)	**>2.00** (F)	**>2.00** (F)	**>2.00** (F)	**>2.00** (F)	**>2.00** (F)	**>2.00** (F)	**>2.00** (F)	0.90	0.85	0.85
I-5 SB Ramps & Ashland St (OR 66)	**>2.00** (F)	0.68 (B)	0.68 (B)	0.68 (B)	0.68 (B)	0.70 (B)	0.51 (A)	0.85	0.75	-
I-5 NB Ramps & Ashland St (OR 66)	**>2.00** (F)	**0.76** (B)	0.14 (B)	0.58 (B)	0.58 (B)		0.39 (B)	0.85	0.75	-
Clover Ln & Ashland St (OR 66)	0.47 (B)	0.48 (D)	0.48 (C)	0.49 (C)	0.49 (C)	0.48 (C)	0.48 (B)	0.90	0.85	0.85
E. Main St/Oak Knoll & Ashland St (OR 66)	0.25 (B)	0.29 (C)	0.29 (B)	0.29 (B)	0.29 (B)	0.30 (B)	0.30 (B)	0.90	0.85	0.85

Notes:

1. For unsignalized intersections, the v/c and LOS are for the critical movement, which is typically a stopped side street movement. For signalized intersections the v/c and LOS are for the overall intersection.
2. Intersections with v/c ratios that do not meet the applicable mobility standard are shaded in black.
3. 1999 Oregon Highway Plan Mobility Standards (Table 6); applies to No-Build only.
4. 2003 ODOT Highway Design Manual Mobility Standards (Table 10-1): applies to build alternatives.
5. Ashland Municipal Code requires that traffic operations on City facilities do not exceed capacity (v/c < 1.00) and defers to ODOT mobility standards (HDM shown) for intersections with State highways within the City.

This land use scenario would cause excessive delay and calculated v/c ratios in excess of 2.00 for the critical northbound left-turning movement at Washington Street. The projected traffic volumes on Ashland Street would provide very few acceptable gaps for northbound traffic exiting from Washington Street, resulting in excessive delays for this movement. A potential result of v/c ratios far in excess of capacity is reduced safety because some drivers grow impatient and tend to accept smaller gaps in the traffic stream. This can increase the potential risk of collisions. If land develops to the extent projected by Land Use Scenario #2, some mitigation at Washington Street will be necessary. A possible mitigation could include turn restrictions through installation of a non-traversable median along Ashland Street. Ultimately, the Washington Street approach to Ashland Street should be closed and traffic routed to

Tolman Creek Road[4]. Hence, this measure is listed as a medium/long term action of the access management strategy and plan as described in Section 6.

At the Tolman Creek intersection the analyses of this land use scenario revealed significant queuing and calculated v/c ratios at or marginally above the mobility standard threshold (see Table 4-11). The projected westbound left-turn volumes approach levels that may warrant an additional westbound left-turn lane. Dual westbound left-turn lanes would require widening of Tolman Creek for several hundred feet to the south of Ashland Street to accommodate two southbound receiving lanes. Mitigation for long queues on the northbound approach may include widening and provision of an additional northbound approach lane. It should be noted that closing or restricting some turn movements at Washington Street could create increased vehicular demand at the Tolman Creek intersection and increase the likelihood that one or more of the above-noted improvements would be needed. Additionally, constricted roadway geometry (curb-to-curb width) will limit the ability to maneuver U-Turns at the Tolman Creek intersection to passenger cars and small trucks. Larger vehicles will need to either proceed straight through the intersection or turn onto the cross street to find a more accessible locations to reverse course.

Table 4-11. 95th Percentile Queues (in feet) – 2030 Land Use Scenario #2 Conditions

Intersection	Movement	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI
Tolman Creek Rd & Ashland St (OR 66)	EBL	200	175	175	175	175	175	175
	EBT/R	2550[2]	400	350	425	350	475	550
	WBL	150	175	175	175	175	175	175
	WBT/R	125	450	450	350	350	525	525
	NBL	150	150	150	150	125	125	125
	NBT/R	850	900	900	900	900	700	700
	SBL	125	125	125	125	125	125	125
	SBT/R	1775	300	275	250	250	250	275
Washington St & Ashland St (OR 66)	NBL	150	125	125	125	125	125	125
	WBL	25	50	50	50	50	50	50
I-5 SB Ramps & Ashland St (OR 66)	SBL	675	150	150	150	175	200	150
	SBR	925	200	200	200	200	25	175
	WBL	50	300	250	125	50	50	50
	WBT					25	225	125
	EBT		325	350	300	400	125	175
	EBT/R		350	325	350	350	0	100

[4] Signalization of the Ashland Street/Washington Street intersection is not a viable mitigation measure. See discussion of Land Use Intensification Scenario #1 in previous section.

Table 4-11. 95th Percentile Queues (in feet) – 2030 Land Use Scenario #2 Conditions

Intersection	Movement	No-Build	3-Lane Bridge	3-Lane w/Loop	4-Lane Bridge	5-Lane Bridge	SPUI	DDI
I-5 NB Ramps & Ashland St (OR 66)	NBL	825	75	75	75	75	75	50
	NBR		50	50	50	50	25	50
	EBL	4075[2]	250		225	175	275	150
	EBT		350		25	50	125	150
	WBT		300		250	275	225	100
	WBR		225		175	175	50	25
Clover Ln & Ashland St (OR 66)	NBL/R	125	200	75	150	125	125	125
	WBL	25	25	25	25	25	25	25
E. Main/Oak Knoll & Ashland St (OR 66)	NBL/T/R	50	75	50	50	50	50	50
	SBL	75	75	75	100	75	75	75
	SBT/R	50	50	50	50	50	75	75
	WBL/T/R	25	25	25	25	25	25	50
	EBL/T/R	50	75	75	75	75	75	100

Notes:
1. Shaded cells indicate either free or nonexistent movements where queues are not generated.
2. Queue spills into downstream intersection.

The potential improvements associated with this land use scenario do not constitute recommendations, but merely potential future needs. The potential needs are based on the projections of a speculative land use scenario and neither on the RVMPO model nor any proposed development. Future analysis will be required to determine appropriate mitigation as land use changes occur and new development is proposed.

Preliminary Traffic Signal Warrant Analysis

The need for traffic signals at intersections is established by evaluating existing and projected traffic conditions against traffic signal warrants contained in the *2003 Manual on Uniform Traffic Control Devices* (MUTCD). The MUTCD provides eight signal warrants that consider different conditions under which a new signal may be warranted. The most commonly applied signal warrants are based on traffic volumes, although the MUTCD contains signal warrants based on crash experience, coordinated signal systems, and warrants for signals at pedestrian and school crossings.

The 2006 TAR reported the results of MUTCD signal warrants analysis for existing conditions. For years 2010 and 2030 conditions TPAU preliminary traffic signal warrants were evaluated. The TPAU preliminary warrants are based on MUTCD warrants, but require less data. TPAU developed these warrants for the purpose of projecting future traffic signal needs.

Meeting traffic signal warrants does not guarantee that a signal shall be installed. Before a signal can be installed a field warrant analysis is conducted by the Region. If warrants are met, the State Traffic Engineer will make the final decision on the installation of a signal.

Ashland Street (OR 66) & I-5 Southbound Ramps

TPAU Preliminary Warrant Case A is met under all future year scenarios, and Case B is met under both land use intensification scenarios. This intersection has significant left and right turning volumes on the southbound exit ramp and high cross street volumes on Ashland Street. The high cross street volumes limit the availability of gaps and result in failing v/c conditions with significant queuing that, under no-build conditions, is calculated to spill into the deceleration area of the southbound exit ramp. A right turn reduction was applied for the TPAU preliminary signal warrant analysis consistent with the methodology presented in the Analysis Procedures Manual (APM).

Ashland Street (OR 66) & I-5 Northbound Ramps

TPAU preliminary warrants are not met through the planning horizon. However, this intersection currently experiences significant operational problems that are expected to worsen through the planning horizon. The high volumes on Ashland Street allow few gaps in the traffic stream for left turning vehicles on the northbound exit ramp. Furthermore, the high volumes of eastbound left turning vehicles and the lack of gaps afforded to them generate queues that extend through the southbound ramp terminal intersection. The queue spillover from the northbound ramp terminal exacerbates operational problems at the southbound ramp terminal.

