Seattle Department of Transportation

23rd Avenue Corridor Project
Seattle, Washington

SEPA Checklist

May 23, 2014

STATE ENVIRONMENTAL POLICY ACT (SEPA) ENVIRONMENTAL CHECKLIST

A. BACKGROUND

1. Name of proposed project, if applicable:

23rd Avenue Corridor Project

2. Name of applicant:

City of Seattle Department of Transportation (SDOT)

3. Address and phone number of applicant and contact person:

Contact: Kit Loo
Phone: (206) 386-3669
Address: Seattle Department of Transportation
P.O. Box 34996
Seattle, WA 98124-4996

4. Date checklist prepared:

May 23, 2014

5. Agency requesting checklist:

SDOT

6. Proposed timing or schedule (including phasing, if applicable):

The project will be constructed in three phases. Phase 1 will begin construction in November 2014, with anticipated completion in July 2016. Construction of phases 2 and 3 is anticipated to begin in fall 2015, with anticipated completion in summer 2017.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, the Central Area Neighborhood Greenway project is related to the 23rd Avenue Corridor project. The 23rd Avenue Corridor lacked sufficient right-of-way to include a protected bike lane, so SDOT determined that it will install bike facilities on adjacent streets to accommodate cyclists in the project area. The greenway will be phased in a similar manner to the 23rd Avenue Corridor project. SDOT anticipates that Phase 1 of the greenway will be constructed prior to Phase 1 of the 23rd Avenue Corridor project, followed by phases 2 and 3. Because the Greenway will be constructed on separate facilities and at different times and is a project with independent utility, it will undergo a separate environmental evaluation.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

- *23rd Avenue Corridor Improvement Project Air Quality Report*, May 2014, prepared by HNTB Corporation, 600 108th Ave NE, Suite 900, Bellevue, WA 98004

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

No, there are no known applications pending for government approvals of other proposals directly affecting the property covered by this proposal.

10. List any government approvals or permits that will be needed for your proposal, if known.

- National Environmental Policy Act (NEPA) Approval for Phase 1 (E John Street to S Jackson Street)
- National Pollution Discharge Elimination System (NPDES) Construction Stormwater General Permit
- City of Seattle Parks and Recreation Revocable Use Permit
- City of Seattle Department of Planning and Development (DPD) Noise Variance

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

23rd Avenue is a principal arterial that connects a variety of users to business, educational institutions, and residences in the Central District and beyond. This area serves high volumes of vehicles, pedestrians, cyclists, and transit users (approximately 5,800 daily transit riders—the eighth highest ridership in King County). Currently, the roadway is in poor condition with hundreds of patches where potholes existed, narrow lanes, and no turn lanes. In addition, the roadway is bordered in many places by constricted and uneven sidewalks.

The project limits are from E Roanoke Street in the north to Rainier Avenue S to the south. The project will be constructed in three phases. Phase 1 includes the portion of 23rd Avenue from E John Street to S Jackson Street, Phase 2 is the portion of 23rd Avenue from S Jackson Street to Rainier Avenue S, and Phase 3 is 23rd Avenue from E John Street to E Ward Street, Turner Way E from E Ward Street to E Helen Street, and 24th Ave from E Helen Street to E Roanoke Street.

Project components include new pavement, re-channelization, pedestrian improvements, lighting improvements, additional electronic trolley bus infrastructure for Metro Route 48, new bus stop facilities, traffic signal upgrades, and public art. To balance the need of users in the area, SDOT proposes to reconfigure 23rd Avenue between E John Street and S Norman Street (phases 1 and 2) from the current four lanes (two lanes in each direction) to three lanes (one lane in each direction and a center turn lane). The roadway will remain in the four-lane

configuration at key intersections in phases 1 and 2, as well as from S Norman Street to Rainier Avenue S, and between E Roanoke Street and E John Street (Phase 3).

In addition to these roadway improvements, Seattle Public Utilities (SPU) proposes to replace a municipal drinking water main that is located under 23rd Avenue between E John Street and S Jackson Street. The main varies in diameter from 6 inches to 8 inches, which is substandard for all existing zoning and land uses adjacent to 23rd Avenue. The existing main will be replaced by a 12-inch main to support redevelopment and densification in the project area.

In addition to replacing the main, SPU proposes to replace the perpendicular connecting mains under six major signalized intersections (E John, E Madison/E Denny, E Union, E Cherry, E Yesler and S Jackson streets) and under three small signalized intersections (Alder, Terrace, and E Olive streets). SPU will also replace the connecting water main pipe in the perpendicular streets at these intersections, move or add valve locations at the four corners of the intersections so that low-impact water main shutdowns can be conducted in the future, and move all existing services and hydrants outside of the intersections. New valves will be added to reduce the size of the high-impact shutdown block at S Jackson Street and 23rd Avenue S. Finally, SPU will also replace the existing 6-inch pipe with new 8-inch pipe along 23rd Avenue S between E John and E Madison. This pipe has a leak history and has several larger services that serve multifamily development.

All new pipe will be placed on specified, compacted bedding or backfill material. Existing water services will then be connected to the new pipe. All existing mains will be cut, capped, and abandoned in place. Temporary water services are not anticipated. By coordinating SPU's drinking water system improvements with SDOT's roadway improvements, the City is able to:

- minimize lifecycle costs associated with those drinking water system improvements;
- lower construction impacts to the surrounding community and traffic on a major arterial; and
- reduce future water main failures on a heavily traveled major arterial through a lower income diverse neighborhood.

This work will be constructed concurrently with SDOT's 23rd Ave Corridor improvements; therefore, it is included in this SEPA evaluation.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Project improvements will be implemented within the 23rd/24th Avenue right-of-way from its intersection with Rainier Avenue S to its intersection with E Roanoke Street, a length of approximately 4 miles. The project is located within sections 4 and 9 of Township 24, Range 04E, and sections 21, 28, and 33 of Township 25, Range 04E. The project is located in east Seattle, through the Montlake, Stevens, Mann, Minor, and Atlantic neighborhoods.

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: *[Check the applicable boxes]*

☒ Flat ☒ Rolling ☒ Hilly ☒ Steep Slopes ☐ Mountainous
☐ Other: (identify)

The project traverses four miles of east Seattle, and the terrain varies, but is generally from flat to hilly, with some areas of steep slopes (see item B.1.b).

b. What is the steepest slope on the site (approximate percent slope)?

The corridor right-of-way crosses several steep slope Environmentally Critical Areas (ECA) (slope of 40% or greater). These intersect the corridor between its intersection with E Galer Street and E Helen Street, and between its intersection with S Judkins Street and S Massachusetts Street.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The project area is almost entirely covered by impervious surfaces. There are no agricultural soils located on the site.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Yes, the project crosses a potential slide ECA from 24th Avenue and its intersection with E Lee Street to south of its intersection with E Highland Drive (a distance of approximately 500 feet). The corridor also crosses a liquefaction-prone ECA from south of S Holgate Street to Rainier Avenue S (a distance of approximately 520 feet).

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate the source of fill.

In areas where the concrete base is being repaired, the project will require approximately 6 to 12 inches of excavation and fill to accommodate the increased thickness of the new paving section. Areas where drainage features will be installed will require excavations of up to 12 feet in depth.

Replacement of SPU's water main and perpendicular connecting mains will require excavations up to 6 feet in depth. All new pipes installed will be placed on specified, compacted bedding or backfill material.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Disturbed areas of the project site could be susceptible to erosion during pavement and concrete removal operations. Construction will be phased, limiting the area of exposed soil. Appropriate best management practices (BMPs) will be implemented to ensure that erosion is minimized.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

The project site is a paved road and is almost entirely composed of impervious surface. Planned landscaping improvements will result in a slight decrease in the amount of impervious surface in the project area once the project is constructed.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

BMPs will be implemented to contain loose material during construction, in accordance with the City's Standard Specifications for Road, Bridge, and Municipal Construction, along with the Seattle Stormwater Code.

The contractor will be required to submit a Stormwater Pollution Prevention Plan (SWPPP), and comply with the Washington Department of Ecology National Pollutant Discharge Elimination System (NPDES) Construction Stormwater General Permit.

All refueling of construction vehicles will be conducted according to a Spill Prevention Plan to be developed by the contractor.

2. Air

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Construction:
The typical sources of emissions during construction of transportation projects include:

- Fugitive dust generated during the excavation, grading, and other construction activities;
- Engine exhaust emissions from construction vehicles, work vehicles, and construction equipment;
- Increased motor vehicle emissions associated with increased traffic congestions during construction; and
- Volatile organic and odorous compounds emitted during asphalt paving.

The total emissions and timing of the emissions from these sources will vary depending on the phasing of the project and construction methods.

The project is estimated to result in approximately 35,580 metric tons of carbon dioxide equivalent (MTCO2e), which accounts for the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

This estimate was calculated using a conservative emissions factor of 50 MTCO2 per 1,000 square feet of new pavement (711,611 square feet), developed by King County from an analysis of several different life cycle assessments of the environmental impacts of roads. It is important to note that these studies estimated the embodied emissions for streets. Paving that includes sidewalks will likely use less cement and hence have lower embodied emissions.

After Construction:
While it is expected that the project will increase waiting times at some intersections during peak hours, it is unlikely to result in a significant increase in vehicle emissions.

