3.9 AIR QUALITY

3.9.1 Regulatory Setting

3.9.1.1 Criteria Pollutants
The Clean Air Act as amended in 1990 is the federal law that governs air quality. This law sets standards for the quantity of pollutants that can be in the air. These standards are called National Ambient Air Quality Standards (NAAQS). Standards have been established for six criteria pollutants that have been linked to potential health concerns; the criteria pollutants are: carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), lead (Pb), and sulfur dioxide (SO₂). A region is a nonattainment area when designated by the U.S. Environmental Protection Agency (EPA) when one or more monitoring stations in the region fail to attain the relevant standard. Areas that were previously designated as nonattainment areas but have met the standard are called maintenance areas.

Under the 1990 Clean Air Act Amendments, the U.S. Department of Transportation cannot fund, authorize, or approve federal actions to support programs or projects that are not first found to conform to the State Implementation Plan (SIP). Conformity with the Clean Air Act takes place at the regional level and at the project level. Any build alternative must conform at both levels to be approved.

See Appendix L for a Summary of National Ambient Air Quality Standards and Oregon Air Quality Standards.

Regional Conformity
Regional level conformity in Oregon is concerned with how well the region meets the standards set for CO, O₃, and PM. Oregon is not designated nonattainment for the other criteria pollutants. At the regional level, Metropolitan Planning Organizations (MPOs) develop Regional Transportation Plans (RTP) that include all of the transportation projects planned for that region over at least the next 20 years. Based on the projects included in the fiscally constrained RTP, an EPA air quality model is used to determine whether or not the implementation of those projects meets the emission budgets or other tests showing that attainment requirements of the Clean Air Act are met. If all requirements for regional conformity are met, the FHWA and the Federal Transit Administration jointly make a conformity determination that the RTP conforms to the SIP for achieving the goals of the Clean Air Act. MPOs are also required to develop a Transportation Improvement Program (TIP), which includes projects that will be funded and implemented in the near term. Both RTPs and TIPs are required to meet regional conformity requirements.

Project-Level Conformity
In addition to meeting regional-scale conformity requirements, individual federal projects must meet certain project-level conformity requirements. Federal projects are required to be in a conforming RTP and TIP, and the design concept and scope of the project need to be consistent with those analyzed in the RTP and TIP. Conformity at the project-level also requires consideration of "hot spot" analysis, which is an analysis of localized pollutant concentrations when an area is classified as nonattainment or maintenance for CO and/or PM. In general, pollutant concentrations
due to building the project either need to be below the NAAQS, or lower than the concentrations associated with not building the project (the no-build alternative).

**Mobile Source Air Toxics**

In addition to the criteria air pollutants for which there are NAAQS, EPA also regulates air toxics. Most air toxics originate from human-made sources, including on-road mobile sources, non-road mobile sources (e.g., airplanes), area sources (e.g., dry cleaners) and stationary sources (e.g., factories or refineries).

Mobile Source Air Toxics (MSATs) are a subset of the 188 air toxics defined by the Clean Air Act. The MSATs are compounds emitted from highway vehicles and non-road equipment. Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline.

The EPA is the lead federal agency for administering the Clean Air Act and has certain responsibilities regarding the health effects of MSATs. Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that EPA regulate 188 air toxics, also known as hazardous air pollutants. EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from its 1999 National Air Toxics Assessment (NATA). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority MSATs, the list is subject to change and may be adjusted in consideration of future EPA rules.

The 2007 EPA rule mentioned above requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA’s MOBILE6.2 model, even if vehicle activity (vehicle-miles traveled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSATs is projected from 1999 to 2050.

### 3.9.2 Affected Environment

Under the Preferred Alternative, approximately 1,000 linear feet of the Bypass portion of the project will be located in the Portland-Vancouver Air Quality Maintenance Area. The area was redesignated to an ozone attainment area by EPA, but still has an ozone maintenance plan in place. The ozone maintenance plan does not include regional or project-level transportation conformity requirements. The project alignment is located in an attainment area for all other pollutants.

The Oregon Department of Environmental Quality (DEQ) does not collect ambient pollutant monitoring data for any pollutants (criteria or MSAT) in the project area. The project is located in the Willamette Valley agroclimatic area. Its climate is relatively free of extremes in temperatures with long growing seasons and abundant moisture most of the year. The prevailing wind direction at the McMinnville Airport (southeast of the project area) is from the southwest.

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area) is north. Weather systems in this area of Oregon generally move from west to east off the Pacific, with the occasional intrusion of continental air masses into the valley.

