

**DATE:** Feb. 2, 2021

**TO:** Recipients of the State Environmental Policy Act Determination of Nonsignificance (SEPA DNS) for Leschi Elementary School Addition

**FROM:** Fred Podesta, SEPA official



Seattle Public Schools (SPS) has determined that the final SEPA checklist dated January 2021, meets our environmental review needs for the current proposal to expand Leschi Elementary School. The proposal is funded by the Distressed Schools funding from the Office of Superintendent of Public Instruction (OSPI) to address critical capacity needs. Project construction is scheduled to begin in the summer of 2021 and be ready for occupancy in the Fall of 2022. During construction, students will remain at the school.

After conducting an independent review, SPS has determined that the project does not have significant adverse impacts on the environment as documented in the checklist and the enclosed DNS.

The final SEPA checklist discusses the potential environmental impacts that could result from construction of the project. A draft of the checklist was released for public comment initially from July 27, 2020 to August 26, 2020. Comments received informed revisions to the final SEPA checklist on which the DNS is based. The responses to written comments received are summarized in the SEPA Public Comments and Seattle Public Schools Responses, included with the SEPA checklist.

Thank you for your participation in the SPS SEPA process. Your involvement has helped to make the Leschi Elementary School Addition proposal a much better project.

**Fred Podesta, Chief Operations Officer**

**P.O. Box 34165, MS 22-183, Seattle WA 98124 \* 206-252-0102**

**STATE ENVIRONMENTAL POLICY ACT  
DETERMINATION OF NONSIGNIFICANCE (DNS)  
LESCHI ELEMENTARY SCHOOL ADDITION PROJECT**

**Date of issuance:** Feb. 9, 2021  
**Lead agency:** Seattle Public Schools  
**Location of proposal:** Leschi Elementary School, 135 32nd Ave., Seattle, WA  
(Section 4, Township 24N, Range 4E)

**Description of proposal** – Add four classrooms and increase enrollment capacity by 51 seats, for a total capacity of 420 seats. Existing classrooms on the first level of the school will be converted to Pre-K and security components added to the main entrance and administration area. The building addition will be two stories and adjoin the north side of the existing building. A play structure will be relocated to the north of its current location. There will be approximately 7,206 square feet of new construction.

**The lead agency for this proposal has determined that it will not have a probable significant adverse impact on the environment. An environmental impact statement (EIS) is not required under RCW 43.21C.030(2)(c). This decision was made after review of a completed environmental checklist and other information on file with the lead agency. This information is available to the public on request at the following location: John Stanford Center, 2445 3<sup>rd</sup> Ave. S, Seattle, WA 98124-1165 (Attn: Brian Fabella, Phone: 206-252-0702) and online at: <http://www.seattleschools.org/sepa>**

This DNS is issued under WAC 197-11-340(2); the lead agency will not act on this proposal prior to Feb. 24, 2021 (at least 15 days from the issuance date listed above). Comments and appeals (appealed by written notice setting forth specific factual objections) are to be received no later than Feb. 24, 2021 (15 days) and sent to:

Superintendent  
Seattle Public Schools  
P.O. Box 34165, MS 32-151  
Seattle, WA 98124-1165

**Name of agency making threshold determination:** Seattle Public Schools  
**Responsible Official:** Fred Podesta, Chief Operations Officer, Seattle Public Schools  
**Phone:** 206-252-0102  
**Address:** MS 22-183, P.O. Box 34165, Seattle, WA 98124-1165

**Date:** Feb. 2, 2021 **Signature:** Fred Podesta



# Leschi Elementary School Classroom Addition Project

## Final SEPA Checklist

Seattle Public Schools is committed to making its online information accessible and usable to all people, regardless of ability or technology. Meeting web accessibility guidelines and standards is an ongoing process that we are consistently working to improve.

While Seattle Public Schools endeavors to only post documents optimized for accessibility, due to the nature and complexity of some documents, an accessible version of the document may not be available. In these limited circumstances, the district will provide equally effective alternate access.

For questions and more information about this document, please contact the following:

Brian Fabella  
Project Manager  
[brfabella@seattleschools.org](mailto:brfabella@seattleschools.org)

While the Leschi Elementary School Classroom Addition Project Final State Environmental Policy Act (SEPA) Checklist is accessible and ADA compliant, the attached figures and appendices which support the checklist contains complex material that are not accessible. The following is a description of what is contained in the figures and appendices:

- **Figure 1, Leschi Elementary School Classroom Addition Vicinity Map, Seattle, Washington**

Figure 1 is an aerial photograph of the Leschi Elementary School Classroom Addition site and its surrounding neighborhood to within an approximately three-block radius. The school property is outlined in a red line. The school property is bounded by East Spruce Street to the north, 32<sup>nd</sup> Avenue and Peppi's Playground (Seattle Parks and Recreation) to the east, East Yesler Way to the south, and 31<sup>st</sup> Ave to the west. The main entry of the school faces East Yesler Way.

- **Figure 2, Leschi Elementary School Classroom Addition Project Area, Seattle, Washington**

Figure 2 shows the project area and proposed classroom addition for the Leschi Elementary School. The school property is outlined in a red line. The new classroom addition is outlined in a yellow line and is located at the north end of the existing building. Vehicular parking remains at the south end of the site and is accessed from East Yesler Way.

- **Figure 3, Leschi Elementary School Classroom Addition Site Plan, Seattle, Washington**

Figure 3 shows the Leschi Elementary School existing building facility and the proposed classroom addition. The proposed area of work for the new classroom addition is outlined in a dashed line at the north end of the existing building. The proposed area of work for the security improvements at the main entrance is outlined in a dashed line at the south end of the existing building.

- **Attachment 1: SEPA Public Comments and Seattle Public Schools Responses**

Attachment 1 includes the public comments submitted for the Draft SEPA Checklist for the Leschi Elementary School Addition Project. Attachment 1 also includes the Seattle Public Schools responses to the public comments. The comment period on the Draft SEPA Checklist was from July 27 to Aug. 26, 2020.

- **Appendix A: Transportation Technical Report**

Appendix A is a Transportation Technical Report prepared by Heffron Transportation Inc. dated July 28, 2020. This report documents the existing conditions in the site vicinity, presents estimates of project-related traffic, and evaluates the anticipated impacts to the surrounding transportation system including transit, parking, safety, and non-motorized facilities. There are figures and tables throughout this document, including in the appendices, which graphically depict and organizes data to support the findings in the report. Attached to the end of the report, there are Appendix A – Level of Service Definitions, and Appendix B – Parking Utilization Study Data.

- **Appendix B: Greenhouse Gas Emissions Form**

Appendix B is the Greenhouse Gas Emission Worksheet prepared by Environmental Science Associates (ESA) dated January 2021. This worksheet estimates the embodied Greenhouse Gas Emissions that could be created from this construction project. Note that it is an estimate of analyzed potential emissions that may be created through the extraction, processing, transportation, construction, and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass).

This concludes the SEPA checklist.

**Leschi  
Elementary  
School Addition**

**FINAL SEPA  
Checklist**

January 2021

PREPARED FOR:

SEATTLE PUBLIC SCHOOLS  
2445 THIRD AVENUE SOUTH  
SEATTLE, WA 98134

PREPARED BY:

ESA  
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SEATTLE, WA 98107

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**Figure 1: Project Vicinity**

**Figure 2: Project Area**

**Figure 3: Site Plan**

**Attachment 1: SEPA Public Comments and Seattle Public Schools Responses**

**Appendix A: Transportation Technical Report**

**Appendix B : Greenhouse Gas Emmissions Form**

## ENVIRONMENTAL CHECKLIST

### A. BACKGROUND

**1. Name of the proposed project, if applicable:**

Leschi Elementary School Addition

**2. Name of Applicant:**

Seattle Public Schools

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

Brian Fabella  
Seattle Public Schools  
2445 3rd Ave S  
Seattle, WA 98134  
206-252-0702

**4. Date checklist prepared:**

January 2021

**5. Agency requesting checklist:**

Seattle Public Schools

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

Construction is planned to begin in the summer of 2021 with use of the new classrooms beginning in the fall of 2022. During construction, students would remain at the school using the existing buildings onsite.

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

There are no plans for future additions or expansions at this time.

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

The following reports have been prepared for the proposed project:

- Transportation Technical Report for the Leschi Elementary School Classroom Addition, Heffron Transportation, August 2020



- Leschi Elementary School Classroom Addition Project Cultural Resources Assessment, Short Report, ESA, August 2020
- Geotechnical Engineering Report for Leschi Elementary School Addition, Intertek PSI, June 2020

A hazardous building materials survey is also currently being undertaken.

**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.**

There are no other proposals pending for government approval that would affect the property covered by the proposed project.

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

The following permits/approvals may be required for this project:

- Type two Master Use Permit (MUP), City of Seattle
- Building Permit, City of Seattle
- Construction Permit, City of Seattle
- Right-of-Way Permit, City of Seattle
- Electrical Permit, City of Seattle
- Puget Sound Clean Air Agency (PSCAA) permit

**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.**

SPS is proposing to expand the existing Leschi Elementary School. The project would be funded by Distressed Schools funding from the Office of Superintendent of Public Instruction (OSPI) to address critical capacity needs. The purpose of the project is to address current and projected elementary enrollment and to reduce overcrowding.

The project would add four classrooms and increase the enrollment capacity by 51 seats. The total capacity of the school would be raised to 420 seats. The project would also include converting existing classrooms on the first level of the school to Pre-K and adding security components to the main entrance and administration area. The building addition would be two stories and would adjoin the north side of the existing building on the north side of the site. A play structure currently in the location of the building addition would be relocated to the north of its current location. There would be approximately 7,206 square feet of new construction (including two stories and a mechanical attic).

- 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.**

The school site is located at 135 32nd Ave. Seattle, WA 98122. The site is bounded by single family residences to the north, south and west, with Peppi's Playground park to the east. The site is located in the Section 4, Township 24N, range 4E. The site is made up of one parcel (341660-0240) totaling 2.96 acres with the following legal description:

HOLMES H E ADD ALL BLK 4 & POR VAC ST ADJ

**Figure 1** shows the project vicinity. **Figure 2** shows the project site.

## **B. ENVIRONMENTAL ELEMENTS**

### **1. Earth**

#### **a. General description of the site (underline):**

Flat, rolling, hilly, steep slopes, mountainous, other \_\_\_\_\_

The site is located on a hill and rises approximately 18 feet from the east to west sides of the site.

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

The City of Seattle designates slopes greater than 40% with a rise of at least 10 feet as critical areas (Seattle Municipal Code [SMC] 25.09.012). No steep slopes are located in the project area. Steep slopes greater than 40% are located adjacent to the northwest corner of the school property.

#### **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 Natural Resources Conservation Service (NRCS) map for King County indicates that the soils in the site vicinity consist of urban land-

Alderwood complex, 5 to 12 percent slopes and Urban land-Alderwood complex, 12 to 35 percent slopes.

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

There are no potential slides, known slides, or liquefaction areas mapped by the King County on the project site (King County, 2020).

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

Approximately 1,000 cubic yards of earth would be exported from the project site during construction. Approximately 100 cubic yards of clean fill would be required for import, and would be obtained from a source approved by the City of Seattle.

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

As with all construction projects, erosion could occur as a result of construction activities, particularly earthwork. Erosion potential would be reduced through an erosion control plan consistent with City of Seattle standards (SMC 22.800) and implementation of best management practices (BMPs).

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

The proposed site of the addition is currently covered by impervious surfaces (a play area and cement walkways); therefore, the construction of the addition would not result in a net increase of impervious surfaces on site. The percentage of the site currently covered by impervious surfaces is 83 percent.

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

Temporary erosion and sedimentation control BMPs and construction water quality treatment measures would be implemented to minimize erosion and to treat stormwater runoff during construction. BMPs specific to the site and project would be specified by SPS in the construction contract documents that the construction contractor would be required to implement.

**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.**

During construction activities, there would be a small increase in exhaust emissions from construction vehicles and equipment and a temporary increase in fugitive dust. This increase in dust would be localized and temporary.

Emissions from construction vehicles, as well as emissions from construction workers' vehicles, would contribute greenhouse gases to the atmosphere during this period. Additionally, when the project is complete, the vehicular traffic accessing the school would create emissions; however, this impact is already present at the school and is not expected to increase significantly. Appendix B includes a Greenhouse Gas Emissions form for the project.

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

There are no offsite sources of emissions or odors that would affect the project.

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

The contractor chosen for the proposed project would be required to comply with applicable Puget Sound Clean Air Agency (PSCAA) regulations. Regulations that apply to the proposed project include Regulation I, Section 9.11 prohibiting the emission of air contaminants that would or could be injurious to human health, plant or animal life, or property; and Regulation I, Section 9.15 prohibiting the emission of fugitive dust, unless reasonable precautions are employed to minimize the emissions.

Contractors would use best management practices to minimize construction-related emissions. These emissions are expected to be minimal. Construction equipment would also be equipped with the appropriate emission controls.

To reduce fugitive dust emissions from construction vehicles leaving the site, the contractor would be required to establish wheel-cleaning stations at the exits from the site if necessary. Streets would be regularly swept to remove dust and debris from construction vehicles.

### **3. Water**

#### **a. Surface Water:**

- 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.**

Lake Washington is located approximately 1/3 mile to the east of the Leschi Elementary School site. Frink Creek is located within Frink Park, approximately 380 feet southeast of the Leschi Elementary School site. Frink Creek flows into Lake Washington.

- 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 would not require any work over, in or adjacent to any surface water bodies.

- 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 proposed project would not require any work in or near surface water, and would not place any fill or dredge material in surface waters or associated wetlands.

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

The proposal would not require any surface water withdrawals or diversions.

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

According to the federal Emergency Management Agency (FEMA) Flood Insurance Maps, the site is not located within a 100-year floodplain.

- 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.**

The project would not involve any discharge of waste materials into any surface waters.

**b. Ground Water:**

- 1. Will groundwater 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.**

No groundwater would be withdrawn for drinking water or other purposes.

- 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.**

No new waste material would be discharged into the ground from septic tanks or other sources. Waste materials generated from the site would be routed into the City's existing sewer and storm systems.

**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 roof and surrounding impervious surfaces of the four classroom addition would generate stormwater, similar to existing conditions. Stormwater on site is routed into the City's existing storm drainage system. The project would comply with all City and state code requirements for stormwater discharge.

Bioretention planters would be added at the north and south ends of the new addition to retain and infiltrate stormwater generated on site.

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

It is unlikely that sediment generated during building construction could leave the site with the implementation of construction best management practices (BMPs). Once the addition is constructed the surrounding area would be restored to existing conditions.

