Chapter 4: Environmental Impacts

INTRODUCTION

This chapter reviews the direct and indirect impacts of the Preferred Alternative, Modified 3J, and the other Build Alternatives and compares these impacts to those of the No Build. For comparison purposes, the impact discussion includes information on the Build Alternatives as presented in the LDEIS. Estimations of the potential indirect impacts on land use, transportation, and economic impacts of road construction and operation are based on ODOT’s Transportation Planning Analysis Unit (TPAU) Gen1 model. Chapter 5 presents an analysis of the potential cumulative impacts resulting from Modified 3J and the other Build Alternatives.

As discussed in Chapter 2, ODOT and FHWA selected Modified 3J as the Preferred Alternative for the Bypass corridor. The Preferred Alternative, identified in the LFEIS, will be carried forward through the Tier 2 analysis for more detailed study. The Tier 2 work will involve further refinement of the Preferred Alternative, including locating the Bypass within the preferred corridor and completing preliminary engineering. Because preliminary engineering is not completed, it is not possible to precisely identify the impacts that could occur; therefore, potential project impacts are discussed in a general manner. The Bypass design details, which are neither identified nor analyzed in the LFEIS, will be included in Tier 2 analysis. Impacts specific to Modified 3J will be mitigated where feasible. Potential mitigation strategies are discussed in Chapter 6.

As previously stated, the Bypass project area encompasses a section of Oregon 99W that extends northeast across Yamhill County from the Oregon 99W/Oregon 18 intersection to Rex Hill east of Newberg. Modified 3J is a bypass corridor, at least 330 feet wide, located along the south sides of Newberg and Dundee. While the Bypass itself will require only approximately 60 percent of the corridor width, or 200 feet, the corridor width allows for flexibility during the Tier 2 refinement of the Preferred Alternative. The actual width of the Bypass facility will vary, but generally will likely require about 60 percent of the corridor width, except at interchanges. Wider interchange footprints on the corridor also allow space to account for variations in interchange design. Consequently, all resources within Modified 3J or any of the Build Alternatives will not necessarily be affected. As a result, to estimate impacts, analysts multiplied the total amount of resources found in each corridor by 60 percent, the area of the corridor that will probably be used for Bypass construction. For example, if 100 square feet of a resource are in a corridor, and the Bypass is likely to require 60 percent of the corridor, analysts applied a factor of 0.6 to estimate the potential amount of the resource affected.

As discussed in this chapter, direct impacts are those impacts that are caused by, and occur at the same time and place, as the proposed action. They may include such things as noise, air quality, conversion of land to roadway, and the displacement of houses or businesses. Direct impacts are discussed in individual resource sections in this chapter. Indirect impacts are caused by the proposed action but occur later in time or farther away from the action. They may include such things as growth and other impacts related to induced changes in the pattern of land use, population density or growth rate, and related impacts on air and water and other natural systems, including ecosystems. Direct and indirect impacts are discussed in individual resource sections in this chapter.

IMPACT ANALYSIS

Direct Impacts

Transportation

The project area included in the transportation analysis covers the primary network of roads in the Newberg-Dundee area, including Oregon 99W from the Oregon 99W/Oregon 18 intersection to Rex Hill. Analysis consisted of the following:
• Development of forecasts for year 2025 afternoon peak hour traffic volumes.
• Calculation of intersection volume-to-capacity ratios.
• Travel time estimations.
• Consideration of evaluation measures and criteria selected by the Project Oversight Steering Team (POST).

The transportation modeling conducted to calculate ADT, peak hour traffic volumes, and estimation of other transportation performance measures is distinct from the Gen1 model described in the Indirect Impacts section of this chapter. The transportation model created specifically for the Newberg-Dundee Transportation Improvement Project is described in the Transportation Technical Memorandum, referenced in Appendix B.

Minimum Transportation Performance Threshold

Based upon broad stakeholder input, the POST recommended the use of “minimum transportation performance thresholds.” In setting the thresholds, the project team asked the public and the POST to set measurable thresholds such that not meeting the threshold meant failure to fulfill the project purpose.

An important measure considered was the traffic volume-to-road capacity (v/c) ratio. A volume-to-capacity ratio of 0.50 means that vehicles use only half of the road or intersection capacity, and traffic moves freely. A volume-to-capacity ratio of 1.0 indicates the volume of vehicles has completely utilized the road’s capacity, and the roadway is congested.

The POST selected the following volume-to-capacity thresholds:

- Urban statewide highways: 0.75 volume-to-capacity ratio
- District urban highways: 0.85 volume-to-capacity ratio
- Statewide rural highways: 0.70 volume-to-capacity ratio
- District rural highways: 0.80 volume-to-capacity ratio
- Urban freeways: 0.75 volume-to-capacity ratio

Project staff used these thresholds as a starting point in developing the Build Alternatives reviewed in the LDEIS. Modified 3J and all of the other Build Alternatives meet the minimum transportation threshold and as a result solve congestion problems on Oregon 99W.

Additional information related to recommended minimum performance thresholds for key intersections within the alternative corridors can be found in the Transportation Technical Memorandum, referenced in Appendix B.

Average Daily Traffic Forecasts

Traffic analysts developed Average Daily Traffic (ADT) forecasts for Oregon 99W and the proposed Bypass highways for each of the alternatives. These forecasts are summarized below in Table 4-1. Existing ADT ranges from 25,000 to 40,000 vehicles per day (vpd) along the Oregon 99W corridor with higher volumes closer to Newberg and decreasing volumes south of Dundee (see Table 4-1).

Oregon 99W Corridor

No Build

Under the No Build, ADT in this corridor would increase over time. In year 2025, it is estimated that ADT would increase from 12,000 to 23,000 vpd over existing conditions depending on the location along
the Oregon 99W corridor. This represents a 30 to 70 percent increase over existing levels. ADT is estimated to range from approximately 40,000 to 56,000 vpd in year 2025. The increased traffic levels in 2025 will result in further congestion along this already congested corridor. For example, east of Rex Hill traffic volumes will increase by 70 percent.

**Modified 3J and Other Build Alternatives**

Table 4-1 shows that all of the Build Alternatives would reduce the ADT over the No Build in 2025. It is predicted that the Build Alternatives would reduce traffic volumes by 3,000 to 35,000 vpd compared to the No Build depending on location along the Oregon 99W corridor (see Table 4-1). The preferred alternative, Modified 3J, also reduces traffic volumes compared to the No Build and decreases traffic volumes and the resulting congestion at least as much as the other build alternatives. Modified 3J would reduce traffic volumes in year 2025 by 3,000 to 16,000 vpd in the Newberg area and 31,000 to 35,000 vpd in the Dundee area over the No Build (it would also reduce traffic volumes by 24,000 vpd between Newberg and Dundee).

**Table 4-1 Summary of Average Daily Traffic (ADT)**

<table>
<thead>
<tr>
<th>Location</th>
<th>Existing ADT Volumes (2002)</th>
<th>Year 2025 ADT Volumes (in thousands of vehicles per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
<td>Alternatives 3C and 3D</td>
</tr>
<tr>
<td>Oregon 99W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East of Rex Hill</td>
<td>32</td>
<td>55</td>
</tr>
<tr>
<td>East Newberg</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>Newberg Couplet (both directions)</td>
<td>40</td>
<td>56</td>
</tr>
<tr>
<td>Between Newberg and Dundee</td>
<td>34</td>
<td>49</td>
</tr>
<tr>
<td>Dundee at Fifth Street</td>
<td>32</td>
<td>47</td>
</tr>
<tr>
<td>South of Dundee</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>Bypass</td>
<td></td>
<td></td>
</tr>
<tr>
<td>East Segment</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Central Segment</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>West Segment</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Modified 3J and Build Alternatives 3C, 3D, 3G, 3H, 3J and 4C remove the most traffic from downtown Dundee. The highest traffic volumes in downtown Dundee occur under the No Build (47,000 ADT), followed by the Southern Build Alternative 3K (25,000 ADT).

The least traffic in downtown Newberg will occur under Alternatives 3G and 3H, followed by Modified 3J and 3J. The highest traffic volumes in downtown Newberg occur under the No Build (56,000 ADT), followed by Northern Build Alternative 4C (39,000 ADT).
ADT Estimates for Other Major Roads

No Build

Table 4-2 shows the ADT estimates in the year 2025 for Oregon 219 north and south of Newberg, for Oregon 240 west of Newberg, and for the northern arterial in Newberg. Under the No Build, average daily traffic volumes would range from 6,000 vpd on Oregon 219 north of Newberg to 20,000 vpd on the northern arterial in Newberg in the year 2025.

Table 4-2 Average Daily Traffic (Year 2025) on other Major Roads (in thousands of vehicles per day)

<table>
<thead>
<tr>
<th>Major Roads</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon 219 – South of Newberg</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Oregon 219 – North of Newberg</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Oregon 240 – West of Newberg</td>
<td>13</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Northern arterial in Newberg</td>
<td>20</td>
<td>16</td>
<td>16</td>
<td>17</td>
<td>17</td>
<td>17</td>
<td>16</td>
<td>16</td>
<td>16</td>
<td>16</td>
</tr>
</tbody>
</table>

Modified 3J and Other Build Alternatives

Modified 3J and the other Build Alternatives are predicted to result in minor improvements in traffic volumes in 2025 compared to the No Build. For Oregon 219 and Oregon 240, the Build Alternatives are estimated to only reduce traffic volumes by about 1,000 vpd as compared to the No Build (see Table 4-2). For the northern arterial in Newberg, the Build Alternatives would reduce ADT from 3,000 – 4,000 vpd as compared to the No Build.

Based on the results of the modeling as shown in Table 4-2, the Bypass would not provide any substantial service for north-south trips through the Newberg area that can only be served via Oregon 219 (due to constraints caused by the Willamette River and the surrounding mountains). Likewise, the Bypass will not provide any time or distance savings for travelers on Oregon 240, which has its eastern terminus in downtown Newberg.

Other Traffic Volume Issues

ODOT is conducting an interim project to improve the safety at Wilsonville Road, Springbrook Avenue, and Oregon 219 and will develop a local circulation plan of the Oregon 219 interchange area during Tier 2 (Newberg will include this project in the update of the Newberg TSP). In the circulation plan ODOT will address the interface between local roads and the interchange. As discussed in Chapter 2 of this document, ODOT will analyze connectivity and efficient movement of traffic in Tier 2. This project is likely to further improve the through movement in this area, which could influence future traffic volumes. Future traffic volumes may increase if connectivity and circulation is improved in this area.

During the Tier 2 process the feasibility of using toll roads will be evaluated. Tolling could affect ADT on both the Bypass and Oregon 99W. If tolling is applied only to the Bypass and not to Oregon 99W, the number of vehicles that use the Bypass may be reduced. The higher the toll charge, the more likely it is that some vehicles would choose to take Oregon 99W instead of the Bypass. If a tollbooth is placed east of the project, tolling both the Bypass and Oregon 99W, the ADT split between the Bypass and Oregon 99W will be unaffected.

Travel Time

Traffic analysts calculated how much time would be required to drive from east Newberg to Dayton in 2025 under Modified 3J and the other Build Alternatives as compared to the No Build. Results presented in Table 4-3 show travel times in minutes for both the Bypass and Oregon 99W.
Table 4-3 PM Peak Period Travel Time – East Newberg to Dayton (in minutes)

<table>
<thead>
<tr>
<th>Route</th>
<th>Existing</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon 99W</td>
<td>25</td>
<td>40+</td>
<td>19</td>
<td>19</td>
<td>19</td>
<td>21</td>
<td>19</td>
<td>19</td>
<td>20</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td>Bypass</td>
<td>N/A</td>
<td>N/A</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>15</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>14</td>
</tr>
</tbody>
</table>

No Build

Travel time for the No Build would exceed 40 minutes during the PM peak period in 2025 along the Oregon 99W corridor.

Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives would improve efficiency (decrease travel time) for through traffic along the Oregon 99W corridor as compared to the No Build. Travel time on the Bypass is estimated to range from 12 to 15 minutes depending on the alternative. Travelers on Oregon 99W will also benefit, with travel times of about 20 minutes to get through the project area. This is an improvement over current conditions, which require approximately 25 minutes of travel time, as well as a time improvement over future conditions which are predicted to require over 40 minutes of travel time. Construction of Modified 3J results in an approximately 19 minute drive on Oregon 99W and an approximately 12 minute drive on the Bypass between east Newberg and Dayton. These times are the shortest estimated travel times under any alternative. Tolling, which is a possibility under any of the Build Alternatives, could cause a minor increase in travel time if the technology used required some or all of the facility users to stop for payment.

Intersection Operations

Traffic analysts estimated the v/c ratio to determine how future traffic in year 2025 would affect the level of service at intersections along Oregon 99W for the No Build and Build Alternatives.

No Build

Under the No Build, five out of six key intersections on Oregon 99W in the project area operate at an unacceptable level of service (based on the project’s minimum transportation threshold). The one intersection that operates at an acceptable level of service is located at eastbound Oregon 99W and Oregon 219 in downtown Newberg. The remaining five intersections that have unacceptable levels of service that result in congestion are Springbrook Road at Oregon 99W, Villa Road at Oregon 99W, Oregon 219 at Hancock, Fox Farm-Dayton at Oregon 99W, and Fifth Street at Oregon 99W.

Modified 3J and Other Build Alternatives

By design, all intersections under Modified 3J and the other Build Alternatives function within acceptable levels. While Alternative 3K has considerably more traffic projected for downtown Dundee, it still meets the minimum transportation performance threshold, because the project description assumes that two additional travel lanes will be added to Oregon 99W in Dundee and will continue south to the Oregon 99W/Oregon 18 junction.

Bypass Traffic/Origin and Destination

The various Bypass alternatives serve different kinds of traffic to varying degrees. Table 4-4 shows results of a study that considered how the origin and destination of trips will influence the percent of traffic using the Bypass. The table includes the percent of trips that will use the Bypass for different alternatives, based on different origins and destinations. All of the trips that have both an origin and a destination outside of the study area are expected to use the Bypass.
### Table 4-4 Percent of Trips Using the Bypass Depending on Their Origins and Destinations

<table>
<thead>
<tr>
<th>Major Roads</th>
<th>Alternative</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified</th>
<th>3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Origin and destination within the study area (local trips)</td>
<td>N/A</td>
<td>2%</td>
<td>2%</td>
<td>4%</td>
<td>4%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
<td>&lt;1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Either origin or destination in the study area and the other outside the study area</td>
<td>N/A</td>
<td>6%</td>
<td>6%</td>
<td>12%</td>
<td>12%</td>
<td>7%</td>
<td>16%</td>
<td>16%</td>
<td>8%</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Origin and destination outside the study area (through trips)</td>
<td>N/A</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**No Build**

The No Build does not include construction of the Bypass; as a result, there are no origin or destination trips that influence traffic using the Bypass.

**Modified 3J and Other Build Alternatives**

Of those trips with either an origin or a destination outside of the study area (but not both), between 6 and 16 percent are expected to use the Bypass. Under this scenario, 16 percent of drivers use the Bypass if Modified 3J or 3J is selected. The other Build Alternatives attract between 6 and 13 percent. For all Build Alternatives, 4 or fewer percent of local trips, or trips with an origin and a destination within the study area, are expected to use the Bypass.

**Local Traffic**

**No Build**

The No Build does not include modification of arterials, collectors and local streets. As congestion on Oregon 99W worsens, through traffic will seek more out-of-direction routes on roads primarily meant to serve local needs.

**Modified 3J and Other Build Alternatives**

Traffic on local roads would be affected by construction of any of the Build Alternatives because there would be modifications to the local street system. Most of these changes would improve traffic conditions (reduce congestion) as compared to the No Build. (There may be some localized areas where traffic volumes would increase because some roads would be closed or not be through-routes, which would redirect traffic to other streets.) Bypass crossings of arterial or collector streets, as identified in the Newberg and Dundee TSPs, require grade separation. This would reduce traffic levels on local roads. (One exception to this is for Alternative 3I, which would have two at-grade intersections in Newberg and could increase traffic levels at some local intersections.) Smaller local streets that intersect the Bypass route will likely be reconfigured, realigned, or end in cul-de-sacs, and typically will not have a direct connection across the Bypass. Local streets within Newberg, Dundee, and Yamhill County that might be closed as a result of the Bypass will be determined in later phases of the project (i.e., Tier 2 and beyond).

**Transit**

**No Build**

The No Build would continue to provide the current level of bus service in the project area.
Modified 3J and Other Build Alternatives

Strictly for the purposes of transportation modeling, it is assumed that Modified 3J and all of the other Build Alternatives will benefit from improved transit services in the corridor. Although not directly part of the Bypass project or any Build Alternative, improved transit service is being examined by local governments, with ODOT assistance. In order to fairly and conservatively assess the degree to which the need for new highway capacity could be affected by better transit service, forecast model trip generation was reduced by 10 percent for peak hour analysis and by 4 percent for off-peak analysis. This approach was taken to simulate the potential mode split impact of a very successful transit service being implemented throughout the study area. It should be noted that these assumed mode splits (10 percent peak, 4 percent off-peak) are 2 to 3 times higher than those that currently occur in the Portland metropolitan area, which has a highly evolved transit system and much higher population and population density than the Newberg-Dundee area has or will have in the 2025 planning horizon. The need for new highway capacity was not significantly altered by these modeled reductions in forecast trip generation. That is, while improvements in transit service could marginally improve highway facility operation and extend the life of existing and proposed highway facilities by perhaps 2 to 4 years, they will not change the need for the basic amount of highway capacity that will be provided by the existing highway system and the Bypass.

Freight

The numbers of freight trips moving through central Newberg and Dundee on the Oregon 99W corridor were estimated for the year 2025 for the alternatives, and are shown in Table 4-5.

No Build

Under the No Build, freight trips are predicted to range from approximately 2,200 to 3,700 trips per day in 2025 (see Table 4-5). These freight trips would contribute to the congestion that is forecast to occur in 2025 in the cities of Newberg and Dundee. As shown in Table 4-3, under the No Build, traffic travel times are predicted to worsen by approximately 15 minutes over existing conditions by the year 2025. Downtown Newberg will have approximately 15 hours of congestion per day, while Dundee will experience approximately 14 hours of congestion.

Modified 3J and Other Build Alternatives

Under all Build Alternatives, future freight trips along the Oregon 99W corridor would decrease as compared to the No Build. Future freight trips, particularly those that comprise through trips, would be redirected onto the Bypass and thus freight trips through the downtown areas of Newberg and Dundee would decrease. Table 4-5 shows that freight trips are predicted to decrease from approximately 3,700 trips to approximately 1,250 trips, depending on the location and alternative. This represents a significant reduction in truck trips and would reduce congestion in Newberg and Dundee along the Oregon 99W corridor. Modified 3J and Alternatives 3G, 3H, 3J are predicted to provide the greatest reduction in truck trips for downtown Newberg. Modified 3J and Alternatives 3C, 3D, 3G, 3H, 3J, and 4C are estimated to result in the most truck trip reductions in downtown Dundee.
Table 4-5  Number of Daily Freight Trips (Year 2025) on Oregon 99W

<table>
<thead>
<tr>
<th>Highway Segment</th>
<th>Alternative</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified</th>
<th>3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Downtown Newberg (Eastbound)¹</td>
<td></td>
<td>2,200</td>
<td>925</td>
<td>925</td>
<td>700</td>
<td>700</td>
<td>900</td>
<td>750</td>
<td>750</td>
<td>925</td>
<td>975</td>
<td></td>
</tr>
<tr>
<td>Downtown Newberg (Westbound)²</td>
<td></td>
<td>2,200</td>
<td>925</td>
<td>925</td>
<td>700</td>
<td>700</td>
<td>900</td>
<td>750</td>
<td>750</td>
<td>925</td>
<td>975</td>
<td></td>
</tr>
<tr>
<td>Downtown Dundee³</td>
<td></td>
<td>3,700</td>
<td>525</td>
<td>525</td>
<td>525</td>
<td>525</td>
<td>650</td>
<td>525</td>
<td>525</td>
<td>1,250</td>
<td>525</td>
<td></td>
</tr>
</tbody>
</table>

¹ On Hancock Street between the start of the couplet and Oregon 219
² On First Street between Oregon 219 and the end of the couplet
³ On Oregon 99W at Fifth Street

Bicycle/Pedestrian

No Build

The No Build is likely to have adverse impacts on bicyclists and pedestrians in the vicinity of Oregon 99W due to increased traffic and congestion over time. Table 4-1 shows that by 2025, average daily traffic on Oregon 99W will increase by an estimated 16,000 vehicles at the Newberg Couplet and by an estimated 15,000 in downtown Dundee. Connectivity and circulation for bicycle riders and pedestrians will be adversely affected by this increase in traffic, particularly in Dundee, which has few bike and pedestrian facilities and only one signalized crossing of Oregon 99W. Throughout most of Newberg, pedestrian crossings on Oregon 99W are widely spaced and difficult to cross. Under the No Build, bicycle and pedestrian travel conditions will not change because no road or non-motorized travel improvements are proposed.