### 3.9.3 Environmental Consequences

The Bypass is located in an area where regional and project-level conformity analyses are not required. This section will discuss the environmental consequences to air quality in the project area for the No Build Alternative, the Preferred Alternative and Phase 1 of the Preferred Alternative (Phase 1).

#### 3.9.3.1 No Build Alternative

The No Build Alternative would not have impacted regional air quality. However, the No Build Alternative would have resulted in slightly fewer VMTs and slightly lower regional emissions of CO, oxides of nitrogen (NO\(_X\)), and VOCs than for the Preferred Alternative and Phase 1. Congestion would have increased from the No Build Alternative on Oregon 99W, which would have likely increased pollutant levels at intersections and on sidewalks.

#### 3.9.3.2 Preferred Alternative

This section summarizes direct, indirect and construction impacts to regional air quality that will result from the Preferred Alternative.

**Direct Impacts**

Projected 2035 (design year) traffic volumes are used for this Preferred Alternative analysis. The average weekday VMT estimates for 2011 and 2035 remain the same as for 2005 and 2030, respectively, which were the mileages used in the Tier 2 DEIS analysis regional emissions calculations. The same data are therefore used for the 2011 and 2035 average weekday VMTs in this Preferred Alternative Tier 2 FEIS analysis. Refer to Section 3.1, Transportation, for a brief discussion of the reason the 2005 and 2030 Tier 2 DEIS VMTs are the same as the 2011 and 2035 Tier 1 FEIS VMTs.

To update the emissions estimates for the Preferred Alternative, the EPA emission factor model, MOBILE6.2, was used to develop emission factors for the existing year 2011 and the future year 2035. These emission factors were then used to update the regional emissions calculations. The results for the updated emissions calculations are shown in Table PA 3.9-1.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Average Weekday VMT</th>
<th>PM(_{2.5}) Emissions (tons/year)</th>
<th>PM(_{10}) Emissions (tons/year)</th>
<th>CO Emissions (tons/year)</th>
<th>NO(_X) Emissions (tons/year)</th>
<th>VOC Emissions (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing 2011</td>
<td>427,097</td>
<td>4</td>
<td>7</td>
<td>2,621</td>
<td>204</td>
<td>130</td>
</tr>
<tr>
<td>No Build 2035</td>
<td>703,046</td>
<td>4</td>
<td>8</td>
<td>3,106</td>
<td>96</td>
<td>109</td>
</tr>
<tr>
<td>Preferred Alternative 2035</td>
<td>729,649</td>
<td>4</td>
<td>8</td>
<td>3,224</td>
<td>100</td>
<td>114</td>
</tr>
</tbody>
</table>

Source: Newberg Dundee Bypass Tier 2 Final Air Quality Technical Memorandum, ODOT 2012.

The estimated annual emissions of PM\(_{2.5}\) and PM\(_{10}\) do not differ for the 2035 No Build and Preferred Alternatives. Emissions of CO, NO\(_X\) and VOC are predicted to be higher in 2035 with the Preferred Alternative than they would have been for the No Build Alternative because the project will provide additional road capacity and will have higher VMTs. Despite the Preferred Alternative resulting in slightly higher emissions than the No Build Alternative, the project is not expected to change the regional air quality status. Air
quality in the region currently meets the ambient air quality standards, and the region is expected to maintain its attainment status in the future. Future year vehicle fleets are predicted to have emissions reductions due to improvements in fuels and control technologies on vehicles. These reductions in vehicle emissions are not very apparent in a comparison between existing 2011 and future 2035 conditions, because the increase in VMTs is greater than the decrease in per mile emissions, resulting in overall emissions increases for the design year over the existing 2011 year.

The differences in estimated regional emissions for the Tier 2 DEIS and this Tier 2 FEIS are due to changes in the analysis years for existing and future scenarios. Refer to Section 3.9.6 Tier 2 DEIS Build Alternative for DEIS emissions.

See Appendix L for updated regional emissions calculations.

MSAT Impacts

In the September 2009 interim guidance for MSATs in National Environmental Policy Act (NEPA) documents, FHWA has developed a tiered approach for conducting MSAT analysis. Depending on the specific proposed project circumstances, FHWA identified three levels of analysis:

- No analysis for projects with no potential for meaningful MSAT effects or exempt projects;
- Qualitative analysis for projects with low potential MSAT effects; or
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Higher potential for MSAT effects typically occurs for roadways with an annual average daily traffic (AADT) volume of 140,000 to 150,000 vehicles per day or greater in the design year. The AADT for the Bypass is forecast to be 34,600 in 2035, resulting in low potential for MSAT impacts. Therefore, a qualitative analysis for this Tier 2 FEIS is recommended by the FHWA guidance.

