Jones & Stokes

Technical Memorandum

Date: June 28, 2007

To: Kristen Overleese, PE, City of Shoreline

From: James Wilder

cc: Jennifer Barnes

Subject: Air Quality Analysis, Aurora Corridor Improvement Project: N 165th Street – N 205th Street

Introduction

What is the purpose of this memorandum?

The City of Shoreline (City) proposes to construct the Aurora Corridor Improvement Project: N 165th Street to N 205th Street (Project), which will improve a 2-mile-long segment of State Route (SR) 99, named Aurora Avenue North (N) within the City. This Project must be developed in compliance with the National Environmental Policy Act (NEPA) and the Washington State Environmental Policy Act (SEPA).

This technical memorandum was prepared in general accordance with Section 420 of the Washington State Department of Transportation (WSDOT) Environmental Procedures Manual. It describes the air quality regulations that apply to the Project, and the potential effects of the Project on air quality (WSDOT 2006).

Where is the Project located?

The Project is located within the city limits of the City on Aurora Avenue N between N 165th Street and N 205th Street (Figure 1, *Project Vicinity*).

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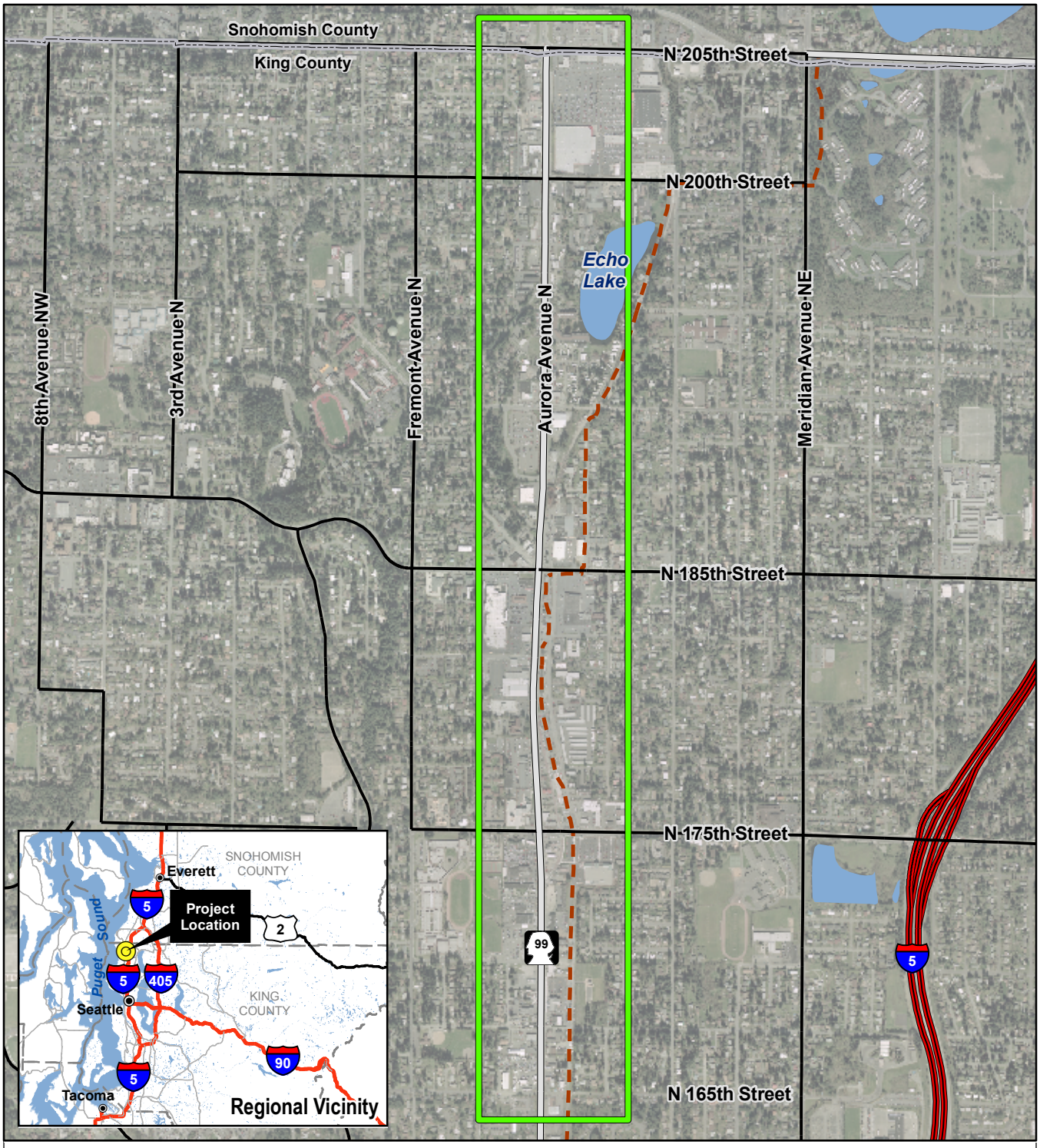

Sources: City of Shoreline (2006); Jones & Stokes (2007)

City Boundary
Project Area
Interstate
State Route
Arterial
Interurban Trail

N

Feet

0 1,000 2,000

Figure 1. Project Vicinity
Aurora Corridor Improvement Project
June 2007

What are the existing characteristics of the Aurora Avenue North corridor?

Aurora Avenue N is a major north/south urban highway that serves both local and regional traffic within the City (Figure 1, *Project Vicinity*). It is a key regional vehicular, transit, and truck corridor within the greater area of Puget Sound and serves as the City's primary arterial roadway, running approximately parallel to Interstate (I)-5 with connections at N 145th Street, N 175th Street, and N 205th Street. Development along the corridor is predominantly commercial, mixed with some multi-family housing. Echo Lake is located approximately 200 feet to the east of the roadway, north of N 192nd Street. The Interurban Trail, currently under construction, runs roughly parallel to Aurora Avenue N, to the east in the Project corridor. Aurora Avenue N has two general-purpose travel lanes in each direction, with a center two-way left-turn lane. Shoulder and sidewalk of varying widths are located sporadically along the corridor, with no curb or gutter, and little landscaping.