Although signal warrants based on traffic volumes are met only at the southbound ramp terminal, signalization of only the southbound ramp terminal without also signalizing the northbound ramp terminal would counteract the operational benefits of signalization at the southbound ramp terminals.

Other warrants, particularly Warrant 8, Roadway Network, or Warrant 7, Crash Experience (location is a top 10% SPIS site), may provide justification for installation of a traffic signal, and installation of a signal may well be necessary to solve the operational problems including queuing and v/c problems related to the eastbound to northbound left turn.

All build options for Interchange 14 include signalized intersections at the northbound and southbound ramp terminals.

A summary of preliminary traffic signal warrants is provided in Table 4-12.

Table 4-12. ODOT Preliminary Signal Warrant Analysis Summary

Location	Year/LU Scenario	TPAU Preliminary Traffic Signal Warrant	
		Case A	Case B
I-5 SB Ramps at Ashland Street (OR 66)	2010 Baseline	YES	NO
	2030 Baseline	YES	NO
	2030 LU #1	YES	YES
	2030 LU #2	YES	YES
I-5 NB Ramps at Ashland Street (OR 66)	2010 Baseline	NO	NO
	2030 Baseline	NO	NO
	2030 LU #1	NO	NO
	2030 LU #2	NO	NO

Freeway Ramp Merge/Diverge Analysis

Analyses of freeway ramp merge and diverge operations were performed at each of the entrance and exit ramps. The results indicate that mainline operations on I-5 in the vicinity of the interchange ramps would meet all applicable operations standards under future conditions. The analysis assumes that all geometric characteristics of the ramp merge and diverge points meet applicable design standards. The results are summarized in Table 4-13 below.

Table 4-13. Freeway Merge/Diverge Analysis Results

Movement	V/C Ratio			
	2010 Baseline	2030 Baseline	2030 LU #1	2030 LU #2
SB Diverge	0.45	0.54	0.62	0.60
SB Merge	0.18	0.24	0.24	0.24
NB Diverge	0.14	0.25	0.25	0.25
NB Merge	0.28	0.43	0.48	0.49

Summary of Traffic Operations Analysis

The analysis of future conditions showed that each of the interchange alternatives could adequately accommodate the traffic volumes associated with the traffic growth projected in the RVMPO travel demand model. In addition, the analysis showed that each of the interchange alternatives could accommodate the added traffic volumes associated with substantially higher levels of development as projected in the two land use intensification scenarios. However, not all of the interchange alternatives maintain acceptable v/c ratios under additional traffic loading.

The 2030 calculated v/c for the unsignalized Washington Street approach is unacceptable under both land use scenarios. If land develops to the extent projected by either scenario, some mitigation at Washington Street will be necessary that could include turn restrictions through installation of a non-traversable median along Ashland Street. Ultimately, the Washington

Street approach to Ashland Street should be closed and traffic routed to Tolman Creek Road. Hence, this measure is listed as a medium/long term action of the access management strategy and plan as described in Section 6.

Year 2030 analysis of Land Use Scenario #2 at the Tolman Creek intersection revealed significant queuing and calculated v/c ratios approaching acceptable limits. Potential future improvement needs at the intersection could include widening of Ashland Street to accommodate dual westbound left-turn lanes and a corresponding widening of southbound Tolman Creek Road leaving the intersection, and/or the provision of an additional northbound approach lane. Closing or restricting some turn movements at Washington Street could create increased vehicular demand at the Tolman Creek intersection and increase the likelihood that one or more of the above-noted improvements would be needed. Additionally, constricted roadway geometry (curb-to-curb width) will limit the ability to maneuver U-Turns at the Tolman Creek intersection to passenger cars and small trucks. Larger vehicles will need to either proceed straight through the intersection or turn onto the cross street to find more accessible locations to reverse course.

5. POTENTIAL MANAGEMENT ACTIONS AND LAND USE POLICIES

An integral part of the Interchange Area Management Plan (IAMP) process is providing a strategy and plan to protect the function of the interchange and its influence area. This section explores a set of measures that could be employed at or near Interchange 14.

Potential Management Actions

Management actions, as applied to Interchange Area Management Plans (IAMPs) are intended to preserve the capacity of an interchange for as long as possible. The toolkit of potential management actions includes four overarching strategies:

- **Local System Improvements** that enhance the local street network to disperse trips and reduce congestion near an interchange;
- **Transportation Demand Management Actions** that provide travel options to reduce the number of trips or vehicles on the road;
- **Transportation System Management Actions** that improve system efficiency and reduce delays;
- **Land Use and Development Actions** that guide land use development to result in fewer trips in the interchange area.

Many management actions are most applicable when applied throughout a region or in a large urban area. Nonetheless, a positive impact may be produced even if the measure is limited to Ashland or study area. The management tools with potential to preserve capacity at Interchange 14 are described below. The discussion includes a brief description, a qualitative assessment of applicability and potential benefits, a summary of the issues that would be required to implement them, and a qualitative assessment of potential adverse impacts.

Benefits of Management Actions at Interchange 14

Management actions have the potential to reduce the number of trips at the interchange area, and in effect, slow the growth of demand. As a result, management actions can extend the life of the interchange and allow incremental implementation of improvements.

Local System Improvements

Local system improvements can be effective in enhancing the effectiveness of the local street network to provide circulation and access for the community near the interchange without relying solely on the interchange or its approach roadways.

Enhancing the Local Street Network

The local street network is well developed and interconnected throughout much of Ashland. The city is accessed from I-5 by three interchanges (11, 14 and 19). As displayed in Figure 5-1, the vicinity of the Interchange 14 study area is crossed by three arterials (classified as "boulevards" in the Ashland TSP) that provide access to concentrated commercial, residential, industrial, and institutional areas such as the Southern Oregon University campus and four public schools (Ashland High School, Ashland Middle, Walker Elementary, and Bellview Elementary). East Main Street and Ashland Street cross the study area in an east-west direction and both streets connect diagonally to the third arterial, Siskiyou Boulevard, which runs in a southeast-northwest direction and directly accesses downtown Ashland. North-south connections within the study area are via four collectors ("avenues") – three of which bisect Ashland Street and directly link Siskiyou Boulevard to East Main Street (Walker Avenue, Normal Avenue, and Tolman Creek Road).