Air toxics analysis is an emerging field. Current scientific techniques, tools and data are not sufficient to accurately estimate human health impacts that would result from this transportation project in a way that would be useful to decision makers. Refer to Appendix L for more detailed information regarding compliance with 40 CFR 1502.22(b). Reliably forecasting MSAT exposure near roadways is particularly difficult, as is determining the length of time that people are actually exposed at a specific location. The methodologies for forecasting health impacts include:

1. Emissions modeling
2. Dispersion modeling
3. Exposure modeling
4. The final determination of health impacts

Each step in the process builds on the model predictions obtained in the previous step. All of the steps are encumbered by technical shortcomings and/or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion,
accident rates, and fatalities, plus improved access for emergency response, that are better suited for quantitative analysis.

Significant scientific uncertainties remain in our understanding of the relationship between adverse health effects and near-road exposure, including the exposures of greatest concern, the importance of chronic versus acute exposures, the role of fuel type (e.g., diesel or gasoline) and composition (e.g., percentage aromatics), relevant traffic patterns, the role of co-stressors including noise and socioeconomic status, and the role of differential susceptibility within the “exposed” populations. The modeling also has certain key limitations such as the results are most accurate for large geographic areas, exposure modeling does not fully reflect variation among individuals, and non-inhalation exposure pathways and indoor sources are not taken into account.

For the No Build and Preferred Alternatives the amount of MSATs emitted in the future would be proportional to the VMTs, assuming other variables such as fleet mix are the same for each alternative. The VMTs for the Preferred Alternative are predicted to be 4 percent higher than for the No Build Alternative (see Table PA 3.9-2). Therefore, MSAT emissions would be only slightly higher on a regional basis under the Preferred Alternative. The increase in VMTs would lead to higher MSAT emissions for the Bypass, along with a corresponding decrease in MSAT emissions along parallel routes (such as Oregon 99W) where traffic volumes would be reduced as a result of the Preferred Alternative. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to the EPA MOBILE6.2 model, emissions of all of the priority MSATs, except for diesel particulate matter, decrease as speed increases. The proposed project will result in an overall increase in traffic in the region, because the project will add capacity through the addition of a new roadway with four travel lanes. The project should result in higher vehicle speeds and reduce congestion times and traffic volumes on Oregon 99W.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Existing</th>
<th>2035 No Build</th>
<th>2035 Preferred Alternative</th>
<th>% Change Preferred to No Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newberg Dundee VMT</td>
<td>427,097</td>
<td>703,046</td>
<td>729,649</td>
<td>4</td>
</tr>
</tbody>
</table>

Source: Newberg Dundee Bypass Tier 2 Final Air Quality Technical Memorandum, ODOT 2012.

Regardless of the alternative chosen, emissions for the design year Build and No Build Alternatives would likely be lower than present levels because of the EPA national emission control programs. These programs are expected to result in improvements in fuel and control technology that would reduce MSAT emissions by 72 percent from 1999 to 2050. Local conditions could differ from these national projections due to the mix of vehicles, VMT growth rates, and local control measures. However, the predicted amount of the EPA-projected reductions is so great, that MSAT emissions in the project area would likely be lower in the future in virtually all locations. Therefore, on a regional basis, MSAT air emissions would actually decrease over time, even under the Preferred Alternative.

The new travel lanes being built under the Preferred Alternative will have the effect of moving some traffic closer to nearby homes and businesses. As a result, localized areas may exist in which ambient concentrations of MSATs would be higher under the Preferred Alternative than they would have been for the No Build Alternative. The
localized differences in MSAT concentrations would likely be most pronounced along the new roadway sections of the Bypass. Localized MSAT concentrations along 99W may decrease slightly as traffic volumes are diverted to the new Bypass. However, the magnitude and duration of these potential increases in the vicinity of the Bypass, compared to the No Build Alternative, cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Further, under all alternatives, overall future MSATs are expected to be substantially lower than today due to implementation of the EPA vehicle and fuel regulations.

**Indirect Impacts**

Land use modeling and growth projection assumptions used in the development of the Bypass are based on comprehensive plans developed by Yamhill County and the Cities of Newberg, Dundee, and Dayton. These plans are the basis for traffic projections for the No Build Alternative and the Preferred Alternative. Because the air quality analysis is based directly on the traffic study results, the analysis takes into consideration indirect impacts.

