

# Air Quality

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## Studies and Coordination

This section summarizes the air quality analysis for the proposed 20th Street SE road improvements between the US 2 Trestle and a point 400 feet west of 91st Avenue SE, southwest of the city of Lake Stevens, in Snohomish County, Washington. Under federal and state rules, this project is subject to a transportation air quality conformity review because it would affect carbon monoxide (CO) emissions in a CO maintenance area. The complete report of the air quality analysis can be found in Appendix C. Resource documents and information that were used in the analysis include:

- *Air Quality Technical Memorandum*, Geomatrix, Inc., November 2007.
- *Interim Guidance on Air Toxic Analysis in NEPA Documents*. Web Page: <http://www.fhwa.dot.gov/environment/airtoxic/020306guidmem.htm>, Federal Highway Administration (FHWA), assessed July 2007.
- *20th Street SE Widening – Cavalero Road to 91<sup>st</sup> Avenue SE Traffic Analysis*, Perteet, Inc., 2007.
- *General information*. Seattle, Washington. website: <http://www.pscleanair.org>, Puget Sound Clean Air Agency (PSCAA), assessed March 2007.
- *Guidebook for Conformity - Air Quality Analysis Assistance for Nonattainment Areas*. Puget Sound Regional Council (PSRC), September 1995.
- *Guideline for Modeling Carbon Monoxide from Roadway Intersections*. Office of Air Quality Planning and Standards. Technical Support Division. Research Triangle Park, North Carolina. EPA-454/R-92-005. U.S. Environmental Protection Agency (U.S. EPA), 1992.

Three agencies have jurisdiction over the ambient air quality in unincorporated Snohomish County: the U.S. Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). These agencies establish regulations that govern both the concentrations of pollutants in the outdoor air and rates of contaminant emissions from air pollution sources. The air quality analysis was conducted in accordance with EPA guidelines and in a manner consistent with state and federal air quality rules.

# Affected Environment

## Existing Air Quality

Typical air pollution sources in the project area include vehicular traffic, a few commercial uses, agriculture, and residential wood-burning devices. While many types of air pollutant sources are present, the largest pollutant emission sources are on-road mobile sources and residential wood burning. For projects that affect the transportation system, the air pollutant used as the primary indicator of potential impacts is carbon monoxide (CO) because this is the vehicular pollutant emitted in the largest quantities for which there are health-based ambient air quality standards. Vehicle exhaust and tire action on pavement (or unpaved areas) also generate fine particles (also called PM10 and PM2.5 based on their size fraction), but emission rates are small compared with other sources like wood-burning stoves. Motor vehicles also emit sulfur oxides and nitrogen dioxide, but ambient concentrations of these pollutants are not usually high except near large industrial facilities.

In addition to CO and particulate matter, EPA has identified a number of known or suspected hazardous air pollutants emitted by vehicles that are coming under increasing scrutiny. Some of the substances have been designated as mobile source air toxics (MSATs). Although currently there are no good data or agreed upon procedures for conducting quantitative analyses for MSATs during environmental reviews, the Federal Highway Administration (FHWA) has issued interim guidance for describing and considering MSATs related to transportation projects.

To measure existing air quality, Ecology and PSCAA maintain a network of monitoring stations throughout the Puget Sound region. Based on monitoring information collected over a period of years, the state (Ecology) and federal (EPA) agencies designate regions as being "attainment" (i.e., complying with) or "nonattainment" areas for specific air pollutants. Therefore, attainment status is a measure of whether air quality in an area complies with the National Ambient Air Quality Standards (NAAQS). Regions that were once designated nonattainment but that have since attained compliance with a standard are considered "maintenance" areas. The project area is within a maintenance area for CO and ozone, but there have been no measured violations of the standards in a number of years.

## Methodology

In accordance with EPA guidance, the air quality analysis considered the potential for traffic-related impacts based on evaluation of conditions at signalized intersections most likely to be adversely affected by this project. EPA focuses on potentially performing air quality modeling analyses for the most congested signalized intersections based on the overall intersection delay or "level of service" (LOS) during peak-hour conditions. Intersection LOS ranges from "A" (good operation with little or no delay) to "F" (poor operation due to extensive delay). The criteria for selecting intersections for potential inclusion in "hot-spot" modeling are based on considering intersections operating at LOS "D," "E," or "F," or any expected to change to LOS "D," "E," or "F" as a result of a proposed project. Therefore, intersections operating at LOS "C" or better are unlikely to cause a potential violation of the CO standard, and generally do not require further analysis. Based on these definitions and guidance and the relatively good

expected operating conditions with and without the proposed project, a determination regarding potential project-related air quality impacts was made based on a qualitative review.

