Volume 1

I-84 Barnhart Road Interchange Area Management Plan

Umatilla County, Oregon

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I-84/Barnhart Road Interchange Area Management Plan

Umatilla County, Oregon

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Table of Contents

List of Figures

List of Tables

Preface

The progress of this plan was guided by the Project Planning Management Team (PPMT) identified below.

Project Planning Management Team (PPMT)

Teresa Penniger ODOT Region 5	Tamra Mabbott Umatilla County	Bob Patterson City of Pendleton
Doug Wright ODOT Region 5	Hal Phillips Umatilla County	Jon Jinings DLCD
Don Fine ODOT Region 5	Mike Muller City of Pendleton	Darren Nichols DLCD
George Ruby ODOT District 12	Tim Simons City of Pendleton	

The PPMT members devoted a substantial amount of time and effort to the development of the I-84/Barnhart Road IAMP, and their participation was instrumental in the development of the recommendations that are presented in this report.

Project Consultant Team:

Kittelson & Associates, Inc.
Anderson Perry & Associates, Inc.

Section 0

Introduction

Introduction

As part of the Barnhart Road-Airport Road Connector project, an Interchange Area Management Plan (IAMP) was conducted at the I-84/Barnhart Road Interchange to ensure that the interchange area continues to operate and function as designed with the new connection between Barnhart Road and Airport Road. The following section provides an overview of the Interchange Area Management Plan (IAMP) study area and describes the project goals, objectives, and evaluation criteria that were established with input from the Planning Project Management Team (PPMT).

Interchange Area Management Plan (IAMP) Study Area

At a minimum, the IAMP study area is required to include all land uses and roadways located within approximately 1,320 feet of the existing I-84 / Barnhart Road interchange. This distance corresponds to the spacing standard outlined in the Oregon Administration Rule (OAR) 734, Division 51 rules for interchanges. The Barnhart Road-Airport Road Connector alignment alternatives and the roadway network and land use patterns surrounding the I-84/Barnhart Road Interchange were reviewed to determine the need to extend beyond the 1,320-foot minimum requirement. Based on this review, the study area was extended to the north to include the most northern potential alignment option and the EFU land that would become segmented between I-84 and the new *Barnhart Road-Airport Road Connector* roadway alignment. The study area roadways include Interstate-84, Barnhart Road, Clark Lane (north of the interchange), and Fanshier Road (south of the interchange). The study roadways and properties included within the proposed Barnhart Road IAMP study area are shown in Figure 0-1

Problem Statement

The I-84/Barnhart Road Interchange is a rural interchange which primarily provides access to farmland as well as several Rural Industrial and Rural Tourist Commercial properties. The proposed *Airport Road-Barnhart Road Connector* project will change the nature of this interchange as it will provide a direct connection from an existing rural interchange to the Pendleton Airport; a growing industrial area within the City of Pendleton's urban growth boundary.

Today, all vehicle travel to and from the airport and surrounding industrial lands and Interstate-84 must use Airport Road to access I-84. This roadway has several steep grades, is difficult to travel, and can be impassible for trucks during inclement weather. The *Airport Road-Barnhart Road Connector* project will provide a direct route without sustained steep grades for traffic headed to/from the west. This connection is anticipated to significantly increase the amount of traffic as well as the number of freight vehicles through the I-84/Barnhart Road Interchange.

IAMP STUDY AREA
PENDLETON, OR

FIGURE
0-1

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

File Path: K:\Kittelson\Pendleton_IAMP\MXD\IAMP_Study_Area_081006_11x17.mxd, Date: March 8, 2007 4:28:34 PM

Goals, Objectives, and Evaluation Criteria

The IAMP process is intended to protect the function of interchanges and the needs of the property owners who rely on the interchange for local access when a significant modification such as a new connection is planned. As stated in Policy 3C of the 1999 Oregon Highway Plan, "it is the policy of the State of Oregon to plan for and manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways." From this definition, the goals and objectives of the I-84/Barnhart Road IAMP are to:

- Protect the function and operation of the Barnhart Road interchange and Interstate-84 as a facility of statewide significance.
- Develop an access management plan for the Barnhart Road interchange that is compatible with the Barnhart Road-Airport Road Connector through a collaborative effort involving design professionals, jurisdictional representatives, and local citizens and business owners.
- Ensure that the access management plan meets projected near-term and long-term travel demands between I-84, Barnhart Road, and the Barnhart Road-Airport Road Connector.
- Protect the long-term function of the interchange through access management techniques and the development of a planned, supporting, local roadway infrastructure.
- Protect the function and operation of the existing local street network within the IAMP study area.
- Ensure changes to the planned land use system are consistent with protecting the long-term function of the interchange and the local street system.
- Ensure that the interchange will function to support local economic development.
- Comply with the intent of Statewide Planning Goal 2: Land Use Planning, 3: Agricultural Lands, 5: Natural Resources, 11: Public Facilities, 12: Transportation, and 14: Urban Growth Boundaries.

Based on the above objectives, the following evaluation criteria were assembled to ensure that each concept would be evaluated for consistency with the overall intent of the community and the project. The five evaluation criteria are as outlined below:

- Transportation Operations: This category consists of those criteria that assess the ability for vehicles to travel through and within the study area. Special considerations within this category include safety, local connectivity, mobility, truck accommodation, and local circulation.
- Land Use: This category consists of those criteria that assess right-of-way impacts, the consistency with adopted land use plans, impacts to utilities, economic development impacts, and impact to EFU resources.
- Cost: This category consists of those criteria that assess the practicality of a design concept from a construction cost and feasibility perspective.
- Environmental/Social: This category consists of those criteria that assess the degree to which an alternative is compatible with the natural and built environment including environmental impacts, social/economic impacts, storm water drainage, and hazardous waste impacts.

- Accessibility: This category consists of those criteria that assess the ability to access properties and businesses within the study area to/from the regional infrastructure network including the balance between local access and roadway function, future access for undeveloped properties, and adherence to the access spacing standards.

Development of the I-84/Barnhart Road IAMP

The I-84/Barnhart Road IAMP was guided by the Project Planning Management Team (PPMT), a technical review committee made up of representatives from the Oregon Department of Transportation (ODOT), the City of Pendleton, and Umatilla County. The PPMT roster list is provided in the Preface of this document and in Section 1. The PPMT convened throughout the course of the project to review and guide the technical analysis prepared by the consultant team. A summary of the individual PPMT meetings is provided in Section 1. Minutes from the meetings are provided in Appendix "A" of *I-84/Barnhart Road IAMP Technical Appendix*.

Public Involvement

In addition to the technical review work provided by the PPMT, local citizens, property owners, and business owners participated in two public workshops. The workshops provided them with opportunities to comment on the design of the intersection of the Connector Roadway and Barnhart Road and the supporting local circulation network. Summaries of the public meetings are also provided in Section 1 within the PPMT meeting minutes provided Appendix "A" of *I-84/Barnhart Road IAMP Technical Appendix*.

I-84/Barnhart Road IAMP Outline

The development of the I-84/Barnhart Road IAMP began in September 2006 when the project development team first met with the PPMT. Since then, this group has undergone an extensive process that has involved a review of existing and future transportation conditions, future land use analyses, Connector Roadway alignment and design, and supporting local access and circulation planning. Technical memorandums documenting this extensive work effort have been prepared throughout the course of the project and are provided in the *I-84/Barnhart Road IAMP Technical Appendix.* In an effort to summarize this process, the remainder of this document provides an overview of the following sections of the IAMP:

- **Section 1** details the interagency and public involvement plan;
- **Section 2** provides the plan and policy review;
- **Section 3** outlines the existing land use patterns and transportation facilities within the IAMP study area;
- **Section 4** documents the future land use conditions and how they were addressed by the study effort;
- **Section 5** provides a description of the alternatives analysis and transportation planning efforts involving the selection of a preferred alignment for the Connector Roadway within the interchange vicinity as well as the supporting local access and circulation network;
- **Section 6** documents the I-84/Barnhart Road IAMP and the associated transportation improvement projects that are necessary to ensure the continued long-term safety and function of the I-84/Barnhart Road Interchange; and

- **Section 7** documents how the I-84/Barnhart Road IAMP complies with the Oregon Administrative Rules for the development of an interchange area management plan as well as the Oregon Highway Plan.

Section 1

Interagency and Public Involvement Program

Interagency and Public Involvement Program

As part of the I-84/Barnhart Road Interchange Area Management Plan (IAMP) interagency and public involvement occurred through a Project Planning Management Team (PPMT) that had regular meetings as well two public open houses involving local citizens, property owners, and business owners. The following provides an overview of the PPMT meeting and public open house schedule.

Project Planning Management Team

The Project Planning Management Team (PPMT) guided the planning work and was responsible for reviewing all work products, providing input on all planning recommendations such as the project study area, goals and objectives, level of public involvement, technical analysis, and the proposed alternatives. Ultimately the PPMP helped select the preferred local circulation/access, land use management, and coordination elements of the IAMP.

A draft PPMT was established based on input from City, County, and ODOT representatives. The draft PPMT was presented during the combined kick-off meeting, held August 8th, 2006, for the Barnhart Road-Airport Road Connector and IAMP projects. Based on feedback from the meeting's participants, the PPMT shown in Table 1-1 was established.

Table 1-1 Project Planning Management Team

Agency	Name	Position/Title	Role
ODOT – La Grand/Region 5	Teresa Penninger	Region 5 Planning Manager	ODOT Project Manager
	Doug Wright	Federal Aid Specialist	ODOT Project Manager
	Tom Kuhlman	Region 5 Traffic Engineer	Informed
	Craig Sipp	Assistant Traffic Manager	Informed
	Don Fine	Traffic Engineer	PPMT member
ODOT- Pendleton/District 12	George Ruby	District 12 Maintenance Manager	PPMT member
	Marilyn Holt		Informed
Umatilla County	Tamra Mabbott	County Planning Director	County Project Manager
	Hal Phillips	Public Works Director	PPMT member
	Dennis Doherty	Commissioner	Informed
City of Pendleton	Mike Muller	City Planner	PPMT member
	Tim Simons	City Engineer	PPMT member
	Bob Patterson	Public Works Director	PPMT member
	Pete Wells	City Attorney/Planning Director	Informed
DLCD	Jon Jinings	Representative to Umatilla County	PPMT member
	Darren Nichols	Representative to City of Pendleton	PPMT member
	Bob Cortwright	Transportation Planning Coordinator	Informed
	Matt Crall	Transportation Planner	Informed

DLCD – Department of Land Conservation and Development

The PPMT members were selected in order to provide representation from both the planning and traffic engineering departments for each agency involved. Team members identified as "Informed" were copied on all PPMT project correspondence, review materials, and meeting notices and agendas. The informed members were included at the request of the respective agencies because they may have been requested to provide input, attend a PPMT meeting as an alternate or provide their approval of the final project. An outline of all of the PPMT meetings is included in the next section.

Public Involvement Plan

To ensure that adequate project coordination and public participation occurred throughout the development of the Barnhart Road Interchange Area Management Plan, a series of Project Planning Management Team (PPMT) meetings and public workshops were be held over the course of the project. The public workshops were combined stakeholder workshops and public open houses due to the limited number of property owners within the study area. The PPMT and public workshop meeting dates and objectives are summarized in Table 1-2.

In addition to the PPMT meetings and public workshops there will also be opportunities for public comment during the IAMP adoption process during the Planning Commission hearing, Board of County Commissioners hearings, and the Oregon Transportation Commission hearing.

Table 1-2 Meeting Summary

Meeting Event	Date/Location	Meeting Purpose/Objectives
PPMT Meeting #1	Sept. 21st, 2006/ Conference Call	-Review Technical Memo #1: Interagency and Public Involvement Program -Review Technical Memo #2: Document Review The purpose of the PPMT Meeting #1 was to introduce the I-84/Barnhart Road interchange project and the consultant team; review the project schedule; review the project goals, objectives, and evaluation criteria; confirm the study area; confirm the project schedule; and review the project's policy framework.
PPMT Meeting #2	Oct. 19th, 2006/ Pendleton	-Presentation: IAMP 101 -Review Technical Memo #3: Existing Conditions The purpose of PPMT Meeting #2 was to overview the IAMP process: review the existing land use and traffic operations: and adopt the evaluation criteria.
PPMT Meeting #3	Nov. 13 2006/ Pendleton	-Presentation: Local Circulation/Access 101 -Review Technical Memo #4: Future Conditions -Brainstorm Local Circulation/Access Management Alternatives The purpose of the PPMT #3 was to review the future forecast land use and traffic operations, and brainstorm potential local circulation and access management alternatives for each roadway alternative and the existing roadway system.

Meeting Event	Date/Location	Meeting Purpose/Objectives
Public Workshop #1	Nov. 13 2006/ Pendleton	-Presentation: IAMP 101and Local Circulation/Access 101 -Review Technical Memos #1-4 -Brainstorm Local Circulation/Access Management Alternatives, The purpose of the first stakeholder meeting/public workshop was to present the project goals and objectives and findings to date; educate the public and stakeholders on the IAMP process and access management practices; and engage the participants to help develop potential local circulation and access management alternatives.
PPMT Employment Assumptions Meeting	Dec.13, 2006/ Pendleton	-Review Previous Employment and Traffic Growth Assumptions. -Evaluate discrepancies in past work. -Bring Resolution to the Traffic Growth assumptions for analysis of the future conditions. The purpose of the PPMT Employment Assumptions Meeting was to discuss the discrepancy in the various future trip generation studies and to make decisions regarding the PPMT's plan to move forward with the IAMP process.
Public Workshop #2	Jan. 17, 2007/ Pendleton	-Review Technical Memo #5 – Alternatives Analysis -Receive Input on the Preferred Alternative The purpose of the second stakeholder meeting/public workshop was to present the qualitative evaluations of the access management alternatives for the Interchange Area developed during Public Workshop #1 and collect input on a preferred alternative for the Draft IAMP. The participants had the opportunity to comment on and score each alternative.
PPMT Meeting #4	Jan.18, 2007/ Pendleton	-Presentation: Land Use Management 101 -Brainstorm Land Use Management and Coordination Alternatives Review Technical Memo #5 – Alternatives Analysis -Select a Preferred Alternative The purpose of PPMT Meeting #4 was to review Technical Memo #5: Alternatives Analysis, review the qualitative evaluations of the alternative access management strategies for the Interchange Area developed during PPMT #3 and PW #1, brainstorm land use management alternatives, and select a preferred access management alterative to carry forward for the Draft IAMP document.
PPMT Meeting #5	March 6, 2007/ Conference Call	-Review the complete Draft IAMP document The purpose of the PPMT Meeting #5 was to review the complete Draft IAMP document and recommendations.

Section 2

Plan and Policy Review

Plan and Policy Review

This section of the report provides an overview of the regulatory framework associated with the area near the I-84/Barnhart Road Interchange in Umatilla County outside of Pendleton. The regulatory context involves state and local levels of governance that directly impact transportation planning associated with the I-84/Barnhart Road Interchange Area Management Plan (IAMP).

Regulatory Framework

The Statewide Planning Goals relevant to the IAMP express the state's policies on land use and the related topics of resource lands, public facilities, transportation and urbanization. Oregon's statewide goals are achieved through local comprehensive planning. State law requires each city and county to adopt a comprehensive plan and the zoning and land-division ordinances needed to put the plan into effect. The local comprehensive plans must be consistent with the Statewide Planning Goals. Plans are reviewed for such consistency by the state's Land Conservation and Development Commission (LCDC). When LCDC officially approves a local government's plan, it becomes the controlling document for land use in the area covered by that plan.

For both the City and the County, the local comprehensive plan documents contain objectives and policies that are intended to guide growth and development over the 20-year planning horizon. They are based on the specific qualities and characteristics of the community and reflect their desire for future improvements. The comprehensive plans are intended to be consistent with the Statewide Planning Goals.

A transportation system plan (TSP) is the transportation element of a comprehensive plan. TSPs contain policies relating to the transportation system, including streets and bicycle/pedestrian facilities. The Transportation Planning Rule (TPR) requires that land use plans and transportation are consistent with one another. It requires cities, counties and the state to adopt Transportation System Plans linking land use and transportation plans.

Land use and zoning ordinances are used to implement the policies identified in comprehensive plans. They specify the different zoning districts and provide standards, regulations, and review procedures for all development within those zones.

Documents Reviewed

The following transportation and land use plans were reviewed for policies and regulations applicable to the development of a new roadway connection near the Barnhart Road/I-84 interchange. The page number (__p.) where each document's review begins in this memorandum is included for quick reference in the list below.

State/ODOT

- Statewide Planning Goals 2 (Land Use Planning), 3 (Agricultural Lands), 5 (Open Space and Natural Resources), 11 (Public Facilities and Services), 12 (Transportation), and 14 (Urbanization) – p. 13

- Transportation Planning Rule (TPR) Oregon Administrative Rule 660 Division 12 - p.16
- Oregon Administrative Rule 731, Division 15, Department of Transportation Coordination Rules – p. 17
- Oregon Transportation Plan (2006 draft) – p. 18
- Oregon Highway Plan (as amended through 2006) – p. 18
- Oregon Administrative Rule (OAR) 734-051 (Highway Approaches, Access Control, Spacing Standards and Medians) – p. 21
- Ballot Measure 37. Oregon Revised Statutes 197.352 – p. 23

Local

- Umatilla County Comprehensive Plan (1987) – p. 24
- Umatilla County Transportation Plan (2002) – p. 26
- Umatilla County Road Design Standards (2002) – p. 28
- Umatilla County Access Management Standards (2002) – p. 31
- Umatilla County Development Code (2005) – p. 31
- City of Pendleton Transportation System Plan (1996) – p. 36
- City of Pendleton Roadway Design Standards (1996) – p. 36

State of Oregon

Statewide Planning Goals

Statewide Planning Goal 2

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 six statewide planning goals that play a key role in management planning for the Barnhart Road interchange area. The others are Goals 3 (Agricultural Lands), 5 (Open Space and Natural Resources), 11 (Public Facilities Planning), 12 (Transportation), and 14 (Urbanization).

Goal 2 is important for four 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." As part of this project, Goal 2 will require that ODOT coordinate with Umatilla County and the City of Pendleton, which have planning authority over the area impacted by the interchange and roadway improvements. Coordination is particularly important because land development in the County will impact the interchange and, in particular, could affect the function and operation of the interchange.

A second important element of Goal 2 is its provision that land use decisions and actions be 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 a reasonable person would find the evidence to be adequate to support "findings of fact" that a proposed land use action complies with the applicable review standards.

Third, Goal 2 requires that plans and actions related to land use by city, county, and state and federal agencies and special districts be "consistent with the comprehensive plans of cities and counties and regional plans adopted under ORS Chapter 268." This provision is important because elements of an interchange area management plan (IAMP) developed for the Barnhart Road interchange will need to be adopted by Umatilla County as an element of their transportation system plan (TSP).

Finally, Goal 2 includes standards for taking an "exception" to one or more statewide planning goals. The Goal 2 exception standards apply when a local government or property owner proposes to use property in a manner otherwise prohibited by one or more statewide planning goals. The Goal 2 exception standards require the individual or local government taking the exception to demonstrate how the following standards are met:

- Reasons justify why the state policy embodied in the applicable goals should not apply;
- Areas which do not require a new exception cannot reasonably accommodate the use;
- The long-term environmental, economic, social and energy consequences resulting from the use at the proposed site with measures designed to reduce adverse impacts are not significantly more adverse than would typically result from the same proposal being located in areas requiring a goal exception other than the proposed site; and
- The proposed uses are compatible with other adjacent land uses or will be so rendered through measures designed to reduce adverse impacts.

The Goal 2 exceptions standards are interpreted in significant detail in **OAR 660, Division 4**. Rule sections particularly relevant to developing an IAMP for the Barnhart Road interchange are:

- OAR 660-004-0022, which establishes standards under which uses such as residential or industrial development may be justified on rural lands; and
- OAR 660-004-0020(2)(b), which requires demonstration why a proposed use cannot reasonably be accommodated on non-resource land or inside a UGB.

The Goal 2 exceptions criteria provide resource lands with a very high level of protection from higher intensity rural non-farm uses. The exception requirements related to transportation facilities are further refined in the Oregon Transportation Planning Rule, codified in OAR 660-012-0070 (see discussion below).

Statewide Planning Goal 3

Statewide Planning Goal 3, Agricultural Lands, requires that agricultural lands be preserved and maintained for farm use. The goal is implemented through zoning that limits uses on agricultural

lands to "farm uses and those non-farm uses defined by commission rule that will not have significant adverse effects on accepted farm or forest practices." Such zoning is commonly referred to as "exclusive farm use" zoning.

Goal 3 and **ORS 215.780** also require counties to establish minimum sizes for new lots or parcels in each agricultural land designation. ORS 215.780(1)(a) provides that for land zoned for exclusive farm use and not designated rangeland, the minimum lot or parcel size shall be at least 80 acres. This is the minimum lot size applicable to the EFU-zoned lands in the County.

Because Umatilla County is a "non-marginal lands" county for purposes of Goal 3 compliance, the uses identified in ORS 215.283 may be permitted on EFU-zoned lands in the county. Those uses include:

- Schools, churches, certain utility facilities, farm dwellings, reconstruction or modification of public roads, certain other roadway improvements, wineries, farm stands, and facilities for processing farm crops, which are permitted under ORS 215.283(1);
- Mining activities, community centers, public and private parks, playgrounds, golf courses, commercial activities in conjunction with farm use, and additional roadway improvements, which are permitted under ORS 215.283(2); and
- Road, highway and other transportation improvements not allowed under ORS 215.283(1) or (2), which are permitted under ORS 215.283(3).

OAR 660, Division 33 is the Land Conservation and Development Commission's (LCDC) rule establishing limitations on uses statutorily permitted in EFU zones. It includes limitations on uses permitted under ORS 215.283(1) that counties otherwise could not have adopted. It also includes limitations on uses allowed under ORS 215.283(2) that counties may further regulate.

Like ORS 215.780, OAR 660-033-0100(1) requires counties to establish minimum parcel sizes of at least 80 acres for land zoned for exclusive farm use. OAR 660-033-0120 and OAR 660-033-0130 respectively address uses authorized on high value agricultural lands and establish minimum standards applicable to those allowed uses. Under these rules, for example, new public and private schools, churches, golf courses, and private parks, playgrounds and campgrounds are not permitted. Moreover, new schools and churches, and most private campgrounds, are not permitted within three miles of a UGB unless an exception is approved pursuant to ORS 197.732 and OAR 660, Division 4. See OAR 660-033-0120, Table 1, and 660-033-0130(2), (19). Commercial uses in conjunction with farm use are permitted only where such uses will not force a significant change in, or significantly increase the cost of, accepted farm or forest practices on surrounding lands devoted to farm or forest uses.

Statewide Planning Goal 5

Statewide Planning Goal 5: Natural Resources, Scenic and Historic Resources, and Open Spaces, requires local governments to adopt programs that will protect natural, historic, and scenic resources for present and future generations. The goal lists resources that must be inventoried, which include riparian areas, wetlands, wildlife habitat and natural areas. The goal requirements are set forth in OAR 660-015-0000. Subsection B. of the goal includes guidelines for

implementing the goal through local programs. The goal states that "fish and wildlife areas and habitat should be protected and managed in accordance with Oregon Wildlife Commission' fish and wildlife management plans."

Statewide Planning Goal 11

Statewide Planning Goal 11 - Public Facilities 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."

Goal 11 prohibits the establishment of sewer systems outside urban growth boundaries and the extension of sewer lines from within UGBs to serve lands outside UGBs, except where a new or extended system is the only practical alternative to mitigate a public health hazard and will not adversely affect farm or forest land. This effectively limits the ability to establish urban scale land uses in the southern part of the study area. Also, Goal 11 is implemented by OAR 660, Division 11, which prohibits local governments from using the presence, establishment or extension of a water system on rural lands to allow an increase in the allowable density of residential development (see OAR 660-011-0065). This means that to provide urban-scale facilities in the rural agricultural and residential areas adjacent to the interchange, a Goal 11 exception is required.[1]

Statewide Planning Goal 12

Statewide Planning Goal 12, Transportation, requires cities, counties, metropolitan planning organizations, and ODOT to provide and encourage a safe, convenient, and economic transportation system. This is accomplished through development of transportation system plans (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 are relevant to planning a replacement interchange.

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;

1 Public facilities needed to serve urban scale uses would also be considered urban in scale.

- 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.)

LCDC rules implementing Goal 12 do not regulate access management. ODOT adopted OAR 734, Chapter 51, to address access management and it is expected that ODOT, as part of this project, will engage in access management consistent with its Access Management Rule. This could involve the purchase of access rights within one-quarter mile of the interchange ramps.

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)."

Statewide Planning Goal 14

Goal 14 requires that urban growth boundaries be established and maintained by cities, counties and regional governments in order to provide land for urban development needs and to identify and separate urban and urbanizable land from rural land.

Goal 14 was amended by the Land Conservation and Development Commission in December 2005 to address rural industrial development. These amendments were in response to House Bill 2458, which authorizes commercial development in buildings of any size and type on certain lands outside the Willamette Valley and outside the urban growth boundaries of cities.[2]

Goal 14 states that "not withstanding other provisions of this goal restricting urban uses on rural land, a county may authorize industrial development, and accessory uses subordinate to the industrial development, in buildings of any size and type, on certain lands outside urban growth boundaries specified in ORS 197.713 and 197.714, consistent with the requirements of those statutes and any applicable administrative rules adopted by the Commission."

Oregon Administrative Rule 731, Division 15, Department of Transportation Coordination Rules

ODOT's Division 15, Coordination Rules, (OAR 731-015) ensures that the procedures used in developing highway improvement projects and other ODOT actions affecting land use comply with Oregon's Statewide Planning Goals and are consistent with applicable acknowledged comprehensive plans, as required by ORS 197.180. This administrative rule provides

2 House Bill 2458 became effective July 29, 2005.

coordination procedures to be used when adopting Final Facility Plans, such as an interchange area management plan (OAR-731-015-0065).

Oregon Transportation Plan (2006)

The Oregon Transportation Plan (OTP) is a policy document developed by ODOT in response to the federal and state mandates for systematic planning for the future of Oregon's transportation system. The OTP is intended to meet statutory requirements (ORS 184.618(1)) to develop a state transportation policy and comprehensive long-range plan for a multi-modal transportation system that addresses economic efficiency, orderly economic development, safety, and environmental quality.

The OTP consists of two elements: the Policy Element and the System Element. The Policy Element defines goals, policies, and actions for the state for the next 40 years. The Plan's System Element identifies a coordinated multi-modal transportation system, to be developed over the next 20 years, which is intended to implement the goals and policies of the Plan.

The OTP was adopted in 1998 and updated and adopted most recently by the Oregon Transportation Commission (OTC) in October of 2006.

Oregon Highway Plan

The Oregon Highway Plan (OHP), which is a modal element of the OTP, guides the planning, operations and financing of ODOT's Highway Division. 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 OHP is amended from time to time by the OTC when it adopts special facility plans including IAMPs and refinement plans for specific ODOT facilities like those being prepared for the Barnhart Road Interchange.

The policies found within the OHP that apply to the Barnhart Road IAMP include:

- Policy 1A: State Highway Classification System;
- Policy 1B: Land Use and Transportation;
- Policy 1C: State Highway Freight System;
- Policy 1F: Highway Mobility Standards;
- Policy 1G: Major Improvements;
- Policy 2B: Off-System Improvements;
- Policy 2F: Traffic Safety;
- Policy 3A: Classification and Spacing Standards;
- Policy 3C: Interchange Access Management Areas;

- Policy 4A: Efficiency of Freight Movement;
- Policy 5B: Scenic Resources

Policy 1A: State Highway Classification System. The state highway classification system includes five classifications: Interstate, Statewide, Regional, District, and Local Interest Roads. In addition, there are four special purpose categories that overlay the basic classifications: special land use areas, statewide freight routes, scenic byways and lifeline routes. Interstate-84 is an Interstate Highway and is part of the National Highway System (NHS). The Policy 1A definition states: "Interstate Highways provide connections to major cities, regions of the state, and other states. A secondary function in urban areas is to provide connections for regional trips within the metropolitan area. The Interstate Highways are major freight routes and their objective is to provide mobility. The management objective is to provide for safe and efficient high-speed continuous-flow operation in urban and rural areas."

Policy 1B: Land Use and Transportation. This policy recognizes the role of both the State and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning.

Policy 1C: State Highway Freight System. This policy recognizes the need for the efficient movement of freight through the state. Interstate-84 is a designated freight route.

Policy 1F: Highway Mobility Standards Access Management Policy. This policy addresses state highway performance expectations, providing guidance for managing access and traffic control systems related to interchanges.

The mobility standards for the I-84/Barnhart Road Interchange based on *Oregon Highway Plan* (OHP) Table 6 are identified below in Table 2-1. These standards for the maximum volume to capacity ratio (v/c) apply to areas outside of Metro and outside of an Urban Growth Boundary in Rural Lands. Barnhart Road is not an ODOT facility and the mobility standard is therefore based on the District Highway/Local Interest Road designation.

Table 2-1 I-84/Barnhart Road Interchange Mobility Standards

Intersection	Type	OHP V/C Ratio
I-84 Exit 202 EB Ramp and Barnhart Road	Local Interest Road/Interstate Ramp Terminal	0.75
I-84/Exit 202 WB Ramp and Barnhart Road	Local Interest Road/Interstate Ramp Terminal	0.75
I-84 Mainline Segment	Interstate	0.70

Policy 1G: Major Improvements. This policy requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

Policy 2B: Off-System Improvements. This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system. As part of the Barnhart Road IAMP process, ODOT will be working with Umatilla County and the City of Pendleton to complete the development of an access management plan to ensure the efficient and effective operation of the improved interchange.

Policy 2F: Traffic Safety. This policy emphasizes the state's efforts to improve safety of all uses of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues.

Policy 3A: Classification and Spacing Standards. This policy addresses the location, spacing and type of road and street intersections and approach roads on state highways. The adopted standards can be found in Appendix C of the Oregon Highway Plan. It includes standards for each highway classification; Barnhart Road is a rural interchange on an Interstate Highway with an existing two-lane crossroad. There are currently no plans for improvements to the interchange. Generally, the access spacing distance increases as either the highway's importance or posted speed increases. The current adopted spacing standard from the end of the Barnhart Road interchange entrance/exit ramps to the first major intersection is 1,320 feet.

Policy 3C: Interchange Access Management Areas. This policy addresses management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. Action items include developing interchange area management plans to protect the function of the interchange to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges. The local jurisdiction's role in access management is stated in Policy 3C as follows: "necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place (Action 3C.2)."

Access management standards are detailed in Policy 3C and include the distance required between an interchange and approaches and intersections. The most stringent standards apply in interchange areas. Table 16 contains the minimum spacing standards applicable to the proposed Barnhart Road interchange, a freeway interchange that has an existing two-lane crossroad. The spacing standards in a rural area for this type of interchange are:

2 miles (3.2 km)	Distance between the start and end of tapers of adjacent interchanges.
1,320 feet (400 m)	Distance to the first approach on the right (right in/right out only)
1,320 feet (400 m)	Distance to the first major intersection or approach (no left turns allowed).
1,320 feet (400 m)	Distance between the last right in/right out approach road and the start of the taper for the on-ramp.

Policy 4A: Efficiency of Freight Movement. This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. Interstate-84 is a designated Freight Route.

Policy 5B: Scenic Resources. This policy applies to all state highways and commits the State to using best management practices to protect and enhance scenic resources in all phases of highway project planning, development, construction, and maintenance.

Access Management Rule (OAR 734-051)

This Administrative Rule defines the State's role in managing access to highway facilities in order to maintain functional use, safety and preserve public investment.

The purpose of Division 51 rules is to provide a safe and efficient transportation system through the preservation of public safety, the improvement and development of transportation facilities, the protection of highway traffic from the hazards of unrestricted and unregulated entry from adjacent property, and the elimination of hazards due to highway grade intersections. These rules establish procedures and criteria used by the Department to govern highway approaches, access control, spacing standards, medians and restriction of turning movements in compliance with statewide planning goals and in a manner compatible with acknowledged comprehensive plans and consistent with Oregon Revised Statutes (ORS), Oregon Administrative Rules (OAR), and the 1999 Oregon Highway Plan (OHP).

Section 734-051-0125, *Access Management Spacing Standards for Approaches in an Interchange Area*, outlines how the State will manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways.

(1) Tables 4, 5, 6 and 7 identify the spacing standards for approaches in the area of an interchange, which are shown in Figures 1, 2, 3 and 4. These tables and figures are adopted and made a part of this rule. The spacing standards:

> *(a) Are based on classification of highway and highway segment designation, type of area, and posted speed;*
>
> *(b) Apply to properties abutting state highways, highway or interchange construction and modernization projects, planning processes involving state highways, or other projects determined by the Region Manager; and*
>
> *(c) Do not apply to approaches in existence prior to April 1, 2000 except where any of the following occur:*
>
> > *(A) These standards will apply to private approaches at the time of a change of use.*
> >
> > *(B) If infill development or redevelopment occurs, spacing and safety factors will improve by moving in the direction of the access management spacing standards,*

with the goal of meeting or improving compliance with the access management spacing standards.

(C) For a highway or interchange construction or modernization project or other roadway or interchange project determined by the Region Manager, the project will improve spacing and safety factors by moving in the direction of the access management spacing standards, with the goal of meeting or improving compliance with the access management spacing standards.

(2) When the Department approves an application:

(a) Access spacing standards for approaches in the area of an interchange shown in Figures 1, 2, 3 and 4 must be met or approaches must be combined or eliminated to result in a net reduction of approaches to the state highway and improve compliance with spacing standards; and

(b) The approach must be consistent with any applicable Access Management Plan or Interchange Area Management Plan.

(3) Deviations must meet the criteria in OAR 734-051-0135.

(4) Location of traffic signals within an interchange area illustrated in Figures 1, 2, 3 and 4 must meet the criteria of OAR 734-020-0400 through 734-020-0500.

(5) The Department should acquire access control on crossroads around interchanges for a distance of 1320 feet. In some cases it may be appropriate to acquire access control beyond 1320 feet.

Section – 0155 identifies when, how and why ODOT will develop access management plans for particular sections of a highway. The rules states that:

(6) The Department encourages the development of an Interchange Area Management Plan to plan for and manage grade-separated interchange areas to ensure safe and efficient operation between connecting roadways:

(a) Interchange Area Management Plans are developed by the Department and local governmental agencies to protect the function of interchanges by maximizing the capacity of the interchanges for safe movement from the mainline facility, to provide safe and efficient operations between connecting roadways, and to minimize the need for major improvements of existing interchanges;

(b) The Department will work with local governments to prioritize the development of Interchange Area Management Plans to maximize the operational life and preserve and improve safety of existing interchanges not scheduled for significant improvements; and

(c) Priority should be placed on those facilities on the Interstate system with cross roads carrying high volumes or providing important statewide or regional connectivity.

(5) An Access Management Plan must comply with all of the following criteria, unless the Plan documents why a criterion is not applicable:

(a)Include sufficient area to address highway operation and safety issues and development of adjoining properties including local access and circulation.

(b) Describe the roadway network, right-of-way, access control, and land parcels in the analysis area.

(c) Be developed in coordination with local governments and property owners in the affected area.

(d) Be consistent with any applicable Interchange Area Management Plan, corridor plan, or other facility plan adopted by the Oregon Transportation Commission.

(e) Include polices, provisions and standards from local comprehensive plans, transportation system plans, and land use and subdivision codes that are relied upon for consistency and that are relied upon to implement the Access Management Plan.

(f) Contain short, medium, and long-range actions to improve operations and safety and preserve the functional integrity of the highway system.

(g) Consider whether improvements to local street networks are feasible.

(h) Promote safe and efficient operation of the state highway consistent with the

(i) Consider the use of the adjoining property consistent with the comprehensive plan designation and zoning of the area.

(j) Provide a comprehensive, area-wide solution for local access and circulation that minimizes use of the state highway for local access and circulation.

Ballot Measure 37, Oregon Revised Statutes 197.352

Ballot Measure 37 added provisions to ORS Chapter 197 that require all public entities that enact new land use regulations to compensate property owners for any loss in property value as a result of the new regulation or forgo enforcement of the regulation. Claims may only be filed by property owners that owned the property at the time the regulations were put into effect. Ballot Measure 37 claims must be filed within two years of the date a regulation is enacted, or by Dec. 2, 2006 on any regulation enacted prior to the approval of Measure 37. After the two-year rolling timeframe (or after Dec. 2, 2006 on pre-Ballot Measure 37 claims), applicants must complete a development application and be denied based on the existing land use regulations to file a Measure 37 claim.

Umatilla County

Umatilla County Comprehensive Plan (1987)

In 1973, the Oregon Legislature adopted Senate Bill 100, the Oregon Land Use Act, which required local jurisdictions to prepare comprehensive and coordinated land use plans. The Umatilla County Comprehensive Plan was adopted in 1983 and has been updated as recently as 1987. The Comprehensive Plan for the county includes the need for the Barnhart Road-Airport Road Connector project as an important freight connection.

The plan is broken into three sections: Introduction; Plan Elements - Findings, Recommended Policies; and the Plan Map. The introduction gives a general description of Umatilla County (historical and current) and explains the need for a Comprehensive Plan. The Plan Elements section is broken into sections dealing with Umatilla County's 14 goals. Among these is a Transportation Element with findings and recommended policies. The Plan Map section breaks the county into land use classifications. It maps and discusses the unique characteristics of the different regions of Umatilla County. It also describes and maps exception areas.

Agriculture

Umatilla County's primary industry is agriculture. Agriculture not only provides jobs for the county but is an integral part of the region's way of life. The comprehensive plan considers agriculture as an irreplaceable natural resource. The plan lists findings and policies to address agricultural considerations. Several of these apply to the I-84/Barnhart Road IAMP and are included below.

Finding: Agriculture is important economically in Umatilla County and to the state.

Policy 1

Umatilla County will protect, with Exclusive Farm Use zoning pursuant to ORS 215, lands meeting the definition of farmland in this plan and designated Agricultural on the Comprehensive Plan Map.

Finding: Inventory review and local testimony identifies several categories of agriculture in the county: (a) North/South County Agriculture Region; (b) West County Irrigation Districts; (c) Special Agriculture; and (d) Orchards/Forks of Walla Walla River Districts.

Policy 2

Establish four agricultural designations with several regulations to protect and maintain the existing county's agricultural economy.

Finding: Not all non-farm uses allowed in ORS 215 are compatible or desirable in all farming areas of the county (e.g. Uses that increase potentially incompatibilities). For example, schools generate large groups of people on the same days when farming activities occur, whereas churches attract people on days when farming practices are not necessarily occurring.

Policy 9

Require the following outright permitted uses in ORS 215 (Exclusive Farm Use Zoning Laws) to be conditional uses within the intensive Orchards District areas to secure neighborhood input and apply standards assuring compatibility:

- Intensive livestock farming;
- Churches;
- Utility facilities;

In the North/South County Agricultural Regions and special Agricultural Districts, schools shall not be allowed and churches shall be conditional uses.