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

The project would not alter or affect any 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 construction, BMPs would be implemented so that sediment originating from disturbed soils would be retained within the limits of disturbance to the extent possible. BMPs may include installation of a rock construction entrance, catch basin filters, interceptor swales, hay bales, sediment traps, and other appropriate cover measures. BMPs specific to the site and project would be specified by SPS in the construction contract documents that the construction contractor would be required to implement.

**4. Plants**

**a. Check the types of vegetation found on the site:**

☒ deciduous tree: alder, maple, aspen, other

☒ evergreen tree: fir, cedar, pine, other

☒ shrubs

☒ grass

☐ pasture

☐ crop or grain

☐ Orchards, vineyards or other permanent crops.

☐ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other

☐ water plants: water lily, eelgrass, milfoil, other

☐ other types of vegetation

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

Raised gardens that are currently within the footprint of the proposed addition would be removed or relocated. No trees would be removed or altered.

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

No threatened or endangered plant species or critical habitat are known to be on or near the site (WDFW, 2020).

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

In addition to two bioretention planters, there would be a new raised planting area installed to the north of the addition.

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

No plant surveys were conducted for this Checklist and no noxious weeds are known to be onsite. Giant Hogweed, a class A noxious weed has been reported in the forested area of Peppi's Playground, which is located directly to the east of the project site (King County, 2020).

**5. Animals**

**a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.  
Examples include:**

Animals observed on the site are restricted to typical urban birds and animals.

**Fish:** not applicable

**Amphibians:** none observed

**Reptiles:** none observed

**Birds:** species adapted to urban areas such as gulls, American crow, rock pigeon, chickadee, robin, Steller's jay, northern flicker, and Bewick's wren.

**Mammals:** species adapted to urban areas such as Norway rat and other rodents, raccoon, and -opossum.



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

According to the WDFW Priority Habitats and Species program maps, no threatened or endangered species are known to be on or near the site. In addition, the U.S. Fish and Wildlife Service (USFWS) Environmental Conservation Online System (ECOS) Information for Planning and Consultation (IPaC) online tool does not designate critical habitat for threatened or endangered species on or near the site.

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

The Puget Sound area is located within the Pacific Flyway, which is a flight corridor for migrating waterfowl and other avian fauna. The Pacific Flyway extends south from Alaska to Mexico and South America. No portion of the proposed project would interfere with or alter the Pacific Flyway.

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

The proposed project is not expected to result in any impacts to wildlife or wildlife habitat. Therefore, no mitigation measures have been proposed. Some birds and animals may be disturbed during construction, but would likely return following construction because they are adapted to urban areas.

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

Animal surveys were not conducted for this project. It is likely that invasive species typical of an urban area such as rats and opossums are present in the project area.

**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 proposed classroom addition would be powered by electricity.

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

The project would not affect the potential use of solar energy by 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:**

The existing school utilizes a geothermal heat system. The addition would be incorporated into this existing system.

**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.**

Construction of the addition would require the use of construction equipment and vehicles; accidental spills of hazardous materials could occur. The contractor would develop a spill prevention and control plan to prevent the accidental release of contaminants into the environment.

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

According to the Department of Ecology Facility/Sites database, Leschi Elementary School is not known to be contaminated (Ecology 2020).

- 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 existing hazardous chemicals/conditions that could affect the project development. A hazardous building materials survey is currently underway, but limited or no abatement is anticipated to be necessary. It is possible that the existing 1950s building could contain materials such as asbestos-containing materials, lead-containing paint/components, PCB light ballasts, and/or mercury-containing light tubes. Construction in the existing building would be limited to minor cosmetic upgrades (such as painting), replacements of doors, and the opening of one exterior wall to connect the existing building to the new addition. It is unlikely that construction would disturb any hazardous materials in the building.

- 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.**

Chemicals stored and used during construction would be limited to gasoline and other petroleum based products required for maintenance and operation of construction equipment and vehicles.

- 4. Describe special emergency services that might be required.**

It is not anticipated that the project would require any special emergency services.

- 5. Proposed measures to reduce or control environmental health hazards, if any:**

Site-specific pollution prevention plans, spill prevention and control plans would be developed to prevent or minimize impacts from hazardous materials.

**b. Noise**

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

Predominant noise sources in the project area include vehicular traffic, overhead air traffic, and noise from the adjacent park, none of which would affect the proposed project.

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

Vehicle and equipment operation during construction could cause noise impacts to nearby residents. Construction hours and noise levels would comply with the City of Seattle noise standards.

Maximum permissible sound levels in residential communities are not to exceed 55 A-weighted decibels (dB(A)s). However, construction activities are permitted to exceed the established maximum level by 25 dB(A) by the Seattle Noise Control Ordinance (SMC 25.08.425). Maximum permissible sound levels established in SMC 25.08.425 may be exceeded by construction

activities between 7:00 a.m. and 10:00 p.m. on weekdays, and between the hours of 9:00 a.m. and 10:00 p.m. on weekends.

Though enrollment would only increase by about 51 students, the increased enrollment at Leschi Elementary would cause an increase in sound from human voices and from cars in the immediate vicinity during daytime hours. Increases in noise would be minor and would not violate noise regulations.

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

Construction activities would be restricted to hours and levels designated by SMC 25.08.425. Maximum permissible sound levels established in SMC 25.08.425 may be exceeded by construction activities between 7:00 a.m. and 10:00 p.m. on weekdays, and between the hours of 9:00 a.m. and 10:00 p.m. on weekends. If construction activities exceed permitted noise levels, SPS would instruct the contractor to implement measures to reduce noise impacts to comply with the Noise Control Ordinance, which could include additional muffling of equipment. While construction noise is permitted during evenings and weekends, construction would generally occur between 7:00 a.m. and 5:00 p.m. on weekdays.

**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 is currently used as a school and is comprised of one large “L-shaped” building, with a play structure to the north, parking lot to the south, and a paved play area to the west and north of the building.

**b. Has the project 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 nonforest use?**

The site is not currently and has not been previously used for working farmlands or forest lands. No agricultural or forest land would be converted to other uses. The site has been used as a school since 1909 (SPS, 2020).

**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 working farm or forest lands are located near the proposed project, so the project would not affect or be affected by farm or forest land operations.

**c. Describe any structures on the site.**

Structures onsite include the 58,374 square foot school building and a play structure.

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

While the existing school would not be demolished, some features on the north side of the school would be, including gutters and downspouts at the location of the addition, a window, exterior doors and frames, and the brick veneer. Directly to the north of the existing school, a light pole and fixture, raised gardens, and a playground (including the play structure, stairs and handrails, and retaining wall and guardrail) would be demolished.

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

The current zoning classification of the school site is Residential Single Family 5000 (City of Seattle, 2020).

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

The City of Seattle comprehensive plan designation of the site as a “Single Family Residential Area” (City of Seattle, 2019).

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

The project site is not located within a shoreline jurisdiction; therefore, there is no applicable shoreline master plan designation.

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

Review of the City of Seattle Department of Construction and Inspections (SDCI) GIS mapping database for environmental critical areas indicated that steep slopes are found adjacent to the northwest corner of the school’s parcel; however, this is located outside of the project area.

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

No people would reside in the completed project. The project would increase the school's enrollment capacity to 420 students, adding an additional 51 seats for students. To accommodate the increase in students approximately 10 more people would be employed at the school.

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

The completed project would not displace anyone.

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

No displacement impacts are anticipated as a result of this project; therefore, no measures have been implemented.

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

The proposed project would add four additional classrooms to Leschi Elementary School and is therefore compatible with existing land uses.

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

The project is not located near any agricultural or forest lands, so no measures to ensure compatibility are required.

**9. Housing**

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

No housing units would be provided as a result of this project.

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

No housing units would be eliminated as result of this project

**c. Describe proposed measures to reduce or control housing impacts, if any.**

No impacts to housing are anticipated as a result of this project, therefore, no measures have been proposed.

**10. Aesthetics**

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

The addition would not exceed the height of the existing school building, which is approximately 45 feet tall. The principal exterior of the addition would be masonry, which is consistent with the aesthetics of the existing structures on site.

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

The addition would be visible from some directions. Views of trees and a portion of Peppi's Playground from 31<sup>st</sup> street would be slightly obstructed. The land use of the site would remain the same and the addition would be consistent with surrounding structures. Therefore, no aesthetic impacts are anticipated as a result of this project. Additionally, no protected views are located within the project area.

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

The project would not result in any aesthetic impacts, so no measures have been proposed.

**11. Light and Glare**

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

Lighting on the site would remain similar to present conditions. There would be an increase in light when the addition is being used during school hours. However, this would occur predominately during daylight hours and would not result in additional light or glare. New site lighting would consist of full cut-off fixtures and would be located on the exterior of the addition away from the property line. New lighting is not anticipated to impact adjacent properties.

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

Exterior building and property lighting from the completed project would not be a safety hazard and would not be expected to interfere with views.

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

There are no exiting off-site sources of light and glare that would affect the proposal.

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

It is anticipated that both exterior and interior lighting would be on timers so that the site would be mostly dark at night. Safety lighting would be designed to minimize light spill over. Evening activities and events could cause increased light, but impacts on adjacent structures are anticipated to be minor and no different from existing conditions.

**12. Recreation**

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

The Leschi Elementary School site includes a small wood chip play area with a play structure just north of the school, an open grass area north of the wood chip play area, and a large blacktop play area to the west and north of the school.

The school is located directly adjacent to Peppi's Playground, a City of Seattle park with play equipment, a wading pool, a lawn area, restrooms, and a parking lot.

Other nearby City of Seattle parks include:

- Powell Barnett Park, located approximately 900 feet to the northwest and featuring a children's play area, climbing structures, a wading pool, basketball hoops, a field, picnic tables, and ADA accessible restrooms.
- Leschi-Lake Dell Natural Area, located approximately 0.3 mile to the northeast, features a natural area with a ravine and view point.
- Leschi Park offers view of Lake Washington and features exotic trees and rose gardens planted in a rolling hillside, walking paths, a tennis court and a play structure with sand box. The park is located approximately 500 feet to the southeast of the school.
- Frink Park, which is located in a densely vegetated ravine approximately 600 feet south of the project site, offers hiking and a natural woods drive.



- Flo Ware Park, located approximately 0.2 mile to the southwest of the project site, offers a play structure with lawn space and benches.

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

Construction of the project would temporarily displace recreation at the existing play structure on site until it could be relocated or reconstructed to the area north of its existing location. The overall open space as the site would be reduced by approximately 10 percent, but the current recreation facilities on the site would be maintained and there would continue to be substantial open space (over 1 acre) on the site following construction of the addition.

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

As described above, the play structure would be replaced on site and 90 percent of recreational and open space on the site would be maintained.

**13. Historic and Cultural Preservation**

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

The Study Area (Project Area and adjacent parcels) does not contain any aboveground buildings, structures, or objects that are listed in or have been recommended or determined eligible for listing in a historic register.

The original Leschi Elementary school was an 8-room brick structure built in 1909 and designed by school district architect James Stephen (Baist Map Company, 1912; Thompson and Marr, 2002). A 1912 map shows the original Leschi School, constructed of brick, in the location of the proposed Project. This part of today's school property was once the site of a nursery and associated greenhouses (Baist Map Company, 1912). The block also contained wood-frame single-family residences that were removed incrementally after 1920 and were completely removed by at least 1968 at which time the school property had expanded to the entire block (Kroll Map Company, 1920; NETROnline, 2020; Pacific Aerial Surveys, 1937). An addition to the original 1909 school was constructed in the 1961. The original 1909 building was demolished in 1987-1988. The remaining two buildings were constructed in 1989 and 1961 as additions to the former 1909 building (King County Assessor, 2020; Thompson and Marr, 2002).

While the site has housed a school since 1909, the original building is no longer present. The existing school is comprised of 1989 and 1961 additions to the former 1909 building. As such, the current school is over 45 years of age. It is also over 25 years old, which is the minimum age threshold for consideration of its potential eligibility as a Seattle City landmark, which is the applicable local preservation register. To date, it has not been inventoried or evaluated for its eligibility as a Seattle Landmark or for listing on the National Register of Historic Places (NRHP) (King County Historic Preservation Program, 2018; DAHP, 2020; Seattle Landmarks Preservation Board, 2019). The school does not appear to meet any of the six criteria for designation as a Seattle Landmark or the four criteria for listing in the NRHP. The proposed project would require limited demolition of the existing building at the connection point.

There are 24 buildings in the Study Area, including the existing Leschi Elementary and the constructed Peppi's Playground. Of these, 22 were built before 1995 and are over 25 years in age, the minimum age threshold for consideration of their potential eligibility as Seattle Landmarks. The majority (17) were built before 1953. The buildings are primarily single-family dwellings with the earliest constructed in 1901. Two of the houses have determined Not Eligible for listing in the NRHP. The remaining either have not yet been inventoried or lack full eligibility determinations. No direct impacts to these surrounding resources are anticipated by the Project.

**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.**

A cultural resources literature review was prepared for this project (ESA, 2020). No other professional cultural resource assessments have been conducted within or adjacent to the subject parcel. No archaeological sites or cemeteries are recorded within or adjacent to the Leschi Elementary School site (DAHP, 2020). No professional cultural resource studies have been conducted within or adjacent to the Leschi Elementary School site. The Statewide Predictive Model for encountering precontact-era sites classifies the Project Area as Moderate Risk-Survey Recommended (DAHP, 2010). This model does not take into account potential impacts from development or the potential for historic-era archaeological resources. It is likely that past development at the site has destroyed any potential precontact-era archaeological resources; however, it is possible that historic-era archaeological materials associated with the former nursery and original school building are present. These materials, if present, may have been disturbed by construction of school additions.

The site is less than 500 feet northwest of Leschi Park which is the possible Duwamish village site of skah-TEHLB-shahbsh (Thrush, 2006). The Duwamish name for today's Leschi Park is *Changes-Its-Face* or "horned snake" (Hilbert et al., 2001; Thrush, 2007), and is associated with Duwamish oral traditions. To the North of Leschi Park is Saw-Grass-Point or "rushes used for a certain kind of matting"; this is a site on the western shore of Lake Washington where Indigenous peoples traditionally gathered tules or bulrushes, which are used in weaving (Hilbert et al., 2001; Thrush, 2007.) Based on aerial photography, no structures other than those related to the school are known to have existed on the parcel between 1936 and today (NETROnline, 2020).

- 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 archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.**

A cultural resources literature review was prepared for this project (ESA, 2020). The following documents and databases were reviewed in order to identify any potential cultural resources in the project vicinity: Department of Archaeology and Historic Preservation's Statewide Predictive Model and Washington Information System for Architectural and Archaeological Records Data (WISAARD), historic aerial photography, historic preservation registers review, King County historic register and Seattle Landmarks list, published histories, and historical maps.