Modified 3J and Other Build Alternatives

As shown in Table 4-1, Modified 3J is forecast to reduce traffic in downtown Newberg and Dundee as compared with existing conditions and the No Build, thereby improving bicycle and pedestrian circulation and connectivity. Other local road improvements such as intersection improvements, signals, etc. will be explored during Tier 2. Table 4-1 shows considerable variation in ADT on Oregon 99W, depending on the alternatives. Modified 3J and Build Alternatives 3G, 3H, and 3J provide the most reduction in traffic in downtown Newberg. Modified 3J and Build Alternatives 3C, 3D, 3G, 3H, 3J, and 4C contribute to the greatest traffic reduction in downtown Dundee. The Build Alternatives that contribute the least to bicycle and pedestrian connectivity and circulation in downtown Newberg are Alternatives 4C (39,000 average daily traffic) and 3K (38,000 average daily traffic).

While Alternative 4C does not cause high volumes of traffic in downtown Dundee, Alternative 3K does. It will contribute up to 12,000 more vehicles per day to Dundee’s traffic and require widening Oregon 99W in Dundee from three lanes to five lanes. Widening the highway also will affect pedestrian and bicycle movement.

Modified 3J and all of the other Build Alternatives increase bicycle and pedestrian connections by providing bicycle facilities along the Bypass corridor. Investments in bicycle and pedestrian facilities may include the development and improvement of alternative routes, such as the existing Oregon 99W and associated roads.
Crash Potential

Table 4-6 summarizes the estimated crash potential index (per million vehicle miles traveled) for Oregon 99W for the year 2025. Analysts developed the crash potential index\(^9\) using traffic volume and road type. The prediction of crash potential is based on past experiences at similar roadways in Oregon. A lower index number indicates a lower potential for crashes.

No Build

The No Build has the highest crash potential of any of the alternatives. It is predicted that there would be approximately 1.16 crashes per million vehicle miles traveled in the year 2025 under the No Build.

Modified 3J and Other Build Alternatives

In general, shifting more traffic to the Bypass is predicted to reduce the number of crashes on Oregon 99W as compared to the No Build in year 2025. Modified 3J has the second lowest crash potential on the Bypass and is estimated to reduce the crash potential on Oregon 99W from an estimated 1.16 crashes to an estimated 0.32 crashes per million vehicle miles traveled. In total, crashes will occur at about one-third the current rate under Modified 3J. For Modified 3J, the crashes per million miles traveled on the Bypass is estimated to be 0.06. By comparison the other Build Alternatives range from approximately 0.32 to 0.41 crashes per million miles traveled on Oregon 99W and 0.04 to 0.30 crashes per million miles traveled on the Bypass.

<table>
<thead>
<tr>
<th>Route</th>
<th>Alternative</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oregon 99W</td>
<td></td>
<td>1.16</td>
<td>0.35</td>
<td>0.35</td>
<td>0.32</td>
<td>0.32</td>
<td>0.38</td>
<td>0.32</td>
<td>0.32</td>
<td>0.41</td>
<td>0.39</td>
</tr>
<tr>
<td>Bypass</td>
<td>N/A</td>
<td>0.04</td>
<td>0.05</td>
<td>0.05</td>
<td>0.06</td>
<td>0.30</td>
<td>0.06</td>
<td>0.06</td>
<td>0.04</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1.16</td>
<td>0.39</td>
<td>0.40</td>
<td>0.37</td>
<td>0.38</td>
<td>0.68</td>
<td>0.38</td>
<td>0.38</td>
<td>0.45</td>
<td>0.43</td>
</tr>
</tbody>
</table>

Emergency Evacuations

Table 4-7 summarizes the potential capacity of the Bypass and Oregon 99W to handle emergency evacuations (e.g., due to earthquakes) through the project area. Analysts calculated the corridor capacities based on conditions that are likely to occur during emergencies. As an example, they assumed there will be shorter distances between vehicles and slower speeds than normal.

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\(^9\) A crash potential index is a relative weighting of the crash rates and the future traffic exposure for highway conditions that could result from the NDTIP. The crash rate portion of the index is based on 1999 ODOT crash rate data for various highway types (primary versus secondary, freeway versus non-freeway) and location of the highway (urban versus rural). The ODOT crash rates provide a good indication of crash potential in the study corridor since it is based upon characteristics of Oregon drivers, Oregon highway design, and weather conditions. The future exposure of drivers to the highway conditions is based upon the average daily traffic forecasts for each alternative. Note that the crash potential index is not intended as an estimate of future crash quantities. The index is a qualitative estimate of how the traffic on the roadways will be distributed between types of facilities that have different historical crash characteristics. A detailed description of the potential crash index is included in the Transportation Technical Memorandum, referenced in Appendix B.
Table 4-7  Total Corridor Capacity to Handle Emergency Evacuations (in thousands of vehicles per day)

<table>
<thead>
<tr>
<th>Route</th>
<th>Alternative</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass</td>
<td></td>
<td>N/A</td>
<td>88</td>
<td>88</td>
<td>80</td>
<td>80</td>
<td>72</td>
<td>84</td>
<td>84</td>
<td>96</td>
<td>88</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>32</td>
<td>113</td>
<td>113</td>
<td>105</td>
<td>105</td>
<td>97</td>
<td>109</td>
<td>109</td>
<td>146</td>
<td>113</td>
</tr>
</tbody>
</table>

No Build
Since the Bypass would not be constructed, the total capacity of the roadway is limited by the existing roadway conditions; for example, in the project area Oregon 99W is only three lanes. The modeling showed that the total capacity under the No Build would only be approximately 32,000 vehicles per day. However, the Bypass is forecast to be capable of carrying over three times that amount of traffic during an emergency event (see Table 4-7).

Modified 3J and Other Build Alternatives
Modified 3J more than triples the capacity of the Oregon 99W corridor to handle emergency evacuations through the project area. However, Oregon 99W and Oregon 18 continue to have constraints outside of the project area to the east and west. Modified 3J allows the evacuation of up to approximately 109,000 vehicles in one day, with approximately 84,000 of those vehicles using the Bypass and approximately 25,000 using Oregon 99W, as compared to the No Build with a capacity to evacuate only an estimated 32,000 vehicles in one day. Alternative 3K has the greatest capacity for evacuations among the Build Alternatives, with approximately 146,000 vehicles able to move through the study area in a one-day period. Alternative 3K performs well due to the combined improvements of the Bypass and improvements to Oregon 99W, which will provide about one third of the capacity for evacuations under Alternative 3K.

Transportation analysts also considered emergency response time to a potential crash on the Bypass. Response times ranged from three to four minutes, with the exception of Alternative 3K, which will have an average response time of seven minutes. The Transportation Technical Memorandum includes a detailed description of analysis conducted relative to safety and emergency response characteristics of the alternatives.

Land Use
The analysis in this section focuses on information developed to assist in the alternative selection process and comply with land use permitting needs. A Land Use and Planning Technical Memorandum and a Supplemental Land Use Technical Memorandum provide further information about the affected environment, environmental consequences, and potential mitigation. The technical memo is summarized in Chapter 3 of this document and included by reference.

Land Displacement
To measure direct land displacement impacts, data were gathered on the amount of land displaced by Modified 3J and the other Build Alternatives, and used to address the following questions:

- How much land is displaced by each Build Alternative?
- How much of the displaced land is vacant and how much is developed?
- What are the uses of the displaced developed land?
How much of the displaced land is urban (inside UGBs) and how much is rural (outside UGBs)?

For the urban land, do the Build Alternatives differ in terms of displacement of land planned for residential or industrial use?

How much of the rural land is designated EFU (agricultural)?

Table 4-8 summarizes land displacements by comprehensive plan designation.

<table>
<thead>
<tr>
<th>Comprehensive Plan Designations</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban Residential</td>
<td>N/A</td>
<td>35</td>
<td>35</td>
<td>49</td>
<td>49</td>
<td>49</td>
<td>57</td>
<td>65</td>
<td>40</td>
<td>59</td>
</tr>
<tr>
<td>Urban Industrial</td>
<td>N/A</td>
<td>35</td>
<td>44</td>
<td>57</td>
<td>62</td>
<td>57</td>
<td>64</td>
<td>62</td>
<td>49</td>
<td>0</td>
</tr>
<tr>
<td>Other Urban</td>
<td>N/A</td>
<td>7</td>
<td>5</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>8</td>
<td>10</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Urban Total</td>
<td>N/A</td>
<td>77</td>
<td>84</td>
<td>114</td>
<td>119</td>
<td>114</td>
<td>129</td>
<td>137</td>
<td>104</td>
<td>69</td>
</tr>
<tr>
<td>Agricultural</td>
<td>N/A</td>
<td>180</td>
<td>190</td>
<td>178</td>
<td>188</td>
<td>178</td>
<td>190</td>
<td>200</td>
<td>227</td>
<td>198</td>
</tr>
<tr>
<td>Rural Residential</td>
<td>N/A</td>
<td>116</td>
<td>116</td>
<td>111</td>
<td>111</td>
<td>111</td>
<td>111</td>
<td>38</td>
<td>52</td>
<td>146</td>
</tr>
<tr>
<td>Other Rural</td>
<td>N/A</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>10</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Total Rural</td>
<td>N/A</td>
<td>299</td>
<td>316</td>
<td>192</td>
<td>209</td>
<td>192</td>
<td>235</td>
<td>241</td>
<td>287</td>
<td>349</td>
</tr>
<tr>
<td>TOTAL*</td>
<td>N/A</td>
<td>375</td>
<td>400</td>
<td>405</td>
<td>427</td>
<td>405</td>
<td>363</td>
<td>377</td>
<td>390</td>
<td>417</td>
</tr>
</tbody>
</table>

* Numbers do not sum due to rounding.

Total Rural = sum of Agricultural, Rural Residential, and Other Rural lands. Total Urban = Urban Residential, Urban Industrial, and Other Urban lands.

No Build

The No Build does not directly impact urban or rural land uses. Right of way is not required because the Bypass would not be constructed. The No Build does not directly reduce the amount of land available for urban development within the Newberg and Dundee UGB.

Modified 3J and Other Build Alternatives

All Build Alternatives would require acquisition of land for right of way. Compared to No Build, which would not require any land acquisition, all the Build Alternatives would reduce the supply of available land. The total amount of land required for right of way varies from approximately 363 acres for Alternative 3J to approximately 427 acres for Alternative 3H (see Table 4-8). Modified 3J would require approximately 377 total acres and, is one of the alternatives that require the least amount of right of way (Alternatives 3C and 3J require less land).

Modified 3J would acquire the most urban land of any of the alternatives, approximately 137. Alternative 4C would require the least amount of urban land at approximately 69 acres. The Southern Build Alternatives would displace from approximately 35 acres (with Alternative 3C) to 64 acres (with Alternative 3J) planned for industrial use. The Northern Build Alternative (4C) does not displace any land planned for urban industrial use. Compared to other build alternatives, Modified 3J would also require the most agriculturally designated land, except for Alternative 3K (approximately 200 acres versus 227 acres, respectively). However, Modified 3J would require the least rural residential land of any alternative, needing only approximately 38 acres (see Table 4-8).

For Modified 3J and all of the other Build Alternatives, about 25 percent of the total land displaced is urban land (inside the UGB), and about 75 percent is rural land (outside UGB).
In Oregon, new roads, including bypasses, are allowed in urban areas, but new roads in rural areas require exceptions of the Statewide Planning Goals. To minimize the amount of land that requires an exception, Alternative 3J was modified to minimize impacts to rural lands, resulting in Modified 3J.

Modified 3J and all of the other Build Alternatives show minor variation in impacts on land designated for EFU. Alternative 3K affects the most EFU land at approximately 227 acres, because it includes widening of Oregon 99W in addition to construction of the Bypass. Additionally, Alternative 3K crosses EFU land between Newberg and Dundee.

**Indirect Impacts**

**Gen1 Model Overview**

To estimate and understand the potential for indirect effects resulting from Modified 3J, TPAU analyzed the possible indirect land use, transportation, and economic impacts of constructing the Newberg-Dundee Bypass using its internationally recognized Oregon statewide model (Gen1). The following section explains the methodology and assumptions used in the model.

**Methodology and Assumptions**

The Gen1 model is an integrated economic, land use and transportation model. The model covers the entire state of Oregon and neighboring Clark County, Washington, and is a large scale model with 122 zones covering the model area. It is most appropriately used to evaluate “intercity” travel and regional economic and land use effects. Travel demand modeling, such as that described in this section, is not performed as a strict exercise in realism because there are so many interacting factors that determine what the future will be. Rather, the modeling performed with the Gen1 model is a more abstract exercise used primarily to show the tendencies of different policies or large transportation projects to affect the future, nature, and size of these effects.

The proposed Bypass was identified as a project that is sufficiently large to show regional and intercity location and travel effects. TPAU modeled three “Build” scenarios in addition to a reference case “No-action” scenario. The scenarios are identical in all but a few respects. TPAU completed the modeling at five-year intervals from 1990 to 2050. The primary modeling assumptions included:

- The Bypass will be a 4-lane limited access highway approximately 11.0 miles long, connecting to Oregon 99W at a point east of Newberg to the Dayton Junction west of Dundee.
- One build scenario has connections at the two termini of the project. The other two build scenarios also have connections at Oregon 219 and at Dundee.
- Two build scenarios have an assumed posted speed of 55 mph. The other build scenario has an assumed posted speed of 45 mph between the connections with Oregon 219 and Dundee, and 55 mph elsewhere.
- The Bypass will open for travel in 2010.
- Land will be made available for urbanization at historic rates (since the beginning of Oregon's land use planning program).

The build and reference scenarios were compared with respect to the number of households and jobs in the Oregon 99W/Oregon 18 corridor in Yamhill County, passenger and truck trips to and from the corridor area, passenger and truck miles traveled, and passenger and truck hours traveled.

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20 The Gen1 model is described in detail in Appendix I, which also includes the positive results of an international and state peer review of the Gen1 model, validating its use for the intended purposes.

21 The study conducted for the Newberg-Dundee project is cited fully in Appendix B, Information Sources.
The Gen1 model for the area of Yamhill County in the vicinity of Oregon 99W/Oregon 18 is divided into four zones: Newberg (zone 605), Dundee/Lafayette/Dayton area (zone 608), McMinnville area (zone 607), and Sheridan/Willamina area (zone 606). The zones are shown in Figure 4-1.

TPAU compared the distributions of households and jobs for the scenarios for each of these zones and for the corridor as a whole. Modeling focused on Yamhill County.

Gen1 Modeling Results

Thus section presents the results of the Gen1 model, as prepared by Brian Gregor of TPAU. Results are also summarized in the transportation, land use, and natural resource sections of this chapter, as appropriate. The modeling shows noticeable locational and travel differences between the ‘no action’ and ‘build’ scenarios. There are negligible differences among the build scenarios.

Households and Jobs

According to the model results, building the Bypass will increase the growth of households and jobs in Yamhill County relative to doing nothing; … [however,] the increase will be very small (less than 5%) (brackets and emphasis added).

Almost all of the limited increased growth with a Bypass will occur in the McMinnville area, with most increases occurring within 20 years of opening of the Bypass. The increases in employment indicate that the Bypass will make the McMinnville area more attractive as an employment center as well as a more attractive place to live. A positive indirect effect of the Bypass will be a probable improvement in the jobs-housing balance which will, in turn, reduce commuting to the Portland job market area.

22 The actual numbers of households and jobs generated by the Gen1 model are not the significant outputs; rather, the significance is the growth tendencies indicated, which in this case are so small as not to be significant.
Minimal effects are seen in the Newberg area because accessibility to the Portland area will remain about the same with or without the Bypass. Generally, small communities along the Oregon 99W/Oregon 18 corridor will experience little difference in job or population growth between the scenarios. Most of these communities do not have the economic base to attract much new business. The larger economic base in the McMinnville area will be most attractive to business with improved accessibility to the Portland area under the Bypass scenario.

The results of the modeling and analysis for the Bypass are similar to those reported for the Willamette Valley Forum Alternative Transportation Futures Project. Specifically, both jobs and population move to larger outlying communities with major highway improvements. Since as noted above, the smaller communities and smaller economic bases of Newberg, Dundee, Dayton and McMinnville have less attraction than larger cities such as Salem or Portland, the projected growth of jobs and population in these communities is proportionately less significant despite construction of the Bypass. These contrast with transit-oriented scenarios, which tend to encourage the movement of population but not jobs to outlying communities.

**Transportation/Gen1 Model**

**Passenger and Truck Trips**

The Gen1 model shows negligible differences in commuting between Yamhill County and the Portland metropolitan area (Clackamas, Multnomah and Washington counties). Increased trips between the McMinnville area and parts of the Portland metropolitan area are offset by trip reductions elsewhere. The model also shows that commuting from the Newberg area to the Portland metropolitan area will be decrease slightly with the Bypass and that commuting from the Newberg area to the McMinnville area will be slightly increase.

Although the number of trips along the Oregon 99W/Oregon 18 corridor increases and the total miles of system-wide travel increase, the total number of system-wide auto trips does not increase under the build scenarios. The Oregon 99W/Oregon 18 corridor will be less congested with better accessibility provided by a bypass, which will also attract drivers from alternative routes or who will otherwise avoid the corridor because of congestion.

**Passenger and Truck Miles Traveled**

System-wide, there are very small increases in the number of passenger and freight miles traveled among the scenarios. Modeling shows that a Newberg-Dundee bypass will be likely to induce more travel in the Oregon 99W/Oregon 18 corridor but not on Oregon's transportation system as a whole. The Bypass will provide greater accessibility to the Portland area and make the McMinnville area more attractive for employers to locate there. Increased travel will be a consequence of stimulating job growth in the McMinnville area and reducing the cost of travel between the McMinnville and Portland areas. Usually, the more economic growth that occurs, the more travel will occur between that area and other major trade and economic centers. However the modeling shows that this increase in travel will have a very small system-wide impact.

**Passenger and Truck Hours Traveled**

There are no detectable differences among the scenarios in the system-wide average number of passenger hours traveled or freight hours traveled. This could be the result of several different interactions:

- The greater miles of travel in the Oregon 99W/Oregon 18 corridor could be offset by the higher speeds of travel;
- More development occurs in the relatively less congested Oregon 99W/Oregon 18 corridor and less occurs in other more congested corridors; and/or
- Travelers use the less congested Bypass rather than more congested alternative routes.
Conclusions of Transportation Gen1 Modeling

There are several conclusions that can be drawn from this modeling analysis effort:

- The Bypass will provide better access to the McMinnville area, which will help to stimulate the economic growth of the community.

- With a Bypass, there will be more trips between the McMinnville area and the Portland area, contributing to the economic growth of the McMinnville area.

- Minimal growth effects will be seen in the Newberg area and other areas of Yamhill County as a result of a bypass. The overall effect on Yamhill County will be very small.

- Commuter effects vary. Commuting to the Portland area from the McMinnville area shows increases, but those increases are offset by decreases elsewhere, so that the net effect for Yamhill County will be negligible. Moreover, commuting from the Newberg area to the Portland area will decline, while commuting from the Newberg area to the McMinnville area will increase.

- System-wide, the total number of auto trips will not change with the construction of a bypass.

- Although the total miles traveled system-wide will be slightly greater with a bypass, the total hours of travel will not increase.

- Although the Bypass will increase accessibility to significant acreage as discussed below, there will not be any significant indirect impacts to this land or other natural resources as a result of construction of the bypass.

Land Use

New roads can have indirect impacts on land use patterns by reducing travel times and improving accessibility to vacant and redevelopable land. The following three analyses – Travel Time Analysis, Accessibility Analysis, and Oregon’s Land Use Laws – address indirect land use impacts. The major conclusion is that, although the Bypass will increase accessibility to significant acreage as discussed below, there will not be any significant indirect impacts to this land or other natural resources as a result of construction of the bypass. Though this may seem counter-intuitive, the modeling report below shows that because factors other than accessibility, such as the attraction of the economic bases of larger cities in the Willamette Valley, the increased accessibility afforded by the Bypass does not overcome:

- The stronger attraction of the competing economic development opportunities in these larger cities, or

- The lack of attraction of the small economic base of the communities through which the Bypass corridor runs.

- Due to the above points, the very modest overall impact of the Bypass on economic development in the project study area does not generate significant land development, housing or population increases in Newberg, Dundee, Dayton or McMinnville.