Finding: Irrigated farming affords greater diversified crop and animal production, thereby requiring new support / processing facilities.

Policy 16

Ensure availability of necessary supportive services sites through allowed conditional uses in EFU zones and commercial activities allowed on industrial lands.

Open Space

The county has a large supply of open space and wishes to maintain this resource. The comprehensive plan findings and policies which relate to the Barnhart Road IAMP are included below.

Finding: Having only a sparse rural population, Umatilla County is predominately open space.

Policy 1

(a)The County shall maintain this resource by limiting development mainly to existing built up areas. (b) The County shall cooperate with the many public agencies which manage open land in the county. Special contracts will be sought when development proposals are in the vicinity of large tracts of public land.

Transportation

The county's overall transportation goal is *to provide and encourage a safe, convenient and economic transportation system*. The transportation element of the comprehensive plan lists 25 findings and associated recommended policies. Some of the findings and policies which relate to the Barnhart Road IAMP are included below.

Finding: There is a lack of coordinated planning which addresses the specific relationships of all modes of transportation (e.g., air, water, rail, bicycle, road, footpaths, etc.)

Policy 1

Develop a Transportation Master Plan which integrates the cities' and regional system.

Finding: Transportation planning within urban growth boundaries is important to ensure adequate transportation facilities in the county.

Policy 2

Plans within UGBs shall be coordinated with the formulation of the Transportation Master Plan.

Finding: A major cost in development of freeways, highways and county roads is the purchase of right-of-way and displacement of existing uses along the right-of-way.

Policy 5

As part of the Transportation Master Plan, develop a Future Road Zone to be applied between the time a road location is determined and the right-of-way is acquired.

Finding: An important airport industrial complex lies in the northeast corner of the city of Pendleton's UGB where topography and location require a well-planned transportation system to ensure its full and efficient development.

Policy 7

When developing and finalizing the Transportation Master Plan, consider designating an arterial road from Barnhart Interchange on I-84 to the west side of this industrial park, to provide a level and more energy-efficient route for business and manufacturing-related traffic.

Policy 8

Access onto state highways shall be limited, consolidated, and otherwise be controlled as much as feasible. Access control shall emphasize coordination of traffic and land use patterns through the use of frontage roads and access collection points.

Other important findings and policies have to do with specific areas of the county. For instance, the plan calls for supporting the continued growth and maintenance of the Pendleton and Hermiston airports. The Plan also recommends that subdivision of land only be approved if roads are constructed to county standards and that impacts to the transportation system be considered when determining land use designations. The Urbanization Element of the Plan calls for the strong coordination between the county and cities in respect to transportation planning and land use decisions that will impact transportation systems.

Umatilla County Transportation Plan (2002)

The purpose of the TSP is to provide a guide for Umatilla County to meet its transportation goals and objectives. As noted in the comprehensive plan summary, the overall transportation goal for the County is *to provide and encourage a safe, convenient and economic transportation system.*

The goals and objectives of the Transportation Plan were developed from information contained in the county's comprehensive plan and reflect public concerns expressed during public meetings. Several of these apply to the I-84/Barnhart Road IAMP and are included below.

Goal 1

Preserve the function, capacity, level of service, and safety of the local streets, county roads, and state highways.

Objectives:

A. Develop access management standards.

B. Develop alternative, parallel routes.

C. Promote alternative modes of transportation.

D. Promote transportation demand management programs.

E. Promote transportation system management.

F. Develop procedures to minimize impacts to and protect transportation facilities, corridors, or sites during the development review process.

Goal 3

Improve coordination among the cities of Umatilla County, the Oregon Department of Transportation (ODOT), the US Forest Service (USFS), the Federal Highway Administration (FHWA), and the county.

Objectives:

A. Promote county concerns with USFS regarding road matters, including the construction of permanent roads in conjunction with timber sales.

B. Cooperate with ODOT in the implementation of the Statewide Transportation Improvement Program (STIP).

C. Work with cities in establishing right-of-way needed for new roads identified in the transportation system plans.

D. Take advantage of federal and state highway funding programs.

E. Encourage the federal government to improve the existing road system and bridges within the National Recreation Area.

F. Continue to work with cities planning for the county land within their urban growth boundaries.

G. Seek notification of special hazardous materials shipment for county review, comment, and possible control.

H. Work with Umatilla Army Depot on any emergency evacuation plans for possible chemical weapons accidents.

Goal 5

Support efforts to maintain the airport facilities for commercial, small aircraft, and charter services.

Objectives:

A. Encourage the state and local municipalities to improve and maintain airport facilities.

B. Continue to cooperate with cities to protect airports from incompatible neighboring land uses through the use of airport hazard overlay zones and joint management agreements with the cities.

C. Cooperate with airport master planning efforts.

D. Incorporate airport master plans into local comprehensive plans.

E. Provide good overland access to important air facilities. In particular, consider designating an arterial road classification from the Barnhart Road interchange on I-84, to the industrial park near the Pendleton Airport.

Umatilla County Road Functional Classifications and Road Design Standards

Road functional classifications and road design standards identified in the Umatilla County TSP apply to the sections of county roads which lie outside the urban growth boundaries of incorporated cities. Within the urban growth boundaries of cities, adopted city street classifications and design standards are to be employed, even along county-maintained roads.

The county road classification system includes four road classes. All interstate, national, and state highways in Umatilla County are designated as arterials. Rural county roads are classified as rural major collectors, rural minor collectors, or rural local roads and are assigned a County Road Number by the County Public Works Department. *Barnhart Road and Fanshier Road are both designated rural local roads.*

All other roads, not identified as an arterial or collector, which are not located inside the urban growth boundary of a city, are **private roads or public rights of way. These roads are not County Roads** and are not maintained by the county. Umatilla County allows for the establishment of easements to provide legal access to parcels according to partitioning standards.

The road design standards for rural county roads are summarized in Table 2-2. Right-of-way widths identified above allow for safe conditions because of the extra clearance for vehicles on the road and the elimination of drivers' perception of a narrow road. Recommended shoulder widths, based on the amount of traffic expected along the road, are summarized in Table 2-3.

Table 2-2 Umatilla County Rural Road Design Standards

Classification	Surface Width	Right-of-Way Width	Min. Posted Speed
Private Roads and Public Rights of Way			
Option 1	16 feet	30 feet	--
Option 2	22 feet	60 feet	--
Local Road			
Option 1 - residential	26-28 feet	60 feet	15-25 mph
Option 2 - industrial	30 feet	60 feet	15-25 mph
Major and Minor Collector			
Option 1	32-40 feet	60 feet	25-35 mph
Option 2 - Urban	40 feet	60 feet	35-55 mph
Arterial Roads			
Option 1	36-40 feet	60 feet	35-55 mph
Option 2 – Urban	40 feet	60 feet	35-55 mph

Note: The rural arterial road design standards above apply only to roadways that are under county jurisdiction, and do not apply to state highways.

Table 2-3 Shoulder Widths on Rural Roads

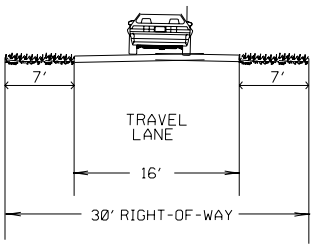
Road Use	Local Roads	Major and Minor Collectors	Arterial Roads
ADT under 400	2 ft	2 ft	4 ft
ADT over 400 DHV* under 100	2 ft	4 ft	6 ft
DHV 100-200	4 ft	6 ft	6 ft
DHV 200-400	6 ft	8 ft	8 ft
DHV over 400	8 ft	8 ft	8 ft

*DHV (Design Hour Volume) is the expected traffic volume in the peak design hour (usually at commuter times).

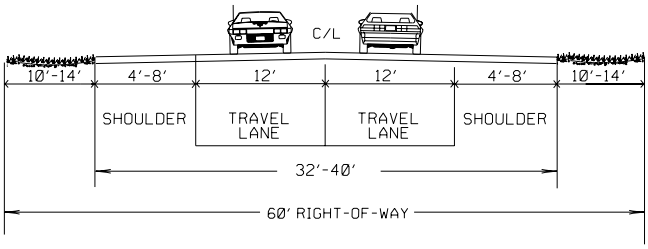
Based on the above tables, Barnhart Road should have a surface width of 30 feet with 60 feet of right-of-way. Under existing conditions two-foot shoulders would be appropriate. Future design hour volumes and recommended shoulder widths have not yet been determined. The proposed Barnhart Road-Airport Road connector roadway will be designed as a collector roadway. Collector roadway standards should be considered for any improvements to Barnhart Road between the new connection and the interchange as this section of Barnhart Road will no longer serve in only a local roadway capacity.

The road design standards for rural county roads are summarized shown in Figure 2-1.

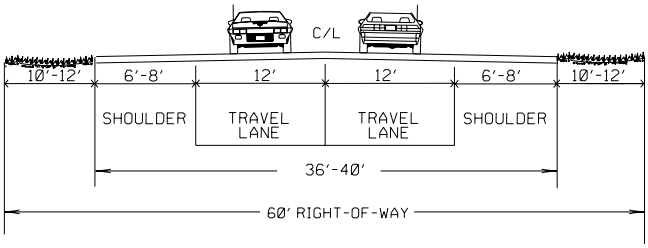
Figure 2-1 Umatilla County Rural Road Design Standards



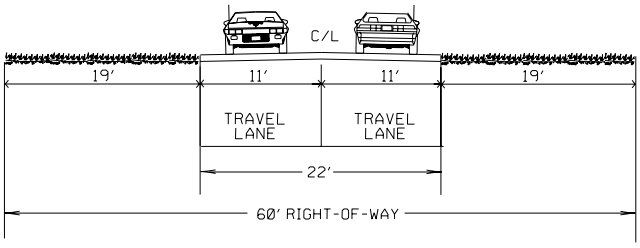
OPTION 1: PRIVATE ROADS AND PUBLIC RIGHT-OF-WAY



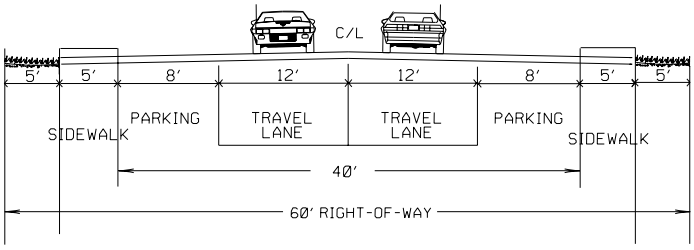
RURAL MAJOR AND MINOR COLLECTOR ROADS



RURAL ARTERIAL ROADS



OPTION 2: PRIVATE ROADS AND PUBLIC RIGHT-OF-WAY



URBAN ARTERIAL ROADS

Umatilla County Access Management Standards

Umatilla County access management standards for new construction are noted in Table 2-4 (Umatilla County TSP table 7-5). Barnhart Road is currently designated a local road with both public and private access on either side of Interstate-84. Sections of Barnhart Road could become designated as a collector roadway once connected to Airport Road.

Table 2-4 Access Management Standards

	Intersections			
	Public Road		Private Drive	
Functional Classification	Type	Spacing	Type	Spacing
Major Collectors (listed in Umatilla County TSP Table 7-2)	At-grade	¼ mile	L/R Turns	500 ft.
Major and Minor Collectors (listed in Umatilla County TSP Table 7-2)	At-grade	500 ft.	L/R Turns	250 ft.
Local Road	At-grade	250 ft.	L/R Turns	Access to Each Lot

Umatilla County Development Code (2005)

The Umatilla County Development Code contains standards and regulations for development that are intended to implement the policies set forth in the county's Comprehensive Plan and Transportation Plan. It defines the use of each zoning type in the county. There are three zoning types within the I-84/Barnhart IAMP study area. They include Exclusive Farm Use, Rural Light Industrial, and Rural Tourist Commercial. These zones are described below.

EFU - EXCLUSIVE FARM USE ZONE

The purposes of the EFU, Exclusive Farm Use Zone, are to preserve and maintain agricultural lands for farm use, including range and grazing uses, consistent with existing and future needs for agricultural products, forest and open spaces; to conserve and protect scenic resources; to maintain and improve the quality of air, water and land resources of the county and to establish criteria and standards for farm uses and related and supportive uses which are deemed appropriate. It is also the purpose of this use zone to provide the automatic farm use valuation for farms, which qualify under the provisions of ORS Chapter 308. The provisions in this use zone are subject to automatic legislative amendments as described in Section 152.004.

The land uses which are permitted outright on EFU lands include:

- Farm use referring to soil and not auxiliary structures
- Forest products
- On-site filming for 45 days or less
- Temporary road detours
- Projects identified in the TSP

- Landscaping for transportation
- Emergency measures for protection of property
- Construction of a road
- Utility facilities
- Maintenance of utility lines

A farm exempt permit can be for "agricultural buildings" such as workshops, barns, storage, elevators and other farm-oriented structures. With a zoning permit other uses may also occur in this zone. These uses are permitted to facilitate the use of the land for its initial purpose of agricultural production.

The uses permitted with a zoning permit on EFU lands include:

- Minor betterment or repair as outlined in the Recreational Policy 11
- Exploration and research for geothermal recourses, oil, and gas
- Exploration for minerals
- A winery
- Farm stands for the sale of products grown on the farm, excluding structures for occupancy
- Alteration, restoration or replacement of a lawfully established dwelling that:
    - Has intact exterior walls and roof
    - Has indoor plumbing consisting of a kitchen sink, toilet, and bathing facilities connected to a sanitary waste disposal system;
    - Has interior wiring for interior lights
    - Has a heating system: and
    - The time period is three months or less
    - Any part of the property may be used that complies with normal siting standards
    - May not be moved from a non-EFU part of a property to an EFU part
    - A Covenant Not to Sue with regard to normal farming practices shall be recorded as a requirement for approval.
    - Permits are valid for four years after which a two year extension may be added
- Signs Type 2,3,4,5,6
- Buildings and structures accessory to dwellings (e.g. garages, storage sheds, carports, swimming pools)
- On-site filming and activities accessory to on-site filming for 45 days or less
- A site for the takeoff and landing of model aircraft, including such buildings or facilities as may reasonably be necessary and not more than 500 square feet in floor area

- Fire service facilities providing rural fire protection services
- The breeding, kenneling and training of greyhounds for racing on a parcel or tract not meeting the definition of high-value farmland
- A gathering of fewer than 3,000 persons that is not anticipated to continue for more than 120 hours in any three month period is not a "land use decision"

RLI - RURAL LIGHT INDUSTRIAL ZONE

The RLI - Rural Light Industrial Zone is designed to provide areas for industrial uses that are appropriate for rural locations, less intensive than heavy industrial uses, less offensive to adjacent land uses, and are compatible with certain commercial uses. It is designed to help the county expand and diversify its economic base. The RLI Zone is appropriate for areas near major transportation facilities which are generally suited for industry and include highways, railroads and waterways. This zone is applied to lands zoned industrial prior to January 1, 2004, that are outside unincorporated communities and urban growth boundaries. The intent of the Rural Light Industrial Zone is to permit the continuation and expansion of existing uses and to provide rural employment opportunities for new uses that are generally rural-scale and low impact or provide for the processing and manufacturing of resource products such as timber and forest related products, farm crops and produce, mineral and aggregate resources, or the maintenance and repair of mechanical equipment related to farm or forest uses.

The land uses which are permitted outright on RLI lands include:

- Preservation activities associated with transportation facilities
- Safety and drainage improvements on existing right-of-ways
- Projects specified in the TSP as requiring no further land use regulation
- Landscaping transportation facilities
- Emergency measures
- Acquisition of right-of-way for transportation designated in the TSP
- Construction of street or road as part of approved sub division or land ordinance

Land uses permitted with a zoning permit on RLI lands include:

- Blacksmith or machine shop
- Bottling works, if agriculturally related
- Contractor's equipment storage yard
- Custom meat cutting and cold storage locker
- Food products processing, except meat processing and rendering plants
- Grain elevator or flour mill

- Greenhouse or nursery
- Hauling, freighting, and trucking yard or terminal (excluding truck stops)
- Ice or cold storage plant
- Primary processing of raw materials produced in rural areas
- Information kiosk
- Manufacturing, compounding, assembling or treatment of products
- Mini-warehouse
- Plumbing or sheet metal shop
- Industrial uses in conjunction with farm, forest or aggregate use
- Signs: Type 3,4,5,7,8,9,10,11
- Tire recapping, with building size
- Truck sales, services, storage and maintenance
- Veterinary clinic or animal hospital primarily devoted to the treatment of large animals, but not kennels
- Welding shop
- Wholesale business, storage building or warehouse, in conjunction with farm or forest use

Business being conducted on RLI shall be conducted inside the built facility or more than 50 feet from surrounding public or private properties. Storage of farm or forest products or equipment is no subject to this limitation. Loading areas will be screened from view of any residentially zoned property adjacent to the site. All noise, vibration, dust, odor, smoke or other objectionable factors must comply with appropriate state and federal regulations. Lawful structures considered existing as of Nov. 12, 2005 will be considered conforming and may be restored in case of damage.

Dimensional Standards for RLI zoning require that lots be a minimum of one acre, at a width of 100 feet. Setbacks around the structure require a 25-foot fronting for county or state roads, a 20 foot spacing to property lines, and a minimum of 55 feet from the centerline of a right-of-way. Yard sizing of at least 20 feet on all sides is required unless parking exists in front, in which case the setback is 40 feet for the front. In the case of a waterway on or adjacent to property a setback of 100 feet is required for the healthy preservation of the body of water.

RTC - RURAL TOURIST COMMERCIAL

The RTC - Rural Tourist Commercial Zone is designed to serve the traveling public along major traffic corridors or at appropriate recreational locations outside unincorporated communities and urban growth boundaries. Facilities may include service stations, eating establishments or over-night accommodations. The RTC Zone is appropriate along major interstate interchanges as discussed in the Comprehensive Plan. This zone is applied to commercial lands outside unincorporated communities and urban growth boundaries for which an exception to Goal 14 has

not been approved. The intent of the Rural Tourist Commercial Zone is to permit the continuation and expansion of existing uses and to provide rural scale tourism related employment uses.

The land uses which are permitted outright on RTC lands include:

- Preservation activities associated with transportation facilities
- Safety and drainage improvements on existing right-of-ways
- Projects specified in the TSP as requiring no further land use regulation
- Landscaping transportation facilities
- Emergency measures
- Acquisition of right-of-way for transportation designated in the TSP
- Construction of streets or roads as part of approved sub division or land ordinance

Land uses permitted with a zoning permit on RTC lands include:

- Automobile service station
- Boarding, lodging or rooming house
- Eating or drinking establishment
- Food store
- Gift shop
- Information center
- Laundromat
- Motel, hotel (up to 30 units)
- Sporting goods or bait shop
- Signs: Type 3,4,5,6,7,8,9,10,11

Rural Tourist Commercial activities are required to limit their use in ways defined by the development code. The outdoor storage areas must be screened from sight of outside people or properties. The maximum floor space is 3,500 square feet. Motels that existed prior to July 1, 2005, may expand to the larger of either 35 units or 50 percent of the current existing with no limitation on square footage. Structures that existed before July 1, 2005 may expand to the large of either to 4,500 square feet or a size fifty percent larger than the building that existed on July 1, 2005. Any structure that is lawfully approved and constructed, if destroyed or substantially damaged, can be reconstructed to its prior state.

Dimensional Standards for RTC zoning require that lots be a minimum of one acre with a minimum width of 100 feet. Setbacks around the structure require a 25-feet fronting for county

or state roads, 20-feet spacing to property lines, and a minimum of 55 feet from the centerline of a right-of-way. Yard sizing of at least 20 feet on all sides is required. In the case of a waterway on or adjacent to property a setback of 100 feet is required for the healthy preservation of the body of water.

City of Pendleton

The City of Pendleton Comprehensive Plan and Development Code were not included in the policy review because the IAMP study area is outside of the city limits and urban growth boundary of the City of Pendleton. However, the sections of the City of Pendleton's Transportation System Plan that relate to the Barnhart Road-Airport Road Connector project and roadway design standards are included because the proposed connector project is a City of Pendleton project and ownership of the proposed roadway is still being negotiated.

City of Pendleton Transportation System Plan (1996)

Section 9 of the City of Pendleton Transportation System Plan outlines the need for a future route to be constructed from the existing 'A' Avenue to Barnhart Road connecting north of the I-84/Barnhart Road Interchange. This new roadway would be a mitigation to help freight reach the airport and surrounding industrial lands.

City of Pendleton Roadway Design Standards (1996)

The City of Pendleton roadway design standards are shown in Table 2-5 and Table 2-6. Table 2-6 also provides minimum private driveway access spacing standards. The design standards are to be used as a guideline for the development of future roadway facilities within the Pendleton urban area. These standards will apply to the portion of the *Airport Road-Barnhart Road Connector* within the Pendleton urban area.

Table 2-5 Roadway Cross-Sections

Right-of-Way	Pavement Width	Travel Lanes	Parking Lanes	Planting, Utility and Sidewalk Areas (Each Side)
Arterial Streets				
60'	44'	2-12'	2-10'	8'
80'	44'	2-12'	2-10'	18'
80'	56'	4-12'	1-8'	18'
80'	64'	4-11'	2-10'	8'
100'	80'	5-12'	2-10'	10'
Collector Streets				
60'	36'	2-10'	2-8'	12'
60'	44'	2-12'	2-10'	8'
60'	44'	2-12'	2-10'	18'

[1]The pavement width shall only be permissible on dead end or cud-a-sac streets and approved by the Planning Commission
[2]Where the street serves as a collector and has been designated by the Planning Commission and approved by the City Council.

Table 2-6 Pendleton Urban Area Roadway Standards

Class	ADT Volumes	Speed	# and Width of Travel Lanes	Median Turn Lane	Bike Lanes	Parking	Paved Width	Side-walks	Planting Utility Area	R.O.W.	Minimum Private Access Spacing
2-3-Lane Arterial	10,000 - 16,000	30-45	2-12'	14'[1]	2-5'[2]	2-10[1]	34'-58'	5'-8'	3'-10'	50'-80'	150'-300'
Collector	4,000 – 10,000	25-35	2-10'-12'	12'[1]	2-5'[2]	2-8'-10[1]	24-56'	5'-8'	3'-10'	60'-80'	75'-100'

[1]*Optional, not required*
[2]*Optional only if not included in the Pendleton Bicycle Master Plan*

In general, the portions of the *Airport Road-Barnhart Road Connector* outside of the existing urban area, including the sections near Barnhart Road, will be designed based on current AASHTO roadway design standards. The proposed roadway is assumed to be a rural collector with a design speed of 65 mph in the straight sections (posted at 55 mph) and 45 mph in the curved section near Barnhart Road (posted at 35 mph). The applicable AASHTO standards are shown in Table 2-7.

Table 2-7 AASHTO Standards for Rural Collectors

Design Speed	Travel Width		Shoulder Width		Clear Zone Width
	1500-2000 ADT	> 2000 ADT	1500-2000 ADT	> 2000 ADT	
45 mph	22 ft	24 ft	6.0 ft	8.0 ft	10 ft
65 mph	24 ft	24 ft	6.0 ft	8.0 ft	26-28 ft

Section 3

Transportation / Land Use Inventory of Existing Conditions

Transportation / Land Use Inventory of Existing Conditions

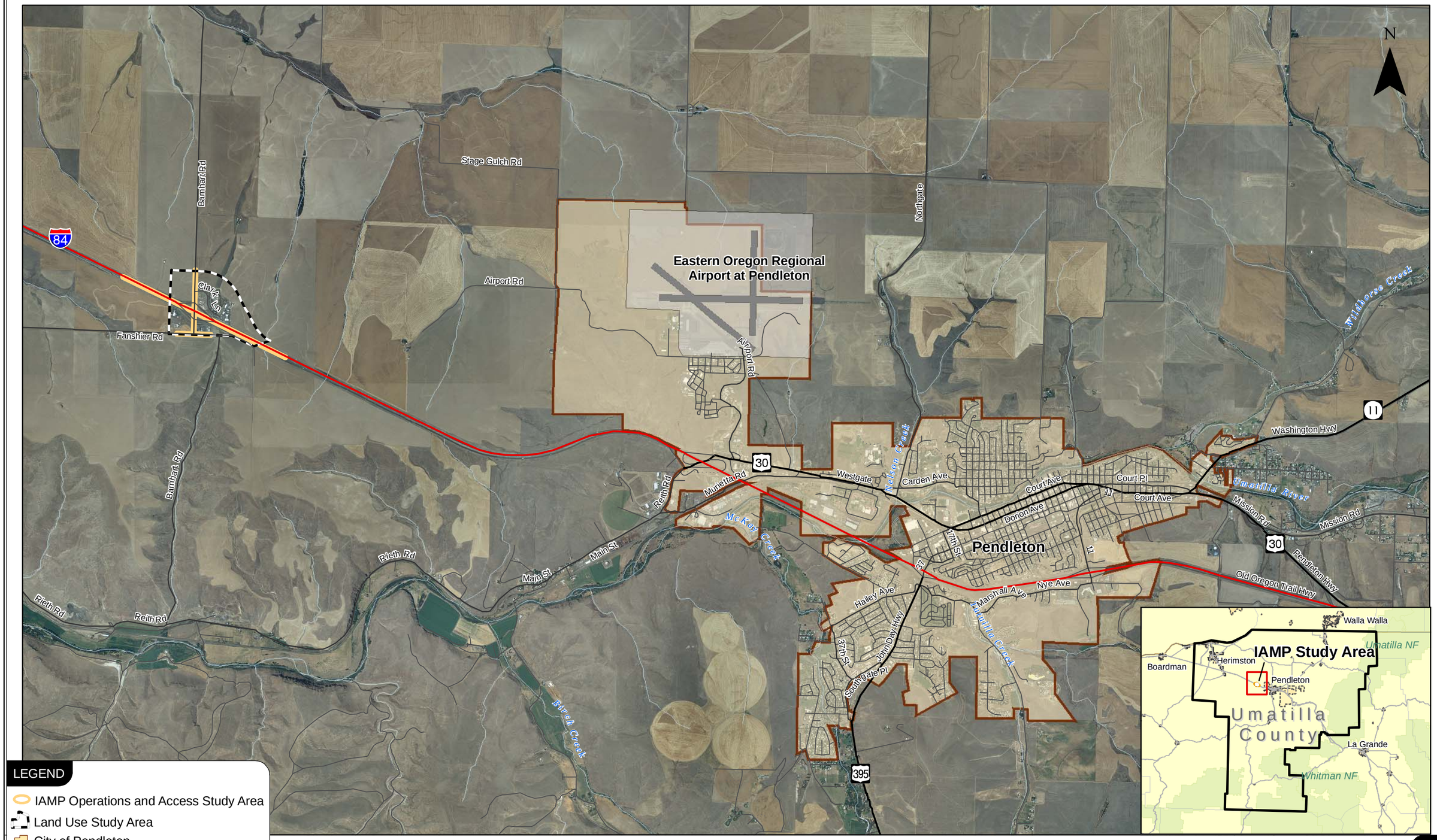
This section of the report documents the current land use conditions as well as the operational and geometric characteristics of the transportation facilities within the study area. The study area vicinity map is shown in Figure 3-1.

INTERCHANGE AREA MANAGEMENT PLAN (IAMP) STUDY AREA

The study area for the Barnhart Road IAMP was selected based on a review of the surrounding roadway network and land use patterns, existing and future travel patterns, a review of the proposed Barnhart Road-Airport Road Connector roadway alignments within the study area vicinity, and input from the Project Planning Management Team (PPMT). At a minimum, the IAMP study area is required to include all land uses and roadways located within approximately 1,320 feet of the existing I-84 / Barnhart Road interchange. This distance corresponds to the spacing standard outlined in the OAR 734-051 Division 51 rules for interchange ramps. The Barnhart Road-Airport Road Connector roadway alignment alternatives and the roadway network and land use patterns surrounding the I-84/Barnhart Road Interchange were reviewed to determine the need to extend beyond the 1,320 feet minimum requirement.

Based on this review, the study area was extended to the north to include the most northern potential alignment option of the proposed Barnhart Road-Airport Road Connector roadway and the EFU land that would become segmented between I-84 and the proposed roadway alignment. The study area roadways include Interstate-84, Barnhart Road, Clark Lane (north of the interchange), and Fanshier Road (south of the interchange).

The land use study area includes approximately 66 acres of RLI zoned land and 13.33 acres of RTC zoned land surrounding the I-84/Barnhart Road Interchange as well as the Exclusive Farm Use (EFU) land which has existing access within the access study area. Also included in the land use study area is the EFU land that may become segmented by the proposed Barnhart Road-Airport Road Connector roadway. The study roadways and properties included within the study area map are shown in Figure 3-2.



LEGEND

- IAMP Operations and Access Study Area
- Land Use Study Area
- City of Pendleton
- Eastern Oregon Regional Airport

0 0.5 1 2 3 Miles

I-84 / BARNHART ROAD IAMP - STUDY AREA VICINITY MAP
UMATILLA COUNTY, OREGON

FIGURE **3-1**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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LEGEND

- IAMP Operations and Access Study Area
- Land Use Study Area

0 200 400 800 1,200 1,600 2,000 Feet

I-84 / BARNHART ROAD IAMP - STUDY AREA MAP
UMATILLA COUNTY, OREGON

FIGURE **3-2**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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EXISTING LAND USE INVENTORY

Pursuant to the requirements stated in the Oregon Administrative Rule 734-051-0155 for the preparation of an IAMP, a land use inventory has been prepared for the Barnhart Road IAMP study area. This section provides a description of the existing land use patterns and zoning regulations that currently exist within the interchange study area.

The I-84/Barnhart Interchange is located in Umatilla County. All of the land uses within the IAMP study area are zoned per the Umatilla County zoning code. The proposed roadway project is not intended to change the jurisdiction of any of the land located within the IAMP study area.

For the purposes of developing future development potential and access alternatives, the study area has been broken up into two sub-areas, as illustrated in Figure 3-3. Sub-Area "A" includes the area north of Interstate-84 and Sub-Area "B" includes the area south of Interstate-84. However, the land uses within Sub-Area "A" and Sub-Area "B", shown in Figure 3-4, are best described by the specific quadrant of the I-84/Barnhart interchange.

Sub-Area "A"

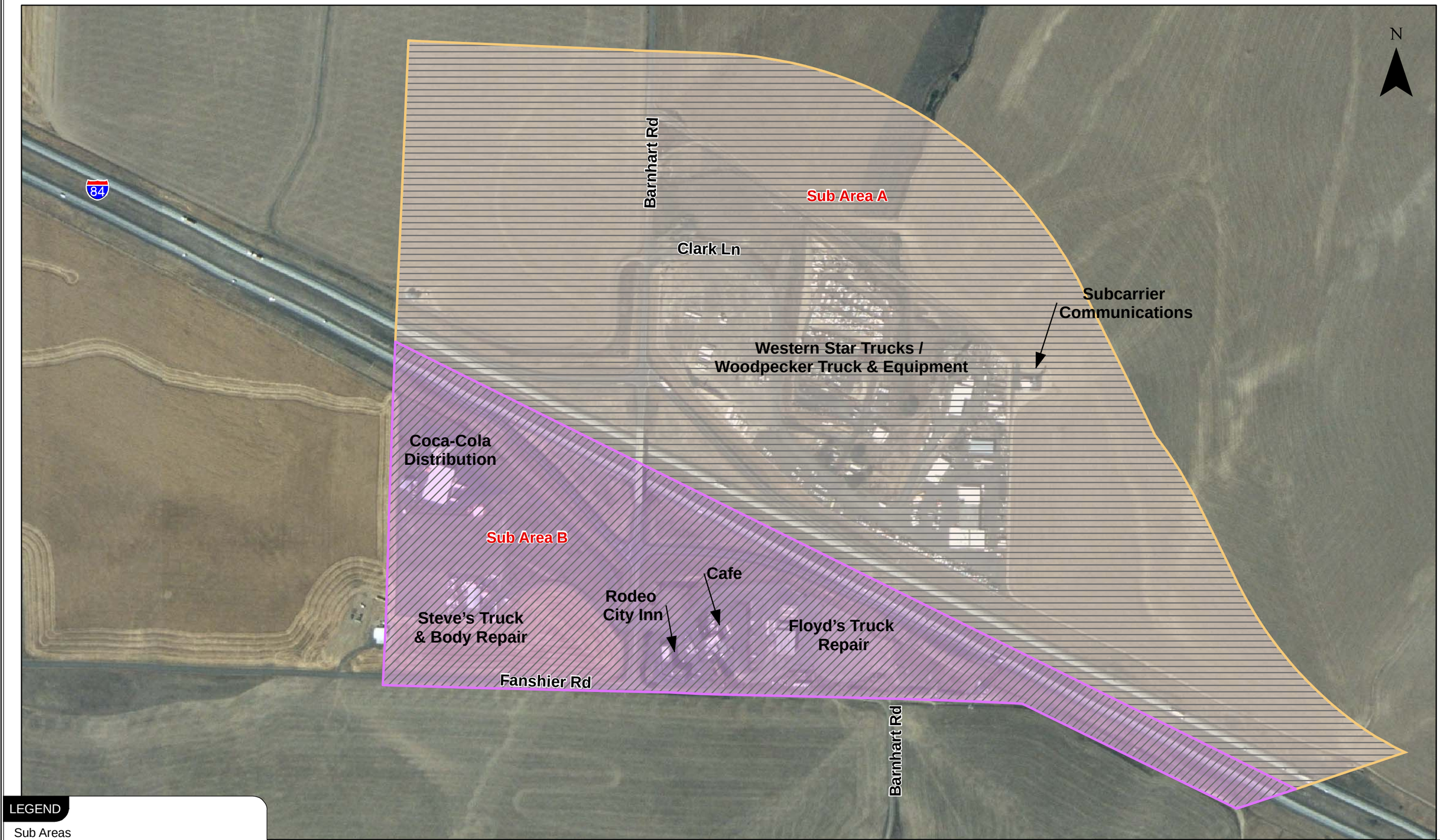
The northwest quadrant of the interchange is currently exclusive farm use only. There is currently an access to a barn related to farm use on this parcel located on Barnhart Road across from Clark Lane. Access to this parcel will need to be considered in the access alternatives.

The northeast quadrant of the I-84/Barnhart Road Interchange currently has four parcels, two of which are zoned Rural Light Industrial (RLI) and two of which is Exclusive Farm Use (EFU). The Woodpecker Truck and Equipment currently owns the two RLI parcels and operates a business that accesses Barnhart Road and the I-84 interchange via Clark Lane. The small EFU parcel adjacent to the northeast corner of Woodpecker Truck and Equipment is owned by Subcarrier Communications, Inc. Access to this site is currently provided by an access roadway immediately north and adjacent to the Woodpecker Truck and Equipment property line.

Sub-Area "B"

The southwest quadrant of the I-84/Barnhart Road Interchange consists of seven parcels which are all zoned RLI; however, there are only two businesses located on these parcels. They include a Coca-Cola distribution center and a truck repair and welding shop. Access to all of these parcels is provided via a shared access roadway that intersects Barnhart Road south of the I-84 eastbound off-ramp. This quadrant has the potential for increased land use intensity.

The southeast quadrant of the I-84/Barnhart Road Interchange consists of three parcels which are all zoned RTC. These parcel are currently occupied by a motel, café (currently vacant), and a truck maintenance/repair shop. Access to all of these parcels is provided via a shared access roadway (directly across Barnhart Road from the access roadway serving the southwest quadrant) that intersects Barnhart Road south of the I-84 eastbound off-ramp. All parcels in this quadrant have the potential for increased land use intensity.



I-84 / BARNHART ROAD IAMP - STUDY AREA MAP
UMATILLA COUNTY, OREGON

FIGURE **3-3**

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

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EXISTING ZONING CLASSIFICATIONS
UMATILLA COUNTY, OREGON

FIGURE **3-4**

File Path: K:\KittelsonPendleton_IAMP\MXD\Figures\Figure3-4 Study_Area_Land_Use_and_Zoning_092806_11x17.mxd, Date: March 8, 2007 3:57:22 PM

EXISTING TRANSPORTATION INVENTORY

The second major component of the Barnhart Road IAMP existing conditions evaluation process is the transportation system. The existing transportation inventory provides a detailed description of all transportation facilities and travel modes within the study area. In addition, the inventory identifies the current operational, traffic control, and geometric characteristics of roadways and other transportation facilities. A detailed description of these facilities is provided in the following sections.

Roadway Facilities

The roadways within the study area include Interstate-84 and three other Umatilla County roadways. A description of each of the roadway facilities is summarized below and in Table 3-1. Figure 3-5 illustrates the existing lane configurations and traffic control devices at the respective study intersections.

Interstate-84

I-84 is a four-lane interstate highway that runs along the southern edge of the City of Pendleton. I-84 is the main east-west travel route within the state, providing connections between Portland, Oregon and Boise, Idaho. I-84 is designated in the *1999 Oregon Highway Plan* as an *Interstate Highway*, *Freight Route*, and is part of the National Highway System. Interstate-84 is in good condition in the vicinity of the Barnhart Road Interchange.

Interstate Ramps

The interstate ramps are single-lane paved connections between the right lane of travel for I-84 and Barnhart Road. The ramps on the northeast and southwest corners of the interchange allow traffic to slow as it approaches Barnhart Road. The ramps terminating at Barnhart Road flare to width providing single-car storage for both a left/through movement and a right turning movement. The ramps on the northwest and southeast corners of the interchange allow traffic to accelerate as it approaches the moving interstate and drivers prepare to merge. The ramp placement at Barnhart Road provides for driver expectancy as the pattern forms a traditional diamond structure.

Barnhart Road

Barnhart Road (County Road 1101) is a two-lane, two-directional County Route. The roadway has asphalt pavement from Clark Lane south to the access roadways serving the RLI and RTC zoned properties south of the interchange. North of Clark Lane and south of the access roadways, Barnhart Road changes to a gravel roadway. Outside the study area, Barnhart Road provides access to EFU-zoned land and connects to Reith Road approximately 2.5 miles south of the I-84 interchange (as shown in Figure 3-1).

EXISTING LANE CONFIGURATIONS
UMATILLA COUNTY, OREGON

FIGURE 3-5

Fanshier Road

Fanshier Road (County Road 1108) is a gravel roadway that forms the southern boundary the study area. It originates just east of the study area and extends west beyond the study area to Old Pendleton River Highway.

Clark Lane

Clark Lane is a paved roadway that originates at Barnhart Road and extends to the east. The roadway operates primarily as a private driveway serving Woodpecker Truck & Equipment. Clark Lane does not intersect any other roadways.

