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EXECUTIVE SUMMARY

This study evaluates the feasibility of moving Portland-to-Eugene intercity passenger rail service from the current Union Pacific (UP) mainline railroad route to a parallel rail route known as the Oregon Electric (OE) alignment. Currently, the Oregon Department of Transportation (ODOT) sponsors two Amtrak trains and three intercity Thruway buses daily between Portland and Eugene. Passenger trains operate on the UP mainline track. Service integrity for these passenger train offerings has been a persistent challenge, in part due to the inherent difficulty of integrating passenger operations into a heavily-used, single-track freight mainline operation.

Significant population growth is expected in the Willamette Valley in the next 20 years. The Oregon Transportation Plan states that “by 2030, Oregon’s Transportation System needs to accommodate 41 percent more population and an 80 percent increase in freight tonnage.” While regional and statewide transportation plans may include some additional transportation capacity in the Valley by 2030, there are no plans to build capacity into the highway and rail systems commensurate with the magnitude of growth in people, jobs and freight.

The increase in highway congestion is likely to spur public interest in energy-efficient alternatives to personal auto travel. Achieving increases in the frequency and quality of passenger rail service will require substantial public investment under any scenario. It is appropriate, therefore, to carefully assess routing alternatives for improved service as a foundation for any long-term investment program.

This study analyzes current and future conditions to determine the feasibility of a variety of alignment and passenger service scenarios for intercity passenger rail service between Portland and Eugene. Analysis of the potential to transfer passenger rail service to the OE line required meetings with rail stakeholders, computer modeling, engineering evaluation of the rail corridors and preliminary investigation into the environmental impacts and potential barriers.

The study concludes that with associated improvements and mitigation of environmental and land use impacts, it is feasible to shift Portland-to-Eugene intercity passenger rail service from the UP rail line to the OE rail line. This shift, along with the corresponding track improvements, would in turn benefit freight rail operations on both the OE and the UP routes.

Cost estimates were developed for the various alternatives based on conceptual design options and unit costs from similar passenger rail projects in Oregon and in the western United States. These estimates show that the OE alternative would cost less than the UP alternative. The study’s comparative evaluation of the two routes shows ridership to be slightly higher on the OE alternative.

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1 Oregon Transportation Plan, 2007.
INTRODUCTION

Travel demand for personal and business trips is projected to grow as population and employment in the Willamette Valley continues to increase. Planning agencies forecast population in the Willamette Valley will grow from nearly 2.4 million people in the year 2000 to 3.45 million people in 2030, a 44 percent increase, along with a similar increase in employment. The Oregon Transportation Plan forecasts freight demand to grow by as much as 80 percent in the same time frame. These increases will result in travel demand that exceeds the available freight and passenger rail capacity in the Willamette Valley.

ODOT is examining alternatives to increase intercity passenger rail capacity in this corridor. ODOT currently sponsors two Amtrak trains and three intercity Thruway buses daily between Portland and Eugene. This service, known as the Amtrak Cascades, is part of a larger federally designated passenger rail corridor, the Pacific Northwest Rail Corridor (PNWRC) that operates between Eugene, Portland, Seattle, and Vancouver, BC.

Intercity passenger trains operate on the Union Pacific (UP) mainline track, and compete with UP freight trains for the limited track capacity of this line. As UP freight business grows, expanding the number of passenger trains to meet demand will be challenging and will require substantial additional rail capacity investment. Quality passenger service necessitates reliable, disciplined operations with consistent on-time performance. Past history on the UP route calls into question whether this is achievable between Portland and Eugene, even with new investment, given the inherent challenges and competition for the limited capacity of this high density freight mainline operation.

PURPOSE OF THIS REPORT

ODOT, UP and BNSF Railway Company (BNSF) own right-of-way on a rail corridor known as the Oregon Electric (OE) line, which runs parallel to the UP mainline. This report examines potential ways to offer expanded intercity passenger rail service between Portland and Eugene in the future by moving passenger service off the UP mainline onto the lesser-used OE line, both shown in Figure 1.

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3 Over 3.2 million people lived in Oregon in 2000, which is projected to increase to 4.8 million by 2030. Further, 71 percent of Oregonians lived in the Willamette Valley in 2000 and, statewide, 58 percent of Oregonians lived in metropolitan areas (Oregon Transportation Plan 2007). Also based on forecasts from Lane Council of Governments, Salem-Keizer Area Transportation Study (SKATS), and Metro.

