U.S. 97: South Parkway
/Murphy Crossing
Interchange Area Management Plan

FINAL VERSION

Technical Memorandum #1

IAMP Definition and Background

Prepared for:
ODOT Region 4
Program & Planning Unit
63085 N. Highway 97, Suite 107
Bend, Oregon

Prepared by:
David Evans and Associates, Inc.
2100 SW River Parkway
Portland, Oregon
and
709 NW Wall St, Suite 102
Bend, Oregon

April 13, 2006
TABLE OF CONTENTS

PURPOSE AND INTENT.............................................................................................................................................. 1

PURPOSE OF THE IAMP.............................................................................................................................................. 1

PROJECT DESCRIPTION AND PRIOR PLANS ........................................................................................................ 2

PURPOSE OF THE TECHNICAL MEMORANDUM.................................................................................................. 2

PROBLEM STATEMENT............................................................................................................................................. 3

INTERCHANGE FUNCTION........................................................................................................................................ 3

GOALS AND OBJECTIVES ...................................................................................................................................... 3

MANAGEMENT AREA............................................................................................................................................... 5

LIST OF FIGURES

Follows Page

FIGURE 1. U.S. 97: SOUTH PARKWAY INTERCHANGE MANAGEMENT AREA....................................................... 5

LIST OF ACRONYMS

IAMP    Interchange Area Management Plan
MPO    Metropolitan Planning Organization
OAR    Oregon Administrative Rule
ODOT    Oregon Department of Transportation
OHP    Oregon Highway Plan
RIRO    Right-in, right-out
SPRP    South Parkway Refinement Study
TAZ    Transportation Analysis Zone
PURPOSE AND INTENT

Purpose of the IAMP

An interchange area management plan (IAMP) is a plan designed to protect the function of an interchange (defined in the next section) and preserve the investment made by the State for a period of at least 20 years. New interchanges are very costly and it is in the interest of the State, local governments and the citizens to ensure that the interchange functions as it was designed. Oregon Administrative Rule (OAR) 734-051 and the Oregon Highway Plan (OHP) require preparation of IAMPs for new interchanges or significant modifications to existing interchanges. The U.S. 97: South Parkway/Murphy Crossing IAMP is required by OAR 734-051-0155 (6) for the new U.S. 97: South Parkway interchange at Murphy Road extension. The transportation improvements will include an interchange with a southbound exit only from the Parkway (U.S. 97), a northbound only entrance to the Parkway, and a southbound flyover ramp from Third Street to U.S. 97, and a northbound exit from U.S. 97 to Third Street. These are depicted in the South Parkway Refinement Plan (SPRP) as H-Modified Option 1. The interchange is part of a larger plan to remove traffic signals at the Parkway intersections with Powers Road, Pinebrook, and South Third Street. In addition, completion of the new interchange will enable related improvements to the City’s street system including an east-west extension of Murphy Road to Brookswood and a north-south frontage road west of the Parkway from Powers Road to Ponderosa Drive and potentially to Baker Road.

The purpose of the IAMP is to manage traffic in the management area so that both safe operations and the public investment in the facility will be best protected. Effective interchange area traffic management will have the effect of maximizing the capacity of the interchange for safe movement of the mainline facility and enabling safe and efficient operations between connecting roadways. The IAMP work will not change the South Parkway Refinement Plan concept, which is also the basis for Murphy Crossing Refinement Plan, although it will develop and analyze three geometry design alternatives to indicate their footprints.

The focus of the IAMP will be on developing and evaluating up to three geometric designs based on the interchange concept and evaluating their traffic generating characteristics along with those associated with the build-out of the existing land use designations and the South Parkway Refinement Plan. After selecting a preferred geometric design, the intent is to devise traffic and land use controls to enable development in the interchange influence area while protecting the operation and function of the interchange through the planning period.

The IAMP will:

- Compare the 2030 population and employment assumptions used in the Bend metropolitan planning organization (MPO) regional transportation model to the development potential associated with the Murphy Crossing Refinement Plan.
- Recommend adjustments to the traffic assumptions based on technical staff recommendations, if necessary.
- Using the adjusted population and employment forecasts, evaluate to what extent and when existing transportation system problems will worsen and if new problems will arise, assuming the existing system plus improvements already scheduled and funded.
- Identify needed new streets and improvements to existing streets.
- Identify lane configuration and traffic control needed to achieve Oregon Department of Transportation (ODOT) mobility standards and City operational standards.
• Develop up to three geometric designs based on the Murphy Crossing Refinement Plan interchange concept Preferred Alternative.

• Identify and prioritize access management techniques.

• Identify traffic and land use control measures and necessary amendments to City plans and regulations.