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

The building addition would be two stories and would adjoin the north side of the existing buildings on the north side of the site. These proposed alterations include retaining wall construction, raised landscaped planter beds, as well as the relocation of electric and other power lines (TCF Architecture, 2020). Due to the close proximity of the site to a former Duwamish village, ESA recommends SPS develop an inadvertent discovery plan (IDP) for project construction. The IDP will set forth procedures and protocols to follow if cultural resources are discovered, including discovery of human remains. The IDP stipulates pre-construction briefings and on-call response if required. SPS would provide tribal representatives, including those of the Duwamish Tribe, with one-week advance notification of the project schedule and invite them to observe construction. Should cultural resources be inadvertently identified during the project, SPS will comply with all laws requiring the protection of cultural resources.

## 14. Transportation

A *Transportation Technical Report* (Heffron Transportation, Inc., August 2020) has been prepared for the proposed project and the results of the report are summarized in this section. For further details on the *Transportation Technical Report*, please refer to Appendix A of this Checklist.

**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 Leschi Elementary School site is bounded on south by E Yesler Way, on the west by 31<sup>st</sup> Avenue, on the north by E Spruce Street, and on the east by 32<sup>nd</sup> Avenue and a Seattle Park known as Peppi's Playground. The "L" shaped school building is located toward the south and eastern portion of the site. There is a parking lot to the south of the building and play areas to the north and west. The on-site surface parking lot is accessed from two one-way driveways on E Yesler Way. There is a small service area on the east side of the building where trash and recycling bins are stored and accessed from 32<sup>nd</sup> Avenue. The large playground blacktop on the northwest portion of the site is made available for automobile parking for large special events and is accessed from a gated driveway on E Spruce Street. School-bus load/unload occurs along the south side of E Spruce Street east of 31<sup>st</sup> Avenue and a school load zone for automobiles is designated along the east side of 31<sup>st</sup> Avenue adjacent to the site.

No access changes are proposed as part of the classroom addition project.

**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?**

Yes, King County Metro Transit (Metro) provides bus service to the site. Transit stops are located directly in front of the school on E Yesler Way just west of 32<sup>nd</sup> Avenue. The stops are served by Metro Route 27, which provides all-day service seven days per week between Coleman Park (on Lakeside Avenue S) and Downtown Seattle with weekday headways (time between consecutive buses) of 20 to 30 minutes.

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

The existing parking lot has 31 spaces and the school uses the hard-surface play area for parking during large events. There is a small service area on the east side of the building where trash and recycling bins are stored and accessed from 32<sup>nd</sup> Avenue. The service area does not have formal marked parking spaces, but historical *Google Street View* images suggest it has been used by up to three vehicles. The project would not add or eliminate

any parking spaces. Since the amount of assembly space on site would not be changed with the project, the project would not require a code departure for on-site parking.

A detailed study of parking conditions was prepared and is presented in the *Transportation Technical Report* (Appendix A). As presented in that report, the 6 to 11 employees that may be added with the proposed classroom addition, could increase peak parking demand by 6 to 14 vehicles. On-street parking within the site vicinity averaged 65% occupied midday, with about 120 unused spaces in June 2020. With the classroom addition, overall school-day utilization is expected to remain between 59% and 73%, which is acceptable to the City of Seattle, and the impacts would not be considered significant. The school would continue to host events periodically throughout the school year and the project is not expected to increase the frequency of these events. A slightly larger enrollment could draw proportionately larger attendances. However, the on-street parking survey results indicated an average of 107 unused on-street parking spaces in the school vicinity on evenings without events at the school. The school would continue to use the hard-surface play area for parking during large events. The higher level of enrollment could increase event-related demand by 15 to 20 vehicles, which is not expected to have a noticeable effect on overall parking occupancy.

- 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).**

No, the project would not require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities.

- 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 would not use or occur in the immediate vicinity of water, rail, or air transportation. However, the Lake Washington waterfront and Leschi Marina are located about one-third of a mile east of the site.

- 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 nonpassenger vehicles). What data or transportation models were used to make these estimates?**

The traffic analysis conducted for this SEPA Checklist reflected conditions with the classroom addition and increased enrollment capacity

up to 420 students (a net increase of 51 students compared to the school's current capacity and fall 2019 enrollment of 369 students). Based on daily trip generation rates published for elementary schools by the Institute of Transportation Engineers, the added capacity at Leschi Elementary School is expected to generate a net increase of about 100 trips per day (50 in, 50 out). The peak traffic volumes would continue to occur in the morning just before classes begin (between 7:15 and 8:15 a.m.) and in the afternoon around dismissal (between 2:00 and 3:00 p.m.).

During the most recent academic year, the school was served by three full-size general education buses and two smaller special education (SPED) buses; no change to the number of buses is anticipated. Other truck trips expected to continue serving the site include deliveries of food and supplies, trash and recycling pick-up, and occasional maintenance. Overall, school buses and small trucks likely represent about 3% of the total daily traffic.

For more information about the anticipated school traffic generation, refer to Appendix A – *Transportation Technical Report* (Heffron Transportation, Inc., August 2020).

**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 proposal would not interfere with the movement of agricultural or forest products on streets in the area because no agricultural or working forest lands are located within the vicinity of the project site.

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

The additional peak hour trips expected to be generated by the proposed project are expected to add negligible delay (less than one second) to the study area intersections and are not expected to change the overall level of service at any of the analysis intersections. All would continue to operate at LOS B or better overall with the project during both analysis periods. The two one-way site access driveways are forecast to continue operating at LOS A overall with all movements operating at LOS B or better with the project during both peak hours.

The 6 to 11 employees that may be added with the proposed classroom addition (and capacity increase of 51 students), could increase peak parking demand by 6 to 14 vehicles.

The proposed Leschi Elementary School classroom addition project would not result in significant adverse impact to the transportation system in the site vicinity. The school will be in session during construction; therefore,

the following measure will be implemented to reduce the short-term construction-related traffic and parking impacts of the project.

**Construction Transportation Management Plan (CTMP):** The District will require the selected contractor to develop a CTMP that addresses traffic and pedestrian control during construction of the classroom addition. It will define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP will direct trucks along the shortest route to arterials and away from residential streets to avoid unnecessary conflicts with resident and pedestrian activity. To the extent possible, truck movements (including earthwork transport and deliveries of materials to the site) will not occur during morning arrival or afternoon dismissal periods for the school. The CTMP will also include measures to keep adjacent streets clean on a daily basis at the truck exit points (such as street sweeping or on-site truck wheel cleaning) to reduce tracking dirt offsite.

## **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 proposed project would increase attendance at the facility by approximately 51 students. This small increase is not anticipated to require additional public services above those already needed for operation.

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

No impacts to public services are anticipated as a result of this project, so no measures have been proposed.

## **16. Utilities**

- a. Underline utilities currently available at the site:**

electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other \_\_\_\_\_

In addition to those utilities indicated above, cable and internet services are also available at the site.

**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.**

Electricity and telephone, and would continue to be provided to the school. SPS would work with Seattle City Light and its telephone provider to coordinate the extension of utilities to the new rooms, if needed.

The contractor would coordinate with utility purveyors to locate all existing utilities prior to proceeding with construction activity. Any active underground pipes encountered would be protected. Should undocumented piping or other utilities be encountered, the utility purveyor would be immediately contacted prior to resuming construction activity near the utility. Storm drains would be maintained and protected as catch basins.



## 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: Brian Fabella

Name of signee: Brian Fabella

Position and  
Agency/Organization: Capital Projects Manager, Seattle Public Schools

Date Submitted: 1-27-21

An earlier version of this checklist was mistakenly  
uploaded without the signature and date above.

Signature added 3/19/21 – BF

## D. REFERENCES

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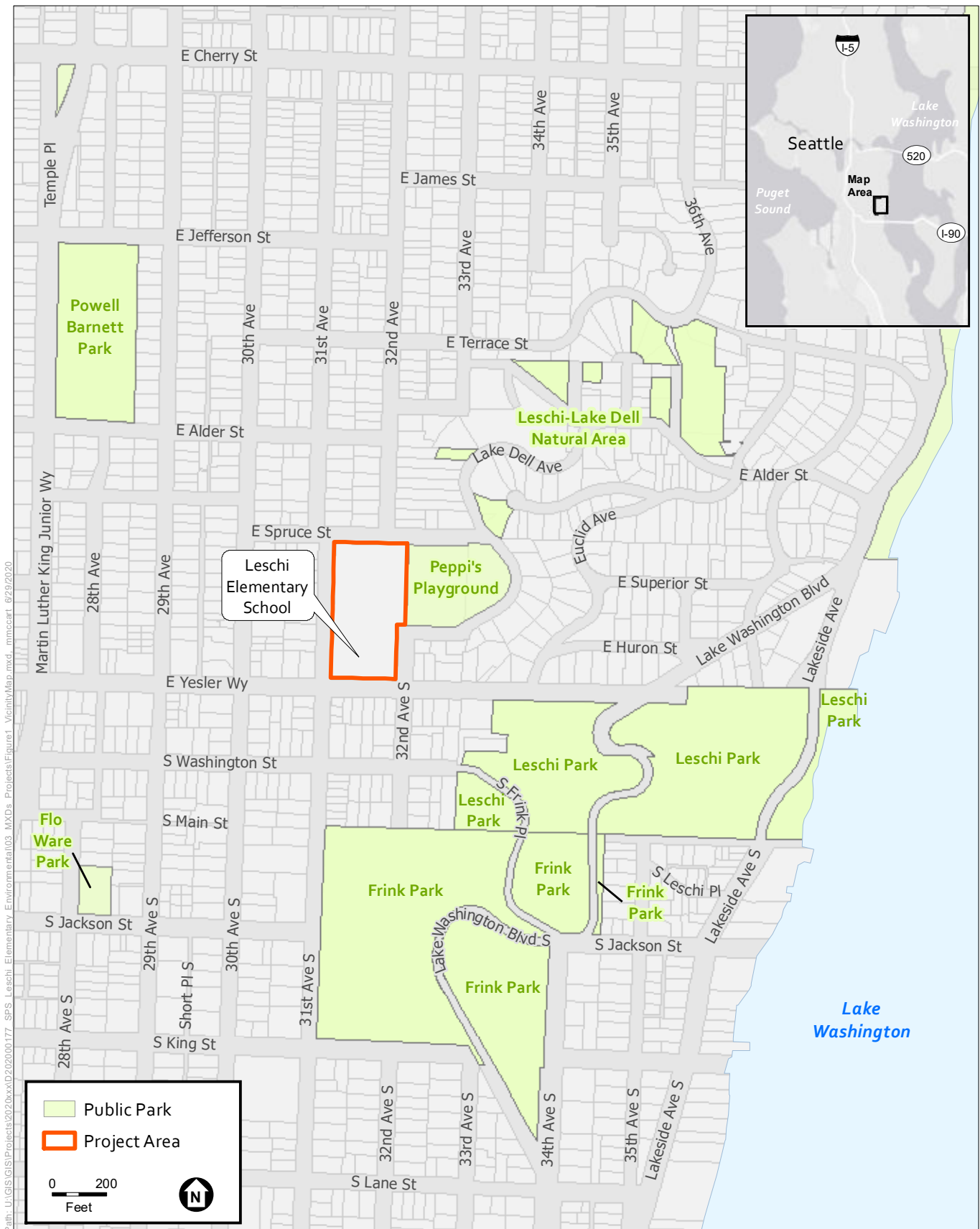
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## **FIGURES**