According to the VISSIM study (a multi-modal traffic flow simulation) that was prepared for the corridor, travel times for the completed project for general purpose traffic will remain approximately the same for the entire corridor, while travel times for buses will decrease. Wait times at intersections may increase slightly, which will potentially increase idling times, which could cause increased vehicle emissions, particularly during peak traffic times. This is not expected to be a significant contribution to regional air quality.

An Air Quality Report evaluated emissions at intersections along the 23rd Avenue Corridor. Intersections were ranked by level of service (LOS) to identify those with an LOS of D or worse. Since only the intersections of 23rd Avenue & John Street and 23rd Avenue & Jackson Street are projected to have LOS of E and D, respectively, these two intersections were included in the analysis. The intersection of 23rd Avenue & Madison Street was also included in the analysis, due to the proximity with the 23rd Avenue & John Street intersection. Traffic and emissions for the existing (2012) condition and the anticipated first year of operation (2015) for the Build alternative were modeled. Based on the air quality analysis completed for the proposed improvements, this project has met requirements for project level transportation conformity for CO and will not contribute to any violation of the National Ambient Air Quality Standards (NAAQS) or result in any increase in Mobile Source Air Toxics (MSAT) emissions.

Please see the attached *23rd Avenue Corridor Improvement Project Air Quality Report*, May 2014, for more detail.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

There are no off-site sources of emissions or odor that may affect the proposed project.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

During construction, impacts to air quality will be reduced and controlled through implementation of standard federal, state, and local emission control criteria, in accordance with the City's Standard Specifications for Road, Bridge, and Municipal

Construction. The City's Standard Specifications require that contractors maintain air quality to comply with the National Emission Standards for Hazardous Air Pollutants and NAAQS.

Reducing air quality impacts during construction could involve such measures as spraying areas of exposed soil with water for dust control, periodically cleaning streets in the construction zone, and minimizing vehicle and equipment idling to limit exhaust emissions.

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

There are no surface waterbodies on or in the immediate vicinity of the site.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

The project does not require work over, in, or adjacent to any waters or wetlands.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

The project will not require fill or dredge material be placed in or removed from surface waters or wetlands.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

The project will not require surface water withdrawals or diversions.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

According the Federal Emergency Management Agency FEMA National Flood Insurance Program (NFIP) Flood Insurance Rate Map (FIRM) King County, Washington and Incorporated Areas Map, Map Number 53033CIND1B (Preliminary as of February 1, 2013), the project area is located entirely within Other Areas, Zone X, which has been determined to be outside the 0.2% annual chance floodplain. A small portion of a flood prone ECA is located in the 23rd Avenue Corridor at E James Street. This is due to this area being relatively low in elevation compared to the surrounding area, rather than being in the vicinity of a stream or other waterbody.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No, the project does not involve the discharge of waste materials to surface waters.

b. Ground:

1) Will ground water be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

The project does not involve withdrawal of or discharges to groundwater.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

The proposed project will not discharge waste materials into the ground.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

The project area consists mainly of paved impervious surface. The project's drainage basins were delineated by reviewing available City GIS data. North of E Cherry Street, stormwater and other runoff are conveyed to a wastewater treatment facility via the City of Seattle sewage system and King County's main sewer line. South of E Cherry Street, stormwater runoff is conveyed to the Duwamish Waterway via the City of Seattle storm sewer system.

2) Could waste materials enter ground or surface waters? If so, generally describe.

During construction, there is a small potential that waste materials (e.g. oil and grease) from construction equipment could enter runoff from the site and could enter groundwater if soils are exposed where existing paving has been removed. However, only minimal patches of soils are likely to be exposed during this project and BMPs will be implemented to ensure that waste materials do not enter ground or surface waters. Concrete cutting will result in a slurry mixture that is vacuumed up as part of normal BMPs. A spill of this slurry will adversely affect the pH of the stormwater or groundwater. Waste materials will not enter ground or surface waters after the project is complete.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.

The project will not alter drainage patterns in the vicinity of the site.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

During project construction, BMPs will be implemented to control stormwater and water materials running off onto and from the site in accordance with the City's Standard Specifications for Road, Bridge, and Municipal Construction and the Seattle Stormwater Code. The contractor will be required to submit and follow a SWPPP, a Construction Stormwater and Erosion Control Plan, and comply with the NPDES Construction Stormwater General Permit.

The project is designed to meet the current City of Seattle Drainage Code, which will include new green stormwater infrastructure for flow control and treatment.

4. Plants

a. Types of vegetation found on the site: *[Check the applicable boxes]*

☒ Deciduous trees: ☐ Alder ☐ Maple ☐ Aspen ☐ Other: (identify)
☒ Evergreen trees: ☐ Fir ☐ Cedar ☐ Pine ☐ Other: (identify)
☒ Shrubs
☒ Grass
☐ Pasture
☐ Crop or grain
☐ Orchards, vineyards, or other permanent crops
☐ Wet soil plants: ☐ Cattail ☐ Buttercup ☐ Bulrush ☐ Skunk cabbage
☐ Other: (identify)
☐ Water plants**:** ☐ water lily ☐ eelgrass ☐ milfoil ☐ Other: (identify)
☐ Other types of vegetation: (identify*)*

b. What kind and amount of vegetation will be removed or altered?

Street trees in the project area will be either removed and replaced following construction, or left in place. There will be no net loss of street trees following project construction.

c. List threatened or endangered species known to be on or near the site.

There are no threatened or endangered plants known to be on or near the project site. The project site is in an urban environment, and the vegetation is landscaped.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

A Tree, Vegetation, and Soil Protection Plan will be prepared prior to project construction. Overall the project will result in an increase in the number of trees and the amount of planting strips in the project area.

e. List all noxious weeds and invasive species known to be on or near the site.

The project site is the 23rd Avenue Corridor right-of-way, and all vegetation in the project area is landscaped. No noxious weeds are known to occur in the project area.

5. Animals

a. Birds and animals which have been observed on or near the site or are known to be on or near the site: *[Check the applicable boxes]*

Birds: ☐ Hawk ☐ Heron ☐ Eagle ☒ Songbirds
☒ Other: Crows, pigeons, doves, starlings, robins, gulls, and house sparrows are common urban species that could occur in the project area.

Mammals: ☐ Deer ☐ Bear ☐ Elk ☐ Beaver
☒ Other: Rodents, including mice, rats, and squirrels, and raccoons are common urban species that could occur in the project area.

Fish: ☐ Bass ☐ Salmon ☐ Trout ☐ Herring
☐ Shellfish ☐ Other: (identify)

b. List any threatened or endangered species known to be on or near the site.

The project area (consisting of a paved road in a highly-developed urban setting) provides very little habitat. As a result, listed threatened and endangered wildlife species are not known to occur in the project area. There are no surface water bodies on site and thus no threatened or endangered aquatic species in the project area.

c. Is the site part of a migration route? If so, explain.

The project site is located within the North American Pacific Flyway, a migratory route for birds. However, the project site is in an urban environment and is unlikely to impact migratory bird species.

d. Proposed measures to preserve or enhance wildlife, if any:

The project is not anticipated to affect wildlife and therefore, the project will not include measures to preserve or enhance wildlife.

e. List any invasive animal species known to be on or near the site.

While several of the urban-dwelling animal species that may be found in the project area are introduced, non-native species, the proposed project is not expected to have any impacts to any animal species.

6. Energy and natural resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

The completed project will not require any supplementary energy to operate. Electricity will be required to continue operation of the street lighting and traffic signals located along the roadway, but this will not represent a change from current conditions.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

The project does not involve building structures or planting vegetation that will block access to the sun for adjacent properties.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

No energy conservation features are included in the plans. The proposed project is not expected to result in energy impacts.

7. Environmental health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

Potentially hazardous materials likely to be present during construction include gasoline and diesel fuels, hydraulic fluids, oils, lubricants, solvents, paints, and other chemical products. A spill of one of these substances could occur during construction as a result of either equipment failure or worker error.

The project may require the removal of creosote-treated railroad ties associated with an old street car line located under the existing pavement. Project specifications will be followed in the removal and disposal of any creosote-treated wood uncovered during project excavations.

Contaminated soils, sediments or groundwater could also be exposed during removal of existing paving. If disturbed, contaminated substances could be exposed to construction workers and potentially other individuals in the vicinity through blowing dust, stormwater runoff, or vapors.

1) Describe any known or possible contamination at the site from present or past uses.

A review of the City of Seattle's GIS and Washington Department of Ecology's Facility/Site Database revealed three sites of potential concern along the project corridor. These sites are Mobil Station 99MPB, 2200 24th Ave E; the Coleman Building, 2203 E Union Street; and the ARCO 5445 Site, 665 23rd Avenue. Excavation activities adjacent to the Coleman Building site will be between 30-40 inches for installation of pipe, and about 12-18 inches for sidewalk. Excavation near the ARCO 5445 site will range from 12-18 inches for sidewalks and repaving.

Communication with the Washington Department of Ecology revealed that the Coleman Building has received a No Further Action determination, and the ARCO 5445 and Mobil Station 99MPB sites are in the process of cleanup. Excavations in the vicinity of the ARCO site will take place on the opposite side of the street from the contamination, and, based on depth and location of excavation, and groundwater depth and gradient, SDOT does not expect to encounter contaminated soil and/or groundwater. Project specifications will be followed in the event that unanticipated contaminated materials are encountered.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.

There are no known existing hazardous chemicals or conditions that might affect project development and design. There are no known underground hazardous liquid or gas transmission pipelines located within the project area.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.