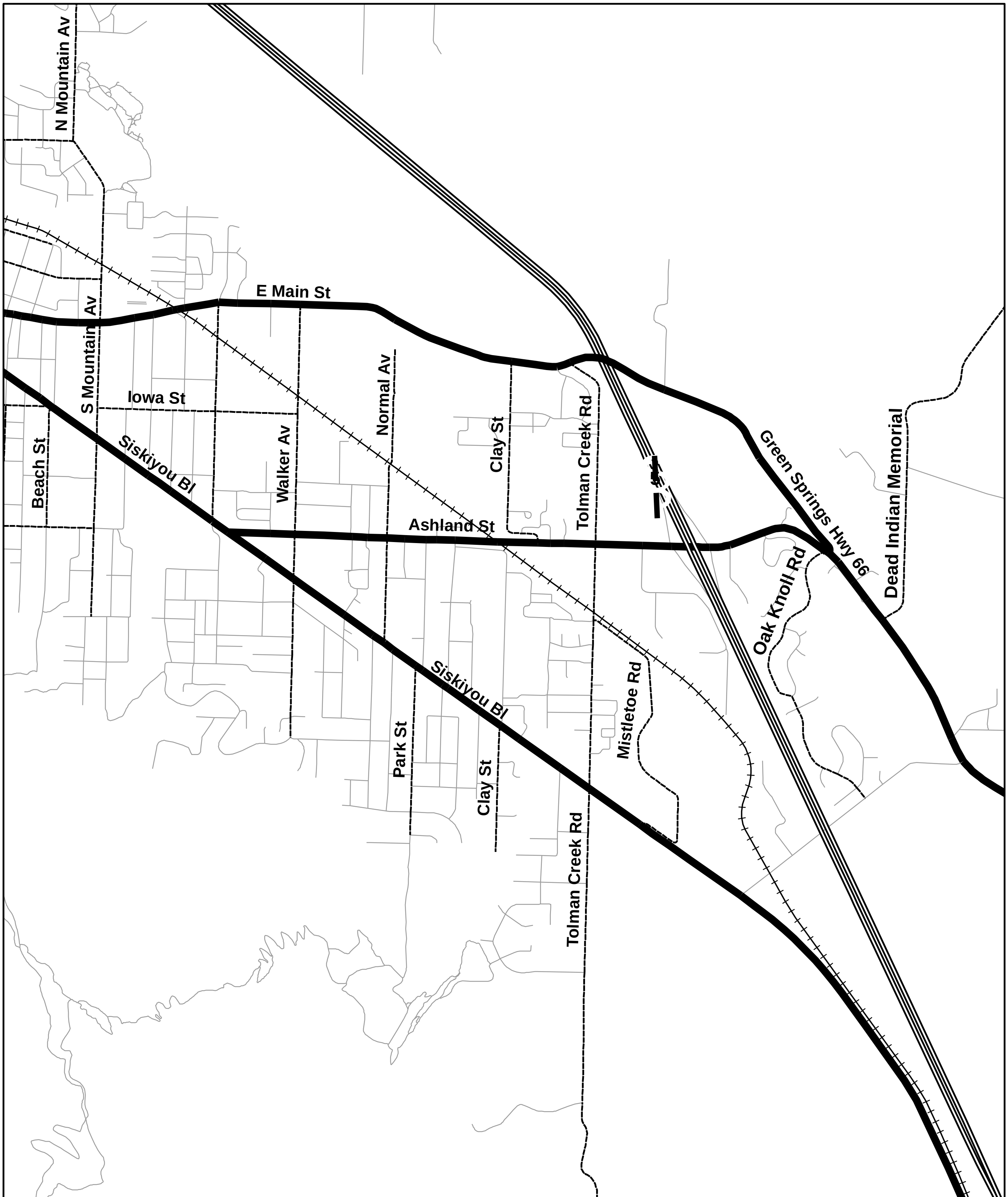
The current reach of the fourth collector (Clay Street) is between East Main Street and Ashland Street. The Central Oregon and Pacific Railroad (CORP) line parallels Mistletoe Road approximately ½ mile north of Siskiyou Boulevard and limits access between the four quadrants of the study area to the arterials and three of the four collectors. Clay Street terminates at Ashland Street and begins again south of the tracks as a neighborhood street.

Most of the remaining developable properties within the study area are situated north of Ashland Street and the CORP railroad line and in the vicinity of the former Croman Mill site (see Section 4). The City Comprehensive Plan designates these areas as largely single and multi family residential north of Ashland Street and industrial in the vicinity of the Croman Mill site. However, it is widely believed that the Croman Mill site will likely redevelop into a concentration of mixed uses that could incorporate commercial, industrial and residential uses. These vacant buildable areas have a less developed local street network, representing an opportunity to enhance existing street connections and accessways between developments and provide important links that could promote alternative modes of transportation other than the automobile. One way to create these connections is to limit the use of cul-de-sacs and to require new streets to connect with existing streets.

Access Management

Access management is a set of techniques that state and local governments can use to control access to highways, major arterials, and other roadways. Access management strategies are designed to extend the operational life of the interchange by reducing congestion, improving traffic flow, reducing crashes, and reducing conflicting vehicle movements. Access management techniques include:

- ***Access Spacing***: By increasing the distance between traffic signals, flow of traffic on major arterials can be improved. This also reduces congestion and improves air quality for heavily traveled corridors.
- ***Driveway Spacing***: Fewer driveways spaced further apart could allow for more orderly merging of traffic and present fewer challenges to drivers.
- ***Turning Lanes:*** Dedicated left- and right-turn lanes, and indirect left-turns and U-turns could be considered to keep through-traffic flowing.
- ***Median Treatments:*** A non-traversable, raised median is an example of one of the most effective means to regulate access and reduce accidents.



Legend

- Interstate
- Arterial "Boulevard"
- Collector "Avenue"
- Local
- Railroad

GIS Data Source: Jackson County, Ashland Transportation System Plan

Figure 5-1
Local Street Network

Interchange 14 (Green Springs) Area Management Plan

Map Document: (P:\O\ODOT00000590\0600INFO\GS\arcmap\IC14_FIG_5-1_LocalStreetNetwork.mxd)
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Applicable Strategies, Benefits, and Implementation Issues

Local system improvements are critical to providing access to property and ensuring sufficient capacity for development to occur. As the roadway network is developed to support property development, traffic circulation can be enhanced by limiting the use of cul-de-sacs and requiring new streets to connect with existing streets. Cul-de-sacs reduce the permeability of the street network and force drivers to use a limited number of routes to reach their destinations. They also have a negative impact on emergency vehicle access time. In effect, the traffic removed from a cul-de-sac is forced onto other streets, potentially causing traffic problems in these locations as well. Extensions of existing roadways into buildable areas should be encouraged. The City of Ashland Street Standards Handbook establishes connectivity standards whereby streets "shall be interconnected to reduce travel distance, promote the use of alternative modes, provide for efficient provision of utilities and emergency services and provide multiple travel routes." The City limits dead end streets, or cul-de-sacs to extreme topographic or wetland conditions. Under these conditions, the dead end street is limited to 500 feet in length.

To reduce conflicts along existing and planned roadways, access management measures should be explored that, for example, create shared driveways and shared parking for adjacent businesses. These seemingly small measures can have a significant impact on congestion within a corridor. Specific access management recommendations and local street circulation improvements for the Interchange 14 area are detailed in Section 6.

Transportation Demand Management Strategies

Transportation Demand Management (TDM) strategies are designed to reduce vehicle demand, especially for commute trips in the peak periods. Typically, TDM strategies include provision of services or facilities intended to shift travelers to different modes, to non-peak times, or by trip elimination choices, such as telecommuting. TDM strategies are most effective in areas with high concentrations of employment and where a robust transit system exists. Generally, the strategies are easiest to implement where there are large employers or where a transportation management association (TMA) has been established to pool the efforts of many smaller employers.

TDM Strategies that Shift Modes

The following strategies are designed to offer choices and encourage people to commute in a way other than driving alone, resulting in fewer vehicles on the road during the peak periods.

> <u>Carpool Programs:</u> This strategy encourages and supports commuters to share the ride with other commuters who live and work in the same general area. Carpools may receive preferential parking, or incentives such as a small stipend, reduced parking rate or coupons. Carpools enjoy the benefit of a reduced commute cost because the price of gasoline and parking is typically shared.

Vanpool Programs: This strategy involves providing vans for groups to use for commuting. These can be employer sponsored vans, private vans, or agency sponsored vans. Vanpools can be arranged for large employers, or for locations where several employers are located in close proximity.

Transit: Transit can be a cost saving and stress-reducing alternative to commuting by personal automobile. For transit to be a reliable alternative to personal automobiles, transit service should be offered approximately every 30 minutes and extend beyond the peak periods. Transit commuters need to have confidence that they will be able to get home if they need to leave work early or stay late.

Bicycling: Many people choose to commute by bicycle for health, stress-reduction, and environmental reasons. The provision of safe and convenient bicycle facilities have long been recognized as one of the key prerequisites for increased bicycling for transportation purposes. Conversely, the absence of good, safe bicycle facilities discourages all but the most dedicated cyclists from using this mode for transportation. In addition, the provision of showers, clothing storage, and safe, secure bicycle parking at workplaces is recommended.

Walking: When people live close to work, they may have the option to walk. Some do so for health, stress reduction, and for the connection they feel with their community. Most transit riders are also walkers for some portion of their commute. Safe walking facilities such as sidewalks and separated paths are important features to incorporate in projects to encourage walking.