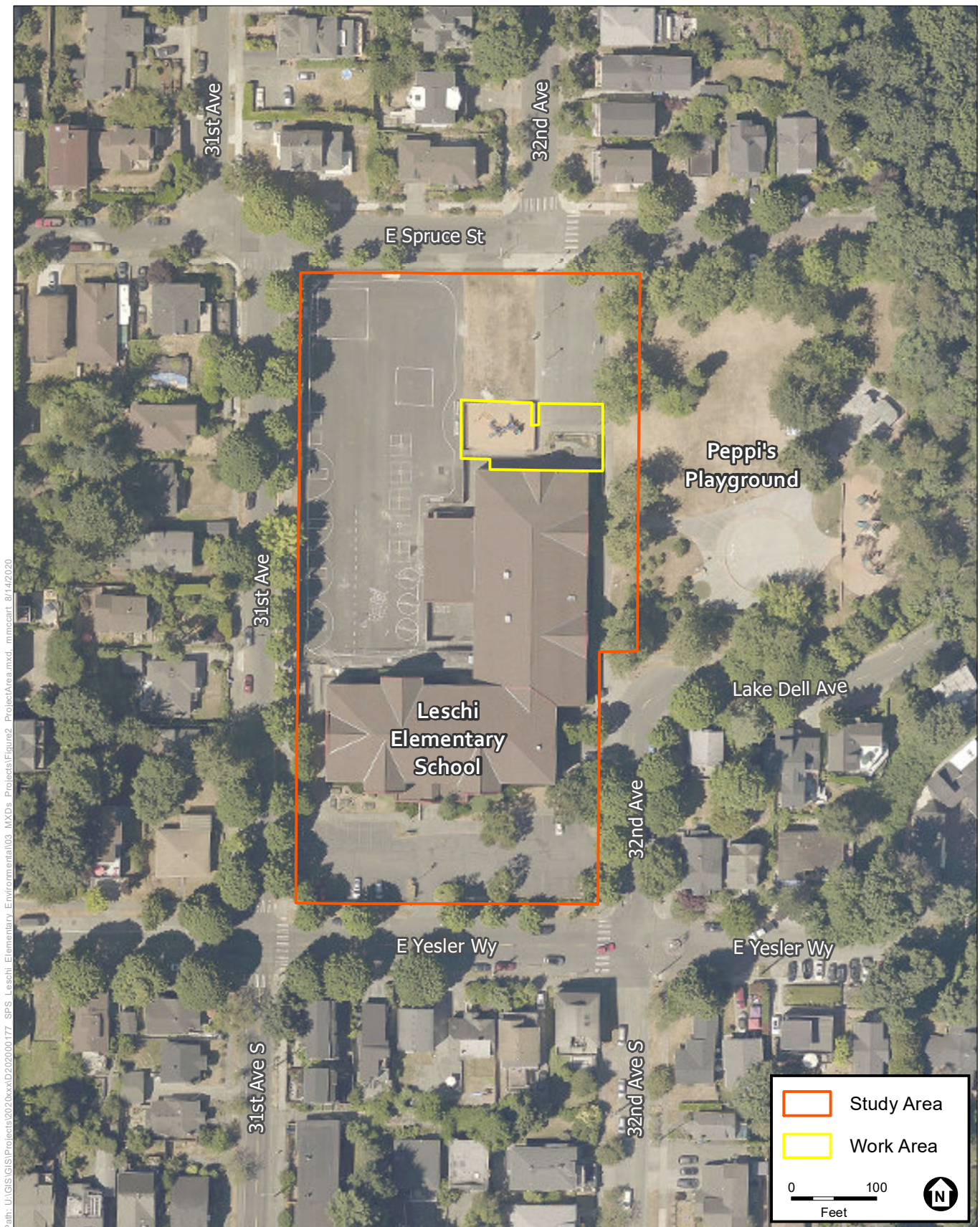


SOURCE: King County, 2017; OSM, 2018; ESA, 2020

D2020177 SPS Leschi Elementary Environmental

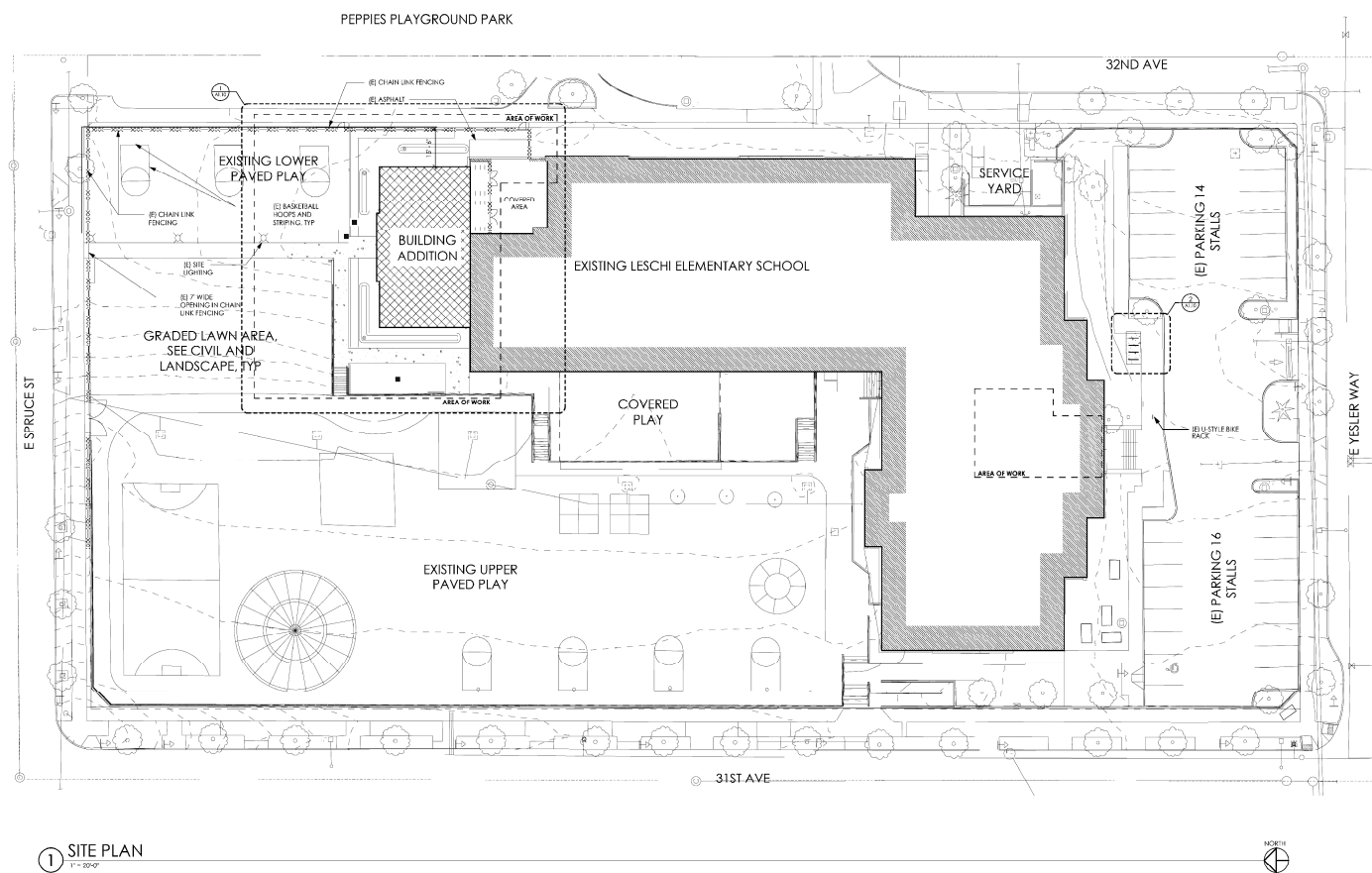
**Figure 1**  
Vicinity Map  
Seattle, Washington





SOURCE: King County, 2017; ESA, 2020

D2020177 SPS Leschi Elementary Environmental



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Project Number  
2020-001

AGENCY RESPONSE 1 

Sheet Title  
**SITE PLAN**

A1.01

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SOURCE: Seattle Public Schools, 2020

D2020177 SPS Leschi Elementary Environmental

**Figure 3**  
Site Plan  
Seattle, Washington



**ATTACHMENT 1: SEPA PUBLIC COMMENTS AND SEATTLE PUBLIC  
SCHOOLS RESPONSES**



## **Leschi Elementary School Addition Project SEPA Public Comments and Seattle Public Schools Responses**

SEPA regulations recommend that public comments on draft Checklists be considered and responded to, but provides flexibility in how the comments are presented. The comment period on the Draft SEPA Checklist for the Leschi Elementary School Addition Project was from July 27 to August 26, 2020. Individual comment letters, emails, or postcards were received from the 3 individuals listed below.

1. Adam Hoyos-Marre
2. Chris Jackins, Seattle Committee to Save Schools
3. Kelby Johnson, postcard

For efficiency, the comments have been summarized and similar comments have been grouped together and responded to below. Following each comment, the numbers in brackets refer to the commenter number (above) who submitted a similar comment. Any person interested in reading the individual comments may contact SPS for access to them.

1. **Determination of Significance (DS)/EIS Preparation.** Project has significant adverse environmental impacts. Further detailed environmental review should be provided through an Environmental Impact Statement (EIS). [Commenter 2, 3]

The SPS SEPA Responsible Official is reviewing the revised SEPA Checklist and taking all comments received on the Draft SEPA Checklist into consideration in making a determination of the significance of impacts from the Leschi Elementary School project.

2. **Project Description.** Is the school really a “distressed school” per the state money designation and what makes it so? [Commenter 2]

The source of funding is not an aspect of SEPA review. However, qualification for Distressed School funding is determined by the Office of Superintendent of Public Instruction (OSPI). The addition to Leschi Elementary is being funded with Distressed School funding to address critical capacity needs.

3. **Future notification.** Please include me on the list of people to be notified about the status of the environmental review of this project. [Commenter 3]

SPS will provide future notifications to all parties who live within a two block radius of the project, and those who have requested to be included on future notifications.

4. **No Public Meeting.** SPS has held public meetings for other similar projects. Why was no public meeting held? [Commenter 2]

Public meetings are not required for this project under SEPA. While soliciting public comments is also not required prior to making a threshold determination, SPSP gives the public opportunity to comment on the draft checklist. When the threshold determination is made SPS will send postcards notifying the public of the determination to residences within a two block radius.

5. **Reproduce Public Comments.** The Final Checklist should include copies of public comments received. [Commenter 2]

SPS has summarized the comments for efficiency and included a list of commenters. Comments are identified by commenter number herein in each summarized comment and response. Access to the individual public comments can be obtained by contacting SPS sending a request to [SEPAComments@seattleschools.org](mailto:SEPAComments@seattleschools.org) or calling 206-252-0990.

6. **Aesthetics/ Views.** Although the new building will not exceed the height of the existing building and the Checklist states that “No views in the immediate vicinity would be altered or obstructed,” residents walking on the street to the west and northwest would see a building rather trees in the adjacent Peppi’s Playground park. [Commenter 2]

As noted in the SEPA Checklist, there are no protected views in the vicinity of the project. A small portion of Peppi’s Playground would be obstructed from views

on 31<sup>st</sup> Ave. However, the new addition would be consistent with the height of the existing building and existing land uses and views of the school.

SEPA Document Reference B.10.

7. **Noise. Daily construction noise will have significant impacts on neighbors. The new building will also extend “echo chamber” that focuses daily and nightly noise toward residences to the north and west of the school. I have noticed several basketball players in the covered area with a boom box playing loud music. The dribbling of the basketball and music was easily audible at neighbor’s porches on Spruce Street to the north and 31<sup>st</sup> Avenue to the west. [Commenter 2]**

As stated in the SEPA Checklist construction activities are permitted to exceed the established maximum level by 25 dB(A) by the Seattle Noise Control Ordinance (SMC 25.08.425). Maximum permissible sound levels established in SMC 25.08.425 may be exceed by construction activities between the hours of 7:00 a.m. and 10: p.m. on weekdays, and between the hours of 9:00 a.m. and 10:00 p.m. on weekends. However, while construction noise is permitted during evenings and weekends, construction would generally occur between 7:00 a.m. and 5:00 p.m. on weekdays.

Seattle Municipal Code [SMC] 25.08 establishes that the maximum allowable noise during weekday day time and evening hours (7:00 a.m. to 10:00 p.m.) is limited to 55 Leq (dBA) and the maximum allowable noise from one property to another within residential districts is reduced to 45 Leq (dBA) from 10:00 p.m. to 7:00 a.m. Noise levels resulting from the completed project are expected to adhere to the Seattle Noise Ordinance.

The existing basketball courts would not be impacted by the project.

SEPA Checklist Reference B.7.b.

8. **Water. The checklist seems sure that no water contamination would occur, while acknowledging a lot of nearby water like Frink Creek and Lake Washington. [Commenter 2]**

As described in the SEPA Checklist the project would not require any work over, in or adjacent to any surface water bodies. Best management practices would also be implemented during construction so that sediment originating from disturbed surfaced would be retained within the limit of disturbance to the maximum extent possible.

All runoff and waste materials from the completed project would be routed into the City’s existing storm and sewer. Additionally, bioretention planters would be added at the west and east ends of the new addition that manages the stormwater generated onsite. Construction would also comply with all measures specified the City’s Stormwater Code (SMC 22.800- 22.808)

SEPA Document Reference B.3.

**9. Noise. Request a hard stop of construction at 6 pm due to noise. [Commenter 1]**

As noted in the SEPA Checklist, construction would generally occur between 7:00 a.m. and 5:00 p.m. on weekdays.

SEPA Checklist Reference B.7.b.

**10. Land Use and Recreation. The overall open space at the site would be reduced by 10%. Cramming in over-development creates a less-livable city. Is it really necessary to cram more onto the site? [Commenter 2]**

The reduction in open space is acknowledged in the SEPA Checklist. The addition is being constructed in order to address critical capacity needs at Leschi Elementary. Additionally, current recreation facilities on the site would be maintained and there would continue to be substantial open space on the site following construction of the addition.

SEPA Document Reference A.11, B.12.b.

**11. Recreation. Enrollment capacity is expected to increase by 11%, while open space would reduce by 10%. So there will be 11 % more students with 10% less space to play in. This is part of a District-wide chipping away at playgrounds, as schools continue to have their play areas reduced. [Commenter 2]**

As discussed in the SEPA Checklist, despite the reduction in playground space, recreation at the current facilities onsite would be maintained and there would continue to be substantial open space on the site following construction of the addition.

SEPA Document Reference B.12.b.

**12. Historic and Cultural Resources. The Checklist states “the school does not appear to meet any of the six criteria for a designation as a Seattle Landmark.” The district said the same things about Wilson-Pacific and they were wrong. [Commenter 2]**

The Wilson Pacific School project is not related to the SEPA process for Leschi Elementary.

SEPA Document Reference B.13.

**13. Historic and Cultural Resources. The Checklist states a cultural resources literature review was conducted for the site, please make this review available to the public. [Commenter 2]**

Cultural resources reports are exempt from public disclosure under RCW 42.56.300. The cultural resource report findings are summarized in section B.13 of the SEPA Checklist. Members of the public can request a redacted copy of the cultural resources report.

SEPA Document Reference B.13.

- 14. Historic and Cultural Resources. The site, the neighborhood and the City have already lost some special history and the project area is classified as “Moderate Risk- Survey Recommended.” There are probable significant adverse impacts from the project on archeological and cultural resources and further environmental review should be done. [Commenter 2]**

Historic and cultural resources were evaluated in a Cultural Resources Assessment, which is summarized in Section B.13 of the Checklist. Note that the predictive model classification (“Moderate Risk”) does not take into account past development, which reduces the likelihood for intact cultural resources in this specific project area. The SPS SEPA Responsible Official is reviewing the revised SEPA Checklist and taking all comments received on the Draft SEPA Checklist into consideration in making a determination of the significance of impacts from the Leschi Elementary School project. An inadvertent discovery plan has also been developed as part of this project.

SEPA Document Reference B.13.

- 15. Historic and Cultural Resources. Please adopt the recommendation to develop an inadvertent discovery plan along with the recommendation to include notification of the Duwamish Tribe. [Commenter 2]**

SPS will develop an Inadvertent Discovery Plan (IDP) for this project, and the Duwamish Tribe will be listed in the IDP as one of the Tribes to be contacted in the event of the discovery of archaeological resources.

SEPA Document Reference B.13.d.

- 16. Traffic. There would an increase in 100 vehicular trips per day with peak traffic 7:15 am to 8:15 am and 2 pm to 3pm and no increase in school buses. [Commenter 2]**

Comment noted.

SEPA Document Reference B.14.f. and Appendix A: Traffic Impact Analysis.

- 17. Parking. The Checklist omits an analysis of parking impacts and only mentions traffic impacts. However, the transportation report in Appendix A discusses parking impacts. The Transportation Report notes that due to COVID-19 the school was closed and no direct measurements of school parking impacts were made. There are 31- onsite striped spaces accessed from E Yesler Way. [Commenter 2]**

The SEPA Checklist incorporates and refers to the *Leschi Elementary School Classroom Addition Transportation Technical Report* (Heffron Transportation, Inc., August 14, 2020), which presents the results of detailed parking analysis, including analysis of potential project-related parking impacts. The analysis was performed consistent with standard practice for preparing traffic and parking impact analyses as recommended by the Institute of Transportation Engineers (ITE) and required by the City of Seattle. The analysis approach is consistent with

that applied for most development projects, by which it is not possible to measure direct parking demand because the analysis is prepared before the project is constructed. The comment also paraphrases and restates some text from the referenced technical report.

SEPA Document Reference B.14.f.