Potentially hazardous materials likely to be present during construction include gasoline and diesel fuels, hydraulic fluids, oils, lubricants, solvents, paints, and other chemical products.

4) Describe special emergency services that might be required.

Special emergency fire or medic services will not be required for the proposed project.

5) Proposed measures to reduce or control environmental health hazards, if any:

A Health and Safety Plan will be submitted by the construction contractor before work commences. This plan will provide information on any toxic substances that may be associated with the project and outline safe procedures for handling any of these substances.

A Spill Plan will be developed to control spills on site. Any contaminated materials that are encountered during construction will be contained and disposed of in a manner consistent with the level of contamination, in accordance with federal, state and local regulatory requirements, by a qualified contractor(s) and/or City staff.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

There are no sources of noise that will affect the project.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Noise levels in the vicinity of construction will temporarily increase during construction activities. Noise levels within 50 feet of construction equipment may exceed 90 dB for short periods of time. However, short-term noise from construction equipment will be limited to the allowable maximum levels specified in the City of Seattle's Noise Control Ordinance (SMC 25.08.425 – Construction and equipment operations).

Noise from construction equipment will occur between the hours of 7 am and 10 pm weekdays, and 9 am to 10 pm on the weekends during construction. If there is a need for work outside these times to minimize traffic impacts, the project will request a noise variance permit to allow some construction work at night.

After completion of the project, occasional noise from equipment used for on-going routine maintenance and repair will occur, but will be limited to 7 am to 10 pm weekdays and 9 am to 10 pm weekends.

3) Proposed measures to reduce or control noise impacts, if any:

SMC 25.08.425, which prescribes limits to noise and construction activities, will be fully enforced while the project is under construction.

The following measures could be used to minimize noise impacts during construction:

- Whenever possible, operation of heavy equipment and other noisy activities will be limited to non-sleeping hours.
- Effective mufflers will be installed and maintained on equipment.
- Equipment and vehicle staging areas will be located as far from residential areas as possible.
- Idling of power equipment will be minimized.

8. Land and shoreline use

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The site itself is the paved extent of the existing roadway, and the adjacent sidewalks and planting strips. This corridor is primarily used by public transit, vehicles, bicycles, and freight. Pedestrians use the sidewalks adjacent to the roadway. Adjacent properties support various retail, restaurant institutional, park, and business uses, as well as residential areas. Twelve King County Metro bus routes (see 14.b. for listed bus routes) have stops within the project area.

The project consists of modifications to an existing road, and is not expected to affect land uses on nearby or adjacent properties.

b. Has the site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or non-forest use?

The site has not been used as working farmlands or working forest lands. The project area is road right-of-way in a developed urban area.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how?

No, the project consists of modifications to an existing road in an urban environment.

c. Describe any structures on the site.

The project area consists of roadway used primarily for vehicular traffic. Sidewalks exist throughout the project area. Numerous residential and commercial structures are located adjacent to the project site, and structures along the corridor include utility poles with street lights and signal systems, and underground structures for drainage, electric, water, and other utilities.

d. Will any structures be demolished? If so, what?

The project does not require the demolition of any structures.

e. What is the current zoning classification of the site?

The 23rd Avenue Corridor project area is typically zoned as either commercial or residential. Zoning is as follows, from north to south:

- Small section of Major Institution Overlay (MIO) District on the west side of 24th from E Roanoke Street to E Montlake Place E;
- Single Family and Residential Small Lot from E Roanoke Street to E McGraw Street;
- Neighborhood Commercial from E McGraw Street to E Boston Street;
- Single Family and Residential Small Lot from E Boston Street to E Thomas Street;
- MIO District from E Thomas to E Madison Street;
- Neighborhood Commercial along E Madison Street and west side of 23rd to E Olive Street;
- MIO District on east side of 23rd between E Denny Way and E Olive Street;
- Single Family and Residential Small Lot from E Olive Street to E Pike Street;
- Neighborhood Commercial from E Pike Street to E Spring Street;
- Single Family and Residential Small Lot from E Spring Street to E Cherry Street;
- Neighborhood Commercial at E Cherry Street;
- MIO District south of E Cherry Street to E Yesler Way;
- South of Yesler Way, there is an MIO west of 23rd Avenue, and a Neighborhood Commercial zone on the east of 23rd Avenue, until S Main Street;
- Neighborhood Commercial from S Main Street to S King Street;
- MIO District from S King Street to S Dearborn Street;
- MIO District south of Dearborn Street to S Charles Street;
- Single Family and Residential Small Lot from S Charles Street to S Norman Street;
- MIO District from S Norman Street to S Holgate Street; and
- Commercial from S Holgate Street to Rainier Avenue S.

The MIO Districts are regulated areas that apply generally to hospitals, universities, and colleges, and intend to allow for appropriate institutional growth while minimizing adverse impacts, and include requirements for balancing public benefit from institutions with protecting neighborhood livability, and encouraging concentration within existing campuses.

f. What is the current comprehensive plan designation of the site?

The northern part of the project corridor (north of Madison Street) is covered mostly by single family residential areas. South of E Madison Street, the project corridor is a mixture of single family residential areas with some multi-family residential areas and commercial/mixed use areas, until E Cherry Street, where the corridor is mostly covered by multi-family residential and commercial/mixed use areas.

g. If applicable, what is the current shoreline master program designation of the site?

Not applicable. The project is not located within the boundaries of the City's shoreline master program.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

Yes, there are several ECAs within the 23rd Avenue Corridor project area. A small portion of a flood-prone ECA is located in the right-of-way at E James Street, due to it being a relatively low-lying area. The project crosses a potential slide ECA from 24th Avenue and its intersection with E Lee Street to south of its intersection with E Highland Drive (a distance of approximately 500 feet). The corridor also crosses a liquefaction-prone ECA from south of S Holgate Street to Rainier Avenue S (a distance of approximately 520 feet). The corridor crosses several steep slope ECAs. These intersect the corridor between its intersection with E Galer Street and E Helen Street, and between its intersection with S Judkins Street and S Massachusetts Street.

i. Approximately how many people would reside or work in the completed project?

The project is entirely within road right-of-way and no people will reside or work within the completed project.

j. Approximately how many people would the completed project displace?

The project will involve construction within road right-of-way and will not displace any people.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable; the project will not displace any people.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

No measures are proposed because the project will not result in changes to existing or planned land uses. SDOT's Complete Streets Assessment supports the new three-lane corridor configuration of the project from E John Street to Rainier Avenue S, and the design was informed by the City of Seattle's Pedestrian Master Plan, Bicycle Master Plan, and Transit Master Plan.

m. Proposed measures to ensure that the proposal is compatible with nearby agricultural and forest lands of long-term commercial significance, if any:

Not applicable. There are no agricultural or forest lands of long-term commercial significance in the vicinity of the project.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

The project does not involve constructing any housing units.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

The project does not eliminate any housing units.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable; the project will not add or eliminate any housing units and will not have housing impacts.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

No structures will be built as part of this project.

b. What views in the immediate vicinity would be altered or obstructed?

The project will not alter or obstruct any views.

c. Proposed measures to reduce or control aesthetic impacts, if any:

As no aesthetic impacts are expected from this project, no mitigation measures for aesthetic impacts are planned.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

The completed project will not produce any light or glare not currently produced in the project area. If any construction work were to occur after daylight hours, the contractor might use portable lighting to illuminate work areas.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not applicable. Lighting conditions will remain unchanged in the project area.

c. What existing off-site sources of light or glare may affect your proposal?

There are no existing off-site sources of light or glare that will affect the project.

d. Proposed measures to reduce or control light and glare impacts, if any:

Because no impacts to light or glare will result from the proposed project, no measures to reduce or control impacts are proposed.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

There are several parks in the vicinity of the project. From north to south, these are:

- Interlaken Park is crossed by the project south of Boyer Avenue E;
- Washington Park Arboretum is located between 600-1,800 feet east of the project, stretching from the project's northern limit to E Madison Street;
- Prentis I. Frazier Park is located adjacent to the project, to the east, at E Republican Street;
- Pendleton Miller Playfield is located approximately 700 ft west of the project, on E Thomas Street;
- Homer Harris Park is located approximately 700 ft east of the project, at E Howell Street;
- Garfield Playfield is crossed by the project at E Jefferson Street;
- Bruce Street Minipark is located approximately 700 ft west of the project at E Fir Street;
- Dr. Blanche Lavizzo Park is located approximately 300 ft west of the project at S Jackson Street;
- Judkins Park and Playfield is adjacent to the project on the west side at S Judkins Street;
- Sam Smith Park is adjacent to the project on its east side at S Judkins Street;
- Northwest African American Museum is located at 2300 S Massachusetts Street, at the intersection of 23rd Avenue and S Massachusetts Street;
- Benvenuto Viewpoint is adjacent to the project on its west side at I-90; and
- Colman Playground is adjacent to the project on its east side at S Massachusetts Street.

b. Would the proposed project displace any existing recreational uses? If so, describe.

SDOT will acquire a 113 sq. ft. piece of property owned by Seattle Parks and Recreation Department (Parks) through a Transfer of Jurisdiction to accommodate construction of American with Disabilities Act (ADA)-compliant curb ramps at this intersection. This parcel is currently used as a parking lot, and is located at the southwest corner of 23rd Avenue and Jefferson Street. This 113 sq. ft. piece will become SDOT right-of-way. This action will not remove any parking from the lot, and will not impact access to Parks' facilities. This will result in a permanent loss of this square footage from Parks' property.