4 A fourth roundtrip that begins and ends at the University of Oregon campus in Eugene operates on most Fridays and Sundays in addition to the three daily roundtrips.
This study examines the following for the two alternatives considered:

- Concerns about passenger and freight rail interaction identified by the railroads;
- Existing UP and OE characteristics, (e.g. line condition and nearby land uses);
- Operating plan assumptions such as stations, train equipment and schedule;
- Ridership, capacity, land use and environmental effects;
- Conceptual cost estimates for design options for both the OE and UP alternatives; and
- Other considerations including control over train priority.

**BACKGROUND**

Amtrak routes around the country are, in general, a legacy of the final privately-operated passenger corridors in operation when Amtrak was created in 1971 by Congress to take over passenger rail operations. As part of this legislation, the federal government agreed to relieve freight carriers of their obligation to provide passenger service in exchange for perpetual rights of access for Amtrak to operate on the freight carriers’ lines.

Oregon is fortunate to have two active rail alignments serving the major population centers in the Willamette Valley. Each alignment was engineered with passenger rail service in mind. The original companies, now owned by UP and BNSF, actually competed vigorously for passengers in the early 1900s between Portland, Salem and Eugene. Passenger service on the OE ended in 1933. Southern Pacific (SP), the predecessor to UP, was still operating a thrice weekly Oakland, California-to-Portland Cascade train over the present Cascades route at the time of the 1971 Amtrak assumption of passenger service.

The Amtrak Cascades service on the UP line is a legacy of the 1971 Amtrak agreement and may not present the best long-term alternative for providing and investing in passenger rail expansion for the future.

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5 Formerly, the Burlington Northern and Santa Fe Railway Company.
Figure 1. Intercity Passenger Rail Assessment Study Corridors
CORRIDOR HISTORY AND CURRENT USE

Passenger Service

The Amtrak Cascades service between Portland and Eugene began in 1995 under the sponsorship of the Oregon Department of Transportation (ODOT) with one daily roundtrip train. A second roundtrip train was added in October 2000. Currently, there are two Amtrak Cascades trains and three intercity Thruway buses daily between Portland and Eugene. There are two northbound trains in the morning and two southbound trains in the evening. The three roundtrip Thruway buses run at other times of the day to Portland’s Union Station where they provide connections to two additional Amtrak Cascades trains into Washington state (and to Vancouver, British Columbia) as well as Empire Builder trains traveling to and from points east, including Chicago. Amtrak’s Coast Starlight also provides interstate passenger rail service with one southbound and one northbound trip per day between Los Angeles and Seattle that includes stops in Eugene, Albany, Salem, and Portland. This service carries a substantial number of local passengers between Portland and Eugene.

Union Pacific (UP) Mainline

The original north-south interstate rail line through the Willamette Valley and into California was built by a succession of entrepreneurs and business rivals between 1868 and 1887. Early competition featured near-simultaneous ground-breakings in Portland for construction of alternatives including a “west side” route via McMinnville and Corvallis to Eugene and an alternative “east side” alignment through Oregon City and Salem. By 1870 Ben Holladay, promoter of the easterly alignment, came to control both routes and, with the support of German financiers, incorporated the Oregon and California Railroad (O&C). O&C’s aim from the outset was to complete a route that would connect with SP’s track in northern California. The route reached Eugene by October 1871 and Roseburg by the close of the following year. While the westerly alignment was eventually extended through Corvallis to Eugene as per the original plan, the easterly Oregon City-to-Salem track evolved to become the principal route for north south trains in the state and continues in that role to the present day.

Passenger operations were the principal driver for construction of most rail lines in the late 1880’s; the O&C/SP lines in Oregon were no exception. Long-distance trains continued to operate over the Oregon City-to-Salem-to-Eugene route to and from California. The heyday of modern long-distance passenger services occurred before World War II, prior to development of the Interstate highways and modern air travel. During that period, five long distance passenger trains ran over the Portland-to-Eugene alignment each day: three to the Bay Area, one to Los Angeles, and a single Portland-

6 A fourth roundtrip that begins and ends at the University of Oregon campus in Eugene operates on most Fridays and Sundays in addition to the three daily roundtrips.