Table 3-1 Existing Transportation Facilities and Roadway Designations

Roadway	Existing Roadway Ownership/ Functional Classification	Cross-section	Surface Type	Posted Speed	Side-walks	Bicycle Lanes	On-Street Parking
Interstate-84	ODOT/ Interstate Highway	4-lanes	Paved	65 mph	No	No	No
On/Off Ramps	ODOT/ Limit Access Interchange	1-lane	Paved	Not Posted	No	No	No
Barnhart Road	Umatilla County/ Rural Local Road	2-lanes	Paved at Interchange[1]	Not Posted	No	No	No
Fanshier Road	Umatilla County/ Rural Local Road	2-lanes	Gravel	Not Posted	No	No	No
Clark Lane	Umatilla County/ Rural Local Road	2-lanes	Paved	Not Posted	No	No	No

[1] Gravel north of Clark Lane and south of the interchange just north of Fanshier Road. The paved section ranges from 27 feet to 32 feet across the bridge.

Public Transportation Facilities

There are no public transportation facilities that operate within the study area. The City of Pendleton provides free taxi tickets to citizens over the age of 60 and those who are disabled; however, the tickets are good for travel within Pendleton only.

Pedestrian and Bicycle Facilities

There are currently no dedicated bicycle or pedestrian amenities located along any of the roadways within the study area. Field observations revealed no pedestrian or bicycle activity. This lack of pedestrian and bicycle activity is to be expected in this type of rural environment with little commercial activity.

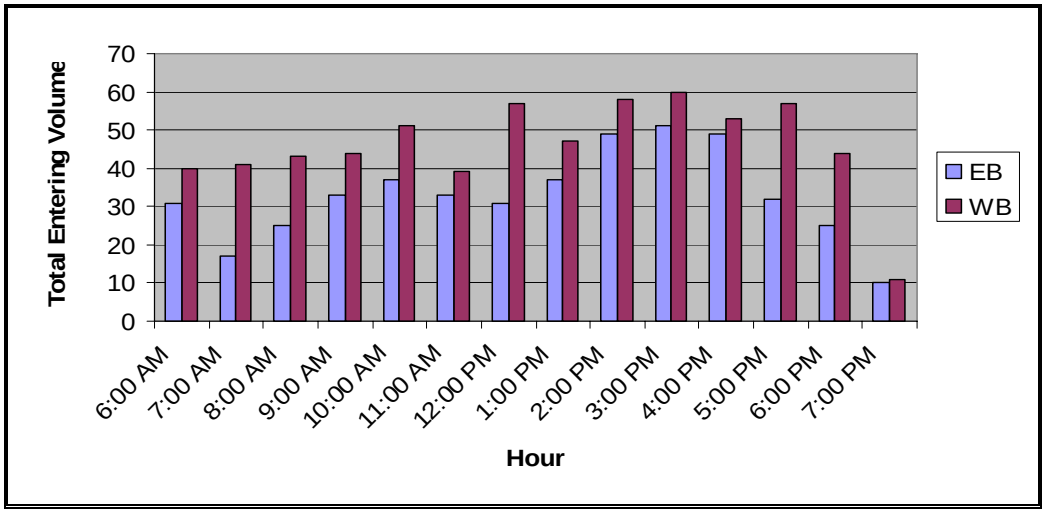
EXISTING TRAFFIC VOLUMES AND PEAK HOUR OPERATIONS

To assess the operational performance and characteristics within the study area, manual intersection turning movement counts were conducted at each of the study intersections located within the study area and 14-hour manual turning movement counts were collected at the two interchange ramp terminals. These counts were conducted on mid-week days in July 2006. A description of the data as it was utilized for the purposes of this report is summarized in the following sections.

Peak Hour Intersection Volumes

The 14-hour turning movement counts revealed that the peak hour at the interchange occurs from approximately 3:00 to 4:00 p.m. as shown in Exhibit 1. However, these volumes were only marginally higher (less than 10 entering vehicles) as compared to the weekday evening peak hour (between 4:00 – 6:00 p.m.). Therefore, weekday morning (7:00 – 9:00 a.m.) and evening (4:00 – 6:00 p.m.) peak hour traffic conditions were summarized for the purposes of evaluating the existing traffic operations at the key study intersections. These time periods represent the time periods with the best available data for projected future travel demand in the study area. In addition, future traffic growth created with the Barnhart Road project and local development is likely to coincide with the traditional weekday morning and evening peak hour periods. *The existing traffic counts are provided in Attachment "A" of Technical Memorandum #3 in the I-84/Barnhart Road IAMP Appendix.*

Exhibit 1 I-84/Barnhart Road Interchange Ramp Terminal Daily Traffic Volumes



Seasonal Adjustments

Roadways in eastern Oregon are prone to traffic volume fluctuations due to the effects of seasonal variation. Typically, the summer months experience higher traffic volumes due to additional recreational traffic while the winter months tend to experience the lowest traffic volumes. Using the methodology outlined by ODOT's Transportation Planning Analysis Unit, a seasonal adjustment factor was not applied to the traffic counts collected for the existing conditions analysis as they were collected during the peak traffic volume month of the year in the study area according to the ODOT Automatic Traffic Recorder data in the area. The weekday a.m. and p.m. intersection turning movement counts used for the existing conditions analysis are shown in Figure 3-6.

Existing Intersection Operations

All level of service analyses described in this analysis were performed in accordance with the procedures stated in the *2000 Highway Capacity Manual*. The operational standard for the I-84/Barnhart Road interchange ramp terminals is 0.75 based on Barnhart Road being a local facility that is outside of the UGB and located in rural lands. Umatilla County does not currently have adopted operational thresholds for its intersections. As shown in Figure 3-6, all study intersections currently operate at a level of service "A" and very low volume-to-capacity ratios

(meeting the ODOT volume-to-capacity thresholds at the ramp terminals) during both the weekday a.m. and p.m. peak hours. *The existing conditions level-of-service worksheets are provided in Attachment "B".*

TRAFFIC SAFETY

The crash histories at the respective study intersections were reviewed in an effort to identify potential intersection safety issues. Crash records were obtained from ODOT for the five-year period from Jan. 1, 2001 through Dec. 31, 2005. There were no records of any crashes occurring at any of the study intersections. Reasons for this lack of data might be that the property damage limit was not exceeded or that the motorists did not report some crashes. *The ODOT crash data sheets are provided in Attachment "C".*

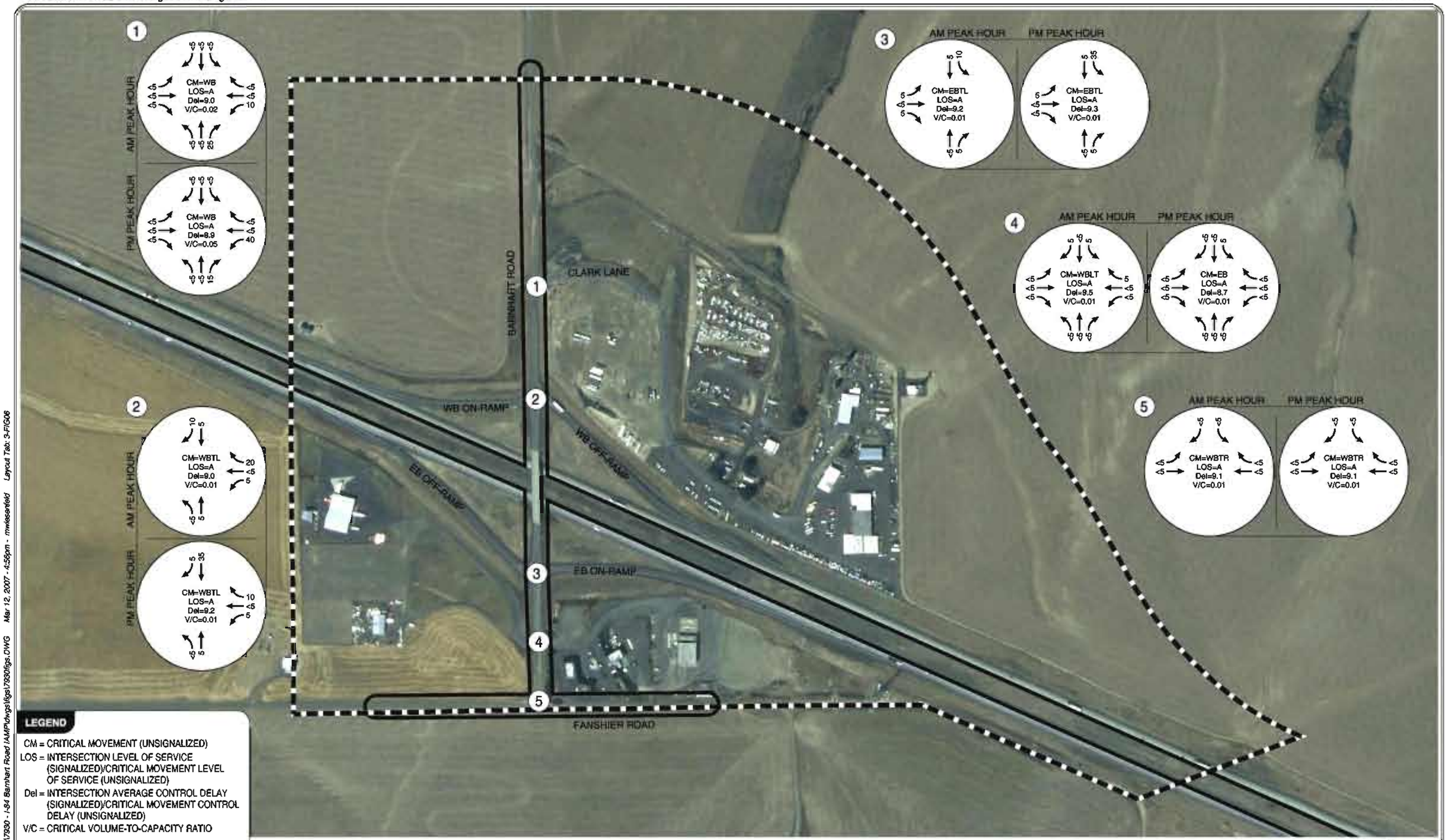
The crash history presented in the *Barnhart Road Extension Transportation and Engineering Analysis*, from a three-year period prior to 2001, indicated four crashes occurred at the Barnhart Road interchange. All four crashes occurred along the I-84 mainline and were identified to have occurred during icy or snowy conditions with a cause listed as driving too fast.

EXISTING ROADWAY ACCESS CONDITIONS

There are currently five access points within the access study area along Barnhart Road. (There are no existing access points located along Fanshier Road within the access study area.) The existing access points are a combination of public and private approaches and demonstrate past efforts to consolidate access as many serve multiple properties. All of the access points have relatively large cross-sections due to the rural nature of the area and large percentage of heavy vehicles. Figure 3-7 shows the location and type (public or private) of each of the access locations within the access study area. Table 3-2 identifies the tax lots and existing businesses served by each of the access points.

Oregon Administrative Rule 734 Division 51 and the Oregon Highway Plan identify ODOT's access management standards that apply to Barnhart Road within the vicinity of the interchange as 1,320 feet from the ramp terminals from for any type of access (partial or full). The 'IAMP Operations and Access Study Area Boundary' identified in Figure 3-2 represents the 1,320-feet access control area south of Interstate-84. North of Interstate-84, the 1,320-foot access control area ends approximately 150 feet south of the IAMP Operations and Access Study Area Boundary. Therefore, none of the access points (public or private) identified within the study area meet ODOT's current access management standards for the I-84/Barnhart Road Interchange.

Umatilla County's access spacing standards for Barnhart Road (local roadway) is 250 feet between public roadways. There are no spacing standards for private driveways which are allowed to access each property. If Barnhart Road were to become designated as a minor collector, the spacing requirement would be 500 feet between public roadways and 250 feet between driveways and between driveways and public roadways. Currently, there is approximately 500 feet between the westbound ramp terminal and Clark Lane and over 250 feet between the eastbound ramp terminal and the private access roadway south of the interchange and between the private access roadway and Fanshier Road (measured center-to-center).



LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

IAMP OPERATIONS AND ACCESS STUDY AREA

LAND USE STUDY AREA

EXISTING TRAFFIC CONDITIONS WEEKDAY AM AND PM PEAK HOUR
UMATILLA COUNTY, OREGON

FIGURE **3-6**

H:\projfile\17930 - I-84 Barnhart Road IAMP\dwgs\figs\17930figs.DWG Mar 12, 2007 - 4:56pm - mwiesenfeld Layout Tab: 3-FIG06

LEGEND

- IAMP Operations and Access Study Area
- Land Use Study Area
- Tax lot

Type of Access

- (#) Public Approach
- [#] Private Approach

0 200 400 800 1,200 1,600 2,000 Feet

EXISTING ACCESS LOCATIONS
UMATILLA COUNTY, OREGON

FIGURE **3-7**

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File Path: K:\Kittelson\Pendleton_IAMP\MXD\Figures\Figure3-7_Existing_Roadway_Access_Locations_092806_11x17.mxd, Date: March 8, 2007 4:00:29 PM

Table 3-2 Barnhart Road Public/Private Approach Inventory

Approach Type	Figure 3-7 Access Number	Intersection Name	Side	Property Owner/ Business Name	Serves (Tax Map) & Tax Lot Number	Zoning	Acreage
Public	1E	Barnhart Road/ Clark Lane	East	Woodpecker Truck & Equipment Inc.	400, 500	RLI	15, 25
				Clark E M Woody	500	RLI	25
Private	1W	Barnhart Road/ Clark Lane	West	Rew Ranches Inc.	100	EFU	160
				USA (Federal Aviation Administration)	100	EFU	160
Public	2	Westbound Off-Ramp	East	ODOT	Interstate-84	NA	NA
		Westbound On-Ramp	West			NA	NA
Public	3	Eastbound Off-Ramp	West	ODOT	Interstate-84	NA	NA
		Eastbound On-Ramp	East			NA	NA
Private	4	Barnhart Road/ Private Access Roadway	East	Rattu Jaswant & Kumari Santosh	700	RTC	2.05
				Stephens, Eli F	800, 900	RTC	1.57, 9.17
Private	4	Barnhart Road/ Private Access Roadway	West	Coca-Cola Bottling Co	300	RLI	9.17
				Woodpecker Truck & Equip. Inc	500, 700	RLI	0.27, 0.73
				Graves Russell E & Graves Doris L (TRS)	400, 600, 801	RLI	5.05, 4.36, 2.17
				Kilkenny Christopher John & Loretta Lynn	800	RLI	3.71
Public	5	Barnhart Road/ Fanshier Rd	East / West	Umatilla County	Fanshier Rd	NA	NA

RLI – Rural Light Industrial
RTC – Rural Tourist Commercial
NA – Not Applicable

EXISTING ROADWAY DEFICIENCIES

No significant existing roadway deficiencies were identified within the study area along the paved sections of roadway. The Umatilla County design standards require a 12-foot travel lane in each direction with a four- to eight- foot shoulder and a 60-foot of right-of-way on Barnhart Road and a 30-foot right-of-way on Clark Lane. Right-of-way maps were not available from Umatilla County in the study area; however, the right-of-way requirements appear to be met based on field observations.

The paved section of Barnhart Road does not extend beyond the access points of the properties within the IAMP study area boundary; however, Barnhart Road appears to meet the existing needs of the surrounding property owners.

Traffic operations at each of the study intersections are currently acceptable during both the weekday a.m. and p.m. peak hours and there are no identified safety issues based on the crash history.

NATURAL AND CULTURAL RESOURCES

At this time, no fish or wildlife habitat, flood plains, historic properties, archeological resources, hazardous materials, or major utilities have been identified within the IAMP study area boundary. The presence of these resources is currently being investigated along the Barnhart Road-Airport Road Connector study area.

SUMMARY

- The roadways within the study area include Interstate-84 and three Umatilla County Rural Local Roads including Barnhart Road, Fanshier Road, and Clark Lane.
- All of the study roadways have a two-lane cross-section with the exception of Interstate-84, which is a four-lane facility.
- Barnhart Road is currently a gravel roadway beyond the access points to the properties within the study area.
- There are no pedestrian or bicycle facilities along the roadways within the study area.
- All of the study intersections operate at a Level-of-Service “A” during the weekday a.m. and p.m. peak hours and the ODOT volume-to-capacity thresholds are also met at the ramp terminals during both peak periods.
- There are no identified safety issues within the study area based on a review of the most recent five years of available crash data.
- There are currently five access points located within the access study area located along Barnhart Road. The existing access points are a combination of public and private approaches and demonstrate past efforts to consolidate access as many serve multiple properties.
- ODOT’s access spacing standard for Barnhart Road within the vicinity of the interchange is 1,320 feet from the ramp terminals to any type of access (partial or full). None of the access

points (public or private) identified within the study area meet ODOT's current access spacing standard.

- Although Barnhart Road is currently designated as a local roadway, all of the access points identified within the study area meet Umatilla County's access spacing standards for a minor collector roadway.

- There are no identified existing roadway deficiencies within the study area along the paved sections of roadway. The existing gravel sections appear to meet the needs of property owners outside of the IAMP study area.

Section 4

Future Conditions

Future Conditions

This section of the report documents the future traffic conditions as well as a possible future land use scenario in the vicinity of the interchange and the airport industrial areas. Based on this land use scenario, an assessment of future year 2025 "No-Build" (without the Connector Roadway) and a "Build" forecast is provided for the proposed Barnhart Road-Airport Road Connector Project and the I-84/Barnhart Road IAMP. The remainder of this section summarizes the land use, regional traffic growth, and traffic reassignment assumptions as well as the forecasted year 2025 traffic operations.

FUTURE CONDITIONS STUDY AREA

The future conditions study area will focus on the three identified sub-areas 'A,' 'B' and 'C.' The sub-area 'A' is comprised of those land uses located north of Interstate-84 in the vicinity of the Barnhart Road interchange. The sub-area 'B' comprises the lands located to the south of the interstate near the interchange. Sub-area 'C' reflects land currently within and proposed to be within the Urban Growth Boundary in the vicinity of the airport that would generate traffic and affect the operations of the Barnhart Interchange with the construction of the Barnhart Road-Airport Road Connector.

The IAMP study area comprised of Sub-areas 'A' and 'B' is focused on the specific connector roadway alignment and the related traffic impacts and property accessibility issues within the immediate vicinity of the interchange.

PLANNED TRANSPORTATION IMPROVEMENTS

With the exception of the Barnhart Road-Airport Road Connector Project, no additional transportation improvements inside the IAMP study area are identified in ODOT's Statewide Transportation Improvement Plan (STIP) or the City of Pendleton and Umatilla County Transportation System Plans. The Pendleton TSP calls for the Barnhart Road-Airport Road Connector to provide a connection between the airport industrial area and the existing I-84/Barnhart Road Interchange in order to allow for additional industrial development, and to provide improved access to the interstate due to the existing topographical constraints along the current Airport Road-Westgate (US 30) route to I-84.

YEAR 2025 NO-BUILD TRAFFIC VOLUMES FORECAST METHODOLOGY

Year 2025 "No-Build" (Without the Connector Road) traffic volume forecasts for intersection turning movements and street segments were developed in order to analyze the effects of traffic growth on the I-84/Barnhart Road Interchange and the surrounding transportation system that serve adjacent urban and rural land uses. For this assessment, a year 2025 "No-Build" scenario was developed based on the currently adopted Umatilla County and City of Pendleton comprehensive plans. The remainder of this section describes the methodology and assumptions used to develop year 2025 forecasts.

Year 2025 No-Build Scenario

The year 2025 No-Build Scenario was developed by considering the following three types of traffic growth:

- Future traffic growth related to development and redevelopment of the Umatilla County Rural Light Industrial and Rural Tourist Commercial exception land in the vicinity of the I-84/Barnhart Road Interchange.

- Future traffic growth related to development and redevelopment of the land located currently within the Pendleton UGB in the immediate vicinity of the airport.
- Future traffic related to regional growth focusing on the increase use of the Westgate (US 30) and I-84 corridors for intercity and interstate travel.
- Regional traffic growth at the study intersections in the IAMP study area was considered to be negligible because nearly all trips at the interchange are related to the land uses within the IAMP study area. These land uses were included in the future traffic at their full trip generation potential as described below.

The specific assumptions used in each of these traffic growth components are summarized below.

I-84/Barnhart Road Interchange Area Traffic Growth Assumptions

To account for local traffic growth attributed to the development and redevelopment of the Umatilla County Rural Light Industrial and Rural Tourist Commercial exception land in the vicinity of the I-84/Barnhart Road Interchange, the project team calculated the reasonable "worst-case" trip generating potential of the properties based on development assumptions summarized in Table 4-1 and illustrated in Figure 4-1.

As shown in Table 4-1, it was assumed that all the existing properties with the exception of the Coca-Cola property within the I-84/Barnhart Road Interchange Area would redevelop over the next 20 years. The reasonable "worst-case" trip generating potential for each sub-area was calculated for the weekday a.m. and p.m. peak hour. The reasonable "worst-case" trip generation potential for the RLI area was developed using ITE Trip Generation rates for General Light Industrial land use based on the total acreage. Tables 4-A1 and 4-A2 and Figures 4-A1 and 4-A2 in appendix of Technical Memorandum #4 of the *I-84/Barnhart Road IAMP Technical Appendix* summarize the specific land use assumptions, trip generation calculations, and trip assignments onto the local transportation system for the I-84/Barnhart Road Interchange Area.

Table 4-1
I-84/Barnhart Road Interchange Area Land Use Assumptions

Land Use Assumption	Zoning	Acreage	Size	Net New Peak Hour Trips	
				Weekday AM	Weekday PM
Sub-Area A – North of Interchange					
Complete Redevelopment	RLI	40	330,000[3]	300	290
Sub-Area B – South of Interchange					
Maintain Coca-Cola Property	RLI	4.27	Existing	n/a	n/a
Complete Redevelopment of Remaining Industrial Land	RLI	16.29	179,000[4]	122	118
Complete Redevelopment of all RTC Property	RTC	12.79	12-Position Gas Station w/Convenience Store, 3,000sf Fast-Food w/ Drive-Thru and a 30-Bed Motel	146	125
Sub-Area "B" Total	RLI/RTC	33.35		268	243

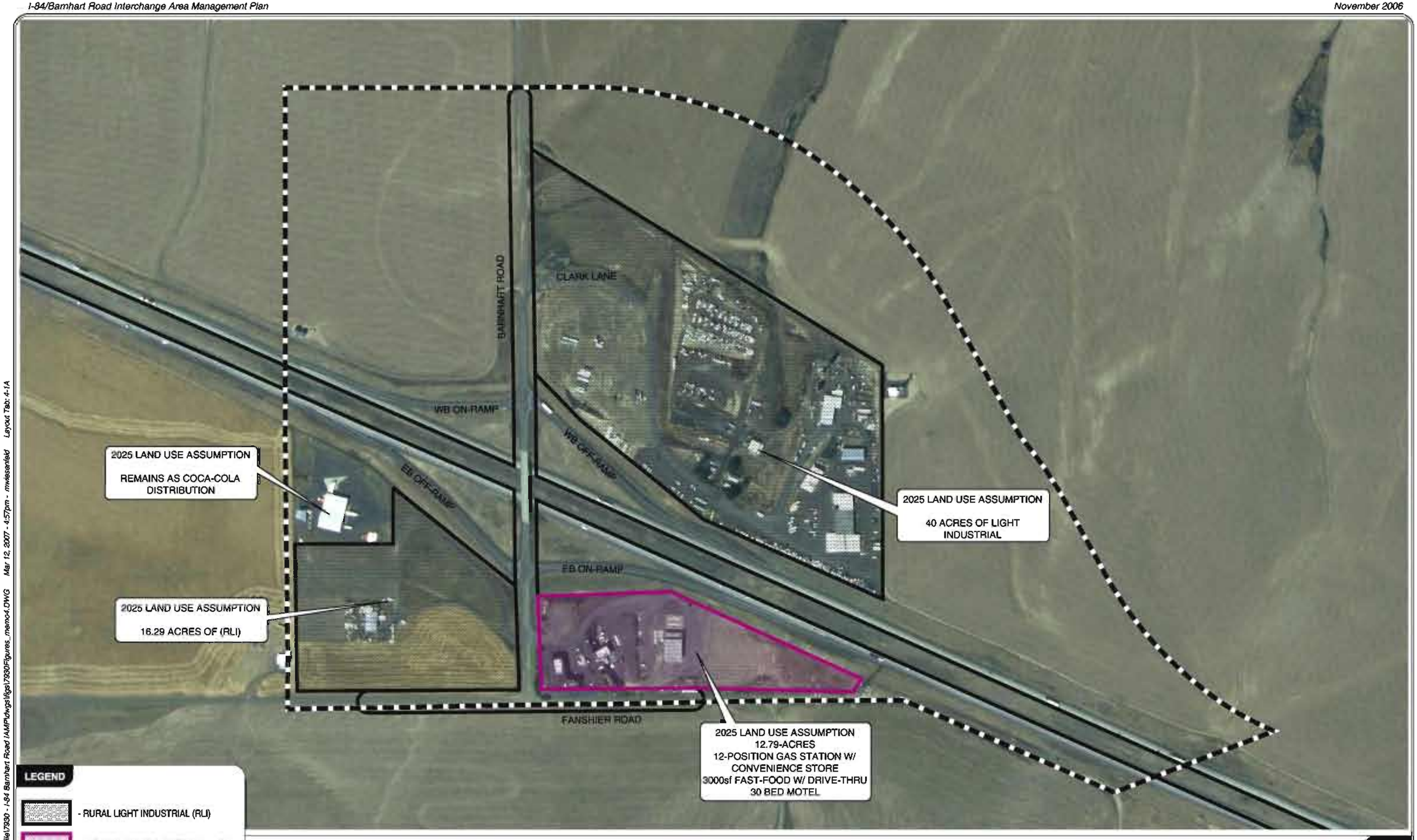
Airport Area and Background Traffic Growth Assumptions

To determine the local traffic growth attributed to the development and redevelopment of the industrial land in the Airport Industrial Area, as well as the growth of regional traffic in the vicinity of Airport Road and US 30, the Pendleton travel demand model was run with the Connector Roadway. All growth in the Airport Industrial Area was assigned to the Connector Roadway to determine the number of weekday p.m. peak hour trips associated with the projected growth of the Airport Industrial Area. The traffic volumes on the Connector Roadway were then manually added to the Airport Road/Westgate (US30) intersection to access the interstate for the No-Build scenario.

The potential growth in the Airport Industrial Area was determined using five percent continuous employment growth rate for the area. This rate was agreed upon by the PPMT at its December 13th, 2007 meeting. The employment statistics for the year 2006 were provided by the City of Pendleton's Economic Development Department and projected to 2025. The 2025 employment was input into the Airport Industrial Area Traffic Analysis Zones (TAZs), assigned to the Connector Roadway, and evaluated in the Pendleton travel demand model to determine the number of trips to attribute to the future growth of the Airport Industrial Area.

3 Back calculated using the number of estimated weekday p.m. peak hour trips based on the ITE Trip Generation Manual General Light Industrial square-footage rate.

4 Back calculated using the number of estimated weekday p.m. peak hour trips based on the ITE Trip Generation Manual General Light Industrial square-footage rate.



I-84/BARNHART ROAD INTERCHANGE AREA-LAND USE ASSUMPTIONS
UMATILLA COUNTY, OREGON

FIGURE 4-1

K:\proj\file17930 - I-84 Barnhart Road IAMP\dwgs\figs\17930Figures_mamc4.DWG Mar 12, 2007 - 4:57pm - mwiesenfeld Layout Tab: 4-1A

The model output was also used to establish growth rates for Airport Road and Westgate (US 30). Airport Road was assumed to have a 10% per year traffic growth rate. Westgate (US 30) was assumed to have a 3% per year traffic growth rate. These traffic growth rates account for background growth in the region.

YEAR 2025 NO-BUILD TRAFFIC CONDITIONS

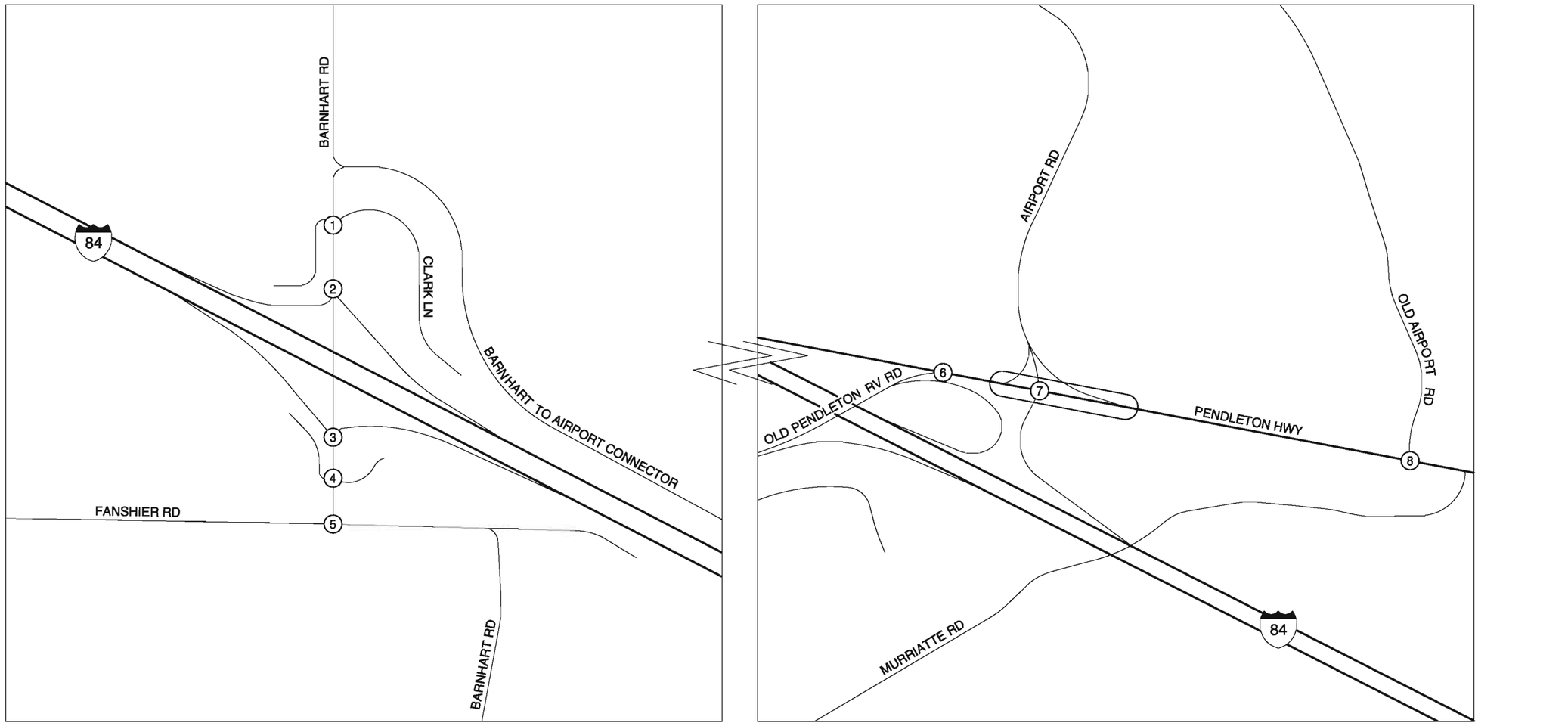
Future year 2025 No-Build weekday a.m. and p.m. peak hour traffic volumes were determined by increasing the existing 2006 traffic in the network by growth rates and trip generation estimates at the I-84/Barnhart Road Interchange. (Figures 4-A3 through 4-A5 in the appendix of Technical Memorandum #4 of the *I-84/Barnhart Road IAMP Technical Appendix* summarize the existing 2006 lane configurations and traffic control devices, weekday a.m. peak hour traffic conditions, and weekday p.m. peak hour traffic conditions, respectively). The resulting year 2025 No-Build weekday a.m. and p.m. peak hour traffic volumes are shown in Figures 4-2 and 4-3. It should be noted that these forecasts are somewhat conservative due the building coverage and full-buildout assumptions applied to the developable lands within sub-area 'A' and 'B'. The growth rates applied in the airport area are based on the Travel Demand Model data provided by ODOT.

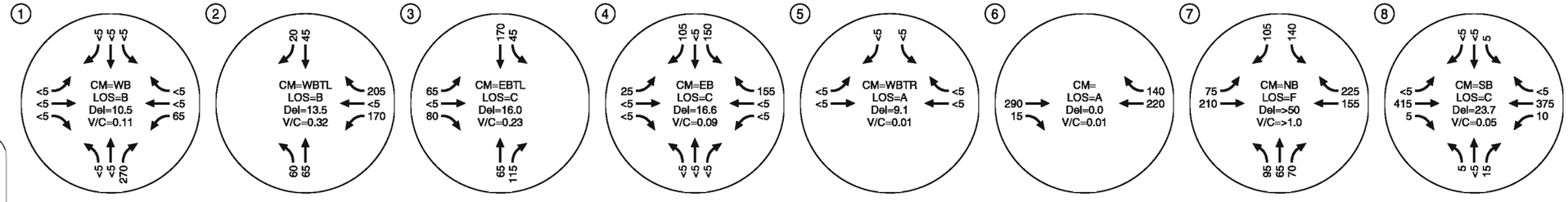
Year 2025 No–Build Intersection Operations Analysis

A traffic operations analysis was performed for the study intersections using the forecast year 2025 "No-Build" weekday a.m. and p.m. peak hour traffic volumes shown in Figure 4-2 and 4-3, respectively. As shown in the figures, by the year 2025, assuming no transportation improvements are made within the study area, all study intersections are expected to operate acceptably with the exception of the Airport Road/Westgate (US 30) intersection during the weekday a.m. and p.m. peak hours. This identified operational deficiency and the possible mitigation solutions are discussed below.

Airport Road/Westgate (US 30)

The Airport Road/Westgate (US 30) intersection fails to meet operational standards during weekday a.m. and p.m. peak hours because of the high southbound left-turn demand created by growth in employment within the Airport Industrial Area. This level of traffic would likely require signalization of the Airport Road/Westgate (US 30) intersection to accommodate for this movement. Under 2025 No-Build Conditions the 8-Hour, 4-Hour, and Peak Hour Vehicular Volume signal warrants are met. Signalization can be undertaken at a future date when traffic volumes warrant the signalization.



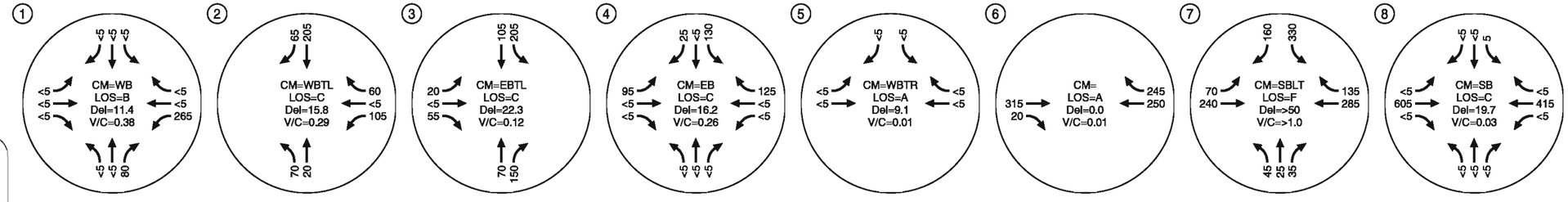


LEGEND

CM = CRITICAL MOVEMENT (UNSIGNALIZED)
LOS = INTERSECTION LEVEL OF SERVICE (SIGNALIZED)/CRITICAL MOVEMENT LEVEL OF SERVICE (UNSIGNALIZED)
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2025 NO BUILD WEEKDAY AM PEAK HOUR TRAFFIC CONDITIONS
UMATILLA COUNTY, OREGON

FIGURE 4-2



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V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2025 NO BUILD WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS
UMATILLA COUNTY, OREGON

FIGURE 4-3

YEAR 2025 BUILD (WITH CONNECTOR ROAD) TRAFFIC VOLUMES FORECAST METHODOLOGY

A year 2025 "Build" scenario was developed in order to predict the needs of the interchange and airport area considering the presence of the Connector Roadway and increases in the travel demand described in the 'No Build' scenario. The remainder of this section describes the methodology and assumption used to develop year 2025 build forecast scenario.

Connector Roadway Scenario

This 'Build' scenario assumes the same land use assumptions documented in the year 2025 "No-Build" scenario; however, it assumes that the Barnhart Road-Airport Road Connector is in place. As a result of this connection, it was assumed that all of the traffic created by new development within the Airport Industrial Area would use the new Connector Roadway for trips with origins or destinations west of Pendleton. This 100% distribution of new trips conservatively estimates the capacity needs of the I-84/Barnhart Road Interchange. In addition, it was assumed that 50% of the traffic currently traveling to or from the west along I-84, using Westgate (US 30) and Airport Road would alter there driving pattern to use the Connector Roadway[5]. Figures 4-A6 and 4-A7 in the appendix of Technical Memorandum #4 of the *I-84/Barnhart Road IAMP Technical Appendix* illustrates the proposed re-routed traffic volumes.