**Project Description and Prior Plans**

Between Powers and Knott/Baker roads, U.S. 97 has three signalized intersections (Powers, Pinebrook, and South Third Street), and has four stop-controlled intersections (Badger, Romaine Village Way, Ponderosa/China Hat, and Rocking Horse), and one interchange (Knott/Baker Road). ODOT will construct a grade-separated interchange at Powers Road and the City and/or ODOT will construct a new Murphy road crossing over the Parkway. These improvements will replace the at-grade intersection(s). ODOT is eliminating at-grade intersections along the Parkway in the south end of Bend to bring the roadway into conformance with its Expressway designation. Action 1A.2a. (under Policy 1A: State Highway Classification System) in the OHP defines an Expressway.

Expressways are complete routes or segments of existing two-lane and multi-lane highways and planned multi-lane highways that provide for safe and efficient high speed and high volume traffic movements. Their primary function is to provide for interurban travel and connections to ports and major recreation areas with minimal interruptions. A secondary function is to provide for long distance intra-urban travel in metropolitan areas. In urban areas, speeds are moderate to high. In rural areas, speeds are high. Usually there are no pedestrian facilities, and bikeways may be separated from the roadway.

In addition, private access is discouraged and public road connections are highly controlled.

In 2004, ODOT completed the SPRP to develop and select alternatives for eliminating the at-grade intersections. The purpose of the plan is to ensure the long-term safety and capacity of the South Parkway and South Third Street. The selected alternative is Alternative H-Modified, Option 1. The plan eliminates at-grade cross-access from the neighborhoods on either side of U.S. 97 and replaces them with a Powers interchange and an extension of Murphy Road that will go over the Parkway, ending at Brookswood. The plan also includes an extension of north-south grid streets.

In 2005, WinCo Foods proposed to develop a 24-hour grocery store in the underdeveloped Murphy Crossing area. The City of Bend and its consultants, through a Transportation and Growth Management Program Quick Response grant, prepared the Murphy Crossing Refinement Plan (Urbsworks Architecture & Urban Design, et al, 2005). The Murphy Crossing study area is bounded by Deer Valley Drive on the north (Pinebrook residential subdivision), Ponderosa Drive on the south, U.S. 97 on the east, and Ridge Drive/Limelight Court ((old Brooks-Scanlon logging road right-of-way) on the west. The purpose of the plan is to devise a network of local streets that provide access to individual parcels in the study area. The street network is designed to limit vehicular speed and to minimize traffic volumes on any single street by distributing traffic.

**Purpose of the Technical Memorandum**

The purposes of this memorandum are to state the management problem at the interchange and to establish the interchange function, goals and objectives for the IAMP, and the management area.
PROBLEM STATEMENT

There are two challenges related to management of the Parkway between Powers and Baker Road. The first is that although the Parkway was opened in 2001, it is expected to experience capacity problems within 20 years. Rapid residential and commercial development in southern Bend will continue to impact the transportation network, causing congestion and safety problems on U.S. 97. The SPRP indicated that in 2022 a No Build Option would result in several intersections in the study area would be over capacity with a volume-to-capacity ratio in excess of 1.0. As congestion increases safety decreases, especially at the unsignalized intersections. The new interchange offers substantially increased capacity for the Parkway operation in comparison to the existing at-grade intersections. However, a significant portion of that capacity will be “used up” by existing traffic and traffic generated from planned development in the management area and regional growth.

The second issue is the potential for more intensive development to occur than assumed in the regional land use and transportation plans and the regional transportation forecasting model. Traffic operations analyses for the interchange and nearby intersections are based on regional population and employment projections. Households, population, and employment by type (e.g., retail, service, industrial) were calculated consistent with the Bend Comprehensive Plan and the Regional Transportation Plan. If development is more intense than the projections, operations at the interchange and local street network could exceed capacity at additional intersections. Existing comprehensive plan and zoning designations allow more intensive uses than that assumed in the regional model used for forecast future traffic.

INTERCHANGE FUNCTION

The primary function of the Parkway/Murphy interchange is to serve north-south inter-regional traffic. The secondary function of the interchange is to provide east-west connectivity between areas west of the Parkway with the City’s south-central commercial and residential core. Once the overcrossing is constructed, Murphy Road will serve as the main east-west connector in the immediate vicinity of the interchange, and one of three in the management area. The Oregon Transportation Commission (OTC) in its adoption of the SPRP set a condition of approval that the southbound off and northbound on ramps would not be constructed until after the Murphy over crossing was completed.

The Bend Parkway is under ODOT jurisdiction. It is five lanes (two travel lanes in each direction) with a divided median and shoulders. It is classified as an Expressway and is a designated Freight Route. According to the OHP, the purpose of an Expressway is to provide for safe and efficient high speed and high volume traffic movements for interurban travel and connections to major recreation areas with minimal interruptions. A secondary function is to provide for long distance intra-urban travel in metropolitan areas.

