D. Air Quality

This section provides a review of the air quality implications of transportation system improvements proposed as part of the Northgate CTIP. The air quality review focused on changes to the affected environment that could result from the CTIP short-term and long-term improvement concepts. The analysis considered existing conditions in the project vicinity and included a qualitative review of future roadway/traffic conditions.

Affected Environment

Air quality is generally assessed in terms of whether concentrations of air pollutants are higher or lower than ambient air quality standards established to protect human health and welfare. Three agencies have jurisdiction over ambient air quality in the project area: the U.S. Environmental Protection Agency (EPA), the Washington Department of Ecology (Ecology), and the Puget Sound Clean Air Agency (PSCAA). All three agencies establish regulations that govern both the concentrations of pollutants in the outdoor air and contaminant emissions from air pollution sources. The Puget Sound Regional Council (PSRC) conducts regional emissions modeling of transportation sources to assure that emissions related to transportation plans and programs comply with "budgets" established in air quality control plans.

In order 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 either "attainment" or "nonattainment" for particular air pollutants. Attainment status is therefore a measure of whether air quality in an area complies with the National Ambient Air Quality Standard (NAAQS). Former nonattainment areas reclassified as attainment are considered air quality "maintenance" areas for at least 10 years after reclassification to assure attainment has been achieved.

There are no longer any active air quality monitors in the immediate project area since local carbon monoxide (CO) monitoring was discontinued in March 2003. This monitor and all others in the Puget Sound region had not measured a violation of the 1-hour or 8-hour CO standards in recent years (EPA 2005). In addition, most other air pollution measurements in the region have been less than the other applicable air quality standards, indicating air quality in the area is generally good. The project planning area is in an area considered to be attainment/maintenance for all air pollutants, which is an improvement from the nonattainment designation for carbon monoxide (CO) and ozone of the early to mid 1990’s.

There are special requirements in federal and state air quality rules for nonattainment and maintenance areas to ensure that proposed transportation projects and plans do not cause or contribute to existing air quality problems. These so-called "conformity rules" require analyses to demonstrate compliance with existing air quality control plans and programs. The specific requirements for air quality conformity are discussed later in this section.

The Northgate CTIP study area encompasses the Northgate Urban Center, which is generally located between Lake City Way and Ashworth Avenue, just north of the Maple Leaf neighborhood. Typical existing sources of air pollution in the study area include vehicle traffic along the I-5 corridor and to and from the Northgate Mall and Northgate Transit Center, traffic related to low and high density residential developments, several commercial and retail enterprises (e.g., restaurants), and residential wood-burning devices used for space heating and aesthetics. Residential wood burning produces a variety of air contaminants, including large quantities of fine particulate matter (PM_{10} and $PM_{2.5}$, which are subclasses of "total" particulate matter where the numbers in the designations indicate the aerodynamic diameter of the particles, so PM_{10} are particles less than about 10 micrometers in size). Pollutant emissions from diesel sources (e.g., most heavy-duty truck engines and transit buses) include $PM_{2.5}$ and a variety of toxic air pollutants. Non-diesel vehicle emissions are comprised primarily of CO, but also include small amounts of sulfur dioxide (SO2), toxic air pollutants, and both hydrocarbons and nitrogen oxides, which can transform to become ground-level ozone.

Vehicles also emit PM_{10} and $PM_{2.5}$ directly in their exhaust and indirectly as a function of their tires generating dust on paved and unpaved roads, but the amounts of particulate matter generated by individual vehicles are small compared with other sources (e.g., a wood-burning stove). Because vehicles are a primary air pollutant source in the project vicinity, an increase in traffic due to neighborhood growth and development could potentially affect air quality.

Significant Impacts of the Alternatives

Construction Impacts

Draft CTIP Improvements

The CTIP includes numerous recommended changes to area roadways, intersections, and other facilities that would require construction in a variety of locations over a range of years. While none of these activities are likely to result in significant impacts to air quality, the following discussion focuses on the potential effects on air quality from various construction activities that could occur throughout the phased construction process.

Any demolition of existing structures could require the removal and disposal of building materials that could contain asbestos. In this event, demolition contractors would be required to comply with U.S. EPA and PSCAA regulations related to the safe removal and disposal of any asbestos-containing materials.

Construction activities such as excavation, grading, and filling would be employed to construct the facilities proposed to enhance and improve vehicle, pedestrian, and bicycle movement. During any such activities, dust from excavation and grading would contribute to localized increases in ambient concentrations of suspended particulate matter. Construction contractor(s) would have to comply with the PSCAA Regulation I, Section 9.15, requiring reasonable precautions to avoid 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, but these emissions and the resulting concentrations would be far outweighed by emissions from traffic around and within the project area. Nonetheless, emissions from such sources, and especially from diesel-fueled engines, are coming under increasing scrutiny because of their suspected risk to human health. So, although there is little or no danger of such emissions resulting in pollutant concentrations that would exceed an ambient air quality standard, pollution control agencies are now urging that such emissions be minimized to the extent practicable or located as far as possible from sensitive uses (e.g., homes) in order to reduce health risks.