Travel Time Analysis

The impact of reduced travel time on potential residential growth was estimated by mapping travel times and commute patterns for the various Build Alternatives from a common starting point at the junction of Oregon 99W with 1-5 near Portland. A 45-minute travel time was identified as a reasonable commute for the year 2025. Because the POST was most interested in how reduced travel times might encourage residential development in rural areas, the travel time maps were used to calculate how many acres outside of urban growth boundaries would fall within a 45-minute commute to the Portland area in 2025 under each alternative. Table 4-9 shows the 45-minute commute data.
Table 4-9  Comparison of Alternatives: Land Outside Within 45-Minute Commute to Portland Metro Area (in acres)

<table>
<thead>
<tr>
<th></th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2,379</td>
<td>21,990</td>
<td>21,993</td>
<td>51,089</td>
<td>48,508</td>
<td>50,087</td>
<td>50,087</td>
<td>19,901</td>
<td>19,236</td>
</tr>
</tbody>
</table>

Though the acreage potentially affected is significant, the actual development of this land is by no means a foregone conclusion:

- Travel times from the Portland metro area to Newberg and Dundee between Newberg and Dundee are not appreciably reduced by the Bypass.
- Many areas closer to the Portland metro area, the primary economic attractor, compete with these areas of increased accessibility.
- Much of this land is zoned for agricultural use and is protected from development by Oregon land use laws (see discussion of this issue under General Land Use Impacts below).

Though the mapped travel times respond to the POST’s concerns, the analysis by TPAU showed that the areas affected by reduced travel times are not likely to experience any significant indirect land use impacts, as explained below.

**No Build**

Under the No Build, most of the Newberg UGB and a limited portion of the rural area have a 45-minute commute access to the Portland area in the year 2025. Rural areas to the north and east of the Newberg UGB will fall within the 45-minute commute line. Residents of Dundee and rural areas west of Newberg will not be able to commute in 45 minutes to the Portland area under the No Build.

The No Build could result in fewer indirect growth impacts, because travel times within the corridor would continue to increase with higher levels of traffic and congestion on Oregon 99W. Indirect impacts resulting in growth are typically associated with reductions in travel times or new accessibility provided by new or improved interchanges. The No Build does not include either of these features; thus, it is more likely that growth rates would slow as travel times and congestion increase.

**Modified 3J and Other Build Alternatives**

With the exception of Alternative 3K (which is the only alternative that does not include an interchange between Newberg and Dundee), Modified 3J and all of the other Build Alternatives reduce travel times and improve accessibility to the rural residential area between the two cities. Modified 3J also reduces travel times to the Portland area from Dundee and communities farther west (Dayton, Lafayette and McMinnville). McMinnville is not within a 45-minute commute of Portland, even with the Bypass. However, the larger economic base in McMinnville could be more attractive to business with improved accessibility to the Portland area under a Bypass scenario.

Modified 3J provides a 45-minute commute access to a larger rural area in 2025. Of the Build Alternatives, the Northern Build Alternative provides a 45-minute commute accessibility to the smallest amount of rural land, less than 20,000 acres.

Modified 3J and the other Build Alternatives that include an Oregon 219 Interchange provide a 45-minute commute access to twice as large a rural area (about 50,000 acres) as the Build Alternatives that do not include the Oregon 219 Interchange. Options that include the Oregon 219 Interchange include more land extending south of Newberg toward St. Paul (in Marion County). However, this rural area is unlikely to experience urban development pressures because it already is in productive agricultural use, is zoned EFU, and is a long distance from any UGB or urban services. However, the St. Paul and northern Marion County areas already have direct access to the Portland metropolitan area via the I-5/Donald interchange.
and McKay Road. Modified 3J and the other Build Alternatives, even with an Oregon 219 Interchange, are unlikely to offer faster or more convenient commuter access from St. Paul and northern Marion County to the Portland metropolitan area than the existing McKay Road route to I-5.

Accessibility Analysis – Improved Accessibility at Interchanges and Intersections

To address how interchanges could improve accessibility to certain properties, data was gathered on vacant and potentially redevelopable land within 0.6 miles (1 km) driving distance of interchanges associated with Modified 3J and each of the other Build Alternatives. Analysis focused on interchanges that were either in or close to UGBs, because these areas are more likely to experience development pressure due to the availability of urban services such as sewer and water.

With the exception of the proposed interchange west of Dundee, interchanges are located within or close to the UGBs of Newberg, Dundee, or Dayton, and these interchanges improve accessibility to vacant land planned for urban development. The interchanges also improve accessibility to rural residential and agricultural lands located outside of the UGBs. Table 4-10 summarizes the data on vacant and redevelopable land in the interchange areas associated with each Build Alternative.

Table 4-10 Comparison of Alternatives: Vacant and Redevelopable Land in or Adjacent to a UGB and Within 0.6 Mile (1 km) Driving Distance From an Interchange, by Comprehensive Plan Designation, in Acres

<table>
<thead>
<tr>
<th>Comprehensive Plan Designation</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>N/A</td>
<td>111</td>
<td>111</td>
<td>162</td>
<td>162</td>
<td>246</td>
<td>213</td>
<td>213</td>
<td>31</td>
<td>170</td>
</tr>
<tr>
<td>Commercial</td>
<td>N/A</td>
<td>26</td>
<td>23</td>
<td>28</td>
<td>28</td>
<td>23</td>
<td>19</td>
<td>19</td>
<td>13</td>
<td>33</td>
</tr>
<tr>
<td>Industrial</td>
<td>N/A</td>
<td>84</td>
<td>142</td>
<td>218</td>
<td>218</td>
<td>311</td>
<td>215</td>
<td>215</td>
<td>139</td>
<td>84</td>
</tr>
<tr>
<td>Mixed Use</td>
<td>N/A</td>
<td>54</td>
<td>54</td>
<td>54</td>
<td>54</td>
<td>126</td>
<td>54</td>
<td>54</td>
<td>67</td>
<td></td>
</tr>
<tr>
<td>Public / Quasi-Public</td>
<td>N/A</td>
<td>--</td>
<td>--</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>43</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Rural Residential</td>
<td>N/A</td>
<td>482</td>
<td>482</td>
<td>570</td>
<td>570</td>
<td>601</td>
<td>376</td>
<td>376</td>
<td>226</td>
<td>492</td>
</tr>
<tr>
<td>Agricultural</td>
<td>N/A</td>
<td>207</td>
<td>1,106</td>
<td>532</td>
<td>1,327</td>
<td>773</td>
<td>562</td>
<td>562</td>
<td>922</td>
<td>206</td>
</tr>
<tr>
<td>TOTAL</td>
<td>N/A</td>
<td>964</td>
<td>1,818</td>
<td>1,607</td>
<td>2,459</td>
<td>2,123</td>
<td>1,482</td>
<td>1,482</td>
<td>1,385</td>
<td>1,052</td>
</tr>
</tbody>
</table>

No Build

The No Build does not include construction of the Bypass and related interchanges; and as a result, the No Build does not have an impact on accessibility to property due to interchanges.

Modified 3J and Other Build Alternatives

Compared to the No Build, all of the Build Alternatives would improve accessibility to vacant or developable land. The Build Alternatives would improve access from zero acres under the No Build to approximately 964 to 2,459 acres of vacant or developable lands, depending on the Build Alternative.

Modified 3J and all the other Build Alternatives include interchanges. They are subject to OAR 734-51, which requires an interchange area management plan (IAMP) for any new interchange or significant modifications to an existing interchange. The purpose of the IAMPs is to protect the function and capacity of interchanges, provide safe and efficient operations between connecting roadways, and minimize the need for major improvements of existing interchanges. The OHP states that access control shall be purchased on crossroads for a minimum distance of 1,320 feet from a ramp intersection.
The following discussion first addresses interchange and intersection proximity and potentially improved accessibility to urban lands, then to rural lands (which includes rural residential and agricultural lands) for Modified 3J.

Undeveloped portions of the Springbrook Oaks Specific Plan area, on the east side of Newberg, is within 0.6 miles driving distance of the East Newberg Interchange for Modified 3J and the other Build Alternatives. The Springbrook Oaks property is inside the Newberg UGB and planned for mixed-use development.

Providence Health System is building the Providence Newberg Medical Center adjacent to the south side of Oregon 99W near the eastern terminus of the project. It has a projected opening date of Fall 2005. Portions of the Medical Center development on the east side of Newberg are within 0.6 mile driving distance of all East Newberg Interchange options (Northern and Southern Bypass Alternatives). Modified 3J and the other Build Alternatives that include an Oregon 219 Interchange provide accessibility to a larger amount of vacant and redevelopable land that is planned for urban use than the Build Alternatives that do not include an Oregon 219 Interchange (3C, 3D 3K and 4C). This interchange provides accessibility to the Newberg riverfront area, the Sportsman Airpark, and undeveloped sites along Oregon 219/Springbrook Road that are within the Newberg UGB. Of all Build Alternatives, Alternative 3I provides accessibility to the largest amount of vacant and redevelopable urban land, with two additional at-grade intersections inside the Newberg UGB.

Because Alternative 3K does not include an interchange between Newberg and Dundee, it has the least amount of rural residential land, at approximately 225 acres, within a 0.6 mile driving distance of the interchanges. Modified 3J and all the other Build Alternatives (except 3K) that include an interchange between Newberg and Dundee provide greater accessibility to vacant and redevelopable rural residential land, ranging from a low of approximately 482 acres (Alternatives 3C and 3D) to a high of approximately 601 acres (Alternative 3I).

Modified 3J has approximately 562 acres of agricultural land accessible to the Bypass. Alternative 4C and Alternative 3C have the smallest amount of agricultural land located within a 0.6 mile driving distance of the interchanges, at about 207 acres. Alternative 3H has the largest amount of agricultural land accessible to the new facility, at about 1,327 acres.

Without mitigation measures, new highway capacity could foster low-density, auto-oriented development patterns with incomplete urban services that use land inefficiently, limit the feasibility of transit or bicycle use as alternative transportation modes, and impair community livability. See Chapter 6 for mitigation measures that will reduce and help avoid unplanned impacts to vacant and redevelopable land.

**Oregon’s Land Use Laws**

Oregon’s land use planning framework influences the potential for indirect land use impacts associated with a new Bypass and interchanges. UGBs and agricultural zoning limit the expansion of urban areas, as well as urban water and sewer facilities. Because of Oregon’s stringent land use laws, the more dispersed development that has occurred around freeways in other parts of the United States has not occurred here to the same degree. If present land use laws remain in effect, they should have the same effect in the Newberg, Dundee and Dayton areas, for the most part limiting development to locations inside UGBs and areas already designated for rural residential development. At the time of this report, it is not yet known what impacts the implementation of Statewide Measure 37 by local governments may have on these assumptions. With Measure 37, there is a possibility that there are parcels that may assert a claim to develop outside of the current land use regulations. Also, revisions to Measure 37 are under consideration by the state legislature. The Oregon Attorney General has cautioned that public entities may not waive

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laws on a blanket basis and that Measure 37 allows waivers only after a claimant has established entitlement to relief under the criteria of Measure 37.\textsuperscript{24}

In Oregon, due to uniquely strong statewide land use laws, there is no significant causal relationship between highway expansions and urban expansion.

The lack of a causal relationship between highway expansions and urban expansion is developed in detail in the report \textit{Statewide Congestion Overview for Oregon, The Economics of Congestion}.\textsuperscript{25} The paper concludes that, due to Oregon’s strong land use and planning laws, the potential effects of highway expansions on land use have been minimized. Summarizing other research on the topic, the author concludes that:

- Developments occurring after highway improvements were generally consistent with the comprehensive plans established before the highway improvements were made.
- None of the highway improvements appeared to be associated with annexations or urban growth boundary (UGB) expansions.
- Development of all types occurring after highway construction was dispersed throughout the communities and was not concentrated around the highway projects.

In a review of multiple Oregon case studies of highway expansion projects, no examples were found of major new developments occurring outside of Urban Growth Boundaries (UGBs). In fact, Oregon administrative rules (OAR 660-012-0060(4)) clearly specifies that “the presence of a transportation facility or improvement shall not be a basis for an exception to allow residential, commercial institutional or industrial development on rural lands under this division or OAR 660-04-0022 and 660-004-0028.”

The specific areas in the project corridor most likely to experience development pressure are at the proposed interchanges of the selected Build Alternative. During the approximately three-year period between a Record of Decision (ROD) on Location (Tier 1) and a ROD on Tier 2, local governments will adopt land use policies that prohibit zoning changes in the areas around interchanges. During this period, preliminary engineering of the interchanges will be completed, and access control through purchase of access rights, local street connections and land uses in the areas around the interchanges will be planned as part of IAMPs. (To see the areas covered by the IAMPs, refer to Figure 1-3.) Pursuant to provisions of a state administrative rule, the State Agency Coordination agreement (OAR 731-015-0005 \textit{et. seq}), the IAMPs must be adopted by local governments and the Oregon Transportation Commission prior to submittal of a Final Design Environmental Impact Statement. Thus, indirect impacts at interchanges due to land development around interchanges will be controlled and mitigated through the measures described above.

\textbf{Plan Compatibility}

Under OAR 731-015-0005 \textit{et. seq}, the State Agency Coordination administrative rule requires that the proposed alternative is consistent with local, regional, and state plans prior to submittal of Tier 1 and Tier 2 Final EISs. The Modified 3J corridor complies with the Statewide Planning Goals and was found to be compatible with the comprehensive plans and policies for Yamhill County, and the cities of Dayton, Dundee and Newberg. This type of review will also occur prior to the issuance of the Tier 2 EIS for the roadway alignment.

\textsuperscript{24} Attorney General 2004 Oregon Ballot Measure 37 Initial Questions and Answers, Feb. 28, 2005.

\textsuperscript{25} ODOT Transportation Planning Analysis Unit, February 2004, Brian Gregor, Principal Author.
Statewide Planning Goals

No Build

The No Build does not construct the Bypass; as a result, no exceptions to Statewide Planning Goals are required for the location of the Bypass or related interchanges.

Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives require that Yamhill County take “exceptions” to some of the Statewide Planning Goals. Figures 4-2 and 4-3 highlight the portions of the Build Alternatives that require exceptions to Goals 3 (Agricultural Lands), 11 (Public Facilities and Services), and 14 (Urbanization). Table 4-11 provides additional details on the components of each Build Alternative that require exceptions (for example, new road alignment, interchanges or road widening). Exceptions to the Statewide Planning Goals are not required for portions of the Bypass or interchanges located inside of the Newberg, Dundee, and Dayton UGBs.

Statewide Planning Goal 12 (Transportation) and the Transportation Planning Rule articulate the state policy to provide and encourage a safe, convenient, and economic transportation system. They require regional and local governments to adopt TSPs that meet the needs for movement of people and goods between and through communities and accessibility to regional destinations. The Transportation Planning Rule underscores the importance of “connectivity” for transportation systems. More specific goals include the reduction of vehicle miles traveled per capita within the Portland metropolitan region.

Table 4-11 Summary of Elements of the Alternatives Requiring Exceptions to Statewide Planning Goals, in Acres

<table>
<thead>
<tr>
<th>Elements of Alternatives Requiring Goal Exceptions</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K*</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive Farm Use Land (Requires exception to Goals 3, 11, and 14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New road</td>
<td>82</td>
<td>86</td>
<td>80</td>
<td>84</td>
<td>80</td>
<td>94</td>
<td>106</td>
<td>96</td>
<td>109</td>
</tr>
<tr>
<td>Interchange areas</td>
<td>98</td>
<td>104</td>
<td>98</td>
<td>104</td>
<td>98</td>
<td>96</td>
<td>79</td>
<td>96</td>
<td>89</td>
</tr>
<tr>
<td>Widening of Oregon Highway 99W/18</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
<td>35</td>
<td>--</td>
</tr>
<tr>
<td>Subtotal (Exclusive Farm Use)</td>
<td>180</td>
<td>190</td>
<td>178</td>
<td>188</td>
<td>178</td>
<td>190</td>
<td>185</td>
<td>192-227</td>
<td>195</td>
</tr>
<tr>
<td>Rural Exception Areas (Requires exception to Goals 11 and 14)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New road</td>
<td>40</td>
<td>40</td>
<td>32</td>
<td>31</td>
<td>32</td>
<td>22</td>
<td>34</td>
<td>17</td>
<td>60</td>
</tr>
<tr>
<td>Interchange areas</td>
<td>79</td>
<td>86</td>
<td>82</td>
<td>90</td>
<td>82</td>
<td>22</td>
<td>15</td>
<td>27</td>
<td>91</td>
</tr>
<tr>
<td>Widening of Oregon Highway 99W/18</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td></td>
<td>16</td>
<td>--</td>
</tr>
<tr>
<td>Subtotal (Rural)</td>
<td>119</td>
<td>126</td>
<td>114</td>
<td>121</td>
<td>114</td>
<td>44</td>
<td>49</td>
<td>44-60</td>
<td>151</td>
</tr>
<tr>
<td>Total hectares (acres) requiring goal exceptions</td>
<td>299</td>
<td>316</td>
<td>292</td>
<td>309</td>
<td>292</td>
<td>234</td>
<td>234</td>
<td>236-287</td>
<td>349</td>
</tr>
</tbody>
</table>

* Note: The portion of Alternative 3K associated with the widening of Oregon Highway 99W southwest of Dundee may not require a goal exception, depending on several factors such as whether the improvements could be located within existing ODOT right of way and whether the improvements were classified as passing lanes or travel lanes.
Figure 4-2. Areas Requiring Exceptions

- Areas requiring exception to Statewide Goals 3, 11 & 14
- Areas requiring exception to Statewide Goals 11 & 14

Project Area

Urban Growth Boundary
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Figure 4-3. Modified 3J - Areas Requiring Exceptions

- Areas requiring exception to Statewide Goals 3, 11 & 14
- Areas requiring exception to Statewide Goals 11 & 14
- Project Area
- Urban Growth Boundary
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The exceptions process provides the framework to balance the policy objectives of Goal 12 with the policy objectives of Goals 3 (Agricultural Lands), 11 (Public Facilities and Services) and 14 (Urbanization), which together seek to protect agricultural lands for farm uses and restrict urban level uses and public facilities to lands within UGBs. Yamhill County has approved exceptions to Statewide Planning Goals 3 (Agricultural Lands), 11 (Public Facilities and Services), and 14 (Urbanization) for two sections of the project. See Chapter 6, Mitigation, for a discussion of the exceptions process.

Comprehensive Plans

The local comprehensive plans for Yamhill County, Newberg, Dundee, and Dayton are briefly described below. Plan amendments and applicable criteria are identified at a general level. Following that, the key policies and criteria from the OHP (Policy 1G: Major Improvements) and the TPR (Section 0075, Transportation Improvements on Rural Lands) are briefly described. A more thorough analysis and findings are included as part of the exceptions document, “Findings of Fact and Statement in Support of Exceptions to Goals 3, 11, and 14,” and supporting documentation. The adopted amendments to the Cities of Newberg, Dundee and Dayton, and Yamhill County Comprehensive Plans are included as Appendix D.

Yamhill County Comprehensive Plan

No Build

The No Build is not compatible with the Yamhill County Comprehensive Plan or TSP. The Yamhill County TSP expressly “supports the concept of the Bypass.”

Modified 3J and Other Build Alternatives

Yamhill County has land use jurisdiction over components of Modified 3J and the other Build Alternatives that are located outside of city UGBs. For Modified 3J and all of the other Southern Build Alternatives, an average of about 75 percent of the total displacement impacts will affect rural lands under Yamhill County jurisdiction. As shown in Figures 4-2 and 4-3, these are the segments of the project that will require exceptions to Statewide Planning Goals 3, 11, and 14.

The Yamhill County Comprehensive Plan includes strong policies to direct growth and development to the incorporated cities. Yamhill County does not provide public sewer and water services. This has resulted in a land use pattern where urban development is concentrated at the incorporated cities. The Yamhill County plan also includes a strong policy emphasis to protect agricultural and forest lands and the resource-based economy.

The concept of a limited-access highway bypassing downtown Newberg and Dundee has been circulating for at least 20 years. The Yamhill County TSP expressly “supports the concept of the Bypass”. The county’s plan states: “The exact location of the Bypass will be determined in the Environmental Impact Statement, and the public will have their opportunity to provide input on the optimum location through that process” (TSP, p.109).

The Yamhill County Comprehensive Plan currently includes a policy addressing alternatives for routing Oregon 99W traffic through or around Newberg and Dundee (Page 32, Section IIIA, Policy R). A separate policy prohibits direct access from the state highway system for commercial development oriented to limited-access highways (p., Section IG, Policy H). The plan also includes a policy to maintain the integrity and function of the highway system by discouraging new commercial development along the route of any limited-access highway (p., Section IG, Policy I).

To implement Modified 3J, Yamhill County amended its Comprehensive Plan and has taken exceptions to Statewide Planning Goals 3, 11, and 14.
City of Newberg Comprehensive Plan

No Build

The No Build is not compatible with the Newberg Comprehensive Plan. Increasing congestion associated with the No Build is inconsistent with plan policies that seek to reduce the negative impact of regional traffic on the local transportation system, the downtown area and community livability.