Murphy Road is two lanes with bicycle lanes and no sidewalks. It is under the City of Bend’s jurisdiction. It is classified as a Major Collector. A Major Collector is designed to carry traffic between arterials and between local streets and arterials. The collector street system places a greater emphasis on mobility over access to land use.

GOALS AND OBJECTIVES

This section establishes goals and objectives in order to guide the IAMP process. The goals and objectives will guide the development of the geometry alternatives and traffic and land use control measures. The goals state what the IAMP intends to accomplish. The objectives are achievable and measurable standards derived from the goals that are used to evaluate the interchange management alternatives. The IAMP goals and objectives build upon the OHP Policy 1A: State Highway Classification System (Action 1A.2 for expressways), OAR Division 51, City of Bend policies for the Parkway and the Murphy Crossing area, and
the two refinement plans relevant to the interchange management area. The Murphy Crossing Refinement Plan does not define goals and objectives, but the primary purposes of the plan is ensure east-west connectivity between the area west of the Parkway and the goods and services on Third Street. A complementary goal is to provide access to individual parcels and establish a City grid system.

**The IAMP goals are:**

- To maintain the primary function of the interchange to serve north-south inter-regional traffic over the 20-year planning period in order to preserve the investment in the facility.
- Minimize future improvements to the Parkway interchanges.
- To maintain the secondary function of the interchange to connect U.S. 97 with the City’s south-central commercial and residential core.
- On the local street network, accommodate local trips generated by current and planned land uses in a safe and efficient manner that serves the community.
- Accommodate free-flow movements from Third Street to Parkway.
- Provide improved connectivity for bicycle and pedestrian facilities.

**The IAMP traffic objectives are:**

- Develop and utilize the local street network for local traffic circulation and linkage between neighborhoods and commercial areas.
- Provide local streets consistent with the City of Bend spacing standards and design standards.
- Utilize local streets to link neighborhoods west of the Parkway to businesses along Third Street and points east while meeting City of Bend LOS standards and OHP mobility standards.
- Develop a network of frontage roads and city grid streets consistent with City of Bend spacing standards and road design standards to let local traffic circulate through the area without using Parkway.
- Manage access, including implementing an access management strategy in compliance with applicable OAR 734 Division 51.
- Resolve access issues to vacant properties south of Murphy and west of Parkway.
- Utilize the Murphy Road overcrossing as the main east-west connector in the immediate vicinity of the interchange.
- Determine whether to continue to make intersection of U.S. 97 and China Hat – Ponderosa a right-in, right-out (RIRO) or to make it an overpass.
- Determine a trigger for disconnecting Rockinghorse Road from U.S. 97.

**The IAMP land use objectives are:**

- Identify and develop land use controls so that future land uses will be consistent with the operation and safety of the new interchange.
- Effectively manage traffic generation to be consistent with the operation and safety of the new interchange by identifying implementing tools and “best practices.”
- Ensure ODOT is involved in future land use decisions that could affect the interchange by notifying ODOT through transmittals about land use applications or pre-application conferences.
- Minimize disruption to neighborhoods by utilizing existing streets, “stubbed out” streets, or rights-of-way.
- Look at possibility of mixed-use zoning for large vacant parcels.
- Ensure development is consistent with the Murphy Crossing Refinement Plan, the Bend Comprehensive Plan, Oregon Highway Plan.
- Maintain compatibility with zoning.

**MANAGEMENT AREA**

The fourth step in the process of developing an IAMP is to determine the area of influence (management area) around the interchange, where traffic operations and land uses will most likely have an impact upon safety and operation. The management area includes all of the road segments that were considered in the design of the new interchange plus an area where traffic was judged to have a substantial impact on the interchange.

The South Parkway/Murphy Crossing IAMP management area centers on the location of the new interchange and encompasses the Murphy Crossing area. It excludes the downtown area, but encompasses most of the commercial and residential land in south Bend. The south portion of the management area is outside the City of Bend limits and the urban growth boundary. The management area includes the remaining six at-grade intersections with the South Parkway that will be eliminated: Powers road, Pinebrook Boulevard, Badger Road, South Third Street, Romaine Village Way, and Ponderosa/China Hat Road (see Figure 1). The boundaries are SW Powers Road/Chase Road on the north, Knott Road/Baker Road on the south, the Deschutes River on the west, and Country Club on the east. The boundary is based on the transportation analysis zone (TAZ) boundaries. The management area includes TAZs 436, 437, 441-444, 450-454, 497-507, 511, 512, 516-518, and 562. The transportation analysis will review the intersection operation at the U.S. 97 ramp terminals at Baker Road and Knott Road.