- 18. Parking. The Transportation Report presumes that current on-street parking is higher than “normal” because of people working from home. The on-street parking utilization cited between 65% and 72% with unused parking spaces ranging from 94 to 125 within 800 feet of the site. The city considers utilization of 85% “effectively full” and the cited percentages are not that far from “full.” [Commenter 2]**

As stated in the referenced *Transportation Technical Report* in section 3.4.1:

*“...on-street parking within the site vicinity averaged 65% occupied midday, with about 120 unused spaces. This occupancy level reflected conditions with the school closed and many local residents likely remaining home due to the COVID-19 pandemic. Assuming morning residential demand in the vicinity under normalized conditions would be reduced to about 80% of the level observed in June 2020 and accounting for on-street parking demand associated with the school (both existing and with the classroom addition), overall school-day utilization is expected to remain between 59% and 73%. This is within the range of acceptable parking utilization by the City, and the impacts would not be considered significant.”*

SEPA Document Reference Appendix A.

- 19. Parking. The Transportation Report concludes that on street parking would not be “full” when adding daytime school parking or evening school events on an assumption that there will be “normalized” non-Covid-19 conditions and thereby reduced residential demand to “about 80% of the levels observed in June 2020.” The report concludes that there will not likely be a noticeable effect or significant impact on street parking, which seems incorrectly non-conservative given the actual observations. Adding in school parking demand will make on-street parking full, mitigation and/or further study by an EIS should occur. [Commenter 2]**

The estimate of reduced on-street parking demand (about 80% of observed levels) was based on observations and comparisons of on-street demand around other Seattle schools at various times of day and with and without school in session. Even with no change to the observed background study-area parking levels that reflected very high work-from-home levels (about 49% of adults in Seattle metro area were teleworking because of the pandemic per *Household Pulse Survey*, U.S. Census Bureau, August 19 through September 28, 2020), the potential added parking demand estimated to result from the classroom addition is not expected to cause utilization to exceed 76%. This is within the City’s range of acceptable

parking utilization, and the impacts would not be considered significant. The portion of employees working from home does not affect the analysis of evening event conditions.

SEPA Document Reference B.14.f.

## **APPENDIX A: TRAFFIC IMPACT ANALYSIS**



# TRANSPORTATION TECHNICAL REPORT

for the

## **Leschi Elementary School Classroom Addition**

PREPARED FOR:

**Seattle Public Schools**

PREPARED BY:



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**August 14, 2020**

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# 1. INTRODUCTION

This report presents the transportation impact analyses for the Seattle Public Schools' (SPS) proposed addition to Leschi Elementary School. The scope of analysis and approach were based on extensive past experience performing transportation impact analyses for projects throughout the City of Seattle, including numerous analyses prepared for Seattle Public Schools projects. This report documents the existing conditions in the site vicinity, presents estimates of project-related traffic, and evaluates the anticipated impacts to the surrounding transportation system including transit, parking, safety, and non-motorized facilities. These analyses were prepared to support the SEPA Checklist for this project.

At the time of this analysis, all Washington State schools were closed for the remainder of the 2019-20 school year due to the COVID-19 pandemic crisis and stay-at-home order issued in March 2020 by Governor Inslee. Therefore, the analyses were prepared using traffic data collected by the Seattle Department of Transportation (SDOT) in the vicinity between 2014 and 2019.

## 1.1. Project Description

SPS is proposing an addition at Leschi Elementary School, which is located at 135–32<sup>nd</sup> Avenue in the Leschi neighborhood of Seattle. The following sections describe the existing school site and the proposal.

### 1.1.1. Existing Site

The Leschi Elementary School site is bounded on south by E Yesler Way, on the west by 31<sup>st</sup> Avenue, on the north by E Spruce Street, and on the east by 32<sup>nd</sup> Avenue and a Seattle Park known as Peppi's Playground. The "L" shaped school building has 58,654 square feet (sf)<sup>1</sup> of floor area and is located toward the south and eastern portion of the site. There is a parking lot to the south of the building and play areas to the north and west.

The on-site surface parking lot has 31 striped spaces and is accessed from two one-way driveways on E Yesler Way. There is a small service area on the east side of the building where trash and recycling bins are stored and accessed from 32<sup>nd</sup> Avenue. The service area does not have formal marked parking spaces, but historical *Google Street View* images suggest it has been used by up to three vehicles. The large playground blacktop on the northwest portion of the site is made available for automobile parking for large special events and is accessed from a gated driveway on E Spruce Street.

School-bus load/unload occurs along the south side of E Spruce Street east of 31<sup>st</sup> Avenue. During the most recent academic year, the school was served by three full-size general education buses and two smaller special education (SPED) buses. A school load zone for automobiles is designated along the east side of 31<sup>st</sup> Avenue adjacent to the site. Signage at the entrance to the main parking lot notes that is not to be used for student drop-off or pick-up.

According to information published in *Building for Learning, Seattle Public Schools Histories, 1862-2000*,<sup>2</sup> construction of Leschi School began in February 1909 and then served approximately 300 students in grades 1 through 8 for about ten years. It became a K–6 school in 1938 when Washington Junior High School opened. The playfield was blacktopped during the 1950s and the school's site was enlarged to the south along 32<sup>nd</sup> Avenue. Enrollment peaked at 592 students for the 1958-59 school year. In 1961, the school was expanded and remodeled, adding seven classrooms, an administrative-health unit, a lunchroom-auditorium, a gymnasium, and covered playcourt. The 1909 structure was then demolished and replaced with an addition that opened in 1989.

<sup>1</sup> Existing total building area from King County Assessor, online property report, accessed June 2020.

<sup>2</sup> Nile Thompson and Carolyn J. Marr; *Building for Learning, Seattle Public Schools Histories, 1862-2000*; 2002.



From 2016 through 2020, enrollment ranged from 358 students (2019) to 402 students (2017).<sup>3</sup> The school currently has 58 employees.<sup>4</sup> The existing permanent school capacity is 369 students.<sup>5</sup>

### **1.1.2. Proposed Site Changes**

The proposed project would construct a four-classroom addition about 7,200 sf in size on the north side of the main school building and remodel some interior spaces of the existing building to convert classrooms on the first level to childcare space to support the school's existing before and after-school programs. The total capacity of the school would be increased to 420 students (a net increase of 51 students compared to current enrollment and capacity). With the classroom addition, the school could add between 6 and 11 new employees, increasing from 58 to between 64 and 69 staff.<sup>6</sup>

No other changes are proposed with this project that would affect the overall site, assembly spaces, buildings, on-site parking lots, or the site access driveways. The school-bus load/unload zones adjacent to the school on E Spruce Street would remain and no changes to the number of school buses is anticipated.<sup>7</sup> Figure 1 shows the site plan with the location of the proposed classroom addition.

Construction is planned to begin in summer 2021 with occupancy of the new classrooms by fall 2022. During construction, the students would remain in the building. Future analyses (without and with the project) presented in this report reflect year 2022 conditions.

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<sup>3</sup> Seattle Public Schools, P223 Enrollment Data for Basic Enrollment report, Oct. 2016, 2017, 2018, 2018, and Feb.2020.

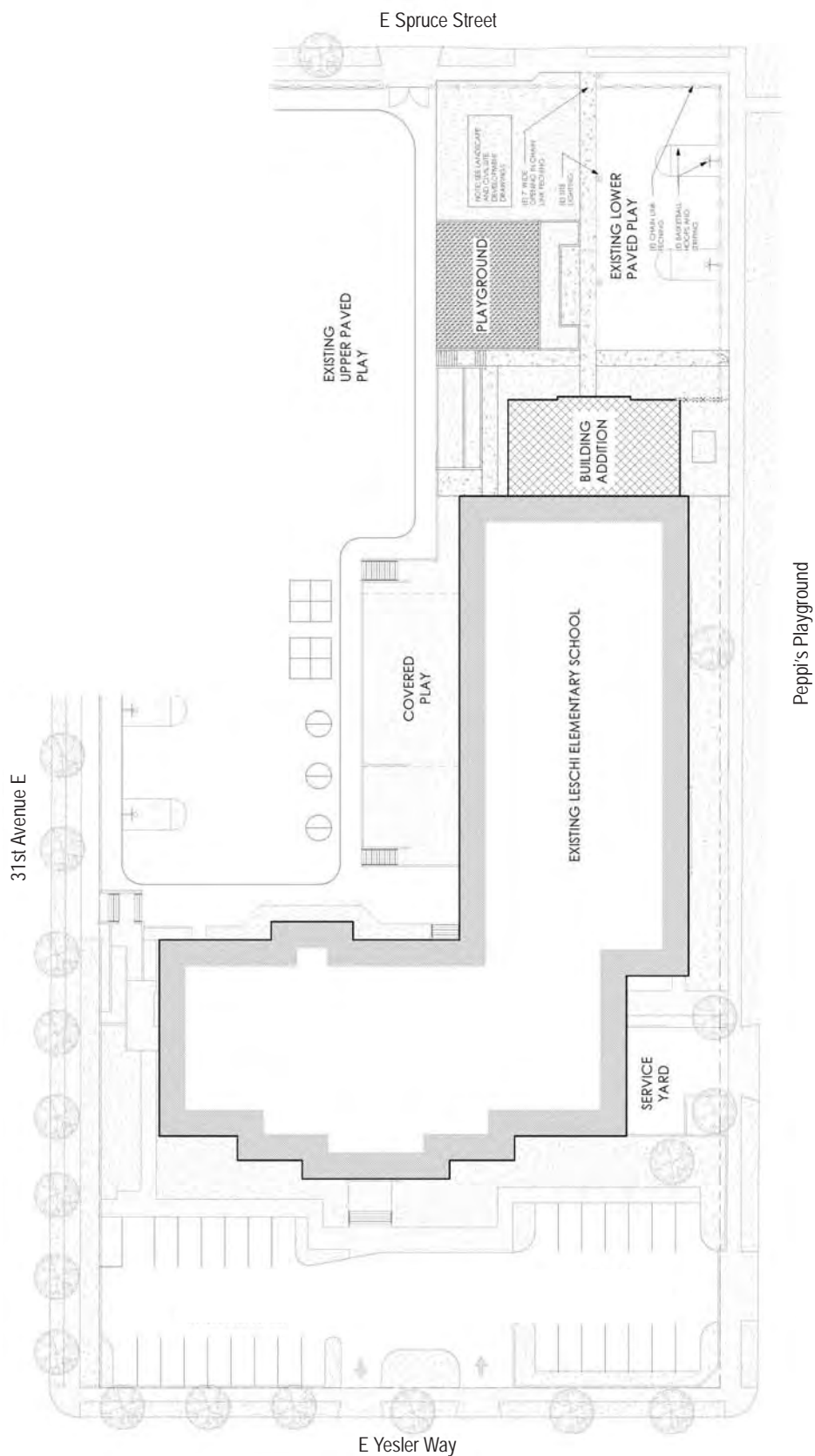
<sup>4</sup> Email communication, B. Fabella, June 2020.

<sup>5</sup> Seattle Public Schools, School Capacity Summary, Updated October 16, 2019. Reflects number of students that will fit into the school based on the number of teaching spaces and class sizes in the Weighted Staffing Standards (WSS) model.

<sup>6</sup> Email communication, B. Fabella, June 2020.

<sup>7</sup> Email communication, B. Fabella, July 2, 2020.





Source: TCF Architecture, PLLC, Pre-Design Set Sheet A1.01, June 5, 2020.

## Leschi Elementary School Classroom Addition

Figure 1  
Site Plan and Proposed  
Classroom Addition Location



## 2. BACKGROUND CONDITIONS

This section presents the existing and future conditions without the proposed project. The impacts of the proposed project were evaluated against these base conditions. For comparison, and to provide an analysis of potential new traffic and parking impacts, year 2022 without-project conditions assume Leschi Elementary School would operate at its current enrollment capacity (369 students). The following sections describe the existing roadway network, traffic volumes, traffic operations (in terms of levels of service), traffic safety, transit facilities, non-motorized facilities, and parking.

Figure 2 shows the project site location and vicinity. Four off-site intersections plus the site access driveways were selected for study based on the size of the proposed project (in terms of added student capacity), vicinity traffic counts, and travel routes used by family drivers, buses, and staff to access and egress the site area. The following study area intersections were identified for analysis for both the morning and afternoon peak hours.

- E Yesler Way / 32<sup>nd</sup> Avenue / 32<sup>nd</sup> Avenue S
- E Spruce Street / 31<sup>st</sup> Avenue
- E Yesler St / 31<sup>st</sup> Avenue / 31<sup>st</sup> Avenue S
- E Spruce Street / 32<sup>nd</sup> Avenue

### 2.1. Transportation Network

#### 2.1.1. Existing Network

The surrounding area predominantly consists of single-family residences, with some multi-family and commercial development to the west along E Yesler Way. Key roadways that serve the site are described below. Roadway classifications were obtained from the City of Seattle's (City's) *Street Classification Maps*.<sup>8</sup> Speed limits are 25 miles per hour (mph) on arterials (unless otherwise marked) and 20 mph on local access streets. The following describes key roadways in the site vicinity.