Transportation projects that affect either the physical structure or the operation of the regional transportation system in an air quality nonattainment or maintenance area are subject to a transportation air quality conformity review. Conformity rules are intended to prevent regionally significant transportation projects from either causing or contributing to localized air quality problems. Only projects that have a neutral or positive affect on air quality are allowed to proceed to implementation. The proposed project is subject to an air quality conformity review, which requires that conditions with and without the project be considered for the Opening Year (2010 for this project), and the Horizon Year, defined by the current regional air quality analysis as 2030.

Consistent with EPA guidance, project-affected signalized intersections were screened for possible "hot-spot" modeling based on review of intersection LOS and traffic volume in future years. This review indicated that none of the most project-affected intersections required quantitative analysis. The specifics of this review are discussed in the impacts section below.

## **Impacts – Air Quality**

### **During Construction**

#### **Preferred Alternative**

Construction of the proposed project could temporarily change localized air quality. Dust from construction activities would contribute to ambient concentrations of suspended particulate matter. Construction contractor(s) would have to comply with the PSCAA regulations requiring that all reasonable precautions be taken to minimize fugitive dust emissions.

Construction would require the use of heavy trucks and smaller equipment such as generators and compressors. These engines would emit air pollutants that would slightly degrade local air quality. Nonetheless, emissions from construction equipment, and especially from diesel-fueled engines, are coming under increasing scrutiny because of their suspected risk to human health. Although there is little or no danger of these emissions resulting in pollutant concentrations that would exceed a health-based ambient air quality standard, pollution control agencies are now urging that emissions from diesel-powered equipment be minimized to the extent practicable in order to reduce potential health risks. Construction equipment and material hauling can also affect traffic flow in a project area, leading to vehicle idling for periods of time.

Some phases of construction would cause odors detectable to some people in the area. This would be particularly evident during paving operations using asphalt. The construction contractor(s) would have to comply with the PSCAA regulations during activities that emit odor bearing air contaminants. These impacts from paving operations would be short term.

Construction equipment and material hauling can affect traffic flow in a project area. Given that there is heavy traffic during some periods of the day, scheduling haul traffic during off peak times (e.g., between 9 a.m. and 4 p.m.) would have the least effect on other traffic and would minimize indirect increases in traffic related emissions.

With the implementation of required measures to provide reasonable controls of dust and odors, construction of the proposed project would not be expected to result in significant air quality impacts.

### **No Action Alternative**

With this alternative, the proposed project would not be built, so no construction activities would occur and no construction-related air quality impacts would be expected.

## **During Operation**

### **Preferred Alternative**

Of the morning and afternoon peak commute periods, the projected future AM peak-hour traffic levels were consistently worse at all project-affected intersections. For this reason, the air quality review focused on morning commute period traffic. The AM peak-hour LOS summary for the three most project-affected intersections is presented in Table 18. As shown, the traffic analysis indicated the project's build alternative would result in the same or decreased AM peak-hour traffic delays at all project-affected intersections in both future years. Therefore, the proposed project would be expected to result in neutral or beneficial effects on localized air quality conditions near these intersections, and no additional analysis is required to determine that significant adverse air quality impacts are unlikely.

These findings are consistent with data collected during many years of CO monitoring in the Puget Sound region which have shown CO concentrations to be decreasing over the past 15 years, due to cleaner car technologies and a required inspection and maintenance system. In recent years, measured CO concentrations have remained well below the 1-hour and 8-hour standards.

### **Mobile Source Air Toxics (MSATs)**

In addition to the "criteria" air pollutants like CO discussed above, there are a variety of other potentially hazardous air pollutants for which health-based ambient air quality standards have not been established. Of the identified hazardous air pollutants, some have been designated as mobile source air toxics (MSATs). As actual data related to potential effects of MSATs, as well as the mechanisms related to analyzing dispersion of MSATs, are incomplete or unavailable, specific analyses of these substances are not as yet typically performed. However, the FHWA has released interim guidance for considering MSAT effects during the process of NEPA evaluations for transportation projects subject to FHWA review. While 20th Street SE is not subject to FHWA review, FHWA guidance for screening level review for MSATs was applied in the event there is interest or concern regarding such emissions related to this project.

**Table 18. Morning Peak-Hour Levels of Service at Project-Affected Intersections**

| Intersection with<br>20th Street SE | 2006     |                         | 2010                   |            |                      |            | 2030      |            |         |            |
|-------------------------------------|----------|-------------------------|------------------------|------------|----------------------|------------|-----------|------------|---------|------------|
|                                     | Existing |                         | No Action <sup>1</sup> |            | Project <sup>2</sup> |            | No Action |            | Project |            |
|                                     | Delay    | LOS <sup>3</sup> (secs) | Delay                  | LOS (secs) | Delay                | LOS (secs) | Delay     | LOS (secs) | Delay   | LOS (secs) |
| 83rd Avenue SE                      | C        | 24                      | C                      | 24         | B                    | 15         | F         | 105        | C       | 22         |
| SR-9                                | E        | 53                      | E                      | 56         | D                    | 45         | F         | 85         | E       | 58         |
| S Lake Stevens Rd                   | D        | 29                      | C                      | 24         | C                    | 24         | D         | 37         | C       | 31         |