7 These trains are sponsored by the Washington State Department of Transportation.

8 In 1913.
to-Ashland roundtrip. Only a thrice weekly Oakland, California-to-Portland Cascade train carried passengers over the route when Amtrak assumed control of the nation’s long-distance trains in 1971. Under Amtrak, this train evolved to become the daily Los Angeles-to-Seattle Coast Starlight. Except for a state-supported experiment in 1980-81 when Amtrak operated two roundtrip Willamette Valley Express passenger trains between Eugene and Portland, the Coast Starlight remained as the only passenger rail service in the valley until Oregon began support of the Cascades service in 1994.

In 1996, UP acquired SP in its entirety and thus took ownership and control of train operations along this corridor, which included all Amtrak trains. The current Amtrak Cascades intercity passenger trains operate on this UP mainline track, competing with UP freight trains for the same limited rail capacity. The scheduled trip time between Eugene and Portland is two hours and 35 minutes. However, sometimes trains arrive at their final destination as much as 20 minutes ahead of schedule, indicating that the 2008-2009 line conditions are conducive to running times of 2 ¼ to 2 ½ hours. On average, passenger trains run on-time approximately 68 percent of the time, but on-time rates over the past ten years have been as low as 45 to 50 percent.9

The UP north-south mainline carries as many as 20 to 25 freight trains per day along the Willamette Valley. Based on current UP system capacity and projected freight growth, this could increase to as many as 30 to 35 trains per day before 2030. The growth in freight traffic emphasizes the need for investment to support additional passenger train frequencies while, at the same time, achieving a standard of on-time performance that can be competitive with highway travel.

Since the mid-1990s, Oregon has funded a variety of rail improvements on the UP mainline to mitigate for the impact of increased passenger service on freight operations. Improvements have included installation of Centralized Traffic Control (CTC), at-grade crossing signal upgrades, and track upgrades. ODOT’s 2001 Rail Plan provides background for future rail improvements to be undertaken in concert with future additional passenger train service. With regard to track condition, the UP mainline existing track and bridges are in good condition, and the line’s centralized train control and communications systems will support passenger trains operating at the maximum speed of 79 miles per hour (mph) for many miles of the UP line. However, only six percent of the Portland-to-Eugene route is currently posted for 79 mph.

Oregon Electric (OE) Line

Parallel to the I-5 corridor, also extending between Portland and Eugene, is a secondary rail corridor dubbed the “Oregon Electric” (OE) line. The OE line was first developed as an independent passenger-oriented operation (the Oregon Electric Railway Company), and at its zenith it was the largest electrified railroad operation in Oregon. The OE transitioned to a freight emphasis with the demise of electric interurban trains on this line in the early 1930s. Corporately, OE was absorbed into the Spokane, Portland and Seattle (SP&S) Railroad in 1910, one of the Hill-affiliated rail companies that together

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9 Historical on-time performance reports for Amtrak Cascades from Amtrak.com.
with Northern Pacific and Great Northern later formed the Burlington Northern (BN) Railroad. BN later merged with Atchison Topeka & Santa Fe Railway to become BNSF in 1995. Both BN and BNSF sold and leased many branch line properties in the 1980s and 90s to short line operators, trimming costs, consolidating capital spending and retaining local business through agreements with the more flexible, locally based short line operators.

Today, Portland & Western Railroad (PNWR), a large regional short line owned by Genesse & Wyoming Inc., operates the OE line from Willsburg Junction to Eugene. There are three separate right-of-way owners along the line: UP owns a segment from Willsburg Junction to Tualatin (10 miles); ODOT owns the right-of-way between Tualatin to just North of Keizer (28 miles); and BNSF Railway (BNSF) owns the stretch from North of Keizer to Eugene (76 miles). The operating rights of the ODOT-owned right-of-way are owned by the PNWR. The sections owned by the BNSF and UP are leased to PNWR.

Current track condition on the OE line is suitable for short line operations and generally supports freight train speeds of up to 25 mph. However, significant upgrades are needed for the line to meet federal standards for passenger service. Continued local service to freight rail clients must be considered along with slow-speed operations where track runs within or closely adjacent to streets in Salem, Albany, Junction City, and Harrisburg. Several bridges along the corridor likely will need rehabilitation or reconstruction in the next 10 to 15 years in order to keep train speeds at their current levels.

