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Report Authors

Identified in the following table are the authors who participated in preparing this Energy Report and the authors’ titles, name of their affiliated organizations, education, experience, and project role.

Technical Report Authors, Experience, and Education

<table>
<thead>
<tr>
<th>Author / Title / Organization</th>
<th>Education / Experience</th>
<th>Project Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jason Lien / Transportation Planner / Otak, Inc.</td>
<td>MCRP, Rutgers University / 10 years experience</td>
<td>Transportation Planner</td>
</tr>
</tbody>
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Introduction

The purpose of this Energy Report is to discuss and disclose any potential environmental effects that may result from the proposed improvements to the Woodburn Interchange and Transit Facility. The project has been previously evaluated under the National Environmental Policy Act (NEPA) and documented in a 2005 Environmental Assessment (EA) and again in 2006 in a Revised Environmental Assessment (REA). Additionally, changes have occurred in the affected environment and to regulations and policies relevant to the proposed project. Energy was not evaluated in the previous environmental analysis.

Project Background

The Woodburn Interchange is located on Interstate 5 (I-5) at milepost (MP) 271.85 in Marion County, Oregon, see Figure 1. The overcrossing roadway is Oregon Highway 214 (OR 214) east of the interchange and Oregon Highway 219 (OR 219) west of the interchange. The proposed project consists of reconstruction of the northbound and southbound highway ramps and widening of the overcrossing, as well as related improvements along the OR 214 and OR 219 approaches to accommodate the reconfigured interchange. The project also includes construction of a public transit center at the northwest corner of OR 214 and Evergreen Road.

The 2006 REA analysis of the Recommended Interchange Alternative did not comprehensively address the development of the public transit facility, which is identified in the Woodburn Interchange Area Management Plan (IAMP) as a component of the improvements supporting the function of the reconstructed interchange. Due to this omission, it is necessary to incorporate the potential effects of the transit facility into a Re-evaluation of the 2005 EA and 2006 REA. The Re-evaluation will update technical studies and findings, as needed, to address the transit facility and analyze the completeness of the preceding environmental reports in terms of the latest available information on the interchange design and refinements, changes in the affected environment, regulatory changes, and NEPA compliance. The Re-evaluation and supporting technical reports will not be stand-alone documents, but rather supplement the previous environmental documentation.

The interchange is the only I-5 connection (Exit 271) within the City of Woodburn and also provides access to northern Marion County. Woodburn has grown to a population of 24,080 in 2010, a 20% increase from its 2000 population. In the same time period, Marion County’s population increased by 10.7% to 315,335 people. Average Annual Daily Traffic on I-5, taken from an ODOT traffic counter 0.3 miles south of the Woodburn Interchange, was 81,900 vehicles in 2009 (41,190 vehicles southbound and 40,710 vehicles northbound). At the interchange, average daily traffic (ADT) volumes on the ramps ranged from 6,620 ADT (northbound off-ramp) to 7,810 ADT (northbound on-ramp) in 2009. Total volume of all four ramps was 28,830 vehicles. The ramp
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volumes show a substantial increase (89.2%) in traffic over previous years—in comparison, total ramp traffic volume in 2001 was 15,240 vehicles.

The Woodburn Interchange Project (Key No. 12518 (OR 214 @ Evergreen Rd. Transit Facility); Key No. 15739 (I-5 @ OR 219/214)) is intended to address existing operational and safety deficiencies that are anticipated to worsen with continued growth in Woodburn and the Willamette Valley as a whole. Safety deficiencies are characterized by high crash rates at six intersections and inadequate queuing storage at the southbound off-ramp, leading to traffic queues that occasionally back on to the shoulder of southbound I-5. Road grades that exceed acceptable standards are present on the eastbound and westbound approaches to the overcrossing bridge, resulting in poor sight-distance for drivers and creating delay. To help alleviate these issues and enhance overall function of the interchange area, geometric and capacity improvements to the road network are proposed as well as enhancements to pedestrian/bicycling facilities and multi-modal connectivity.

Figure 1. Project Vicinity Map
As noted earlier in this report, considerable time has been spent studying potential effects of the proposed interchange improvements on transportation conditions and the surrounding environment. An Environmental Assessment was completed in 2005. In 2006, the Recommended Interchange Alternative was evaluated in a Revised Environmental Assessment, which updated the 2005 EA, as needed, based on acceptance of the preferred alignment alternative. Following review of these environmental documents, a Finding of No Significant Impact (FONSI) was signed by the Federal Highway Administration in December 2006.

The Final Interchange Area Management Plan (IAMP) for the Woodburn Interchange, published June 2006 and adopted by the Oregon Transportation Commission (OTC), documents interchange management measures agreed to by the City and ODOT. It summarizes information on the Woodburn Interchange Project's background, purpose and need, relevant plans and policies, land use and environmental issues, transportation conditions and deficiencies, alternatives development and analysis, plan recommendations, public involvement, and implementation strategies.