TDM Strategies that Shift Trips to Non-Peak Periods

Employers can have a significant impact on reducing peak hour trips by reducing the number of employees who are expected to arrive during the morning peak (approximately 7 am to 9 am) and depart during the evening peak (approximately 4 pm to 6 pm). Methods to reduce peak hour arrivals and departures include offering flexible work schedules, and shifting work schedules.

Flexible Work Schedules: An example of a flexible work schedule might require employees to be present during core hours of 9:30 to 3:30, and allowing arrivals and departures around that time while maintaining an 8 hour work day. Another example involves working fewer days per week, such as working four ten-hour days with one day off.

Off-Peak Shifts: An example of an off-peak shift might be having a work day start at 6 am and end at 2 pm. Another shift might start at 2 pm and end at 9 pm. This is a common practice in industry because it allows for multiple shifts in a 24-hour period.

TDM Strategy that Eliminates Trips

One TDM strategy can eliminate trips altogether.

<u>Telecommuting:</u> This strategy allows employees to work from home for some portion of or all of their work. Telecommuting is gaining popularity and acceptance and is available to more professions as a result of improvements in technology. Various office functions including technical support, call center operations, and order processing are increasingly being conducted using telecommuting and dispersed workers. Employers who offer telecommuting are able to market it as a benefit, and telecommuting often results in cost savings to the employer because of reduced office space and equipment requirements.

Applicable Strategies, Benefits, and Implementation Issues

Policies and goals from the State, Jackson County, Rogue Valley Metropolitan Planning Organization (RVMPO), and City of Ashland contain provisions that embrace TDM measures. Urban areas with populations over 25,000 are required by the Oregon Transportation Planning Rule (TPR) to address TDM. Subsequently, the RVMPO has adopted Policy 6.A-2, stating that TDM measures "should be considered before transportation capacity expansion is determined to be necessary".

The Rogue Valley Regional Transportation Plan (RTP) acknowledges differences between TDM outreach strategies for employers and the public. A variety of marketing and promotional activities, such as flyers, trip reduction programs, and other incentives, are available to employers interested in promoting alternate commute options. Informing the general population about non-SOV travel options relies more on public outreach, typically employing general marketing strategies such as brochures, commercials, and special events such as Car Free Day.

The Rogue Valley Transit District (RVTD) has had a TDM program in place for the region since 1993. The Rogue Valley Transportation District (RVTD) provides bus service to and from Ashland via Bus Route 10 twice an hour between 5:00 am and 6:30 pm on weekdays. The frequency of bus service provided (every 30 minutes) meets the general threshold deemed necessary for the transit system to be considered an effective TDM measure.

Workers who are employed in Ashland and reside in neighboring cities or rural areas outside the city might benefit from TDM programs instituted in Ashland. This might result in a modest reduction of trips using the interchanges. Implementing TDM strategies is most successful when there are incentives and when making the switch to a non-personal-auto mode of travel is relatively simple – particularly for intermediate to long distance trips. Establishment of Transportation Management Associations (TMA) are useful because a TMA typically takes on the responsibility of promoting TDM programs, organizing carpool and vanpool programs, obtaining grants, distributing incentives, and working with transit agencies to provide additional transit service and/or reduced cost transit passes.

The Rogue Valley Transportation Management Association (TMA), encompassing the Medford metropolitan area (including the City of Ashland) is a voluntary alliance of private and public sector interests established in 2002 to increase the efficiency of the local transportation system. As described in Policy 6.A-3 of the RTP, the purpose of the TMA is to "work with major employers to adopt trip reduction goals, policies and programs designed to reduce site vehicular trip generation, and to offer specific incentives in partnership with regional TDM projects."

The City of Ashland examined long-term growth projections and travel demand that led to a determination that an area-wide TDM policy, combined with Transportation System Management (TSM) strategies would yield an overall system that operates within capacity. TDM measures considered in Ashland's analysis were:

- Improved pedestrian and bicycle system connectivity, access, and circulation;
- Enhanced transit coverage and service;
- Employer-based transit incentives (e.g., university student pass program);
- Rideshare, carpool, and vanpool programs; and
- Mixed use land development

Ashland lacks the large employers or collection of industrial employers that usually attract TDM strategies such as carpool or vanpool. However, based on the City of Ashland Comprehensive Plan, a majority of buildable land within the study area north of Ashland Street will be residential in nature. Less certain is what will occur south of Ashland Street – particularly in the vicinity of the former Croman Mill site (see Section 4). Currently designated for industrial and employment uses, future development on the site along the north side of Siskiyou Boulevard could incorporate a more compact mixed-use pattern of light industrial, office, residential, and some commercial land uses.

Often referred to as transit oriented development (TOD), such compact, mixed-use developments demonstrate the important inter-relationship between TDM and land use by reducing trip lengths that, in turn reduce demand on the surface transportation system by decreasing the length of vehicle trips. Hence, bicycling and walking – commute modes that are most applicable for short trips – could increasingly become viewed, along with transit, as viable commute options due to the relative close proximity of residential areas to employment areas in the Interchange 14 vicinity.

Telecommuting and transit are effective alternatives regardless of trip distance. The transportation element of the Ashland Comprehensive Plan cited the increased number of residents who work at home – effectively doubling between 1980 and 1990 from 3.7% to 7.1% respectively. According to the 2000 Census, home occupations have increased further to 8.4% of the population.

Transportation System Management Strategies

Transportation System Management (TSM) strategies are designed to make maximum use of existing transportation facilities, and include:

- Traffic engineering measures that improve the operations and efficiency of streets and intersections

- System monitoring and traveler information systems (e.g., Intelligent Transportation Systems (ITS), variable message signs, etc.),
- Facility management systems (e.g., ramp meters, special use lanes, signal priority for special users such as transit), and
- Incident management systems (e.g., incident response and recovery teams).

These strategies are described below.

Traffic Engineering Measures

Traffic engineering measures such as signal timing changes, provision of turn lanes, turn restrictions, and restricting on-street parking to increase the number of travel lanes without road widening are included in this category. These traffic engineering measures are routinely included as part of the traffic analyses used in conjunction with the design process for intersection and roadway projects. Optimizing traffic signal operations, for example, is performed by the traffic engineer before specifying the number of lanes and queue storage requirements for the intersection design.

Such measures must consider all movements at an intersection, including side street traffic, main street traffic, transit, bicycles, and pedestrians. Competing priorities can arise between modes and directions of traffic and both county and state policy and objectives must be considered when setting priorities. For example, additional turn lanes may reduce delay at intersections for automobiles, but increase the crossing distance for pedestrians, making their crossing less safe. Or, turn movement restrictions may increase throughput on a roadway, but reduce access to business. Decisions regarding access restrictions especially require involvement and input from the community.

Section 4 provides operations analysis results and system improvement recommendations at interchange area intersections.

System Monitoring and Traveler Information Systems

System monitoring employs Intelligent Transportation Systems (ITS) technologies that enable jurisdictions to monitor traffic, respond to traffic crashes and vehicle breakdowns more quickly, and communicate with the motoring public in real time. System monitoring requires deployment of infrastructure like a Traffic Operations Center (TOC) with video and closed circuit TV, and surveillance cameras, detection cameras and traffic sensors on highways to improve the capability of agencies to keep track of the transportation system on a real time basis. This system monitoring capability allows the operators in a TOC to dynamically adjust signal timing, dispatch emergency vehicles, and provide information to the motorists.

The real time traffic information can be shared with travelers in a variety of ways, by variable message signs, highway advisory radio, 5-1-1 Traveler Phone Information, web sites, and specialized warning systems (such as fog warnings), to let them make their own decisions about when to drive and what route to choose.

Facility Management Systems

Various system elements can be used to improve the performance the street and highway system or provide operational advantages for specific users. Facility management systems are tied into the system monitoring and traveler information systems discussed above and can be used to benefit users of alternative modes of transportation and TDM programs discussed in the previous section of this memorandum.