Operational Analysis

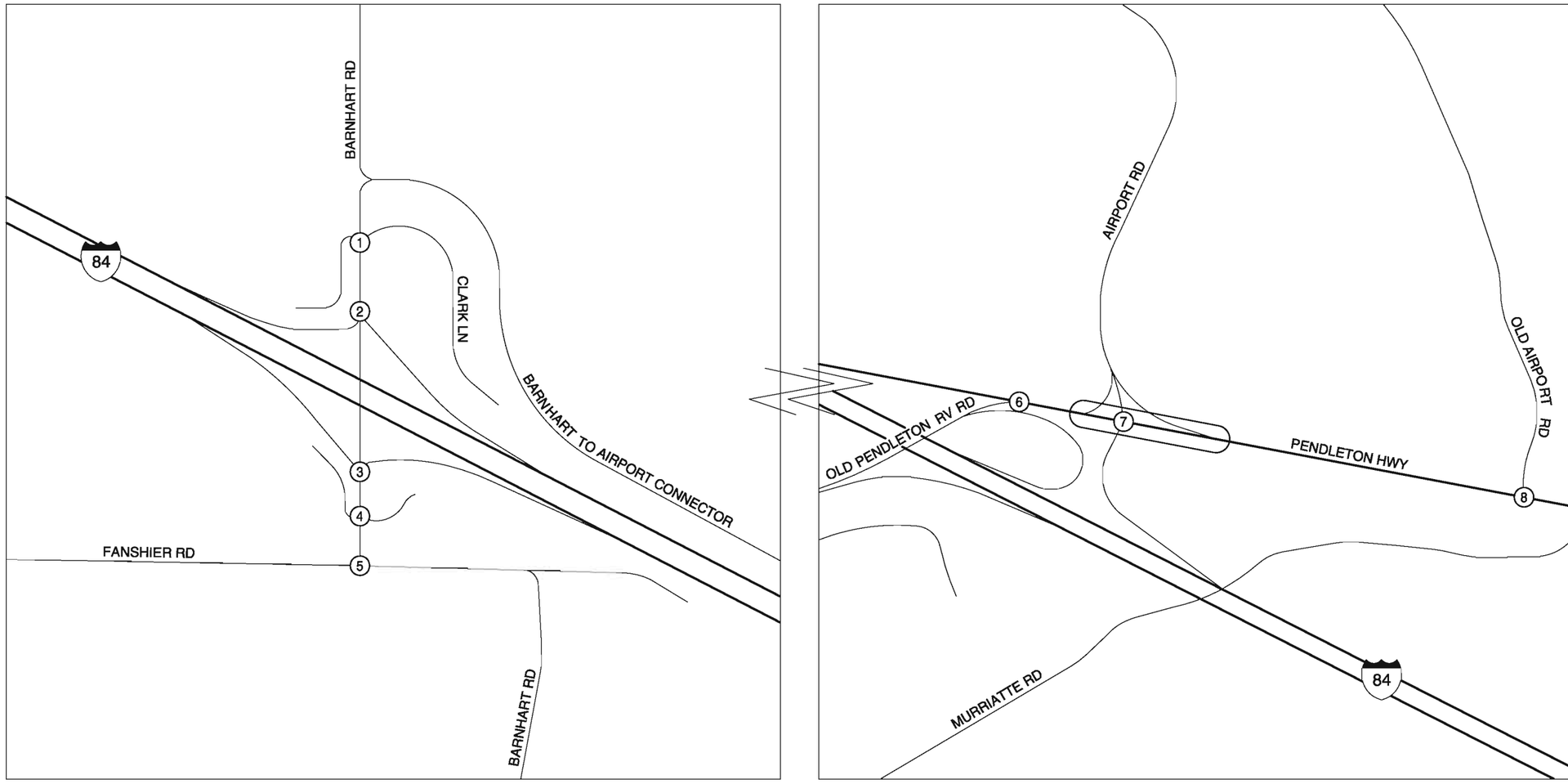
A traffic operations analysis was performed for the study intersections under the Connector Roadway Scenario using the forecasted weekday a.m. and p.m. peak hour traffic volumes shown in Figures 4-4 and 4-5, respectively. As shown in the figures, all study intersections are expected to operate acceptably with the proposed connector roadway in place, except for the Airport Road/Westgate (US 30) intersection during both the weekday a.m. and p.m. peak hours. These identified operational deficiencies and the possible mitigation solutions are discussed below.

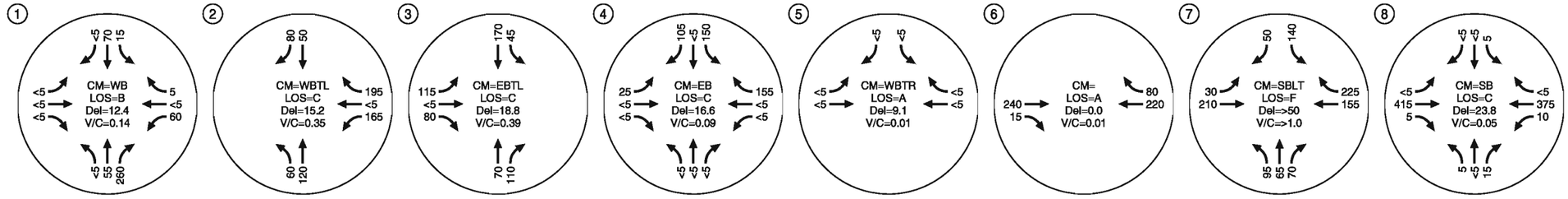
As shown in Figure 4-5, the projected weekday p.m. peak hour two-way traffic on the Connector Roadway north of the IAMP study area is approximately 150 vehicles. The two-way average daily traffic along the Connector Roadway is estimated to be between 1,000 and 1,500 vehicles per day. According to Chapter 20 of the Highway Capacity Manual regarding two-lane highways, a two-lane cross-section can carry up to 3,200 vehicles per day. The average daily traffic volumes projected for the proposed Connector Roadway can be adequately served with a two-lane cross-section.

Airport Road/Westgate (US 30)

The Airport Road/Westgate (US 30) intersection fails to meet operational standards during weekday a.m. and p.m. peak hours because of the high southbound left-turn demand created by growth in employment within the Airport Industrial Area. This level of traffic would likely require signalization of the Airport Road/Westgate (US 30) intersection to accommodate for this movement. Under 2025 Build Conditions the 8-Hour, 4-Hour, and Peak Hour Vehicular Volume signal warrants are met. Signalization can be undertaken at a future date when traffic volumes warrant the signalization.

5 All growth in the Airport Industrial Area was assumed to use the Connector Roadway because the growth is projected for areas at the north end of Airport Road. Existing traffic to/from the southern half of Airport Road was assumed to continue to use the Highway 30 interchange to access I-84.





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CM = CRITICAL MOVEMENT (UNSIGNALIZED)
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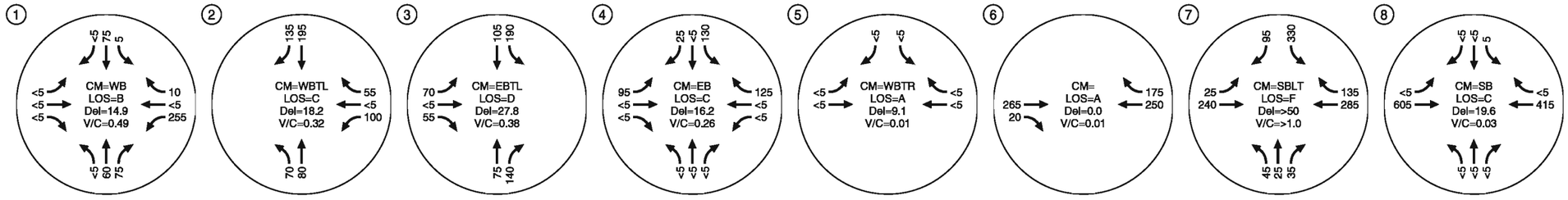
Del = INTERSECTION AVERAGE CONTROL DELAY (SIGNALIZED)/CRITICAL MOVEMENT CONTROL DELAY (UNSIGNALIZED)
V/C = CRITICAL VOLUME-TO-CAPACITY RATIO

YEAR 2025 TOTAL WEEKDAY AM PEAK HOUR TRAFFIC CONDITIONS WITH CONNECTOR BUILT
UMATILLA COUNTY, OREGON

FIGURE 4-4



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YEAR 2025 TOTAL WEEKDAY PM PEAK HOUR TRAFFIC CONDITIONS WITH CONNECTOR BUILT
UMATILLA COUNTY, OREGON

FIGURE 4-5

SUMMARY OF YEAR 2025 FUTURE YEAR CONDITIONS

The year 2025 "No-Build" and "Build" forecasts and analysis resulted in the following findings:

- Trip generation for both the No-Build and Connector Roadway scenarios is based on the reasonable highest development at the I-84/Barnhart Road Interchange and predicted growth in the Airport Industrial Area. Reasonable worst-case development of existing properties that are likely to redevelop and vacant properties within the I-84/Barnhart Road Interchange Area will result in approximately 509,000 square feet of industrial space and several service-related uses per the adopted Umatilla County comprehensive plans. The growth for the Airport Industrial Area is in accordance with the City of Pendleton's employment model for the area.

- In the year 2025 "No Build" (Connector Roadway not built) all study intersections are found to operate acceptably with the exception of the Airport Road/Westgate (US 30) intersection. The Airport Road/Westgate (US 30) intersection fails to meet operational standards during weekday a.m. and p.m. peak hour because of the high southbound left-turn demand created by growth in employment within the Airport Industrial Area. This level of traffic would likely require signalization of the Airport Road/Westgate (US 30) intersection to accommodate for this movement. Under 2025 No-Build Conditions the 8-Hour, 4-Hour, and Peak Hour Vehicular Volume signal warrants are met. Signalization can be undertaken at a future date when traffic volumes warrant the signalization.

- Trip generation and forecast growth for the year 2025 "Build" (with Connector Roadway) scenario was assumed to be the same as the year 2025 "No-Build" forecast. However, trips generated from the Airport Industrial Area's employment growth with origins or destinations west of Pendleton were assigned to use the new Connector Roadway.

- In the year 2025 Connector Roadway scenario, all study area intersections operate acceptably under total traffic forecast with the exception of the Airport Road/Westgate (US 30) intersection. The Airport Road/Westgate (US 30) intersection fails to meet operational standards during weekday a.m. and p.m. peak hour because of the high southbound left-turn demand created by growth in employment within the Airport Industrial Area. (The Connector Roadway does not reduce the number of southbound left turns at this intersection.) This level of traffic would likely require signalization of the Airport Road/Westgate (US 30) intersection to accommodate for this movement. Under 2025 Build Conditions the 8-Hour, 4-Hour, and Peak Hour Vehicular Volume signal warrants are met. Signalization can be undertaken at a future date when traffic volumes warrant the signalization.

- The year 2025 Connector Roadway scenario's total traffic forecasts indicate that a two-lane Connector Roadway will be sufficient enough to accommodate the estimated 1,000 – 1,500 daily trips between Barnhart Road and the Airport Industrial area. It should be noted that the roadway will likely require a median (turn lane) within the I-84/Barnhart Road Interchange and Airport Industrial Area to facilitate left-turn movements; however, no turn lanes will be necessary along the section accessing EFU lands.

Section 5

Opportunities and Constraints

Opportunities and Constraints

This section of the report documents the development and preliminary evaluation of eight northerly roadway alignments around the Barnhart Road to Airport Road Connector (Connector Roadway) and the two southerly roadway alignment and access concepts that have been developed as part of the IAMP process. In addition, specific roadway improvement needs and potential land use management strategies are presented. This evaluation includes a description of the process used to develop the eight concepts and a detailed description of each, a qualitative assessment discussing the advantages and disadvantages of each, and a quantitative analysis of each concept's roadway alignment and access characteristics.

The purpose of this section to provide a quantitative and qualitative assessment and feasibility analysis of each roadway alignment and access concepts, and to assist in the screening process that will ultimately result in a preferred northerly and southerly concept. These concepts cover the alignment of the new Barnhart Road to Airport Road Connector Roadway (Connector Roadway), the minor access roads which will need to be constructed, and modifications that can be made to the existing roadways south of the I-84/Barnhart Road Interchange to bring that area closer to meeting ODOT's access spacing standards.

CONCEPT DEVELOPMENT PROCESS

The development of the initial roadway alignment and access concepts for the I-84/Barnhart Road IAMP began with two separate design workshops. The first workshop was held for members of the PPMT, while the second workshop was held for interested citizens, business owners, and landowners in a public open house setting. Both of these workshops were held on Nov. 13, 2006.

Within each workshop, participants were presented with an overview of applicable design parameters and local circulation/access management techniques. Following these presentation overviews, participants were asked to sketch their ideas for the future transportation network in terms of a new I-84/Barnhart Road Interchange and a supporting collector/local street circulation network.

Following the completion of the PPMT and public workshops, the consultant team developed a series of individual roadway alignment and access concepts for the north and south sides of the interchange based on the ideas generated during the workshop's exercises. These concepts are described in the following sections.

ROADWAY ALIGNMENT AND ACCESS DESIGN CONCEPTS

Based on the general design ideas developed as part of the workshop exercises, the consultant team developed a set of eight northerly and two southerly roadway alignment and access concepts. These concepts represent a culmination of the individual design ideas developed by the workshop participants. Technical refinements to these ideas were made by the consultant team to ensure proper design parameters and constructability of the proposed Connector Roadway. Each of the concepts and the key design components are described below.

Northerly Interchange Roadway Alignments and Access Design Concepts

Concept #N1A

Figure 5-1 shows the roadway alignment and access design for Concept #N1A. This concept is defined by new connector roadway utilizing the existing Clark Lane alignment through the industrial zoned property in the northeast quadrant of the interchange. The Clark Lane and Barnhart Road intersection is moved slightly to the northeast onto the existing industrial property along a continuous horizontal curve starting immediately north of the westbound interchange terminal. The connector roadway would be the through movement and the existing segment of Barnhart Road north of the new intersection will form a stop-controlled 'T' intersection. In addition, the existing farm access roadway serving the property in the northwest quadrant of the intersection would be realigned to the north and tie into the northern segment of Barnhart Road via a second stop-controlled "T" intersection.

Concept #N1B

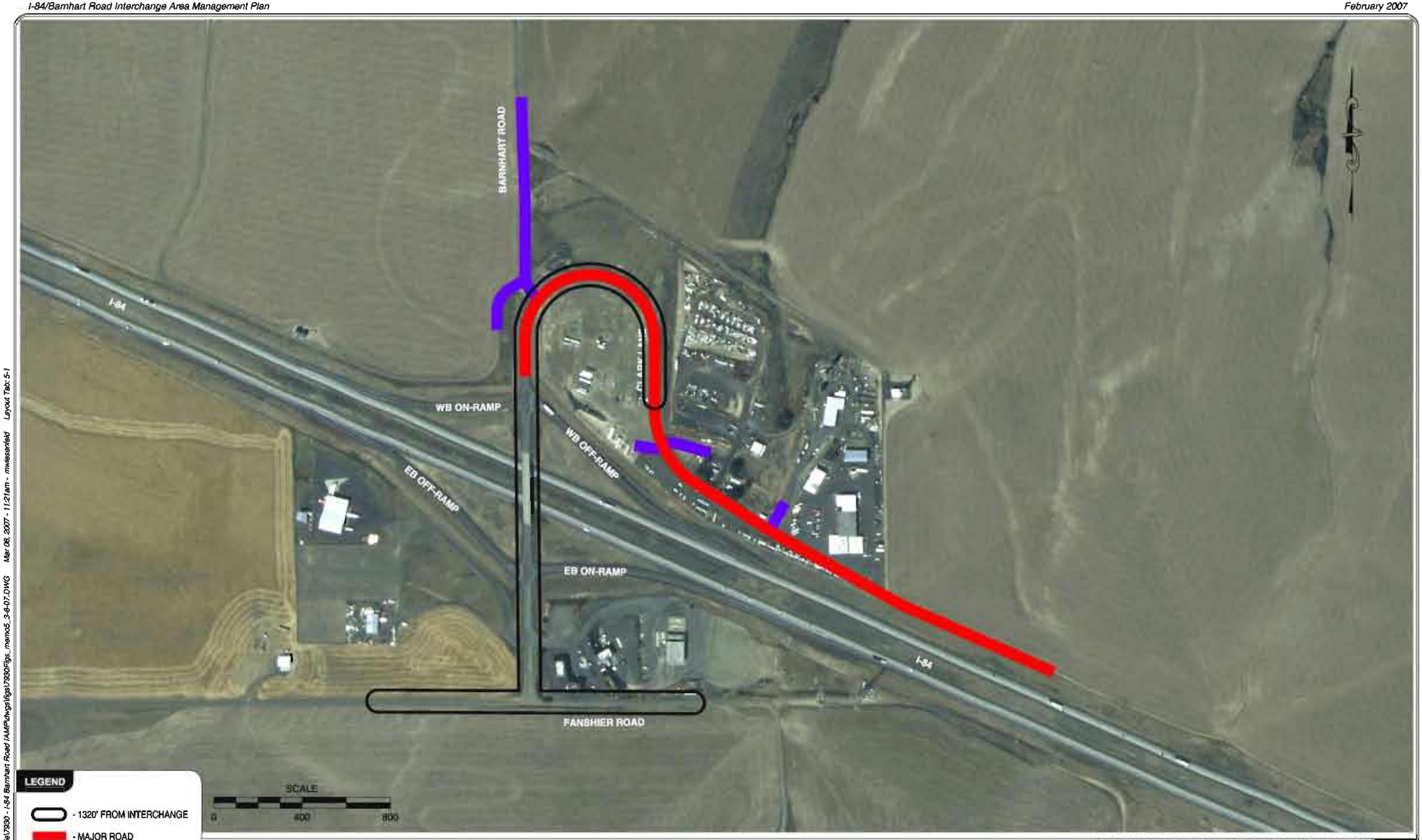
Figure 5-2 shows the roadway alignment and access design for Concept #N1B. This concept is similar to Concept #N1A; however, instead of two "T" intersections being formed, the new connector and existing farm access create a four legged stop-controlled intersection with the existing Barnhart Road alignment. The new connector roadway again utilizes the existing Clark Lane alignment through the industrial property. The primary movement through the Barnhart Road/Connector roadway intersection remains Barnhart Road under this concept.

Concept #N2A

Figure 5-3 illustrates the roadway alignment and access design for Concept #N2A. The principle feature of this concept is the large horizontal curvature of the new roadway which extends Barnhart Road northeasterly from the westbound interchange terminal through the northwest corner of the existing industrial land and into the EFU land adjacent of the industrial area. The remaining northerly segment of the Barnhart Road alignment forks at the northwest corner of the industrial property. The southwesterly fork provides access to the farm use in the northwest corner of the interchange. The northeasterly fork crosses the new alignment at 1,100 feet from the interchange and extends into the industrial area to provide driveway access to this property along the Clark Lane alignment. The alignment of this access road north of the new Connector Roadway was chosen to provide adequate site distance as this intersection. For the purpose of providing an intersection at a lesser grade, access to the industrial property would also be provided near the southeast corner of the industrial property.

Concept #N2B

Figure 5-4 depicts the roadway alignment and access design for Concept #N2B. The new Connector Roadway would follow the same alignment as in Concept #N2A. The existing Barnhart Road north of the interchange would be re-routed to the east so that the intersection of the Connector Roadway and Barnhart Road is approximately 1,600 feet from the interchange. There would be a four-way intersection at this location to provide access to the industrial property.



I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N1A
UMATILLA COUNTY, OREGON

FIGURE 5-N1A

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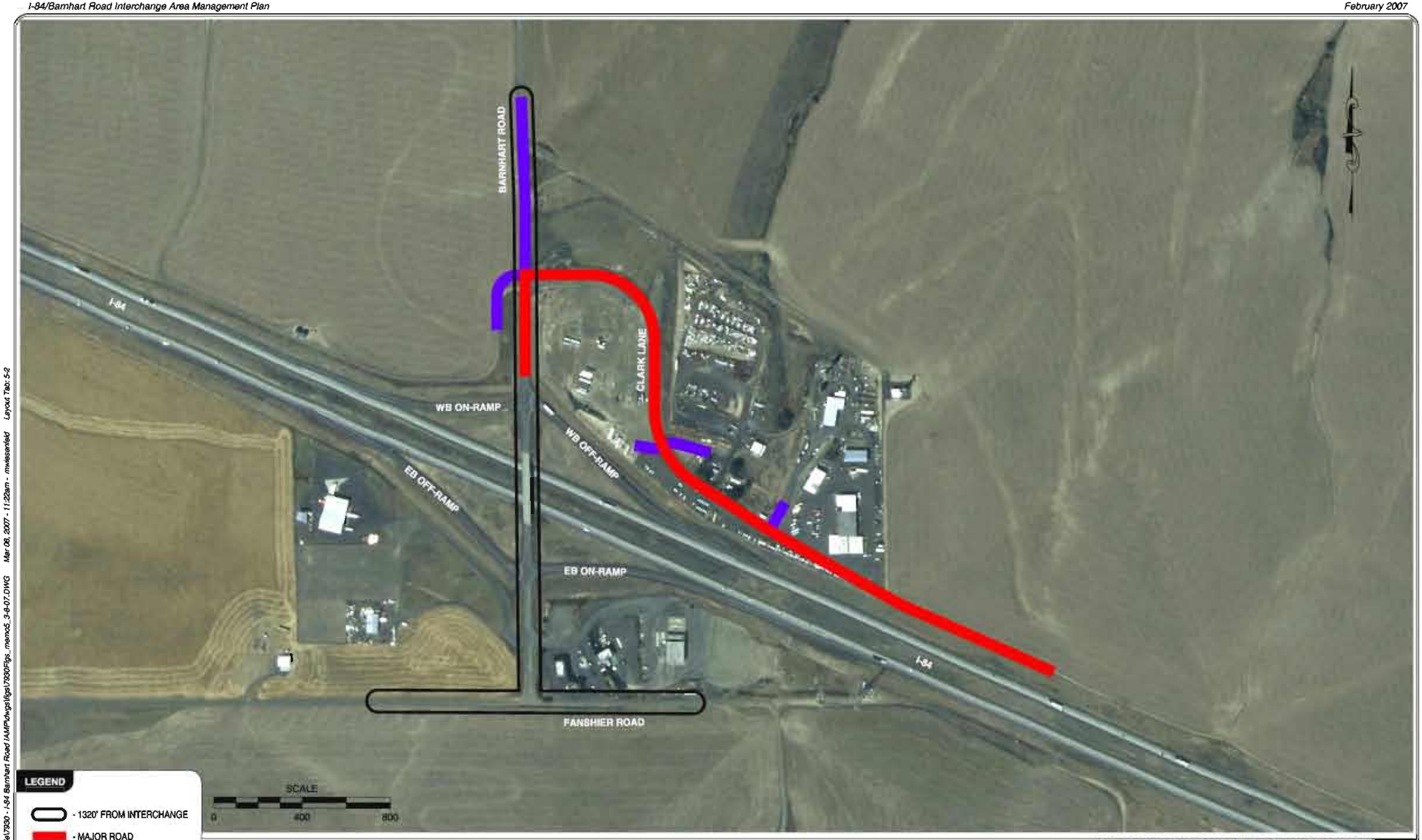

I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N1B
UMATILLA COUNTY, OREGON

FIGURE 5-N1B

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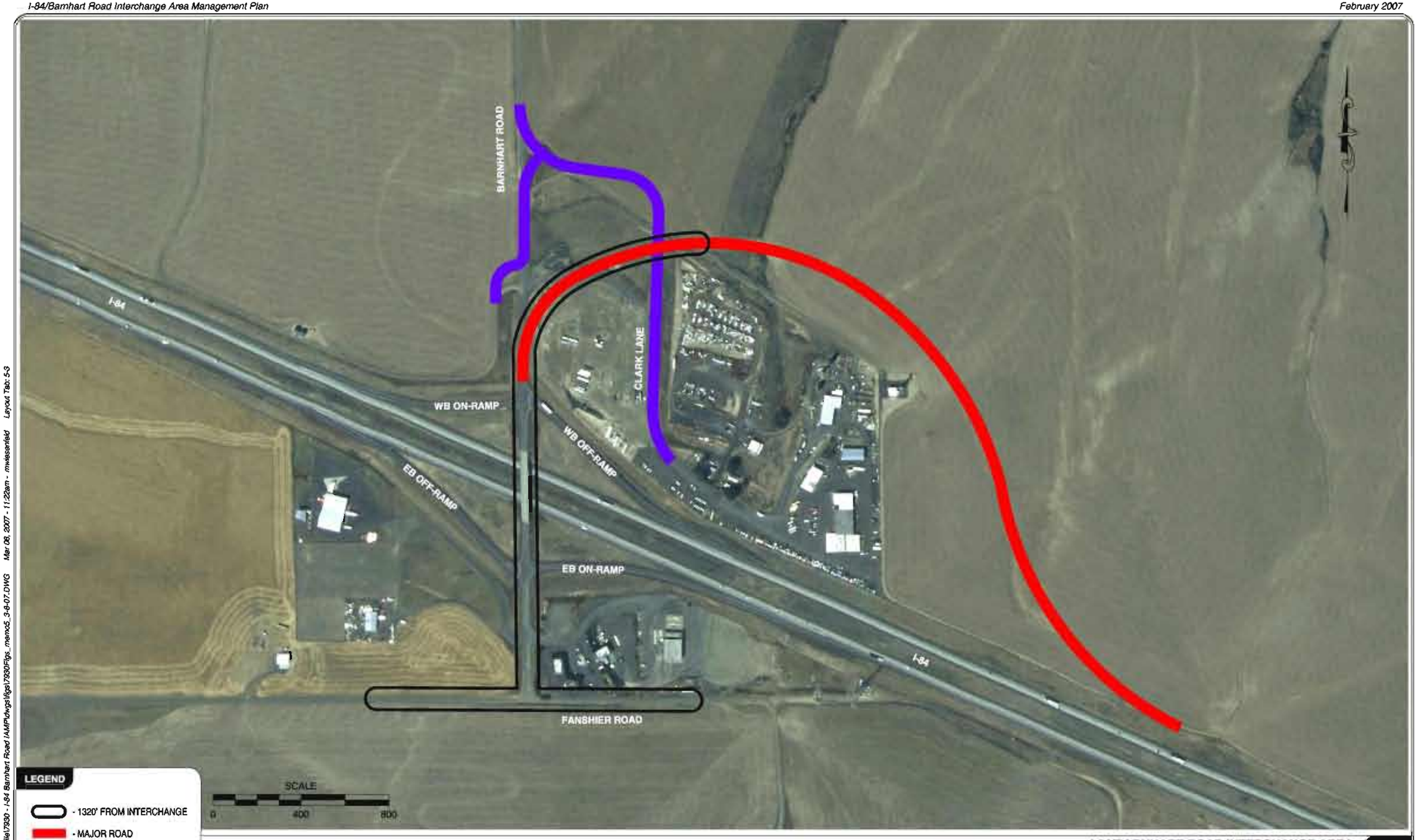
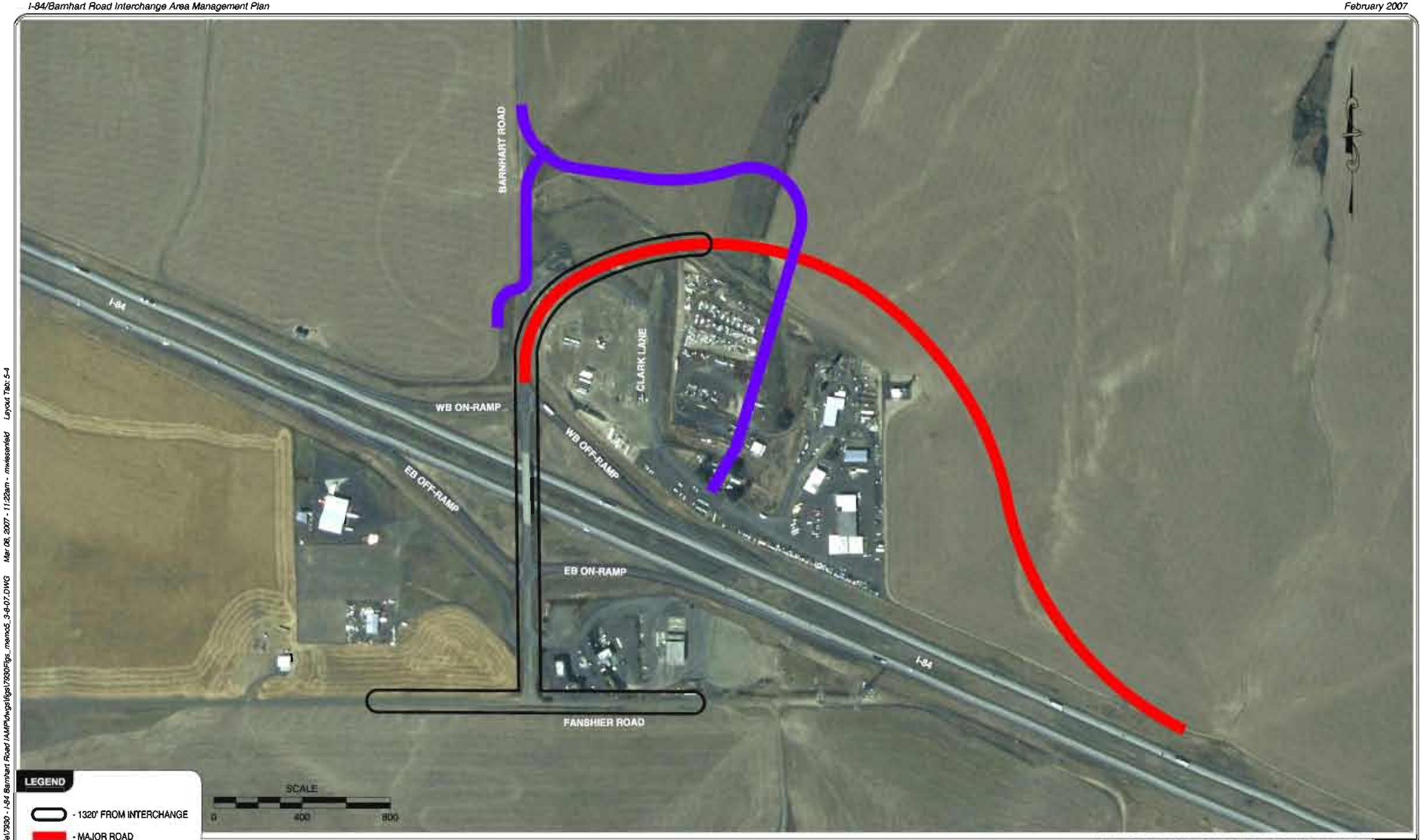


I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N2A
UMATILLA COUNTY, OREGON

FIGURE 5-N2A



I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N2B
UMATILLA COUNTY, OREGON

FIGURE 5-N2B

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Concept #N3

Figure 5-5 shows the roadway alignment and access for Concept #N3. This concept achieves 1,320 feet and takes a large horizontal curving path, north of all current development, as it meets as a four-way intersection with the existing Barnhart Road north of the industrial site. The existing farm access on the west side is extended to the north to complete the fourth leg of this intersection. Clark Lane will be a right-in/right-out intersection at its current intersection with Barnhart Road. Full access to the industrial property will be provided by an access road which comes to a 'T' intersection with the new roadway north of the industrial property.

Concept #N4

Figure 5-6 shows the roadway alignment and access for Concept #N4. This concept places the new road through the industrial land with a larger horizontal curvature than the existing Clark Lane. The new roadway would meet with the existing Barnhart Road at the westbound ramp terminals. The new roadway would curve back to the south in such a manner to clip the industrial property's northeast corner 'inside' of the microwave tower. The existing northern piece of the Barnhart Road alignment forks at the northwest corner of the industrial property. The western fork provides access to the farm-use property in the northwest corner of the interchange. The eastern fork crosses the new roadway alignment along the northern edge of the industrial property and extends south intersecting and then following the Clark Lane roadway alignment. The angle of the roadways approach was chosen to improve site distance at the intersection of Barnhart Road and the new Connector Roadway. The current Clark Lane alignment will no longer access where it had previously, but will have full access along the western fork of the new access roadway forking from Barnhart Road. For the purpose of providing an intersection at a lesser grade, access to the industrial property would also be provided near the southeast corner of the industrial property.

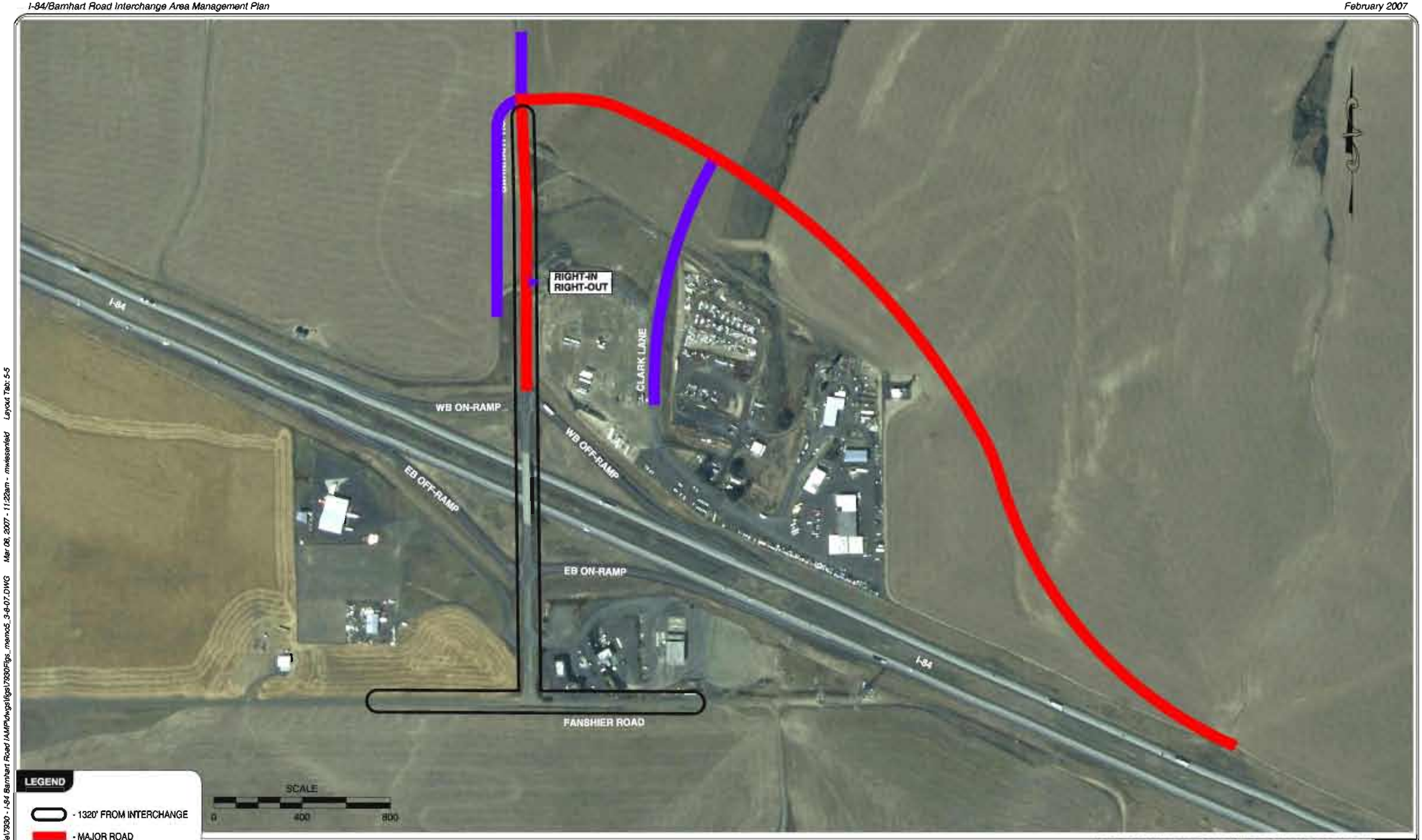
Concept #N5

Figure 5-7 shows the roadway alignment and access for Concept #N5. This concept uses the existing Clark Lane roadway for most of the alignment. Instead of meeting Barnhart Road at its current location, the new roadway would stretch north intersecting Barnhart Road at the 1320 foot mark. The existing farm access on the west side of this existing intersection is extended north to complete the new four-legged intersection. Local access to the industrial property will be provided by two short spurs off the new roadway inside the existing property lines.

Note: Concepts N6 and N7 were converted to concepts N1B and N2B, respectively due to similarities between concept N1A and N2A.