**Project Description**

The Recommended Interchange Alternative is a hybrid of the “widen north” and “widen equal” alternatives (developed and evaluated in the 2005 EA) that would reconstruct the interchange at the junction of I-5 and OR 214 and OR 219 to a partial cloverleaf-A (loop ramps in advance of the overcrossing structure of I-5) and widen OR 214 and OR 219 equally or northerly of the existing centerline, depending on the segment. The Recommended Interchange Alternative widens the overcrossing structure to the north. According to the 2006 REA, the design alignment along existing OR 214 east of the Woodburn Interchange is addressed using the following principles:

- Public support for widening north of the existing centerline west of Evergreen Road.
- Shift the alignment towards an equal widening on both sides of the existing centerline, as is practical and feasible, between Evergreen Road and Cascade Drive.
- Between Evergreen Road and Cascade Drive, particular attention should be given to minimizing impacts, as is practical and feasible, to the property currently occupied by Kentucky Fried Chicken and to the Senior Estates properties adjacent to Oregon 214.
- East of Cascade Drive, particular attention should be given to providing as much space as is practical and feasible between the medical offices at the southeast corner of Oregon 214 and Cascade Drive and the back of the sidewalk running along the south side of Oregon 214.

The Recommended Interchange Alternative includes new 6-foot sidewalks with an additional 6-foot wide landscaped buffer between the sidewalk and the curb. A bicycle lane is provided in each direction along OR 214 and OR 219. A raised median is added and modifications to access for city streets would be made at Oregon Way, Evergreen Road, and Lawson Avenue. Further, the project alternative provides dedicated turning lanes onto local streets at key intersections with OR 214 along with local street improvements along Old Arney Road (MP 36.63), Lawson Avenue (MP 36.95),
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Evergreen Road (MP 37.02), Oregon Way/Country Club Road (MP 37.14), and Cascade Drive (MP 37.27).

To support multi-modal use, the project includes a new transit park and ride facility in the northeast quadrant of the interchange at the intersection of OR 214 and Evergreen Road, and an extension of Evergreen Road north of OR 214 to Country Club Court. The transit facility site, located north of OR 214 and between the extended Evergreen Road and I-5 northbound on-ramp, will facilitate alternative mode (bus) travel at the interchange. The Evergreen Road extension will provide alternative access to adjacent properties during and after construction.

It is anticipated that construction staging areas will be located within the project footprint.

Purpose

The purpose of the Woodburn Interchange Project is to improve the traffic flow and safety conditions of the existing Woodburn/I-5 interchange.

Need

The exiting Woodburn/I-5 interchange does not meet current design and operational standards, which causes traffic to move at slower speeds and increases congestion. Future growth in the interchange area will increase congestion problems, increase the difficulty to access adjacent businesses, and increase the risk of safety to drivers, bicyclists, and pedestrians.

Affected Environment

Project Design Changes

The project design concept is the same as the alternative evaluated in the 2006 REA with the exception of the inclusion of a transit park and ride facility. The transit facility is planned at the northwest corner of OR 214 and Evergreen Road. While the transit facility has been part of the interchange concept for some time, it was not evaluated as part of the Recommended Interchange Alternative in the 2006 REA and is included in this analysis. In addition, placement of noise mitigating sound barriers is an updated design element—specific sound barrier design parameters were not known at the time of the previous analysis.

Inclusion of the transit facility involves the extension of Evergreen Road to the north along the existing northern leg of the OR 214 / Evergreen Road intersection, providing improved access to
the transit facility and adjacent properties (extension of Evergreen Road was an element of the Recommended Interchange Alternative and included in the previous environmental analysis).

The transit facility would be constructed over an existing asphalt parking lot. Buildings formerly located at this site have been razed, only the parking lot and a few landscape trees remain.

**Area of Potential Impact**

For the purposes of this analysis, the Area of Potential Impact (API) is the study area shown in Figure 1.

**Relevant Policies, Guidelines and Regulations**

Various regulations and guidelines require ODOT to consider and evaluate energy efficiency and to incorporate energy saving procedures into transportation facilities and programs.

**National Environmental Policy Act (NEPA) of 1969**

The National Environmental Policy Act (NEPA) of 1969 was established to minimize or eliminate damage to the environment caused by actions funded or taken by the federal government. NEPA establishes policy, sets goals, and provides means for carrying out the policy. In order to comply with NEPA, an energy analysis is appropriate for some proposed transportation projects.

**FHWA Technical Advisory T 6640.8**

The Federal Highway Administration Technical Advisory T 6640.8, dated February 24, 1982, states that Environmental Impact Statements “should discuss in general terms the energy requirements and conservation potential of various alternatives under consideration.”