Modified 3J and Other Build Alternatives

Modified 3J and Other Build Alternatives are compatible with the Newberg Comprehensive Plan. The Plan includes policies to support the development of a bypass and minimize the impact of regional traffic on the local transportation system (pp. 23-24, Goal 4, Policies C, H and I). The Plan authorizes construction of a Bypass in a southern alignment within the Newberg UGB (p. 24, Policy H). The Newberg TSP identifies a need for a refinement plan for the Bypass. Amendment of the City’s TSP will be needed for any of the Build Alternatives.

Modified 3J is compatible with the approved alignment in the Newberg Comprehensive Plan and reduces regional traffic on the local transportation system, consistent with Goal 4 of the Transportation Chapter of the Newberg Comprehensive Plan. Modified 3J could affect plans for the Springbrook Oaks area and the Newberg Riverfront District. The Springbrook Oaks site is a large developing area (about 284 acres) within the Newberg UGB. The Newberg City Council adopted a specific plan to provide a coordinated framework for a mix of land uses on the site. Modified 3J displaces a portion of the specific plan area and could fragment portions of the site to the east and west of the Bypass.

The Newberg Riverfront master plan, completed in 2001, is for the 200-acre riverfront area. The City adopted plan amendments to change the comprehensive plan for this area from industrial to a mix of open space, riverfront, commercial, and residential uses. The Riverfront Plan calls for creation of a pedestrian-oriented, mixed-use district. The Build Alternatives that include an Oregon 219 Interchange or an intersection at River Street enhance regional accessibility to the Riverfront District from the Bypass. However, access across the Bypass from the Newberg community is potentially a more important feature than direct access from the Bypass. Depending on the design, the Bypass could block access to the riverfront from the Newberg community. Furthermore, overcrossings could block access along intersecting streets for up to two blocks. The adopted Riverfront Master Plan includes specific design recommendations for the Bypass, including a recommendation to consider a below-grade facility or a boulevard design through the riverfront area. Specific design elements such as connectivity to the riverfront will be analyzed in the Tier 2 EIS.

Most of the vacant residential land within the Newberg UGB is located in northern Newberg. The city has adopted an urban reserve area that extends north of the UGB to Bell Road. This area is expected to accommodate long-term (30 to 50 year) urban growth needs. The Northern Bypass Alternative could fragment this future urban development area from the remainder of Newberg.

In summary, Modified 3J is compatible with the Newberg Comprehensive Plan. The Plan includes numerous goals and policies supporting transit, pedestrian, bicycle and street connectivity improvements. Additionally, the plan includes policies that prohibit direct access to a limited-access facility, support commercial uses in the downtown area, and discourage highway-oriented commercial development. Additional policies and ordinance provisions have been adopted by the City to protect the function of the Bypass and interchange areas within the Newberg UGB. During the comprehensive plan and ordinance adoption process, the City of Newberg also evaluated whether adequate land will be available within the UGB to meet projected 20-year housing needs, taking into account the displacement of urban land for the Bypass and interchanges.

Additional plan policies and ordinances may be needed to fully implement the transportation and land use elements and interchange area management plans for the portions of Modified 3J within the Newberg
relevant statewide planning goals, Oregon Highway Plan (OHP) policies, and Newberg Comprehensive Plan policies will provide the criteria for amendments to Newberg’s Comprehensive Plan and implementing ordinances.

**City of Dundee Comprehensive Plan**

**No Build**

The No Build is not compatible with the City of Dundee Comprehensive Plan or TSP. The Dundee City Council adopted a resolution that supports a southerly alignment for the Bypass that is closer to the Willamette River, with an interchange between the cities of Newberg and Dundee.

**Modified 3J and Other Build Alternatives**

The City of Dundee is in the process of updating its Comprehensive Plan. The Dundee City Council recently adopted a resolution that supports a southerly alignment for the Bypass that is closer to the Willamette River, with an interchange between the cities of Newberg and Dundee. Similar to the Newberg and Yamhill County plans, the Dundee TSP support for the southerly Bypass is contingent on approval of the necessary plan amendments.

Dundee’s 1978 Comprehensive Plan included policies that supported the concept of widening Oregon 99W to four lanes. The City deleted these policies from the plan when it was updated in 1990. Therefore, the widening of Oregon 99W to five lanes through Dundee (Alternative 3K) is inconsistent with the Dundee Comprehensive Plan.

The 1978 Plan expressed a community preference for a bypass around Newberg and Dundee. The Build Alternatives other than 3K are consistent with the community preference noted in the Dundee Comprehensive Plan.

Dundee’s plan includes policies to coordinate with Yamhill County and Newberg to manage the land between the two cities and preserve the separation of the communities. With the exception of Alternative 3K, all Build Alternatives include an interchange connecting the Bypass to Oregon 99W between the two cities. An interchange management plan is an important tool to comply with the OHP and the Dundee Comprehensive Plan and retain the separation of Newberg and Dundee.

Unlike the Yamhill County and Newberg Comprehensive Plans, the Dundee plan does not currently include policies to prohibit highway-oriented commercial development along the Bypass corridor or at proposed access points. Working in coordination with ODOT and neighboring jurisdictions, Dundee is amending its Comprehensive Plan to include policies similar to Yamhill County and Newberg.

The City of Dundee adopted additional plan policies and implementing ordinances to fully implement the transportation and land use elements for the portions of Modified 3J that fall within the Dundee UGB. Relevant Statewide Planning Goals, OHP policies, and Dundee Comprehensive Plan policies provided the criteria for amendments to Dundee’s plan and implementing ordinances.

**City of Dayton Comprehensive Plan**

**No Build**

The No Build is not compatible with the City of Dayton Comprehensive Plan. In 2004, the Dayton City Council adopted amendments the Plan to include policies supporting the Bypass in a southern location corridor described as Modified 3J, including the Dayton Interchange.
Modified 3J and Other Build Alternatives

The City of Dayton updated its Comprehensive Plan in 1993 and is in the process of developing its TSP. In 2004, the Dayton City Council adopted amendments to the Comprehensive Plan to include policies supporting the Bypass in a southern location corridor described as Modified 3J, including the Dayton Interchange. The amendment also supports the development of an IAMP for the Dayton Interchange that will protect the function and capacity of the interchange as part of a plan for local access, local street circulation, and adjacent land uses, including property zoned for industrial uses.

Relevant Statewide Planning Goals, OHP policies, and Dayton Comprehensive Plan policies provided the criteria for amendments to Dayton’s plan and policies.

1999 Oregon Highway Plan

The Oregon Transportation Commission adopted the Oregon Highway Plan (OHP) in 1999, which guides state highways that are developed and managed over the next 20 years. As described earlier in this LFEIS, the transportation analyses of all Bypass alternatives were based on mobility and performance standards in the OHP.

The OHP includes a number of specific policies and actions that guide planning for major highway improvements and bypasses. The policies and actions protect the mobility function of bypasses and other major transportation improvements for the long term. These elements cover a range of concerns and emphasize agreements with local governments in the state and/or local planning process that will support bypasses and other major improvements, as well as development of local street systems.

As the first step in the highway improvement process, and the step most critical to the Bypass, Policy 1G outlines the state policy for major improvements and analysis of alternatives:

Policy 1G: Major Improvements

It is the policy of the State of Oregon to maintain highway performance and improve safety by improving system efficiency and management before adding capacity. ODOT will work in partnership with regional and local governments to address highway performance and safety needs. (OHP, page 82)

Action 1G.1 (OHP, 82-83) describes the priorities for addressing problems of maintaining highway performance and improving safety and how the priorities are to be applied. Plans must document the findings that support using lower priority measures before higher priority measures. The priorities for maintaining highway performance and safety are summarized below:

1. Protect the existing system. The highest priority is to preserve the functionality of the existing highway system by means such as access management, local comprehensive plans, transportation demand management, improved traffic operations and alternative modes of transportation.

2. Improve the efficiency and capacity of existing highway facilities. The second priority is to make minor improvements to existing highway facilities, such as widening highway shoulders or adding auxiliary lanes, providing better access for alternative modes (e.g., bike lanes, sidewalks, bus shelters), extending or connecting local streets and making other off-system improvements.

3. Add capacity to the existing system. The third priority is to make major roadway improvements to existing highway facilities, such as adding general purpose lanes and making alignment corrections to accommodate legal size vehicles.

4. Add new facilities to the system. The lowest priority is to add new transportation facilities such as a new highway or bypass.
ODOT and local jurisdictions in the project corridor have made substantial investments in Oregon 99W and the local road system to protect the existing system, improve the efficiency and capacity of existing highway facilities, and add capacity to the existing system. Most recently, ODOT reconstructed segments of Oregon 99W through Newberg to add travel and turn lanes, add bike lane and sidewalk improvements, eliminate the 90-degree turn of 99W at River and Hancock, and install new traffic signals.

As described in Chapter 1, numerous additional transportation projects are included in state and local TSPs to improve the efficiency and capacity of the existing highway facilities and add capacity to the existing system. These projects include plans and funding commitments for additional improvements to Oregon 99W and construction and extension of parallel roads, such as the northern arterial in Newberg, and Dayton Avenue between Newberg and Dundee.

Discussion of the alternatives that were considered but withdrawn was provided in Chapter 2 of the LDEIS. In particular, the Transportation Management Alternative was dropped as a stand-alone alternative because it failed to meet the minimum transportation performance threshold consistent with the OHP. Even with the assumed transportation management improvements, traffic volumes on Oregon 99W will substantially exceed capacity, indicating very heavy congestion. The components of the Transportation Management Alternative, including system management and demand management elements, were incorporated into the Build Alternatives under consideration in the LDEIS.

As part of the Goal Exception process, planners from Yamhill County and the Cities of Dayton, Dundee, and Newberg documented findings that support the Preferred Alternative, Modified 3J, using the standards of Policy 1G. Additional OHP policies and actions apply, as highlighted below.

- Establish the bypass or major improvement as a freeway or expressway. (Action 3A.1)
- Work with local governments to plan for appropriate land uses and to develop or amend supporting ordinances and regulations before the facility is constructed. (Action 1B.2)
- Implement reasonable measures to manage the transportation system. (Action 1G.1)
- Protect the mobility standards of the bypass or major improvement. (Action 1B.4)
- Control access. (Action 1G.4)
- Protect interchanges. (Action 1B.5 and 3C.1)
- Use medians as much as possible. (Policy 3B)
- Work with local governments to provide local street connectivity that supports the bypass and the community. (Action 1G.2)
- Avoid the expansion of the UGB along statewide highways and around interchanges. (Action 1B.4)
- Develop cost-sharing agreements with local governments. (Action 1G.3)
- Transfer the bypassed facility. (Action 1G.5)

Excerpts of the key policies and strategies from the OHP are attached as an appendix to the Land Use Technical Memorandum.

**Transportation Planning Rule (TPR)**

The Oregon Land Conservation and Development Commission adopted the Transportation Planning Rule in 1991 to implement the Statewide Planning Goal on Transportation (Goal 12). Among other purposes, the Transportation Planning Rule (TPR) is intended to explain how local governments and state agencies responsible for transportation planning demonstrate compliance with other statewide goals and to identify how transportation facilities are provided on rural lands consistent with the goals.
Section 0065 of the TPR identifies transportation facilities, services and improvements which may be permitted on rural lands consistent with Goals 3, 4, 11, and 14 without a goal exception. All of the Build Alternatives include a “new road,” and will therefore not be permitted without a goal exception under the provisions of Section 0065. The component of Alternative 3K that includes the widening of Oregon 99W between Dundee and Dayton may not require an exception.

Section 0070 of the TPR outlines requirements for exceptions for transportation improvements on rural land. The key criteria for the exception are summarized below. The full text of this section of the TPR is included in Appendix B.

- To address Goal 2, Part II(c)(1), the exception must demonstrate that there is a transportation need identified that cannot reasonably be accommodated through one or more of the following measures that do not require an exception:
  - Alternative modes of transportation.
  - Traffic management measures.
  - Improvements to existing transportation facilities.

- To address Goal 2, Part II(c)(2), the exception must demonstrate that non-exception locations cannot reasonably accommodate the proposed transportation improvement or facility.

To determine the reasonableness of alternatives to an exception, cost, operational feasibility, economic dislocation and other relevant factors must be addressed. Local governments must justify in their exception the thresholds they used to judge whether an alternative method or location could not reasonably accommodate the proposed transportation need or facility. To address Goal 2, Part II(c)(3), the exception must:

- Compare the economic, social, environmental and energy consequences of the proposed location and other alternative locations requiring exceptions.

- Determine whether the net adverse impacts associated with the proposed exception site are notably less adverse than the net impacts from other locations which also require an exception. A proposed exception will fail to meet this requirement only if the affected local government concludes that the impacts associated with it are significantly more adverse than the other identified exception sites.

- The evaluation of the consequences of general locations or corridors need not be site-specific, but may be generalized consistent with the requirements of this rule.

- To address Goal 2, Part II (c) (4), the exception must:
  - Describe the adverse effects that the proposed transportation improvement is likely to have on the surrounding rural lands and land uses, including increased traffic and pressure for non-farm or highway-oriented development on areas made more accessible by the transportation improvement.
  - Adopt as part of the exception, facility design and land use measures which minimize accessibility of rural lands from the proposed transportation facility or improvement and support continued rural use of surrounding lands.

Several of the exception criteria parallel the Major Improvements Policy in the OHP. Essentially, a new road or bypass must not be constructed on rural land unless it can be demonstrated that one or a combination of alternative modes, traffic management measures and improvements to existing facilities cannot reasonably accommodate the identified transportation need. Chapter 1 of this LFEIS documents the identified state, regional and local transportation need. Chapter 2 of the LDEIS documents the alternatives that were considered and withdrawn because they could not reasonably meet the identified transportation need (including the Transportation Management Alternative, which relied heavily upon
alternative modes of transportation, traffic management measures and improvements to existing facilities).

Oregon 99W crosses in and out of several urban growth boundaries and traverses urban and rural land. Other than the No Build, there are no alternatives available that could reasonably accommodate the transportation need that will not also require an exception.

All of the Build Alternatives will require an exception for the improvements on rural land (See Figure 4-2). This LFEIS compares the economic, social, environmental and energy consequences of the Build Alternatives on a generalized corridor basis, as allowed by the TPR. The following types of consequences are addressed in the LFEIS under these broad headings:

- **Economic Consequences.** Business displacements, displacement/fragmentation of agricultural land, changes in travel patterns and accessibility, impacts on highway-related businesses and established business districts, employment and freight movement.

- **Social Consequences.** Growth inducement, neighborhood or community cohesion, impacts on community facilities, impacts on racial/ethnic minorities and low-income populations, residential displacements, cultural resources and the visual environment.

- **Environmental Consequences.** Air quality, noise, water resources, biological resources, geophysical conditions and hazardous materials.

- **Energy Consequences.** Fuel consumption by alternative, comparison of vehicle miles traveled by alternative.

The discussion of indirect land use impacts in this chapter describes the adverse impacts the proposed Build Alternatives could have on surrounding rural lands and land uses, including increased commuting and pressure for non-farm or highway-oriented development in areas made more accessible by interchanges.

A Bypass will be an access-controlled facility. Interchange area management plans will be developed for each proposed interchange to protect the function of the facility. Once an alternative is selected, more detailed facility design and land use mitigation measures to support continued rural use of lands surrounding the facility will be adopted as part of an exception.

**SOCIOECONOMICS**

**Right of Way**

After receiving a ROD on the Tier 1 LFEIS, and prior to receiving an ROD on the Tier 2 Final Environmental Impact Statement, ODOT intends to acquire a limited amount of right of way within the approved corridor with federal funds. The strategy ODOT will use in acquiring land for right of way during this period is described in Chapter 5. ODOT’s relocation policy and benefits are described in Appendix H.

**Area and Cost of Property**

**Direct Impacts**

**No Build**

The No Build does not require property acquisition; as a result, it requires no area and has no cost of property impacts.
Modified 3J and Other Build Alternatives

Direct cost of property impacts for Modified 3J and other Build Alternatives are a result of property acquisition for location of the Bypass and its interchanges. The total land area that could be needed for construction of each Build Alternative is provided in Table 4-12. All of the Build Alternatives require more land area acquisition than the No Build. The amount of land required for each Build Alternative ranges from approximately 363 acres for Alternative 3J to approximately 413 acres for Alternative 4C. Modified 3J requires acquisition of approximately 382 acres. For Modified 3J and all of the other Build Alternatives, agricultural land makes up the largest proportion of the total area required (44 percent to 59 percent) for the Bypass.

Based on a survey completed in 2002, estimated right of way acquisition costs range between approximately $28 and $57 million for Modified 3J and the other Build Alternatives. The right of way acquisition cost for each alternative is shown in Table 4-13.

<table>
<thead>
<tr>
<th>Table 4-12</th>
<th>Land Area Needed for Alternative Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
</tr>
<tr>
<td>Acres</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table 4-13</th>
<th>Right of Way Acquisition Cost by Alternative (millions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
</tr>
<tr>
<td>Estimated cost of right of way acquisition</td>
<td>NA</td>
</tr>
</tbody>
</table>

Indirect Impacts

No Build

The No Build does not require property acquisition; as a result, there will be no indirect impacts.

Modified 3J and Other Build Alternatives

Indirect impacts that may result from property acquisition are increases in property values of comparable replacement property due to competition for replacement property.

**Residential and Business Displacement**

Direct Impacts

No Build

The No Build does not require property acquisition; as a result, there will be no residential or business displacements.

Modified 3J and Other Build Alternatives

Potential residential displacement as a result of Modified 3J and other Build Alternatives range between 61 and 127 residential units. The residential displacements for Modified 3J are 108. The residential
displacement totals include farm housing. The potential impacts associated with each Build Alternative are factored to represent potential impacts associated with only the proportion of the corridor likely to be needed to build the alternatives. The estimated number of residential displacements by alternative is shown in Table 4-14.

Potential business displacements for Modified 3J and other Build Alternatives range between 5 and 16 businesses. Modified 3J has 14 business displacements. Build Alternatives that include the Oregon 219 Interchange displace the Newberg Business Center, thus increasing impacts. The widening of Oregon 99W within Dundee could displace additional businesses (see Appendix F of the LFEIS).

<table>
<thead>
<tr>
<th>Table 4-14 Residential and Business Displacements by Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Build</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Residential displacements</td>
</tr>
<tr>
<td>Business displacements</td>
</tr>
</tbody>
</table>

Indirect Impacts

No Build

The No Build does not require property acquisition; as a result, there will be no indirect residential or business displacements.

Modified 3J and Other Build Alternatives

Indirect residential displacement impacts from the some of the Build Alternatives could affect the Columbia Empire Farms (CEF) farm worker housing. CEF is located southeast of the East Dundee Interchange, and provides housing for as many as 30 of its migrant workers during peak season and full-time housing for the farm manager. Modified 3J, 3J, 3K, and 4C, the northern alternative, avoid substantial impacts to the farm property and operations. However, Alternatives 3C, 3D, 3G, 3H, and 3I substantially impact farm operations, by dividing the farm property into two parcels; these alternatives also impact farm housing. In order to minimize these impacts, ODOT modified Build Alternative 3J by realigning the connector road further north, off the exception land and away from CEF operations. The result is Modified 3J. In addition, Modified 3J does not impact CEF processing facilities, farm worker housing or other built improvements on the farm.

Division of farmlands could also result in indirect impacts, if the division and/or purchase of portions of existing farms affect the cost or efficiencies in farming these smaller parcels. Alternative 3J divides Columbia Empire Farms into three parcels. Resulting indirect impacts are smaller field areas and potentially decreased efficiency for moving employees and equipment between fields. Although Modified 3J does divide the farm into separate two main parcels, during the goal exception hearing, ODOT agreed to provide connectivity. Specific farm access and parcel connectivity will be analyzed further during Tier 2, preliminary engineering.

Though specific operating costs and profit margins for this farm are unknown to ODOT, fixed costs are estimated to be rather large for products produced by the farm (especially hazelnuts). As a result, reductions in farmable area and reduced operational efficiency could have a detrimental impact.

---

26 Recently, CEF informed ODOT of a third, relatively small adjacent parcel that is leased for agricultural purposes.
Alternative 4C also indirectly impacts orchards and fields used for farm operations to the north. This alternative results in division of farms, reductions in farmable area, and the likelihood of reduced operational efficiency as orchards and fields are included in potential right of way. Indirect farm displacement could result from disruption of farm operations.

Changes in Travel Patterns and Accessibility

Direct Impacts

No Build

The No Build continues to increase traffic on Oregon 99W in downtown Newberg and Dundee, degrades access to downtown businesses and hinders north-south travel across these communities due to increasing congestion.

Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives directly affect travel patterns and accessibility for local and non-local traffic. With the exception of those classified as arterials or collectors, local streets that intersect the alternatives could be bisected. Exceptions include: Oregon 219, Oregon 240, River Road, Wynooski Road, Fernwood Road, Fox Farm Road, Dayton Road, and a planned but yet undeveloped road in Newberg’s northern undeveloped residential zone (northern Arterial). By comparison, the No Build continues to increase traffic on Oregon 99W in downtown Newberg and Dundee, degrades access to downtown businesses and hinders north-south travel across these communities due to increasing congestion.

Modified 3J and all of the other Build Alternatives also directly impact travel patterns and accessibility by reducing local street connectivity, and potentially affect accessibility to some road systems and structures. Table 4-15 indicates potential impacts of each Build Alternative on local access. The potential impacts to buildings with reduced accessibility as shown in Table 4-15 are worst case scenarios. It is unlikely this many buildings will be affected, if ODOT uses design solutions and mitigation to provide reasonable access to those buildings affected by reduced access.

Table 4-15 Potential Impacts to Local Access

<table>
<thead>
<tr>
<th>Potential Impact</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisected Local Streets</td>
<td>0</td>
<td>30</td>
<td>31</td>
<td>29</td>
<td>27</td>
<td>27</td>
<td>24</td>
<td>23</td>
<td>27</td>
<td>44</td>
</tr>
<tr>
<td>Buildings with Potentially Reduced</td>
<td>0</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>56</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>59</td>
</tr>
<tr>
<td>Accessibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Neighborhood schools could also experience reduced accessibility, especially to a portion of households within walking distance. Modified 3J and other Build Alternatives reduce the number of travel routes accessing schools. Four school area boundaries could be bisected by all the Southern Build Alternatives, and six would be bisected by Northern Build Alternative 4C.

Indirect Impacts

No Build

Increasing congestion on Oregon 99W is expected to indirectly impact changes in travel patterns accessibility by changing regional travel patterns.
Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives indirectly impact changes in travel patterns and accessibility by changing regional travel patterns. Through traffic is expected to account for between 53 percent and 79 percent of all future (2025) travel on the Bypass (depending on the Build Alternative). Downtown areas of Newberg and Dundee will experience reduced future traffic volumes under all Build Alternatives. Modeling shows that average daily traffic in downtown Dundee will drop by between 47 percent and 72 percent (depending on the alternative) compared to the No Build. Similarly, average daily traffic in downtown Newberg will be 30 to 50 percent lower. These reductions will improve local street connectivity and circulation, especially for bicyclists and pedestrians. Alternatives 3G and 3H will result in the largest reduction of traffic on Oregon 99W within the City of Newberg.

Regional and Local Economy

For this evaluation, the regional economy is described as comprising the whole of Yamhill County. The local economy focuses on the cities of Newberg and Dundee.

Direct Impacts

No Build

The No Build directly impacts the regional and local economy by inhibiting the movement of goods, people, and services between the Portland metropolitan area, Yamhill County, and the Oregon Coast.

Modified 3J and Other Build Alternatives

Construction of Modified 3J or other Build Alternatives enhances short-term income and employment, and increases accessibility to business areas around Oregon 99W. The direct impacts on short-term income from construction of the new roadway include:

- Direct added income associated with new highway and construction jobs.
- Indirect added income from jobs created in industries supplying goods and services to the highway and construction firms.
- Induced income resulting from additional purchases made by the households receiving the new direct and indirect income benefits.
- Potential adverse short-term business impacts related to reduced access and construction noise. The short-term impacts due to construction could last a year or more in specific locations, depending on project schedule.

Analysts estimate that in Yamhill County, about $334,000 of new personal income is generated per $1 million of highway construction spending. The cost of construction of Modified 3J is approximately $270 million. Direct, indirect and induced income impacts from construction spending could generate an estimated $90.2 million of added personal income from highway construction jobs, industries supplying construction materials, and other purchases with new income (as identified above). These income impacts could be expected to dissipate relatively quickly following the end of the construction period.

Indirect Impacts

No Build

Under the No Build indirect impacts on the local and regional economies are related to the ability of Newberg and Dundee to continue to function as local economic centers as traffic congestion on Oregon 99W increases. Increased congestion will make locally oriented businesses in commercial districts less
desirable places to visit. Freight mobility and employee willingness to travel to and from industrial areas will be diminished, and regional economic growth could be impaired.

**Modified 3J and Other Build Alternatives**

For Modified 3J and other Build Alternatives, indirect impacts on the local and regional economies are related to increased attractiveness of the area due to added travel capacity. The LDEIS reported that longer-term indirect impacts from added travel capacity on the Bypass could include:

- Stimulation of development in the vicinity of the new roadways. In particular, development or redevelopment could be expected at new major intersections and interchanges, unless precluded and/or redirected through local land use policy.
- Increased perception of Newberg and Dundee as good places to live and do business, thus attracting additional residential, commercial and industrial development.
- Increased travel between Newberg, Dundee and Yamhill County and other destinations such as Portland and the Oregon Coast.

However, subsequent modeling using the Gen1 model suggests that the indirect impacts to land development resulting from the Bypass will be very small. According to the Gen1 model results described in earlier in the chapter, building a bypass increases the growth of households and jobs in Yamhill County relative to doing nothing, but the projected increase is less than five percent, and the growth is primarily in jobs concentrated in the McMinnville area.

The model shows increases in employment, which indicates that a bypass will make the McMinnville area more attractive as an employment center. A positive indirect effect of the Bypass will be a probable improvement in the jobs-housing balance which will, in turn, slightly reduce commuting to the Portland area.

In terms of impacts on communities along the Bypass, minimal changes in jobs or housing are expected in Newberg because accessibility to the Portland area remains about the same as under current conditions. Dundee and Dayton will experience little difference in job or population growth between the scenarios because they do not have the economic base to attract much new business. The larger economic base in McMinnville area will be most attractive to business with improved accessibility to the Portland area under a Bypass scenario.

**Highway-Related Businesses**

Currently, through traffic uses existing Oregon 99W. As a result, highway-related businesses (those that rely on drive-by traffic for a large amount of their business) are dispersed along Oregon 99W, with some business clusters.

**Direct Impacts**

**No Build**

The No Build has no direct impacts on highway-related business because it largely reflects continuation of existing conditions.

**Modified 3J and Other Build Alternatives**

No direct impacts to highway-related businesses located along the Bypass are expected because the Bypass is a limited-access facility and will not have businesses located along it.
Indirect Impacts

No Build

Indirect impacts could include adverse impacts to highway-related businesses on Oregon 99W due to increasing traffic congestion. Particularly in instances where current or future traffic volume exceeds roadway capacity, highway-related business viability is adversely impacted. Potential drive-by customers will have difficulty reaching businesses (especially those accessed by a left-turn movement). Businesses could be vulnerable if they are perceived as less convenient or accessible and if they have competition elsewhere in the area. Continuing traffic congestion on Oregon 99W could adversely affect as many as 82 highway-related businesses during the evening peak traffic periods.

Modified 3J and Other Build Alternatives

The Build Alternatives with the largest indirect impact on highway-related businesses will be those that could result in average daily traffic counts on Oregon 99W declining by 30 percent or more from current (year 2000) levels. Such substantial traffic reductions could affect businesses that rely on drive-by traffic for customers. Another indirect impact could be to stimulate development in the vicinity of interchanges; however, this tendency will be controlled by land use regulations in conformance with IAMPs to be adopted by local governments and the Oregon Transportation Commission in Tier 2.

In instances where traffic volume will or does exceed roadway capacity, highway-related business viability is also adversely impacted. The net impact of the Build Alternatives could be positive, even in instances where traffic volumes will be reduced. This occurs when reduced congestion improves accessibility to the businesses and a lesser decline in the through-traffic customer base is expected.

Modified 3J and Alternatives 3I, 3C, 3D, 3J and 4C will likely have some impact on highway-related business location/relocation, but could have a net positive effect due to reduced congestion and a lesser decline in through-traffic customer base. Alternatives 3G and 3H will result in the largest reduction of traffic on Oregon 99W within the City of Newberg (where the majority of these businesses are located). As a result, these two alternatives are likely to impact a total of 66 highway-related businesses and most likely to encourage location/relocation of highway-related businesses in the vicinity of bypass interchanges and intersections.

During construction, temporary adverse impacts related to reduced roadway access and construction noise could affect highway-related businesses in the vicinity of the proposed interchanges that connect with Oregon 99W.

Established Business Districts

Established business districts in the vicinity that could be directly and indirectly affected include the downtowns of Newberg and Dundee and the auto-oriented commercial district along Oregon 99W between Newberg’s downtown and its eastern city limits. IAMPs will control development and deter large retail establishments surrounding the interchanges, thereby promoting the continued economic viability of downtown businesses.

Direct Impacts

No Build

The No Build largely reflects continuation of existing conditions; as a result, no direct impacts in established business areas are expected.
**Modified 3J and Other Build Alternatives**

No direct impacts to highway-related businesses as a group are expected. Construction will be on the new Bypass and will not interfere with existing businesses on Oregon 99W, with a few exceptions around interchanges between Oregon 99W and the Bypass.

**Indirect Impacts**

**No Build**

Indirect impacts could include a decline in competitive position for businesses on Oregon 99W in all three commercial districts due to increasing traffic congestion. Businesses in these districts could be vulnerable if they are perceived as less convenient or less accessible, or if they have competition elsewhere in the area.

**Modified 3J and Other Build Alternatives**

Modified 3J and all of the other Build Alternatives have more positive than negative impacts on the three business districts as compared to the No Build. Impacts vary among business types. Some of the businesses are destinations themselves, while others rely on drive-by traffic. Adverse impacts may occur in the near term for those businesses on Oregon 99W (in all three established districts) that are most reliant on drive-by traffic. They may experience a reduced customer base. Overall, a bypass improves accessibility during peak traffic hours for all businesses (even those that rely on drive-by traffic). Alternatives that provide easy access to business districts regardless of direction of travel are most beneficial.

Reducing through traffic volumes from current (year 2000) levels for the downtown of both Newberg and Dundee improves local street connectivity and circulation, and creates a better environment for bicyclists and pedestrians. This could increase people’s level of comfort with driving, bicycling and walking in the downtowns, which, in turn, creates an opportunity to market these downtown districts as destinations. Customer visits and business volumes are expected to grow.

The business mix in downtown Dundee is about evenly divided between businesses that do and do not rely on drive-by traffic. As through traffic is reduced along Oregon 99W, the composition of businesses in that area will change. Reduced through traffic will, over time, attract different businesses to the Oregon 99W corridor. Because the location of the East Dundee Interchange will redirect higher volume traffic, downtown Dundee’s business district will have a greater potential of achieving an intimate pedestrian-oriented downtown as outlined in the Dundee Vision.

Downtown Newberg could receive the most positive net benefit from Modified 3J. Businesses with substantial reliance on drive-by traffic represent only 34 percent of those located on Newberg’s couplet. The majority of businesses will benefit from improved accessibility and an enhanced pedestrian environment (compared to those potentially affected by declines in customer base). Highway-related businesses comprise approximately 40 percent of the East Newberg business district. Decreased traffic volume could affect those businesses, but the majority of establishments will benefit from improved accessibility. Alternatives 3G, 3H, 3I, 3J and Modified 3J, which include an interchange at Oregon 219, offer the best access to business districts in Newberg.

**Employment**

**Direct Impacts**

**No Build**

The No Build does not provide project-related construction expenditures. No direct employment impacts are expected.
Modified 3J and Other Build Alternatives

For Modified 3J and all of the other Build Alternatives, employment impacts from construction expenditures include the direct employment impacts of immediate construction hiring, as well as indirect and induced impacts.

Within Yamhill County, approximately 7.4 construction jobs and 2.4 jobs in other sectors of the local economy are created for every $1 million of construction expenditure. The retail trade and service sectors gain some employment because of construction-related purchases. This induced employment is estimated at about 5 jobs per $1 million of construction spending.

The estimated cost of construction of Alternative Modified 3J is approximately $270 million dollars. Direct, indirect, and induced employment impacts from construction spending will generate approximately 4,000 added jobs. These employment impacts are expected to dissipate relatively quickly following completion of the project. New development stimulated in the project area could result in additional employment increases.

Indirect Impacts

No Build

No Build long-term indirect impacts could include reduced levels of employment growth if the study area is perceived as less desirable for additional development because of roadway congestion.

Modified 3J and Other Build Alternatives

Modified 3J and other Build Alternatives will have similar indirect employment impacts, including employment by businesses providing goods and services to the construction firms.

Induced impacts for Modified 3J and other Build Alternatives are similar, including jobs created as a result of additional purchases made by households due to increased incomes linked to direct or indirect employment impacts.

Modified 3J and other Build Alternatives have similar longer-term indirect impacts, including stimulating development and new employment opportunities in the vicinity of the new intersections and interchanges (where local zoning and other regulations do not prevent it). However, as stated above, this development will be controlled by IAMPs. Overall, the Gen1 model predicts very modest gains over the next 20 years. Other impacts include continued and increased perception of Newberg and Dundee as good places to live and do business, thus attracting additional residential, commercial and industrial development (and related employment). The precise mix of future development and net cumulative impact on employment will be affected not only by the alternative selected, but also by a variety of influences, including local and regional economic trends, land use and growth management policies, land availability and infrastructure capacity.

Neighborhood or Community Cohesion

Direct Impacts

No Build

The No Build does not change roadway configuration; as a result, there are no direct impacts. However, increasing congestion on Oregon 99W widens the north-south division of Newberg and Dundee from a community perspective.
Modified 3J and Other Build Alternatives

Modified 3J and other Build Alternatives have the direct impact of separating some residences from their existing neighborhoods. The number of neighborhoods of concern associated with each alternative is listed in Table 4-16. Instances where Build Alternatives could affect homes at the edge of a neighborhood or those located in areas that are more rural in character (and thus not readily identifiable as a neighborhood) are excluded.

Table 4-16 Potential Neighborhood/Community Cohesion Impacts

<table>
<thead>
<tr>
<th>Alternative</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of potentially affected neighborhoods</td>
<td>0</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Alternative 3J was shifted to the south to minimize impacts to a neighborhood in South Newberg, resulting in Modified 3J. ODOT made the modification in response to recommendations from the POST in an effort to minimize potential environmental justice issues associated with disruption of this neighborhood. For more information on why Modified 3J was shifted south in this area, see Chapter 2 and the Environmental Justice section of this chapter.

Alternatives 3C, 3D, 3G and 3H affect the same two neighborhoods. The first is located west of the SP Newsprint Co. Depending on the location of the alignment, construction could cause some homes to be separated from the remainder of the neighborhood north of the Bypass. The second neighborhood affected is located east of the East Dundee Interchange. Homes in this neighborhood could also potentially be separated from the remainder of the neighborhood north of the Bypass.

Alternative 4C affects two other neighborhoods. One is located just west of the proposed East Newberg Interchange. A group of homes south of Crestview Drive could be separated from homes south of the Bypass, depending on the location of the alignment. The second affected neighborhood lies just north of the East Dundee Interchange. A small group of homes east of the Bypass could be separated from the remainder of the neighborhood to the west, depending on the location of the alignment.

The City of Newberg adopted a Riverfront Master Plan in 2002 to reorient and connect Newberg to the Willamette River as a community amenity. As part of the Riverfront Master Plan adoption, the City also amended Comprehensive Plan designations for the approximately 200-acre riverfront area from industrial to a mix of open space, commercial and residential uses. The Riverfront Master Plan included a conceptual alignment for a Southern Bypass and concluded that any future southern bypass could be integrated with the riverfront plan, if the bypass route did not bisect the planning area and sufficient access was provided to the riverfront area from the bypass and the rest of the city. An Intergovernmental Agreement between ODOT and the City of Newberg commits the parties to work together on this issue in Tier 2 planning.

Modified 3J and all of the other Southern Build alternatives bisect the undeveloped residential areas in the Riverfront District to varying degrees. Through the public review process, the Newberg City Council and ODOT concluded that it is preferable to shift the corridor south of 11th Street to the west of River Road to reduce housing displacement impacts and minimize the negative impacts of the Bypass on developed residential neighborhoods. Fragmentation of the undeveloped residential areas in the Riverfront District will be addressed and mitigated in Tier 2, with consideration of appropriate local street crossings and Bypass design features.
Community Facilities

Direct Impacts

No Build

The No Build does not change roadway configurations or maintenance practices. As a result, there are no direct impacts to community facilities.

Increasing Oregon 99W congestion generally increases the difficulty of providing fire, police and emergency services (especially during peak hour traffic).

Modified 3J and Other Build Alternatives

All Southern Build Alternatives except Modified 3J displace at least a portion of Scott Leavitt Park in Newberg. Although Modified 3J avoids displacing the park property, there could be direct noise and/or visual impacts to the park. These impacts will be minimized to the extent possible during preliminary engineering in Tier 2.

Following release of the LDEIS, ODOT engineers shifted the Modified 3J corridor to the south to avoid direct impacts to Scott Leavitt Park, a potential 4(f) resource. Because Modified 3J is the Preferred Alternative, the corridor shift was only directly applied and analyzed for that alternative. However, based on the importance of the park, any of the Southern Build Alternatives would have been shifted to avoid this park facility had they advanced to be the Preferred Alternative. See Appendix E, Location Final Section 4(f) Evaluation, for additional analysis of potential park impacts.

Indirect Impacts

No Build

The No Build is not expected to result in any indirect impacts because it does not change roadway configurations or maintenance practices and is a continuation of existing conditions.

Modified 3J and Other Build Alternatives

Indirect impacts from Modified 3J and other Build Alternatives could include:

- Increased ability for fire, police and emergency vehicles to provide timely service to areas that require them to access or cross Oregon 99W.
- Better access to and from Dundee Elementary School, the Fire Station and Newberg City Hall, as a result of reduced traffic on Oregon 99W.
- Impacts to one or more sites under consideration for new schools. (See Related Projects List in Chapter 1.)
- Impacts to the southern portion of the proposed Providence Health Systems relocation and expansion site near the East Newberg interchange (Southern Alternatives only). Current plans for the property show that parking could be affected.
- Depending on design, there could be noise and/or visual impacts to Scott Leavitt Park.

Environmental Justice

In 1994, Executive Order 12898 was issued to address Environmental Justice in minority and low-income populations, specifically “disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.” FHWA states in the document titled, “FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (1998) that:
“Disproportionately High and Adverse Effect on Minority and Low-Income Populations means” an adverse effect that:

(1) Is predominately borne by a minority population and/or a low-income population; or
(2) Will be suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non low-income population.

This Environmental Justice analysis studied the potential effects on households in the project area. Social groups considered for this assessment include racial and ethnic minorities and low-income populations.

As reported in Chapter 3, 13 percent of households in Yamhill County report income of less than $15,000 annually (1999). For more information on household income in the study area, see Table 3-4. About 89 percent of the population in Yamhill County classifies themselves as from the “white” racial group, which can include Hispanics. The next largest racial category is “Other,” with 5.1 percent of the population. People reporting Hispanic origins total 10.6 percent of the population in Yamhill County. In census reporting, this classification is not tied to race. Persons of a Hispanic origin have a stronger presence in Dayton (more than 26 percent of the population) than in Dundee (8 percent) or Newberg (11 percent). For more information on the race and ethnicity from the 2000 census in the study area, see Table 3-3.

**Newberg Survey**

In response to environmental justice concerns in Newberg, ODOT conducted a door-to-door survey in a neighborhood adjacent to Newberg’s industrial district in April 2003 to determine the concentration of Spanish-speaking households in the proposed project area for Modified 3J. Neighborhood canvassers interviewed residents to determine and record the primary language spoken in the household, provide residents with project information in their primary language, and ask respondents if they would like to be included on the project mailing list for future project updates. Canvassers attempted contact with 173 residences and found 118 English-speaking households, 15 Spanish-speaking households, and one Spanish and English speaking household. Data from the remaining 39 residences were unavailable. Seven residences were vacant and in 32 residences no one answered the door. Overall, the proportion of Spanish-speaking households found in the study area is similar to the percentage of population reported in the 2000 Census as being of Hispanic origin in Newberg and Yamhill County.

Of the 134 residences that responded in the study area, 54 residences were within the proposed Modified 3J corridor. Of these 54 residences, five were Spanish-speaking households, representing nine percent of the total number of households in the proposed corridor. By comparison, approximately 12 percent of the households in the larger study area were identified as Spanish-speaking (16 of 134 residences). Therefore, the corridor will directly affect a lower percentage of Spanish-speaking households than are present in the larger study area. Table 4-18 presents the data collected during the door-to-door survey.