Ramp Meters: Ramp meters, which are used on the on-ramps to freeways and other limited access highways, can be used for two different purposes. First, ramp meters can discourage drivers from using freeways to bypass congestion on local roads. Second, when traffic demand is high, ramp metering can adjust the metering rate such that the density on the freeway remains below the critical value, thereby increasing flow or preventing traffic breakdown of the freeway mainline. Its benefits can be reaped when the traffic flows are neither too light (in which case metering is not needed) nor too high (in which breakdown will happen anyway). Ramp meters increase travel times and meter the rate of flow entering the highway. In its simplest application, ramp meters set minimum intervals between vehicles entering the freeway from the ramp with a fixed-time signal.

Preferential lanes: This strategy involves the reservation of a travel lane for a preferred group such as high occupancy vehicles and transit. This strategy is often used at ramp meter locations, allowing transit to bypass waiting vehicles and providing travel time savings and reliability for transit.

Traffic Signal Priority: This strategy is used primarily for transit in regions that experience significant congestion and delay at intersections. In general, the strategy allows transit to receive a green light for a few seconds before other vehicles so that it can advance ahead of a queue, or it can hold a light green for a few seconds longer to allow a bus to get through a signal before it turns red.

Applicable Strategies, Benefits, and Implementation Issues

Traffic system management strategies, including optimization of traffic signal timing, are routinely practiced by ODOT for facilities under its jurisdiction. It was assumed in the analyses performed for the IAMP that the signals in the OR 66 (Ashland Street) corridor would be interconnected and that the signal timing would be coordinated to optimize traffic operations. This would include potential future signals at the Interchange 14 ramp terminals.

The Rogue Valley Intelligent Transportation Systems (RVITS) plan, completed in 2004, is a 20-year plan that identifies advanced technologies and management techniques that can relieve traffic congestion, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. RVITS projects recommended for implementation address the following categories:

- Travel and Traffic Management: improve travel time, reduce crashes, provide incident response, and provide traveler information.
- Communications: e.g., provide early warning for delays or closure of the Siskiyou Pass.

- Public Transportation Management: intended to enhance existing RVTD systems and to improve transit traveler information.
- Emergency Management: reduce emergency response times and integrate emergency management with transportation and transit management.
- Information Management: collect, archive, and manage various types of transportation-related data.

Maintenance and Construction Management: aimed at improving the safety of motorists and workers in construction zones, improve efficiency of construction management and control, enhance construction scheduling, and tracking weather conditions that affect maintenance.

Facility monitoring strategies, such as ramp meters, preferential lanes, and signal priority, will not likely be considered at Interchange 14 in the short term since freeway congestion is not expected to be a concern in 2030. If I-5 should become congested in the future, metering of interchange ramp terminals throughout the Rogue Valley region may become necessary.

Land Use and Development Actions

Several potential land use and development actions are available with the potential to directly or indirectly influence the transportation impacts of future development. Some potential actions include:

- Using trip allocations or trip caps to directly manage traffic impacts of developments and
- Retaining the current Comprehensive Plan designations and land use zoning.

Use Trip Budgets to Directly Mange Traffic from Development

The practice of limiting trips, or placing "trip caps" or "trip budgets" involves permitting development projects based on the number of trips each will generate, in the context of development within a specified area. Using a trip budget program could also provide a measure of flexibility for developers while limiting the total impact of development. A development that did not use all the allowable traffic generation potential of its land might be able to pass on its unused traffic potential to an adjacent development that could be allowed to generate more traffic. As long as the total traffic generation from the area remained within limits, the interchange operations would be protected.

There are several scenarios by which more traffic could be generated in the eastern portion of Ashland than what is currently identified in the RVMPO model[5]. These include: developing with an emphasis on high-traffic uses within current zoning; rezoning to allow more intensive uses;

[5] The predicted 2030 traffic volumes in the RVMPO regional travel demand model form the basis for the future baseline traffic analysis described in Section 4. Traffic design parameters of the future replacement bridge (e.g., number of lanes, turn lane lengths and traffic signals) are also based on projected traffic volume data from the regional model. The model population and employment projections correspond to those in the Jackson County Comprehensive Plan, which are based on statewide projections generated by the Oregon Employment Department.

and expanding the urban growth boundary. Traffic congestion could become severe if properties in the vicinity of the interchange are developed more intensively than assumed for the model under these scenarios.

The flexibility offered a developer under the current zoning and Comprehensive Plan provides wide variation in the number of households and amount of employment that can occur on a parcel. Thus, traffic volume forecasts in the model could be exceeded if each property owner develops to maximum intensity. This, in turn, could lead to increased congestion and potentially cause the system to exceed mobility standards at the interchange.

Retain Current Comprehensive Plan Designations and Land Use Zoning

This strategy represents a commitment by the City of Ashland to retain the current Comprehensive Plan and zoning for the Interchange 14 area. The Ashland Comprehensive Plan provides for significant residential, industrial, and commercial development within the study area. Currently, there is vacant and underutilized residential land north of Ashland Street and industrial land concentrated in the vicinity of the former Croman Mill site (see Section 4).

Transportation modeling draws guidance from comprehensive plans, but requires making assumptions about the type, intensity and location of development that can occur within each zone. As described in Section 4, trip generation modeling was performed for the Interchange 14 study area assuming two different land intensification scenarios in addition to the base RVMPO model assumptions. In reality, land use development and intensities will occur in a way that is unique from these scenarios, but the scenarios provide examples for evaluation.

Changes to the current land use zoning could dramatically affect the number of trips generated, trip patterns, and traffic volumes at intersections and the interchange. As a result, traffic operations at the interchange may approach capacity more rapidly than anticipated, shortening the life of the new interchange and hastening the need for costly investments for additional interchange improvements. For this reason, managing the number of trips using the interchange could be an effective measure to extend the life of the interchange.

Applicable Strategies, Benefits, and Implementation Issues

Based on analysis results discussed in Section 4, there is not currently a strong technical basis for either trip budgets or restricting Comprehensive Plan amendments or zoning changes. However, actual development patterns and traffic growth may create conditions under which such measures are warranted in the future.

Land use districts within the City of Ashland's Municipal Code are by design more flexible than more traditional zoning districts. For example, the industrial zoning district allows for industrial uses as well as more intense uses such as light industry, offices, and retail uses. This is critical as it pertains to the Croman Mill site. As the site redevelops, it will likely adopt more mixed use characteristics that integrate residential uses, including affordable housing. Therefore, retaining existing plan designations and zoning would not be a realistic solution in the IC 14 study area.

The measure would perhaps not only restrict the ability of the City to redevelop the Croman Mill site, but it could also limit the ability of the City to adopt TOD characteristics for the site that could fulfill TDM measures discussed previously.

Summary of Recommended Measures

As shown in Section 4, vehicle trip generation associated with current Comprehensive Plan designation land uses in the Interchange 14 Management Area are anticipated to contribute to increased traffic congestion at study area intersections, including the new interchange. The intensity, timing and location of actual development may result in more congestion than is estimated by the RVMPO model. Therefore, several measures need to be implemented to maintain and preserve the capacity of the interchange and key area intersections.

This section presents a brief summary of the strategies that should be implemented:

- Implement the **Access Management Strategy** for the Interchange 14 area, summarized in Section 6;
- Apply **Transportation System Management** strategies when implementing traffic signal system, including signal interconnect, coordination, and optimization.
- **Enhance the local street network** as land develops by enhancing existing street connections and accessways between developments and providing links to promote alternative modes of transportation other than the automobile.
- Implement **Transportation Demand Management** strategies in cooperation with other jurisdictions within the RVMPO.
- Consider inclusion of Interchange 14 if RVMPO **ITS/ATMS or ramp metering** system is employed.

Implement Access Management

Implementation of the access management is critical to the safe and efficient operations of the interchange. Section 6 provides short-term, medium term and long term recommendations for access management improvements in the Interchange 14 area. All of these recommendations should be implemented.

Implement Traffic System Management Measures

As noted above, TSM measures are assumed to be included when the signals are designed and constructed. This includes signal interconnect and optimized signal timing. If ODOT transfers ownership of any signals along OR 66/Ashland Street, the agencies should agree to maintain coordinated signal operations. This would be specified in an intergovernmental agreement (IGA) or memorandum of understanding (MOU). Additional or more advanced features are not recommended for Interchange 14, unless included as part of an area-wide implementation.