Under existing conditions, average daily traffic (ADT) on the roadway is 33,000 to 39,000 vehicles per day. A steady level of pedestrian and bicycle travel occurs along and across the roadway, but the corridor is heavily oriented to vehicle travel and is generally not conducive to non-motorized travel. WSDOT has designated several areas of Aurora Avenue N between N 165th Street and 205th Street with poor safety ratings. The corridor is served heavily by public transit provided by King County Metro, with additional service at the north end of the corridor provided by Community Transit.

Why improve Aurora Avenue North?

The purpose of the Aurora Corridor Improvement Project, N 165th Street to N 205th Street, is to improve safety, circulation, and operations for vehicular and non-motorized users of the roadway corridor, to support multi-modal transportation within the corridor, and to support economic stability along the corridor.

Why consider air quality in planning this Project?

The Project is subject to the air quality regulations under the federal Transportation Conformity (40 CFR Part 93) because the Project is in the carbon monoxide (CO) maintenance area. Under the air quality regulation, the project-level CO hot-spot analysis is required for this Project.

What are the key points of this memorandum?

- The Project is in the maintenance area for CO.
- The Project is included in a conforming Transportation Improvement Program (TIP) that has been reviewed and approved by WSDOT, Washington State Department of Ecology (Ecology), and the Puget Sound Regional Council (PSRC).
- The Project would not cause any significant regional air quality impacts due to operational emissions of volatile organic compounds (VOC) or nitrogen oxides (NO_X). The regional emissions for CO and ozone precursors (VOC and NO_X) are less than the emission budgets specified by Ecology.
- The Project would not cause or contribute to any localized air quality violations. Predictive modeling of CO concentrations (including background concentrations) at the most congested intersections showed the Project would not cause CO concentrations to exceed the National Ambient Air Quality Standards (NAAQS) limits.
- Based on the above conclusions, the Project satisfies state and federal Transportation Conformity regulations.

Table 1 summarizes the potential air quality effects and mitigation measures, as identified in this technical memorandum.

Table 1. Potential Air Quality Effects and Mitigation

	Alternatives			
Potential Effects and Mitigation	No Build	A	B	C
Potential Operational Effects				
The Project satisfies Transportation Conformity, and no CO mitigation measures are recommended.	X	X	X	X
Potential Construction Effects				
Emissions during construction will be controlled using BACT and stationary-source emission controls as required by PSCAA regulations. Air quality impacts during construction will be minor, temporary, and localized, so no mitigations beyond standard BACT are warranted.		X	X	X

PSCAA: Puget Sound Clean Air Agency

Alternatives

What alternatives are considered?

This technical memorandum evaluates the potential effects of a No Build Alternative and three Build Alternatives, which are described in the following sections.

No Build Alternative

Under the No Build Alternative, Aurora Avenue N would remain exactly as it is today. The roadway has two general-purpose lanes in each direction with a center two-way left-turn lane. Shoulder and sidewalks of varying widths are located sporadically along the corridor with no curb or gutter and little landscaping. The corridor is served heavily by public transit provided by King County Metro, with additional service at the north end of the corridor provided by Community Transit. Buses on Aurora Avenue N would continue to travel and stop in the general-purpose lanes.

Build Alternatives

The City has proposed three Build Alternatives: Alternative A, Alternative B, and Alternative C. Table 2 provides an overview of Project features unique in an individual Build Alternative and features common among them. Figures 2, 3, and 4 present plan views of the three build alternatives, respectively. Figure 5 presents more detailed schematic drawings of the proposed roadway configurations under each of the three alternatives. The drawing shows one direction of travel of the proposed roadway alternatives, which is typical of both directions.

When will the Recommended Alternative be selected?

The Recommended Alternative will be selected after all of the environmental analysis has been completed for the No Build Alternative and three Build Alternatives. The discipline reports and technical memoranda that summarize the environmental analysis will be available for public review after they are finalized.

The boundaries of the three Build Alternatives encompass the maximum possible footprint of the Project. The Recommended Alternative ultimately selected for the Project may combine different elements from the different Build Alternatives. However, no part of the Project will occur outside of the study area analyzed in this report.

Table 2. Common and Unique Features of the Aurora Corridor Improvement Project Build Alternatives

Features Common among Build Alternatives A, B, and C	
General Purposes lanes	Project design includes two general-purpose lanes in each direction.
BAT lane	Each Build Alternative would include one Business Access and Transit (BAT) lane in each direction.
Sidewalk	7-foot sidewalks would be constructed along both sides of the corridor.
Curb and Gutter	Curb and gutter would be constructed along both sides of the corridor. Curb ramps would be constructed at all intersections in accordance with ADA requirements.
Underground utilities	Utilities would be placed underground for each of the three Build Alternatives.
Vegetation	Each of the alternatives includes vegetative plantings. Extent and location vary as described below.
Center median	A center median would be added, with left-turn and u-turn pockets (width of the center median varies by alternative, as described below).
Traffic signals	New traffic signals proposed at Aurora Avenue N/N 182nd Street and Aurora Avenue N/Firlands Way N (north of N 195th Street). Signalized intersections will be widened to improve east-west capacity and traffic flow.
Road improvements	Improvements would be made to: ▪ Echo Lake Place (north of N 195th Street), including realignment and a connection to Aurora Avenue N at Firlands Way N; and ▪ Midvale Ave N (N 175th Street – N 183rd Street), including realignment, addition of a center turn lane, curb and gutter, and sidewalk on the east side of the roadway. The new Interurban Trail will serve as the walking path on the west side of the roadway.