SDOT will widen an existing sidewalk onto adjacent Parks' property. This will require construction of an approximately 760 sq. ft. strip of sidewalk on Parks' property adjacent to the Garfield Community Center, on the east side of 23rd Avenue, approximately between E James Street and E Cherry Street. This land is currently a steeply-sloped grassy area with no designated use. This will result in a permanent installation of sidewalk on this Parks' property. The existing on-street parking along the east side of 23rd Avenue between E James Street and E Jefferson Street that accommodates access to Medgar Evers Pool will remain in place upon project completion.

Construction activities in the vicinity of the Garfield Complex may cause temporary impacts to access, as construction will require the temporary closure of 23rd Avenue, and detours. Duration of construction and implementation of the detour in the area of this 4(f) resource will last approximately 3 weeks. Duration of construction of the entire project (from S Jackson Street to E John Street) will last from approximately November 2014 to July 2017.

SDOT has Parks' full cooperation and support on these project features, and will acquire all necessary permits and approvals to complete this work prior to project construction. These project activities are not expected to displace any recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Construction of the project may cause temporary impacts on access to parks in the project vicinity. The project features that will be constructed on Parks' property (a widened sidewalk and ADA-compliant curb ramps) will be a beneficial long-term impact that will enhance accessibility to the Garfield Complex. The project will acquire a small piece of property from Parks', and will construct a permanent facility (a widened sidewalk) on Parks' property. While the project will remove Parks-owned land, the use of that land was not recreational, and access will not be impacted.

13. Historic and cultural preservation

a. **Are there any buildings, structures, or sites located on or near the project site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe.**

Three sites listed on the National Register of Historic Places are located adjacent to 23rd Avenue within the project limits. These are Colman Elementary School (2300 Massachusetts Street), the Dr. Prevost Houses (the Yesler Houses, 103, 107, and 109 23rd Avenue), and the Row Houses on 23rd Avenue (806-828 23rd Avenue).

Numerous properties aged 45 years and older are also located adjacent to 23rd Avenue. These structures have not necessarily been evaluated to determine their historic character.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

There are no landmarks, features, or other evidence of Indian or historic use or occupation of the project site. There is no material evidence, artifacts, or areas of cultural importance on or near the site.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the Department of Archaeology and Historic Preservation, archaeological surveys, historic maps, GIS data, etc.

During project planning, SDOT sent a map and description of the project to the Washington State Department of Archeological and Historic Preservation (DAHP) for its opinion on the likelihood of the project adversely affecting historic, archeological or cultural resources. DAHP recommended that SDOT develop a robust Inadvertent Discovery Plan (IDP), and prepare construction crews for the possibility of encountering archaeological materials during ground disturbing activities. Additionally, DAHP was concerned that project excavations will encounter remnants of an old streetcar line, which exists under the pavement of 23rd Avenue.

DAHP's Washington Information Systems for Architectural and Archaeological Records Data (WISAARD) online database was reviewed to determine the presence of any NRHP-listed or eligible properties (including heritage barns and register districts) and historic aged properties in the project area. The City of Seattle's online list of landmarks and nominations was consulted to determine if any current or nominated city landmarks are located within the project area. Field reconnaissance was performed to determine if any landmarks, markers, or cemeteries were present in the project area.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance of resources. Please include plans for the above and any permits that may be required.

SDOT will implement a robust IDP as part of construction activities. Because of concerns regarding the streetcar line, prior to ground-disturbing activities, SDOT will provide a memo to DAHP detailing the historic background of the streetcar line for DAHP's review and comment. An archaeological monitor will be present during any ground-disturbing work. A professional archaeologist will observe, document, and provide DAHP with a written report of any remnants of the streetcar line or other historical-period features identified during the monitoring effort.

14. Transportation

a. Identify public streets and highways serving the site or affected geographic area, and describe proposed access to the existing street system. Show on site plans, if any.

The project includes 23rd/24th Avenue from its intersection with E Roanoke Street in the north to Rainier Avenue S in the south. The project is approximately 4 miles in length, and crosses numerous streets. A traffic control plan will be prepared so that accessibility is maintained during project construction.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

The project area is served by public transit. King County Metro buses that serve the 23rd Avenue Corridor are as follows:

- **Metro Transit Route 3** - North Queen Anne Hill to Downtown Seattle to Madrona – stops on 23rd Avenue from E Cherry Street to S Dearborn Street, and at Rainier Avenue S.
- **Metro Transit Route 4** - East Queen Anne Hill to Downtown Seattle to Judkins Park – stops on 23rd Avenue from E Cherry Street to S Dearborn Street, and at Rainier Avenue S.
- **Metro Transit Route 8** - Seattle Center to Capitol Hill to Rainier Beach – stops on 23rd Avenue at E Yesler Way and at S Jackson Street.
- **Metro Transit Route 14** - Mount Baker to Downtown Seattle – stops on 23rd Avenue at S Jackson Street.
- **Metro Transit Route 27** - Colman Park to Downtown Seattle – stops on 23rd Avenue at E Yesler Way.
- **Metro Transit Route 43** - University District to Montlake to Capitol Hill to Downtown Seattle – stops on 23rd/24th Avenue from SR 520 to E Thomas Street.
- **Metro Transit Route 48** - Mount Baker to University District to Loyal Heights – stops on 23rd/24th Avenue from E Montlake Place to Rainier Avenue S.
- **Metro Transit Route 84** - Downtown Seattle to Madison Park to Madrona – stops on 23rd Avenue at E Madison Street.
- **Metro Transit Route 980** - Madison Valley to Lakeside – stops on 23rd/24th Avenue at Boyer Avenue E, E Aloha Street, and E Republican Street.
- **Metro Transit Route 984** - Lakeside to Downtown Seattle – stops on 23rd/24th Avenue from Boyer Avenue E to E John Street.
- **Metro Transit Route 987** - Lakeside to Rainier Beach – stops on 23rd Avenue at E Yesler Way
- **Metro Transit Route 988** - Madrona to Lakeside – stops on 23rd/24th Avenue at Boyer Avenue E, E Aloha Street, and E Republican Street.

Some bus stops will be relocated to the far sides of intersections to increase transit speed and reliability throughout the project area (see item B.14.d.). Temporary and permanent relocations of bus zones will be coordinated with King County Metro.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or non-project proposal eliminate?

The project is a road improvement and does not include parking facilities. Generally, parking is either prohibited or unrestricted on the 23rd Avenue Corridor. There are also two areas of time-limited parking in the project corridor, on the east side of 24th Avenue between E Ward Street and E Helen Street, and on the east side of 23rd Avenue between E James Street and E Jefferson Street.

Street parking that is offered adjacent to Medgar Evers Pool and the Garfield Playfield will remain in place once the project is completed.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

This project consists of improvements to an existing public street. The proposed project will not require new roads or streets. Existing driveways adjacent to the 23rd Avenue Corridor will be reconstructed to connect to the roadway, where necessary.

The proposed project will re-channelize 23rd Avenue from E Madison Street to S Norman Street, and will change the road from a four-lane configuration (two lanes in each direction) to a three-lane configuration (one lane in each direction with a continuous center turn lane). 23rd Avenue north of E Madison Street, including the intersection, will remain as four lanes; however the southbound right lane at the intersection will be right-turn only.

The purpose of the re-channelization is to improve transit service in the project area. The existing 23rd Avenue cross section in the project area is a narrow four-lane roadway section. At key signalized intersections, through-traffic along the inside lane is typically blocked by traffic queuing to make left hand turns to the side streets. Traffic modeling has shown that the combination of the blocked inside through-lane and split phase signals causes inefficient traffic operations in the project area. Inefficient traffic movement impacts transit time and reliability. A left-hand turn pocket is required in order to eliminate both the left turn blockage and the split phase signals at the intersections, which have the most impact for traffic flow. In order to be able to construct the left turn pockets, the roadway cross section had to change from a 4-lane cross section to a 3-lane cross section with a center left turn lane. Re-analysis of the traffic model showed that the re-channelization with the left run pockets and elimination of the split phase signals, along with re-spacing of the bus stops, and moving most of the bus stops to the far sides of intersections, reduce transit travel time along the corridor by 17%. The re-channelization has an added benefit of improving the pedestrian environment, making it safer for people to walk instead of drive.

The table below presents existing travel times for buses and general purpose traffic (GP traffic) for the existing corridor, and projected travel times for the future (2015) build condition.

23rd Avenue Project Corridor Travel Times for Buses and General Purpose Traffic

Direction	Travel Time Section	Travel Time in Minutes	
		Existing Condition	Future Build Condition
Travel Times for Buses			
NB	Rainier Ave S to S Jackson St	5.5	4.3
NB	S Jackson St to E John St	9.9	6.9
NB	E John St to E Roanoke St	7.6	6.7
NB	***Rainier Ave S to E Roanoke St***	***24.3***	***20.5***
SB	E Roanoke St to E John St	8.4	7.3
SB	S John St to S Jackson St	11.2	7.3
SB	S Jackson St to Rainier Ave S	5.6	5.0
SB	***E Roanoke St to Rainier Ave S***	***25.5***	***20.8***
Travel Times for General Purpose Traffic			
NB	Rainier Ave S to S Jackson St	2.9	3.1
NB	S Jackson St to E John St	5.1	4.9
NB	E John St to E Roanoke St	4.0	3.9
NB	***Rainier Ave S to E Roanoke St***	***13.2***	***13.1***
SB	E Roanoke St to E John St	4.6	4.9
SB	S John St to S Jackson St	5.2	5.6
SB	S Jackson St to Rainier Ave S	3.6	3.5
SB	***E Roanoke St to Rainier Ave S***	***13.5***	***14.4***

Source: 23rd Avenue Corridor Project VISSIM Results Summary

While southbound travel times for general purpose traffic along the corridor are expected to increase slightly, the corridor serves less than 25,000 vehicles per day and SDOT does not anticipate that the proposed project will significantly affect traffic within the project area.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

The project will not use or impact water, rail, or air transportation.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and non-passenger vehicles). What data or transportation models were used to make these estimates?