Enhance the Local Street Network

Creating a robust local street network is essential to maximizing the life of any of the new designs at Interchange 14. Ashland is fortunate to have a well developed and interconnected street network throughout the city. As development occurs and congestion increases on this roadway, Ashland should continue its policy of limiting cul-de-sacs and connecting new and existing streets together. The Ashland TSP identifies projects that will improve circulation in the study area and reduce dependence on Ashland Street and Interchange 14, including a street extension of Normal Avenue and upgrades along Tolman Creek Road, Ashland Street, East Main Street and Siskiyou Boulevard. Some of these projects have been completed since adoption of the TSP in 1999. The remaining projects should be studied further to determine timing, alignment, and environmental issues, and actions that would preclude the projects from being implemented. Additional local street connections that are recommended in Section 6 should be considered for adoption into the next update of the Ashland TSP.

Implement Transportation Demand Management as the Interchange Area Develops

TDM strategies that encourage the use of carpools, vanpools, bicycling and walking should be continued. An active Transportation Management Association (TMA) would be useful to promote travel options, coordinate shared rides, obtain grants, advocate for transit service, and provide incentives to participants. Ashland may wish to establish a mechanism by which employers of a certain size are required to participate in a TMA, or provide incentives to employers who choose to participate in a TMA.

Consider Interchange 14 for ITS/ATMS or Ramp Metering Implementation

It is possible that the rate and type of development may occur differently than anticipated, and congestion may become an issue on the freeway. While an ITS or Advanced Traffic Management Systems (ATMS) program would not necessarily be appropriate to employ in the Ashland area in the foreseeable future, the Ashland area interchanges might be included as part of a Rogue Valley regional implementation. The ultimate decision about the employment of ramp metering, ITS, and ATMS would belong to ODOT, but would benefit from cooperation by the City of Ashland.

6. ACCESS MANAGEMENT

A major component of the IAMP, access management is an essential tool for maintaining capacity, traffic flow, and safety in the vicinity of an interchange. Implementation of effective access management measures has the effect of protecting the public investment in the interchange facilities, enabling it to accommodate traffic volumes safely and efficiently into the future while ensuring circulation necessary for good access to the highway. The IAMP acknowledges the vital need of adjacent property owners to maintain roadway access to their businesses and residences. However, driveways and minor street intersections near a ramp terminal can drastically increase conflicts, causing operational problems, reducing the capacity of the intersections, and generally degrading service for all system users. Hence, the IAMP must balance the competing needs of compatible land uses, private access, and function of the transportation system.

Although access management imposes some restrictions and reduction of access for property in close proximity to the interchange, access management actions in this IAMP do not prevent the properties from being used or developed in a manner consistent with their adopted comprehensive planning designations. Access management instead will help to ensure that property owners continue to be able to utilize site advantages of their properties by improving traffic circulation, mobility, and freeway access.

The access management measures for this IAMP are categorized into an ***Access Management Strategy*** and an ***Access Management Plan***. The strategy identifies access management measures that will be implemented during the construction phases of the project at Interchange 14. They represent short-term actions consistent with IAMP goals. In contrast, the access management plan represents medium/long-term measures that may be triggered by future construction projects that propose access to and from the state highway system.

Access Standards and Objectives

Access management must balance the competing needs of traffic capacity and safety with local access needs. The Oregon Highway Plan (OHP) devotes an entire section to the discussion of access management. More detailed requirements, action definitions, and the access spacing standards for state highways are specified in Oregon Administrative Rule (OAR) 734-051 (Division 51): Highway Approaches, Access Control, Spacing Standards, and Medians[6]. Ideally, a project will include provisions by which access within the project limits can be made fully compliant with Division 51. In many instances, however, access needed for existing development will not allow these standards to be met. When the requirements and standards cannot be met, progress toward meeting the applicable standards must be demonstrated.

Division 51 and the OHP contain standards for private driveway and public road approach spacing based on highway classifications and speeds. Access spacing standards are measured

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

from the center of one access to the center of the next access on the same side of the road. These standards were used in the preparation of this IAMP. Proposed construction projects and land use changes near Interchange 14 will require approach permits from ODOT in order to demonstrate compliance with the standards applicable to this project and the objectives of this plan as listed below:

- The first full intersection on the crossroad at an interchange should be no closer than 1,320 feet for fully developed urban interchanges with multi-lane crossroads.
- Approach roads that are less than 1,320 feet but no closer than 750 feet should be limited to right-in/right-out access only.
- All access from abutting properties to the interchange and interchange ramps should be restricted.
- In attempting to meet access management spacing standards, exceptions may be allowed to take advantage of existing property boundaries and existing or planned public streets, and to accommodate environmental constraints.
- Where feasible, private approaches should be consolidated or replaced with public streets to provide consolidated access to multiple properties.
- All properties impacted by the project should be provided reasonable access to the transportation system.
- Approaches on opposite sides of roadways should be aligned, where feasible, to reduce turning conflicts.

As part of the approach permit approval process, requests for deviations from these standards can be made as outlined in Division 51. Deviation findings would need to be prepared if necessary, to explain why the approach cannot meet the standards. For example, modifying approach roads in the planning area to adhere to spacing standards might create safety and traffic operation problems. The Region Access Management Engineer may require that a plan identifies measures to reduce the number of approaches to the highway in order to approve a deviation for a public approach.

A traffic impact study should be performed upon development or redevelopment of parcels in the study area in the context of the normal development process under existing rules. The study should address access points and potential safety issues. The traffic evaluation may result in a possible need for access control (including restrictions that prohibit certain movements). For example, implementation of right-in/right-out restrictions near an interchange is typical. Under certain circumstances left-in movements may also be appropriate where turn restrictions are applied. Providing an allowance for U-turns or alternative routes may be necessary in combination with the restrictions in order to increase accessibility to/from intersections with restricted movements

Access Management Strategy

The access management strategy comprises short-term actions implemented concurrently with Interchange 14 improvements that are consistent with IAMP goals. Short term actions consider the need to maintain reasonable access to existing properties while addressing safety priorities. Hence, short term actions are directed toward improving highway conditions by moving towards meeting appropriate ODOT access management standards. These improvements will be implemented with the construction of the interchange improvements.

Table 6-1 and Figure 6-1 illustrate the actions recommended in the strategy. These focus around the installation of a raised median barrier from southbound ramp terminals west approximately 200 feet - terminating just east of the Washington Street intersection. Under the short-term access management strategy, full access for Washington Street will be maintained.

Table 6-1. Access Management Strategy

Approach Number	Land Use	Access Management Strategy *(Short-Term Action)*
1	Service Station	Left turns restricted by non-traversable median
2	Service Station/ Restaurant	Left turns restricted by non-traversable median
3	Vehicle Rental Store	Left turns restricted by non-traversable median
4	Vehicle Rental Store	Left turns restricted by non-traversable median
5	Service Station	Left turns restricted by non-traversable median
6	Service Station	Left turns restricted by non-traversable median

These measures will undoubtedly impact the corridor. Most affected will be travelers attempting to access businesses that directly front Ashland Street. The issue could be somewhat mitigated by extending the east-west portion of Washington Street paralleling Ashland Street west to connect with Tolman Creek Road, a measure identified in the access management plan described later in this section. This roadway extension would provide an option for westbound motorists to access the businesses on the south side of on Ashland Street via the Tolman Creek Road connection but all traffic exiting these driveways would need to turn right when exiting the properties.

200 100 0 200
Feet

GIS Data Source: Jackson County

Legend

Taxlots outlined in white

0 Approach Location

Access Actions

Non-traversable Median Barrier

Figure 6-1

Access Management Strategy

Interchange 14 (Green Springs) Area Management Plan

Access Management Plan and Enhanced Local Street Network

The access management plan consists of medium/long-term measures for the interchange area and recommendations to enhance the local street network. These measures do not infer any chronological significance to recommendations, but rather are triggered by events other than the planned interchange project. The measures would be implemented when one or more of the following occurs:

- Land use changes or development occurs
- Future highway improvement projects are planned
- Safety and/or operational problems arise.