Freight traffic dominates the OE corridor and, until this year, freight was the only train activity on the OE alignment. PNWR operates approximately two to six trains per day between Portland and Eugene. Freight service demand on PNWR is the product of traffic moving to and from local Oregon business clients for delivery to further locations by both UP and BNSF, along with some modest but growing short-haul local traffic.

Since February 2009, PNWR began sharing a portion of the OE line with Trimet’s commuter rail service (WES), from Tualatin to Wilsonville, overlapping where intercity passenger trains might run in the future.

**ALTERNATIVES CONSIDERED**

Two alternative routes were considered for intercity passenger rail service between Portland and Eugene: 1) using the current UP mainline, and 2) using the parallel OE rail line.

The term “scenario” applies to levels of train service (in terms of frequency and travel time) analyzed with each alternative. For each alternative, a variety of passenger train service scenarios were analyzed to estimate passenger ridership for the future year of 2030. These scenarios range from maintaining the current service (referenced as the “baseline” scenario with two train and three bus roundtrips per day) up to increased
service of six train roundtrips per day. Table 1 summarizes the assumptions of the scenarios considered for each alternative.

The two and six daily roundtrip scenarios assumed track and crossing improvements as well as train control improvements would be made to achieve an increase in maximum running speed from the current 79 mph to 90 mph under either alternative.\textsuperscript{10}

\textsuperscript{10} Federal “Rail Safety Improvement Act of 2008”.
Table 1. Assumptions for Alternatives and Scenarios Examined

<table>
<thead>
<tr>
<th>Year, Alternative, Scenario</th>
<th>Assumptions</th>
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<tr>
<td><strong>1998 UP Actual</strong></td>
<td>Actual counts used to calibrate the statewide travel model. Travel time between Portland and Eugene was approximately 2¼ hours each way. Note: the Oregon City station was not in operation in 1998.</td>
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<td><strong>1998 UP As Modeled</strong></td>
<td>Annual ridership calculated by the model, and used for comparisons to the 2030 scenarios. Travel time between Portland and Eugene modeled as approximately 2¼ hours each way. Note: the Oregon City station was not in operation in 1998.</td>
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<tr>
<td><strong>2008 UP Actual</strong></td>
<td>Two train and three <em>Thruway</em> bus roundtrips per day. Estimated counts are based on the September 2008 <em>Cascades</em> Ridership Report. Travel time between Portland and Eugene averages approximately 2¼ to 2½ hours each way.</td>
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<tr>
<td><strong>2030 UP “Baseline”</strong></td>
<td>Trains still on UP line, no further track improvements between now and 2030 beyond what are already funded to be in place between 2008 and 2010. Service includes two train and three <em>Thruway</em> bus roundtrips per day. A higher Portland-to-Eugene travel time of 3 to 3¼ hours is assumed and modeled to reflect an increase in delays due to freight train traffic.</td>
</tr>
<tr>
<td><strong>2030 UP, 2 Train Roundtrips per Day</strong></td>
<td>Two train and three <em>Thruway</em> bus roundtrips per day, running on travel time schedules similar to today along with track improvements to accommodate running speeds of up to 90 mph that would reduce estimated travel times to 2 to 2¼ hours each way. Requires significant capital investment to offset growth of freight volumes and to reach acceptable level of on time performance.</td>
</tr>
<tr>
<td><strong>2030 OE, 2 Train Roundtrips per Day</strong></td>
<td>Two train and three <em>Thruway</em> bus roundtrips per day, running on travel time schedules similar to today along with track improvements to accommodate running speeds of up to 90 mph that would reduce estimated travel times to 2 to 2¼ hours each way. Requires significant capital investment to provide passenger rail service at an acceptable level of on time performance and to mitigate impact to freight business.</td>
</tr>
<tr>
<td><strong>2030 UP, 6 Train Roundtrips per Day</strong></td>
<td>Six train roundtrips per day and track improvements to accommodate running speeds of up to 90 mph that would reduce estimated travel times to 2 to 2¼ hours each way. Requires significant capital investment, similar to UP two train scenario.</td>
</tr>
<tr>
<td><strong>2030 OE, 6 Train Roundtrips per Day</strong></td>
<td>Six train roundtrips per day and track improvements to accommodate running speeds of up to 90 mph that would reduce estimated travel times to 2 to 2¼ hours each way. Requires similar capital investment as the OE two train scenario.</td>
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UP Alternative