The number of vehicular trips and peak volumes are not expected to change as a result of the proposed project. Construction-related traffic (i.e., large trucks and materials hauling) will occur temporarily during the construction period.

g. Will the proposal interfere with, affect, or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

The project is not expected to impact the movement of any vehicles in the project area. Construction of the project may cause temporary impacts as traffic is detoured off of the road, but this will be temporary.

h. Proposed measures to reduce or control transportation impacts, if any:

The following measures will be in place to reduce or control transportation impacts:

- SDOT will work to minimize disruptions and maintain adequate access during the construction phase.
- SDOT will inform adjacent property owners of work progress.
- SDOT will conduct public outreach before and during project construction to notify residents, businesses, local agencies, transit agencies, and other stakeholders of expected disruptions or changes in traffic flow.
- Temporary road closures will be minimized, and detour routes will have proper signage.
- The construction contractor will be required to submit a traffic control plan for approval by the City. The contractor will enforce the traffic control plan during construction.
- Alternative routes for pedestrians, bicyclists, and those with disabilities will be identified and marked clearly.
- Any proposed modifications to transit stops will be clearly marked.

15. Public services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

The project will have no impact on the need for public services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Because the project will not impact public services, no measures to reduce or control impacts are proposed.

16. Utilities

a. Utilities currently available at the site, if any: *[Check the applicable boxes]*

☐ None
☒ Electricity ☒ Natural gas ☒ Water ☒ Refuse service
☒ Telephone ☒ Sanitary sewer ☐ Septic system
☒ Other: fiber optics, stormwater drainage

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

No new utilities are proposed for the project; however, SPU proposes to replace an existing water main and associated distribution pipes in Phase 1 of the 23rd Avenue Corridor project. An existing water main that varies in diameter from 6-8 inches will be replaced with a 12-inch water main, connecting water main pipes in specified intersections will be upgraded or replaced (including moving or adding valve locations at the four corners of the intersections so that low-impact water main shutdowns can be conducted in the future), and all existing services and hydrants will be moved outside of the intersections. New valves will be added to reduce the size of the high-impact shutdown block at S Jackson Street and 23rd Avenue S. SPU will also replace the existing 6-inch pipe with new 8-inch pipe along 23rd Avenue S between E John Street and E Madison Street.

At the intersections where SPU will replace connecting mains (see item A.11.), the amount of drinking water distribution infrastructure in these intersections increases the likelihood that damage could occur during roadway construction. Damage to infrastructure at these intersections could cause a future drinking water infrastructure failure and water main shutdown. Should a water main failure occur at these intersections, these high traffic volume intersections will become significant choke-points for traffic flow. Most of these intersections have commercial zoning and therefore a water main failure will have greater impacts to customers, commerce, and the community.

C. SIGNATURE

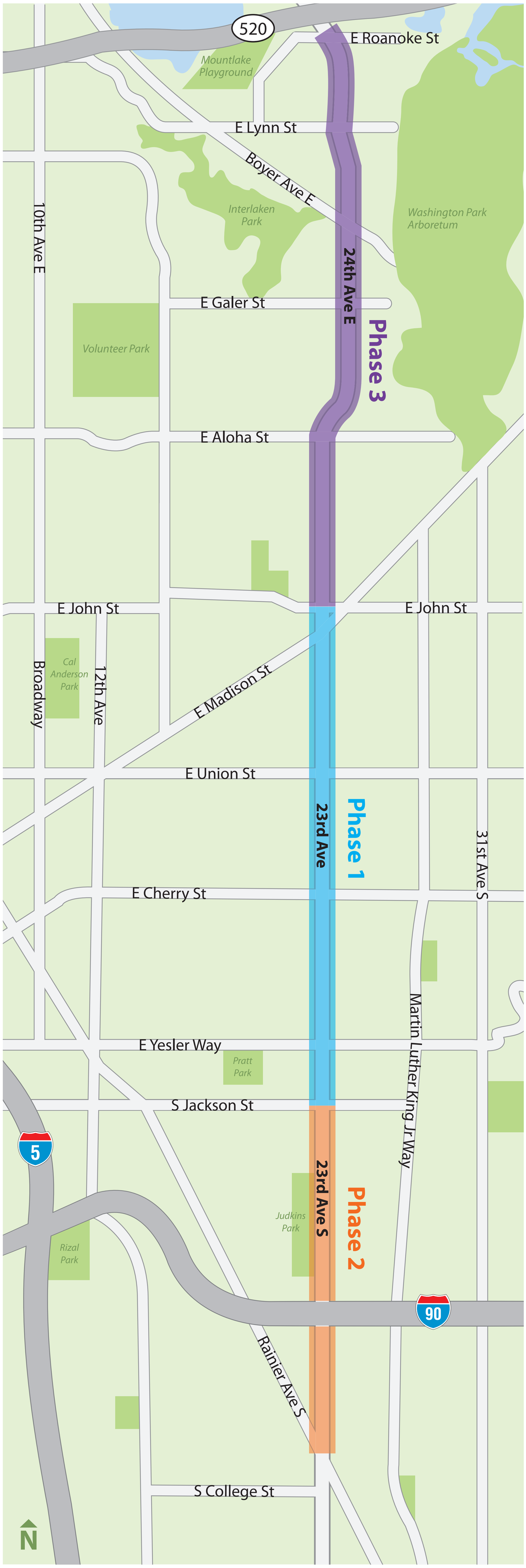
The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....
Kit Loo, Project Manager

Date Submitted: 5/23/14

Prepared by: .....
Jill Macik, Associate Environmental Analyst

23rd Avenue Corridor Improvements Project



SDOT
Seattle Department of Transportation

Air Quality Report

23rd Avenue Corridor Improvement Project

Seattle, Washington

June 2014

Prepared for:
Perteet Inc.
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EXECUTIVE SUMMARY

This report evaluates the potential air quality impacts of the proposed 23rd Avenue Corridor Improvement Project. It was prepared in compliance with the Clean Air Act (CAA) and its amendments, related Federal regulations, Federal Highway Administration (FHWA) and Washington State Department of Transportation (WSDOT) Guidance and addresses regional and project level conformity in accordance with 40 CFR Part 93. The report presents the results of a CO-hot-spot analysis comparing the results to the National Ambient Air Quality Standards (NAAQS) along with information on Mobile Source Air Toxics (MSATs).

The 23rd Avenue corridor is a major north south arterial street on the east side of Capitol Hill in Seattle that is a major transit corridor. The project will reconstruct pavement, rechannelize segments of the roadway along the corridor, and upgrade eight signalized intersections by installing pedestrian countdown signal heads. Controller cabinets will be upgraded to meet transit signal priority (TSP) needs and accommodate intelligent transportation system (ITS) upgrades. The project also includes installation of closed circuit television, detection systems, and license plate readers for travel time information. Fiber communication will be included as needed along the corridor to relay information back to the City's Traffic Management Center. Upgrades to curb ramps, bus stops, repairs to sidewalks and lighting improvements are also included.

The 23rd Avenue Corridor Improvement Project is located within the Puget Sound Air Quality Control Region (AQCR #229). This AQCR includes King, Snohomish, Pierce and Kitsap counties. King County is currently in attainment status for 4 of the 6 criteria pollutants, lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter ($PM_{2.5}$), and sulfur dioxide (SO_2) and was re-designated from nonattainment to maintenance for carbon monoxide (CO) in 1996 and particulate matter (PM_{10}) in 2000.

Regional level transportation conformity is addressed through the approval of the TIP. The FHWA and the Federal Transit Administration (FTA) found that the *2013-2016 Regional Transportation Improvement Program* prepared by the Puget Sound Regional Council (PSRC) "conforms with the State Implementation Plan to reduce the severity and number of NAAQS violations, insuring expeditious attainment of standards." The 23rd Avenue Corridor Improvement project is identified as project number: SEA-169 in the TIP.

The results of the CO microscale air quality modeling indicate that none of the concentrations at the 36 receptors modeled exceed the 1-hour (35 ppm) NAAQS.

Ozone project level conformity is addressed through the approval of the TIP which was approved by the FHWA and FTA on November 29, 2012.

The project meets the FHWA's definition of a project with no meaningful potential MSAT effects, as this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

Based on the air quality analysis completed for the proposed improvements, this project has met the 40 CFR Part 93 requirements for project level transportation conformity for CO and will not contribute to any violation of the NAAQS or result in any increase in MSAT emissions.