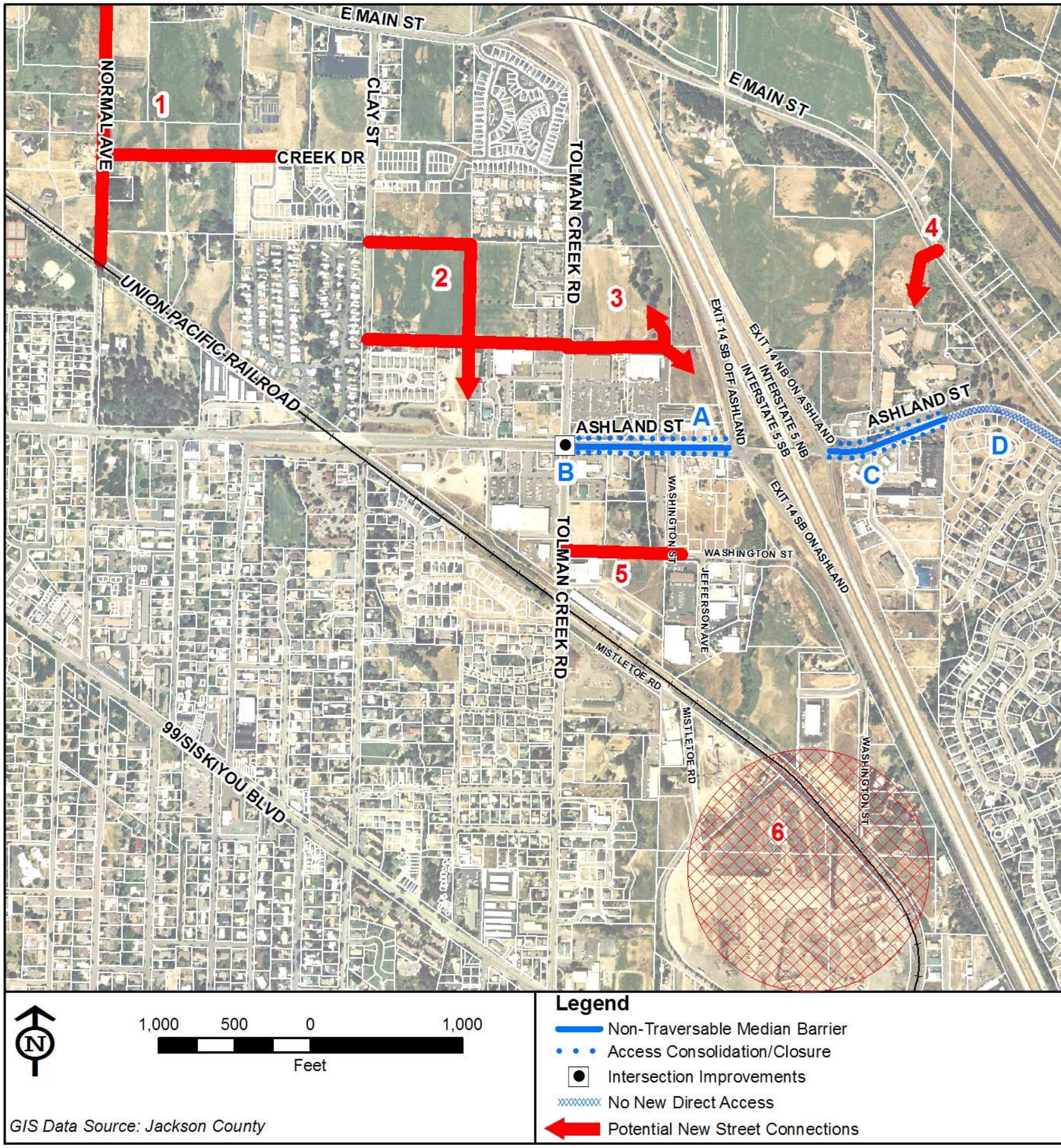
Such measures will be coordinated with Ashland prior to implementation. The plan is intended to address existing roadway and circulation deficiencies, enhance redevelopment opportunities, reduce vehicular conflicts, and preserve the functional integrity of the interchange. These measures are particularly important in the vicinity of Interchange 14 as development and redevelopment progresses, future highway improvements are implemented, and/or safety and operational issues become apparent. The medium/long-term access management measures, illustrated in Figure 6-2, include:

A. Extend the non-traversable median barrier recommended under short-term actions west of I-5 to Tolman Creek Road, thereby restricting left-turning movements between the southbound ramp terminals and Tolman Creek Road. Add signage indicating permitted U-turns at the Ashland Street/Tolman Creek Road intersection. Consolidate/close driveways along Ashland Street, where feasible, as properties redevelop between the I-5 southbound ramp terminals and Tolman Creek Road.

B. Construct capacity improvements at the Ashland Street/Tolman Creek Road intersection. Potential future improvement needs at the intersection could include 1) widening of Ashland Street to accommodate dual westbound left-turn lanes and a corresponding widening of southbound Tolman Creek Road leaving the intersection and/or 2) widening Tolman Creek Road south of Ashland Street to provide an additional northbound approach lane.

C. Restrict left-turn movements by installing a non-traversable median barrier between the northbound ramp terminals and Sutton Place. Widen Ashland Street at the Sutton Place/Windmill Inn driveway to accommodate U-turns at by passenger vehicles and small trucks. Consolidate/close driveways along Ashland Street, where feasible, as properties redevelop between the I-5 northbound ramp terminals and Tolman Creek Road.

D. Do not permit any new driveway access to Ashland Street between Sutton Place and Oak Knoll Drive/East Main Street.



Access Management Measures:

A. Extend non-traversable median barrier to east of Tolman Creek Road intersection, permit U-turns at Ashland Street/Tolman Creek Road intersection, and consolidate/close driveways along Ashland Street as properties redevelop

B. Construct capacity improvements at the Ashland Street/Tolman Creek Road intersetcion

C. Install non-traversable median barrier west of Sutton Place, widen Ashland Street to accommodate U-turns at the Sutton Place intersection, and consolidate/close driveways alsong Ashland Street as properties redevelop

D. No new access to Ashland Street between Sutton Place and Oak Knoll Drive/East Main Street

Enhance Local Street Network:

1. Improve and extend Normal Avenue north of the UPRR rail line to E. Main Street and connect Normal Avenue to Creek Drive

2. Develop a network of new north-south and east-west local streets north of Ashland Street and west of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcel adjacent to Ashland Street

3. New developments in the vicinity north of Ashland Street and east of Tolman Creek Road should be accessed via a network of new streets linked to Tolman Creek Road

4. Construct a local street connection westward from E. Main Street that could provide secondary access into developed property along Ashland Street as well as serve adjacent undeveloped property along E. Main Street

5. Extend and reroute the existing east-west segment of Washington Street to connect with Tolman Creek Road. Either close direct access onto Ashland Street or limit right-in right-out access

6. Extend and connect streets where possible in the vicinity of the Croman Mill site

Figure 6-2

Access Management Plan and Enhanced Local Street Network

Interchange 14 Area Management Plan

In addition to these access management measures, the City should amend its TSP with a more robust street network in the IAMP management area to protect the function of the interchange and improve mobility. The following enhancements to the local street network are recommended, as illustrated in Figure 6-2:

1. Improve and extend Normal Avenue north of the UPRR line to E. Main Street and connect Normal Avenue to Creek Drive.
2. Develop a network of new north-south and east-west local streets north of Ashland Street and west of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcels adjacent to Ashland Street.
3. Develop a network of local streets east of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcels.
4. Construct a local street connection westward from E. Main Street that could provide secondary access into developed property along Ashland Street as well as serve adjacent undeveloped property along E. Main Street.
5. Provide a new connection between Washington Street and Tolman Creek Road. (This connection may make it feasible to close existing Washington Street access to Ashland Street.)
6. Extend and connect existing streets, where feasible to maintain traffic flow as the former Croman Mill site redevelops.

The street connections displayed in Figure 6-2 are conceptual and should be used for planning purposes only.