Features that vary among Alternatives A, B, and C	Alternative A	Alternative B	Alternative C
Cross Section	Typically 98 feet from back-of-sidewalk to back-of-sidewalk. The cross section will be wider where utility vaults, light/signal poles, and bump outs are located, as described below. This dimension is 12 feet narrower than the cross sections proposed under Alternatives B and C, due to a narrower median (12 feet instead of 16 feet) and the absence of the 4-foot amenity zone on each side of the roadway. The City would also acquire a continuous 3-foot-wide easement behind the sidewalk on each side of the roadway for placement of utilities.	110 feet from back-of-sidewalk to back-of-sidewalk.	
Median Width	Center median would be 12 feet wide.	Center median would be 16 feet wide.	
Amenity Zone	No amenity zone provided. Utility vaults and light/signal poles would be located behind the sidewalks in the 3-foot easement area.	A 4-foot amenity zone would be located between the curb and sidewalk on each side of the street. Utility vaults, light/signal poles, bus stop signs, hydrants, and other pedestrian amenities would be located in this area.	
Bump Outs	Bump outs approximately 4 feet in additional width would be needed at u-turn and left-turn locations to achieve the turning radii needed to accommodate u-turns.	None needed. U-turns would be sufficiently accommodated within the standard roadway width.	
Placement of Alignment	Required widening would be shifted to the east of the existing right-of-way in the vicinity of N 175th Street, N 185th Street, and N 200th Street.	Required widening would be shifted to the east of the existing right-of-way in the vicinity of N 175th Street, N 185th Street, and N 200th Street.	Required widening would be shifted to the west of the existing right-of-way in the vicinity of N 175th Street, N 185th Street, and N 200th Street.
Vegetation	Limited vegetation would be provided in the median.	More vegetation accommodated by wider median. Vegetation could also be planted in areas within the amenity zone.	