**Transportation Planning Rule (OAR 660-12-035)**

Section 35 of the Transportation Planning Rule (OAR 660-12-035) states that the following standards shall be used to evaluate and select transportation system alternatives: The transportation system shall minimize adverse economic, social, environmental and energy consequences.

**Statewide Planning Goals: Goal 13: Energy Conservation (OAR 660-015-0000(13))**

To conserve energy: Land and uses developed on the land shall be managed and controlled so as to maximize the conservation of all forms of energy, based upon sound economic principles.
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Guidelines

Planning
1. Priority consideration in land use planning should be given to methods of analysis and implementation measures that will assure achievement of maximum efficiency in energy utilization.
2. The allocation of land and uses permitted on the land should seek to minimize the depletion of non-renewable sources of energy.
3. Land use planning should, to the maximum extent possible, seek to recycle and re-use vacant land and those uses which are not energy efficient.
4. Land use planning should, to the maximum extent possible, combine increasing density gradients along high capacity transportation corridors to achieve greater energy efficiency.
5. Plans directed toward energy conservation within the planning area should consider as a major determinant the existing and potential capacity of the renewable energy sources to yield useful energy output. Renewable energy sources include water, sunshine, wind, geothermal heat and municipal, forest and farm waste. Whenever possible, land conservation and development actions provided for under such plans should utilize renewable energy sources.

Implementation
1. Land use plans should be based on utilization of the following techniques and implementation devices which can have a material impact on energy efficiency:
   a. Lot size, dimension, and siting controls;
   b. Building height, bulk and surface area;
   c. Density of uses, particularly those which relate to housing densities;
   d. Availability of light, wind and air;
   e. Compatibility of and competition between competing land use activities; and
   f. Systems and incentives for the collection, reuse and recycling of metallic and nonmetallic waste.

Oregon Transportation Plan
The Oregon Transportation Plan (OTP) gives direction to the coordination of transportation modes and states the desired characteristics of a transportation system. The OTP includes guidelines which operate in conjunction with the Transportation Planning Rule.

Goal 4 of the Oregon Transportation Plan, Sustainability, sets a policy framework that applies to all types of travel and transportation investments. The policies provide guidance on environmental quality, energy supply and creating communities that support the integration of land use and transportation including the key fundamentals of building street networks, connecting modes and utilizing land in efficient ways that reduce travel.
Policy 4.1 includes “environmental responsibility,” as a characteristic for a transportation system. Policy 4.1 of the OTP states:

To provide a transportation system that is environmentally responsible and encourages conservation of natural resources.

City of Woodburn Comprehensive Plan (Amended 2005)
Section M in the Comprehensive Plan addresses Energy Conservation. Goal M-1 of the City is to “encourage conservation of energy in all forms, and to conserve energy itself in the City’s operations, buildings, and vehicular use.” The goal is followed by seven policies in support of its implementation.

City of Woodburn Transportation System Plan (TSP) (2005)
Goal 1 of the TSP is to establish a transportation system that is not reliant on one form of transportation and minimizes energy consumption and air quality impacts. Supportive policies advocate for improved bikeway and pedestrian facilities as well as expanded bus service options.

Environmental Consequences

At this time, no local, state, or federal laws specifically constrain energy use. For the purposes of this report, ODOT polices regarding energy use will be used to evaluate the Woodburn Interchange and Transit Facility project. Goal 4 of the Oregon Transportation Plan (OTP), Sustainability, sets a policy framework that applies to all types of travel and transportation investments. Under Goal 4 of the OTP, Policy 4.1 encourages energy conservation and Policy 4.2 provides guidance on energy supply.

OTP Policy 4.2 – Energy Supply
It is the policy of the State of Oregon to support efforts to move to a diversified and cleaner energy supply, promote fuel efficiencies and prepare for possible fuel shortages.

Under this policy, Strategy 4.2.2 supports the conversion of passenger vehicles and public transportation fleets to more fuel-efficient and alternative fuel vehicles. While the Woodburn Interchange is predicted to see an increase in vehicular traffic consistent with population growth in the Willamette Valley, the project employs strategies that encourage the use of new technologies. Specifically, the project will provide space for up to 50 electric vehicle charging stations within the transit facility site. This includes the installation of new conduit, trenching, and junction boxes for future installation of the charging stations, facilitating the use of cleaner-running and less energy intensive vehicles.
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The transit facility will serve Woodburn Transit (local transit service), the Chemeketa Area Regional Transportation System paratransit service, and express commuter service between Wilsonville and Salem provided by South Metro Area Rapid Transit (SMART). The makeup of the respective bus fleets is not known, but it is likely that many of the vehicles run on conventional diesel or gasoline engines. Strategy 4.2.2 could be further supported by a bus fleet that runs on biodiesel or other alternative fuel supply.