Concept #N8

Figure 5-8 shows the roadway alignment and access for Concept #N8. This concept's defining feature is a large horizontal curvature along the Connector Roadway which would isolate approximately 40 acres of EFU land. The intent of the isolation is that this much land would remain as a farmable remnant. The new Connector Roadway would extend Barnhart Road northeasterly from the westbound interchange terminal through the northwest corner of the existing industrial land and into the EFU land adjacent of the industrial area. The remaining northerly segment of the Barnhart Road alignment forks at the northwest corner of the industrial



I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N3
UMATILLA COUNTY, OREGON

FIGURE 5-N3

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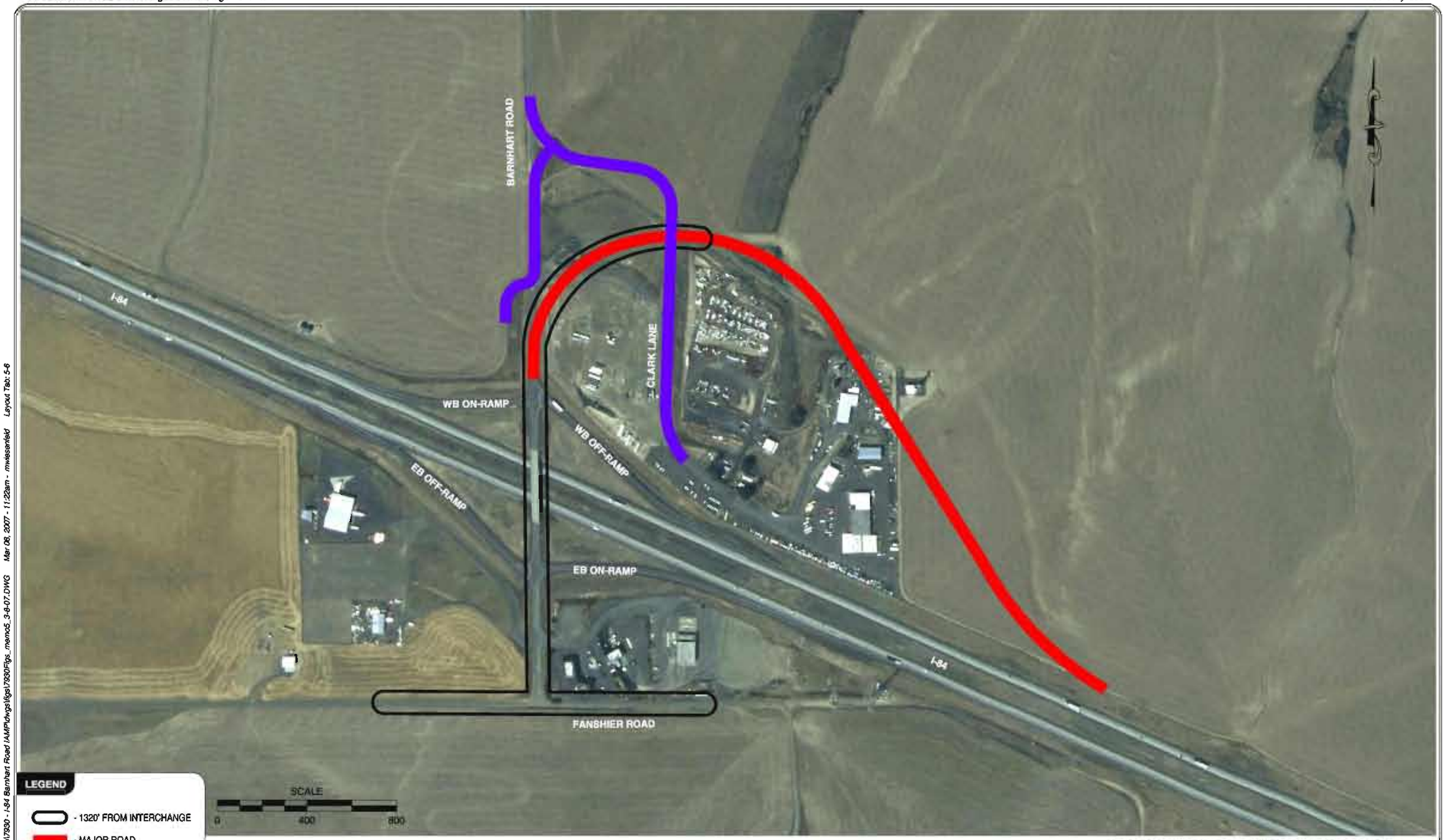
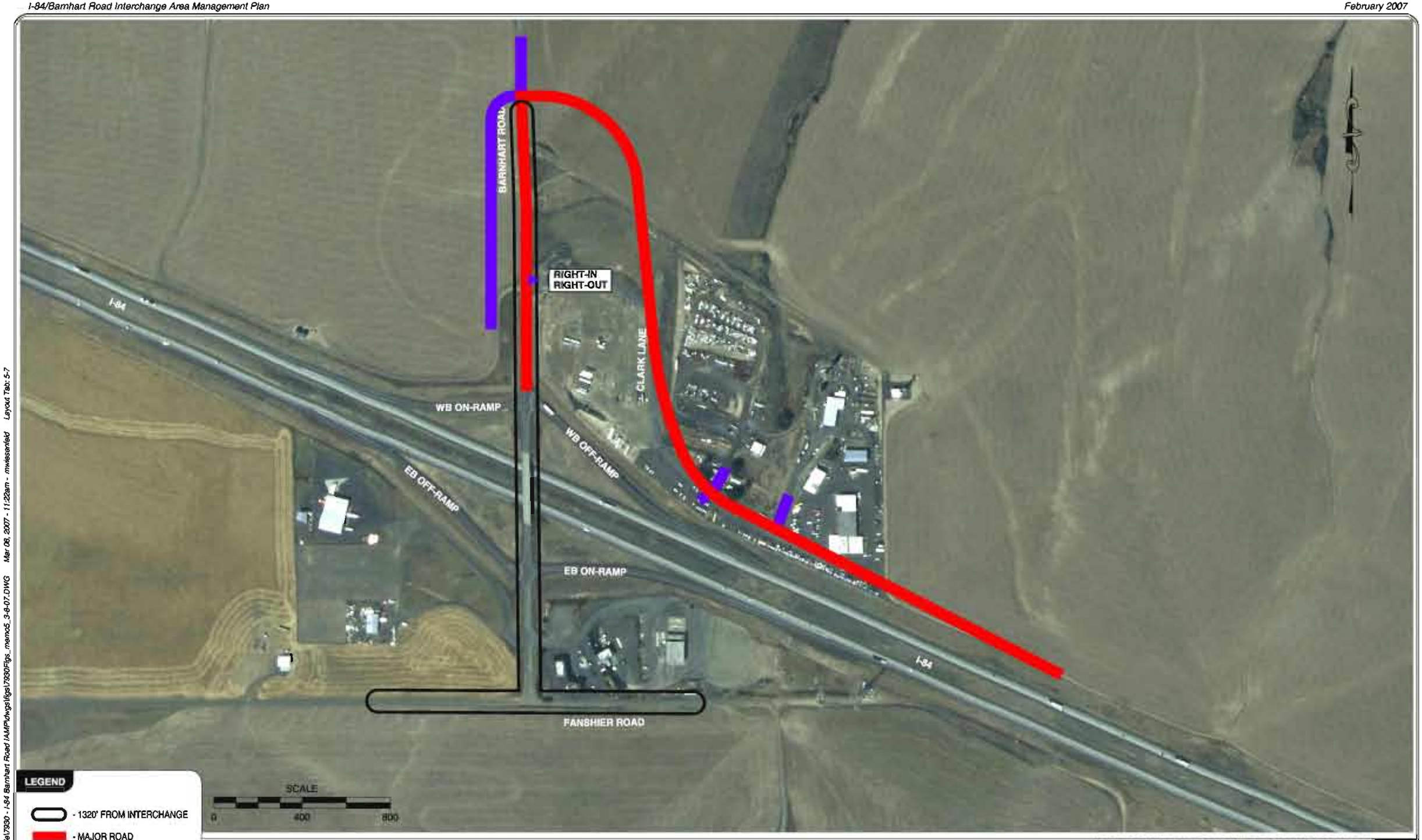


I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N4
UMATILLA COUNTY, OREGON

FIGURE 5-N4



I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N5
UMATILLA COUNTY, OREGON

FIGURE 5-N5

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

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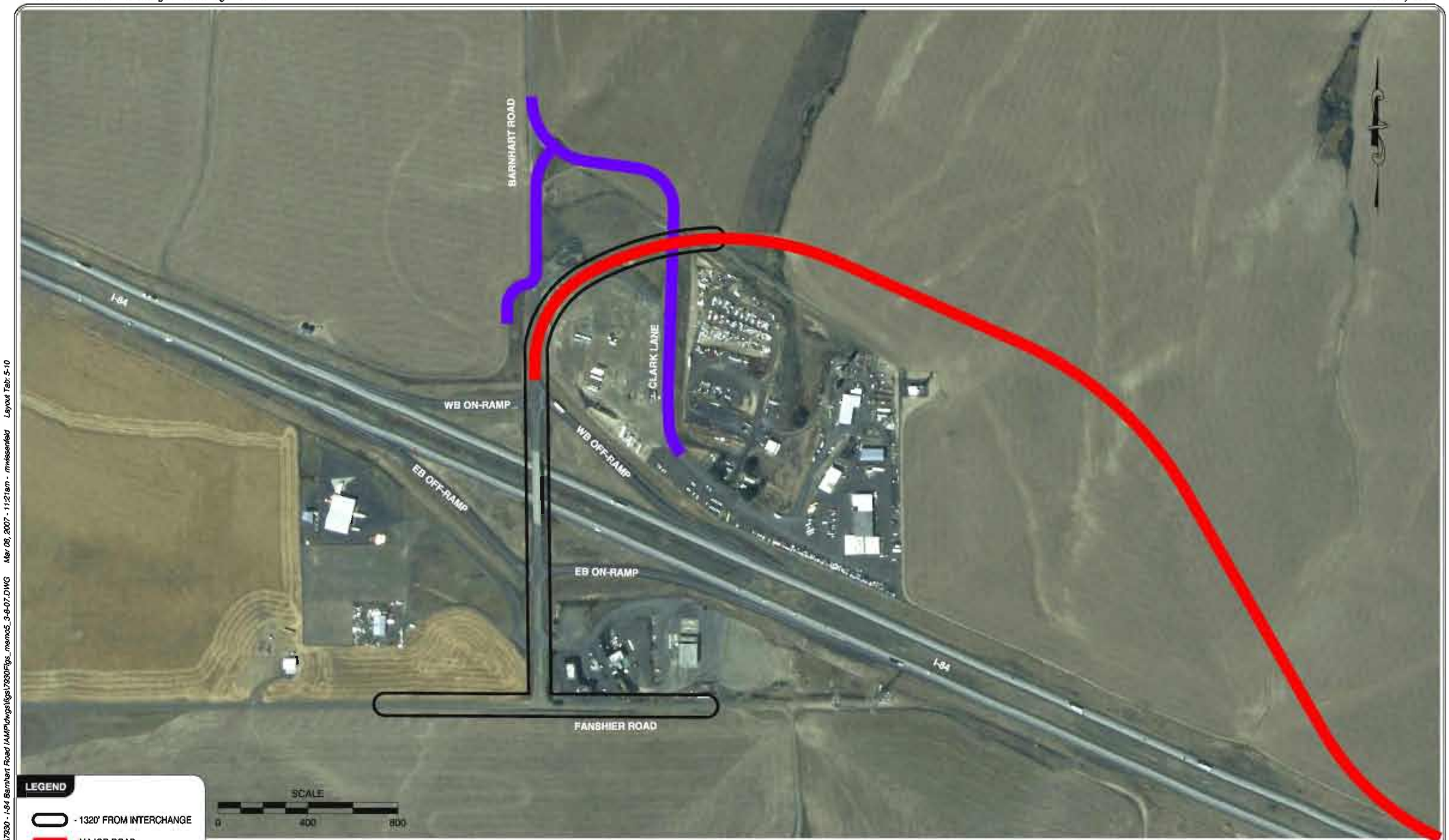

I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N8
UMATILLA COUNTY, OREGON

FIGURE 5-N8

property. The southwesterly fork provides access to the farm-use property in the northwest corner of the interchange. The northeasterly fork crosses the new alignment at 1,100 feet from the interchange and extends into the industrial area to provide driveway access to this property along the Clark Lane alignment. The alignment of this access road north of the new Connector Roadway was chosen to provide adequate site distance as this intersection.

Southerly Interchange Roadway Alignments and Access Design Concepts

Concept #S1

Figure 5-9 shows the roadway alignment and access design for Concept #S1. Concept #S1 proposes that the property access on the southern side of I-84 be relocated from Barnhart Road to Fanshier Road. The existing private approaches to Barnhart Road located approximately 250 feet south of the eastbound interchange terminal would be relocated to three locations along Fanshier Road. The relocation of access would result in the Barnhart Road/Fanshier Road intersection, located 500 feet south of the interchange terminal, being the first access point south of the interchange.

Concept #S2

Figure 5-10 shows the roadway alignment and access design for Concept #S2. Concept #S2 proposes that a median be implemented along Barnhart Road between the eastbound interchange terminal and Fanshier Road, converting the existing easterly and westerly private access approaches to right-in/right-out. Through the median installation the total number of conflict points south of I-84 is reduced from 32 to 4 points. Full access would be made available along Fanshier Road. In addition, a roundabout could be considered at the Barnhart Road/Fanshier Road intersection to help facilitate the U-turning movements generated by the right-in/right-out access control along Barnhart Road.

I-84/BARNHART ROAD INTERCHANGE AREA
SOUTH ROADWAY ALIGNMENT & ACCESS CONCEPT #S1
UMATILLA COUNTY, OREGON

FIGURE 5-S1

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I-84/BARNHART ROAD INTERCHANGE AREA
SOUTH ROADWAY ALIGNMENT & ACCESS CONCEPT #S2
UMATILLA COUNTY, OREGON

FIGURE 5-S2

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QUANTITATIVE ANALYSIS OF ROADWAY ALIGNMENT AND ACCESS CONCEPT CHARACTERISTICS

To provide a better understanding of the impacts of each concept, the consultant team analyzed the specific right-of-way and land use impacts, conceptual costs, roadway and operational characteristics, and access spacing characteristics of each concept. Each element of these four fundamental concept characteristics is described below and summarized in Table 5-1.

Right of Way and Land Use Impact Characteristics

The right-of-way and land use impacts characteristics were quantified by the following four elements:

Overall Right-of-Way (ROW) Acquisition Area – This defines the total amount of ROW acquisition, in acres, necessary to develop the new Connector Roadway and minor roadway connections within the interchange study area.

Impacted Exclusive Farm Use (EFU) Land – This defines the total amount of EFU land, in acres, impacted directly by the ROW acquisition necessary to develop the new Connector Roadway and minor roadway connections within the interchange study area. It should also be noted that indirect impacts in those areas that become separated and/or isolated from the large existing EFU plots may occur but have not been accounted for in this analysis.

Impacted Rural Light Industrial (RLI) Land – This defines the total amount of RLI land, in acres, impacted directly by the ROW acquisition necessary to develop the new Connector Roadway and minor roadway connections within the interchange study area.

Impacted Buildings – This defines the number of existing structures impacted directly by the ROW acquisition necessary to develop the new Connector Roadway and minor roadway connections within the interchange study area.

Conceptual Cost Characteristics

The conceptual cost characteristics are based on preliminary roadway alignment layouts and were quantified by the following five elements:

Right-of-Way (ROW) Acquisition Cost – This is the estimated cost to acquire all the necessary right-of-way needed for the new Connector Roadway and minor roadway connections within the interchange study area.

Construction Cost – This is the estimated cost to construct new Connector Roadway and minor roadway connections within the interchange study area.

Engineering Cost – This is the estimated cost to design and oversee the construction of the new Connector Roadway and minor roadway connections within the interchange study area.

Contingency Cost – This is the estimated amount needed to cover any for unforeseen cost that may evolve throughout the design and construction of the new Connector Roadway and minor roadway connections within the interchange study area.

Total Cost – This is the sum of the estimated cost of acquisition, construction, engineering, and contingency in creating the new Connector Roadway and minor roadway connections within the interchange study area.

Roadway and Operational Characteristics

The conceptual roadway and operational characteristics were quantified by the following four elements:

Main Roadway Length – This is the length of the new Connector Roadway which will be built within the interchange study area.

New Access Roadway Length – This is the length of the new access roadways which will be built within the interchange study area.

Minimum Design Speed – This is the minimum speed which the new Connector Roadway will be built to accommodate within the interchange study area.

Maximum Grade – This is the steepest grade which will be accepted along the new Connector Roadway within the interchange study area.

Access Spacing Characteristics

The conceptual access spacing characteristics were quantified by the following two elements:

Distance to First Right-In Right-Out – This is the length from the interchange ramp terminal to the first right-in/right-out intersection.

Distance to First Full Access – This is the length from the interchange ramp terminal to the first full access intersection.

Table 5-1 Roadway Alignment and Access Concept Characteristics

Concept	Right of Way & Land Use Impact & Characteristics				Conceptual Cost Characteristics	Roadway & Operational Characteristics				Access Spacing Characteristics	
	TOTAL REQ'D R/W (Acres)	EFU R/W (Acres)	ML R/W (Acres)	NUMBER OF BUILDINGS IMPACTED	TOTAL PROJECT COST ($)	LENGTH MAIN RD (FT)	LENGTH NEW ACCESS RD (FT)	MINIMUM DESIGN SPEED (MPH)	MAXIMUM GRADE (%)	DISTANCE TO FIRST RIGHT-IN RIGHT-OUT (FT.)	DISTANCE TO FIRST FULL ACCESS (FT.)
N1A	10.5	4.7	5.8	–	$2,505,000	4,950	900 Gravel	30	6%	NA	500
N1B	10.3	4.7	5.6	–	$2,070,000	5,070	–	30 Additional[2] Stop	6%	NA	500
N2A	17.8	13.8	4	–	$3,200,000	5,155	750 Paved 1,000 Gravel	40	6%	NA	1,100
N2B	23.4	18	5.4	2±	$5,515,000	5,155	1,100 Paved 1,600 Gravel	40	6%	NA	1,650
N3	18.6	16.8	1.8	–	$3,750,000	6,180	1,000 Paved	65 Additional[2] Stop	6%	500	1,320
N4	16.4	11.8	4.6	–	$3,625,000	5,240	750 Paved 1,000 Gravel	40	6%	NA	1,100
N5	12.3	7.2	5.1	–	$2,362,000	6,548	500 Gravel	35 Additional[2] Stop	6%	500	1,320
N8	19	15	4	-	$3,520,000	5,200	750 Paved 1,000 Gravel	40	6%	NA	1,100
S1[1]	-	-	-	-	<$50.000	-	-	-	-	NA	500’
S2[1]	-	-	-	-	<$50.000	-	-	-	-	250	500’

[1] The concepts for the southside of the interchange do not require the construction of a new roadway.

[2] These concepts require the westbound Connector Roadway to stop at a two-way stop-controlled intersection.

Quantitative Analysis of Roadway Alignment and Access Concept Characteristics

In order to more easily assess the information summarized in Table 5-1, the following findings have been made regarding each roadway alignment and access characteristics.

Right of Way and Land Use Impact Characteristics

The right-of-way and land use impacts characteristics found that Concept #N2B had the most impacts while #N1B has the least.

Overall Right-of-Way (ROW) Acquisition Area – Concept #N2B impacts the most land area by nearly five acres and has more than twice the impacts of Concepts # N1A and N1B.

Impacted Exclusive Farm Use (EFU) Land – The EFU impact for Concepts #N1A and #N1B are less than half of the EFU impact of Concepts #N2A, #N2B, #N3, #N4, and #N8.

Impacted Rural Light Industrial (RLI) Land – The RLI impacted by concept #N3 is less than half that of any other concept. Concepts #N1A, #N1B, #N2B, and #N5 carry the most impacts.

Impacted Buildings – The only concept which impacted any existing structures was concept #N2B which will affect a minimum of two structures.

Conceptual Cost Characteristics

The conceptual cost characteristics found that Concept #N2B is the most costly while #N1B is the least costly.

Right-of-Way (ROW) Acquisition Cost – The cost of ROW for Concept #N3 at $216,000 is less than half of the other concepts

Construction Cost – The cost of construction is minimized in concepts that use the existing Clark Lane roadbed. Concept #N2B is considerably more expensive to construct than the other concepts.

Total Cost – The total project cost for concepts #N1A and N1B are less than half of that Concept #N2B

Roadway and Operational Characteristics

The conceptual roadway and operational characteristics are similar for each concept with exception of minimum design speed.

Minimum Design Speed – The minimum design speed for Concept #N3 is considerably higher than the other alternatives. However, these design speeds do not account for whether the option requires an additional stop prior to the interchange. In concepts #N1B, #N3, and #N5, an additional stop is required and this would cause extra delay in movement from the airport to the Barnhart Road interchange.

Access Spacing Characteristics

The conceptual access spacing exceeds the 1,320-foot standard under Concept #N2B. For Concepts #N3 and # N5, the Connector Roadway spacing achieves the standard. For the remaining Concepts, the provided access spacing was below the 1,320-foot access spacing standard. Concepts #N2A, #N4, and #N8 are shy of achieving standard, while Concepts #N1A and #N1B are far below the standard.

ROADWAY IMPROVEMENTS NEEDS

Based on the findings of the future conditions analysis, the consultant team developed proposed roadway cross-sections and traffic control and lane configurations for the Connector Roadway. These roadway improvement needs are described below.

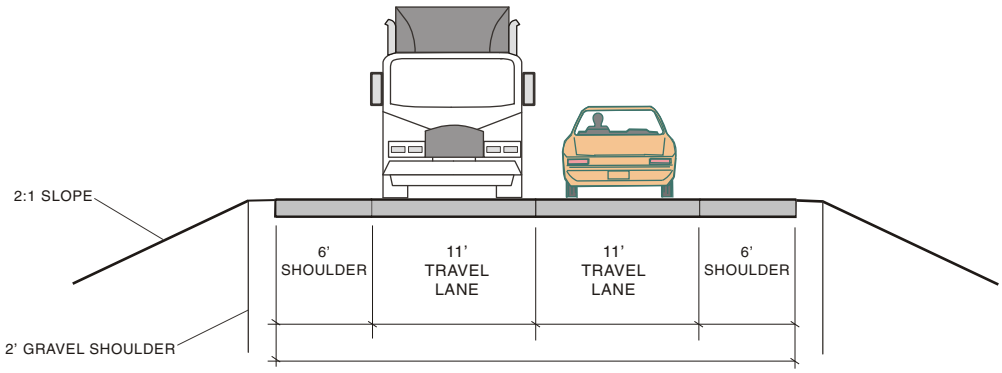
Connector Roadway Cross-Section

The proposed Connector Roadway is projected to carry less than 4,000 vehicles per day at full build-out of the existing RLI and RTC zoned land in the vicinity of the interchange and the Light Industrial (M-1) and Airport Light Industrial (AA) zoned land in the vicinity of the Airport. Based on this volume level and the limited access between the Airport and the interchange area, a two-lane roadway with 11-foot travel lanes and six-foot paved shoulders was deemed appropriate outside of the interchange area. Within the interchange area, it is recommended that the roadway cross-section be expanded to include a 12-foot median in order to accommodate the existing and future turning movements. Figure 5-11 illustrates the two proposed roadway cross-sections for the Connector Roadway.

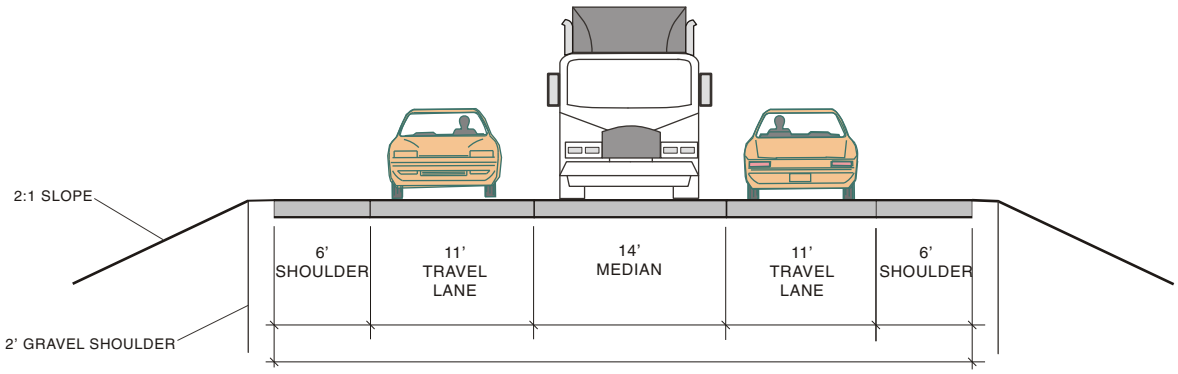
Lane Configurations and Traffic Control Devices

To accommodate the forecasted turning movements at the interchange terminals and Barnhart Road/Fanshier Road intersection, near-term and long-term lane configuration and traffic control needs have been identified. The needs of each individual intersection is described below and illustrated in Figure 5-12.

(NO SCALE)



CROSS-SECTION OUTSIDE INTERCHANGE MANAGEMENT AREA



CROSS-SECTION INSIDE INTERCHANGE MANAGEMENT AREA

*APPLIES ONLY WHERE EXCLUSIVE
LEFT-TURN LANE SHOWN IN FIGURES 6-3

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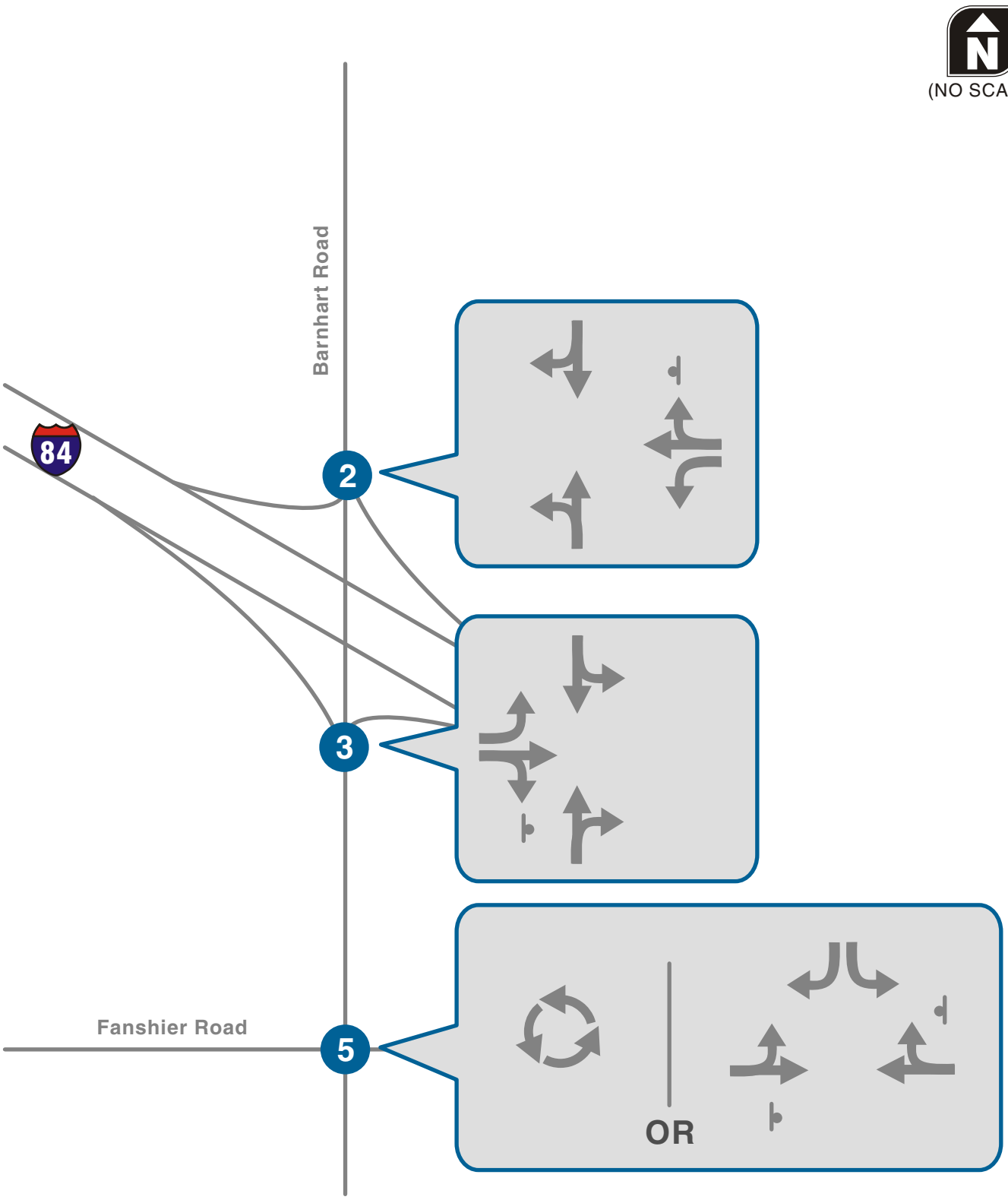
I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
BARNHART ROAD-CONNECTOR ROADWAY CROSS-SECTIONS
UMATILLA COUNTY, OREGON

FIGURE 5-11



Long-Term Lane Configureation & Traffic Control Device Needs

FIGURE 5-12

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I-84 Westbound Ramp/Barnhart Road Terminal – This intersection can continue to operate under both near-term and long-term conditions using the existing lane and two-way stop-controlled configuration.

I-84 Eastbound Ramp/Barnhart Road Terminal – This intersection can continue to operate under near-term conditions using the existing lane and two-way stop-controlled configuration. However, future growth over the horizon year will require the eventual development of an exclusive eastbound left-turn lane and the eventual need for signalization. An exclusive eastbound left-turn lane could be provided at the intersection without reconstruction of the off-ramp; however, it would have limited queue storage. It should be noted that a traffic signal will not be installed before the intersection achieving signal warrants based on future traffic demands.

Barnhart Road/Fanshier Road – This intersection can continue to operate under both near-term and long-term conditions using the existing lane and two-way stop-controlled configuration. It may be advantageous to explore the installation of a roundabout at this intersection in the future to potentially facilitate southbound u-turn movements on Barnhart Road.

LAND USE MANAGEMENT STRATEGIES

As illustrated in the eight northerly roadway alignment and access design concepts, the primary components of each involve the alignment of the new Barnhart Road to Airport Road Connector Roadway and the location of site accesses to various land uses within the vicinity of the interchange. In developing the various concepts, it has become evident that the competing objectives (i.e., to minimize impacts to existing businesses and exclusive farm uses within the vicinity of the interchange and to achieve the operational performance needs of the Connector Roadway and access spacing requirement of the Oregon Highway Plan) cannot be simultaneously achieved. However, the roadway alignment and access design concepts in conjunction with potential land use management strategies could lead to solutions that move closer to or fully achieve these objectives.

Land Use Management Strategy Alternatives

In reviewing the various impacts to EFU land, the consultant team developed four alternative land use management strategies that could be utilized as part of the IAMP process. Each strategy has been crafted to deal with the specific impacts created by the concepts that require the Connector Roadway alignment to extend outside of the existing RLI zoned land in the northeast quadrant of the interchange (i.e., Concepts #N2A, #N2B, #N3, #N4, and #N8). These strategies, shown in Figure 5-13 include:

A. *No Change* - The base strategy is to leave the zoning the same as it is today. Although this strategy is available for every Concept, it is the preferred strategy for Concepts #N1A, #N1B, #N5, and #N8.

B. *Conversion of Isolated Exclusive Farm Use (EFU) to Rural Light Industrial (RLI)* - This strategy accounts for the land which would become separated from current farming patterns and have limited or no viability as future sustainable farmland. The quantity of land converted from EFU to RLI would have no appreciable effect on the operation of the

surrounding transportation facilities as documented in Technical Memorandum #4. This strategy is applicable for the Concepts except #N1A and #N1B.

C. *Interchange Area Zone Swap* - This strategy would take land located north of the new Connector Roadway and currently zoned RLI and convert it to EFU under the Concepts which extend outside the RLI land. Land currently zoned EFU and located between the new connector roadway and I-84 would be converted to RLI as it would have potentially limited viability as future sustainable farmland. This strategy is most applicable for the Concepts #N2A, #N2b, and #N4.

D. *Interchange Area and Airport Industrial Area Zone Swap* - This strategy would allow EFU separated from current farming patterns by the new Connector Roadway in the vicinity of the interchange to be converted to RLI. To offset this impact and maintain the same amount of EFU land in the local area and within the extents of the Connecter Roadway, existing city-controlled light industrial land of the same quantity near the airport would be converted back to EFU. This strategy is most applicable for the Concepts #N2A, #N2B, #N3, #N4, and #N5.

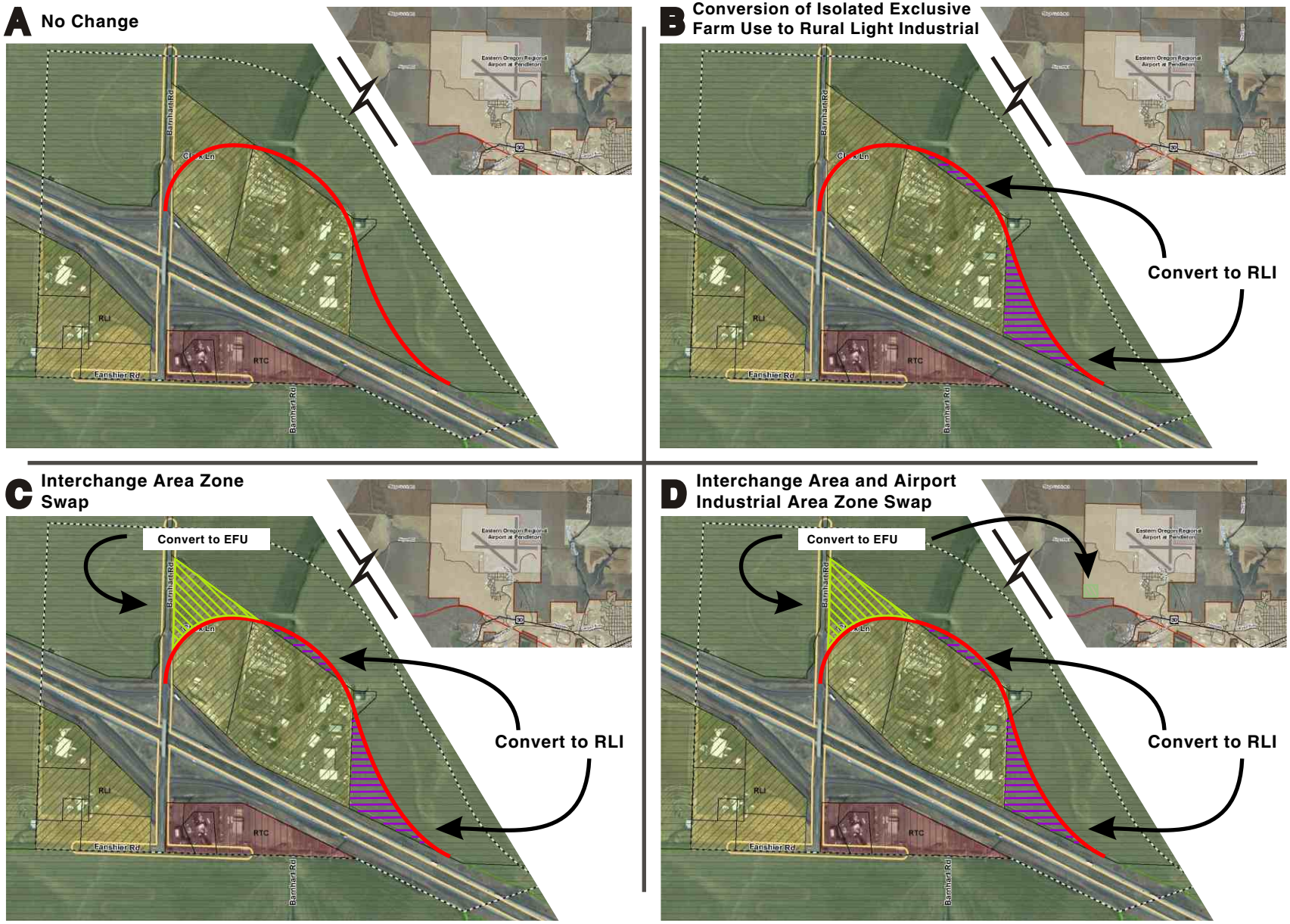
Table 5-2 summarizes the applicability of the four proposed land use management strategies under the eight northerly roadway alignment and access concepts. It should be noted that land use management strategies were not deemed applicable for the southerly roadway alignment and access concepts because both concepts utilize existing right-of-way.

Table 5-2 Applicability of Alternative Land Use Management Strategies

Land Use Strategy / Concept #	Strategy 'A'	Strategy 'B'	Strategy 'C'	Strategy 'D'
Concept #N1A	Yes	No	No	No
Concept #N1B	Yes	No	No	No
Concept #N2A	Yes[1]	Yes	Yes	Yes
Concept #N2B	Yes[1]	Yes	Yes	Yes
Concept #N3	Yes[1]	Yes	No	Yes
Concept #N4	Yes[1]	Yes	Yes	Yes
Concept #N5	Yes	Yes	No	Yes
Concept #N8	Yes	Yes	Yes	Yes

[1] While Strategy "A" could be deployed under Concepts #N2A, #N2B, #N3, and #N4, it would result in isolated EFU parcels that would remain between the new Connector Roadway and the existing Rural Light Industrial land.

In reviewing the various land use management strategies described above, it becomes clear that the potential impacts to EFU land Concepts #N2A, #N2B, #N3, #N4, and #N5 can be minimized to a certain degree under Strategies "B" or "C" and potentially negated through the implementation of Strategy "D."



I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
POTENTIAL LAND USE MANAGEMENT
UMATILLA COUNTY, OREGON

FIGURE 5-13

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PRELIMINARY QUALITATIVE EVALUATION

After the development of the eight northerly and two southerly roadway alignment and access design concepts, and completing the quantitative analysis of the specific right-of-way and land use impacts, conceptual cost, roadway and operational characteristics, and access spacing characteristics of each concept, the next step is to begin a detailed qualitative evaluation of each concept. This detailed evaluation centered on the formally adopted set of evaluation criteria developed during the initial stages of the I-84/Barnhart Road IAMP process. These evaluation criteria, as summarized in Table 5-3, were developed and refined through consultation with members of the PPMT.

Table 5-3 Evaluation Criteria

Main Criteria Heading	Criteria
Transportation Operations	Enhance multimodal options Provide safe traveling speeds Provide connectivity to local road network Provide mobility with adequate capacity Provide accommodations for through truck movements Maintain local circulation network
Land Use	Minimize right-of-way impacts Provide consistency with statewide planning rules and/or with adopted land use plans Minimize existing and future utility impacts Support economic development Minimize impact to EFU resources
Cost	Estimated Cost Construction Feasibility
Environmental/Social Impacts	Minimize environmental and social impacts Provide for storm water drainage Comply with land use planning regulations Hazardous Waste Impact
Accessibility	Balance access to local properties with the function of the new roadway Provide consistency with adopted access plans Provide future access to undeveloped properties

To help determine how to rank each of the concepts according to the evaluation criteria, a scoring system was developed. In essence, each evaluation criterion was assigned a range of numerical values (+2, +1, 0, -1, -2 for example). A definition specific to the evaluation criterion was then assigned to each value, (i.e. "+2 for a Significant Increase…" and a -2 for a "Significant Decrease…"). The specific scoring definitions for each criterion are also provided in *Appendix "A"*of Technical Memorandum #5 in the *I-84/Barnhart Road IAMP Technical Appendix*. Using the unique scoring system for each evaluation criterion, the eight northerly and two southerly concepts were carefully evaluated and scored by the consultant team. The following paragraphs

summarize the overall process that was undertaken for each evaluation criterion followed by the evaluation summary tables.

Transportation Operations Scoring

The transportation-related evaluation criteria included the enhancement of multimodal options, travel safety, connectivity of the local roadway network, capacity, accommodation of through trucks, and the provision of a local circulation network. Of these six sub-criteria, only the accommodation of through trucks and capacity offered a numerical comparison. The remaining transportation sub-criteria were evaluated based on a thorough review of the Concepts and general transportation-related observations. Table 5-4 summarizes the Transportation Operations evaluation for each concept.

Land Use Scoring

To characterize the land use impacts, the project team quantitatively assessed the consistency with statewide planning goals and estimated right-of-way and residential/business displacements for each concept. Qualitative assessments were made for the utility impacts, the consistency with adopted land use plans, and the ability of each concept to support economic development. Table 5-5 summarizes the land use evaluation for each concept.

Cost

To evaluate the overall cost component, a detailed preliminary cost estimate was prepared for each concept. Table 5-6 summarizes the conceptual cost estimate for each concept summary. In addition, the feasibility to build the new connector roadway and accesses were reviewed for each concept.

Environmental / Social Impacts

To characterize the environment/social impacts, the project team conducted a windshield inventory of environmental resources in the project area. Environmental resources evaluated included wetlands, threatened and endangered species, cultural resources, socioeconomics, water quality and hydrology, geology and soils, hazardous material and waste sites, land use, and EFU impacts. Table 5-7 summarizes the Environmental / Social Impacts evaluation for each concept.

Accessibility

To evaluate the overall accessibility of properties and businesses within the study area, a qualitative review process was applied to each concept that focused on the application of adopted access management policies imposed by ODOT, the City of Pendleton, and Umatilla County. Table 5-8 summarizes the accessibility evaluation for each concept.

Table 5-4 Transportation Operations

Evaluation Criterion: Transportation Operations

Concept Scoring										
Specific Criteria	**North 1A**	**North 1B**	**North 2A**	**North 2B**	**North 3**	**North 4**	**North 5**	**North 8**	**South 1**	**South 2**
Enhance Multimodal Options	1	1	1	1	1	1	1	1	1	1
Provide Safe Traveling Speeds	-1	-1	1	1	0	1	-1	1	1	1
Provide Connectivity Throughout the Local Road Network	0	0	-1	-1	-2	-1	-2	-1	-2	-1
Provide Mobility with Adequate Capacity	1	-1	1	1	1	1	1	1	1	1
Accommodation of Through Trucks	0	-1	1	1	0	1	-1	1	0	0
Maintain a Local Circulation Network	-1	-1	1	0	-1	1	-1	1	-2	-1
System Perspective (Average Score)	**0.00**	**-0.17**	**0.67**	**0.50**	**-0.17**	**0.67**	**-0.50**	**0.67**	**-0.17**	**0.17**

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 1A	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles.	– Ice formed in the curves will be difficult to prepare for or remove
	Provide Connectivity Throughout the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange.	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build-out scenarios. – The continuous path of the new roadway to the interchange allows non-stop through movements to the interstate from the airport.	– Space for truck 'stacking' would not be available in case of inclement weather.
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	– The smaller radii curves near the interchange will force a slower truck movement to the highway. (30 mph Design Speed)
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	–
North 1B	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles.	– This alternative would require westbound movement along the Connector Roadway to stop in the study area, prior to reaching the interchange. The eastbound movement would require vehicles slowing below 15mph to make a comfortable right turn.
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build-out scenarios.	– Space for truck 'stacking' would not be available in case of inclement weather.
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	– The additional stop and the smaller radii curves near the interchange will force a slower truck movement to the highway. (30mph Design Speed)
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– Use of Connector Roadway required to travel between parcels.