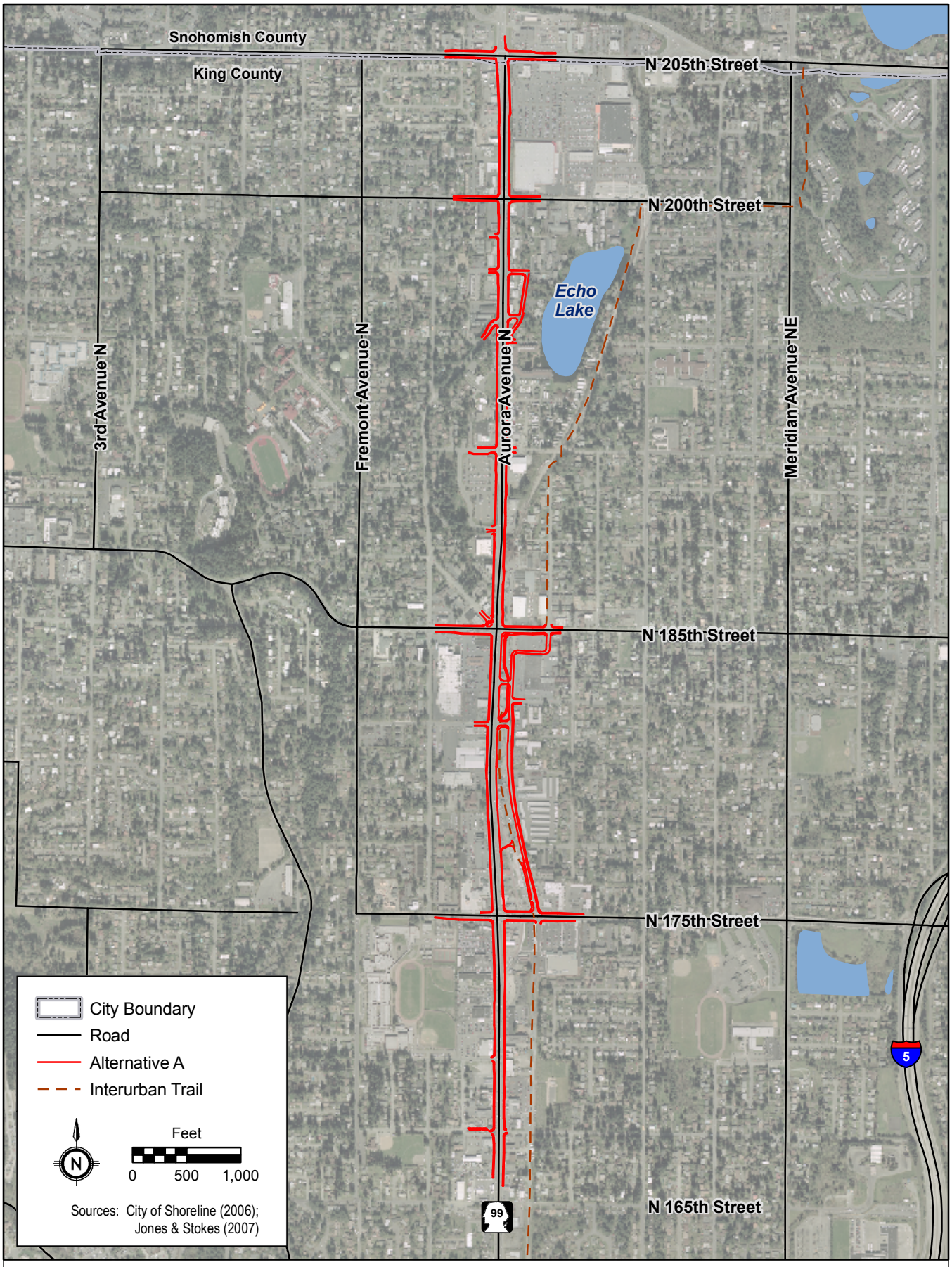

Figure 2. Alternative A
Aurora Corridor Improvement Project
June 2007

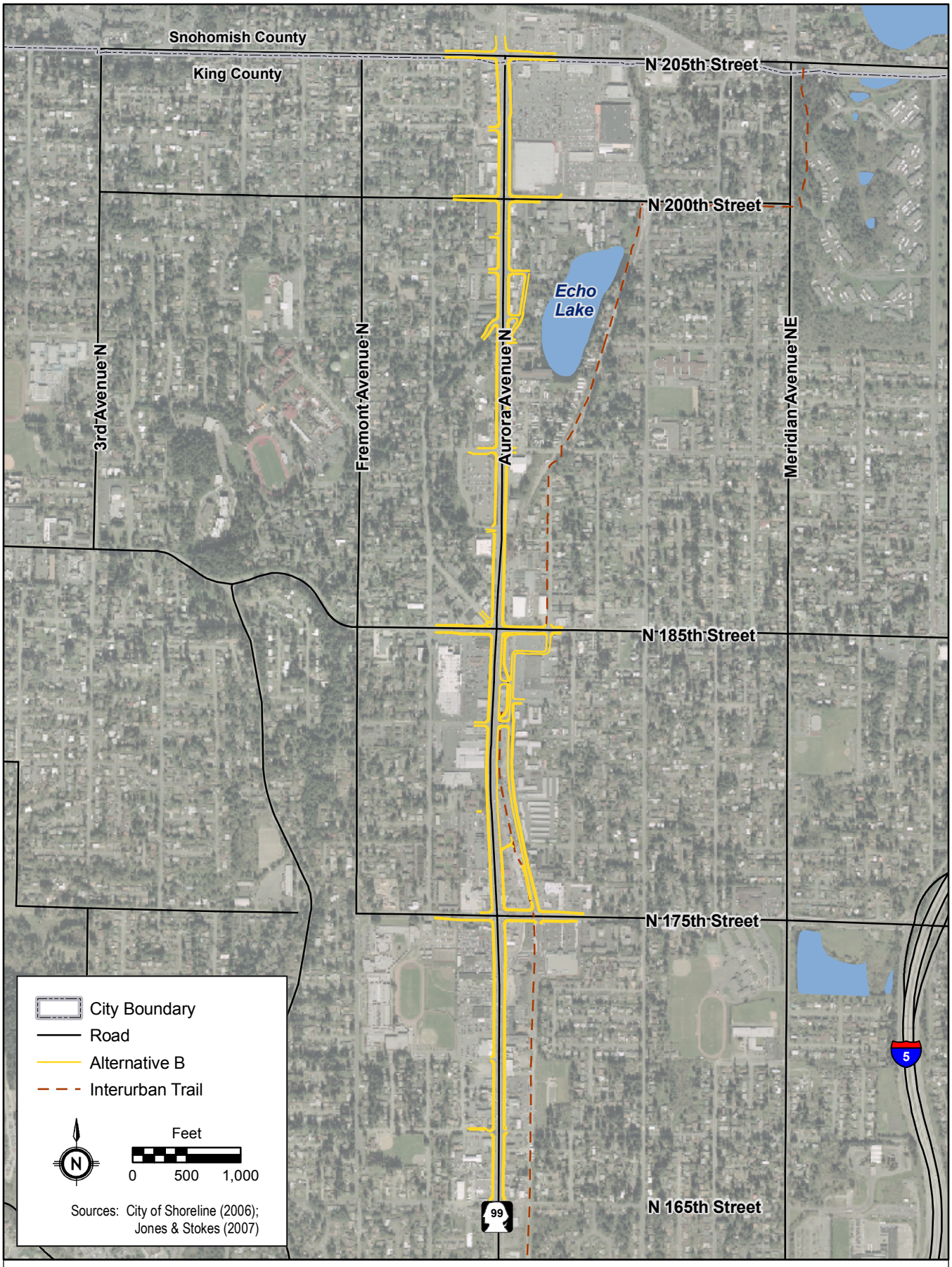

Figure 3. Alternative B
Aurora Corridor Improvement Project
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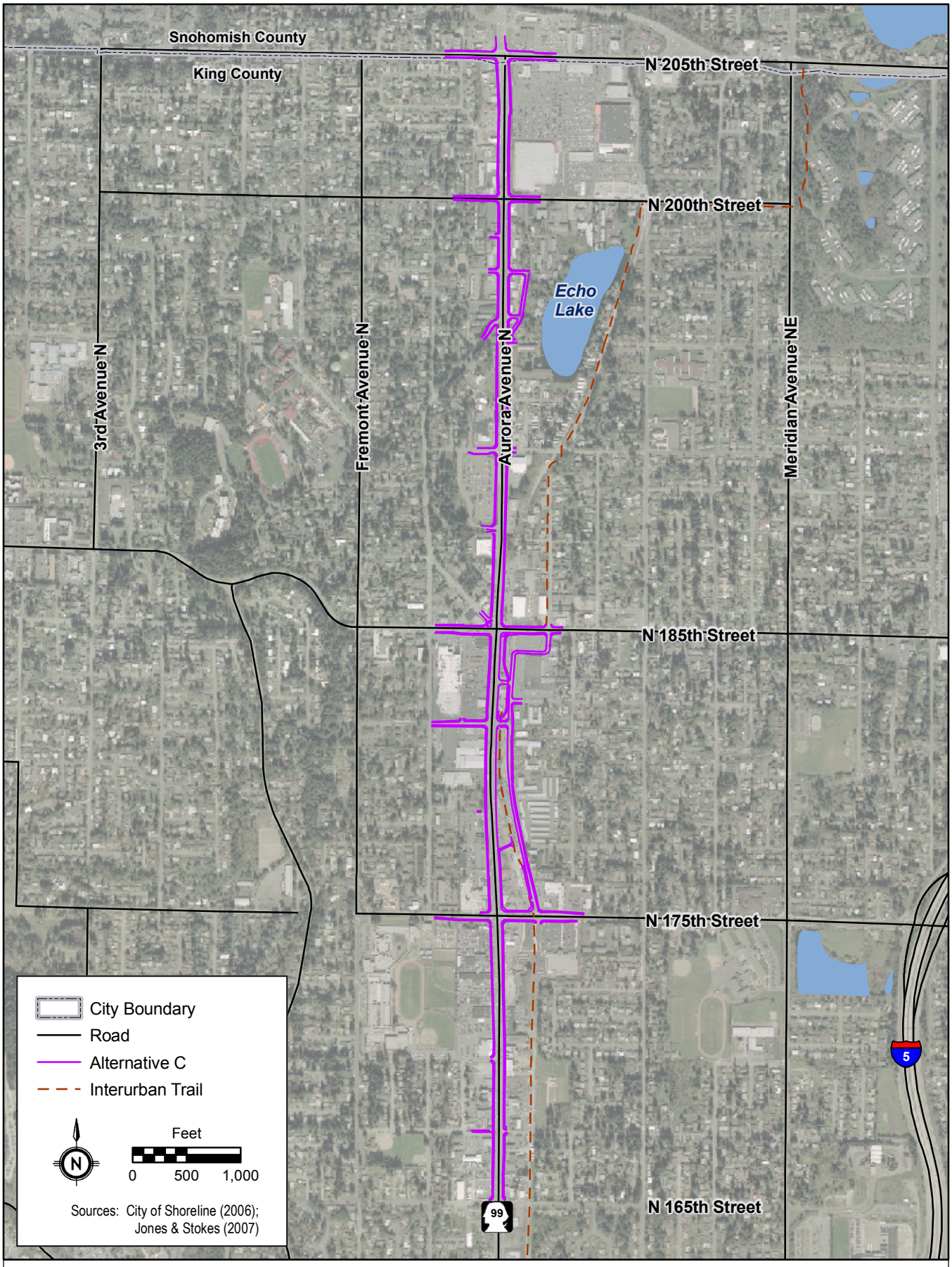