Air Quality Report

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1.0 PROJECT DESCRIPTION

The 23rd Avenue corridor is a major north south arterial street on the east side of Capitol Hill in Seattle that is a major transit corridor. The project will reconstruct pavement, rechannelize segments of the roadway along the corridor, and upgrade eight signalized intersections by installing pedestrian countdown signal heads. Controller cabinets will be upgraded to meet transit signal priority (TSP) needs and accommodate intelligent transportation system (ITS) upgrades. The project also includes installation of closed circuit television, detection systems, and license plate readers for travel time information. Fiber communication will be included as needed along the corridor to relay information back to the City's Traffic Management Center. Upgrades to curb ramps, bus stops, repairs to sidewalks and lighting improvements are also included.

Figure 1 shows the location of this project.

Figure 1 - Project Location Map

2.0 PURPOSE OF THE REPORT

This report evaluates the potential air quality impacts of the proposed 23rd Avenue Improvement Project. It was prepared in compliance with the Clean Air Act (CAA) and its amendments, related Federal regulations, FHWA and WSDOT Guidance and addresses regional and project level conformity in accordance with 40 CFR Part 93. The report presents the results of a CO-hot-spot analysis for the existing condition (2012), the Build alternative (2015) and the Build alternative (2040) comparing the results to the National Ambient Air Quality Standards (NAAQS). The report also presents information on Mobile Source Air Toxics (MSATs).

3.0 AIR QUALITY – BACKGROUND INFORMATION

3.1 Criteria Pollutants

The Federal Clean Air Act of 1970 established the NAAQS (**Table 1**). These standards were established by the United States Environmental Protection Agency (EPA) to protect public health, safety, and welfare from known or anticipated effects of carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM_{10}, 10-micron in diameter and smaller along with $PM_{2.5}$, 2.5 micron in diameter and smaller) and sulfur dioxide (SO_2). EPA refers to these pollutants as the “criteria” pollutants.

TABLE 1
National Ambient Air Quality Standards (NAAQS)

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide (CO)		Primary	8 – Hour	9 ppm	Not to be exceeded more than once per year
			1 – Hour	35 ppm	
Lead (Pb)		Primary and secondary	Rolling 3-Month Average	0.15 µg/m^3 (1)	Not to be exceeded
Nitrogen Dioxide (NO_2)		Primary	1 – Hour	100 ppb 5)	98th percentile, averaged over 3 years
		Primary and secondary	Annual Mean	53 ppb (2)	Annual Mean
Ozone (O_3)		Primary and secondary	8 – Hour	0.075 ppm (3)	Annual fourth-highest daily maximum 8-hr concentration, averaged over 3 years
Particulate Pollution	Particulate Matter ($PM_{2.5}$)	Primary	Annual	12 µg/m^3	annual mean, averaged over 3 years
		Secondary	Annual	15 µg/m^3	annual mean, averaged over 3 years
		Primary and secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years
	Particulate Matter (PM_{10})	Primary and secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxides (SO_2)		Primary	1-hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

(1) Final rule signed October 15, 2008. The 1978 lead standard (1.5 µg/m3 as a quarterly average) remains in effect until one year after an area is designated for the 2008 standard, except that in areas designated nonattainment for the 1978, the 1978 standard remains in effect until implementation plans to attain or maintain the 2008 standard are approved.

(2) The official level of the annual NO2 standard is 0.053 ppm, equal to 53 ppb, which is shown here for the purpose of clearer comparison to the 1-hour standard.

(3) Final rule signed March 12, 2008. The 1997 ozone standard (0.08 ppm, annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years) and related implementation rules remain in place. In 1997, EPA revoked the 1-hour ozone standard (0.12 ppm, not to be exceeded more than once per year) in all areas, although some areas have continued obligations under that standard ("anti-backsliding"). The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is less than or equal to 1.

(4) Final rule signed June 2, 2010. The 1971 annual and 24-hour SO2 standards were revoked in that same rulemaking. However, these standards remain in effect until one year after an area is designated for the 2010 standard, except in areas designated nonattainment for the 1971 standards, where the 1971 standards remain in effect until implementation plans to attain or maintain the 2010 standard are approved.

Source: http://www.epa.gov/air/criteria.html, accessed January 27, 2014

The primary pollutants from motor vehicles are unburned hydrocarbons, NOx, CO, and particulates. Hydrocarbons (HC) and nitrogen oxides (NOx) can combine in a complex series of reactions catalyzed by sunlight to produce photochemical oxidants such as ozone and NO_2. Because these reactions take place over a period of several hours, maximum concentrations of photochemical oxidants are often found far downwind of the precursor sources. Ozone and NO_2 are regional problems.

Carbon monoxide is a colorless and odorless gas which is the product of incomplete combustion, and is the major pollutant from gasoline fueled motor vehicles. CO is a localized air quality issue.

Particulate matter includes both airborne solid particles and liquid droplets. These liquid particles come in a wide range of sizes. PM_{10} particulates are coarse particles, such as windblown dust from fields and unpaved roads. $PM_{2.5}$ particulates are fine particles generally emitted from activities such as industrial and residential combustion and from vehicle exhaust. Particulates from transportation can be a localized issue when a project is determined to be a project of air quality concern for either PM_{10} or $PM_{2.5}$ emissions in a particulate nonattainment area.

An exceedance of the NAAQS pollutant level does not necessarily constitute a violation of the standard. Some of the criteria pollutants (including CO) are allowed one exceedance of the maximum level per year, while for other pollutants criteria levels cannot be exceeded. Violation criteria for other pollutants are based on past recorded exceedances. **Table 1** lists the allowable exceedances for the EPA criteria pollutants.

3.1.1 Attainment Designation

The Clean Air Act Amendments (CAAA) of 1977 and 1990 required all states to submit to the EPA a list identifying those air quality regions, or portions thereof, which meet or exceed the NAAQS or cannot be classified because of insufficient data. Portions of air quality control regions which are shown by monitored data or air quality modeling to exceed the NAAQS for any criteria pollutant are designated “nonattainment” areas for that pollutant. The CAAA also established time schedules for the states to attain the NAAQS.

States that have nonattainment areas are required to prepare State Implementation Plans (SIP) that lay out a plan to show how the state will improve the air quality to attain the NAAQS. Both new and improvement highway projects must be contained in the area’s Transportation Improvement Program (TIP). The TIP is prepared by the Metropolitan Planning Organization (MPO). Once the MPO has completed the TIP, it is submitted to the FHWA for review and approval according to the requirements of the CAAA and related implementation regulations.

The 23rd Avenue Corridor Improvement Project is located within the Puget Sound Air Quality Control Region (AQCR #229). This AQCR includes King, Snohomish, Pierce and Kitsap counties. King County is currently in attainment status for 4 of the 6 criteria pollutants, Pb, NO_2, O_3, particulate matter ($PM_{2.5}$), and SO_2 and was re-designated from nonattainment to maintenance for CO in 1995 and particulate matter (PM_{10}) in 2000. The re-designation from nonattainment to maintenance for particulate matter (PM_{10}) in 2000 was for a specific area of in King County. The 23rd Avenue Corridor Improvement project is not within this specific area and thus, project level conformity for particulate matter (PM_{10}) is not required for this project.

4.0 REGIONAL CONFORMITY

Regional level transportation conformity is addressed through the approval of the TIP. The FHWA and the Federal Transit Administration (FTA) found that the *2013-2016 Regional Transportation Improvement Program*[1] prepared by the Puget Sound Regional Council (PSRC) "conforms with the State Implementation Plan to reduce the severity and number of NAAQS violations, insuring expeditious attainment of standards."[2] The 23rd Avenue Corridor Improvement project is identified as project number: SEA-169 in the TIP.

WSDOT approved 11 MPO TIPs for 2013-2016 on December 11, 2012. The PSRC 2013-2016 TIP was one of the 11.[3] The FHWA and Federal Transit Administration (FTA) approved the 2013-2016 STIP and found that the "2013-2016 STIP is based on a transportation planning process that substantially meets the requirements of 23 U.S.C. Sections 134 and 135, 49 U.S.C. Sections 5303-5304, and 23 CFR 450 Subparts A, B, and C."[4]

5.0 PROJECT LEVEL CONFORMITY

Project level conformity analysis evaluate whether there are air quality impacts on a smaller scale than an entire nonattainment or maintenance area. It relates a project to the NAAQS on a more localized basis. The project level analyses addresses the results of a CO hot-spot analysis for the existing condition (2012), the Build alternative (2015) and the Build alternative (2040) comparing the results to the NAAQS. The analysis also presents a discussion on ozone, and PM_{10}.

5.1 CO Hot-Spot (Microscale) Analysis

CO emissions are greatest from vehicles operating at low speeds and prior to complete engine warm-up (within approximately eight minutes of starting). Congested urban roads, therefore, tend to be the principal problem areas for CO. Because the averaging times associated with the CO standards are relatively short (1 and 8 hours), CO concentrations can be modeled using simplified "worst-case" meteorological assumptions. Modeling is also simplified considerably by the stable, non-reactive nature of CO.

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[1] *2013-2016 Regional Transportation Improvement Program:* http://www.psrc.org/transportation/tip/current/1316tip

[2] Daniel M. Mathis and R.F. Krochalis, "Air Quality Conformity Determination Puget Sound Regional Planning Council (PSRD) 2012-2016 Transportation Improvement Program (TIP)" letter addressed to Bob Drewel, November 29, 2012. In Appendix J of *2013-2016 Regional TIP* (http://www.psrc.org/assets/8606/J-_Approvals.pdf).

[3] Judy Lorenzo, "2013-2016 Metropolitan Transportation Improvement Programs (TIPs) for Approval", letter, addressed to Paula Hammond, December 7, 2012, January 7, 2013. In Appendix J of *2013-2016 Regional TIP* (http://www.psrc.org/assets/8606/J-_Approvals.pdf).