<table>
<thead>
<tr>
<th>Geographic Area</th>
<th>Total Households</th>
<th>English Speaking Households</th>
<th>Spanish Speaking Households</th>
<th>Percent Spanish Speaking</th>
</tr>
</thead>
<tbody>
<tr>
<td>In corridor (2003)</td>
<td>54*</td>
<td>49</td>
<td>5</td>
<td>9.3%</td>
</tr>
<tr>
<td>Study area (2003)</td>
<td>134</td>
<td>118</td>
<td>16</td>
<td>11.9%</td>
</tr>
<tr>
<td>Newberg (2000)</td>
<td>6,099</td>
<td>10.5%**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yamhill County (2000)</td>
<td>28,732</td>
<td></td>
<td>10.6%**</td>
<td></td>
</tr>
</tbody>
</table>

* Approximate number of households surveyed. About 70 houses sit inside the proposed corridor. Assuming that the vacancy rate or no response households are evenly distributed across the neighborhood (23% of survey), this number needs to be reduced for a fair comparison, to 77% of the total, or 54 households.

**Identified in 2000 Census as Hispanic origin. Hispanic origin is not a racial group classification and does not necessarily mean Spanish is spoken in the home.
Based on the locations of the Spanish-speaking households in relation to the proposed corridor identified in the door-to-door survey, there is no disproportional impact to Spanish-speaking households from corridor development compared to English-speaking households within the Newberg study area. See Chapter 7, Public and Agency Involvement, for information on special efforts made to involve potential Environmental Justice communities.

**Direct Impacts**

**No Build**

No direct impacts are indicated for the No Build because there is no change from existing conditions.

**Modified 3J and Other Build Alternatives**

Through the public comment process on the LDEIS, many individuals expressed concerns with disproportionate impacts of the project on low-income housing in south Newberg. In response to these concerns, the leading southern alternative, Alternative 3J, was shifted south to avoid some of the impacts to housing in south Newberg. The resulting alternative is Modified 3J. Modified 3J displaces 18 fewer existing homes in south Newberg compared to 3J (49 vs. 67). In addition to minimizing housing impacts, this shift in the corridor optimized other objectives such as:

- Crossing Chehalem Creek at an optimal location and angle,
- Avoiding Scott Leavitt Park,
- Possibly keeping at least one lane of 11th Street open,
- Minimizing interference with truck movements on the mill property, and
- Avoiding the airport.

Based on census data, Alternatives 3C, 3D, and 3K, are estimated to have the highest potential for disproportionate impacts to Hispanic, minority, or low-income households. Residents are classified as low-income based on the 2000 Census percentage of households below poverty level within census block groups (the smallest area for which income related data are reported). The percentage occurrence of below-poverty households for the block group was applied to the number of potential displacements within each block group. Of the estimated total residential displacements, between 11 percent and 23 percent could be Hispanic, minority, or low-income households. Nineteen percent of the residential displacements under Modified 3J could be Hispanic, minority, or low-income households. Modified 3J and Alternatives 3I, 3J and 3K affect the same potentially low-income neighborhood west of the Smurfit Newsprint Corporation. Table 4-17 estimates the number of low-income, minority and Hispanic households that could be displaced by Modified 3J and other Build Alternatives and compares those numbers to the total number of residential displacements.

These numbers could understate the potential impacts to low-income households in cases where low-income households are concentrated in one area as opposed to evenly distributed throughout the block group. For instance, potential displacements near the Smurfit Newsprint Company are the closest in the block group to the industrial area and may include a higher concentration of low-income households. Similarly, there is a mobile home park in the Oregon 219 Interchange area at Springbrook that will be impacted by the project.

Minority, Hispanic, and low-income households are displaced at a higher rate as compared to No Build, than they occur in the population of Yamhill County under Modified 3J and all of the Southern Build Alternatives. These alternatives displace Hispanic households in the area adjacent to Newberg’s industrial district. Alternative 4C is the only alignment that does not displace Hispanic households to this degree. Modified 3J and all of the Southern Build Alternatives potentially could displace 14 to 23 minority,
Hispanic, or low-income residences. Alternative 4C potentially could impact ten minority, Hispanic, or low-income households, or 11 percent of total household displacements, the fewest of any alignment.

Table 4-17  Comparison of Alternatives for Displacement of Low-Income and Minority Households

<table>
<thead>
<tr>
<th>Household Category</th>
<th>Estimated Households/Units Displaced (Percent of Total Displacements)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3C</td>
</tr>
<tr>
<td>Number of potential minority/low-income housing units displaced*</td>
<td>16</td>
</tr>
<tr>
<td>Number of potential housing unit displacements</td>
<td>76</td>
</tr>
<tr>
<td>Percent minority/low-income displacements</td>
<td>21%</td>
</tr>
</tbody>
</table>

* Households are classified as minority based on 2000 Census percentages of minority residents in census blocks. This percentage was applied to a count of residences that could be displaced by a Bypass corridor. Households are classified as Hispanic based on 2000 Census percentages of Hispanic residents within census blocks along the Bypass corridors. This percentage was applied to a count of residences that could be displaced by a Bypass.

Specific issues regarding air quality, visual and aesthetic impacts, and noise in this area of the Modified 3J corridor will be addressed in Tier 2. In addition, the Tier 2 process will use a public process that will include measures to invite and include participation from potential environmental justice communities. For more information on the public process followed during the Location phase of the project (Tier 1), see Chapter 7.

Indirect Impacts

No Build

No indirect impacts are indicated for the No Build because there is no change from existing conditions.

Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives may result in indirect impacts, including dislocation of Hispanic migrant worker residents of the Columbia Empire Farm, if it is acquired for the project.

Cultural Resources

Direct Impacts

No Build

The No Build will have no direct impacts on any historic properties except for the generation of noise from traffic. Traffic noise could potentially impact historical properties located along Oregon 99W by affecting the historic character that may include lower noise levels. There will be no impacts to archaeological sites or other cultural use areas under the No Build.

Modified 3J and Other Build Alternatives

Archaeological

No prehistoric or historical archaeological sites have been recorded within the project area. However, Modified 3J and all the other Build Alternatives will affect an area within which prehistoric artifacts are
likely to be present because this area was historically used by Native Americans. Thus, some areas within the alignment corridors may have cultural significance.

Since Modified 3J and all of the Southern Build Alternatives share the same basic terrain and environmental attributes, they cannot be differentiated in terms of the probability for the presence of prehistoric archaeological sites. These alternatives cross a high terrace above the Willamette River. This land surface was stable throughout the Holocene period, so it was accessible for Native American use and occupation. Archaeological sites are most often found on flat ground near water. Some Willamette Valley sites are located on low mounds that rise slightly above the surrounding level terrain. No low rise mounds were specifically noted during the field reconnaissance, but most of the terrain in the Southern Build Alternatives is level or gently sloping, and water is nearby.

The setting of the Northern Build Alternative (4C) differs from the Southern Build Alternatives primarily because part of this alternative passes along the lower slopes of the foothills bounding the main valley floor. The valley plain area crossed by Alternative 4C around Newberg is farther away from the Willamette River, and the general slope of this part of the valley is somewhat greater. While farther from major waterways, this route is still near a number of creeks. One nearby archaeological site is located on a hill, and the eastern end of the 4C corridor is in the vicinity of a reported (but unconfirmed) archaeological site.

Foundations, other remains of early buildings, or other facilities from historical homesteads or farms may be present throughout the project area. Therefore, all alternatives should be considered to have a high potential for historical archaeological sites.

**Historic**

Table 4-19 summarizes the number of National Register of Historic Places properties and those potentially eligible for inclusion in the National Register that could be impacted by the No Build and Build Alternatives. These “Historic” properties are all standing structures. The historic reconnaissance suggests that between 6 and 17 listed or potentially historic properties are located within the proposed project corridors. This LFEIS focuses on the distribution and clustering of historic resources identified for each corridor. Protection of historic resources also falls under Section 4(f) of the Department of Transportation Act. See Appendix E, Location Final Section 4(f) Evaluation, for discussion of cultural and historic resources as they relate to Section 4(f). Modified 3J has 6 listed potentially eligible historic sites, which is the least of any build alternative. Alternative 3K has the most listed and potentially eligible historic properties, at 17.

<table>
<thead>
<tr>
<th>Table 4-19</th>
<th>Listed and Potentially Eligible Historic Properties That May Be Affected by the Proposed Bypass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
</tr>
<tr>
<td>Number of Properties</td>
<td>0</td>
</tr>
</tbody>
</table>

**Indirect Impacts**

The National Environmental Policy Act (NEPA) and Section 106 of the Natural Historic Preservation Act require that indirect impacts also be considered. Indirect impacts from a proposed project can include a loss of historic integrity and feeling for the cultural resources located along the project. Depending on the actual location of the proposed road, historical properties could become subject to increased noise, vibration and visual impacts, and may face reduced setbacks, increased traffic volumes and future development pressures. Table 4-19 gives an indication of the extent to which indirect, as well as direct, impacts should be anticipated for historic resources.
Development of the Tier 2 EIS will follow Section 106 of the National Historic Preservation Act guidelines for protecting historic and archaeological resources. A “Determination of Eligibility” will be prepared for the properties that could be affected by the project and are potentially eligible for inclusion in the National Register. For properties that are listed on the National Register and those determined to be eligible for listing, a comprehensive effort will be made to avoid or minimize direct and indirect adverse impacts to the properties. A “Finding of Effect” will be prepared for properties that are listed or eligible for listing on the National Register that are potentially impacted by the project. If adverse effects to eligible or listed properties are not avoidable, a Memorandum of Agreement will be prepared and submitted to the State Historic Preservation Office that documents the mitigation requirements.

AIR QUALITY

The federal government established National Ambient Air Quality Standards (NAAQS) to protect the public from air pollution. Nonattainment areas are geographic areas where concentrations of a pollutant exceed the NAAQS. Maintenance areas are areas previously designated as nonattainment that are now in compliance with air quality standards. The Bypass project is located within an Oregon designated air quality attainment area for both carbon monoxide and ozone. Therefore the project study area generally meets the clean air levels set by the U.S. Environmental Protection Agency in the National Ambient Air Quality Standards, and no further analysis is required.

NOISE

Noise-sensitive sites in the project area were identified to determine operational noise impacts of the No Build and Build Alternatives. Sensitive sites included residences, schools, and parks.

Direct Impacts

No Build

Under the No Build, most sites that are currently affected by noise associated with Oregon 99W will continue to be affected. These include several residences. However, if increased congestion causes travel speeds on Oregon 99W to decrease substantially for longer periods of the day, noise levels might drop in some places. Lower speeds decrease the level of noise produced by traffic. Noise levels could be elevated on some local streets because drivers may take alternative routes to Oregon 99W. As a result, noise levels may increase in some areas and decrease in others, depending on changes in traffic volumes and traffic speeds.

Modified 3J and Other Build Alternatives

Operational Impacts

As described in Chapter 3, the FHWA traffic noise standard for exterior sound is 67 decibels for land uses such as residences, parks, and schools. A potential noise impact area for each Build Alternative was developed by creating a 67-decibel contour line around each corridor. This contour was then used to determine the number of potentially affected noise-sensitive sites within that area. Traffic information such as traffic volumes, percentage of heavy trucks, vehicle speed and number of lanes were used to develop the noise contour line.

<table>
<thead>
<tr>
<th>Table 4-21 Potential Noise Impacts on Residences</th>
</tr>
</thead>
<tbody>
<tr>
<td>3C</td>
</tr>
<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>Number of Impacted Residences</td>
</tr>
<tr>
<td>159 163 109 112 26 112 112 156 95</td>
</tr>
</tbody>
</table>
Table 4-21 incorporates a “worst case analysis” for residences that could be affected by Modified 3J and other Build Alternatives. The modeling is “worst case” because it assumed that no walls, below-grade sections, or intervening topography or structures will block the transmission of noise. A more detailed noise analysis will be conducted during Tier 2.

The modeling indicated that the highest potential number of noise-impacted sites will be associated with Alternatives 3C, 3D and 3K, which will impact 159, 163, and 156 sites, respectively. Many of the residences that could have noise impacts under these alternatives will be displaced (thus effectively removing them from being impacted by noise). Alternative 3I has substantially fewer potential impacts than the other alternatives. This is probably because some residences that would have had noise impacts from other Southern Build Alternatives will be displaced by 3I. Another possible reason is that the slower speeds through Newberg with this alternative could reduce noise.

Table 4-22 shows a “worst case analysis” for parks that could be affected by the Build Alternatives. Modified 3J and Alternatives 3C, 3D, 3G, 3H, 3I, 3J, and 3K could affect Spring Meadow Park, Friends Park, Herbert Hoover Park, an undeveloped park on Wilsonville Road, and an unnamed park near Ewing Young Park. Alternative 4C could affect Spring Meadow Park, Scott Leavitt Park, Herbert Hoover Park and Oak Knoll Park. Comparing the Build Alternatives to No Build, the Build Alternatives actually reduce the number of park sites impacted by noise from 1 to 5 sites depending on the alternative.

Table 4-22  Non-residential Noise Impacts

<table>
<thead>
<tr>
<th>Build Alternatives</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Impacted Sites</td>
<td>6</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

ODOT will address mitigation of noise-related impacts in Tier 2. Mitigation will be consistent with the requirements in 23 CFR Part 772.

Construction-Related Impacts

Construction-related noise will impact sensitive sites under Modified 3J and all of the other Build Alternatives. Noise will impact sites adjacent to the construction and could also impact sites adjacent to roads that lead to the construction. For example, earthwork could result in truck traffic from a quarry or to a fill site.

Indirect Impacts

No indirect noise impacts are anticipated for the No Build, Modified 3J, or other Build Alternatives.

VISUAL ENVIRONMENT

Potential impacts to the visual environment were assessed by examining various components of the visual environment in relation to stationary viewers and mobile viewers. Stationary viewers are individuals viewing the Bypass from a given location; mobile viewers are individuals traveling on the Bypass. The vividness, intactness, and unity of specific landscape areas within 160 feet (50 meters) of the corridor were evaluated for impacts on stationary viewers. For mobile viewers, characteristics such as long-distance views and views to and from highway crossings were considered. Using these assessments, the visual impacts that could result from the No Build and Build Alternatives were evaluated. The landscape areas addressed include Agricultural Croplands, Single-family Residential, Mature Forest, Rural Residential, and Rural Highway Commercial landscape areas. The assessment of the existing visual character and a description of the existing views are located in Chapter 3, Table 3-6. Special attention was paid to Rural Residential, Single-family Residential and Agricultural Cropland landscape areas because of their visual sensitivity.
The visual impact analysis only considers the general location of the Build Alternatives within each of the corridors, because the exact location for the bypass is not yet known. The location of the Bypass within the corridor and number of related structures such as bridges sound walls, retaining walls, or cut and fill slopes will be determined in Tier 2. Visual impacts could change considerably, depending on whether a Bypass is located above existing grade, at-grade, or below grade.

Direct Impacts

No Build

No indirect impacts are indicated for the No Build because there is no change from existing conditions.

Modified 3J and Other Build Alternatives

Modified 3J and other Build Alternatives will include structures such as walls, bridges or fill slopes with culverts at creek crossings. Although the number, size, and type of structures may vary among the alternatives, they will introduce new, large visual elements into the landscape that will be seen by stationary and mobile viewers. The number of structures used will typically increase near changes in topography where bridges and retaining walls are required or where road and railroad grades need to be separated. Sound walls could be located near residences and businesses for mitigation purposes. All of these structures have the potential to negatively affect the visual environment. They will introduce large scale, unnaturally flat surfaces and have noticeable color contrasts that could conflict with the harmony and intactness of the existing visual environment.

Table 4-23 evaluates the location and number of potential visual impacts affecting stationary and mobile viewers. These include:

**Potential Stationary Viewers**

- Residential land within 160 feet (50 meters) of either edge of the corridors – calculated by using Geographic Information Systems (GIS) tax lot data, based on residential comprehensive plan designation. Does not include residential land that will be lost during construction.
- Commercial and industrial land within 160 feet of corridors – calculated by GIS based on commercial and industrial comprehensive plan designation. Does not include commercial and industrial land that will be lost during construction.
- Number of residential buildings visually impacted within 160 feet of corridors – estimated by examining aerial photographs for single-family and multi-family structures (actual number of viewers per structure is unknown).
- Number of commercial and industrial buildings visually impacted within 160 feet of corridors – estimated by examining aerial photographs for commercial and industrial structures (actual number of viewers is unknown).

**Potential Visual Impacts to Stationary and Mobile Viewers**

- Likely minimum number of bridges required – estimated based on Bypass crossings of steep topography and/or streams.
- Amount of mature tree canopy likely to be removed – calculated by determining the forested areas identified in the Biological Resources section of this document.
- Impacts to rural residential and agricultural scenery – considered the amount of rural residential and agricultural scenery that will likely be impacted due to the Bypass adding pavement, structures, and traffic to a rural area.
- Impacts to long-distance views – considered the regional views that will be impacted due to the Bypass adding pavement, highway structures and traffic to existing regional views.
- Number of highway crossings – number of times the alternative alignment will cross or connect with Oregon 219, Oregon 240, and Oregon 99W.

### Table 4-23 Potential Visual Impacts of Each Alternative

<table>
<thead>
<tr>
<th>Measure</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Mod 3J ***</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential land within 160 feet of corridors (in acres)</td>
<td>N/A</td>
<td>63</td>
<td>64</td>
<td>60</td>
<td>59</td>
<td>59</td>
<td>63</td>
<td>61</td>
<td>76</td>
<td>90</td>
</tr>
<tr>
<td>Number of residential buildings visually impacted by Bypass*</td>
<td>N/A</td>
<td>159 SF 1 MF</td>
<td>154 SF 1 MF</td>
<td>140 SF 1 MF</td>
<td>135 SF 1 MF</td>
<td>140 SF 1 MF</td>
<td>98 SF 1 MF</td>
<td>93 SF 0 MF</td>
<td>143 SF 2 MF</td>
<td>164 SF</td>
</tr>
<tr>
<td>Commercial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial and industrial land within 160 feet of corridors (in acres)</td>
<td>N/A</td>
<td>67</td>
<td>76</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>76</td>
<td>89</td>
<td>1126</td>
<td>17</td>
</tr>
<tr>
<td>Number of commercial and industrial buildings visually impacted by Bypass</td>
<td>N/A</td>
<td>0</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Likely minimum number of Bypass structures due to topography</td>
<td>N/A</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Amount of tree canopy likely to be removed (in acres)</td>
<td>N/A</td>
<td>34</td>
<td>41</td>
<td>36</td>
<td>43</td>
<td>36</td>
<td>26</td>
<td>31</td>
<td>36</td>
<td>33</td>
</tr>
<tr>
<td>Impacts to rural residential and agricultural scenery**</td>
<td>N/A</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Minor to Mod. Impact</td>
<td>Minor to Mod. Impact</td>
<td>Minor to Mod. Impact</td>
<td>Minor to Mod. Impact</td>
<td>Minor to Mod. Impact</td>
<td>Minor Impact</td>
<td>Minor Impact</td>
</tr>
<tr>
<td>Impacts to long distance views**</td>
<td>N/A</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Mod. Impact</td>
<td>Minor Impact</td>
<td>Mod. Impact</td>
</tr>
<tr>
<td>Number of highway crossings</td>
<td>N/A</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
<td>5</td>
</tr>
</tbody>
</table>

Note the following definitions:
* SF – single-family structure
MF – multi-family structure
** Minor – low number of residents or other sensitive viewers affected, low impact of structures and/or low impact of additional pavement.
Moderate – moderate number of residents or other sensitive viewers affected, moderate impact of structures and/or moderate impact of additional pavement.
***Estimates for Modified 3J were calculated using most recent comprehensive plan updates.
Modified 3J and the other Build Alternatives will increase visual impacts as compared to No Build by introducing structures such as retaining walls, noise walls, and culverts, removing trees, and altering land uses such as agricultural land.

Modified 3J will have relatively low visual impacts as compared to the other Build Alternatives, with low amounts of residential land and few houses within 160 feet of the corridor, as well as having the second lowest loss of tree canopy. Modified 3J will also have the fewest residential buildings (93) within the 160-foot viewing distance. Alternatives 3C, 3D, and 4C will have the greatest number of buildings (154-164) within proximity to the bypass.

In general, if the Bypass is routed adjacent to or through an established residential neighborhood, impacts are likely as new roadway pavement, structures, and traffic replace views of homes, yards, and landscaping. The Southern Build Alternatives will have notable impacts on the established neighborhood park on 11th Street and to the Rolling Acres subdivision on Edwards Road. Modified 3J mitigates this somewhat, as it will be located to the south of the other Southern Alternatives. Alternatives 3C and 3K have the lowest impact (none) to commercial and industrial buildings within the 160-foot viewing distance. Alternatives 3G, 3H, 3I and 3J will impact the most non-residential buildings (four to five).