The UP alternative, shown in Figure 2, is based on the same track alignment as the existing UP mainline. For this alternative, it is assumed that projects on the UP mainline already underway or programmed and funded for completion in the next two to three years will be in place. Additionally, it is assumed that a complete second mainline track between Eugene and Portland will be necessary to reach acceptable levels of on time performance under either a two or six train roundtrip-per-day scenario. All intercity passenger rail stations (Portland, Oregon City, Salem, Albany, and Eugene) would remain in their existing location. For cost estimating and evaluation purposes, the UP alternative is treated as one segment between Eugene and Willsburg Junction, which is located south of Portland, instead of to Union Station. Both the OE and UP alternatives would operate over the UP mainline from Willsburg Junction to Union Station in Portland.

OE Alternative

The OE alternative was developed with the intent of shifting service as much as possible onto the existing OE line. There are locations where trains cross over and use UP right-of-way for select segments of the route. There are others where more than one alignment option was developed due to offset issues with cost, freight train operations, and potential environmental impacts. The OE alternative is shown in Figure 3.

The OE alternative is analyzed in five segments between the south end of Portland, where it deviates from the UP mainline at Willsburg Junction, and Eugene. A sixth segment is the UP mainline between Willsburg Junction and Portland’s Union Station, on which passenger trains currently operate. No changes to this segment are examined in this study.

The following OE alternative segments are:

- **Segment 1**, between Willsburg Junction and Tualatin. The OE alignment travels south on the UP Tillamook branch to a junction in Lake Oswego known as “Cook Junction”, then continues south on the Newberg branch. Both the Tillamook and Newberg branch lines are owned by UP, and leased and operated by the PNWR.

- **Segment 2**, in Tualatin. At Tualatin, a connection is needed to transition from the roughly east-west Newberg branch to the north-south OE route to continue to Salem and eventually to Eugene. Options for Segment 2 in the Tualatin area are shown in Figure 4. There are alignment options for the connection in Tualatin:
  
  - **Segment 2A**: A new rail viaduct likely raising the north-south track so freight and commuter rail service can continue toward Beaverton, while enabling the intercity passenger trains to connect to the east-west route. The rail line would be grade separated over Tualatin-Sherwood Road near the Tualatin passenger station.
Segment 2B: A new rail route that connects the north-south OE corridor with the Newberg route in the Tualatin area is also an option.
Figure 2. UP Alternative between Portland and Eugene.
Figure 3. OE Alternative Segments between Portland and Eugene
Figure 4. Options for Segment 2 (Tualatin Area) of the OE Alternative
Segment 3, Tualatin to Salem. Both options use the OE line, and passenger trains share track with PNWR freight trains. This segment includes two to three 7,000-foot long sidings to allow passenger trains to pass freight trains operating at locations near industrial sites where freight operations are more frequent. These sidings also alleviate the impact of passenger trains on freight train operations by allowing for approximately 1.3 miles of two-track operations at each location.

- Segment 4, Salem to Albany. Segment 4 of the OE alternative continues to use the OE line. A new Amtrak Cascades passenger rail station would need to be located along the OE line near downtown Salem.

- Segment 5, through Albany: In Albany, the alternative moves from the existing OE line over to the UP right-of-way and remains adjacent to but separate from the UP mainline track past the Albany Amtrak station, as shown in Figure 5.

- Segment 6, south of Albany. South of Albany, two options were developed to provide a connection between the OE and UP corridors. The options south of Albany include:
  - Segment 6A: Provides a new bridge crossing over the Calapooia River on the south side of Albany.
  - Segment 6B: Uses an existing UP bridge crossing over the Calapooia River south of Albany

- Segment 7, between the reconnection point south of Albany and Junction City. From the reconnection point, the OE alternative remains on the OE line to Junction City.