[4] Daniel M. Mathis and R.F. Krochalis, "2013-2016 Statewide Transportation Improvement Program (STIP) Federal Approval", letter, addressed to Paula Hammond, January 7, 2013. In Appendix J of *2013-2016 Regional TIP* (http://www.psrc.org/assets/8606/J-_Approvals.pdf).

5.1.1 Methodology

The CO hot-spot analysis followed the modeling guidelines presented in EPA's "Guideline for Modeling Carbon Monoxide from Roadway Intersections"[5] and EPA's "Using MOVES in Project-Level Carbon Monoxide Analyses"[6]. The EPA's MOVES2010b (MOVES) and EPA's approved CAL3QHC 2.0 (CAL3QHC)[7] computer models were used to analyze vehicular emissions and the hourly dispersion of CO at three intersections in the 23rd Avenue Corridor study area. Intersections along the 23rd Avenue Corridor were ranked by level of Service (LOS) to identify those with an LOS of D or worse. Since only the intersections of 23rd Avenue & John Street and 23rd Avenue & Jackson Street are projected to have LOS of E and D, respectively, these two intersections were included in the CO Microscale Analysis.[8] The intersection of 23rd Avenue & Madison Street was also included in the analysis, due to the proximity with the 23rd Avenue & John Street intersection. Traffic and emissions for the existing (2012) condition, the Build alternative (2015) and the Build alternative (2040) were modeled.

EPA's MOVES2010b was used to develop vehicular emission rates based on peak traffic volumes and average operating speeds from the VISSIM simulation model.[9] PSRC provided county specific input variables for MOVES.[10]

CAL3QHC is a pollutant dispersion-modeling program for predicting pollutant concentrations from motor vehicles under free-flow conditions, or in the vicinity of roadway intersections. The MOVES emission factors along with the peak traffic volumes were used to analyze the intersections. Thirty-six air quality receptors, A1 – A36, were placed 10 ft. away from the edge of pavement, at the stop line paralleling the traffic lanes and at 82 foot intervals as shown in **Figure 2** and **Figure 3**. The study area consists primarily of residential, commercial and retail uses.

[5] "Guidelines for Modeling Carbon Monoxide from Roadway Intersections", U.S. Environmental Protection Agency, EPA-454/R-92-005, November 1992.
[6] "Using MOVES in Project-Level Carbon Monoxide Analyses", U.S. Environmental Protection Agency, EPA-420-B-10-041, December 2010.
[7] "User's Guide to CAL3QHC Version 2.0: A Modeling Methodology for Predicting Pollutant Concentrations Near Roadway Intersections", U.S. Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, NC, September 1995.
[8] "Guidelines for Modeling Carbon Monoxide from Roadway Intersections", EPA-454/R-92-005, U.S. Environmental Protection Agency, November 1992, page 3-3
[9] Sherry Kim, (sjkim@hntb.com), "RE: Environmental Traffic Data", e-mail message, January 21, 2014.
[10] Rebecca Frohning (rfrohning@psrc.org), "RE: Seattle 23rd Avenue Corridor", e-mail message, January 22, 2014 and May 20, 2014.

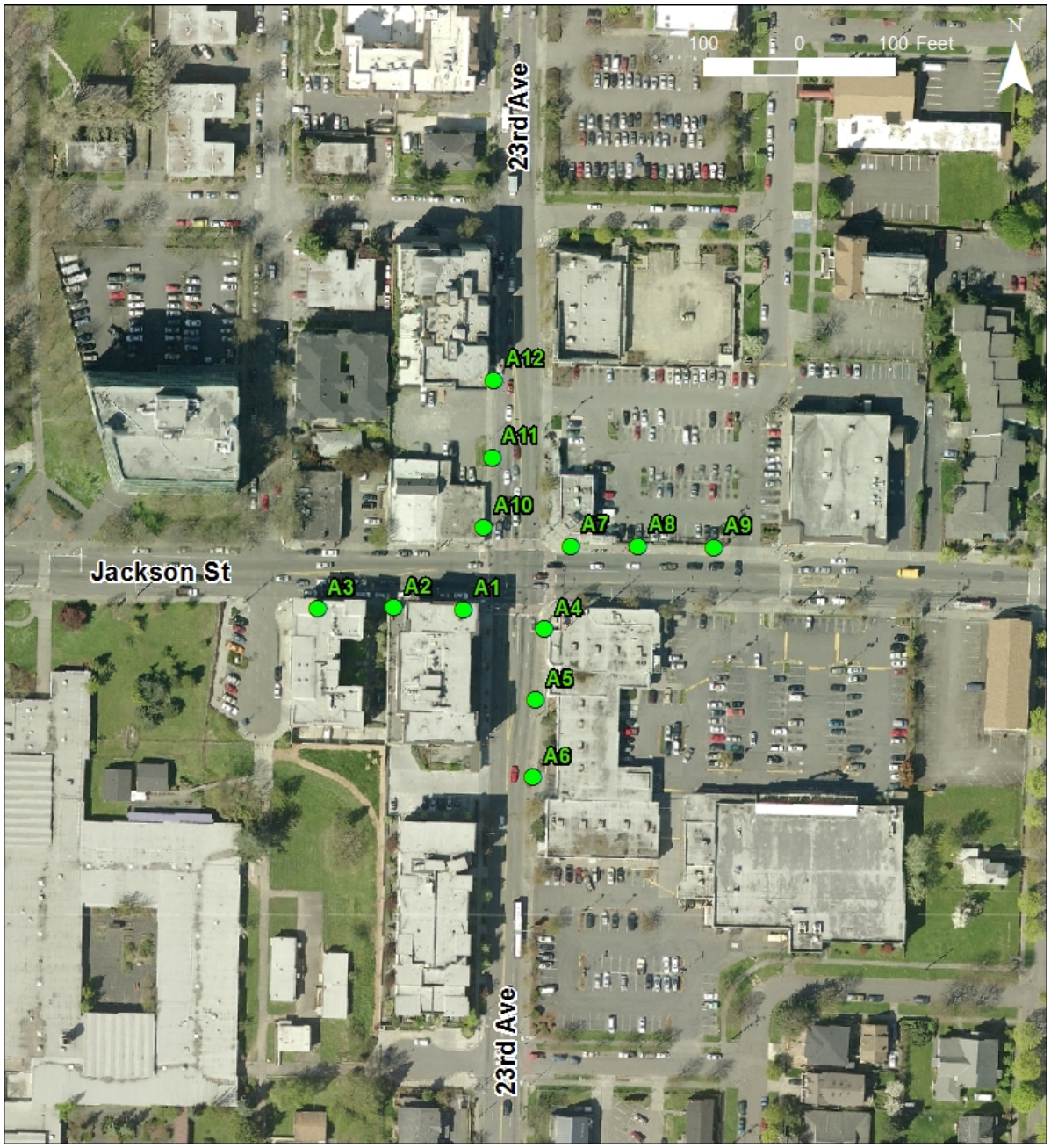

Figure 2 – CO Hotspot Analysis – Existing and Build Conditions – 23rd Avenue & Jackson Street