Figure 4. Alternative C
Aurora Corridor Improvement Project
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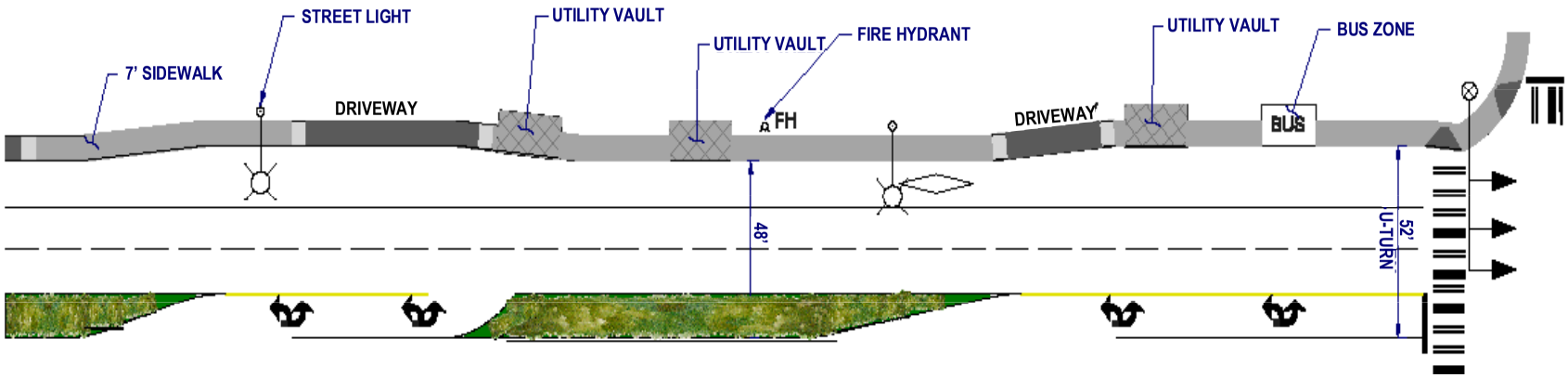
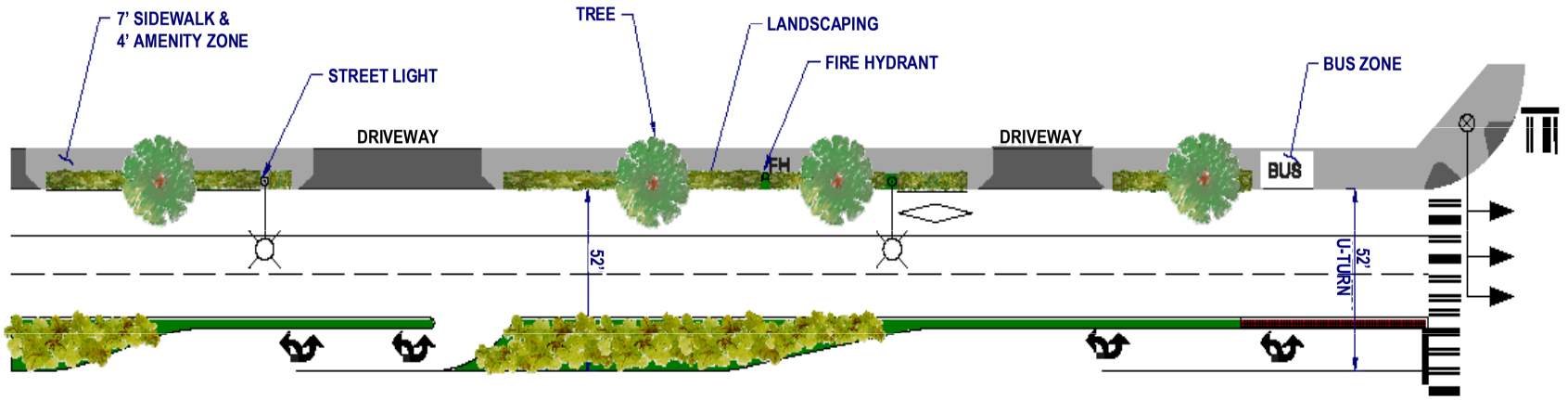
Alternative A



Alternatives B and C

Note: Drawing shows one direction of travel of the proposed roadway alternatives, which is typical of both directions



CITY OF SHORELINE AURORA CORRIDOR

Figure 5. Proposed Plan Detail for Build Alternatives
Aurora Corridor Improvement Project
June 2007

Affected Environment

How was information on air quality collected?

The data collected for the analysis of air quality was based on the guidance document *Guidance for Conformity* (KJS Associated 1995), prepared for WSDOT in accordance with Environmental Protection Agency (EPA) guidance (EPA 1992). EPA and Ecology provided air quality standards and air quality status for the Project. Transportation Conformity information was provided by PSRC. Traffic data for the project-level CO hot-spot analysis were provided by the Project's engineering consultant (CH2M Hill 2007).