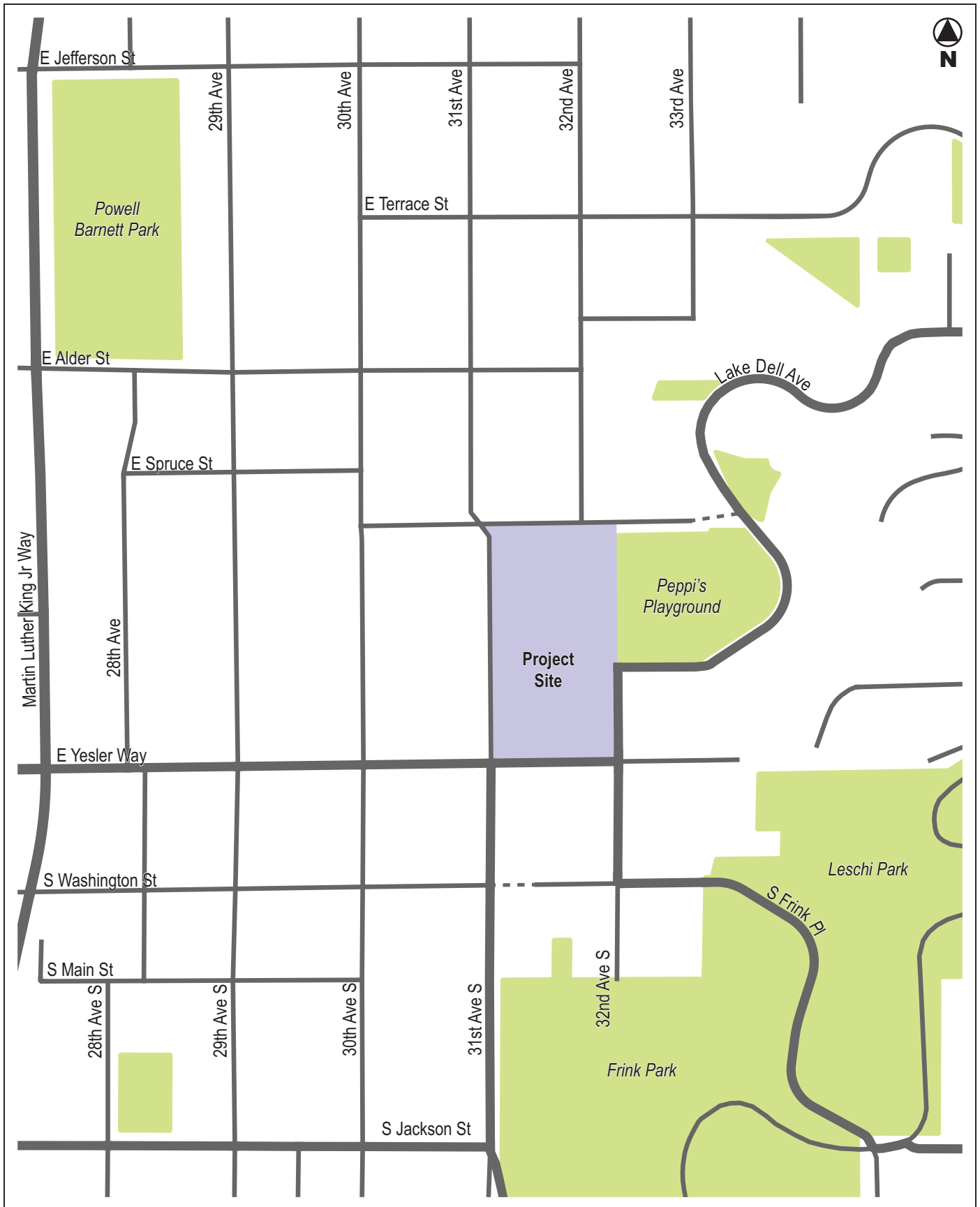
**E Yesler Way** is an east-west arterial that connects the Leschi neighborhood to Downtown Seattle. Between 32<sup>nd</sup> Avenue and Martin Luther King Jr. Way, it is designated as a Collector Arterial; west of Martin Luther King Jr. Way, it is a Minor Arterial. In the site vicinity, E Yesler Way has one travel lane in each direction with sidewalks, curbs, and parallel on-street parking on both sides. Its intersections with 31<sup>st</sup> Avenue / 31<sup>st</sup> Avenue S and 32<sup>nd</sup> Avenue/32<sup>nd</sup> Avenue S are all-way-stop controlled. There is a marked bicycle lane in the westbound (uphill) direction between 31<sup>st</sup> and 29<sup>th</sup> Avenues. Near the site, there is a School Zone speed limit of 20 mph in effect when beacons are flashing.

**31<sup>st</sup> Avenue / 31<sup>st</sup> Avenue S** is a north-south roadway between E Cherry Street to the north and the Mount Baker neighborhood to the south. North of E Yesler Way, 31<sup>st</sup> Avenue is a local access residential street; south of E Yesler Way, it is a Collector Arterial. At its intersection with E Spruce Street, the north leg is off-set from the south leg by about 40 feet and both intersections are currently uncontrolled. Near the site, it has sidewalks and curbs on both sides. North of E Yesler Way, parking is allowed on the west side; on the east side adjacent to Leschi Elementary School, the curb-side is signed for 15-minute school load only in the morning and afternoon with no parking all other times. South of E Yesler Way, there is a bike lane on the west (southbound) side and no parking on either side.

**32<sup>nd</sup> Avenue / 32<sup>nd</sup> Avenue S** is a short north-south roadway that connects between Lake Dell Avenue on the north and a dead-end at Frink Park on the south. The two-block segment between S Washington Street and Lake Dell Avenue is designated as a Collector Arterial. It has curbs and sidewalks on both sides with parking allowed on the east side north of E Yesler Way and on the west side south of E Yesler Way. It is signed as a School Zone with speed limit of 20 mph when children are present.

<sup>8</sup> Seattle Department of Transportation (SDOT), Street Classification Maps, accessed June 2020.





## Leschi Elementary School Classroom Addition

Figure 2  
Site Location and Vicinity





### 2.1.2. Planned Improvements

The following plans and programs were reviewed to determine if any planned transportation improvements could affect the roadways and intersections near Leschi Elementary School by 2022 when the classroom addition project is planned to be complete and occupied.

***City of Seattle's Proposed 2020-2025 Proposed Capital Improvement Program (CIP)***<sup>9</sup> – No improvements to the transportation network were identified in the site vicinity.

***Adopted Seattle Bicycle Master Plan (BMP)***<sup>10</sup> – The plan proposes future improvements along several roadways within the site vicinity. A neighborhood greenway (low-speed, low-volume streets that are designed to be shared by pedestrian, bicycle, and vehicular traffic) is recommended along 29<sup>th</sup> Avenue west of the site; a neighborhood greenway local connector is recommended along 31<sup>st</sup> Avenue north of E Yesler Way adjacent to the site. The *Seattle Bicycle Master Plan – 2019-2024 Implementation Plan*<sup>11</sup>, which defines the priorities of the projects, does not identify any of these projects for implementation by 2022 when the classroom addition would be complete and occupied.

***Seattle's Neighborhood Greenway Network***<sup>12</sup> – Neighborhood greenway information provided by SDOT indicates no additional greenways currently in design or planning stages in the site vicinity.

***Levy to Move Seattle – Workplan Report***<sup>13</sup> – This document outlines SDOT's workplan to deliver citywide transportation projects and services funded in part or in full by the *Levy to Move Seattle* (approved by voters in 2015). The nine-year workplan (2016-2024) documents achievements and challenges and sets the agency's plan for future years. There are no projects defined in the site vicinity.

None of the above planning documents included any transportation improvements that would affect the roadway network operations or intersection capacity within the study area by 2022. However, SDOT's *Your Voice, Your Choice*<sup>14</sup> program, a participatory budgeting initiative in which Seattle residents decide how to spend a portion of the City's budget on small-scale park and street improvements, lists several changes being implemented in response to higher vehicle speeds and volumes near Leschi Elementary School. The planned enhancements would include the following:

- Install speed humps along 31<sup>st</sup> Avenue between E Yesler Way and E Alder Street (exact locations to be determined);
- Install speed humps along 32<sup>nd</sup> Avenue between E Spruce Street and E Alder Street (exact locations to be determined);
- Install school zone flashing beacons for westbound Lake Dell Avenue traffic;
- Install school zone flashing beacons for northbound 31<sup>st</sup> Avenue S traffic;
- Install a marked crosswalk on the west leg of the intersection at 31<sup>st</sup> Avenue and E Spruce Street;
- Install new "Stop" signs and stop bars for east-west traffic on E Spruce Street at 31<sup>st</sup> Avenue; and
- Restrict parking within the intersection of 30<sup>th</sup> Avenue and E Spruce Street.

SDOT anticipated construction on the above changes as soon as fall/winter 2020. Therefore, they were assumed to be in place for the 2022 analysis presented in this report. However, it is noted that SDOT's July 7, 2020 budget presentation addressed the impacts of COVID-19 and the West Seattle Bridge

<sup>9</sup> City of Seattle, 2019.

<sup>10</sup> City of Seattle, March 2015.

<sup>11</sup> SDOT, June 13, 2019.

<sup>12</sup> <https://www.seattle.gov/transportation/projects-and-programs/programs/greenways-program>, Map updated January 24, 2020, Accessed June 2020.

<sup>13</sup> SDOT, November 2018.

<sup>14</sup> <https://www.seattle.gov/transportation/projects-and-programs/programs/pedestrian-program/vyvc-program/vyvc-district-3>, accessed June 2020.



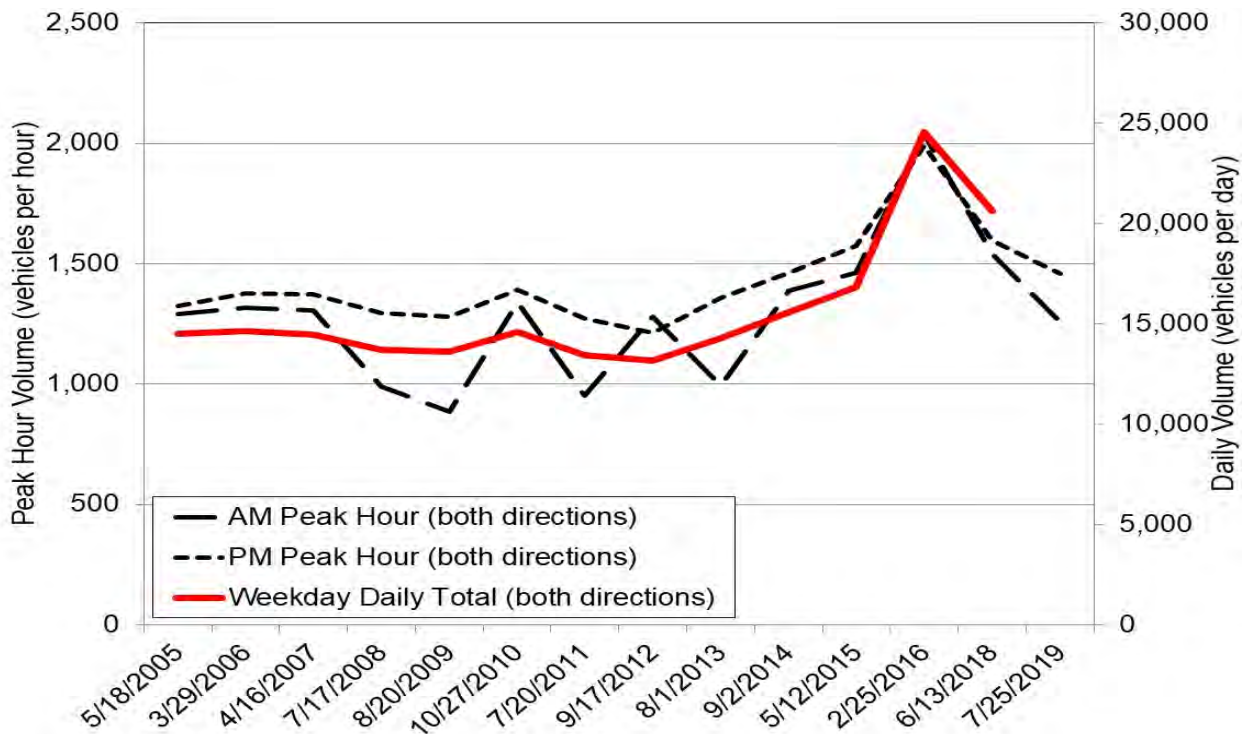
closure and repair investigation. Due to a loss of revenue, SDOT has paused several major transportation improvement projects, including *Safe Routes to School* and *Safety Corridor* projects as well as *Your Voice, Your Choice* projects.

## 2.2. Traffic Volumes

### 2.2.1. Historical Traffic Volumes

Historical peak hour and daily traffic counts collected by SDOT on Martin Luther King Jr. Way near E Yesler Way were reviewed and compiled for the years between 2005 and 2019 and are shown on Figure 3.<sup>15</sup> As shown, there was a sharp increase in peak hour and daily volumes between 2015 and 2017 when Phase 1 of the 23<sup>rd</sup> Avenue Corridor Improvement project (between S Jackson and E John Streets) was under construction in the vicinity and diverted noticeable volumes to the Martin Luther King Jr. Way corridor. The Phase 1 segment of the 23<sup>rd</sup> Avenue project was completed and re-opened to traffic in February 2017, though Phase 2 (south of S Jackson Street) continued in May 2018.<sup>16</sup> As shown, by July 2019, peak hour volumes had returned to levels consistent with the prior ten years.

Figure 3. Traffic Volumes on Martin Luther King Jr. Way near E Yesler Way – 2005 to 2019



Source: SDOT Traffic Count Database, June 2020. 2019 volumes from intersection turning movement counts; daily volumes unavailable.

Traffic count data on E Yesler Way near the school site (west of 31<sup>st</sup> and 32<sup>nd</sup> Avenues) were also compiled to determine how volume changes by time of day. SDOT's most recent data were collected in September 2014 and November 2015. As indicated in the chart of traffic data on Martin Luther King Jr. Way, volumes during 2014 and 2015 were similar to levels in 2019.

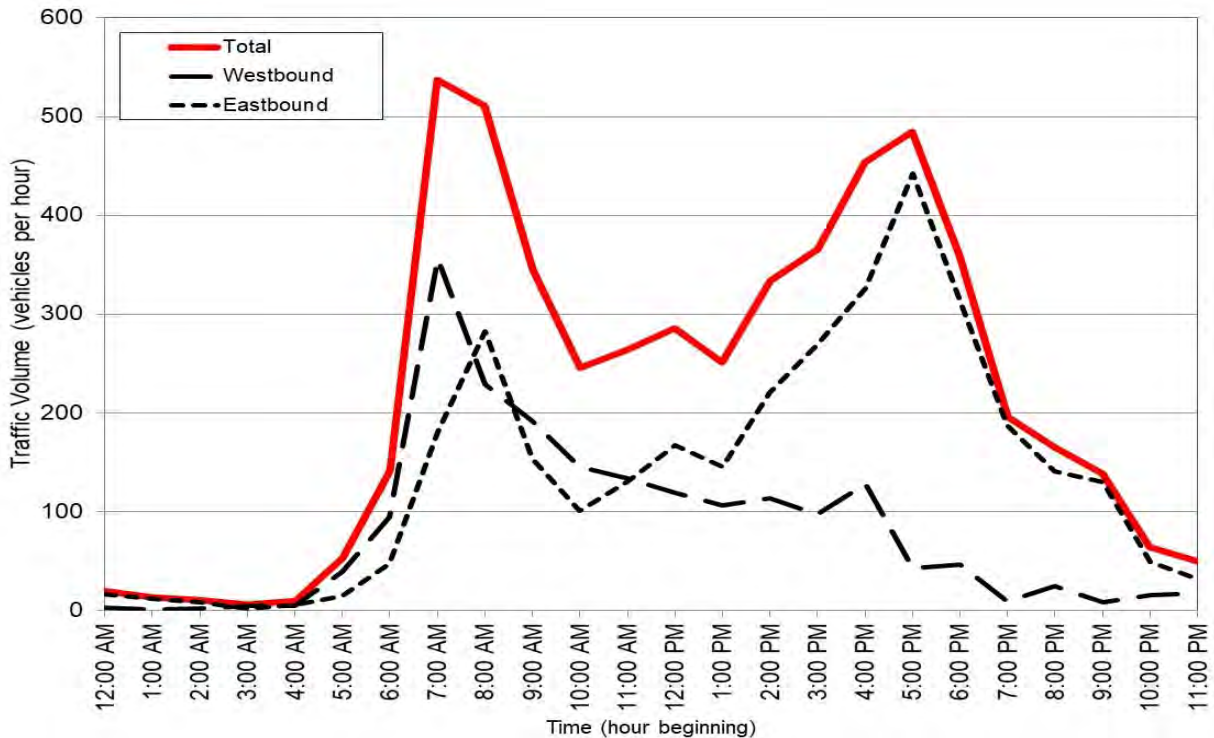
Figure 4 shows that traffic volumes on E Yesler Way follow the traditional commuter patterns in Seattle where volumes peak in the morning and afternoon with lower volumes midday.