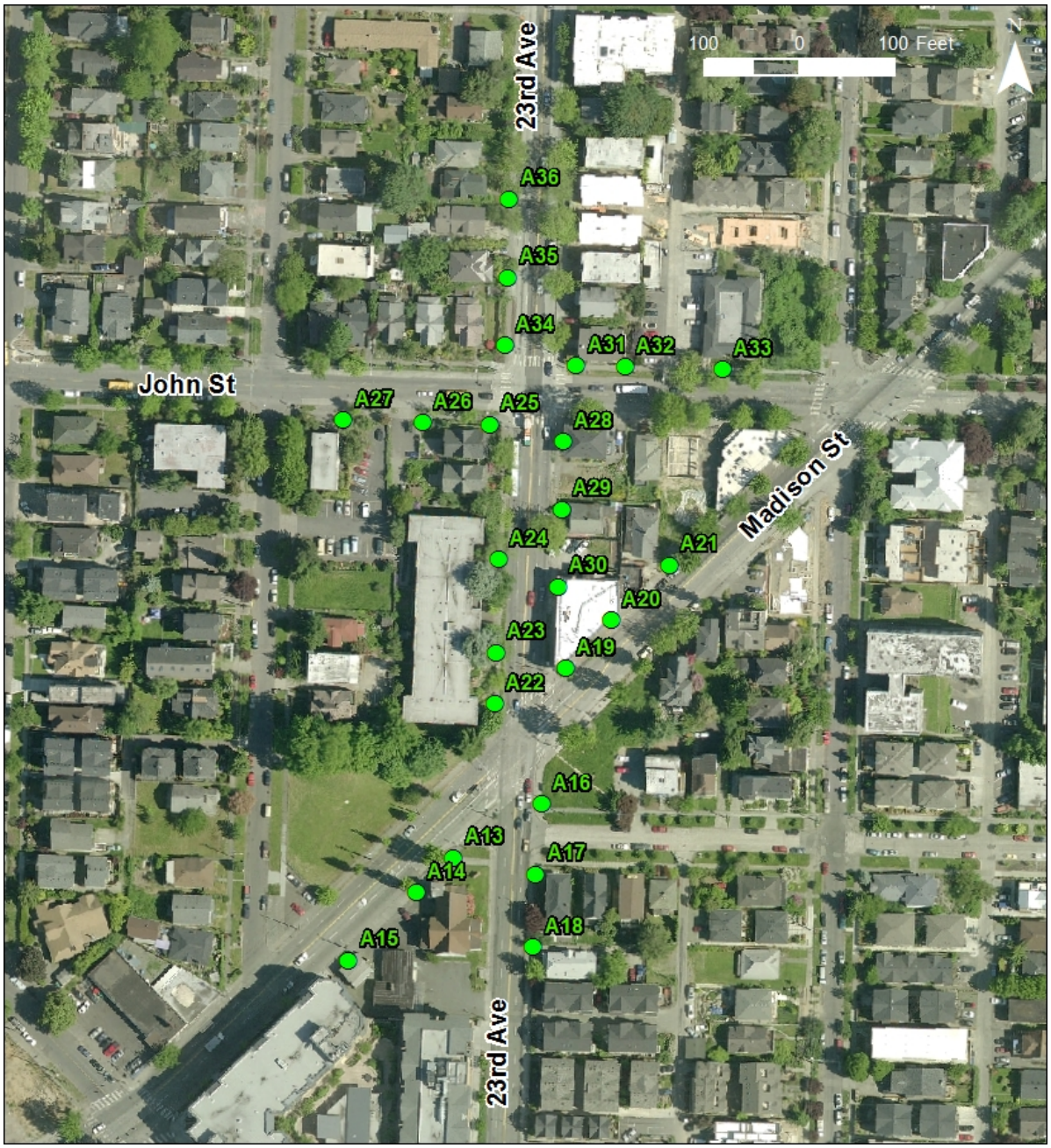

Figure 3 – CO Hotspot Analysis – Existing and Build Conditions – 23rd Avenue & John Street Intersection and 23rd Avenue & Madison Street Intersection

In accordance with EPA procedure, average speeds for each link were used to develop the CO emission factors with MOVES. Worst-case meteorological variables and an urban background CO concentration obtained from WSDOT were used for the analysis. The 8-hour CO concentrations were not analyzed because the 1-hour does not exceed the 8-hour concentration.[11]

- Meteorological conditions:
  Wind speed: 1 m/s (2.2 mph), worst case.
  Wind direction: Worst case for each receptor location, calculated every 10 degrees.
  Atmospheric stability class: Pasquill Class "E"

- Surface roughness: 175 cm (68.9 in.), study area is a mixture of industrial and single family residential.

- Mixing height: 1000 m (3280.83 ft).

- Background CO concentration: 3.0 ppm 1-hour.[12]

- Existing 2012, Build 2015 and Build 2040 CO emission factors from MOVES2010b.

5.1.2 Results

The results of the CO microscale air quality modeling are presented in **Table 2** (1-Hour concentrations). The maximum 1-hour CO concentrations were 4.6 ppm for existing conditions 2012, 3.9 ppm for the 2015 Build alternative and 4.0 ppm for the 2040 Build alternative. The 1-hour concentrations include a background concentration of 3.0 ppm. None of these concentrations exceed either the 1-hour (35 ppm) or the 8-hour (9 ppm) NAAQS. Therefore, the project meets the project level conformity requirements in 40 CFR Part 93.

[11] Jim Laughlin (WSDOT), telephone conversation with John Jaeckel (HNTB), November 12, 2013.
[12] Ibid.

TABLE 2

MICROSCALE AIR QUALITY ANALYSIS
MAXIMUM 1-HOUR CO CONCENTRATIONS (ppm)*

Air Quality Receptor ID	2012 Existing	2015 Build	2040 Build
	1 hour		
A1	4.2	3.5	3.6
A2	3.8	3.4	3.5
A3	3.7	3.5	3.5
A4	4.4	3.8	3.8
A5	4.5	3.7	3.8
A6	4.5	3.7	3.6
A7	4.0	3.5	3.6
A8	3.8	3.4	3.4
A9	3.8	3.4	3.4
A10	4.4	3.8	3.7
A11	4.4	3.7	3.7
A12	4.6	3.8	3.8
A13	4.2	3.7	3.8
A14	4.1	3.6	3.7
A15	3.9	3.5	3.6
A16	4.6	3.8	3.9
A17	4.4	3.9	3.9
A18	4.3	3.6	3.9

Air Quality Receptor ID	2012 Existing	2015 Build	2040 Build
	1 hour		
A19	4.4	3.8	3.9
A20	4.2	3.5	3.6
A21	4.2	3.5	3.5
A22	4.3	3.8	3.9
A23	4.2	3.8	3.9
A24	4.2	3.6	3.7
A25	4.0	3.5	3.5
A26	3.6	3.3	3.3
A27	3.7	3.3	3.4
A28	4.3	3.6	3.6
A29	4.2	3.6	3.7
A30	4.3	3.7	3.7
A31	4.0	3.5	3.6
A32	3.7	3.4	3.5
A33	3.8	3.3	3.4
A34	4.1	3.6	3.8
A35	4.2	3.7	3.8
A36	3.6	3.3	3.8

*The National Ambient Air Quality Standard for CO is 35 ppm for a one hour average.
Concentrations include an ambient background level of 3.0 ppm (1 hour)
Indicates maximum concentration for each alternative and year of analysis.
Source: HNTB Corporation, May 2014

5.2 Ozone

Ozone project level conformity is addressed through the approval of the TIP. As stated in section **4.0 Regional Conformity**, *The 2013-2016 Regional Transportation Improvement Program* for the Puget Sound Region was approved by the FHWA and FTA. Therefore, the 23rd Avenue Corridor Improvement project meets the project level conformity requirements in 40 CFR Part 93.

6.0 MSAT

In addition to the criteria air pollutants presented in **Table 1**, 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).

"Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments (CAAA) of 1990, whereby Congress mandated that the U.S. Environmental Protection Agency (EPA) regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://cfpub.epa.gov/ncea/iris/index.cfm). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their 1999 National Air Toxics Assessment (NATA) (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butidiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, 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. Based on an FHWA analysis using EPA's MOVES2010b model, "even if vehicle-miles travelled (VMT) increases by 102 percent as assumed from 2010 to 2050, a combined reduction of 83 percent in the total annual emissions for the priority MSAT is projected for the same time period."[13]

"The FHWA developed a tiered approach for analyzing MSAT in NEPA documents, depending on specific project circumstances:.

1. No analysis for projects with no potential for meaningful MSAT effects;
2. Qualitative analysis for projects with low potential MSAT effects; or
3. Quantitative analysis to differentiate alternatives for projects with higher potential MSAT effects…

(1) Projects with No Meaningful Potential MSAT Effects or Exempt Projects.

"The types of projects included in this category are:

> Projects qualifying as a categorical exclusion under 23 CFR 771.117(c) (subject to consideration whether unusual circumstances exist under 23 CFR 771.117(b));
>
> Projects exempt under the Clean Air Act conformity rule under 40 CFR 93.126; or
>
> Other projects with no meaningful impacts on traffic volumes or vehicle mix."[14]

[13] April Marchese, "Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents", Memorandum, addressed to FHWA Division Administrators, December 6, 2012, p. 2.
[14] "Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA Documents", p. 4.

The purpose of this project is to enhance transit operations along 23rd Avenue. "This project has been determined to generate minimal air quality impacts for CAAA criteria pollutants and has not been linked with any special MSAT concerns. As such, this project will not result in changes in traffic volumes, vehicle mix, basic project location, or any other factor that would cause an increase in MSAT impacts of the project from that of the no-build alternative.

"Moreover, EPA regulations for vehicle engines and fuels will cause overall MSAT emissions to decline significantly over the next several decades. Based on regulations now in effect, an analysis of national trends with EPA's MOVES model forecasts a combined reduction of over 80 percent in the total annual emission rate for the priority MSAT from 2010 to 2050 while vehicle-miles of travel are projected to increase by 100 percent. This will both reduce the background level of MSAT as well as the possibility of even minor MSAT emissions from this project."[15]

7.0 CONSTRUCTION MITIGATION

The 23rd Avenue Corridor Improvement Project construction will take place over one construction season. Over this time there would be localized increased emissions from construction equipment and particulate emissions from construction activities. Particulate emissions, whether from construction equipment diesel exhaust or dust from the construction activities, should be controlled as well as possible. Contractors should follow all WSDOT *Standard Specifications for Road, Bridge, and Municipal Construction*[16] Sections that address the control of construction equipment exhaust or dust during construction.

Even though construction mitigation measures are not required, there are several measures that could be considered to reduce engine activity or reduce emissions per unit of operating time. Operational agreements that reduce or redirect work or shift times to avoid community exposures can have positive benefits. Also, technological adjustments to construction equipment, such as off-road dump trucks and bulldozers, could be an appropriate strategy. The EPA recommends Best Available Diesel Retrofit Control Technology (BACT) to reduce diesel emissions. Typically, BACT requirements can be met through the retrofit of all diesel powered equipment with diesel oxidation catalysts or diesel particulate filters, and other devices that provide an after-treatment of exhaust emissions.

8.0 CONCLUSION

Based on the air quality analysis completed for the proposed improvements, this project has met the 40 CFR Part 93 requirements for project level transportation conformity for CO and will not contribute to any violation of the NAAQS or result in any increase in MSAT emissions.

[15] Ibid, Appendix A.
[16] *Specifications for Road, Bridge, and Municipal Construction*: http://www.wsdot.wa.gov/Publications/Manuals/M41-10.htm

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