What is the study area for air quality and how was it defined?

The project-level CO hot-spot analysis is required for this Project because the Project is in the CO maintenance area. The study area for CO hot spot analysis was defined based on the guidance document *Guidebook for Conformity* (KJS Associates 1995) prepared for the WSDOT in accordance with (EPA) guidance (EPA 1992). The CO hot-spot modeling study area was limited to sidewalks adjacent to the most heavily congested intersections along the Project corridor.

Based on these guidelines, signalized intersections, which were evaluated in the Transportation Discipline Report prepared for the Project, were screened to identify the most heavily congested intersections used for the CO hot-spot analysis. Although air quality analysis is completed for the No Build and Build Alternatives, the selection of analysis locations are based on traffic projected under the Build Alternatives. For each Build Alternative, the intersections were ranked twice based on the forecasted 2030 PM peak hour traffic conditions. One ranking was made for intersection level of service (LOS), with LOS A indicating the lowest level of roadway congestion, and LOS F indicating the highest level of roadway congestion. A second ranking was made for PM peak hour traffic volumes, which were used because the PM period was identified as generating the highest traffic volumes during a 24-hour day. For each Build Alternative, the three signalized intersections with the worst LOS and the three intersections with the highest traffic volumes were selected. Table 3 shows the results of the intersection ranking for Alternatives A, B, and C. As shown in the table, the projected LOS and traffic volumes are the same for all three alternatives. The following four intersections met one or both criteria; and thus define the study area for the CO hot-spot analysis:

- Aurora Avenue N and N 205th Street
- Aurora Avenue N and N 200th Street
- Aurora Avenue N and N 185th Street
- Aurora Avenue N and N 175th Street

Table 3. Hot-Spot Intersection Selection

Intersection	2030 PM Peak Hour Conditions for Build Alternatives[1]		Top 3 Locations		Hot-Spot Analysis Location[2]
	LOS	Volume	Worst LOS	Highest Volume	
Aurora Avenue N / N 205th Street	E	5,495	X	X	X
Aurora Avenue N / N 200th Street	E	4,315	X		X
Aurora Avenue N / N 195th Street	B	3,645			
Aurora Avenue N / N 192nd Street	B	3,720			
Aurora Avenue N / N 185th Street	E	4,965	X	X	X
Aurora Avenue N / N 182nd Street	D	3,880			
Midvale Avenue N / N 182nd Street	C	320			
Aurora Avenue N / N 175th Street	D	5,275		X	X
Midvale Avenue / N 175th Street	B	2,385			

[1] Projected 2030 peak hour volumes and LOS are the same for all three Build Alternatives, A, B and C
[2] Hot-spot analysis locations consist of intersections that meet one or both of the top three "Worst LOS" or "Highest Volume" criteria
Source: CH2M Hill 2007.

What are the general land use characteristics of the study area?

The study area intersections along Aurora corridor are surrounded on all sides by commercial businesses and offices. The public has access to sidewalks along both sides of each street at each intersection.

Who regulates air quality?

EPA, Ecology, and the Puget Sound Clean Air Agency (PSCAA) together regulate air quality in the study area.

What standards apply to air quality?

National Ambient Air Quality Standards

EPA and Ecology have established regulations designed to limit emissions from air pollution sources and to minimize concentrations of pollutants in the outdoor ambient air. Although their regulations are similar in stringency, each agency has established its own standards. Unless the state or local jurisdiction has adopted more stringent standards, EPA standards apply.

Table 4 lists both the national and Washington ambient air quality standards for five criteria pollutants: CO, particulate matter less than 10 micrometers in size (PM10), particulate matter less than 2.5 micrometers in size (PM2.5), lead (Pb), sulfur dioxide (SO_2), ozone (O_3), and nitrogen dioxide (NO_2). The NAAQS consist of primary standards designed to protect public health and secondary standards designed to protect public welfare (e.g., preventing air pollution damage to vegetation). Ecology has established additional ambient standards for total suspended particulates and SO_2 standards more stringent than the federal requirements.

Table 4. National and State of Washington Ambient Air Quality Standards

Pollutant	National Standards (EPA)		Washington Standards (Ecology)
	Primary	Secondary	
CO			
8 hour average[1]	9 ppm	9 ppm	9 ppm
1 hour average[1]	35 ppm	35 ppm	35 ppm
Total Suspended Particles			
Annual average	No standard	No standard	60 µg/m^3
24-hour average	No standard	No standard	150 µg/m^3
PM10			
24-hour average[2]	150 µg/m^3	150 µg/m^3	150 µg/m^3
PM2.5			
Annual average[3]	15 µg/m^3	15 µg/m^3	No standard
24-hour average[4]	35 µg/m^3	35 µg/m^3	No standard
Pb			
Quarterly average	1.5 µg/m^3	1.5 µg/m^3	No standard
SO_2			
Annual average	0.03 ppm	No standard	0.02 ppm
24-hour average[1]	0.14 ppm	No standard	0.10 ppm
3-hour average[1]	No standard	0.50 ppm	No standard
1-hour average[6]	No standard	No standard	0.40 ppm
O_3			
8 hour average[5]	0.08 ppm	0.08 ppm	No standard
NO_2			
Annual average	0.053 ppm	0.053 ppm	0.05 ppm

Notes: ppm = parts per million; µg/m^3 = micrograms per cubic meter.

[1] Not to be exceeded more than once per year.

[2] Not to be exceeded more than once per year on average over 3 years.

[3] To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m^3.

[4] To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 65 µg/m3.

[5] 0.25 ppm not to be exceeded more than two times in any 7 consecutive days.

[6] To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average O_3concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

Sources: EPA 2007, Ecology 2007.

Attainment Status

Ecology maintains a network of air quality monitoring stations throughout Washington. These stations are placed in areas where there may be air quality problems, usually in or near urban areas or close to large air pollution sources. A limited number of additional stations are located in remote areas to provide an indication of regional background air pollution levels.