Impacts due to Bypass structures will likely be similar for Modified 3J and all of the Southern Build Alternatives. Structures will likely be needed in very steep areas and where the road crosses creeks in the southern portion of Newberg and southwest of Newberg. Structures in these locations will be visible to both stationary and mobile viewers. Alternative 4C will also require structures, but a lower number of stationary viewers will see them. The notch cut into the hillside north of Newberg that Alternative 4C requires will be noticeable to mobile viewers, but probably not to many stationary viewers.

Impacts from the amount of tree canopy to be removed will be similar for all of the Build Alternatives, ranging from a high of 42.7 acres for Alternative 3H to a low of 26.1 acres for Alternative 3J. The major difference is that Modified 3J, 3I, and 3K skirt around the southeast edge of the mature forest area shown in Figure 3-5, while Alternatives 3C, 3D, 3G, 3H, and 3I cut through this area. The forested area that 4C will remove is more scattered. Loss of tree canopy will be noticeable to both stationary and mobile viewers.

Impacts to rural residential and agricultural scenery will vary by the amount of new roadway pavement that will be introduced to these landscape areas, as well as the number of stationary viewers that will be impacted. Alternative 3K will have the lowest impact (minor impact) due to the minimum amount of pavement and due to the fact that it will be visible to a low number of rural residents.

Impacts to long-distance views will vary by the amount of pavement and structures that will intrude into current long-distance views to the rolling hills beyond Newberg and Dundee (as shown in Figure 3-5). The impacts will be moderate for most of the Build Alternatives, since new pavement, traffic and structures will be visible, but the long-distance views will still be seen from the new roadway.

The visual resource assessment also considered the number of times an alternative will cross another highway, with the assumption that the new roadway crossings will be viewed by a higher number of mobile viewers. Alternatives 4C and 3I will have the most highway crossings (five), and therefore a higher impact on mobile viewers. Alternative 3K will have the least number of crossings (three), and therefore a lower impact on mobile viewers.

**Impacts to Landscape Areas by Segment**

The following summarizes changes to the landscape areas by segments within the project area. As noted above, the landscape areas are Agricultural Croplands, Single-family Residential, Mature Forest, Rural Residential, and Rural Highway Commercial. These areas and the assessment of their existing visual qualities are described in Chapter 3. The landscape areas and important visual features are shown on Figures 3-5 and 3-6. The segments within the project area and potential impacts are discussed below.
Impacts between Dundee and Dayton

The Agricultural Croplands landscape dominates the area between Dundee and Dayton. Because this area is sparsely populated, mobile viewers will experience the greatest visual impacts in this area. West of Dundee, near Dayton, the visual impacts of introducing a new road and interchange into a rural landscape probably will be greatest under Alternatives 3D, 3H, Modified 3J, and 3K. The integrity and visual unity of the area will be disrupted by the Bypass and related structures. New traffic lanes will be added south of the railroad tracks under all Build Alternatives. Therefore, travelers will have expanded views of pavement in the foreground, but regional views of rolling hills and croplands will still be visible from the roadway. All Build Alternatives will reduce the existing vegetation at wooded stream crossings.

Widening portions of Oregon 99W west of Dundee under Alternative 3K will cause only minor impacts for both stationary and mobile viewers, due to an expansion of the existing pavement here.

Dundee Impacts

Urban Center, Rural Residential and Agricultural landscape areas dominate Dundee. The Build Alternatives follow routes to the east and south of Dundee. Alternative 3K will require widening Oregon 99W in Dundee through the downtown, which is characterized by older, unique buildings. This road widening will change the visual character of the downtown by introducing more paved area, but the wider road also could include visual amenities such as sidewalks, street trees, streetlights and other fixtures. These amenities could serve to visually tie together the downtown commercial features, such as the Argyle Winery and the hazelnut factory. Alternatives 3C, 3D, 3G, 3H, 3I and 4C have similar impacts on the eastern side of Dundee, where the route will be parallel to Edwards Road, directly behind the backyards of several new homes in the Rolling Acres subdivision (shown on Figure 3-6). Some Dundee residents currently have scenic views across farm fields to the rolling hills of the Parrett Mountain area to the east. Also, there is little landscaping in place that could buffer views from the homes to a new road. Due to the rural residential and agricultural character, long distance views and number of new homes that will be affected, this impact will be substantial.

Alternatives 3J, Modified 3J, and 3K have lower visual impacts on this area because their alignments are farther away from the developed area. Impacts overall will be lower, since development is sparse and fewer homes will be affected. Drivers on the Bypass will have better views than on existing Oregon 99W because the new routes travel through areas with rural, agricultural and regional views. Along existing Oregon 99W views will remain similar except for the reduced amount of traffic, resulting in a somewhat beneficial impact. Also, viewers in vehicles will be spending less time in traffic and views of the developed area will be seen for a shorter period of time.

Impacts Between Dundee and Newberg

The Agricultural Croplands, Single-family Residential, Mature Forest and ravines, Rural Residential and Rural Highway Commercial landscapes dominate the area between Newberg and Dundee. Alternatives 3C, 3D, 3G, 3H, 3I, and 4C will impact more Agricultural Croplands, while Alternatives Modified 3J and 3K will impact more Mature Forest in Single-family Residential areas. However, Alternative 3K will have fewer impacts around Fox Farm Road and Dayton Avenue, because there will be no grade separation or interchange east of Dundee. Except for Alternative 3K, all of the Build Alternatives considered in this document will have visual impacts associated with the East Dundee Interchange connector road.

Newberg Impacts

The southern portion of Newberg contains mostly Single-family Residential and Agricultural landscape areas, with a few large industrial sites and some commercial uses mixed in. Modified 3J and all of the Southern Build Alternatives follow the same alignment in Newberg, though the number of access points will differ. The Southern Build Alternatives, except for Modified 3J, will be aligned through an
established, older, densely built, residential neighborhood and park in the south part of Newberg. This neighborhood is located around College, River, and 11th streets. Many residents could be affected, making this one of the most visually impacted Single-family Residential areas. The Bypass could appear as an obvious, flat linear surface in the foreground. It will change the current human scale of the neighborhood. Above-grade structures for streets crossing the Bypass will disrupt views and increase visual impacts. Under a worst-case scenario, approach fills could extend for two blocks on either side of the Bypass, also obstructing views. For sections below grade, impacts will be substantially lower than at-grade or above-grade design options, although in the case of Alternative Modified 3J, safety railings will still have a visual impact. The new road will partially displace an existing scenic farm with horses, introducing an obvious, flat linear surface and changing the current scale of an agricultural area with narrow roads. If the project is constructed at-grade or above grade, mobile viewers in this area will have views of urban development, a newsprint plant, and agricultural scenery all in one short stretch of road.

Southern Alternatives 3G, 3H, 3I, 3J, and Modified 3J have an interchange at Oregon 219 rather than the overpass that is common to Alternatives 3C, 3D, and 3K. The interchange will have a greater visual impact on both stationary and mobile viewers than an overpass because the interchange will have more and larger structures. However, many of the residences that house stationary viewers could be displaced by the interchange. The interchange also will bring mobile viewers closer to the existing wastewater treatment plant and will partially displace a hazelnut orchard, which is a unique visual feature in this part of Oregon.

The Single-family Residential and Rural Residential landscape areas will be similarly affected by Alternatives 3D, 3G, 3H, and 3I. These all traverse a mature forested residential area, and will introduce new pavement to scenic croplands. Vegetation at the wooded stream crossings will also decrease with all the Build Alternatives.

The presence of two at-grade intersections in Alternative 3I will not substantially change the visual impacts from the existing views of Agricultural and Residential landscape areas, except that the Bypass will more likely be at-grade or nearly at-grade at these intersections, limiting the potential visual benefits of a below-grade design. Drivers also will see views of the new pavement and traffic for a longer time.

Alternative 4C is located along the northern edge of Newberg, through Single-family, Rural Residential and Agricultural Croplands landscape areas, with some industrial uses mixed in. Alternative 4C will cut through two residential neighborhoods in the north part of Newberg around Foothills Drive, Crestview Drive, Springbrook Street, and Libra Street. The new roadway will introduce a flat gray or black surface, which is a noticeable contrast to the existing visual color and texture. The Bypass could cause visual impacts to many homes, two schools and a senior center, making these substantial areas of impact. The number of homes that will be affected will be slightly less than those affected by Modified 3J and all of the other Southern Build Alternatives. Fills or separated grades could increase visual impacts. Although a notch in the hillside will be required for this alternative, the cut will be visible to drivers and less visible to residents to the south. Mobile viewers along the new road will have scenic views of croplands, orchards, and rolling hills to the north. The A-dec Technical Park may be visible.

Along the bypassed portion of Oregon 99W, views will remain similar except for the reduced amount of traffic, resulting in a somewhat beneficial impact. Also, since cars will be spending less time in traffic, the views of both the unique downtown area and the large shopping centers will be seen for a shorter period of time.

Impacts to institutional buildings will be negligible for Modified 3J and the Southern Build Alternatives, because the new road will not be easily viewed from those buildings.

The following are the substantial impacts of all the Build Alternatives to visual quality in Rural Residential, Single-family Residential and Agricultural Croplands, which were selected for specific analysis due to existing high visual quality and high viewer sensitivity.
The Rural Residential Landscape Area will experience moderate to substantial adverse impacts to stationary viewers. A future highway will encroach upon existing pastoral scenery, although impacts from an at-grade structure could be mitigated with sound walls or berms. Mobile viewers will incur moderate beneficial impacts, and will experience striking scenery and a harmonious composition with few other encroachments.

The Agricultural Landscape Area also will experience moderate to substantial adverse impacts for stationary viewers. A future highway will encroach upon existing pastoral scenery, although impacts from an at-grade structure could be mitigated with sound walls or berms. Mobile viewers will incur moderate beneficial impacts, and will experience striking scenery and a harmonious composition with few other encroachments.

The Single-family Residential Landscape Area could experience substantial adverse impacts due to expanded pavement, new structures, and additional traffic on the bypass encroaching upon established single-family neighborhoods.

Indirect Impacts

The No Build and Build Alternatives are not anticipated to result in indirect visual impacts on surrounding commercial and residential properties.

WATER RESOURCES

This section describes impacts on floodplains and water resources. The water resources analysis focuses on the potential for increased stormwater runoff and potential impacts of pollutants in the runoff on water quality. The amount of paved (impervious) surface was calculated for each build alternative. See Figure 3-7 for locations of floodplains.

Direct impacts

No Build

Under the No Build, no new roadways are constructed; as a result, there is no direct impact on the amount of paved surface draining to stormwater or floodplains within the project area. Existing stormwater treatment facilities continue to function. Stormwater retrofits could be constructed to treat currently untreated areas and improve water quality. Over time, an increase in traffic congestion could increase pollutants in roadway runoff.

Modified 3J and Other Build Alternatives

Under the Build Alternatives, additional paved (impervious) surface will be created, which will not occur under No Build. The amount of additional impervious over No Build is estimated to range from 69 acres for Modified 3J to 89 acres for Alternative 3D. Table 4-24 shows the amount of paved surface area for each alternative.

<table>
<thead>
<tr>
<th>Table 4-24</th>
<th>Paved Surface Area</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
</tr>
<tr>
<td>Paved Surface Area in acres</td>
<td>NA</td>
</tr>
</tbody>
</table>

The creation of impervious surface can have implications for both water quantity and water quality. Water quantity impacts can be caused because impervious surfaces do not allow stormwater runoff to percolate into the ground, but instead concentrate and accelerate the speed of runoff. This can alter stream flow by increasing the rate and frequency of peak flows. Peak flows may result in flooding and water quality
impacts such as erosion and sedimentation (e.g., increases of sediment in the water column increases turbidity and can affect pH, Biological Oxygen Demand, and dissolved oxygen demand).

Water quantity impacts to streams are worse when stormwater isn’t detained or stored effectively. There are several ways to reduce the water quantity impacts described above. Engineered features such as stormwater detention ponds can collect and convey runoff so that it can penetrate the soil and be released at slower rates. Landscape-based approaches include preserving or restoring infiltration areas and mature vegetation.

Impacts to water quality are related to increased pollutant loading from stormwater collected on paved and impervious surfaces and transported downstream. Highway runoff can contain water quality contaminants. The most common contaminants are heavy metals, inorganic salts, aromatic hydrocarbons and suspended solids that accumulate on the road surface as a result of regular highway operation and maintenance activities. Salting and sanding practices, for example, may leave concentrations of chloride, sodium and calcium on the roadway surface. Ordinary operations and the wear and tear of vehicles also result in the dropping of oil, grease, rust, hydrocarbons, rubber particles and other solid materials on the highway surface. These materials are often washed off the highway during rain or snow storm events. Without mitigation, the build alternatives are likely to cause water quality impacts on streams located in the vicinity of the project from contaminants in the highway runoff.

Modified 3J and other Build Alternatives cross a portion of the Hess Creek 100-year floodplain, south of Dundee. All of the Build Alternatives cross the Springbrook 100-year floodplain near the East Newberg Interchange. Modified 3J and all of the other Southern Build Alternative corridors cross the Hess Creek and Chehalem Creek 100-year floodplains in south Newberg. Alternatives 3J and 3K cover the most area of the Chehalem Creek 100-year floodplain. There is a small portion of the Dayton Interchange (Alternatives 3D, 3H and 3K) that intersects with the 100-year floodplain of Miller Creek. Alternative 4C intersects a portion of Chehalem Creek’s 100- and 500-year floodplains west of Newberg.

Indirect Impacts

No Build

Under the No Build no new roadways are constructed; as a result, there are no indirect impacts to floodplains or water resources.

Modified 3J and Other Build Alternatives

As described in the indirect land use impacts analysis, no significant indirect impacts to land use are expected to result from the construction and operation of the Bypass. Therefore, there should be no significant indirect impacts to water resources, including floodplains, resulting from changing land use in the project area that can be attributed to the Bypass.

BIOLOGICAL RESOURCES

The biological resources section addresses impacts to wildlife ecology (including vegetation cover types, wildlife habitat, wildlife corridors and riparian buffers), fish ecology, threatened and endangered species (including listed fish, wildlife and plants), noxious weeds and wetlands.

Wildlife Ecology

The impacts to terrestrial wildlife habitat focus on vegetation cover types, wildlife habitat, wildlife movement corridors and riparian buffers. Each of these focus areas is discussed below.
Direct Impacts

No Build

The No Build has no direct impacts on any of the four wildlife habitat components (vegetation, habitat, wildlife corridors, and riparian buffers) identified during investigation for this project. The No Build is a continuation of existing conditions wildlife ecology will be unaffected.

Modified 3J and Other Build Alternatives

Table 4-25 summarizes the removal of vegetation and other cover types that results from Modified 3J and other Build Alternatives. Modified 3J impacts the least amount of herbaceous and agricultural land compared to the other Build Alternatives. Alternative 4C has the greatest impact on all types of vegetation, eliminating approximately 412 acres, of which more than 50 percent is farmland. Alternative 3J impacts the smallest area of undisturbed (forest, scrub-shrub, or water) cover types, followed by Alternatives 3G and 3I. Alternative 4C has the greatest impacts to oak forest, removing approximately 4.9 acres. The other Build Alternatives cause between 0.8 and 1.9 acres of impact to oak forest areas, with Modified 3J impacting only 0.9 acres of oak forest.

Table 4-25  Potential Impacts of Vegetated and Other Cover Types

<table>
<thead>
<tr>
<th>Build Alternatives</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agricultural/Herbaceous</td>
<td>206.0</td>
<td>210.7</td>
<td>217.2</td>
<td>222.0</td>
<td>217.2</td>
<td>193.5</td>
<td>191.1</td>
<td>196.0</td>
<td>227.0</td>
</tr>
<tr>
<td>Developed</td>
<td>67.3</td>
<td>80.8</td>
<td>82.1</td>
<td>95.6</td>
<td>82.1</td>
<td>62.6</td>
<td>70.0</td>
<td>84.8</td>
<td>63.7</td>
</tr>
<tr>
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<td>40.3</td>
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<td>24.6</td>
<td>32.3</td>
<td>35.6</td>
<td>28.0</td>
</tr>
<tr>
<td>Nursery</td>
<td>42.8</td>
<td>38.9</td>
<td>47.2</td>
<td>43.2</td>
<td>47.2</td>
<td>59.0</td>
<td>56.8</td>
<td>46.6</td>
<td>63.6</td>
</tr>
<tr>
<td>Oak Forest</td>
<td>1.8</td>
<td>1.1</td>
<td>1.9</td>
<td>1.2</td>
<td>1.9</td>
<td>1.6</td>
<td>0.9</td>
<td>0.8</td>
<td>4.9</td>
</tr>
<tr>
<td>Scrub-shrub</td>
<td>17.4</td>
<td>17.7</td>
<td>14.8</td>
<td>15.0</td>
<td>14.8</td>
<td>19.8</td>
<td>24.6</td>
<td>25.2</td>
<td>23.2</td>
</tr>
<tr>
<td>Open Water</td>
<td>1.6</td>
<td>0.2</td>
<td>1.8</td>
<td>0.5</td>
<td>1.8</td>
<td>1.8</td>
<td>0.6</td>
<td>0.2</td>
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<td>405.5</td>
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<td>362.9</td>
<td>376.3</td>
<td>389.3</td>
<td>412.4</td>
</tr>
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</table>

Notes: Areas of impact were determined from aerial photo interpretation of each corridor using a factor of 0.6 to account for area of 300-foot wide study corridor that will be developed.
A factor of 0.8 was used for portions of Alternative 3K that are located inside of the Dundee UGB. Includes unvegetated cover types: developed and open water.

Direct impacts to wildlife terrestrial habitats and species that could occur during construction and operation of a Bypass include road kill of deer and other species in wildlife corridors the Bypass could cross. Removing vegetation and other wildlife habitat components (including upland mixed forest, oak forest and open water habitat) could directly affect wildlife by forcing it to move to other habitats. Wildlife displacement is associated with habitat fragmentation and increased competition for limited resources. Once a habitat is fragmented, edge-adapted species, such as crows and raccoons, tend to move into an area. These species may compete with or consume native wildlife.

Alternative 3H has the greatest impact to high-quality wildlife habitat, eliminating upland mixed forest, oak forest and open water habitat. Alternative 3D will also have high impacts to these habitat types. Alternative 3J results in the least impact to high quality wildlife habitat, removing approximately 27 acres27 in total. A summary of the impacts to habitat is presented in Table 4-26.

27 To estimate impacts, analysts multiplied the total amount of resources found in each corridor by the percentage (60 percent) of the corridor that will likely be used for Bypass construction. For example, if 100 feet of a resource are in a corridor, and the Bypass...
Alternative 4C impacts fewer potential wildlife corridors than the other alternatives. The remaining Build Alternatives each cross two wildlife corridors. See Table 4-27 and Figure 3-8 for a breakdown of wildlife corridor crossings by alternative.

Alternative 4C results in the greatest loss to riparian buffers. Approximately 25 acres of riparian buffer will be lost under this alternative. Alternatives 3K and 3D also result in relatively high losses to riparian buffers, removing approximately 24 acres and 22 acres, respectively. Alternative 3J has the least impact to riparian buffers. This alternative impacts an estimated 17 acres of this resource.

Table 4-26  Potential Impacts on Wildlife Habitat (acres)

<table>
<thead>
<tr>
<th></th>
<th>Build Alternatives</th>
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<th></th>
<th></th>
<th></th>
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<tbody>
<tr>
<td></td>
<td>3C</td>
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<td>3J</td>
<td>3J</td>
<td>3K</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
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<td>Medium Quality</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Low Quality</td>
<td>206.0</td>
<td>210.7</td>
<td>217.2</td>
<td>222.0</td>
<td>217.2</td>
<td>193.5</td>
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<td>196.5</td>
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</tr>
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<td>Mixed Forest</td>
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<tr>
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<td>0</td>
<td>0</td>
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</tr>
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<td>Nursery</td>
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</tr>
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<td>0</td>
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<tr>
<td>Scrub-shrub</td>
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<td>Open Water</td>
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<td>1.8</td>
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<tr>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
</tbody>
</table>

is likely to require 60 percent of the corridor, analysts applied a factor of 0.6 to estimate that 60 feet of the 100 feet of the resource would be affected.
## Table 4-27 Potential Impacts on Wildlife Corridors and Riparian Buffers

<table>
<thead>
<tr>
<th>Build Alternatives</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Quality</td>
<td>35.6</td>
<td>41.5</td>
<td>37.2</td>
<td>43.2</td>
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<td>27.4</td>
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<td>36.6</td>
<td>34.3</td>
</tr>
<tr>
<td>Medium Quality</td>
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<td>60.8</td>
<td>56.4</td>
<td>60.8</td>
<td>79.3</td>
<td>80.2</td>
<td>70.4</td>
<td>83.8</td>
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<tr>
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<td>301.1</td>
<td>256.2</td>
<td>262.5</td>
<td>282.2</td>
<td>294.4</td>
</tr>
</tbody>
</table>

Notes: Areas of impact were determined from aerial photo interpretation of each corridor using a factor of 0.6 to account for area of 300-foot wide study corridor that will be developed.