<sup>15</sup> SDOT, 24-hour machine count database, 2012 – 2018.

<sup>16</sup> SDOT, <https://www.seattle.gov/transportation/projects-and-programs/programs/maintenance-and-paving/current-paving-projects/23rd-ave-corridor-improvements>, accessed, June 2020.



**Figure 4. Hourly Traffic Volumes on E Yesler Way west of 31<sup>st</sup> & 32<sup>nd</sup> Avenues – 2014/2015**



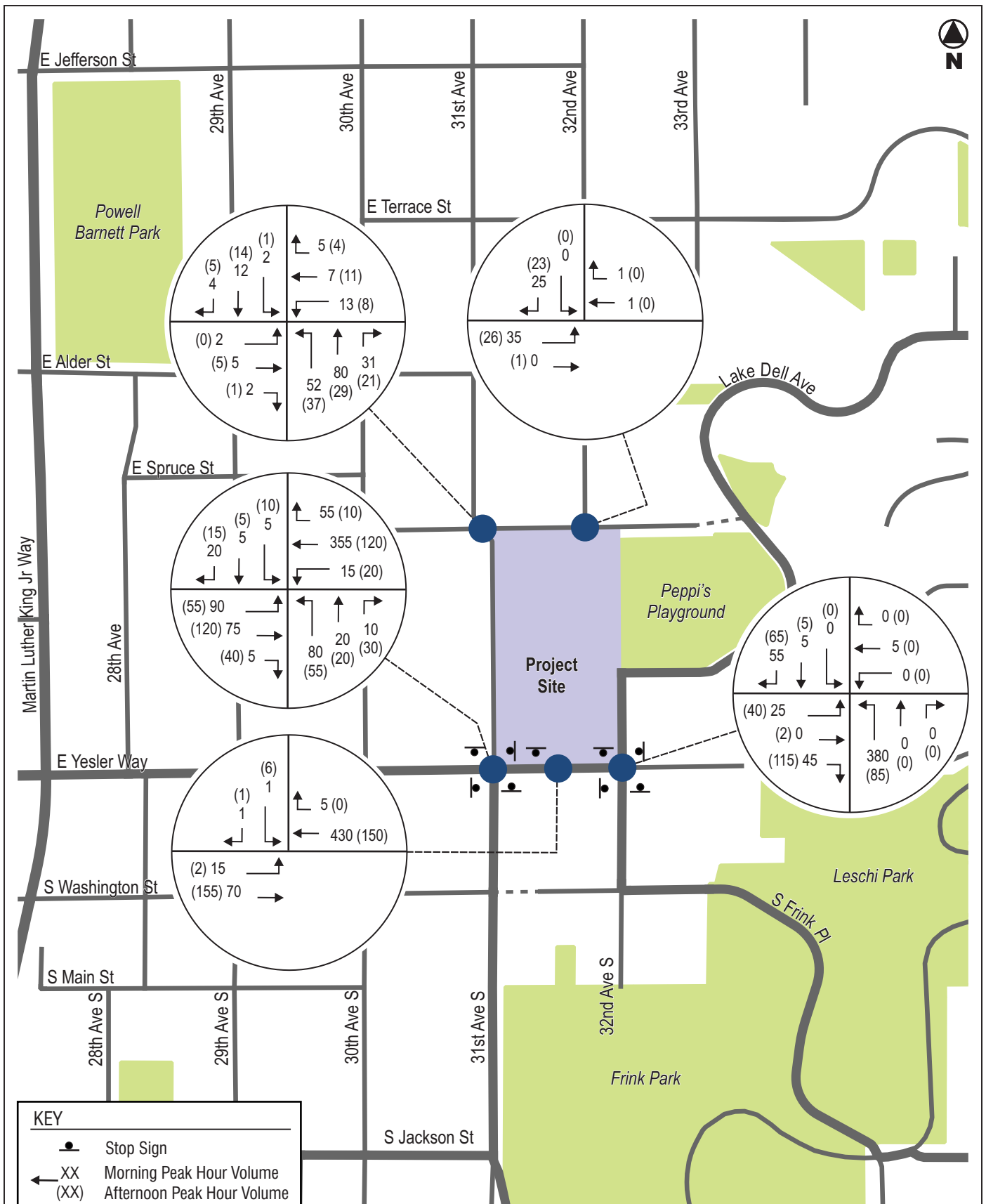
Source: Counts performed by SDOT on E Yesler Way. Total volume from count w/o 32<sup>nd</sup> Avenue, Nov. 2015; eastbound volume from count w/o 31<sup>st</sup> Avenue, Sept. 2014; and westbound estimated by Heffron Transportation, Inc.

### 2.2.2. Existing Traffic Volumes

Due to state-wide school closures that were in effect at the time of the analysis, it was not possible to collect new traffic data specifically for the Leschi Elementary School Classroom Addition project. However, SDOT traffic data collected in the vicinity were available and were compiled for use in this analysis. Turning movement counts were performed at the E Spruce Street / 31<sup>st</sup> Avenue intersection from 6:00 A.M. to 7:00 P.M. on Thursday, September 19, 2019. Machine counts performed on E Yesler Way, Lake Dell Avenue, and 31<sup>st</sup> Avenue were all compiled and paired with the available turning movement data to derive turning movement estimates for the study-area intersections. Figure 5 shows the estimated existing morning and afternoon peak hour traffic volumes at study area intersections.

### 2.2.3. Forecast Without-Project Traffic Volumes

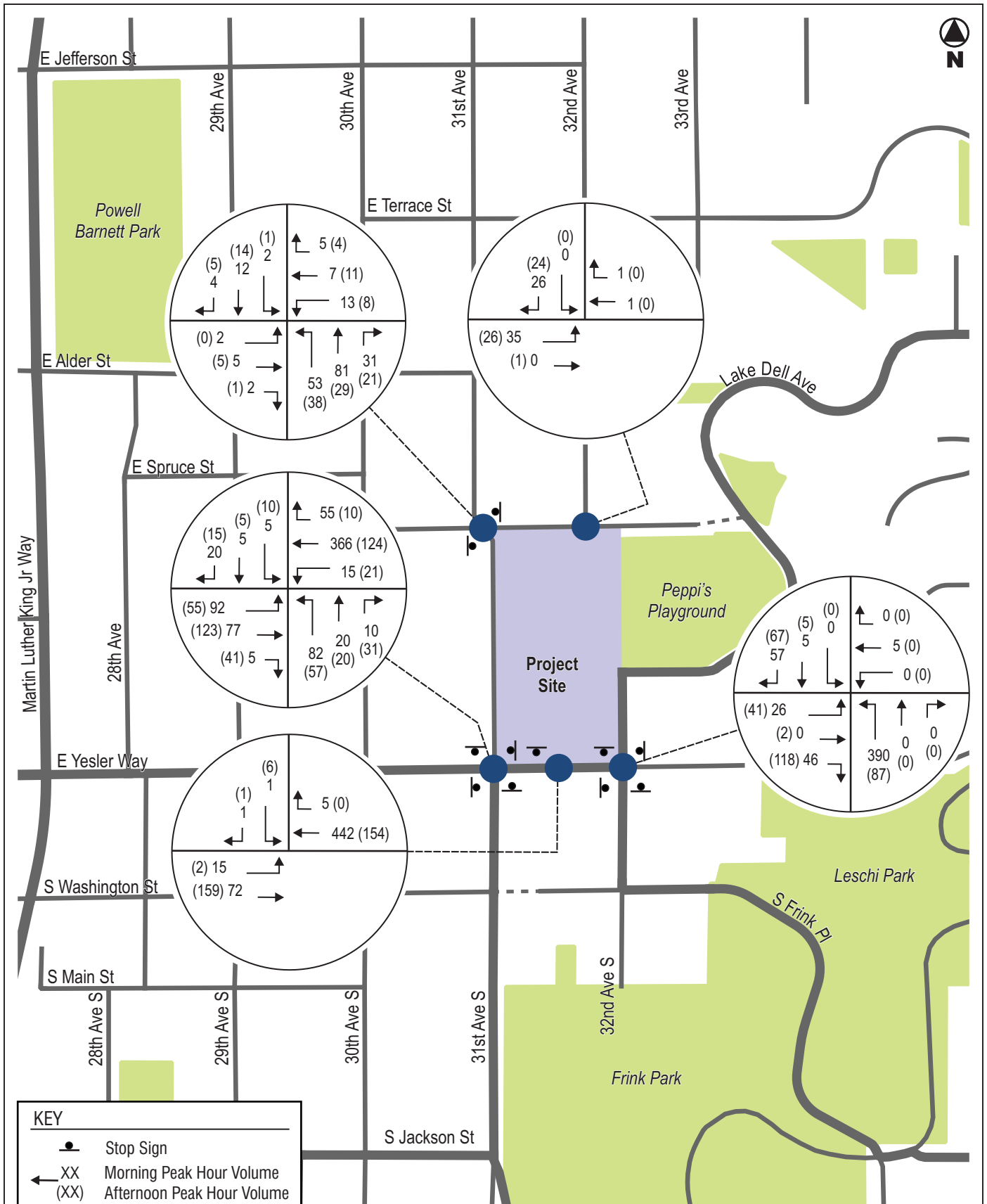
The classroom addition is planned to be occupied by fall 2022. Without-project traffic forecasts for 2022, were developed after review of study-area traffic growth patterns and potential for new pipeline development in the vicinity. The Seattle Department of Construction & Inspection's (SDCI's) Property and Building Activity permit map was reviewed to determine if any large future development projects are planned that could potentially generate additional traffic in the project study area. No development projects were identified that are expected to add noticeable traffic to study-area intersections during the analysis peak hours by 2022. Therefore, despite relatively unchanged traffic volumes over the longer term described previously, a 1.0% annual growth rate was applied to the estimated non-school traffic volumes for three years to reflect year 2022 volumes without the classroom addition project. This is consistent with rates used for traffic analyses of other developments in Seattle. Figure 6 shows the forecast 2022-without-project morning and afternoon hour traffic volumes.



# Leschi Elementary School Classroom Addition

Figure 5  
Existing Traffic Volumes  
Morning and Afternoon Peak Hours





# Leschi Elementary School Classroom Addition

Figure 6  
Forecast 2022 Without-Project Traffic Volumes  
Morning and Afternoon Peak Hours





## 2.3. Traffic Operations

Level of service (LOS) is a qualitative measure used to characterize traffic operating conditions. Six letter designations, “A” through “F,” are used to define level of service. LOS A is the best and represents good traffic operations with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. The City of Seattle does not have adopted intersection level of service standards; however, project-related intersection delay that causes a signalized intersection to operate at LOS E or F, or increases delay at a signalized intersection that is projected to operate at LOS E or F without the project, may be considered a significant adverse impact. The City may tolerate delays in the LOS E or F range for minor movements at unsignalized intersections where traffic control measures (such as conversion to all-way-stop-control or signalization) are not applicable or desirable.

Levels of service for the study area intersections were determined using the methodology in the *Highway Capacity Manual, Sixth Edition [HCM 6]*.<sup>17</sup> Appendix A includes level of service thresholds and definitions for unsignalized intersections. Delay at unsignalized intersections is determined for vehicles that must stop or yield for oncoming traffic; it is related to the availability of gaps in the main street's traffic flow and the ability of a driver to enter or pass through those gaps. All level-of-service calculations were performed using the *Synchro 10.3* traffic operations analysis software and reported using the *HCM 6* module. Table 1 summarizes existing and forecast 2022-without-project levels of service at the study-area intersections for morning and afternoon peak hours. As shown, all intersections currently operate at LOS B or better overall. The projected growth in background traffic and planned traffic control change at the E Spruce Street / 31<sup>st</sup> Avenue intersection are expected to change delays for some movements, but all are expected to continue operating at good levels of service during both peak hours in 2022 without the project.

Table 1. Level of Service Summary – Existing and 2022-Without-Project Conditions

Intersections	Morning Peak Hour (7:15–8:15 A.M.)				Afternoon Peak Hour (2:00–3:00 P.M.)			
	Existing		Without Project		Existing		Without Project	
	LOS <sup>1</sup>	Delay <sup>2</sup>	LOS	Delay	LOS	Delay	LOS	Delay
<b>All-Way-Stop Controlled</b>								
E Yesler Way / 32 <sup>nd</sup> Ave / 32 <sup>nd</sup> Ave S	B	11.1	B	11.3	A	7.9	A	8.0
E Yesler Way / 31 <sup>st</sup> Ave / 31 <sup>st</sup> Ave S	B	13.4	B	13.9	A	9.5	A	9.5
<b>Two-Way-Stop Controlled</b>								
E Spruce Street / 31 <sup>st</sup> Avenue	B	10.9	A	3.9	A	9.3	A	4.2
Northbound All Movements <sup>3</sup> / Left <sup>4</sup>	B	12.8	A	7.5	B	11.0	A	7.4
Eastbound Left <sup>3</sup> / All Movements <sup>4</sup>	A	7.2	B	10.4	A	0.0	B	10.3
Westbound Left <sup>3</sup> / All Movements <sup>4</sup>	A	7.5	B	13.7	A	7.4	B	13.1
Southbound All Movements <sup>3</sup> / Left <sup>4</sup>	A	9.7	A	7.6	A	9.3	A	7.5
E Spruce Street / 32 <sup>nd</sup> Avenue <sup>3</sup>	A	7.6	A	7.6	A	7.6	A	7.6
Westbound Left Turn	A	7.4	A	7.4	A	7.5	A	7.5
Northbound Movements	A	8.5	A	8.5	A	8.5	A	8.5

Source: Heffron Transportation, Inc., June 2020.

1. Level of service.
2. Average seconds of delay per vehicle.
3. Intersection is currently uncontrolled and evaluated as stop-controlled for north-south legs for existing conditions.
4. SDOT's Your Voice, Your Choice program will install stop signs on east and west legs in 2020.

<sup>17</sup> Transportation Research Board [TRB], 2016.