Based on monitoring information collected over a period of years, state and federal agencies designate regions as being attainment or nonattainment areas for regulated air pollutants. Attainment status indicates that air quality in an area meets the federal, health-based ambient air quality standards, and nonattainment status indicates that air quality in an area does not meet those standards. Regions previously designated as nonattainment that have demonstrated consistent improvements in air quality have been reclassified as maintenance areas, requiring approval of maintenance plans by Ecology.

The Project would occur in a designated maintenance area for CO and an attainment area for all other pollutants.

Transportation Conformity

Transportation projects proposed for construction within nonattainment areas or maintenance areas are subject to the Transportation Conformity specified under the federal regulations (40 CFR Part 93). The proponent must demonstrate conformity by implementing the following steps:

- confirm the project is included in the regional TIP,
- confirm that the regional on-road emissions (including those from the proposed project) described in the TIP are within the allowable emission budget specified by Ecology,
- use an EPA-approved air quality dispersion model to assess CO concentrations at the most heavily congested intersections, and
- if the modeled CO concentration exceeds the NAAQS limit and the modeled concentrations for the No Build Alternative exceed those for the Build Alternatives, the proponent must provide mitigation to reduce the CO concentrations for the Build Alternatives.

Potential Effects

What methods were used to evaluate potential effects on air quality?

Project-level CO hot-spot analyses for the study area intersections were evaluated using WSDOT Washington State Intersection Screening Tool (WASIST) (WSDOT 2005). WASIST is a computerized screening model used to estimate worst-case CO concentrations near signalized

intersections. The results from WASIST are based on inputs from EPA-approved vehicle emission and dispersion models, Mobile6 version 2.03 and CAL3QHC.

General inputs required for WASIST to describe the study area include analysis year, background concentration, County name, name of CO maintenance area, and land use type surrounding the intersection. Traffic input parameters required to describe the analysis intersections include lane configurations, traffic volumes, approach speeds, and signal timing of each intersection. Receptor inputs required to describe the receptor positions include number of receptors, and distance from the edge of roadways. A receptor is the position where the CO concentration is estimated. The WASIST was run with the following input values:

- The Project is located in the King County, Puget Sound CO maintenance area.
- The modeling was performed for 3 years: the existing year (2005), the build year 2013 (No Build and Build Alternatives, and the horizon year 2030 (No Build and Build Alternatives).
- Background CO concentrations of 3 parts per million (ppm) were used for 1-hour and 8-hour averaging periods as specified in the WASIST User's Manual (WSDOT 2005). The modeled 1-hour CO concentration was converted to an estimated 8-hour concentration by applying a 0.7 scale factor.
- Land use type surrounding the intersections in the study area is classified as "Offices" to present the retail businesses in the area.
- The approach speed at intersections is 5 miles per hour (mph) as suggested in the *WASIST User's Manual.*
- The transportation consultant for the Project provided lane configuration, traffic volume, and signal timing of each analysis intersection (CH2M Hill 2007). Since the intersection configuration, traffic volume, signal timing, and LOS are identical for all three alternatives, the CO hot-spot modeling for each analysis intersection was done once to represent three alternatives under the 2013 and 2030 build conditions.
- Receptors were located where the highest total Project CO concentrations are likely to occur and where the general public is likely to have continuous access (e.g., sidewalks). Consistent with EPA recommendations (EPA 1992), receptors were located on sidewalks approximately 10 feet from the edge of the nearest traffic lane. One receptor was placed at each corner of every intersection.

How would the Project affect air quality?

Carbon Monoxide Hot-Spot Impacts

Table 5 shows the CO hot-spot analysis results for both the No Build Alternative and Build Alternatives. The table shows that the modeled 1-hour average and 8-hour average CO concentrations for both the No Build and Build Alternatives are much lower than the allowable

NAAQS limit for each of the modeled years. The model indicates that CO concentrations would decrease from 2005 to 2030, even though the traffic volumes were projected to increase from 2005 to 2030. The net improvement in ambient concentrations is due to the expected continuous improvement in emissions from individual vehicles, which more than offsets the increase in traffic volume.

The modeled concentrations in Table 5 apply to the PM peak-hour period. CO impacts for the AM peak were not modeled, because traffic volumes for the AM peak period are projected to be lower in all directions compared to the PM peak period. Therefore, the maximum CO impacts during the AM peak period would also be much lower than the NAAQS limits.

In general, the modeled ambient CO concentrations for Build Alternatives are less than those for the No Build Alternative, with the exception of one intersection (Aurora Avenue and N 175th Street). At that intersection, the modeled 8-hour CO concentration for the Build Alternatives is only 0.2 ppm higher than the No-Build Alternative. That slight increase is not significant. That increase is likely a modeling artifact, because the WASIST model is unable to model traffic flow in right-turn lanes; and therefore, likely over-estimates CO impacts for intersections that actually use such lanes.

Regardless, in all cases the modeled ambient CO concentrations at all intersections are below the allowable NAAQS limits. Therefore, the modeling results confirm that none of the Build Alternatives would cause any significant air quality impacts adjacent to study area intersections.

Table 5. Carbon Monoxide Hot-Spot Analysis Results

	No Build Alternative		Build Alternatives A, B, C		NAAQS	
Modeled Year	1-hour (ppm)	8-hour (ppm)	1-hour (ppm)	8-hour (ppm)	1-hour (ppm)	8-hour (ppm)
Aurora Avenue N / N 205th Street						
Existing Year (2005)	11.1	8.7	-	-	35	9
Build Year (2013)	8.4	6.8	8.3	6.7	35	9
Horizon Year (2030)	7.4	6.1	7.3	6.0	35	9
Aurora Avenue N / N 200th Street						
Existing Year (2005)	10.4	8.2	-	-	35	9
Build Year (2013)	7.9	6.4	7.6	6.2	35	9
Horizon Year (2030)	6.8	5.7	6.7	5.6	35	9

	No Build Alternative		Build Alternatives A, B, C		NAAQS	
Modeled Year	1-hour (ppm)	8-hour (ppm)	1-hour (ppm)	8-hour (ppm)	1-hour (ppm)	8-hour (ppm)
Aurora Avenue N / N 185th Street						
Existing Year (2005)	10.6	8.3	-	-	35	9
Build Year (2013)	8.2	6.6	8.0	6.5	35	9
Horizon Year (2030)	7.3	6.0	7.0	5.8	35	9
Aurora Avenue N / N 175th Street						
Existing Year (2005)	11.06	8.6	-	-	35	9
Build Year (2013)	8.3	6.7	8.6	6.9	35	9
Horizon Year (2030)	7.1	5.9	7.1	5.9	35	9

Mobile Source Air Toxics

The federal Clean Air Act identified 188 air toxics, also known as hazardous air pollutants. 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). The EPA has assessed this expansive list of 188 air toxics and identified a group of 21 as mobile source air toxics (MSATs), which are set forth in an EPA final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235).