1. No Action refers to no 20th Street SE improvements
2. Project refers to the 5 lane build with one westbound HOV lane during the AM peak time
3. LOS is a designation reflecting average intersection delay reported in seconds

Source: Perteet, Inc. 2007

In the case of the proposed project, future vehicle miles traveled (VMT) with each of the project alternatives including No Action are expected to be about the same. Therefore, if the proposed project increases the efficient operation of the roadway compared with No Action as is expected, the more efficient movement of traffic through the project corridor would decrease MSAT emissions related to slower speeds and increased congestion.

In addition, MSAT emissions in future years are expected to decline compared with existing levels of emissions as a result of national emission control programs. FHWA projections show a reduction in MSAT emissions on highway vehicles of 57 to 87 percent between 2000 and 2020.

### Transportation Conformity Determination

In the project's opening and horizon years, the levels of service at the three most project-affected intersections are expected to remain the same or else improve compared with the No Action Alternative. Therefore, the proposed project would not create a new violation of an air quality standard or worsen the current situation. Consequently, at the project level, the proposed action conforms with the purpose of the current State Implementation Plan (SIP), and with all requirements of the Clean Air Act Amendments of 1990, and the Washington State Clean Air Act of 1991.

### No Action Alternative

With the No Action Alternative, the widening and other improvements to 20th Street SE would not occur, so project-related air quality impacts would not be expected. However, the traffic study suggests that intersection congestion along the project corridor would continue to deteriorate, particularly during the AM peak-hour, and that travel times would substantially increase. Such increased congestion would increase vehicle-related emissions and somewhat degrade air quality compared with the improved conditions expected with the action alternative.

# Mitigation – Air Quality

## During Construction

### Preferred Alternative

The project would be required to comply with all relevant federal, state, and local air quality laws, and would be required to control dust and odors sufficiently to comply with PSCAA regulations. The following is a list of possible mitigation measures that could be implemented to reduce potential air quality impacts during construction of the project:

- Use only equipment and trucks that are maintained in optimal operational condition.
- Require all off-road equipment to be retrofit with emission reduction equipment (i.e., require participation in Puget Sound region Diesel Solutions by project sponsors and contractors), including particulate matter traps and oxidation catalysts to reduce MSATs.
- Use bio diesel or other lower-emission fuels for vehicles and equipment.
- Use car pooling or other trip reduction strategies for construction workers.
- Stage construction to minimize overall transportation system congestion and delays to reduce regional emissions of pollutants during construction.
- Implement construction curbs on hot days when region is at risk for exceeding the ozone NAAQS, and work at night instead.
- Implement restrictions on construction truck idling (e.g., limit idling to a maximum of 5 minutes).
- Locate construction equipment away from sensitive receptors such as fresh air intakes to buildings, air conditioners, and sensitive populations such as the elderly or young.
- Locate construction staging zones where diesel emissions won't be noticeable to the public or near sensitive populations.
- Spray exposed soil with water or other suppressant to reduce emissions of PM<sub>10</sub> and deposition of particulate matter.
- Pave or use gravel on staging areas and roads that would be exposed for long periods.
- Cover all trucks transporting materials, wet materials in trucks, or provide adequate freeboard (space from the top of the material to the top of the truck bed), to reduce PM<sub>10</sub> emissions and deposition during transport.
- Provide wheel washers to remove particulate matter that would otherwise be carried off site by vehicles to decrease deposition of particulate matter on area roadways.
- Remove particulate matter deposited on paved, public roads, sidewalks, and bicycle and pedestrian paths to reduce mud and dust; sweep and wash streets continuously to reduce emissions.
- Cover dirt, gravel, and debris piles as needed to reduce dust and wind blown debris.
- Route and schedule construction trucks to reduce delays to traffic during peak travel times to reduce air quality impacts caused by a reduction in traffic speeds.

### **No Action Alternative**

With this alternative, no construction activities would occur that could affect air quality, so no mitigation would be required.

### **During Operation**

#### **Preferred Alternative**

The air quality analysis indicates the proposed 20th Street SE improvement would not result in any significant adverse air quality impacts in the study area. Consequently, no operational impact mitigation measures are warranted or proposed.

#### **No Action Alternative**

With the No Action Alternative, the proposed widening and other improvements to 20th Street SE would not occur and it would continue serving traffic in its current form. Under this alternative, no mitigation is required.

### **Significant Unavoidable Adverse Impacts**

No significant adverse impacts have been identified or are anticipated. It is expected that the additional travel lanes will increase the efficient operation of the roadway, moving vehicles more quickly through the corridor, resulting in a decrease in emissions associated with slower travel speeds.