Implementation of Access Management Plan

The measures identified in the access management plan will be implemented as development (or redevelopment) occurs or when appropriate criteria are met. However, approval or delay of implementation may be determined by the Region Access Management Engineer. Implementation criteria for the various access management measures and local street improvements are described below.

Access Management Measures:

A. Extend the non-traversable median barrier recommended under short-term actions west of I-5 to Tolman Creek Road, thereby restricting left-turning movements between the southbound ramp terminals and Tolman Creek Road. Add signage indicating permitted U-turns at the Ashland Street/Tolman Creek Road intersection. Consolidate/close driveways along Ashland Street, where feasible, as properties redevelop between the I-5 southbound ramp terminals and Tolman Creek Road.

   Installation of the median barrier and U-turn signage should be considered when one or more of the following criteria are met:

- *Average daily traffic for Ashland Street between the Tolman Creek Road and the I-5 southbound ramp terminals exceeds 28,000[7] vehicles per day*
- *The annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT SPIS[8] rating in the top 10 percent*

Design of the median barrier should accommodate potential capacity improvements at the Ashland Street/Tolman Creek Road intersection and may be constructed concurrently with those improvements.

Consolidation or closure of driveways should be considered when properties redevelop and when reasonable access can be provided with a single access point or via a local street.

B. Construct capacity improvements at the Ashland Street/Tolman Creek Road intersection. Potential future improvement needs at the intersection could include 1) widening of Ashland Street to accommodate dual westbound left-turn lanes and a corresponding widening of southbound Tolman Creek Road leaving the intersection and/or 2) widening Tolman Creek Road south of Ashland Street to provide an additional northbound approach lane.

Intersection improvements should be constructed when one or more of the following criteria are met:

- *The intersection requires additional capacity to accommodate increased demand from nearby development, such as the Croman Mill site*
- *The new connection between Washington Street and Tolman Creek Road is constructed*

Design of the intersection improvements should accommodate potential installation of non-traversable median barrier and may be constructed concurrently with those improvements.

C. Restrict left-turn movements by installing a non-traversable median barrier between the northbound ramp terminals and Sutton Place to the last parking entrance onto the Windmill Inn property. Widen Ashland Street at the Sutton Place/Windmill Inn driveway to accommodate U-turns at by passenger vehicles and small trucks. Consolidate/close driveways along Ashland Street, where feasible, as properties redevelop between the I-5 northbound ramp terminals and Tolman Creek Road.

Installation of the median barrier and roadway widening for U-turns should be considered when one or more of the following criteria are met:

- *Average daily traffic for Ashland Street between the I-5 northbound ramp terminals and Sutton Place exceeds 17,000[9] vehicles per day*

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[7] 1999 Oregon Highway Plan, Policy 3B, Medians

[8] Safety Priority Index System

- *The annual accident rate is greater than the statewide annual average accident rate for similar roadways or the section has an ODOT SPIS rating in the top 10 percent*

Consolidation or closure of driveways should be considered when properties redevelop and when reasonable access can be provided with a single access point or via a local street.

D. Do not permit any new driveway access to Ashland Street between Sutton Place and Oak Knoll Drive/East Main Street.

No criteria necessary.

Local Street Network Enhancements:

1. Improve and extend Normal Avenue north of the UPRR line to E. Main Street and connect Normal Avenue to Creek Drive.

   Extensions should occur concurrently with adjacent development unless other mechanisms for funding the improvements are identified in the Ashland TSP.

2. Develop a network of new north-south and east-west local streets north of Ashland Street and west of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcels adjacent to Ashland Street.

   Network improvements should occur concurrently with adjacent development unless other mechanisms for funding the improvements are identified in the Ashland TSP.

3. Develop a network of local streets east of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcels.

   Network improvements should occur concurrently with adjacent development unless other mechanisms for funding the improvements are identified in the Ashland TSP.

4. Construct a local street connection westward from E. Main Street that could provide secondary access into developed property along Ashland Street as well as serve adjacent undeveloped property along E. Main Street.

   Local street connection should be considered when one or more of the following criteria are met:

   - *The median barrier on Ashland Street is installed between the I-5 northbound ramp terminals and Sutton Place*
   - *Adjacent properties develop*

5. Provide a new connection between Washington Street and Tolman Creek Road.

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[9] National Cooperative Highway Research Program, Synthesis 332, Access Management on Crossroads in the Vicinity of Interchanges, Transportation Research Board, 2004

Local street connection should be considered when one or more of the following criteria are met:

- *The median barrier on Ashland Street is installed between Tolman Creek Road and the I-5 southbound ramp terminals*
- *The STOP-controlled intersection of Washington Street at Ashland Street cannot sufficiently process demand (as indicated by a v/c ratio for the northbound movements that exceeds 0.90, long delays, and extensive queuing on Washington Street) or a consistent crash pattern showing angle or turning collisions involving vehicles turning from Washington Street*
- *Adjacent properties develop*

6. Extend and connect existing streets, where feasible to maintain traffic flow as the former Croman Mill site redevelops.

   Network improvements should occur concurrently with adjacent development unless other mechanisms for funding the improvements are identified in the Ashland TSP.

7. I-5 INTERCHANGE 14 IAMP IMPLEMENTATION

Planning and design for improvements to Interchange 14 began concurrently with IAMP development efforts. Adoption of the IAMP by the OTC is still required under OAR 734-051-0155. Adoption of the IAMP by the City demonstrates a local commitment to the primary objective of this IAMP: the protection of the public investment in the interchange. Local adoption will also help justify additional management area improvements as they become necessary.

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

OHP Policy Statement

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

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

- The highest priority for investments by the State to Interchange 14 shall be directed toward critical safety problems and maintaining the interchange's existing physical infrastructure.
- Future investments by the State to increase capacity within the IAMP 14 study area shall require the City to adopt IAMP 14. IAMP adoption, policies, and/or ordinances must be adopted prior to the project's inclusion in the Statewide Transportation Improvement Program (STIP).

Access Management

Ashland Street (OR 66) is a state highway. Therefore adoption of the Access Management Plan is a state responsibility.

"Access Management Plan" from Section 6 of this document is to be adopted, including Table 6-1, Figure 6-1, Figure 6-2, and explanatory materials.

Amend Ashland TSP: Street Improvement Plan

The TSP is a locally-adopted plan and is thus a responsibility of the City of Ashland. The local street connections shown in Figure 6-2 and as described below shall be included in the update of the Ashland TSP. It should be noted that because the TSP update is in progress and has not yet been adopted, the precise outline and organization of the document has not been established. For this reason, the following projects are not assigned to a particular TSP chapter or section, but rather shall be incorporated into the appropriate sections of the updated TSP:

- Improve and extend Normal Avenue north of the CORP rail line;
- Extend Creek Drive to Normal Avenue;
- Develop a network of new north-south and east-west local streets north of Ashland Street and west of Tolman Creek Road;
- Develop a network of local streets east of Tolman Creek Road that provide access to undeveloped parcels as well as developed parcels.
- Develop a local street connection westward from E. Main Street that could provide secondary access into developed property along Ashland Street as well as serve adjacent undeveloped property along E. Main Street
- Provide a local street connection between Washington Street and Tolman Creek Road.
- Extend and connect existing streets, where feasible to maintain traffic flow as the former Croman Mill site redevelops.

Amend Ashland TSP: Goals and Objectives

The TSP is a locally-adopted plan and is thus a responsibility of the City of Ashland. Adoption of the following Goals and Objectives is also a city responsibility. As noted above, a TSP update will soon begin. The updated TSP shall define goals and objectives that express the city's support of key IAMP actions. Recommended objectives are provided below.

- Support ODOT's efforts to implement an access management plan on Ashland Street (OR 66) between Tolman Creek Road and East Main Street to protect the operations and function of Interchange 14.
- Construct a local, interconnected street system emphasizing connectivity especially in the vicinity of Interchange 14.
- Support ODOT's efforts to implement traffic system management measures consisting of signal interconnect and optimization along the Ashland Street (OR 66) corridor.

The placement of the objectives is dependent on the ultimate outline and structure of the updated TSP.