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 also identified six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene.

The EPA has issued a number of regulations that will dramatically decrease MSATs by mandating the use of cleaner fuels and cleaner engines. The MSAT regulations were issued under the authority in Section 202 of the Clean Air Act. In its regulations, EPA examined the impacts of existing and newly promulgated mobile source control programs, including the reformulated gasoline program, national low emission vehicle standards, Tier 2 motor vehicle emissions standards and gasoline sulfur control requirements, and proposed heavy duty engine and vehicle standards, and on-highway diesel fuel sulfur control requirements. According to a Federal Highway Administration (FHWA) analysis, even if vehicle miles traveled (VMTs) increase by 64%, reductions of 57% to 87% in MSATs are projected from 2000 to 2020 (FHWA 2006).

For each Build Alternative, the MSATs emissions would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each Build Alternative. According to the Project's traffic analysis (CH2M Hill 2007) the future VMT will be higher than existing levels, and the future VMT would be nearly identical for each Build Alternative. However, the magnitude of the EPA-projected MSAT emissions reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future in nearly all cases.

The additional travel lanes proposed as part of the Build Alternatives would have the effect of moving some traffic closer to nearby homes and businesses; therefore, there may be localized areas where ambient concentrations of MSATs could be higher under certain Build Alternatives than under the No Build Alternative. However, the magnitude and the duration of these potential increases compared to the No Build Alternative cannot be accurately quantified due to the inherent mathematical and validation deficiencies of current emission models. In sum, when a highway is widened and, as a result, moves closer to receptors, the localized level of MSAT emissions for the Build Alternative could be higher relative to the No Build Alternative, but this could be offset due to increases in speeds and reductions in congestion (which are associated with lower MSAT emissions). However, on a regional basis, EPA's vehicle and fuel regulations, coupled with ongoing future fleet turnover, will over time cause substantial reductions that, in almost all cases, will cause region-wide MSAT levels to be significantly lower than today.

How would Project construction temporarily affect air quality?

Project construction would be done in accordance with PSCAA regulations for fugitive dust and stationary sources, so construction would not cause any air quality impacts. Information on each construction element is provided below.

Fugitive Dust and Particulates

Construction of the Project would generate temporary emissions of fugitive dust and tailpipe emissions from construction equipment. Fugitive dust emissions would be generated mainly by wind blowing across exposed soil surfaces during grading operations, and by movement of construction equipment over unpaved areas. Another potential source of fugitive dust would be trackout of mud onto public roads during construction.

Fugitive dust emissions during construction would be temporary and localized. PSCAA regulations (PSCAA Rule 1, Section 9.15) require all construction operations to employ Best Available Control Technology (BACT) to minimize fugitive dust emissions, and to prevent mud trackout onto public roads.

Odors

Asphalt installation and paint striping operations will emit small amounts of odor-causing compounds. Odor impacts will be temporary and limited to the immediate vicinity of the construction site.

Tailpipe Emissions from Construction Equipment

Mobile construction equipment and portable stationary engines would emit air pollutants, including NO_X, CO, and PM10. All non-road diesel-powered construction equipment must comply with EPA's nationwide emission regulations. These emissions would be temporary and localized. It is highly unlikely that the temporary emissions would cause ambient concentrations to approach NAAQS limits within the study area.

Emissions from Temporary Portable Stationary Sources

Temporary portable stationary sources, such as an asphalt batch plant or a concrete batch plant, would emit small amounts of particulates, VOCs from asphalt processing, and combustion emissions (VOC, CO, and NO_X). All stationary construction equipment would require an operating permit from PSCAA and would be required to use BACT to minimize emissions.

Construction Emission Controls

Typical mitigation measures to minimize air quality and odor issues caused by fugitive dust and tailpipe emissions include the following:

- require all City construction crews and contractors to comply with PSCAA regulations (PSCAA Rule 1, Section 9.15) for fugitive dust control and soil trackout during construction,
- maintain the engines of construction equipment according to manufacturers' specifications,
- minimize equipment idling while the equipment is not in use, and
- install BACT emission controls on any temporary portable stationary construction equipment.

Does the project conform to air quality standards?

The proposed project satisfies the requirements under Transportation Conformity for the following reasons.

- The Project is within the maintenance area for CO. The Project is included in a conforming TIP (May 22, 2006) that has been reviewed and approved by WSDOT, Ecology, and PSRC. PSRC prepared a regional Transportation Conformity analysis for the TIP (PSRC 2006). The regional emissions from all roadways described in the TIP are less than the allowable emission budgets specified by Ecology.
- Predictive modeling of CO concentrations at the signalized intersections in the study area show the Project would not cause CO concentrations to exceed the NAAQS limits and would not significantly increase CO concentrations compared to the No Build Alternative.

How would the potential effects of the project differ by alternative?

No potential effects are anticipated for the Build and No Build Alternatives.

Measures Taken to Avoid or Minimize Project Effects

What mitigation measures are proposed to avoid and/or minimize impacts on air quality?

Based on the analysis, the project satisfies Transportation Conformity, and no CO mitigations are recommended.

Emissions during construction will be controlled using BACT and stationary-source emission controls as required by PSCAA regulations. Air quality impacts during construction will be minor, temporary, and localized, so no mitigations beyond standard BACT are warranted.

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