A factor of 0.8 was used for portions of Alternative 3K that are located inside of the Dundee UGB. Includes unvegetated habitats: developed and open water.

See habitat quality criteria descriptions in Chapter 3.

## Fish Ecology

### Direct Impacts

**No Build**

The No Build has no direct impacts on aquatic habitat, as existing habitat will be unchanged. As noted above under Water Resources, any existing stormwater treatment facilities will continue to function, and potential retrofits could increase treatment levels and improve water quality. Over time, an increase in traffic volumes could increase congestion and lead to more pollutants in roadway runoff if not sufficiently mitigated.

**Modified 3J and Other Build Alternatives**

The construction process could lead to direct impacts on aquatic habitats and fish. These impacts could include the temporary consequences of constructing stream and wetland crossing structures, as well as construction-related sediments. These construction impacts are typically mitigated by effective use of Best Management Practices, such as erosion control methods and stream isolation techniques. Removing riparian vegetation and other habitat components could have a direct impact on fish. Vegetation removal can cause water temperatures to rise. This physically stresses fish. Resident species have to compete more for remaining vegetative cover, forage habitat and prey. Once a habitat is altered and degraded, non-native and invasive species tend to move in, which may lead to increased predation on and competition with native species.
Table 4-28 shows a comparison of the No Build, Modified 3J and other Build Alternative elements that could affect suitable habitat for fish, particularly those listed with federal or state agencies as endangered or threatened. Modified 3J has 0.6 miles of non-fish bearing and 0.6 miles of fish bearing stream crossed, and 18 acres of riparian areas directly affected, as compared to the Other Build Alternatives, which have a greater length of non-fish bearing stream crossed, the same or greater length of fish bearing stream crossed and slightly less to greater acres of riparian areas affected. Additional information on potential aquatic habitat crossings is available in the Fisheries Technical Memorandum.

<table>
<thead>
<tr>
<th>Build Alternatives</th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length in Miles of Non-Fish-bearing Stream Crossed</td>
<td>NA</td>
<td>1.2</td>
<td>1.3</td>
<td>1</td>
<td>1.2</td>
<td>1</td>
<td>0.9</td>
<td>0.6</td>
<td>1.3</td>
<td>0.9</td>
</tr>
<tr>
<td>Length in Miles of Fish-bearing Stream Crossed</td>
<td>NA</td>
<td>0.7</td>
<td>0.8</td>
<td>0.7</td>
<td>0.7</td>
<td>0.7</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.8</td>
</tr>
<tr>
<td>Acres of Riparian Areas Directly Affected</td>
<td>0</td>
<td>20.1</td>
<td>22.4</td>
<td>17.8</td>
<td>20.2</td>
<td>17.8</td>
<td>17.4</td>
<td>18.0</td>
<td>24.2</td>
<td>25.1</td>
</tr>
<tr>
<td>Quantity of Additional Paved Surface Area in Acres</td>
<td>NA</td>
<td>77</td>
<td>89</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>71</td>
<td>69</td>
<td>87</td>
<td>85</td>
</tr>
</tbody>
</table>

**Threatened and Endangered Species**

**State and Federally Listed Fish**

This section considers fish species listed by either the state and/or federal governments as “threatened and endangered.” The USFWS fish distribution maps identified two federally listed fish that potentially occur in the project area: the Upper Willamette steelhead (winter run) and the Upper Willamette Chinook (spring run), as defined by NMFS in a consultation letter received for a nearby project.

**Direct Impacts**

**No Build**

The No Build does not directly impact habitat for listed fish species, because there will be no development and existing habitat will be unchanged. As noted above under Water Resources and Aquatic Resources/Fish, existing water quality and quantity treatment facilities will continue to function, and potential retrofits could increase treatment levels, if implemented. Over time, an increase in traffic volumes could increase congestion and result in more pollutants in roadway runoff if not sufficiently mitigated.

**Modified 3J and Other Build Alternatives**

Modified 3J and the other Build Alternatives could cause direct impacts to fish habitat. These impacts include removal of riparian cover, bank alteration, loss of physical habitat elements during the construction of water crossing structures, and temporary sediment input during construction. Road runoff could cause indirect impacts due to increased delivery of pollutants. The additional impervious surface could cause water to enter streams more quickly during storms, which can affect the shape and depth of the stream channel over time. Landscape-based stormwater approaches and engineered water quality and quantity treatment facilities will be designed, constructed and maintained to mitigate these potential impacts to the maximum extent practicable. In addition there are potential impacts to the bald eagle fish prey base that could occur in aquatic habitats within the project limits.
Data from the Oregon Department of Fish and Wildlife show the presence of Upper Willamette Spring Chinook in the Willamette River, Chehalem Creek, the lower reaches of Springbrook Creek and its tributary Hess Creek, and the Yamhill River. This listed species could be indirectly affected by development of any of the Build Alternatives because they are all located in the Willamette River basin.

More direct impacts could occur at Chehalem Creek, the only Chinook-bearing creek crossed by all the Build Alternative corridors. A detailed analysis of all potential impacts to Chehalem Creek and the Willamette River basin that could occur as a result of this project will be addressed during the federal Endangered Species Act Section 7 consultation, which will occur during the Tier 2 phase of the project.

Distribution data show that Upper Willamette winter steelhead occupy the main stem of the Willamette River. Accessible reaches of Willamette River tributary streams that provide suitable habitat could be occupied by steelhead at some stage in their life cycle. Under this assumption, all Build Alternatives cross potential steelhead-bearing streams.

Indirect Impacts

No Build

The No Build has no indirect impacts on habitat for fish identified during investigation for this project. Construction of the Bypass does not take place and the existing habitat is maintained.

Modified 3J and Other Build Alternatives

Indirect impacts to fish that could result from Modified 3J and other Build Alternatives include increased sediment and pollutant loads from stormwater runoff from the roadways into the waterways.

State and Federally Listed Wildlife

This section considers wildlife species listed by either the state and/or federal governments as “threatened and endangered.” The Oregon Natural Heritage Program database provided a record for one state and federally listed bird, the bald eagle (Haliaeetus leucocephalus) within the 5-mile search area. The USFWS register of species that may occur in the project area includes the bald eagle, Fender’s blue butterfly (Icaricia icarioides fenderi) (federal endangered), and the Oregon spotted frog (Rana pretiosa) (federal candidate).

Direct Impacts

No Build

The No Build will not have any direct impacts on listed terrestrial wildlife species. Construction of the Bypass does not take place and the existing habitat is maintained.

Modified 3J and Other Build Alternatives

No direct or indirect adverse impacts to bald eagles are expected to occur as a result of construction or operational impacts. No direct or indirect impacts to associated bald eagle habitats for nesting, roosting or foraging are expected as a result of Modified 3J or any of the other Build Alternatives, with the exception of potential impacts to the bald eagle fish prey base that could occur in aquatic habitats within the project limits. The buffer distance to avoid construction impacts recommended by the U.S. Fish and Wildlife Service in its Bald Eagle Recovery Plan is 0.50 mile. The nearest documented occupied bald eagle habitat (nesting territory) occurs near the Willamette River. This site is more than 0.50 mile from the nearest proposed alternative and beyond the recommended buffer distance suggested by the Fish and Wildlife Service (USFWS 1986).
While the Build Alternatives could result in impacts on aquatic resources, including bald eagle prey species, it is highly unlikely that the bald eagles noted above will forage in the lower quality habitat available in the Build Alternative corridors, given the proximity to prey available in the Willamette River.

Indirect Impacts

No Build

The No Build will not have indirect impacts on listed terrestrial wildlife species. Construction of the Bypass does not take place and the existing habitat is maintained.

Modified 3J and Other Build Alternatives

No indirect impacts to bald eagles are expected. No indirect impacts to associated bald eagle habitats for nesting, roosting or foraging are expected as a result of Modified 3J or any of the other Build Alternatives.

State and Federally Listed Plants

Direct Impacts

No Build

The No Build has no direct impacts on affected listed plant species. Construction of the Bypass does not take place and the existing vegetation and habitat will be maintained.

Modified 3J and Other Build Alternatives

No direct adverse impacts are expected to occur to any plants identified during the information review as listed, candidates for listing, or proposed for listing. However, potentially suitable habitat may be present for Nelson’s checker-mallow (state and federal threatened), which grows infrequently in disturbed roadside habitats. Pre-construction surveys for this species will be used to identify locations of populations or individual plants within the project area.

Indirect Impacts

No Build

The No Build has no indirect impacts on affected listed plant species. Construction of the Bypass does not take place and the existing vegetation and habitat will be maintained.

Modified 3K and other Build Alternatives

No indirect adverse impacts will be expected to occur.

Noxious Weeds

Direct Impacts

No Build

The No Build has no direct impacts. Construction of the Bypass does not take place and the existing vegetation is maintained. Currently ODOT treats and/or removes noxious weeds to control and minimize their spread, and this program will continue under the No Build.

Modified 3J and Other Build Alternatives

During project construction, clearing of vegetation will occur. Many vegetated areas in the corridors include noxious weeds. A positive direct impact will be the removal of these types of plants during
construction. Further reduction of noxious weeds could result if project construction plans include specifications for removal of noxious weeds and establishment of native plants.

During construction of the roadway, noxious weed seeds could be transported into or out of the corridor by attaching to vehicles. Such transport of noxious weeds will be an indirect impact if mitigation measures were not implemented. Control of noxious weeds will be part of the construction requirements.

During routine operation of the highway, ODOT will treat and/or remove these weeds to control and minimize their spread.

**Indirect Impacts**

**No Build**

The No Build has no indirect impacts. The existing vegetation is maintained.

**Modified 3J**

ODOT could purchase of rights of way for the project well in advance of construction. If left unmanaged, noxious weeds could spread from adjacent areas into the purchased property.

**Wetlands**

**Direct Impacts**

**No Build**

The No Build has no direct impacts on wetlands because construction of the Bypass will not take place.

**Modified 3J and Other Build Alternatives**

Direct impacts to wetlands will occur as a result of Modified 3J and the other Build Alternatives due to filling of wetlands. Regulating agencies, such as the Department of State Lands (DSL) and the U.S. Army Corps of Engineers, evaluate these impacts based on both quantity and quality of the wetlands affected. The area of all wetland types potentially affected by Modified 3J and the other Build Alternatives is between approximately 12 acres and 24 acres. Modified 3J affects less than 0.1 acre of high functioning wetland, 1.3 acres of medium functioning wetland and 11 acres of low functioning wetland. All of the other Build Alternatives affect the same or more acres of wetlands in each category. See Table 4-30 for a comparison of potential wetland impacts of the Build Alternatives.

The wetlands analysis identified very few impacts to high functioning wetlands. Alternatives 3C, 3D and 3K will have the greatest potential impact on wetlands functioning at a medium level. While Alternative 4C has the lowest impact to medium-level wetlands, it has the highest overall wetland impact of any of the alternatives. If any wetlands are directly or indirectly affected, mitigation options that can be employed are restoration of former wetlands, creation of new wetlands, and/or enhancement of existing wetlands.

Table 4-29 describes the potential amount of various qualities of wetland (from a functional perspective) that could be affected by the alternatives. The Northern Build Alternative 4C could affect 7 to 12 acres more total wetlands than Modified 3J and each of the other Southern Build Alternatives.
Table 4-29  Potential Wetland Impacts Acres

<table>
<thead>
<tr>
<th></th>
<th>No Build</th>
<th>3C</th>
<th>3D</th>
<th>3G</th>
<th>3H</th>
<th>3I</th>
<th>3J</th>
<th>Modified 3J</th>
<th>3K</th>
<th>4C</th>
</tr>
</thead>
<tbody>
<tr>
<td>High functioning wetland</td>
<td>0</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>0.2</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Medium functioning wetland</td>
<td>0</td>
<td>2.0</td>
<td>2.2</td>
<td>1.3</td>
<td>1.5</td>
<td>1.4</td>
<td>1.3</td>
<td>3.2</td>
<td>1.0</td>
<td></td>
</tr>
<tr>
<td>Low functioning wetland</td>
<td>0</td>
<td>14.2</td>
<td>14.1</td>
<td>12.8</td>
<td>12.7</td>
<td>12.8</td>
<td>11.6</td>
<td>11.0</td>
<td>10.7</td>
<td>22.9</td>
</tr>
<tr>
<td>Total</td>
<td>0</td>
<td>16.5</td>
<td>16.5</td>
<td>14.3</td>
<td>14.4</td>
<td>14.3</td>
<td>13.0</td>
<td>12.3</td>
<td>13.9</td>
<td>23.9</td>
</tr>
</tbody>
</table>

Note: The alternative corridors are larger than the actual footprint of the road; therefore, a factor of 0.6 was applied to total area calculations. One exception is that of Alternative 3K; inside the Dundee UGB, the factor is 0.8.

Indirect Impacts

No Build

For the No Build indirect impacts on wetlands will increase as a result of untreated road runoff (oil and other pollutants) in proportion to the increase in traffic on Oregon 99W.

Modified 3J and Other Build Alternatives

Indirect impacts to wetlands that could result from the project include increased sediment and pollutant loads from stormwater runoff from the roadways and alterations of the wetland hydrology sources.

As described in Chapter 6, when the preliminary engineering reaches the appropriate stage, a federal Endangered Species Act (ESA) Section 7 consultation with NMFS and USFWS on potential impacts to listed species will take place. This will be followed by a Joint 404/removal-fill permit obtained from the U.S. Army Corps of Engineers (USACE) and the DSL for jurisdictional wetlands and streams proposed to be filled. These processes will result in Conservation Measures and a Wetland and Habitat Mitigation Plan, detailing additional measures to mitigate for impacts to listed species and their habitats. Identification of potential locations for compensatory mitigation sites and corresponding compensatory mitigation strategies will take place at that time.

GEOLOGICAL HAZARDS

Direct Impact

No Build

Under the No Build, an earthquake or landslide could damage or destroy existing structures and roadways because of the vicinity of two faults (Newberg and Sherwood) and steep slopes in the vicinity of area roads such as Oregon 99W.

Modified 3J and Other Build Alternatives

Modified 3J and Other Build Alternatives cross two faults, the Newberg Fault and the Sherwood Fault. A direct impact resulting from an earthquake might damage or destroy structures or roadways located in the bypass corridors. All bluffs associated with creek drainages in the project area represent some landslide risk. The bluff north of the Willamette River poses the greatest geologic hazard to Modified 3J and the other Southern Build Alternative corridors. Alternatives 3J and 3K will have the highest hazard potential, because these corridors run parallel to the cliff for about 6,000 feet.

Northern Alternative 4C will not be affected, because it is located a considerable distance from the bluff.
Indirect Impact

No Build

For the No Build an indirect impact could disrupt traffic flow because of damaged or destroyed structures or roadways. If an earthquake event is far enough from the roadway to prevent damage at the surface, it could still be strong enough to create soil failure underneath the roadway.

Modified 3J and Other Build Alternatives

For Modified 3J and the other Build Alternatives, an indirect impact could disrupt traffic flow because of damaged or destroyed structures or roadways. If an earthquake event is far enough from the roadway to prevent damage at the surface, it could still be strong enough to create soil failure underneath the roadway.

HAZARDOUS MATERIALS

Direct Impacts

No Build

No direct impacts to hazardous materials sites will occur under the No Build.

Operational impacts could occur in the event of an uncontrolled hazardous materials spill on Oregon 99W in the vicinity of one of the existing stream crossings or wetlands. Spill risk will be higher than Modified 3J and the other Build Alternatives since almost all corridor traffic will continue to use Oregon 99W.

Modified 3J and Other Build Alternatives

Modified 3J and all of the other Build Alternatives have the potential for exposing or disturbing hazardous materials sites. Management and handling of the materials for disposal will depend on the type of material found at the site. Exposure to hazardous materials could be avoided or minimized during construction.

The type and nature of the contaminant found will determine the cost of proper handling, transport and disposal of soils. This material handling will comply with a predetermined regulatory level. The cost of this work is the greatest direct hazardous material impact. There are potential human and environmental health impacts, as well, but these can be mitigated. Responsibility for cleanup of a site remains with the current owner. A thorough understanding of the amount of affected property to be acquired by ODOT will be mandatory prior to construction of an alternative.

The South River Road Sludge site is potentially common to Modified 3J and all of the other Southern Build Alternatives. The exact location of the site is not known at this time and will need to be determined during future phases of the project. The site potentially has chromium, lead, copper, nickel, cadmium and cobalt concentrations. These will have to be managed to protect human and environmental health.

The Old Newberg Landfill consists of unconsolidated material that poses settlement problems if the project were built on top of the landfill. This site is located at the south end of South Blaine Street, which places it along the northern margin of Alternatives 3C, 3D, 3G, 3H, 3I, 3J, Modified 3J and 3K.

Another site located at 23400 South Oregon 99W is at the northern margin of Alternatives 3C, 3D, 3G, 3H, 3I, Modified 3J and 4C. Solvents and other chemicals soaked into the ground at this site and may have contaminated the groundwater. The extent of the contamination is unknown. Due to the site being located downgrade from the alternatives, there is low potential for impacts to groundwater beneath the alternatives.
A site located at 1301 Wyonooski Street has a history of hazardous material contamination and leaky underground storage tanks. This site is next to Alternatives 3C, 3D, 3G, 3H, 3I, 3J, Modified 3J and 3K. As of September 28, 1995, Oregon’s Department of Environmental Quality has had the site on medium priority for further action due to bunker C fuel and kerosene releases. The Department recommends further remedial or investigative action. Due to the proximity of Modified 3J and other Southern Build Alternative corridors, and the long history of industrial use at the Smurfit Newsprint Corporation property, there is potential for the site to have affected the property within the alternatives. Further investigation will be required in Tier 2.

**Indirect Impacts**

**No Build**

No indirect impacts to hazardous materials sites will occur under the No Build.

**Modified 3J and Other Build Alternatives**

Modified 3J and all of the other Build Alternatives reduce the likelihood of a toxic spill entering a stream or wetland, because new facilities will be designed to protect from spills. Streams and wetlands will also be protected during construction by ODOT’s design and specification requirements and permitting procedures.

**ENERGY**

The POST requested an evaluation of the alternatives to determine which have the greatest effect on energy use. The analysis included an estimate of gallons of fuel consumed per day by vehicles under the No Build, Modified 3J and all of the other Build Alternatives. The length and speed of travel for each alternative is the basis for determining fuel consumption.

Fuel consumption was determined by multiplying the length of each alternative corridor by the average daily traffic volume. The result was then multiplied by the fuel consumption rate for each segment of each alternative. The speed limit of the alternative roadway determines the rate of fuel consumption. The rate at which fuel is consumed is based on speeds greater than 20 miles per hour (mph). Under the No Build, projected average speeds in 2025 are less than 20 mph for about one-half the length of Oregon 99W. As a result, the analyst understated the No Build fuel consumption, because consumption rates for speeds under 20 mph are not available.

The amount of fuel consumed per day by alternative is shown in Table 4-30.

<table>
<thead>
<tr>
<th>Table 4-30</th>
<th>Fuel Consumption by Alternative</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No Build</td>
</tr>
<tr>
<td>Fuel Consumption (Thousands of gallons per day)</td>
<td>55</td>
</tr>
</tbody>
</table>

**Direct Impacts**

**No Build**

Under the No Build total fuel consumption in gallons per day, for vehicles using Oregon 99W, will be greater than under the Modified 3J and other Build Alternatives. Fuel consumption for the No Build is 55 thousand gallons per day. Fuel consumption for the No Build will continue to increase as congestion increases and vehicles are delayed further due to the congestion.
Modified 3J and Other Build Alternatives

A direct, positive impact of Modified 3J and all of the other Build Alternatives is that the total fuel consumption for all of the Build Alternatives is less than the fuel consumption for the No Build due to reduction of congestion. Modified 3J and Alternatives 3H, 3J, and 3K will have the best fuel efficiency at 50,000 thousand gallons of fuel consumed per day. Alternative 4C results in the highest fuel consumption of all of the Build Alternatives at 54,000 gallons of fuel consumed each day. This is 8 percent more than Modified 3J and Alternatives 3H, 3J, or 3K and almost as much as the No Build.

Indirect Impacts

No Build

No indirect impacts are expected under the No Build. No fuel is consumed during construction for the No Build since the Bypass is not constructed.

Modified 3J and Other Build Alternatives

Indirect fuel consumption impacts are expected under Modified 3J and the other Build Alternatives because fuel is consumed during construction of the Bypass.