Some construction phases would cause odors detectible to some people near active construction areas. This would be particularly true during paving operations using tar and asphalt. The construction contractor(s) would have to comply with the PSCAA regulations requiring the control of odorous emissions so as to prevent undue interference with nearby uses (Regulation I, Section 9.11). Such odors would be short-term. In addition, no slash or demolition burning would be permitted in association with this project because of local air quality rules.

Construction equipment and material hauling could affect traffic flow in the study area. If construction delays traffic enough to significantly reduce travel speeds in the area, general traffic-related emissions would increase.

Construction activities related to any of the proposed short term or long term improvements would not be expected to significantly impact air quality.

No Action

Without the CTIP improvements, the transportation system and related infrastructure would reflect only those future changes and improvements already proposed as part of separate projects, and no additional construction activities would occur related specifically to the elements of the CTIP. Construction of any projects that would occur under baseline conditions would results in the same potential for air quality impacts as described above for the CTIP elements.

Operational Impacts

The air pollutant of major concern with land use and transportation plans and projects is carbon monoxide (CO). Of the various vehicular emissions that are subject to ambient air quality standards, CO is the pollutant emitted in the largest quantity. Therefore, potential changes in traffic conditions that could affect CO emissions within the project study area are the focus of this review. Because the project area is in a CO maintenance area, any major changes in the transportation system would be subject to regional and project-level review under federal and state transportation air quality conformity rules.[1] Because at this

[1] Federal and state transportation air quality conformity rules prohibit transportation projects in CO maintenance areas from causing new problems and from contributing to any existing localized CO problems. Accordingly, transportation plans and projects must be reviewed at both

point the CTIP is a conceptual planning document, the plan's recommended improvements are not currently detailed enough to allow consideration of air quality at the level of detail that will eventually be required to comply with air quality conformity rules. Consequently, this air quality review comprises a planning-level, qualitative assessment and not a project-level or a regional-level review. As noted in Chapter II of the Draft EIS, SDOT is using phased environmental review to address air quality.

EPA guidance for the conduct of project-level conformity review can, nevertheless, be used to assess whether traffic related to the proposed project would be likely to adversely affect air quality. This guidance suggests that review be based on consideration of signalized intersections where the level of service (LOS) is "D" or worse, because these are the locations with the greatest potential to cause localized air quality impacts.[2] If the proposed CTIP elements adversely affect congested intersections by increasing delay compared to baseline conditions, there would be a potential for air quality impacts near the affected intersections.

For purposes of this analysis, the p.m. peak-hour traffic period in the project's "design" year (2030) would represent the worst-case traffic scenario because peak-hour volumes and related congestion would be greatest by 2030. To establish which intersections would be most affected by the CTIP, 2030 traffic data were used to estimate changes in peak-period total vehicle delays at all intersections considered in the traffic analysis. From these, the seven most congested signalized intersections ranked by total delay are presented in Table 7. Based on these data, it is possible to speculate about the relative air quality implications of the CTIP elements and baseline conditions as discussed following the table.

2030 With CTIP Improvements

With the CTIP recommended improvements, 2030 congestion and delay would be reduced at most intersections considered in the study area compared to expected baseline conditions (No Action) in 2030. At the busiest, most congested intersections (Table 7), potential CTIP improvements would reduce total peak-hour delay or keep conditions about the same as future baseline traffic conditions at all but one intersection. Thus, with the CTIP improvements, air quality would likely remain the same or possibly improve somewhat compared with baseline conditions as a result of less congestion and reduced delay near most intersections.

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a regional and at a project level to assure they will not result in CO violations. At least two components of the proposed CTIP would affect a state route (I-5) and/or a regionally significant arterial (Northgate Way NE) by physically altering roadway capacity (i.e., adding travel lanes on roads or highway ramps). If these two concepts are eventually included in the accepted CTIP, the transportation conformity rules will apply, and quantitative analyses of the air quality implications of these plan elements will be necessary at both a project and regional level.

[2] Intersection level of service is a measure of intersection operation that is based on per-vehicle delay. LOS A represents little congestion and small delay, and LOS F represents substantial congestion and long delays.

At the Corliss Avenue North/N. Northgate Way intersection, average vehicle delay and total cumulative delay would increase substantially over baseline conditions, changing LOS from "C" to "D," and could affect air quality near this intersection. However, even with such an increase the total delay at the Corliss Avenue North/N. Northgate Way intersection would be substantially less than total delay at the most congested intersections, and less than half of the total delay at the worst-ranked intersection, Meridian Avenue North at N. Northgate Way.