**Construction Impacts**

Construction of the Preferred Alternative will result in direct short-term impacts to air quality. These impacts will include generation of dust and increases in vehicle and stationary-source exhaust emissions. Construction activities will be required to comply with DEQ requirements for control of dust. Traffic congestion will increase idling times and reduce travel speeds, resulting in increased CO, NOX, ozone precursors, and MSATs. Diesel-fueled construction equipment will also cause temporary increases in MSAT emissions. Stationary sources such as concrete mixing plants will generally be required to obtain air contaminant discharge permits from DEQ and to comply with regulations to control dust and other pollutant emissions. Construction impacts will vary in extent and location, depending on the weather conditions.

**3.9.3.3 Phase 1**

This section summarizes direct, indirect and construction impacts to regional air quality that will result from Phase 1.

**Direct Impacts**

The VMT for construction of two lanes of the Bypass between Oregon 219 and Dundee will be higher in 2016 (opening year) than the No Build Alternative for the same year due to the new vehicle capacity Phase 1 will add to the region. Regional emissions estimates were not calculated for the Phase 1 VMT. Vehicle fleet emission rates in 2016 will be lower than existing vehicle fleet emission rates but will be higher than the 2035 fleet emission rates because vehicle emission rates are expected to decrease in the future. The emissions resulting in 2016 from Phase 1 can be expected to be between the existing and Preferred Alternative emission estimates shown in Table PA 3.9-1. As neither existing nor the Preferred Alternative emissions result in air quality impacts, the operation of Phase 1 is not expected to cause air quality impacts.

**MSAT Impacts**

The assessment of MSAT emissions in the design year 2035 also holds true for MSAT emissions in 2016 for Phase 1. The new travel lanes for Phase 1 will have the effect of moving some traffic closer to nearby homes and businesses. As a result, localized areas may exist in which ambient concentrations of MSATs will be higher under Phase 1 than under the No Build Alternative in 2016. Localized areas (such as downtown) may also experience decreases in MSAT concentrations as a result of the reduction in traffic volumes due to the operation of the Bypass. Overall, MSATs in 2016 are expected to be
lower than existing MSAT emissions due to implementation of the EPA vehicle and fuel regulations.

**Indirect Impacts**
Potential indirect impacts from Phase 1 will be similar to those resulting from the Preferred Alternative. Indirect growth in the region as a result of the new Bypass was accounted for because the traffic data used land use modeling and growth projection assumptions for the cities and counties in the project area.

**Construction Impacts**
Construction impacts to air quality for Phase 1 will be similar to construction impacts for the Preferred Alternative but the project footprint affected will be smaller with a shorter duration of construction.

### 3.9.4 Cumulative Impacts for the Preferred Alternative

The methodology for cumulative impacts analysis used traffic data based on the cumulative growth and associated impacts. Regional emissions for the Preferred Alternative are slightly higher than for the No Build Alternative, but are projected to be lower than existing emissions due to improvements in tailpipe emissions controls. The improvements in vehicle emissions controls offset increases in traffic volumes. Projected Preferred Alternative regional emissions are lower than existing emissions.

### 3.9.5 Mitigation

#### 3.9.5.1 Preferred Alternative

Mitigation measures for air quality are not required. Although 2035 regional emissions of CO, NO\textsubscript{X}, and VOCs will be higher for the Preferred Alternative than for the 2035 No Build Alternative, overall regional emissions for these three pollutants are not expected to cause air quality impacts. The Preferred Alternative will be located in an area currently meeting all NAAQS and is not expected to exceed any of the standards in the future, because vehicles are expected to have improved tailpipe emissions controls in the future. Exceedances of the standards are not expected to be caused by roadway projects such as the Bypass.

**Construction Mitigation**

Construction contractors are required to comply with state air quality regulations, which provide a list of reasonable precautions to be taken to avoid dust emissions:

- Use of water or chemicals, where possible, for the control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land
- Application of asphalt, oil, water, or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts
- Full or partial enclosure of materials stockpiles in cases where application of oil, water, or chemicals are not sufficient to prevent particulate matter from becoming airborne
- Installation and use of hoods, fans, and fabric filters to enclose and vent the handling of dusty materials
- Adequate containment during sandblasting or other similar operations
- When in motion, always covering open-bodied trucks transporting materials likely to become airborne
- The prompt removal from paved streets of earth or other material that does or may become airborne

In addition, contractors will be required to comply with ODOT standard specifications, including Section 290, which has requirements for environmental protection and air pollution control measures.