- Segment 8, between Junction City and Eugene. Two options were developed, as shown in Figure 6, both of which continue to use the existing Eugene Amtrak station:
  - Segment 8A: Reconnect back to and remain on the UP mainline down to Eugene.
  - Segment 8B: Use the OE track to north Eugene, then construct a new track skirting the Eugene freight yard in the UP right-of-way, to the Eugene passenger station.
Figure 5. Options for Segment 6 (between Albany and Junction City) of the OE Alternative
Figure 6. Options for Segment 8 (between Junction City and Eugene) of the OE Alternative
ANALYSIS METHODS

Analysis Tools
This study used a combination of engineering and environmental review, computer modeling, and rail stakeholder involvement to analyze data and reach conclusions:

- Geographic Information System (GIS) mapping to lay out conceptual rail alignments and estimate potential land use and environmental impacts;
- Estimation of passenger ridership using a computer travel model known as the Oregon Statewide Model (SWIM);
- Track charts and rail engineer observations to assess operating conditions and potential rail capacity improvements needed to mitigate passenger train impacts; and
- Meetings with the rail stakeholders and project team staff to develop and analyze the alternatives. Rail stakeholders included staff from UP, PNWR, BNSF, and Amtrak.

General Assumptions
A general set of service and design assumptions were made and applied to both alternatives, as described below. Other assumptions specific to each alternative are described in the sections that detail those alternatives, presented previously in this report.

Between Portland’s Union Station and Willsburg Junction in the southern area of Portland both alternatives were assumed to use the existing UP mainline. For this report, this was called “Segment 0.” At Willsburg Junction, the OE and UP alternatives diverge onto their respective corridors. The modeling assumes that the long-distance Amtrak Coast Starlight train remains on the UP mainline between Portland and Eugene under both alternatives; however it is possible that Amtrak would move the Coast Starlight to the OE line if the Cascades service is also relocated there.

Maximum operating speed today is 79 mph for passenger trains on the UP corridor. Recent changes in federal signaling standards for mixed passenger and freight operations, which will become effective in 2015, allow for up to 90 mph operations for passenger service, which is assumed in this report.

Model Assumptions
Passenger ridership was estimated by using a computer travel model. The model tested a variety of train service scenarios for both alternatives as described earlier in Table 1. Passenger estimates were developed using population and employment forecasts for the year 2030 developed for the SWIM by ODOT’s Transportation Planning Analysis Unit (TPAU) based on projections developed by the Office of Economic Analysis (OEA).
The SWIM travel model is an integrated land use and transportation model covering the entire State of Oregon. The state is divided into smaller areas known as transportation analysis zones (TAZ) so that travel trends can be measured between geographic areas within Oregon. It employs land use changes (population and employment), changes in the economy (location, types of jobs and commerce), and a computerized representation of the transportation system to forecast trips. These forecasted trips are then assigned to travel modes – cars, trucks, buses, and passenger trains.

Changes were made to the SWIM model enabling its use as a tool to develop and compare passenger ridership between the various alternatives. The modified model can examine high-level passenger trends across the Willamette Valley (50 miles or longer). Therefore only trips of 50 miles or longer were assumed to be potential intercity passenger rail trips on the intercity passenger systems. Interstate passenger service carried by the Coast Starlight is included in the model but is separated from the Amtrak Cascades service.

The model uses a generalized assumption for train speeds and travel times to estimate ridership. Although it cannot specifically model instances where passenger trains are held up by oncoming freight trains, the travel time and speed assumptions were adjusted to account for various freight train delay scenarios. The model assumes trains today are traveling an average of 60 miles per hour between Portland and Eugene, which factors in the time to stop at each station along the way as well as the average delay experienced while waiting for freight trains. This is equivalent to the current 2¼ to 2½ hour train travel times between Portland and Eugene. For the future “baseline” scenario in the UP alternative, an assumption was made to increase the current travel times to 3 to 3½ hours for 2030, to account for an increase of the number of instances passenger trains would be delayed by growing freight rail congestion on the route. For the other future-year scenarios, it was assumed track and train control improvements would be made to achieve running speeds of up to 90 mph (compared to the current maximum 79 mph), reducing travel times to 2 to 2¼ hours between Portland and Eugene.

In the UP alternatives, train stations include Eugene, Albany, Salem, Oregon City, and Portland. For the OE alternatives, the Oregon City station was assumed to be replaced with a Tualatin station co-located with the WES Beaverton-to-Wilsonville commuter rail station. Transfers would be possible. It was assumed that Amtrak’s Coast Starlight interstate passenger train would remain on the UP line under all scenarios for both alternatives, although it is possible that it too could relocate.
ANALYSIS RESULTS

The modeling and analysis conducted in this study provide findings related to ridership, connections to commuter rail service, freight service, improvement costs, and planning and environmental impacts. These results are presented below.