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
		–	–
North 2A	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios. – The continuous path of the new roadway to the interchange allows non-stop through movements to the interstate from the airport.	–
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	–
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– Use of Connector Roadway required to travel between parcels.
North 2B	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios. – The continuous path of the new roadway to the interchange allows non-stop through movements to the interstate from the airport.	–
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	–
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– Vehicles from the north would be required to travel up and down a large grade twice before reaching the interchange.
North 3	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	– .
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	– This alternative would require westbound movement along the Connector Roadway to stop in the study area, prior to reaching the interchange. The eastbound movement would require vehicles slowing below 15mph to make a comfortable right turn.
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios.	–
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	– The additional stop and the smaller radii curves near the interchange will force a slower truck movement to the highway. (30mph Design Speed)
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– The right-in/right-out access will cause confusion and may be disregarded by drivers.

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 4	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios. – The continuous path of the new roadway to the interchange allows non-stop through movements to the interstate from the airport.	– Space for truck 'stacking' would not be available in case of inclement weather.
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	–
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	–
North 5	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	– This alternative would require westbound movement along the Connector Roadway to stop in the study area, prior to reaching the interchange. The eastbound movement would require vehicles slowing below 15mph to make a comfortable right turn.
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios.	– Space for truck 'stacking' would not be available in case of inclement weather.
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	– The additional stop near the interchange will force a slower truck movement to the highway.
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– Use of Connector Roadway required to travel between parcels.
North 8	Enhance Multimodal Options	– The new Barnhart Road to Airport Road Connector will have shoulders adequate for pedestrian and bicycle travel.	–
	Provide Safe Traveling Speeds	– The lesser grades will allow for easier decision making and quicker response, especially for large freight moving vehicles. – Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	– The new Barnhart Road to Airport Road Connector provides connectivity to the existing roadway network north of the interchange	–
	Provide Mobility with Adequate Capacity	– The new roadway would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios. – The continuous path of the new roadway to the interchange allows non-stop through movements to the interstate from the airport.	–
	Accommodation of Through Trucks	– The new roadway connector would smoothly permit trucks bound for the airport area arriving from the west.	–
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	–

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
South 1	Enhance Multimodal Options	–	–
	Provide Safe Traveling Speeds	– Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	–	–
	Provide Mobility with Adequate Capacity	– The roadway system south of the interchange would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios.	–
	Accommodation of Through Trucks	–	–
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	– Though access is maintained, the local business will be accessed further from the interchange and may require signing to indicate where these locations are.
South 2	Enhance Multimodal Options	–	–
	Provide Safe Traveling Speeds	– Improved spacing from interchange ramps will lessen the potential of queuing on I-84.	–
	Provide Connectivity to the Local Road Network	–	–
	Provide Mobility with Adequate Capacity	– The roadway system south of the interchange would provide acceptable long-term traffic operations under either industrial or agricultural build out scenarios.	–
	Accommodation of Through Trucks	–	– A roundabout will not meet the needs of the vehicle population using the Barnhart Road/Fanshier Road intersection.
	Maintain a Local Circulation Network	– Local and collector streets can be provided to serve all study area land parcels.	–

Table 5-5
Land Use Evaluation Matrix

Evaluation Criterion: Land Use

Concept Scoring										
Specific Criteria	**North 1A**	**North 1B**	**North 2A**	**North 2B**	**North 3**	**North 4**	**North 5**	North 8	**South 1**	**South 2**
Minimize Right of Way Impacts	0	*0*	*0*	*-1*	0	-1	0	0	1	1
Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	1	*1*	*0*	*0*	-1	0	0	-1	1	1
Minimize Existing and Future Utility Impacts	-1	*-1*	*0*	*0*	0	-1	-1	0	0	0
Supports Economic Development	-1	*-1*	*1*	*-1*	1	0	-1	0	0	0
Minimize Impacts to EFU Resources	1	*1*	*0*	*0*	-1	0	0	0	0	0
System Perspective (Average Score)	**0.00**	**0.00**	**0.20**	**-0.40**	**-0.20**	**-0.40**	**-0.40**	**-0.20**	**0.40**	**0.40**

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 1A	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	– Generally consistent with Statewide Planning Rules by keeping the alignment inside the Rural Light Industrial land.	–
	Minimize Right of Way Impacts	– This concept uses a similar alignment to the existing Clark Lane and will require minimal expansion in the study area.	– The main building of the existing business would either need to be removed or considerably altered in use
	Minimize Existing and Future Utility Impacts	–	– Utilities that run along the eastern edge of the industrial property would need to be relocated during construction.
	Supports Economic Development	– This alignment will not have a direct affect on the economic situation in the study area.	– This alignment will have a negative effect in the near future for existing business.
	Minimize Impact to EFU Resources	– No EFU is impacted in the study area.	–
North 1B	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	– Generally consistent with Statewide Planning Rules by keeping the alignment inside the Rural Light Industrial land.	–
	Minimize Right of Way Impacts	– This concept uses a similar alignment to the existing Clark Lane and will require minimal expansion in the study area.	– The main building of the existing business would either need to be removed or considerably altered in use
	Minimize Existing and Future Utility Impacts	–	– Utilities that run along the eastern edge of the industrial property would need to be relocated during construction.
	Supports Economic Development	– .	– This alignment will have a negative effect in the near future for existing business.
	Minimize Impact to EFU Resources	– No EFU is impacted in the study area.	–

Concept	Specific Criteria	Performance Evaluation Notes	
		Positives	Negatives
North 2A	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	– Avoids developed light industrial property	–
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– Potentially Increase the developable area of the existing Rural Light Industrial property.	–
	Minimize Impact to EFU Resources	–	– A portion of EFU is impacted on the eastern and northern portions of the study area
North 2B	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	–	– The minor access road would require the removal of two existing buildings.
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– .	– The removal of two or more buildings will have an immediate negative effect on the existing business in the study area
	Minimize Impact to EFU Resources	–	– A portion of EFU is impacted on the eastern and northern portions of the study area
North 3	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	– Avoids all light industrial zoned property.	–
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– Potentially could increase the developable area of the existing Rural Light Industrial property.	–
	Minimize Impact to EFU Resources	–	– EFU is impacted throughout the northeast quadrant of the study area.
North 4	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	–	– The alignment of the Connector Roadway would require the use of the northeast corner of the industrial property.
	Minimize Existing and Future Utility Impacts	–	– A considerable number of utilities will need to be relocated in durning the construction or the Conncetor Roadway
	Supports Economic Development	–	– This alignment would require a change in use for the building and space in the northeast corner of the existing building.
	Minimize Impact to EFU Resources	– A conservative amount of EFU is impacted on the eastern and northern portions of the study area	–

Concept	Specific Criteria	Performance Evaluation Notes	
		Positives	Negatives
North 5	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	– This alignment uses the minimum right-of-way required to achieve the 1320' ODOT spacing standard.	–
	Minimize Existing and Future Utility Impacts	–	– Utilities that run along the eastern edge of the industrial property would need to be relocated during construction.
	Supports Economic Development	– This alignment will not have a direct affect on the economic situation in the study area.	–
	Minimize Impact to EFU Resources	– A conservative amount of EFU is impacted on the northern portion of the study area	–
North 8	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	–	– Not fully consistent with Statewide Planning Rules due to the alignment extending into the EFU area.
	Minimize Right of Way Impacts	– Avoids developed light industrial property	–
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– Provides a farmable space south of the Connector Roadway	–
	Minimize Impact to EFU Resources	– The EFU remnant would still be large enough to potentially be farmed.	– A 40 acre portion of EFU would be disconnected from the existing EFU parcel in the northeast quadrant.
South 1	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	– Generally consistent with Statewide Planning Rules by keeping the alignment inside the Rural Light Industrial land.	–
	Minimize Right of Way Impacts	– The only Right-of-way take is in the accesses along Barnhart for safety and functionality.	–
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– This alignment will not have a direct affect on the economic situation in the study area.	–
	Minimize Impact to EFU Resources	– No EFU is impacted in the study area.	–
South 2	Provide Consistency with Statewide Planning Rules and/or Adopted Land Use Plans	– Generally consistent with Statewide Planning Rules by keeping the alignment inside the Rural Light Industrial land.	–
	Minimize Right of Way Impacts	– Limiting the Barnhart Road access to right-in/right-out will be the only right-of-way action with this Concept.	–
	Minimize Existing and Future Utility Impacts	– No utility impacts were noted in for this Concept.	–
	Supports Economic Development	– This alignment will not have a direct affect on the economic situation in the study area.	–
	Minimize Impact to EFU Resources	– No EFU is impacted in the study area.	–

Table 5-6
Cost Evaluation Matrix

Evaluation Criterion: Cost / Implementation

Concept Scoring										
Specific Criteria	**North 1A**	**North 1B**	**North 2A**	**North 2B**	**North 3**	**North 4**	**North 5**	**North 8**	**South 1**	**South 2**
Estimated Cost	1	*1*	*-1*	*-2*	-1	-1	1	-1	1	1
Construction Feasibility	0	*0*	*0*	*0*	0	0	0	0	0	0
System Perspective (Average Score)	**0.50**	**0.50**	**-.50**	**-1.0**	**-0.50**	**-0.50**	**0.50**	**-0.50**	**0.50**	**0.50**

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 1A	Estimated Cost	– The overall cost for this concept is $2,505,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 1B	Estimated Cost	– The overall cost for this concept is $2,070,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 2A	Estimated Cost	– The overall cost for this concept is $3,200,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 2B	Estimated Cost	– The overall cost for this concept is $5,515,000	– Over twice the cost of the least expensive concept
	Construction Feasibility	– This concept is feasible to construct.	–
North 3	Estimated Cost	– The overall cost for this concept is $3,750,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 4	Estimated Cost	– The overall cost for this concept is $3,625,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 5	Estimated Cost	– The overall cost for this concept is $2,362,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
North 8	Estimated Cost	– The overall cost for this concept is $3,520,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
South 1	Estimated Cost	– The overall cost for this concept is less than $50,000	–
	Construction Feasibility	– This concept is feasible to construct.	–
South 2	Estimated Cost	– The overall cost for this concept is less than $50,000	–
	Construction Feasibility	– This concept is feasible to construct.	–

Table 5-7
Environmental/Social Impacts Evaluation Matrix

Evaluation Criterion: Environmental / Social Impacts

Concept Scoring										
Specific Criteria	**North 1A**	**North 1B**	**North 2A**	**North 2B**	**North 3**	**North 4**	**North 5**	**North 8**	**South 1**	**South 2**
Minimize Environmental Impacts	0	*0*	*-1*	*-1*	-1	-1	-1	-1	0	0
Minimize Social/Economic Impacts	-1	*-1*	*0*	*-1*	0	0	-1	0	0	0
Provide For Stormwater Drainage	1	*1*	*1*	*1*	1	1	1	1	0	0
Hazardous Waste Impacts	0	*0*	*1*	*1*	1	-1	0	1	0	0
System Perspective (Average Score)	**0**	**0**	**0.25**	**0**	**0.25**	**-0.25**	**-0.25**	**0.25**	**0**	**0**

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 1A	Minimize Environmental Impacts	– There will be minimal disruption to the environment through this alternative as previously used roadway will be utilized.	–
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact the business already situated on Clark Lane.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–
North 1B	Minimize Environmental Impacts	– There will be minimal disruption to the environment through this alternative as previously used roadway will be utilized.	–
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact the business already situated on Clark Lane.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–
North 2A	Minimize Environmental Impacts	–	– There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	– The businesses already located on Clark Lane will be minimally impacted.	– The new connector roadway will impact the farmland in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–
North 2B	Minimize Environmental Impacts	–	There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact both the farmland and the business in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 3	Minimize Environmental Impacts	–	– There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact a significant amount of farmland in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–
North 4	Minimize Environmental Impacts	–	– There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	–	– The new connector roadway will slightly impact both the farmland and the business in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	– Hazardous waste mitigation will be required on the Woodpecker property.
North 5	Minimize Environmental Impacts	–	There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact both the farmland and the business in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
	Hazardous Waste Impacts	–	–
North 8	Minimize Environmental Impacts	–	– There will be some disruption to farming practices in the IAMP study area during construction and due to isolation caused by the roadway.
	Minimize Social/Economic Impacts	–	– The new connector roadway will impact a significant amount of farmland and the business in the IAMP study area.
	Provide For Stormwater Drainage	– New construction will include drainage	–
		–	–
South 1	Minimize Environmental Impacts	– Minimal intrusion to the environment will occur on the south side of I-84	–
	Minimize Social/Economic Impacts	–	– Access to the business on the southeast and southwest quadrants will be moved from Barnhart Road to Fanshier Road which may prove less desirable for the business owners.
	Provide For Stormwater Drainage	– Minimal intrusion to the environment will occur on the south side of I-84	–
	Hazardous Waste Impacts	–	–
South 2	Minimize Environmental Impacts	– Minimal intrusion to the environment will occur on the south side of I-84	–
	Minimize Social/Economic Impacts	–	– The current business access points on Barnhart Road south of I-84 for will be made Right-in/right-out only. Full access will be granted off of Fanshier Road.
	Provide For Stormwater Drainage	– Minimal intrusion to the environment will occur on the south side of I-84	–
	Hazardous Waste Impacts	–	–

Table 5-8
Accessibility Evaluation Matrix

Evaluation Criterion: Accessibility

Concept Scoring										
Specific Criteria	**North 1A**	**North 1B**	**North 2A**	**North 2B**	**North 3**	**North 4**	**North 5**	**North 8**	**South 1**	**South 2**
Balance Local Property Access with Function of the Connector Roadway	-2	*-2*	*1*	*1*	1	1	1	1	1	-1
Provide Future Access to Undeveloped Properties	1	*1*	*1*	*1*	1	1	1	1	1	1
Meets Interchange Access Spacing Standards	-2	*-2*	*0*	*1*	1	0	1	0	-2	-3
System Perspective (Average Score)	**-1.0**	**-1.0**	**0.67**	**1.0**	**1.0**	**0.67**	**1.0**	**0.67**	**0.0**	**-1.0**

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 1A	Balance Local Property Access with Function of the Connector Roadway	–	– The Connector Roadway is intended to facilitate freight movement from the interchange to the airport. The radii used on Clark Lane compromises that capacity.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The original Clark Lane access point is less than half the distance required by ODOT for new construction. Using this point would compromise ODOT's standards by over 50%.
North 1B	Balance Local Property Access with Function of the Connector Roadway	–	– The Connector Roadway is intended to facilitate freight movement from the interchange to the airport. The radii used on Clark Lane compromises that capacity. The movement is further degraded by the extra stop that will be required at the intersection between the new Connector Roadway and Barnhart Road.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The original Clark Lane access point is less than half the distance required by ODOT for new construction. Using this point would compromise ODOT's standards by over 50%.
North 2A	Balance Local Property Access with Function of the Connector Roadway	– The larger horizontal curves allow for more efficient freight movement.	– The access provided to the existing facilities is only minimally degraded.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The proposed first access point for this alternative is within 20% of ODOT's access standard.
North 2B	Balance Local Property Access with Function of the Connector Roadway	– The larger horizontal curves allow for more efficient freight movement.	– The access provided to the existing facilities is degraded.
	Provide Future Access to Undeveloped Properties	–	–
	Meets Interchange Access Spacing Standards	– The first access shown in this concept is more than 20% further than required by ODOT's access standard.	–

		Performance Evaluation Notes	
Concept	**Specific Criteria**	**Positives**	**Negatives**
North 3	Balance Local Property Access with Function of the Connector Roadway	– The larger horizontal curves allow for more efficient freight movement.	– The efficient travel along the new Connector Roadway is compromised as a stop occurs where the Connector Roadway intersects with Barnhart Road. – The access provided to the existing facilities is only minimally degraded.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	– The first full access meets ODOT's access standard.	– The right-in/right-out is located closer to the interchange than prescribed by ODOT's access standard.
North 4	Balance Local Property Access with Function of the Connector Roadway	– The larger horizontal curves allow for more efficient freight movement.	– The access provided to the existing facilities is only minimally degraded.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The proposed first access point for this alternative is within 20% of ODOT's access standard.
North 5	Balance Local Property Access with Function of the Connector Roadway	–	– The small horizontal curves degrade the new Connector Roadway's ability to facilitate freight movement. – The access to the industrial development and the farm use in the northwest quadrant are marginal degraded by the increased distance from the interchange.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	– The first full access meets ODOT's access standard.	– The right-in/right-out is located closer to the interchange than prescribed by ODOT's access standard.
North 8	Balance Local Property Access with Function of the Connector Roadway	– The larger horizontal curves allow for more efficient freight movement.	– The access provided to the existing facilities is only minimally degraded.
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The proposed first access point for this alternative is within 20% of ODOT's access standard.
South 1	Balance Local Property Access with Function of the Connector Roadway	– Barnhart Road would have a better access spacing under this alternative than currently exists.	–
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The first full intersection falls more than 50% short of the ODOT's access standard.
South 2	Balance Local Property Access with Function of the Connector Roadway	– Barnhart Road would have a better access spacing under this alternative than currently exists.	–
	Provide Future Access to Undeveloped Properties	– All of the concepts provide access to undeveloped properties to the extent warranted.	–
	Meets Interchange Access Spacing Standards	–	– The first full intersection falls more than 50% short of the ODOT's access standard. – The Right-in/right-out access is less than 50% of the distance from the interchange that is required by ODOT's access standard.

EVALUATION CRITERIA SUMMARY

Based on the detailed assessment of each concept, a summary overview of the key findings are included in the following sections.

Transportation Operations

From a transportation operations perspective, the detailed assessment of each concept revealed the following:

- All of the concepts equally enhance the multimodal transportation options within the study area.
- With the exception of Concepts #N1A, #N1B, and #N5, all of the concepts improve upon the speed at which trucks and freight movement can travel though the study area. Concepts #N1A, #N1B, and #N8 generally maintain the current Barnhart Road alignment and provide minimal improvement.
- All of the concepts either reduce connectivity or are neutral in their effect. Concepts #N2B and #S1 are the most limiting. Concepts #N1B and #N3 have a neutral effect on connectivity inside the study area. The remaining concepts have a moderate effect on reducing connectivity.
- The traffic operations analysis conducted for Technical Memorandum #4 concludes that all the given concepts will be equally effective in providing adequate traffic operations.
- All of the concepts accommodate through truck movements; however, it was noted that Concepts #N1B, #N3, and #N5 require vehicles to make an additional stop inside the study area.

Land Use

From a land use perspective, the detailed assessment of each concept revealed the following:

- Concept #N3 will have considerable more impacts to the farm uses relative to the other concepts.
- All of the concepts will require a compromise in protection of industrial and farmland.
- Utility impacts are minimal and similar in each concept.
- Existing businesses could be negatively impacted economically by access in Concept #N1A and #N1B and by building impacts in #N2B and #N4. Concept #N2A and #N3 have the potential to have a positive economic effect if the amount of light industrial land were to be increased. Concept #N5 and #N8 are not foreseen to have a significant economic impact.

Cost

From a cost and constructability perspective, the detailed assessment of each concept revealed the following:

- Concept #N2B has the highest estimated construction cost at $5.5 million while Concept #N1B has the lowest estimated construction cost at $2.1 million.

- All of the concepts possess certain construction staging challenges; however, there are no design features that completely inhibit the ability to maintain existing traffic flows.

Environmental / Social

From an environmental / social perspective, the detailed assessment of each concept revealed the following:

- All of the concepts will have some level of negative environmental impacts.
- All of the concepts will require a compromise with land use planning regulations
- Concepts #N1A and #N1B minimize impact to EFU land. Concept #N3 would consume the largest quantity of this resource.

Accessibility

From an accessibility perspective, the detailed assessment of each concept revealed the following:

- Concepts #N1A, #N1B, #N5 and #S2 will degrade the balance between the function of the Connector Road/Barnhart Road and local access. This is either because the roadway's alignment does not provide a high enough design speed to serve its purpose, or accesses are spaced to closely and compromise the main roadways operational and safety characteristics.
- The access spacing standard of 1,320 feet is exceeded only under Concept #N2B. For Concepts #N3 and #N5, the access spacing meets the standard. For the remaining concepts, the access spacing was below the prescribed access spacing standard. Concepts #N2A, #N4, and #N8, measuring approximately 1,100 feet, are just below the access spacing standards, while Concepts #N1A and #N1B are substantially below the standard at 500 feet.
- All of the Concepts provide equal access opportunities to undeveloped properties within the study area.

Table 5-9 summarizes the primary evaluation criteria scoring for each concept. This process was followed to provide an initial comparison between each concept for the PPMT to consider in its selection process.

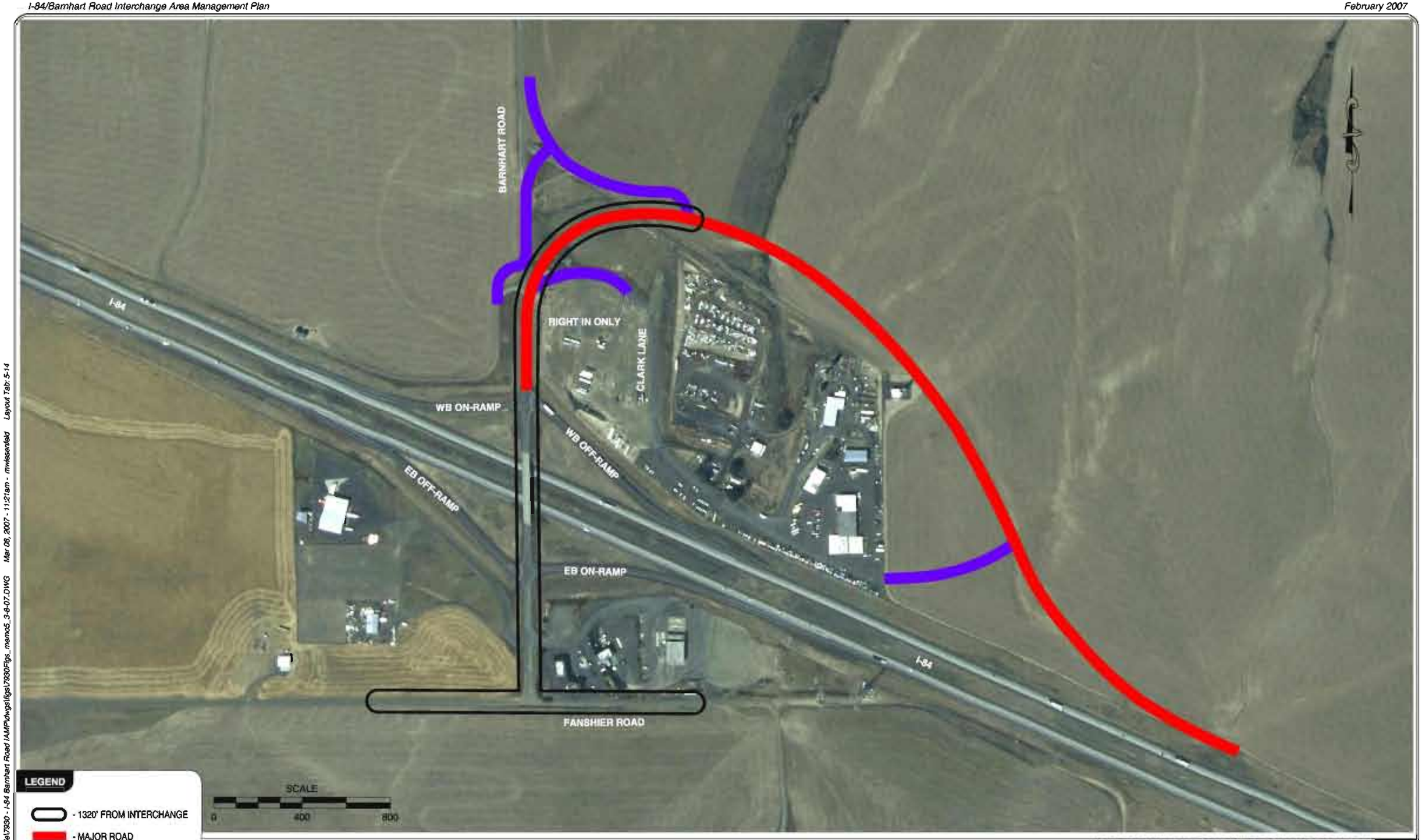
Table 5-9
Evaluation Criteria Scoring Summary

Evaluation Criteria/ Concepts	Transportation Operations	Land Use	Cost	Environmental /Social Impacts	Accessibility	Total Score
North 1A	0.00	0.00	0.50	0.00	-1.00	-0.5
North 1B	-0.17	0.00	0.50	0.00	-1.00	-0.67
North 2A	0.67	0.20	-0.50	0.25	0.67	1.29
North 2B	0.50	-0.40	-1.00	0.00	1.00	0.10
North 3	-0.17	-0.20	-0.50	+0.25	1.00	0.38
North 4	0.67	-0.40	-0.50	-0.25	0.67	0.19
North 5	-0.50	-0.40	0.50	-0.25	1.00	0.35
North 8	0.67	-0.20	-0.50	+0.25	0.67	0.89
South 1	-0.17	0.40	0.50	0.00	0.00	0.73
South 2	0.17	0.40	0.50	0.00	-1.00	0.07

Based on the evaluation criteria scoring, Concept #N2A and Concept #S1 received the highest total scores. Given the similarities between Concepts #N2A and #N4, a more detailed comparison of these two alternatives was completed.

Upon on further review from ODOT, the City of Pendleton, and Umatilla County, the proposed access to the Rural Light Industrial zoned properties in the northeast quadrant of the interchange was modified for both potential preferred northern concepts. As shown in Figure 5-14 and Figure 15, a northbound right-in only access was added to Barnhart Road approximately 500 feet north of the interchange to connect to the existing Clark Lane. Access to the Woodpecker property 1,100 feet from the interchange was removed and replaced with a full access via a new two-way connector road at the east end of the Woodpecker property across the EFU zoned land.

Upon further review of Concept N2A2 (shown in Figure 5-14), additional refinement was done to reduce the super elevation to address inclement weather concerns, balance the cut and fill needs, and reduce the size of the remnant EFU parcel between the proposed roadway and existing development in the northeast quadrant of the interchange. The refined concept is Concept N2A3 and as shown in Figure 5-16.



I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N2A
UMATILLA COUNTY, OREGON

FIGURE 5-N2A2

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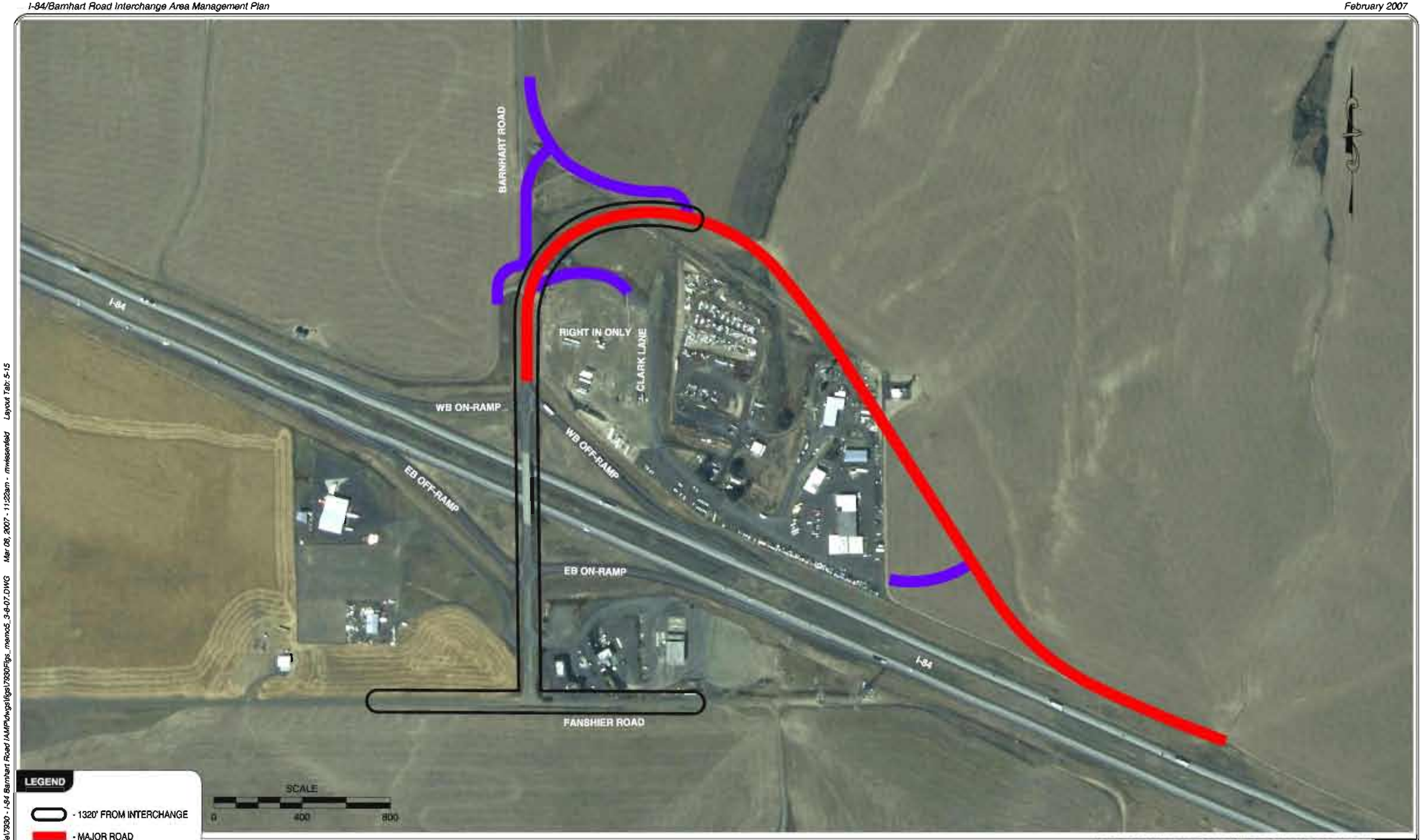

I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS CONCEPT #N4
UMATILLA COUNTY, OREGON

FIGURE 5-N4A

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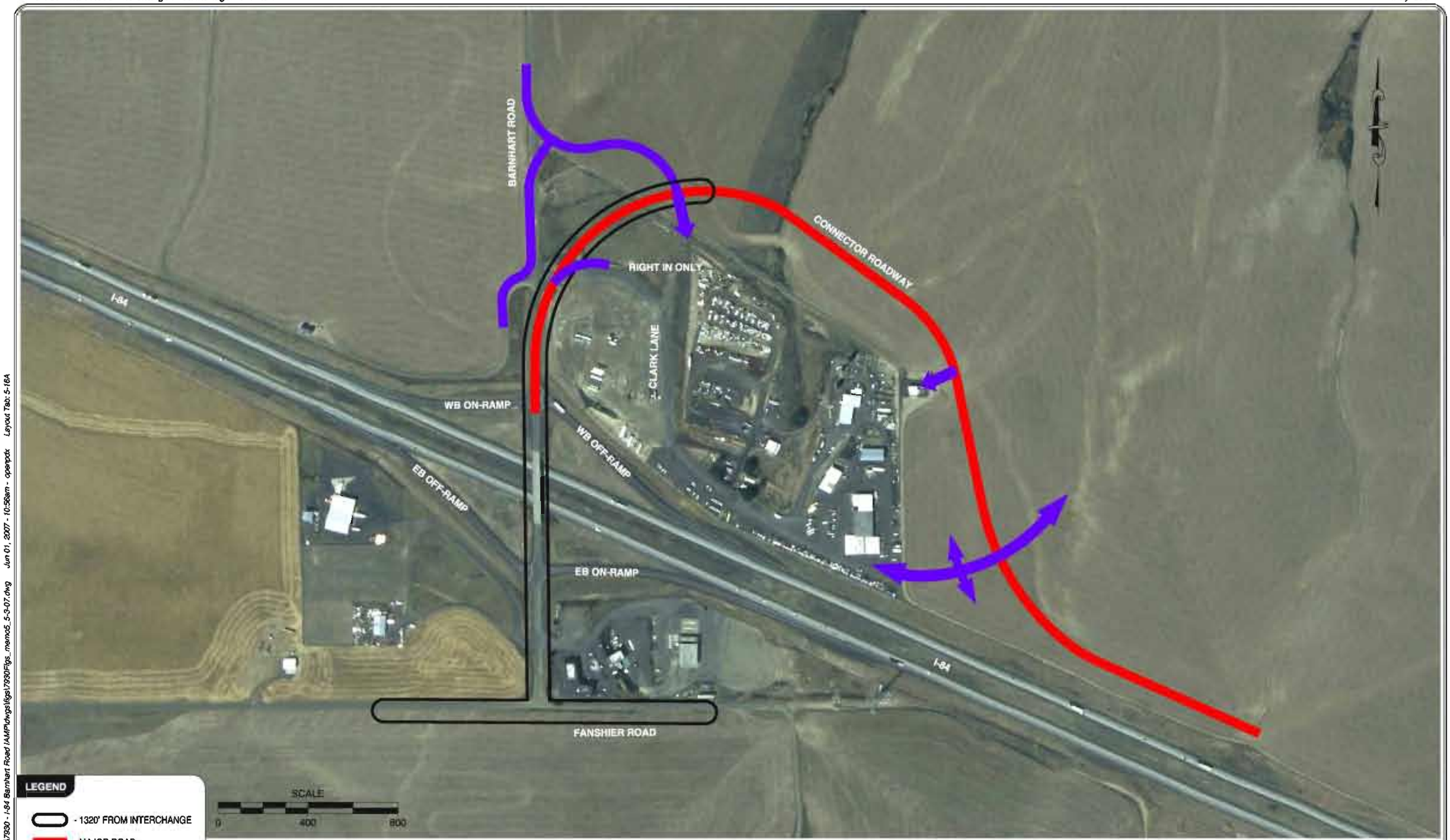

I-84/BARNHART ROAD INTERCHANGE AREA
NORTH ROADWAY ALIGNMENT & ACCESS
UMATILLA COUNTY, OREGON

FIGURE 5-N2A3

Kittelson & Associates, Inc.
TRANSPORTATION ENGINEERING / PLANNING

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Concept #N2A2, #N2A3, and #N4A Comparison

Similar to Concepts #N2A and #N4, Concepts #N2A2/N2A3 and #N4A differ in their alignment in the northeast quadrant of the interchange. Concepts #N2A2 and #N2A3 continue outside of the Rural Industrial zoned land (and proceeds 'outside' the existing microwave tower) where Concept #N4A clips the industrial property's northeast corner 'inside' of the microwave tower. This minor change of alignment has significant tradeoffs between the concepts in costs and impacts to EFU land. To provide a better understanding of impacts of each concept, the consultant team analyzed the specific right-of-way and land use impacts, conceptual costs, roadway and operational characteristics, and access spacing characteristics of each concept. Each element of these four fundamental concept characteristics is summarized in Table 5-10.

Table 5-10 Concept #N2A2, #N2A3, and #N4A Roadway Alignment and Access Concept Characteristics

	Right of Way & Land Use Impact & Characteristics				Conceptual Cost Characteristics	Roadway & Operational Characteristics				Access Spacing Characteristics	
Concept	TOTAL REQ'D R/W (Acres)	EFU R/W (Acres)	ML R/W (Acres)	NUMBER OF BUILDINGS IMPACTED	TOTAL PROJECT COST ($)	LENGTH MAIN RD (FT)	LENGTH NEW ACCESS RD (FT)	MINIMUM DESIGN SPEED (MPH)	MAXIMUM GRADE (%)	DISTANCE TO FIRST RIGHT-IN RIGHT-OUT (FT.)	DISTANCE TO FIRST FULL ACCESS (FT.)
N2A2	17.0	15.4	1.6	–	$3,200,000	5,200	1,000 Gravel, 450 Paved	40	6%	500	1,100
N2A3	16.5	14.9	1.6	–	$3,250,000	5,250	1,000 Gravel, 500 Paved	35	6%	500	1,100
N4A	15.3	12.4	2.9	–	$3,530,000	5,260	1,000 Gravel, 250 Paved	40	6%	500	1,100

As shown in Table 5-10, Concept #N2A2 requires the most overall right-of-way as well as more EFU right-of-way but is anticipated to have the lowest total project costs. #N2A3 has slightly less right-of-way and EFU impacts and has approximately the same estimated project costs as Concept #N2A2. A more detailed comparison of costs and land impacts, including information from the Hazardous Materials Corridor Study (see Appendix B of Technical Memorandum #5 in the *I-84/Barnhart Road IAMP Technical Appendix*) was completed for Concept #N2A2, #N2A3, and #N4A and is shown in Table 5-11.

According to the Hazardous Materials Corridor Study, Concept #N4A would require some environmental clean up in the northeast corner of the Woody Clark property. The extent of the potential environmental mitigation is a significant unknown with Concept #N4A. However, as shown in Table 5-11, Concept #N4A has three acres less EFU land in the proposed right-of-way as compared to Concepts #N2A2 and #N2A3. Concept #N2A3 has nearly thirty percent less EFU in the remnant compared to Concept #N2A2. Each of the three Concepts have the potential threat of litigation; Concept #N2A2 and #N2A3 by the LCDC or other interests and Concept #N4A by the local property owners.

Table 5-11 Concept #N2A2, #N2A3, and #N4A Comparison

	Concept #N2A2 – North of Industrial Site	Concept #N2A3 – North of Industrial Site	Concept #N4A – Through NE corner of industrial site
Environmental Mitigation	No	No	Yes
Additional Utility Relocation			+/- $40,000
Additional Right-of-Way Acquisition			Yes
Additional EFU in Right-of-Way	3 acres	3 acres	
EFU in SE remnant	+/- 9.2 acres	+/- 6.5 acres	+/- 4.0 acres
ML in NW Remnant	+/- 1.7 acres	+/- 1.7 acres	+/- 1.4 acres
Threat of Land Use Litigation	LCDC or others interested in strict interpretation of exception requirements	LCDC or others interested in strict interpretation of exception requirements	Owner of industrial property to be taken

PPMT Recommendation

The PPMT deliberated and decided that based on both land use and engineering concerns that Concepts #N2A3, north of the interchange, and Concept #S1, south of the interchange, maximized the benefit of the new Connector Roadway while minimizing the impacts to both the EFU resource and the existing business at the I-84/Barnhart Road Interchange.

Section 6

Plan Recommendations

Plan Recommendations

The I-84/Barnhart Road IAMP provides a detailed description of the future interchange, local circulation, access management, land use management, and coordination needs to accommodate the proposed Barnhart Road to Airport Connector Roadway and maintain the operational integrity, safety, and function of the interchange and study area.