Generally, fuel efficiencies can be achieved by reducing vehicle miles traveled (VMT) or removing vehicles from the road. Installation of the transit facility encourages the use of public transportation locally and on the highway system, reducing the number of personal vehicles and thereby energy use. The success of this strategy in part depends on price mechanisms. The continued trend of higher fossil fuel prices will make alternative transportation and the selection of alternative fuel vehicles more viable to the consumer. State and federal tax incentives or disincentives also move the price point in favor of alternative energy use or modes. While this is outside the purview of the interchange project, development of the transit facility and electric charging stations position the project to at least encourage more energy efficient practices by the traveling public.

In addition, installation of bike and pedestrian facilities on both sides of OR214/219 and Evergreen Road support alternative mode travel through the interchange area and accessibility to the transit facility. The interchange project strives to provide adequate and safe access for alternative travel modes, allowing people to move through a congested area on dedicated facilities and connect to common destinations under their own power.

Potential Impacts

Expansion of transportation capacity could encourage an increase in vehicular traffic, thus a potential increase in energy consumption. The predicted growth in traffic may be offset by the transit facility and use of public transportation in lieu of multiple, longer auto trips. Furthermore, providing bike and pedestrian connectivity to the transit center may eliminate some auto trips altogether.

The traffic analysis (DKS 2012) conducted for this project indicates peak hour operational benefits at several intersections as a result of completing the interchange project compared to the No-Build scenario. Less vehicular congestion and delay translates to improved fuel efficiencies. A potential project benefit is the provision of infrastructure at the transit facility for future installation of electric vehicle charging stations.

The construction process would result in energy impacts through the production and transport of construction materials as well as the use of heavy equipment. It is possible to reduce the construction impact through mitigation strategies discussed in the next section.
Possible Mitigation

No energy regulations exist that require mitigation. However, there are measures that could encourage energy conservation.

The project should strive to install the electric vehicle charging stations as soon as feasible (not just the capability) and educate the public on their location and operation. The transit park and ride facility would benefit if energy efficient LED lighting were used instead of conventional lighting systems. Alternative fuel vehicles should also be encouraged in the transit facility bus fleet (e.g. biodiesel).

The increase in roadway capacity should not be an incentive to greatly intensify development around the interchange, which could lead to increased congestion and energy inefficiency. To protect the investment in traffic mobility, the Woodburn Interchange Area Management Plan (IAMP) was created in cooperation with the City of Woodburn to manage land uses and trip generation in the project area. The provisions of the IAMP have been codified in the City’s Development Ordinance, and following the IAMP requirements is a strategy to mitigate unwanted traffic growth.

Innovative approaches such as new technologies, energy conservation methods, sustainable design, and maintenance programs may reduce the amount of energy the project would require during construction. Efforts to incorporate energy savings objectives, energy-efficient construction practices, and Best Management Practices (BMPs) may result in a reduction of overall construction energy use. For example, stipulations could be established with the contractor to reduce idle times of heavy equipment (limits on vehicle and equipment idling is currently established in ODOT Specifications Section 290.3 (c)). Use of nighttime construction could facilitate faster completion of the project and reduce heavy equipment operating hours.

Conclusion

The Woodburn Interchange and Transit Facility has elements that provide benefits beyond that of a typical interchange reconstruction project. The inclusion of the transit facility, installation of conduit for electric charging stations, and provision of and improvement to substandard bicycle and pedestrian facilities potentially benefit energy use. Table 1 summarizes the potential impacts and mitigation measures.
Table 1: Woodburn Interchange and Transit Facility Summary of Potential Impacts, Benefits and Mitigation Measures

|---------------------------|---------------------------------------------------------------|------------------------------------------------|--------------------|
| Energy                    | Not evaluated in the 2005 EA or 2006 REA                      | • Increase in traffic volumes, but this may be countered by shift to alternative modes and less peak hour delay  
|                           |                                                               | • Construction process can result in high energy consumption  
|                           |                                                               | • Potential project benefits from inclusion of transit facility, installation of conduit for electric charging stations, provision of and improvement to substandard bicycle and pedestrian facilities | • Bring electric charging stations online as soon as feasible  
|                           |                                                               |                                                  | • Encourage use of alternative fuels in transit facility bus fleet  
|                           |                                                               |                                                  | • Use life cycle cost assessment of construction materials  
|                           |                                                               |                                                  | • Encourage use of “green” construction practices and materials – minimize operating and idle times for heavy equipment, consult Green Highways Partnership for Best Practices in sustainable road building  
|                           |                                                               |                                                  | • Encourage public education on use of the transit facility as well as operation of the electric charging stations when installed |
References


Green Highways Partnership website: (http://www.greenhighwayspartnership.org/index.php)


Oregon Statewide Planning Goals. Oregon Administrative Rules (OAR) 660-14


Title 42 of the United States Code (USC). 42 USC 6201, 13401, and 13431