Ridership Estimates

The forecasted annual passenger ridership results are shown in Figure 7 for all alternatives and their scenarios (please refer to Table 1 earlier in the report for a description of the alternatives). Key findings related to ridership under the alternatives and scenarios considered include:

- The UP 2030 baseline alternative (two trains and three Thruway bus roundtrips per day, no additional track improvements) would see passenger ridership increase 13 percent over 2008 passenger levels even with a 30 to 40 percent increase in passenger rail travel times. This indicates that intercity passenger ridership is relatively stable in the corridor and there will be demand for passenger rail service in the future.

- Both the UP and OE 2030 two roundtrip scenarios would see passenger rail travel times decrease slightly compared to 2008. Ridership is estimated to increase by approximately 75 percent. Under the increased service level scenarios (six roundtrips per day), ridership would more than triple under either alternative compared to actual 2008 ridership.

- In general, the OE alternative would attract a slightly higher number of riders than the UP alternative. Although more detailed modeling is necessary to fully quantify this ridership difference, a qualitative review of the alternatives indicates that this increase may be a result of relocating the Salem passenger rail station to a more walk and transit-accessible downtown location, in addition to the ability to connect intercity passenger rail to the WES commuter rail in the OE alternative.

- The model indicates that future-year traffic congestion along the I-5 corridor will encourage a measurable shift from passenger vehicles to intercity passenger rail.
Figure 7. Annual Passenger Ridership Estimates

Freight Service
Both UP and OE freight service would experience benefits under the OE alternative. Track and capacity improvements would improve operating speeds for freight trains traveling on the OE line. Removing passenger trains from the UP line between Portland and Eugene would free up capacity for freight trains within that corridor.

UP’s railroad management has expressed interest in segregating passenger service from high-density freight mainline services. Even under the most aggressive freight rail growth scenarios, PNWR’s freight density be significantly less than the level of the UP mainline, making it easier to coexist with passenger rail.
Improvement Costs

Cost estimates were generated for both the UP and OE alternatives. These cost estimates used unit costs derived from similar passenger and freight rail projects in Oregon and elsewhere in the western United States and included:

- New or upgraded track, crossing and crossovers to achieve up to 90 mph running speeds;
- Upgrades/reconstruction of bridges (and new track connections in the OE alternative);
- Station platform upgrades (in the UP alternative) or new or rebuilt stations (OE alternative);
- Signals, communications, and positive train control (required under the Safety Act of 2008);
- Maintenance and support facilities; and
- Other cost and contingency elements including design, construction zone train traffic control, and environmental impact mitigation.

Table 2 presents a summary of the costs for each alternative. The total cost estimate for each alternative is $1.266 billion for the UP alternative and $856 million for the OE alternative.

Table 2. UP and OE Alternatives Cost Estimates

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<thead>
<tr>
<th>Cost Element</th>
<th>UP Alternative</th>
<th>OE Alternative</th>
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<tr>
<td>Track and Crossing Improvements</td>
<td>$326,000,000</td>
<td>$217,900,000</td>
</tr>
<tr>
<td>Stations and Platforms</td>
<td>$2,000,000</td>
<td>$4,000,000</td>
</tr>
<tr>
<td>Signalization</td>
<td>$124,000,000</td>
<td>$124,000,000</td>
</tr>
<tr>
<td>Maintenance Facilities</td>
<td>10,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>Bridges &amp; New Connections</td>
<td>238,000,000</td>
<td>176,000,000</td>
</tr>
<tr>
<td>Design, Construction Management and Environmental Mitigation</td>
<td>$566,000,000</td>
<td>$324,100,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$1,266,000,000</strong></td>
<td><strong>$856,000,000</strong></td>
</tr>
</tbody>
</table>
CONCLUSION

This study concludes that with associated improvements, it would be feasible to shift Portland-to-Eugene intercity passenger rail service from the UP line to the OE line.

Oregon’s current intercity passenger rail service quality is challenged by freight congestion on the high-density, freight-dominated UP mainline, which will become more congested as freight and passenger demand grows.

Locating passenger service on the OE line would allow Oregon to better meet the expected increase in demand with more frequent and reliable service. The OE alternative would attract more riders, be less expensive to construct, and improve PNWR freight service without risking on-time performance of the passenger trains. The OE alternative will also improve freight service on the high-density UP line.