The IAMP describes the future transportation network, necessary short- and medium/long-term transportation improvements, street cross-section elements, traffic control, and site access locations for the Connector Roadway and other facilities within the study area. Through adoption by the City of Pendleton, Umatilla County, and ODOT, future development located within the IAMP study area will be required to make half-street improvements, right-of-way dedications, and circulation and access improvements identified in this plan. Implementation of the IAMP improvements will ensure that the I-84/Barnhart Road Interchange and the Connector Roadway will maintain their functional integrity over time and that viable access will be provided to all existing and future land uses. Finally, the action items contained within the plan will ensure proper coordination between the various stakeholders and that the IAMP remains dynamic throughout time.

SHORT-TERM TRANSPORTATION IMPROVEMENTS

The I-84/Barnhart Road IAMP short-term transportation improvement projects include the construction of the Connector Roadway between the interchange and the airport as well as the necessary local circulation and access enhancements necessary to preserve access to the existing parcels within the interchange area and to advance access spacing objectives along Barnhart Road and the Connector Roadway as part of the City of Pendleton's Connector Roadway Project. This project will include right-of-way acquisition for the new roadway, acquisition of all access rights to the new roadway, construction of the new roadway, and construction of local circulation and driveway approaches to reconnect all adjacent parcels to the transportation system. Table 6-1 along with Figure 6-1 provides a detailed description and illustration of the required short-term transportation improvement projects, an estimated cost to complete the project, and the identified funding sources. Figure 6-2 illustrates the proposed roadway cross-sections for the Connector Roadway inside and outside the interchange management area.

MEDIUM/LONG-TERM TRANSPORTATION IMPROVEMENTS

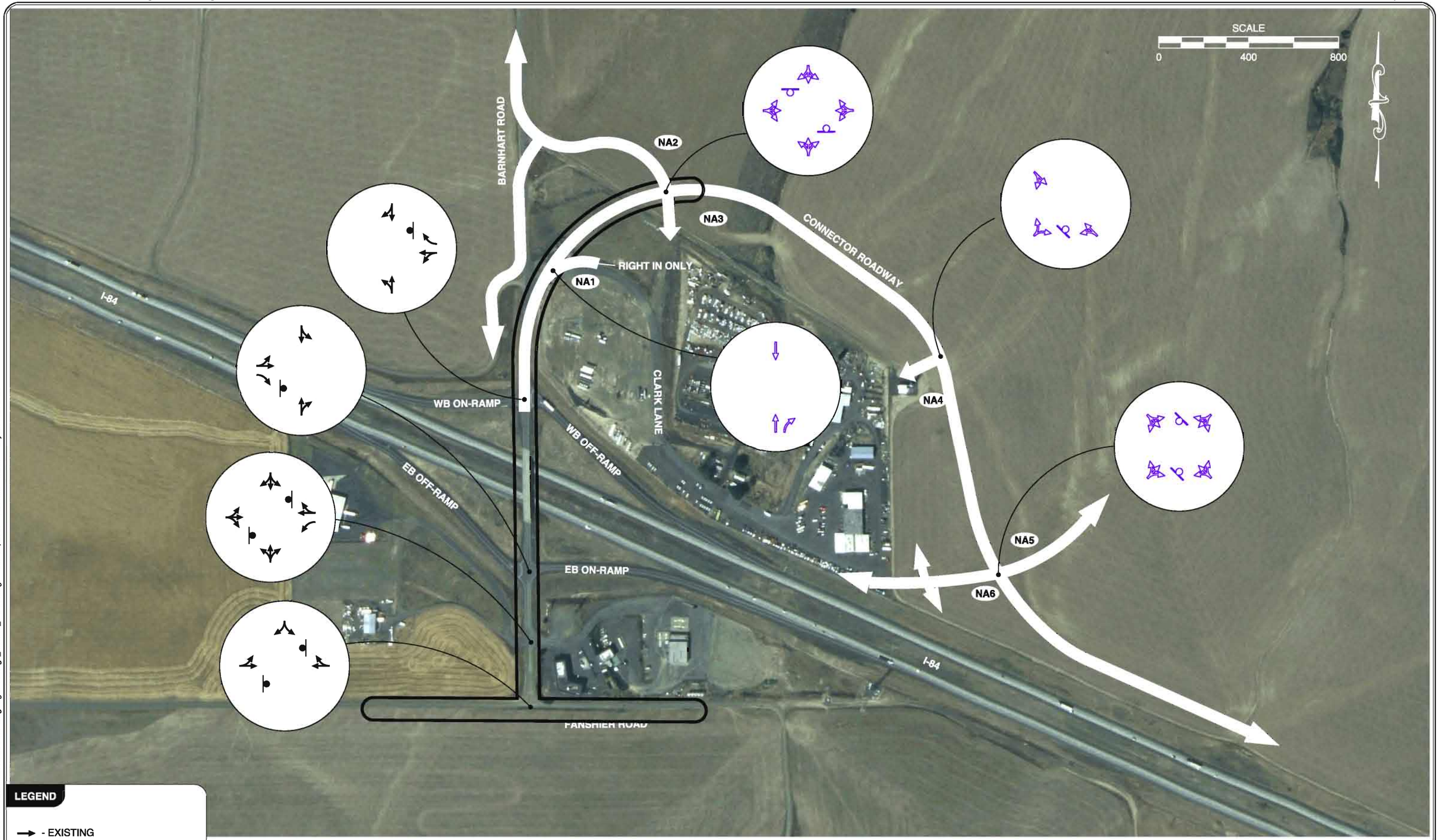
The I-84/Barnhart Road IAMP medium/long-term transportation improvements are required to address future traffic demands and new development/redevelopment in the interchange area through the 2025 horizon year. While no medium/long-term improvements are anticipated to be necessary at the interchange ramp terminals based on the traffic growth forecast, the existing off-ramps will need to be realigned in the future to address the existing skewed alignments with Barnhart Road. Table 6-2 along with Figure 6-3 provides a detailed description and illustration of the required medium/long-term transportation improvement projects, triggers for the improvements, an estimated cost to complete the project, and potential funding sources.

Table 6-1
Short-Term Interchange Area Improvement Project Summary

Road Segment / Intersection	Description of Short-Term Improvement	Estimated Cost[1] (Year 2007 $)	Funding Sources
1 Connector Roadway	– Construct a new roadway between the existing I-84/Barnhart Road westbound terminal and the Airport industrial area. This improvement will involve the following: o Construct the Connector Roadway to include two 11-foot through travel lanes and 6-foot shoulders on both sides. The roadway will also include a 12' right-turn lane at the Woodpecker Right-in Only (#NA1)	$3,200,000 - $3,600,000	– Federal/ City
2 Realignment of Barnhart Road (north Segment)	– The northerly segment of Barnhart Road will be realigned to the east to connect to the Connector Roadway at a point approximately 1,100 feet north of the I-84/Barnhart Road westbound terminal. A climbing lane is recommended for right-turns from the realigned Barnhart Road to the Connector Roadway. This realignment will also provide access to the disconnected farm access currently opposite Clark Lane.	Cost included as part of Project #1 cost.	– Federal/ City
3 Barnhart Road Access Consolidation (I-84 Westbound Terminal to Connector Roadway)	– All existing access rights to Barnhart Road and the new Connector Roadway will be purchased by the City and ODOT in accordance with the Access Management Plan. As a result, six points of access will be provided within the interchange management area north of I-84.	Cost included as part of Project #1 cost.	– Federal/ City

Note: Project is funded by federal appropriations passed through to the City of Pendleton from ODOT and requires a $440,000 local match from the City. The City is using SDC funds for the local match.

[1] The reported project costs are conceptual level planning estimates that are reflective of 2007 dollars and only includes the portion of the Connector Roadway within the Interchange Management Area.



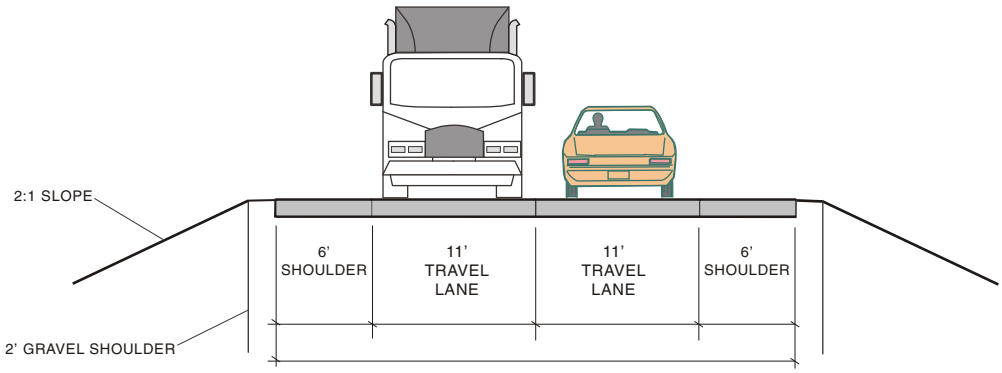
LEGEND

- → - EXISTING
- ⇨ - SHORT TERM IMPROVEMENTS
- (NA#) - NORTH ACCESS LOCATIONS

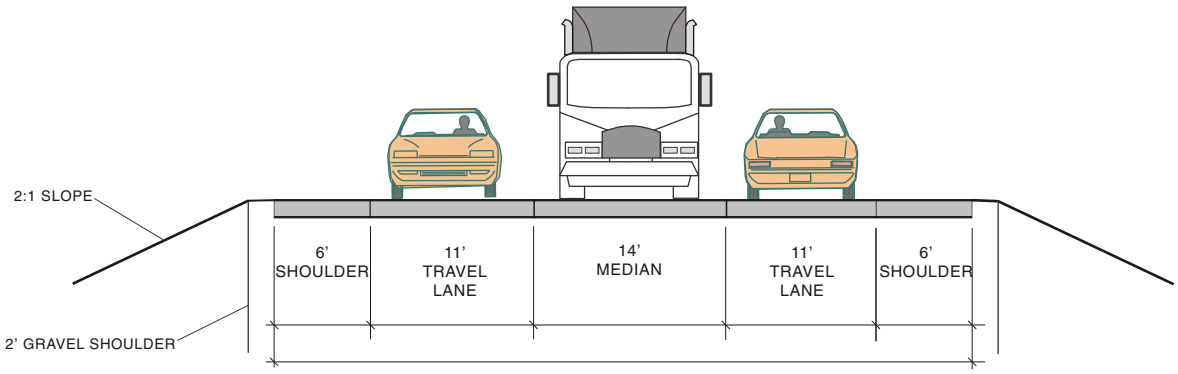
I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
SHORT-TERM TRANSPORTATION IMPROVEMENT PLAN
UMATILLA COUNTY, OREGON

FIGURE 6-1

(NO SCALE)



CROSS-SECTION OUTSIDE INTERCHANGE MANAGEMENT AREA



CROSS-SECTION INSIDE INTERCHANGE MANAGEMENT AREA

*APPLIES ONLY WHERE EXCLUSIVE
LEFT-TURN LANE SHOWN IN FIGURES 6-3

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I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
BARNHART ROAD-CONNECTOR ROADWAY CROSS-SECTIONS
UMATILLA COUNTY, OREGON

FIGURE 6-2

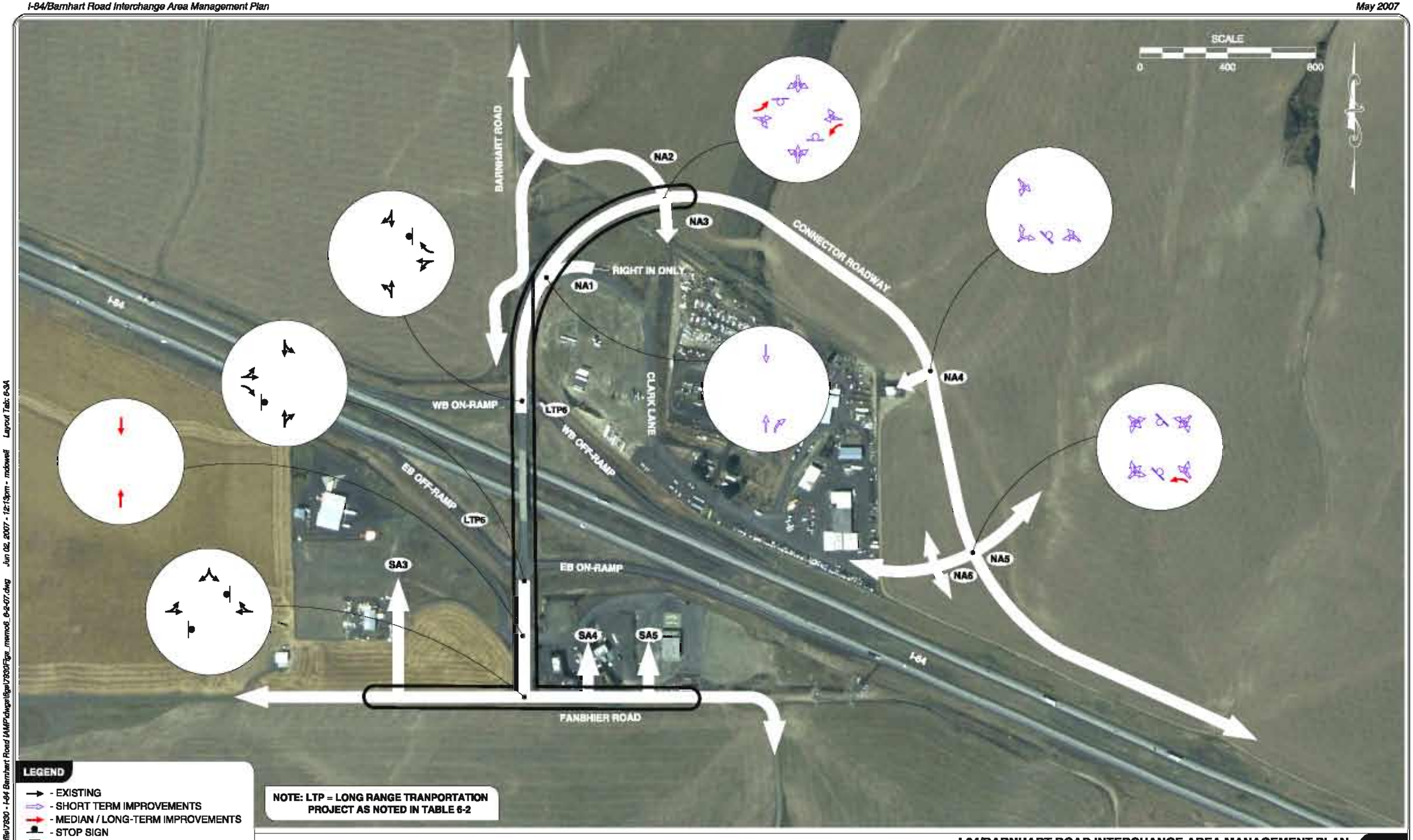
Table 6-2
Medium/Long-Term Interchange Area Transportation Improvement Project Summary

Road Segment / Intersection	Description of Improvement	Trigger for Improvement	Estimated Cost[1] (Year 2007 $)	Potential Funding Sources
4 Exclusive left-turn lanes	– Construct an eastbound and westbound 14-foot left-turn lane at the realigned Barnhart Road intersection and Woodpecker property access (#NA2 and #NA3) and a westbound 14-foot left-turn lane at the realigned full access to the Woodpecker property (#NA6).	– Exclusive left-turn lanes should be constructed when left-turn lane warrants are met per NCHRP Report 279 & 457.	– $150,000 - $175,000 each	– LID – SDC – PDF
5 Realignment of the Eastbound I-84 Off-ramp	– To address the existing skewed intersection alignments at the eastbound terminal, the existing off-ramp will need to be realigned to intercept Barnhart Road at an 80 to 90-degree angle.	– The eastbound off-ramp ramp terminal should be realigned when signal warrants are met per the MUTCD.	– $150,000	– STIP – LID – PDF – SDC
6 Realignment of the Westbound I-84 Off-ramp	– To address the existing skewed intersection alignments at the westbound terminal, the existing off-ramp will need to be realigned to intercept Barnhart Road at an 80 to 90-degree angle.	– The westbound off-ramp ramp terminal should be realigned when signal warrants are met per the MUTCD.	– $150,000	– STIP – LID – PDF – SDC
7 Barnhart Road Access Consolidation (I-84 Eastbound Terminal to Fanshier Road)	– To improve operations along Barnhart Road south of the intersection and increase access spacing and move in the direction of ODOT's interchange spacing, the two existing private accesses should be consolidated to point along Fanshier Road. The specific access points shall comply with the access management plan.	– The need to limit or relocate access on Barnhart Road to Fanshier Road will be evaluated in a TIS for any development with site traffic volume generation increases of 250 average daily trips, 25 peak hour trips, or 10 heavy vehicle trips per day by vehicles exceeding 20,000 pound gross vehicle weight. The TIA will address operational issues with the eastbound I-84 ramp and the access locations south of the interchange on Barnhart Road.	– $300,000	– PDF – STIP[2]

Note: Potential Funding Sources Include the Following:
STIP – Statewide Transportation Improvement Program (ODOT)
LID – Local Improvement District (Umatilla County or City of Pendleton)
SDC – System Development Charge (Umatilla County or City of Pendleton)
PDF – Private Development Funds (Private Parties)
TIS – Traffic Impact Study

[1] The reported project costs are conceptual level planning estimates that are reflective of 2007 dollars.

[2] STIP funding for ODOT access control along Barnhart Road south of the interchange only.



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I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
MEDIUM/LONG-TERM TRANSPORTATION IMPROVEMENT PLAN
UMATILLA COUNTY, OREGON

FIGURE 6-3

ACCESS MANAGEMENT PLAN

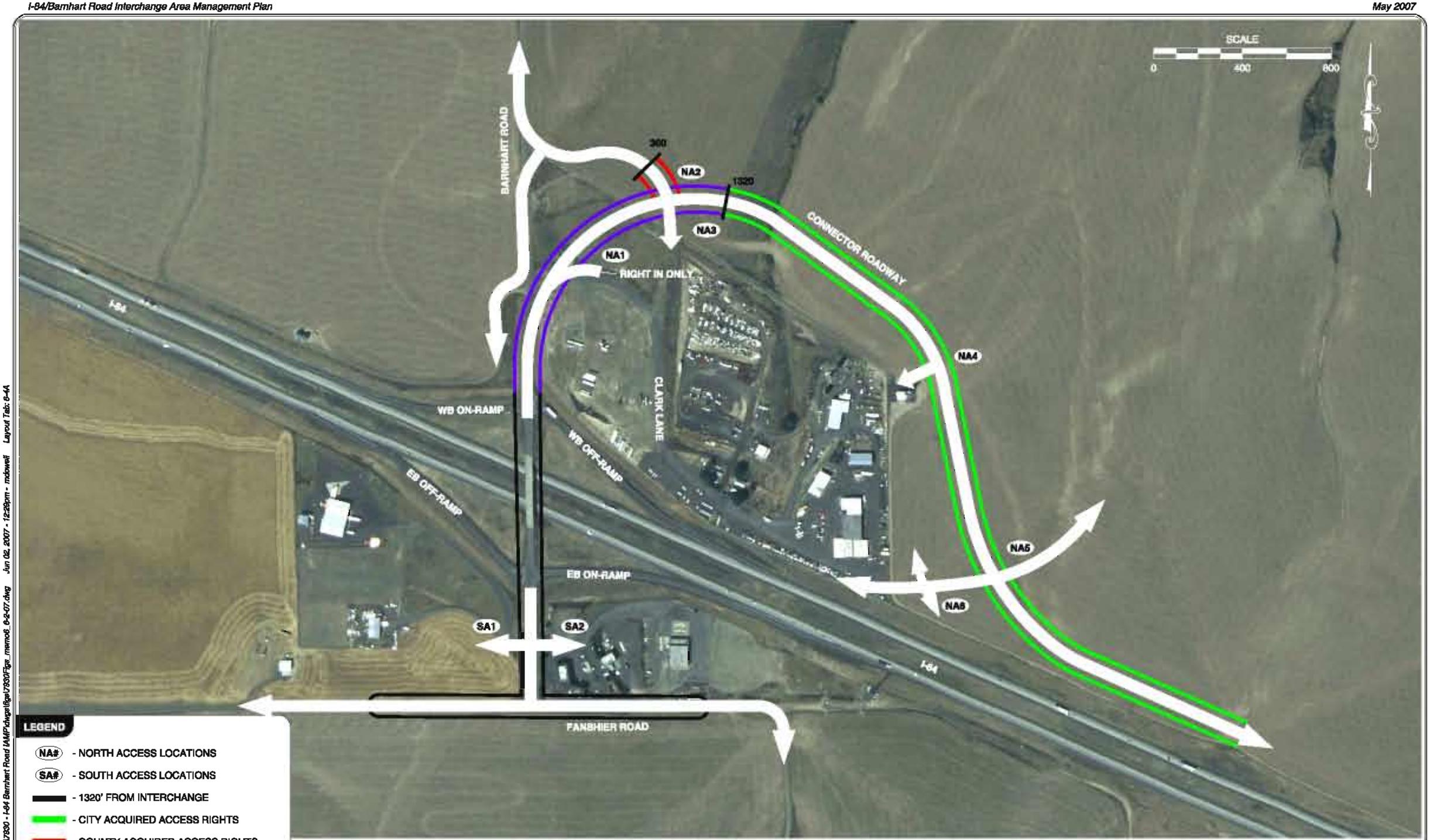
As part of the I-84/Barnhart Road IAMP, future access locations and public street connections were evaluated for properties located along Barnhart Road and the new Connector Roadway within the IAMP study area. Access locations were evaluated based on ODOT's Division 51 Access Management standards and an assessment of traffic operations and safety as described in Action 3C.3 of the *1999 Oregon Highway Plan*. Access locations were developed to minimize impacts to primary facilities (Barnhart Road/Connector Roadway) serving the interchange area. The intent of the Access Management Plan is to identify the location of site-access driveways and internal circulation routes for properties that will be impacted by the new Connector Roadway or for properties located within the interchange management area that are likely to redevelop at some point in the future. The plan, as illustrated in Figure 6-4 and Figure 6-5 and described in the following paragraphs, shall be applied by ODOT, the City of Pendleton, and Umatilla County in future land use decisions involving the properties located within the interchange management area.

Short-Term Access Modifications

Barnhart Road-Connector Roadway (North of I-84)

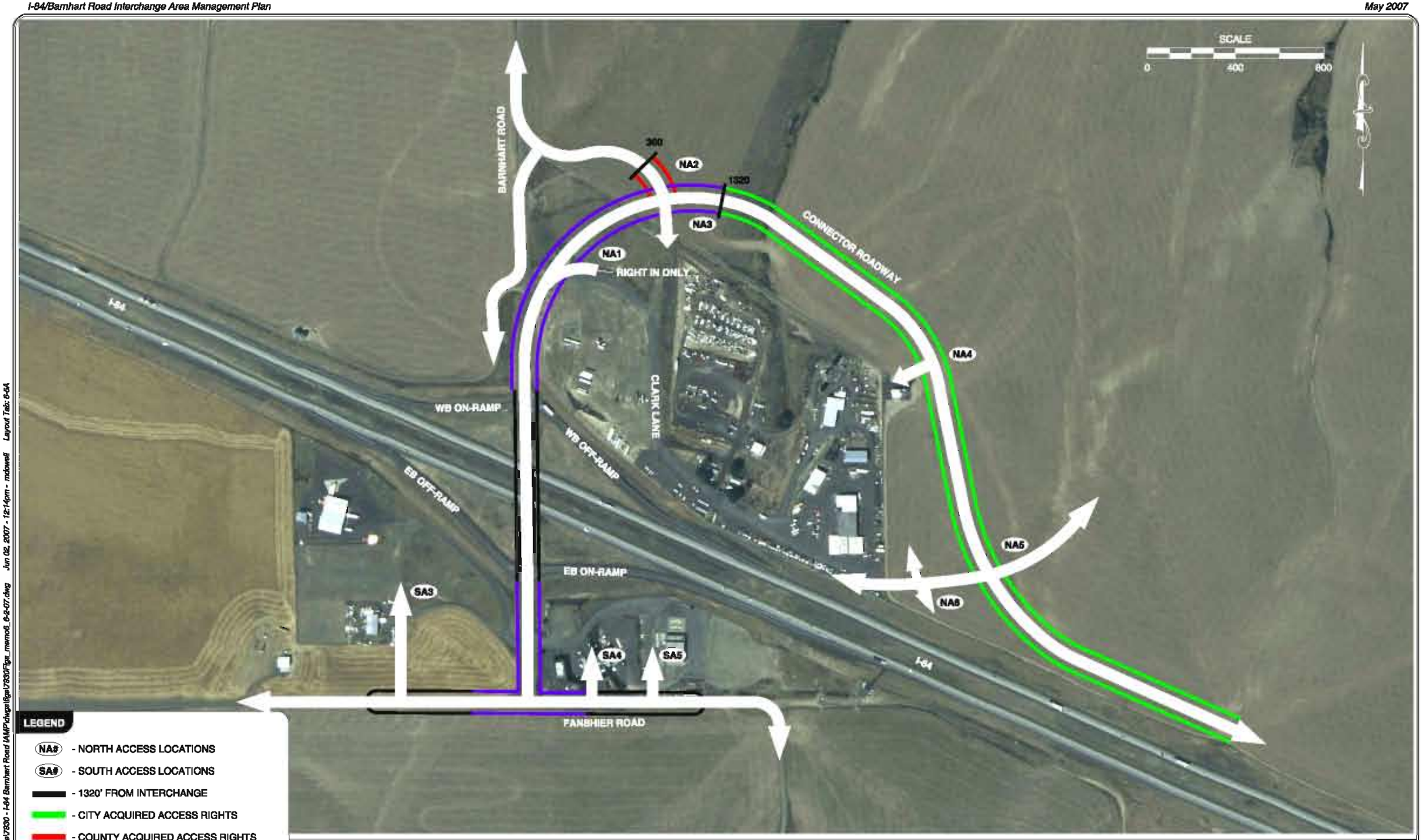
Currently, all properties north of I-84 have access to Barnhart Road via individual private roadway approaches as previously documented in Figure 3-7. Under ODOT's current access management policy, the *1999 Oregon Highway Plan* stipulates that the desired distance between an interchange ramp terminal and the first major approach (public or private) on the crossroad should be 1,320 feet (¼ mile). With the development of the Connector Roadway between the Airport Industrial Area and the I-84/Barnhart Road interchange, a number of these existing accesses will become subject to this policy.

Through the guidance of the I-84/Barnhart Road IAMP planning process, properties located off of Barnhart Road will take future access via a northbound right-in only access to the Woodpecker property (Access #NA1) approximately 500 feet north of the westbound I-84 ramp terminal, a consolidated access for property north and west of the Connector Roadway (Access #NA2) to be established approximately 1,100 feet north of the westbound I-84 ramp terminal, and a full access to the Woodpecker property (Access #NA3) to be established directly across from Access #NA2. Access rights will be acquired by ODOT for 1,320 feet from the interchange along both sides of Barnhart Road-Connector Roadway within the interchange management area except for the 500-foot northbound right-in only (Access #NA1) and the 1,100-foot consolidated access point serving the northerly segment of Barnhart Road (Access #NA2) and the Woodpecker property (Access #NA3). The City will control access to the Connector Roadway east of the 1,320-foot point. Within the IAMP study area, reservations of access will also be located at #NA4 and #NA5 and #NA6 identified in Figure 6-4. No additional access rights to adjacent properties will be granted to the new Barnhart Road-Connector Roadway by the City west of #NA5 and #NA6. The specific characteristics and restrictions of each access are provided in Table 6-3.



I-84/BARNHART ROAD INTERCHANGE AREA MANAGMENT PLAN
SHORT-TERM ACCESS MANAGEMENT & CIRCULATION PLAN
UMATILLA COUNTY, OREGON

FIGURE 6-4



I-84/BARNHART ROAD INTERCHANGE AREA MANAGMENT PLAN
MEDIUM/LONG-TERM ACCESS MANAGEMENT & CIRCULATION PLAN
UMATILLA COUNTY, OREGON

FIGURE 6-5

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Table 6-3 Interchange Management Area Access Locations

Access #	Type/Location/Size	Restrictions
Short-Term Access Modifications		
#NA1	Private - A minimum of 500 feet north of the I-84/Barnhart Road westbound terminal (a maximum of 40-feet wide at throat)l	Northbound Right-In Only Access from the Connector Road to the Woodpecker property.
#NA2	Public - 1,100 feet north of the I-84/Barnhart Road westbound terminal	Full-Access allowing for all movements to/from the Connector Road and the realigned Barnhart Road.
#NA3	Private – 1,100 feet north of the I-84/Barnhart Road westbound terminal	Full-Access allowing for all movements to/from the Woodpecker property.
#NA4	Private – Located within 250 feet of the existing utility tower (a maximum of 30-feet wide at throat)	Full-Access allowing for all movements to/from the Connector Road. The access will be gated and restricted by deed to serve only the existing utility tower located on Tax Lot 600
#NA5	Private - Located a minimum of 500 feet east of #NA4 and directly across from #NA6 (a maximum of 40-feet wide at throat)	Full-Access allowing for all movements to/from the Connector Road and access #NA6 and restricted by deed to farm use practices only
#NA6	Private - Located a minimum of 500 feet east of #NA4 and directly across from #NA5 (a maximum of 40-feet wide at throat)	Full-Access allowing for all movements to/from the Connector Road and access #NA5. This access will serve the Woodpecker property as well as the two remnant EFU parcels on the north and south side of the access road.
#SA1	Private - Existing Access located approximately 250 feet south of the I-84/Barnhart Road eastbound terminal and directly across from #SA2	Full-Access allowing for all movements to/from the Barnhart Road; however, future land use actions and/or transportation improvement projects will consolidate access to #SA3.
#SA2	Existing Access located approximately 250 feet south of the I-84/Barnhart Road eastbound terminal and directly across from #SA1	Full-Access allowing for all movements to/from the Barnhart Road; however, future land use actions and/or transportation improvement projects will consolidate access to #SA4 and #SA5.
Medium/Long-Term Access Modifications		
#SA1	N/A	Consolidated to access point #SA3 on Fanshier Road
#SA2	N/A	Consolidated to access points #SA4 and #SA5 on Fanshier Road
#SA3	Private - A minimum of 300 feet west of Barnhart Road (a maximum of 40-feet wide at throat)	Full Access allowing for all movements to/from Fanshier Road. The access will provides access to the industrial properties located north of Fanshier Road and west of Barnhart Road
#SA4	Private - A minimum of 300 feet east of Barnhart Road (a maximum of 40-feet wide at throat)	Full Access allowing for all movements to/from Fanshier Road. The access will provides access to the commercial properties located north of Fanshier Road and east of Barnhart Road
#SA5	Private - A minimum of 200 feet east of access #SA4 (a maximum of 40-feet wide at throat)	Full Access allowing for all movements to/from Fanshier Road. The access will provides access to the commercial properties located north of Fanshier Road and east of Barnhart Road

Barnhart Road and Fanshier Road (South of I-84)

For properties located south of the interchange along Barnhart Road, no initial access modifications will be made as part of the Connector Roadway project. However, the two existing private access approaches located on the east and west side of Barnhart Roadway will become subject to evaluation for consolidation and relocation as part of future change(s) in use zoning or plan amendment designation changes; construction of new buildings; increases in floor space of existing buildings; division or consolidation of property boundaries; changes in the character of traffic using the approach; internal site circulation design or inter-parcel circulation changes; or reestablishment of a property's use after discontinuance for two years or more that trigger a Traffic Impact Analysis as defined below) that occurs on the parcels served by the approaches. The consolidation and relocation will result in all future access occurring from Fanshier Road outside of 300 feet of its intersection with Barnhart Road.

Medium/Long-Term Access Management Modifications

Barnhart Road-Connector Roadway (North of I-84)

For properties located north of the interchange along Barnhart Road-Connector Roadway, no medium/long-term access management modifications have been identified.

Barnhart Road and Fanshier Road (South of I-84)

As part of future land use actions and/or roadway improvement projects, the two existing private access approaches (#SA1 and #SA2) located on the east and west side of Barnhart Road south of the interchange will be consolidated to future access locations (#SA3, #SA4, and #SA5) along Fanshier Road as identified in Figure 6-5. This consolidation will be completed in order to improve the operational and safety integrity of the interchange and Barnhart Road, and move in the direction of the interchange crossroad spacing standards established in the *1999 Oregon Highway Plan*. The need to limit or relocate access on Barnhart Road to Fanshier Road will be evaluated in a TIS for any development with site traffic volume generation increases of 250 average daily trips, 25 peak hour trips, or 10 heavy vehicle trips per day by vehicles exceeding 20,000 pound gross vehicle weight.

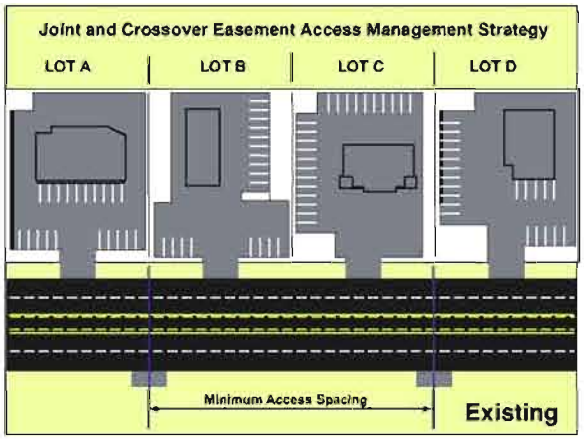
The access locations on Fanshier Road immediately to the west (#SA3) and east (#SA4) of the Barnhart Road intersection will be located at a distance exceeding 300 feet. If the consolidation is stipulated through an improvement project, ODOT or Umatilla County shall acquire the access rights along all of Barnhart Road south of the interchange and for 300 feet to the east and west along Fanshier Road.

To properly consolidate accesses along Barnhart Road south of the interchange, crossover easements shall be used to consolidate future access to Fanshier Road between the adjoining parcels located in the Rural Light Industrial (RLI) zoned property in the southwest quadrant of the interchange and the Rural Tourist Commercial (RTC) property in the southeast quadrant. Figure 6-6 illustrates how this process could, in the long run, facilitate compliance with access management objectives. As suggested in Figure 6-6 and the supporting text of Table 6-4, driveways along Barnhart Road will eventually move in the overall direction of the access spacing standards as development and redevelopment occurs along the study corridor.

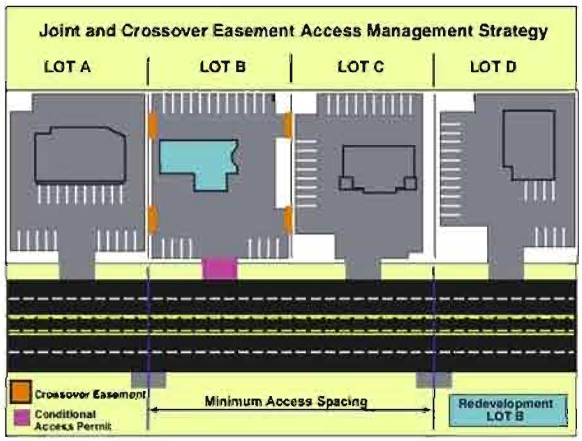
Table 6-4
Example of Crossover Easement / Indenture / Consolidation - Conditional Access Process

Step	Process
1	EXISTING – Currently Lots A, B, C, and D have site-access driveways that neither meet the access spacing criteria nor align with driveways or access points on the opposite side of the highway. *Under these conditions motorists are put into situations of potential conflict (conflicting left turns) with opposing traffic. Additionally, the number of side-street (or site-access driveway) intersections decreases the operation and safety of the highway.*
2	REDEVELOPMENT OF LOT B – At the time that Lot B redevelops, the local jurisdiction would review the proposed site plan and make recommendations to ensure that the site could promote future crossover or consolidated access. Next, the local jurisdiction would issue conditional permits for the development to provide crossover easements with Lots A and C, and ODOT would grant a conditional access permit to the lot. *After evaluating the land use action, ODOT would determine that LOT B does not have either alternative access, nor can an access point be aligned with an opposing access point, nor can the available lot frontage provide an access point that meets the access spacing criteria for this segment of highway.*
3	REDEVELOPMENT OF LOT A – At the time Lot A redevelops, the local jurisdiction and ODOT would undertake the same review process as with the redevelopment of LOT B (see Step 2); however, under this scenario ODOT and the local jurisdiction would use the previously obtained cross-over easement at Lot B to consolidate the access points of Lots A and B. ODOT would then relocate the conditional access of Lot B to align with the opposing access point and provide safe and efficient access to both Lots A and B. *The consolidation of site-access driveways for Lots A and B will not only reduce the number of driveways accessing the highway, but will also eliminate the conflicting left-turn movements on the highway by the alignment with the opposing access point.*
4	REDEVELOPMENT OF LOT D – The redevelopment of Lot D will be handled in the same manner as the redevelopment of Lot B (see Step 2)
5	REDEVELOPMENT OF LOT C – The redevelopment of Lot C will be reviewed once again to ensure that the site will accommodate crossover and/or consolidated access. Using the crossover agreements with Lots B and D, Lot C would share a consolidated access point with Lot D and will also have alternative frontage access via the shared site-access driveway of Lots A and B. *By using the crossover agreement and conditional access permit process, the local jurisdiction and ODOT will be able to eliminate another access point and provide the alignment with the opposing access points.*
6	COMPLETE – After Lots A, B, C, and D redevelop over time, the number of access points will be reduced and aligned, and the remaining access points will either meet or move in the direction of the access spacing plan.