To reduce traffic delays during construction and the emissions caused by delays, ODOT will use a construction traffic management plan, detours, and road restrictions or lane closures during non-peak traffic periods.

3.9.5.2 Phase 1

As with the Preferred Alternative, there will be no air quality mitigation measures with Phase 1, except to address construction air quality impacts.
3.9.6 Tier 2 DEIS Build Alternative

The following is an exact copy of the Tier 2 DEIS Build Alternative section for air quality. In-text references cite information in the Tier 2 DEIS.

The Tier 2 DEIS Build Alternative, which includes all of the design and local circulation options no longer under consideration, is included here as a comparison to the Tier 2 FEIS Preferred Alternative and for informational purposes only.

Copies of the complete Tier 2 DEIS are available from:

Kelly Amador, Senior Project Leader, Region 2
Oregon Department of Transportation
Mid-Willamette Valley Area
885 Airport Road SE, Building P
Salem, OR 97301-4788
kelly.l.amador@odot.state.or.us

3.9.2.2 Build Alternative

Direct Impacts

Construction Impacts

Construction of the Bypass could result in direct short-term impacts to air quality. These impacts would include generation of dust and increases in vehicle and stationary source exhaust emissions. Bypass construction activities would be required to comply with DEQ requirements for control of dust. Traffic congestion would increase idling times and reduce travel speeds, resulting in increased CO, NOX, ozone precursors, and MSATs. Diesel-fueled construction equipment would also cause temporary increases in MSAT emissions. Stationary sources such as concrete mix plants would generally be required to obtain air contaminant discharge permits from DEQ and to comply with regulations to control dust and other pollutant emissions. Construction impacts would vary in extent and location, depending on the design options and weather conditions, as well as on the segment under construction.

Regional Operation Impacts

Regional air emissions of particulate matter (PM$_{2.5}$ and PM$_{10}$), CO, NOX, and VOCs were estimated for the existing conditions, No Build Alternative, and Build Alternative. Data provided to calculate regional emissions were year 2000 and 2030 VMT (Kittelson, 2006). A regional burden analysis is not required by regulation, but is provided for informational purposes.

The Build Alternative was modeled to produce a VMT estimate. VMT would not vary substantially between design options. The horizontal or vertical alignments of the proposed roadway do not affect VMT and the proposed ramp configurations would have very minor affects on VMT. As a result, the various design options do not cause different air pollutant emissions. Emissions are analyzed for the Build Alternative in comparison to existing and No Build conditions.

The VMT estimates were used with 2005 and 2030 emission factors, respectively, to provide an estimate of existing (2005) and design year (2030) Build and No Build Alternative emissions. The estimated existing and 2030 Build Alternative and No Build Alternative emissions are shown in Table 3.9-1. Regional air emissions are expected to decrease for all future conditions compared to existing conditions as a result of improvements in fuels and control technology on vehicles. The Build Alternative would...
result in slightly higher regional emissions of CO, NO\textsubscript{x}, and VOCs than the No Build Alternative because daily average VMT would increase under the Build Alternative due to the increase in capacity provided by the new roadway. Emissions of particulate matter would be similar for the No Build Alternative and Build Alternative. Despite the Build Alternative resulting in slightly higher emissions than the No Build Alternative, the project would not be expected to result in a change in the regional air quality status. The region is expected to maintain the current air quality status, which is not classified as nonattainment for any criteria pollutants.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Average Weekday VMT</th>
<th>(\text{PM}_{2.5}) Emissions (tons/year)</th>
<th>(\text{PM}_{10}) Emissions (tons/year)</th>
<th>CO Emissions (tons/year)</th>
<th>NO\textsubscript{x} Emissions (tons/year)</th>
<th>VOC Emissions (tons/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing 2005</td>
<td>427,097</td>
<td>7</td>
<td>10</td>
<td>3,780</td>
<td>363</td>
<td>210</td>
</tr>
<tr>
<td>No Build Alternative 2030</td>
<td>703,046</td>
<td>4</td>
<td>8</td>
<td>3,109</td>
<td>100</td>
<td>110</td>
</tr>
<tr>
<td>Build Alternative 2030</td>
<td>729,649</td>
<td>4</td>
<td>8</td>
<td>3,227</td>
<td>104</td>
<td>114</td>
</tr>
</tbody>
</table>


**MSAT Impacts**

In the September 2009 interim guidance for MSATs in NEPA documents, FHWA has developed a tiered approach for conducting MSAT analysis. Depending on the specific proposed project circumstances, FHWA identified three levels of analysis:

- No analysis for projects with no potential for meaningful MSAT effects or exempt projects;
- Qualitative analysis for projects with low potential MSAT effects; or
- Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects.