Downward trends in measured and calculated (i.e., modeled) CO levels near the region's most congested intersections due to vehicle emission control requirements suggest that even at high-volume intersections operating at LOS D or worse, existing CO levels probably comply with ambient air quality standards (EPA 2006). In addition, vehicle emission rates in 2030 are expected to decrease substantially compared with existing rates due to vehicle emissions reduction measures implemented by federal and state regulatory requirements in future years. Such reductions would likely offset the potential for increased vehicle emissions due to larger volumes or increased congestion in future years. With the use of cleaner fuels and less-polluting vehicles, CO levels are likely to continue the downward trend and remain below ambient air quality standards in 2030. For these reasons, CO levels near intersections along Northgate Way and near the less congested Corliss Avenue North intersection are not likely to exceed the applicable ambient air quality standards. It is therefore likely that implementation of the CTIP improvements would not result in significant adverse impacts on air quality in the project area.

Table 7: Signalized Intersections Ranked by Total P.M. Peak-Hour Delay with CTIP Improvements

Intersection	Existing	2030 Baseline			2030 w/CTIP		
	LOS/ Delay (sec/veh)	LOS/ Delay (sec/veh)	Volume (veh/hr)	Total Delay (hr)[a]	LOS/ Delay (sec/veh)	Volume (veh/hr)	Total Delay (hr)[a]
Meridian Ave N @ N Northgate Way	D/45	F/119	5,170	170.9	F/104	5,030	145.3
1st Ave NE @ NE Northgate Way	C/33	E/69	6,430	123.2	E/62	6,430	110.7
5th Ave NE @ NE Northgate Way	D/38	F/113	5,360	168.2	E/67	5,360	99.8
Roosevelt Way NE @ NE Northgate Way	D/39	E/74	4,570	93.9	E/75	4,570	95.2
15th Ave NE @ NE 125th St	D/42	E/77	4,550	97.3	E/75	4,550	94.8
3rd Ave NE @ NE Northgate Way	C/28	E/69	4,350	83.4	E/69	4,560	87.4

Corliss Ave N @ N Northgate Way	B/17	C/33	5,160	47.3	D/49	5,160	70.2

[a] Total Delay represents the cumulative hours of vehicle delay at each intersection during the p.m. peak hour (i.e., volume * per-vehicle-delay).

Source: Mirai Associates, Inc. 2005

As indicated above, several potential elements of the CTIP would very likely trigger the need for project-level (and regional) air quality conformity reviews once these elements are proposed as actual projects. These reviews will probably require quantitative modeling of potential air quality impacts at the several most congested intersections that would be affected by these projects to confirm that the proposed transportation system changes would not lead to air quality problems. The results of such dispersion modeling analyses would be reported in supplemental, project-specific environmental documentation.

No Action/2030 Baseline

Because the downward trend in CO levels is likely to persist due to decreasing vehicle emission rates and the use of cleaner fuels, it is unlikely that significant adverse air quality impacts would occur under the baseline conditions even without the CTIP improvements. However, because of increased congestion in the absence of CTIP projects (see Table 7), traffic-related pollutant emissions would be likely to be higher without the CTIP improvements than with them. And as with some components of the CTIP, some future but currently unknown projects that could be implemented in response to congestion could trigger the need for project-level review, including dispersion modeling analysis of the worst congested intersections to verify that CO concentration levels remain below ambient air quality standards.

Mitigation Measures

Construction

Possible mitigation measures for reducing the potential for air quality impacts during construction include measures for reducing both exhaust emissions and fugitive dust. The *City of Seattle Standard Plans for Municipal Construction* (2005; see: http://www.seattle.gov/util/Engineering/Standard_Plans_&_Specs/index.asp) include measures to protect air quality during construction activities that will be required during construction of any components of the CTIP. In addition, the Washington Associated General Contractors brochure *Guide to Handling Fugitive Dust from Construction Projects* and the PSCAA suggest a number of methods for controlling dust and reducing the potential exposure of people to emissions from diesel equipment. In addition to the best management practices included in the standard specifications that the city requires to control dust, the following is a list of possible mitigation measures that could be implemented to reduce potential air quality impacts at on-site and off-site locations during construction.

- 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)
- 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
- Locate construction staging zones where diesel emissions won't be noticeable to the public or near sensitive populations such as the elderly and the young
- Spray exposed soil with water or other suppressant to reduce emissions of M10 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, wetting materials in trucks, or providing adequate freeboard (space from the top of the material to the top of the truck bed), to reduce particulate 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

Operation

Based on a qualitative review there seems to be little potential for air quality impacts related to the proposed CTIP elements or the baseline conditions, so mitigation measures related to operational impacts are not proposed or warranted at this time. The need for specific mitigation measures will be assessed in greater detail when major CTIP components are considered at the project level.

Significant Unavoidable Adverse Impacts

No significant unavoidable adverse air quality impacts have been identified in connection with recommended CTIP improvements.