Access Mangement Strategy



Step 1



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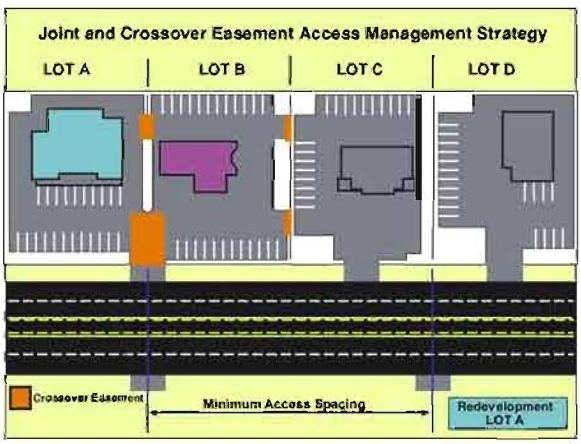

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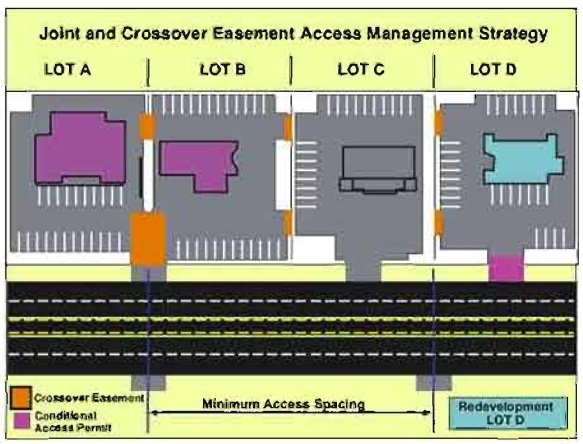

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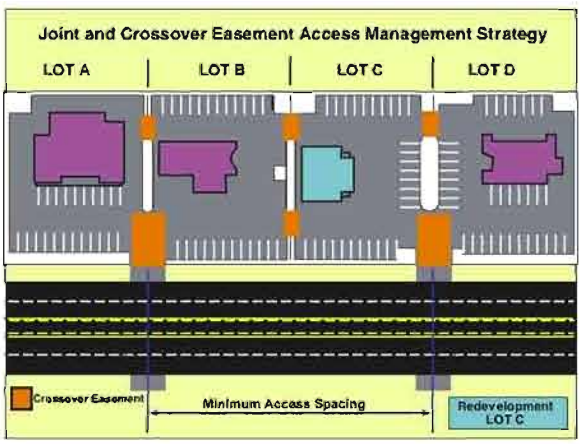

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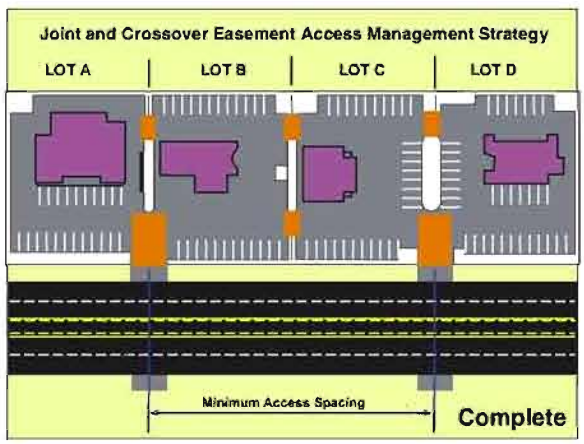


Step 6

I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
EXAMPLE OF CROSS-OVER EASEMENT / INDENTURE / CONSOLIDATION / CONDITIONAL ACCESS PROCESS

FIGURE 6-6

Deviation to the Division 51 Access Management Standards

The proposed Access Management Plan does not meet the 1,320-foot access spacing requirement identified in OAR Division 51 and requires that the Region Access Management Engineer approve a deviation to the standards for the plan. Under the provisions of OAR 734-51-0135(3), the Region Access Management Engineer may approve a deviation if:

(a) Adherence to spacing standards creates safety or traffic operation problems;

> **Response:** Maintaining the 1,320-foot spacing would locate the Barnhart Road/Connector Roadway intersection (NA2 and NA3) at the low-point of a vertical curve at an existing ravine. Locating the intersection west of the low-point (closer to the interchange) will improve sight distance and decrease the speed differential with which vehicles from Barnhart Road enter the Connector Roadway compared to vehicles traveling downhill towards the ravine.

(b) The applicant provides a joint approach that serves two or more properties and results in a net reduction of approaches to the highway;

> **Response:** Access NA2 consolidates an existing access to EFU land (across from the existing Barnhart Road/Clark Lane intersection) with Barnhart Road which provides access to multiple EFU properties.
>
> Access NA5 and NA6 consolidate a full access to Woodpecker with three EFU property access points (one on the north side of the roadway at NA5 and two on the south side at NA6). NA6 relocates the majority of the existing exiting trips from the Woodpecker property to outside of the access spacing standard.

(c) The applicant demonstrates that existing development patterns or land holdings make joint use approaches impossible;

> **Response:** NA

(d) Adherence to spacing standards will cause the approach to conflict with a significant natural or historic feature including trees and unique vegetation, a bridge, waterway, park, archaeological area, or cemetery;

> **Response:** Adhering or exceeding the 1,320-foot standard would place the access point for Barnhart Road in a ravine or require Barnhart Road to cross a ravine and consume additional EFU land.

(e) The highway segment functions as a service road;

> **Response:** NA

(f) On a couplet with directional traffic separated by a city block or more, the request is for an approach at mid-block with no other existing approaches in the block or the proposal consolidates existing approaches at mid-block; or

Response: NA

(g) Based on the Region Access Management Engineer's determination that:

(A) Safety factors and spacing significantly improve as a result of the approach; and

Response: The proposed access management plan moves most conflicting vehicle movements to outside of the 1,320 foot interchange access spacing standard to Access NA6. The three access points within the 1,320 foot interchange access spacing standard are anticipated to operate safely and represent very few conflicting movements. Left-turning movements on/off of Barnhart Road at NA2 are anticipated to be very low as Barnhart Road provides access to EFU land only. The Woodpecker property right-in only access (NA1) will not create any operational or safety issues at the interchange and will reduce the number of potential vehicle conflicts at NA3 and NA6. In addition a separate northbound right-turn lane will be provided at Access NA1 to separate turning movements from the northbound through movement.

(B) Approval does not compromise the intent of these rules as set forth in OAR 734-051-0020 (Which states: The purpose of division 51 rules is to provide a safe and efficient transportation system through the preservation of public safety, the improvement and development of transportation facilities, the protection of highway traffic from the hazards of unrestricted and unregulated entry from adjacent property, and the elimination of hazards due to highway grade intersections.)

Response: The proposed access management plan meets the intent of the Division 51 rules as it consolidates access points, reduces vehicle turning conflicts within the interchange access management area, protects highway traffic and traffic traveling from the interchange to the airport industrial area, and minimizes the hazard of roadway grades near the Barnhart Road/Connector Roadway intersection.

INTERCHANGE MANAGEMENT AREA

The I-84/Barnhart Road interchange management area includes two components: the Interchange Management Overlay Area and the Airport Industrial Area. The Interchange Management Overlay Area illustrated in Figure 6-7 is delineated around the I-84/Barnhart Road Interchange and will serve three functions:

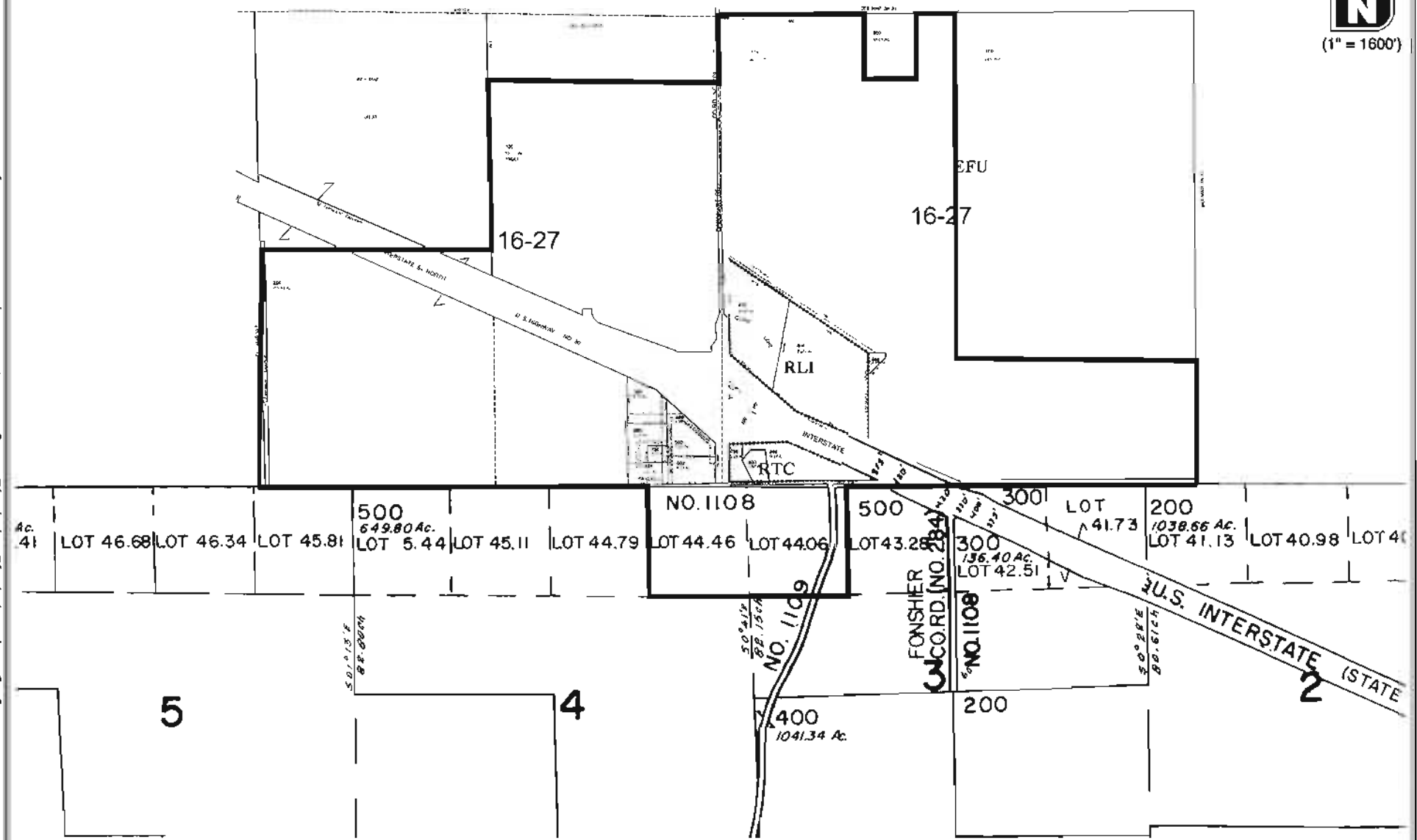
- Identify those parcels on which potential development applications require, due to their proximity to the interchange, a heightened level of coordination among ODOT, the City of Pendleton, and Umatilla County; and
- Identify those parcels and potential land use actions that will require operational analyses of the interchange terminals and will participate in the funding of the medium/long-term improvements at the interchange.
- Identify resource land parcels and designate them as low priority for conversion to non-resource uses.

The I-84/Barnhart Road Interchange Management Overlay Area was delineated by considering which parcels surrounding the interchange could face the greatest development pressure upon construction of

the new Connector Roadway and the existing interchange. Natural boundaries and parcel lines were used to define the area to enable more efficient administration over time.

In addition to the Interchange Management Overlay Area, the interchange management area includes the Airport Industrial Area for development review and funding purposes. The Airport Industrial Area, illustrated in Figure 6-8, is delineated around the area bounded by the City of Pendleton's UGB to the west and north, I-84 and US 30 to the south, and Northgate Road to the east and will serve two functions:

- Identify those parcels on which potential development applications require, due to their proximity to the interchange, a heightened level of coordination among ODOT, the City of Pendleton and Umatilla County; and
- Identify those parcels and potential land use actions that will require operational analyses of the interchange terminals and be assessed system development charges to fund medium/long-term improvements at the interchange.



LEGEND

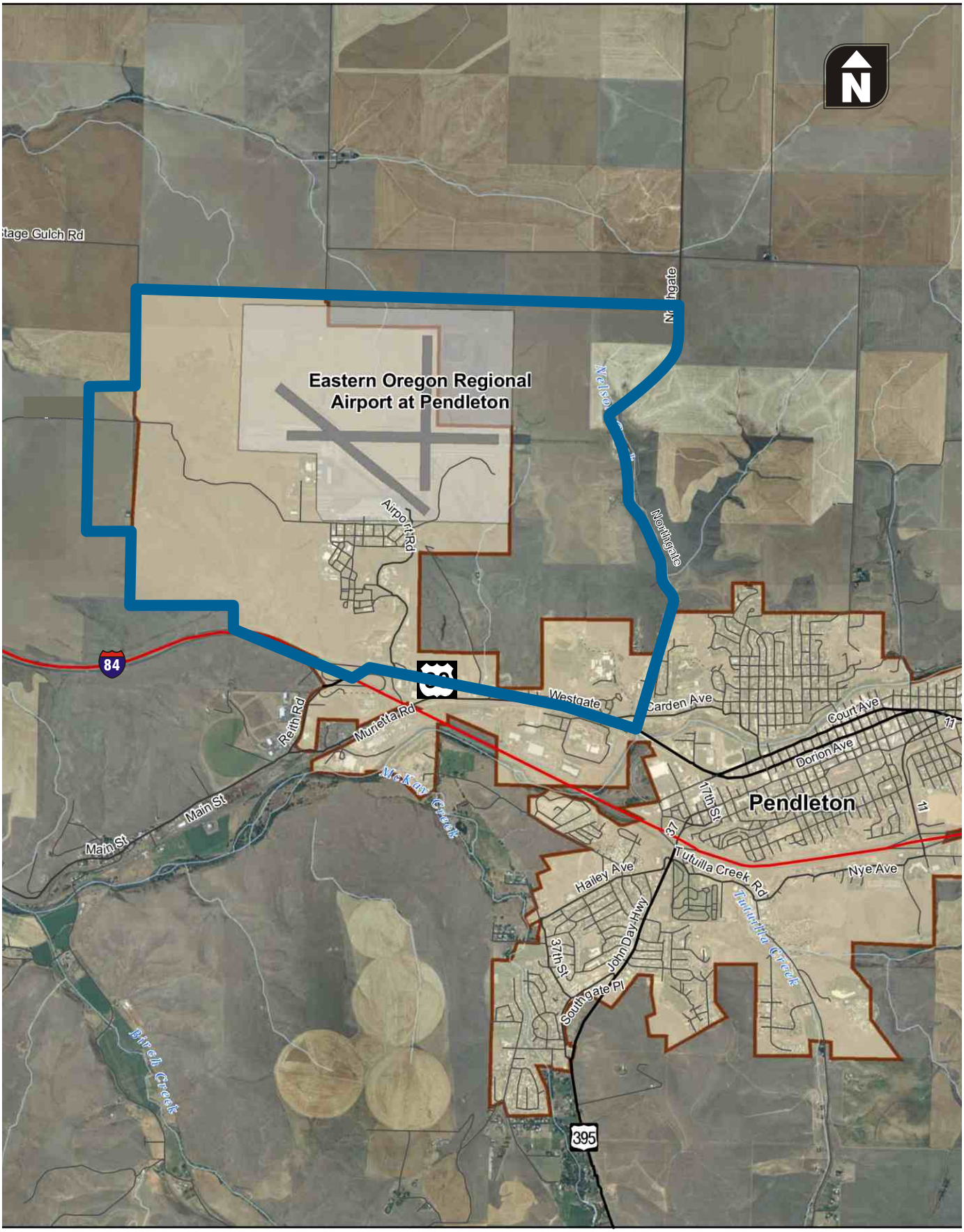
INTERCHANGE MANAGEMENT OVERLAY AREA BOUNDRY

I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
INTERCHANGE MENAGEMENT OVERLAY AREA
UMATILLA COUNTY, OREGON

FIGURE 6-7

KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING / PLANNING

H:\profile\17930 - I-84 Barnhart Road IAMP\dwgs\figs\Chapter 6\property_info\property_info.dwg Mar 08, 2007 - 4:02pm - rnwiesenfeld Layout Tab: FIG6-7



I-84/BARNHART ROAD INTERCHANGE AREA MANAGEMENT PLAN
AIRPORT INDUSTRIAL OVERLAY AREA
UMATILLA COUNTY, OREGON

FIGURE 6-8

H:\projfile\7930 - I-84 Barnhart Road IAMP\cdrfiles\7930FIG5-8.cdr

INTERCHANGE FUNCTION AND POLICY DEFINITION

While both the Umatilla County and City of Pendleton comprehensive plans currently identify the interchange, the IAMP contained herein will protect the function of the interchange because the current comprehensive plans do not clearly define the interchange function. Upon completion of the Goal Exception process for the Connector Roadway, both the City of Pendleton and Umatilla County will amend their TSPs to incorporate the elements of the I-84/Barnhart Road IAMP.

The City of Pendleton and Umatilla County should adopt a clear definition of the I-84/Barnhart Road Interchange function into their respective comprehensive plans and TSPs as a policy to provide direction for management of the interchange area and achieve the objectives and goals of the IAMP. This will help to ensure consistency between future policy decisions with the interchange's intended function.

Following is a definition for the I-84/Barnhart Road Interchange:

> *"The transportation function of the I-84/Barnhart Road diamond interchange will be to provide connections between the Airport Industrial Area and the existing industrial and commercial exception lands and I-84. With respect to land use and development, the function of the I-84/Barnhart Road Interchange will be to serve the existing and planned land uses in the interchange area, the Airport Industrial Area, and resource lands activities in and around the interchange management area. It is not the function of the interchange to facilitate further urbanization of resource lands in the area or land that is not otherwise identified for future development in existing land use plans."*

FUTURE LAND USE AND TRANSPORTATION PLAN AMENDMENTS

To ensure that the IAMP remains dynamic and responsive to changes to the adopted land use and transportation plans, the City of Pendleton, Umatilla County, and ODOT should at a minimum:

- Ensure that the interchange function and policy definition above will apply in the review of future transportation plan amendments.
- Coordinate planning activities per the Transportation Planning Rule (OAR 660-012).
- Establish agreements with developers in advance of annexation (i.e., adjacent to the Airport Industrial Area) to stipulate implementation of actions that support the intended function of the interchange.
- Review mobility standards for the interchange prior to adopting local plan amendments.
- Review Measure 37 claims to assess the impacts to the mobility standards of the interchange as well as potential changes to the local circulation system

TRAFFIC OPERATIONS AT THE INTERCHANGE

To ensure the continued operational and safety integrity of the interchange, the City of Pendleton and Umatilla County will amend their respective development ordinances to ensure that future development and land use actions within the Interchange Management Overlay Area and Airport Industrial Area do

not degrade the interchange terminal volume to capacity ratios below the adopted Oregon Highway Plan mobility standards[6].

MEDIUM/LONG-TERM IMPROVEMENT FUNDING

To provide the necessary funding to develop and construct the identified medium/long-term improvements illustrated in Figure 6-3 and listed in Table 6-2, the City of Pendleton will develop a system development change ordinance and overlay zone for the Airport Industrial Area and Umatilla County will develop a funding mechanism and overlay zone for the Interchange Management Area.

IAMP UPDATES AND MONITORING

To ensure that the I-84/Barnhart Road IAMP continues to preserve operational integrity and safety of the I-84/Barnhart Road Interchange and the Connector Roadway between the interchange and the airport, the City of Pendleton, Umatilla County, DLCD, and ODOT will develop a Memorandum of Understanding (MOU) stipulating to the following monitoring and update program:

- The agencies will review the IAMP, in conjunction with Umatilla County's periodic review process, to ensure that the original assumptions and recommendations regarding the interchange, local circulation system, access management, land use management, and coordination efforts are still appropriate and effective given the current and projected future conditions inside the interchange management area. This review should be conducted through a meeting initiated by Umatilla County or ODOT and including all affected agencies.
- The agencies can request a review of the IAMP at any time, if in their determination specific land use or transportation changes warrant a review of the underlying assumptions and/or recommendations within the IAMP.
- Updates to the IAMP will be prepared as a result of review meeting findings that demonstrate the need for an update to the plan.

IMPLEMENTATION OF THE I-84/BARNHART ROAD IAMP

Implementation of the I-84/Barnhart Road IAMP will occur at several levels of government. As required by OAR 734-051, both the City of Pendleton and Umatilla County will be required to amend their Transportation System Plans to incorporate the elements of the I-84/Barnhart Road IAMP. In addition, new ordinances or amendment to existing ordinances, resolutions, or Inter-Governmental Agreement (IGA) will be required to insure that the access management, land use management, and coordination elements of the IAMP are achieved. This amendment process will include Planning Commission/City Council hearings at the city level and Planning Commission/County Commission hearings at the county level. Following successful adoption at the city and county levels, the I-84/Barnhart Road IAMP will be presented to the OTC for review and approval.

IAMP ACTION ITEMS

The following actions shall be completed before the Connector Roadway project improvements within the vicinity of the I-84/Barnhart Road Interchange described in this IAMP are constructed:

---

6 The mobility standards at the time of adoption of the IAMP are shown in Table 2-1.

1. The City of Pendleton needs to complete and receive approval of the Connector Roadway Goal Exception.

2. The City of Pendleton needs to amend its Transportation System Plan to incorporate the interchange policy statement and short-term and medium/long-term transportation improvement.

3. The Umatilla County Commission needs to adopt the I-84/Barnhart Road IAMP as part of the Umatilla County Comprehensive Plan and Transportation System Plan. This Plan shall serve as the Interchange Area Management Plan and Access Management Plan for the area and facilities that are specifically addressed in the Plan.

4. The Oregon Transportation Commission needs to amend the Oregon Highway Plan to include the I-84/Barnhart Road IAMP.

5. The Interchange Area Management Plan and Access Management Plan contained within, as called for by the OTC and OAR 734-051-125, and the deviations to OAR Division 51 access management standards required for initial construction of the Connector Roadway project need to be evaluated using the provisions of OAR 734-51-0135 and approved by the Region Access Management Engineer.

6. The City of Pendleton needs to acquire the right-of-way and access rights within the interchange management area to construct the Connector Roadway and comply with the access management plan described herein and illustrated in Figure 6-4.

7. The City of Pendleton needs to construct all of the short-term transportation improvements described herein and illustrated in Figure 6-1.

8. The City of Pendleton needs to amend its development ordinances to ensure mobility standards are monitored and to include a funding mechanism that will address the impacts of the Airport Industrial Area to the I-84/Barnhart Road Interchange.

9. Umatilla County needs to identify resource land parcels and designate them as low priority for conversion to non-resource uses.

10. Umatilla County shall amend its comprehensive plan and development ordinances to include an Interchange Management Overlay Area for each property identified in the IAMP that addresses transportation impact analysis and funding mechanism that addresses the impacts within the interchange management area.

PROPOSED AMENDMENTS

The following outline discusses the major Transportation System Plan amendments that will need to occur at both the city and county levels to support adoption of the I-84/Barnhart Road IAMP.

City of Pendleton

- The following interchange policy statement should be included in the City of Pendleton TSP: *The transportation function of the I-84/Barnhart Road diamond interchange will be to*

provide connections between the Airport Industrial Area and the existing industrial and commercial exception lands and I-84. With respect to land use and development, the function of the I-84/Barnhart Road Interchange will be to serve the existing and planned land uses in the interchange area, the Airport Industrial Area, and resource lands activities in and around the interchange management area. It is not the function of the interchange to facilitate further urbanization of resource lands in the area or land that is not otherwise identified for future development in existing land use plans.

- The future short-term and medium/long-term transportation improvement projects illustrated in Figures 6-1 and 6-3 and listed in Tables 6-1 and 6-2 shall be included in the Street and Highway project list of the Transportation System Plan.
- Adopt modifications to the city development review standards.

Umatilla County

- The following interchange policy statement should be included in the Umatilla County TSP: *The transportation function of the I-84/Barnhart Road diamond interchange will be to provide connections between the Airport Industrial Area and the existing industrial and commercial exception lands and I-84. With respect to land use and development, the function of the I-84/Barnhart Road Interchange will be to serve the existing and planned land uses in the interchange area, the Airport Industrial Area, and resource lands activities in and around the interchange management area. It is not the function of the interchange to facilitate further urbanization of resource lands in the area or land that is not otherwise identified for future development in existing land use plans.*
- The future short-term and medium/long-term transportation improvement projects illustrated in Figures 6-1 and 6-3 and listed in Tables 6-1 and 6-2 shall be included in the Street and Highway project list of the Transportation System Plan.
- Adopt modifications to the county development review standards.

OTC

- The I-84/Barnhart Road IAMP shall be adopted by the OTC as part of the *1999 Oregon Highway Plan*.

Section 7

OAR and OHP Compliance

OAR and OHP Compliance

The following section discusses the policy based compliance issues that pertain to the development of the I-84/Barnhart Road IAMP.

OAR Compliance

The I-84/Barnhart Road IAMP was developed in collaboration with ODOT, the City of Pendleton, and Umatilla County and was developed in accordance with the guidelines set forth in the State of Oregon's Oregon Administrative Rules for Interchange Access Management Planning and Interchange Area Management Planning. Table 7-1 identifies the required planning elements from OAR 734-051 and documents how the I-84/Barnhart Road IAMP satisfies the requirements.

Table 7-1
OAR 734-051 Issues Addressed

OAR 734-0051-0155 Requirement	How Addressed	Report Reference
Should be developed no later than the time the interchange is being developed or redeveloped -0155(6)(a)	This plan was produced before and during the planning and design process for the Barnhart Road-Airport Road Connector project. It is also being adopted in advance of final plans and construction.	
Should identify opportunities to improve operations and safety in conjunction with roadway projects and property development or redevelopment and adopt strategies and development standards to capture those opportunities -0155(6)(b)	The land use controls and access management elements identified in this plan, and incorporated into the project design or identified for implementation with future property redevelopment or project development activities, will constitute significant operational and safety improvements.	Chapter 3 Chapter 4 Chapter 5 Chapter 6
Should include short, medium, and long-term actions to improve operations and safety in the interchange area -0155(6)(c)	Short- and medium/long-term actions to improve operations and safety in the interchange area were identified. At the time of construction of the Connector Roadway (short-term), access roads and site access will be constructed that comply with the access management plan. The access management plan will be implemented on the south side of the interchange in the mid- to long-term as redevelopment triggers the need. The interchange ramp terminals will be reconstructed when signal warrants are met.	Chapter 6
Should consider current and future traffic volumes and flows, roadway geometry, traffic control devices, current and planned land uses and zoning, and the location of all current and planned approaches -0155(6)(d)	A full analysis of existing and forecast (2025) operational, geometric, and safety conditions was conducted for this planning effort. All surrounding land use was also identified, as were all affected accesses. These factors led to the plan's transportation improvement project recommendations and to the recommendation for the City of Pendleton to obtain all access rights to the new facility and Umatilla County to implement a Barnhart Interchange Management Overlay Area.	Chapter 3 Chapter 4 Chapter 5 Chapter 6
Should provide adequate assurance of the safe operation of the facility through the design traffic forecast period, typically 20 years -0155(6)(e)	The forecast analysis does show that safe operations will be achieved for the interchange through 2025.	Chapter 4
Should consider existing and	A thorough analysis of surrounding land uses and land use	Chapter 4

proposed uses of all property in the interchange area consistent with its comprehensive plan designations and zoning -155(6)(f)	potentials was performed. This analysis resulted in recommendations for implementing access controls and Umatilla County zoning policies and ordinances to ensure protection of EFU lands.	Chapter 5 Chapter 6
Is consistent with any adopted Transportation System Plan, Corridor Plan, Local Comprehensive Plan, or Special Transportation Area or Urban Business Area designation, or amendments to the Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055 -155(6)(g)	This plan and the Barnhart Road-Airport Road Connector project being implemented are consistent with the City of Pendleton and Umatilla County Transportation System Plans as they both call for the Connector Roadway project to connect to the I-84/Barnhart Road Interchange. Further compliance will be ensured through adoption of the I-84/Barnhart Road Interchange Area Management Plan into the Umatilla County Comprehensive Plan and adoption of the interchange policy statement and short-term and medium/long-term transportation improvements into the City of Pendleton Comprehensive Plan.	NA
Is consistent with the 1999 Oregon Highway Plan -0155(6)(h)	The Connector Roadway and associated I-84/Barnhart Road Interchange Area Management Plan are consistent with the 1999 OHP (See following section).	Chapter 7
Is approved by ODOT through an intergovernmental agreement and adopted by the local government, and adopted into a Transportation System Plan unless the jurisdiction is exempt from transportation system planning requirements under OAR 660-012-0055 -155(6)(i)	The Connector Roadway and associated I-84/Barnhart Road Interchange Area Management Plan are being adopted into the Umatilla County Comprehensive Plan and Transportation System Plan.	NA
THE PLAN WILL DETERMINE		
OAR 734-051-0155 Requirement	**Determination**	**Report Reference**
Driveway and roadway spacing and connections	North of I-84 A Northbound Right-In Only Access from the Connector Road to the Woodpecker property will be constructed a minimum of 500 feet north of the I-84/Barnhart Road westbound terminal A Full-Access allowing for all movements to/from the Connector Road and the realigned Barnhart Road will be constructed a minimum of 1,100 feet north of the I-84/Barnhart Road westbound terminal A Full-Access allowing for all movements to/from the Connector Road and the Woodpecker property will be constructed a minimum of 1,100 feet north of the I-84/Barnhart Road westbound terminal A gated Full-Access allowing for all movements to/from the Connector Road and restricted by deed to serve only the existing utility tower located on Tax Lot 600 will be constructed within 250 feet of the existing utility tower A Full-Access allowing for all movements to/from the Connector Road and restricted by deed to farm use practices only will be constructed a minimum of 500 feet east of the utility tower access and directly across from the Woodpecker access road. A Full-Access allowing for all movements to/from the Connector Road and the Woodpecker property access road will be constructed a minimum of 500 feet east of the utility	Chapter 6

	tower access and directly across from a farm use only access. The Woodpecker access road will provide access to the two remnant EFU parcels north and south of the access road. South of I-84 The two existing private Full-Access points located approximately 250 feet south of the I-84/Barnhart Road eastbound terminal will remain until future land use actions and/or transportation improvement projects consolidate and relocate access to 300 feet west, 300 feet east, and 500 feet east of Barnhart Road on Fanshier Road.	
Local street connections to ensure adequate access to properties and off-highway circulation	As part of initial Connector Roadway project construction, the City of Pendleton shall construct a realignment of Barnhart Road north of the interchange to connect into the Connector Roadway. The realigned Barnhart Road will intersect with the Connector Roadway a minimum of 1,100 feet north of the I-84 westbound ramp terminal. In addition, the existing farm access to the property located in the northwest quadrant of the interchange will be reconnected to the northerly segment of Barnhart Road.	Chapter 6
Median treatments	No additional median treatments are identified.	Chapter 6
Location and type of traffic control devices needed to ensure safe and efficient operations in the operational area of the interchange	Upon initial construction of the Connector Roadway, all access points within the IAMP study area will be stop controlled, including the I-84 eastbound and westbound ramp terminals.	Chapter 4 Chapter 6
Location of sidewalks and bicycle lanes	Sidewalks and bicycle lanes are not called for in the Umatilla County Transportation System Plan within the IAMP study area because it is located within a rural area.	NA
Sidewalk and bicycle lane crossings (highway and ramp crossings)	NA – See above.	NA
Location of potential transit facilities (turnouts, shelters, park and ride areas)	Transit facilities were not considered as part of the IAMP because fixed route transit service does not exist nor is planned within the study area due to its rural location.	NA
Is new policy language needed in the City of Pendleton and/or Umatilla County Comprehensive Plan to support adequate long-term interchange operations?	The City of Pendleton and Umatilla County have agreed amend their respective development ordinances to ensure that future development and land use actions within the interchange management area and airport industrial area do not degrade the interchange terminal volume to capacity ratios below the adopted Oregon Highway Plan mobility standards. These amendments include coordination between agencies, traffic impact analysis requirements, monitoring of traffic operations, a funding mechanism for the long-term improvements, and identifying low-priority EFU land for conversion.	Chapter 6
Are any land use changes/comprehensive plan (including TSP) amendments needed to implement the Interchange Area Management Plan?	The City of Pendleton needs to amend its Transportation System Plan to incorporate the interchange policy statement and short-term and medium/long-term transportation improvement. Umatilla County needs to amend its Transportation System Plan to incorporate the entire IAMP contained herein.	Chapter 6

	The City of Pendleton needs to acquire the right-of-way and access rights within the interchange management area to construct the Connector Roadway and comply with the access management plan described in the IAMP The City of Pendleton and Umatilla County shall amend their development ordinances to include a transportation impact analysis and funding mechanism that addresses the impacts within the interchange management area as well as development within the Airport Industrial Area	
Are any deviations from OHP and OAR 731-051 standards and requirements needed?	A deviation to spacing standards will be needed for the right-in only access located approximately 500 feet north of the westbound ramp terminal, the realigned Barnhart Road located approximately 1,100 feet north of the westbound ramp terminal, and the Woodpecker property access located directly across from the Barnhart Road access located approximately 1,100 feet north of the westbound ramp terminal. The concurrence of the Region 5 Access Management Engineer and adoption of the I-84/Barnhart Road Interchange Area Management Plan by the OTC will constitute approval of these access deviations.	Chapter 5 Chapter 6

Oregon Highway Plan Compliance

The I-84/Barnhart Road IAMP was developed in accordance with the policies set forth in the Oregon Highway Plan (OHP). The following identifies the OPH policies (identified in Section 2) that pertain to the I-84/Barnhart Road IAMP and how the IAMP satisfies the requirements.

Policy 1A: State Highway Classification System. The state highway classification system includes five classifications: Interstate, Statewide, Regional, District, and Local Interest Roads. In addition, there are four special purpose categories that overlay the basic classifications: special land use areas, statewide freight route, scenic byways, and lifeline routes. Interstate-84 is an Interstate Highway and is part of the National Highway System (NHS). The Policy 1A definition states: "Interstate Highways provide connections to major cities, regions of the state, and other states. A secondary function in urban areas is to provide connections for regional trips within the metropolitan area. The Interstate Highways are major freight routes and their objective is to provide mobility. The management objective is to provide for safe and efficient high-speed continuous-flow operation in urban and rural areas."

> *How Addressed:* The I-84/Barnhart Road IAMP recognized I-84 as an Interstate Highway, complies with the mobility standards of the interchange in the 20-year horizon, and along with the Connector Roadway project does provide for new and improved local facilities that will reduce travel on I-84.

Policy 1B: Land Use and Transportation. This policy recognizes the role of both the State and local governments related to the state highway system and calls for a coordinated approach to land use and transportation planning.

> *How Addressed:* ODOT already has worked cooperatively with Umatilla County and the City of Pendleton to develop their TSPs which include the Connector Roadway. This policy has been addressed by Interchange Area Management Plan (IAMP), which will be adopted by Umatilla County, through requirements for coordinated agency review through an interchange management overlay zone.

Policy 1C: State Highway Freight System. This policy recognizes the need for the efficient movement of freight through the state. Interstate-84 is a designated freight route.

> *How Addressed:* The Connector Roadway is intended to provide a direct connection from the rural Barnhart Road interchange to the Pendleton Airport; a growing industrial area within the City of Pendleton's urban growth boundary. While this will increase traffic through the I-84/Barnhart Road Interchange, it will reduce traffic on a segment of I-84 and improve the efficiency of freight movement on the local roadway system.

Policy 1F: Highway Mobility Standards Access Management Policy. This policy addresses state highway performance expectations, providing guidance for managing access and traffic control systems related to interchanges.

> *How Addressed:* The I-84/Barnhart Road IAMP demonstrates that the interchange will meet ODOT mobility standards through the 20-year horizon. It also provides an access management plan that improves access management within the study area.

Policy 1G: Major Improvements. This policy requires maintaining performance and improving safety by improving efficiency and management before adding capacity.

> *How Addressed:* The I-84/Barnhart Road IAMP provides measures to increase efficiency through access management and demonstrates that there is no need to add capacity to the interchange within the planning horizon.

Policy 2B: Off-System Improvements. This policy recognizes that the state may provide financial assistance to local jurisdictions to make improvements to local transportation systems if the improvements would provide a cost-effective means of improving the operations of the state highway system.

> *How Addressed:* As part of the Barnhart Road IAMP process, ODOT is providing in kind project management and right-of-way services to Umatilla County and the City of Pendleton. The resulting IAMP will result in a plan to protect operations of the state highway system through access management and local transportation system improvements.

Policy 2F: Traffic Safety. This policy emphasizes the state's efforts to improve safety of all uses of the highway system. Action 2F.4 addresses the development and implementation of the Safety Management System to target resources to sites with the most significant safety issues.

> *How Addressed:* No existing safety deficiencies were identified within the study area; however, to ensure the long-term safety of the interchange an Access Management Plan was developed. In addition, the need to address the existing skewed intersection alignments at the westbound and eastbound ramp terminals in the long-term (and not as part of the Connector Roadway project) was identified.

Policy 3A: Classification and Spacing Standards. This policy addresses the location, spacing and type of road and street intersections and approach roads on state highways. The adopted standards can be

found in Appendix C of the Oregon Highway Plan. It includes standards for each highway classification; Barnhart Road is a rural interchange on an Interstate Highway with an existing two-lane crossroad. There are currently no plans for improvements to the interchange. Generally, the access spacing distance increases as either the highway's importance or posted speed increases. The current adopted spacing standard from the end of the Barnhart Road interchange entrance/exit ramps to the first major intersection is 1,320 feet.

How Addressed: See Policy 3C.

Policy 3C: Interchange Access Management Areas. This policy addresses management of grade-separated interchange areas to ensure safe and efficient operation between connecting roadways. Action items include developing interchange area management plans to protect the function of the interchange to provide safe and efficient operations between connecting roadways and to minimize the need for major improvements of existing interchanges. The local jurisdiction's role in access management is stated in Policy 3C as follows: "necessary supporting improvements, such as road networks, channelization, medians and access control in the interchange management area must be identified in the local comprehensive plan and committed with an identified funding source, or must be in place (Action 3C.2)."

Access management standards are detailed in Policy 3C and include the distance required between an interchange and approaches and intersections. The most stringent standards apply in interchange areas. Table 16 contains the minimum spacing standards applicable to the proposed Barnhart Road interchange, a freeway interchange that has an existing two-lane crossroad. The spacing standards in a rural area for this type of interchange are:

2 miles (3.2 km)	Distance between the start and end of tapers of adjacent interchanges.
1,320 feet (400 m)	Distance to the first approach on the right (right in/right out only)
1,320 feet (400 m)	Distance to the first major intersection or approach (no left turns allowed).
1,320 feet (400 m)	Distance between the last right in/right out approach road and the start of the taper for the on-ramp.

How Addressed: The I-84/Barnhart Road IAMP includes an Access Management Plan that consolidates access points and improves access spacing over the existing conditions. Ultimately, upon land redevelopment, access on the south side of the interchange will provide 800 feet of access spacing from the I-84 westbound ramp terminal to the first access point through a deviation process. The north side of the interchange will require a deviation from the standard to 1,100 feet to the first full access, due to topographic constraints, and 500 feet to a right-in only access in order to provide reasonable site access to an existing business.

Policy 4A: Efficiency of Freight Movement. This policy emphasizes the need to maintain and improve the efficiency of freight movement on the state highway system. Interstate-84 is a designated Freight Route.

How Addressed: The Connector Roadway will provide a direct connection from the I-84/Barnhart Road Interchange to the Pendleton Airport industrial area thus reducing freight traffic on I-84 between Barnhart Road and Pendleton while also improving the efficiency of freight movement on the local roadway system.

Policy 5B: Scenic Resources. This policy applies to all state highways and commits the State to using best management practices to protect and enhance scenic resources in all phases of highway project planning, development, construction, and maintenance.

How Addressed: This policy was considered as part of the Connector Roadway project development.

Section 8

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