Higher potential for MSAT effects typically occurs for roadways with an annual average daily traffic (AADT) volume of 140,000 to 150,000 vehicles per day or greater in the design year. The AADT for the Bypass is forecast to be 34,600 in 2030, resulting in low potential for MSAT impacts. Therefore, a qualitative analysis for this Tier 2 DEIS is recommended by the FHWA guidance.

Air toxics analysis is an emerging field. Current scientific techniques, tools and data are not sufficient to accurately estimate human health impacts that would result from this transportation project in a way that would be useful to decision-makers. Refer to Appendix L for more detailed information regarding compliance with 40 CFR 1502.22(b). Reliably forecasting MSAT exposure near roadways is particularly difficult, as is determining the length of time that people are actually exposed at a specific location. The methodologies for forecasting health impacts include:

- Emissions modeling;
- Dispersion modeling;
- Exposure modeling; and
The final determination of health impacts.

Each step in the process builds on the model predictions obtained in the previous step. All of the steps are encumbered by technical shortcomings and/or uncertain science that prevent a more complete differentiation of the MSAT health impacts among a set of project alternatives. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision makers, who would need to weigh this information against project benefits, such as reducing traffic congestion, accident rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

For the No Build and Build Alternatives the amount of MSATs emitted in the future would be proportional to the VMT, assuming other variables such as fleet mix are the same for each alternative. The VMT for the Build Alternative is predicted to be 4 percent higher than for the No Build Alternative (see Table 3.9-2). Therefore, MSAT emissions would be only slightly higher on a regional basis under the Build Alternative. The increase in VMT would lead to higher MSAT emissions for the proposed Bypass corridor, along with a corresponding decrease in MSAT emissions along parallel routes (such as Oregon 99W) where traffic volumes would be reduced as a result of the Build Alternative. The emissions increase is offset somewhat by lower MSAT emission rates due to increased speeds. According to the EPA MOBILE6.2 model, emissions of all of the priority MSAT except for diesel particulate matter decrease as speed increases. The proposed project will result in an overall increase in traffic in the region, because the project will add capacity through the addition of a new roadway with four travel lanes. The project should result in higher vehicle speeds and reduce congestion times and traffic volumes on Oregon 99W.

### Table 3.9-2. Annual Regional Vehicle Miles Traveled for 2030

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Existing</th>
<th>2030 No-Build</th>
<th>2030 Build</th>
<th>Percent Change Build to No-Build</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newberg Dundee VMT</td>
<td>427,097</td>
<td>703,046</td>
<td>729,649</td>
<td>4%</td>
</tr>
</tbody>
</table>


Regardless of the alternative chosen, emissions for the design year Build and No Build Alternatives would likely be lower than present levels because of the EPA national emission control programs. These programs are expected to result in improvements in fuel and control technology that would reduce MSAT emissions by 72 percent from 1999 to 2050. Local conditions could differ from these national projections due to the mix of vehicles, VMT growth rates, and local control measures. However, the predicted amount of the EPA-projected reductions is so great that MSAT emissions in the project area would likely be lower in the future in virtually all locations. Therefore, on a regional basis, MSAT air emissions would actually decrease over time, even under the Build Alternative.

The new travel lanes being built under the Build Alternative will have the effect of moving some traffic closer to nearby homes and businesses. As a result, localized areas may exist in which ambient concentrations of MSAT would be higher under the Build Alternative than the No Build Alternative. The localized differences in MSAT concentrations would likely be most pronounced along the new roadway sections of the
Bypass. Localized MSAT concentrations along 99W may decrease slightly as traffic volumes are diverted to the new Bypass. However, the magnitude and duration of these potential increases in the vicinity of the Bypass, compared to the No-Build alternative, cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. Further, under all Alternatives, overall future MSAT are expected to be substantially lower than today due to implementation of the EPA vehicle and fuel regulations.

**Indirect Impacts**

Land use modeling and growth projection assumptions used in the development of the Bypass are based on comprehensive plans developed by Yamhill County and the Cities of Newberg, Dundee, and Dayton. These plans are the basis for traffic projections for the No Build Alternative and Build Alternative. Because the air quality analysis is based directly on the traffic study results, the analysis takes into consideration indirect impacts.