## 2.4. Parking Supply and Occupancy

On-street parking at and around the Leschi Elementary School site was surveyed in June 2020 to determine the existing parking supply and occupancy. The results of those surveys were used to estimate how parking occupancy could be affected by new parking demand generated by the proposed classroom addition project (which is presented later in Section 3.4). The following sections describe the on-street parking supply as well as the observed parking occupancy and utilization rates.

### 2.4.1. Methodology and Study Area

Detailed on-street parking studies were performed and supply was documented according to the methodology outlined in the City's Tip #117.<sup>18</sup> Although Tip #117 was created for another purpose, it outlines the City's preferred methodology to determine the number and type of on-street parking spaces that may exist within a defined study area, and how much of that supply is currently utilized at different times of the day. This analysis was completed to document the existing supply and how it is utilized.

The study area for the on-street parking analysis included all roadways within an 800-foot *walking* distance from the school site, as is typically required by the City of Seattle. The 800-foot walking distance results in a study area that extends to just west of 29<sup>th</sup> Avenue S, E Terrace Street to the north, just north of S Jackson Street, and just east of Leschi Park. Details about parking supply and occupancy are provided in the following sections. The study area consists primarily of single-family residential land uses. Many of the residential garages and driveways in the vicinity are accessed via alleys; area residents also regularly use on-street parking.

### Existing On-Street Parking Supply

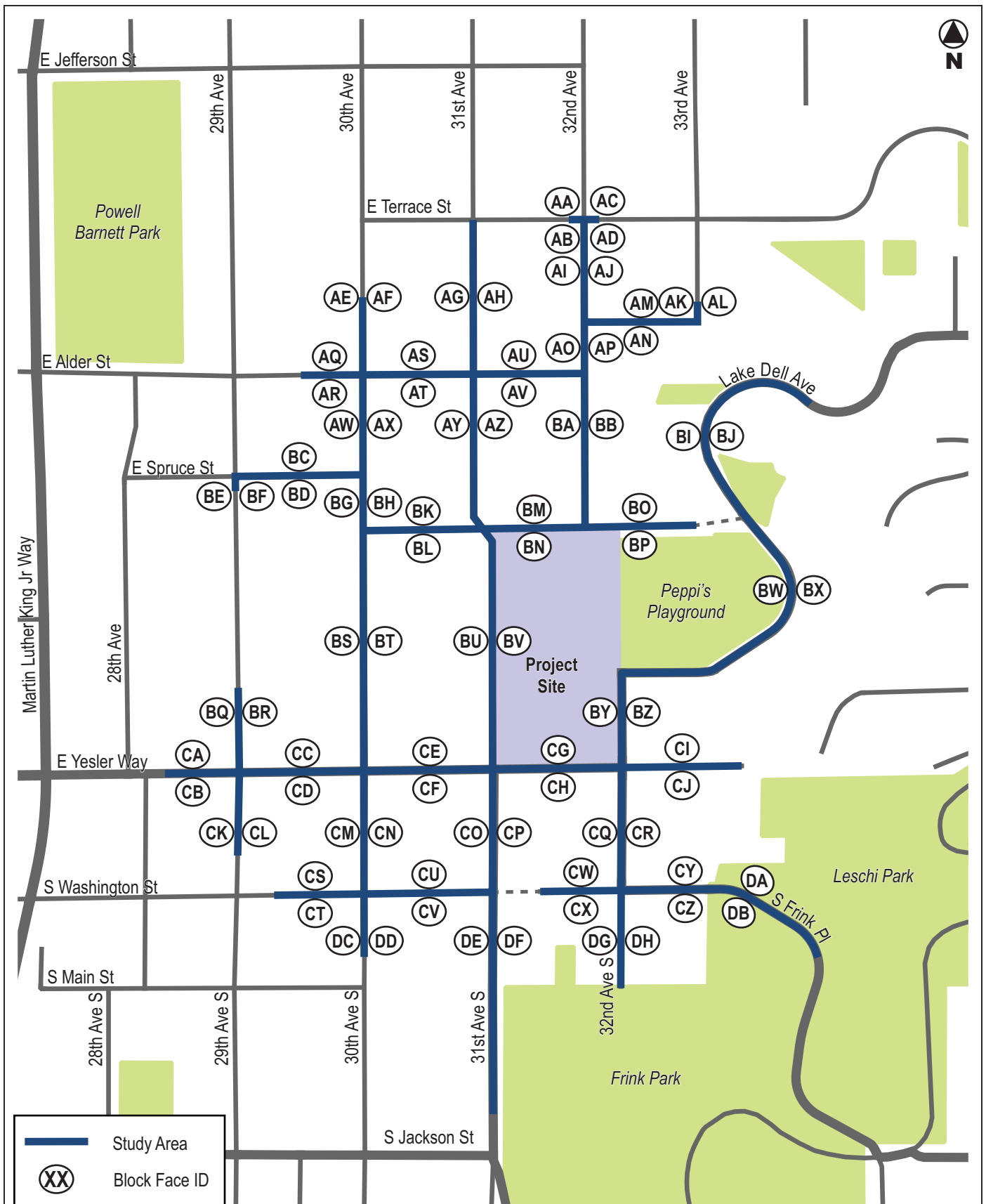
The study area was separated into individual block faces. A block face consists of one side of a street between two cross-streets. For example, the north side of E Yesler Way, between 29<sup>th</sup> Avenue S and 30<sup>th</sup> Avenue S is one block face (identified as block face 'CC' for this study). The study area and block face designations are shown on Figure 7.

Each block face was measured and analyzed to determine the number of legal on-street parking spaces. First, common street features—such as driveways, fire hydrants, and special parking zones— and their buffer requirements were identified. No on-street parking capacity was assumed within 30 feet of a signalized or marked intersection, within 20 feet of an uncontrolled intersection, within 15 feet on either side of a fire hydrant, or within 5 feet on either side of a driveway or alley. The remaining unobstructed lengths between street features were converted to legal on-street parking spaces using values in the City's Tip #117. Based on extensive past experience of Heffron Transportation preparing on-street parking utilization studies, a trend has been observed that the increased popularity of smaller cars and the tendency for drivers to park closer together in areas with higher utilization can result in more available supply than would be suggested by the Tip #117 guidance. Detailed parking supply by block face is provided in Appendix B.

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<sup>18</sup> Seattle Department of Planning and Development, Tip 117, *Parking Waivers for Accessory Dwelling Units*, Updated May 12, 2011.





## Leschi Elementary School Classroom Addition

Figure 7  
Study Area for On-Street Parking  
Occupancy Surveys





## Leschi Elementary School Classroom Addition Transportation Technical Report

The parking supply survey determined that there are 370 on-street parking spaces within the study area and 334 have no signed restrictions. After accounting for school-bus and time-dependent no parking zones along the school frontage (totaling 30 spaces), the total supply is 340 spaces in the morning, 347 spaces mid-morning, and 347 spaces in the evening.

### On-Street Parking Occupancy

At the time of this analysis, all Washington State schools were closed for the remainder of the 2019-20 school year due to the COVID-19 pandemic crisis and stay-at-home order issued in March 2020 by Governor Inslee. Due to this crisis and despite the lifting of the stay-home order on June 1, 2020, many residents have still opted to remain at home—many working from home and home-schooling students. As a result, midday on-street parking demand within Seattle residential neighborhoods, such as Leschi, is likely higher than normal, while school-related demand was not occurring.

Parking occupancy counts were performed in June 2020. School-day occupancy counts were performed during early morning (between 7:00 and 7:45 A.M.), the time when staff typically begin to arrive at the school, and mid-morning (between 10:30 and 11:15 A.M.), the time when school-day parking is typically highest. Evening counts were performed (between 7:30 and 8:15 P.M.) when occasional school events could occur. The counts were performed on Wednesday, June 24 and Thursday, June 25, 2020. The counts for each day were compiled and averaged and results are summarized in Table 2. On-street parking utilization was calculated using the methodology described in Tip #117 and is the number of vehicles parked on-street divided by the number of legal on-street parking spaces within the study area or on a specific block face. The study area utilization totals are also shown. Detailed summaries of the on-street parking occupancy by block face for all counts are provided in Appendix B.

Table 2. On-Street Parking Demand Survey Results – June 2020

Time Period Surveyed	Parking Supply	Total Vehicles Parked	% Utilization
<i>Weekday Early Morning (7:00 to 7:45 A.M.)</i>			
Wednesday, June 24, 2020	340	245	72%
Thursday, June 25, 2020	340	246	72%
<b>Average</b>	<b>340</b>	<b>246</b>	<b>72%</b>
<i>Weekdays Mid-Morning (10:30 to 11:15 A.M.)</i>			
Wednesday, June 24, 2020	347	222	64%
Thursday, June 25, 2020	347	231	67%
<b>Average</b>	<b>347</b>	<b>227</b>	<b>65%</b>
<i>Weekday Evenings (7:30 to 8:15 P.M.)<sup>b</sup></i>			
Wednesday, June 24, 2020	347	251	72%
Thursday, June 25, 2020	347	230	66%
<b>Average</b>	<b>347</b>	<b>241</b>	<b>69%</b>

Source: Heffron Transportation, Inc., June 2020

As shown, the surveys determined that parking utilization ranged from 64% to 72% occupied; the number of unused parking spaces ranged from 94 to 125 spaces over six separate observations. For the purpose of evaluating the potential on-street parking impacts associated with new development, the City considers utilization rates of 85% or higher to be effectively full.



It is noted that the total demand also does not reflect school-related demand that likely occurs on-street when school is in session and operating normally. In addition, published residential parking accumulation rates for suburban areas<sup>19</sup> suggest weekday demand typically begins to decline after 6:00 A.M. when residents leave their homes for work and school. By mid-morning demand may be 36% to 50% of the overnight peak demand. While not all residential demand in the Leschi study area occurs on-street (since many residents have some off-street parking), the residential demand observed during the early- and mid-morning periods are likely higher than would be expected during normal (non COVID-19) conditions. This is consistent with observations and parking demand surveys performed around numerous other Seattle school sites, which show declines in on-street demand of 15% to 25% between 7:00 and 10:00 A.M. including on-street demand generated by elementary schools.

#### **2.4.2. Off-Street Parking**

An on-site surface parking lot with 31 striped spaces is accessed from E Yesler Way. There is also a small service area on the east side of the building where trash and recycling bins are stored and accessed from 32<sup>nd</sup> Avenue. The service area does not have formal marked parking spaces, but historical *Google Street View* images suggest it has been used by up to three vehicles.

School-day parking demand at elementary schools is primarily influenced by staffing levels and family-volunteer activity. Due to the state-wide school closures associated with the COVID-19 pandemic, representative field counts of on-site parking demand were not possible at the time of this analysis. Parking observations in June 2020 on the same days and time periods as the on-street parking occupancy counts found negligible demand (average of two vehicles in the early morning, three in late morning, and zero vehicles during the evening counts). This demand may have been generated by building maintenance or other employees. However, historical Google Earth images were reviewed for weekday parking demand conditions. Two images—one from May 2017 and one from May 2018—appear to reflect midday conditions on weekdays. These images showed 31 and 35 vehicles parked on the site, respectively. In total, the available historical imagery suggests mid-weekday on-site demand of 31 to 38 vehicles.

### **2.5. Traffic Safety**

Collision data for the study area were obtained from SDOT's Open Data Portal for the period between January 1, 2017 and the most recent records available as of June 19, 2020 (3.4 years). The data were examined to determine if there are any unusual traffic safety conditions that could impact or be impacted by the proposed project. Table 3 summarizes the collision data.

Unsignalized intersections with five or more collisions per year and signalized intersections with 10 or more collisions per year are considered high collision locations by the City. As shown, all of the study area intersections averaged fewer than one collision per year, and none meet the criteria for a high collision location for the period of time evaluated. None of the reported collisions resulted in fatalities. Overall, these data do not indicate any unusual traffic safety conditions within the study area.

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<sup>19</sup> ITE, *Parking Generation*, 5<sup>th</sup> Edition, January 2019, Time of Day Distribution for Parking Demand, Multifamily Housing.

Table 3. Collision Summary (January 1, 2017 through June 19, 2020)

Unsignalized Intersections	Rear-End	Side-Swipe	Right Turn	Left Turn	Right Angle	Ped / Cycle	Other	Total for 3.4 Years	Avg / Year
E Yesler Way & 31 <sup>st</sup> Avenue	0	0	0	0	3	0	0	3	0.9
E Yesler Way & 32 <sup>nd</sup> Avenue	0	0	0	0	1	1	0	2	0.6
E Spruce Street & 31 <sup>st</sup> Avenue	0	0	0	0	0	0	0	0	0.0
E Spruce Street & 32 <sup>nd</sup> Avenue	0	0	0	0	0	0	0	0	0.0
Roadway Segment	Rear-End	Side-Swipe	Right Turn	Left Turn	Right Angle	Ped / Cycle	Other	Total for 3.4 Years	Avg / Year
E Yesler Way: between 31 <sup>st</sup> & 32 <sup>nd</sup> Avenues	1	0	0	0	0	0	2 <sup>a</sup>	3	0.9

Source: City of Seattle Department of Transportation, <https://data-seattlecitygis.opendata.arcgis.com/datasets/collisions>, June 19, 2020.

a. Other collisions included one vehicle that struck a parked vehicle and one collision with insufficient information to determine type.

## 2.6. Transit Facilities and Service

King County Metro Transit (Metro) provides bus service to the site. Transit stops are located directly in front of the school on E Yesler Way just west of 32<sup>nd</sup> Avenue. The stops are served by Metro Route 27, which provides all-day service seven days per week between Coleman Park (on Lakeside Avenue S) and Downtown Seattle with weekday headways (time between consecutive buses) of 20 to 30 minutes.

School bus transportation is made available to Leschi Elementary School students who qualify for transportation. The existing school is served by three full-size school buses and two smaller SPED buses.

## 2.7. Non-Motorized Facilities

Sidewalks exist on both sides of the streets that surround the project site and most streets beyond the site in the vicinity. The sidewalk on the north side of Lake Dell Avenue ends at Peppi's Playground. Beyond that point, sidewalk is only along the east side. There are marked crosswalks at the E Yesler Way intersections with 32<sup>nd</sup> Avenue (west leg) and 31<sup>st</sup> Avenue (north, east, and south legs) and at the E Spruce Street intersections with 32<sup>nd</sup> Avenue (east and north legs) and 31<sup>st</sup> Avenue (south leg).

As described previously, the City's Bicycle Master Plan recommends a neighborhood greenway (low-speed, low-volume streets that are designed to be shared by pedestrian, bicycle, and vehicular traffic) along 29<sup>th</sup> Avenue and a greenway local connector along 31<sup>st</sup> Avenue. However, the timing of these projects is unknown and they are not expected to be completed by 2022.

### 3. PROJECT IMPACTS

This section describes the conditions that would exist with the Leschi Elementary School classroom addition project and the school operating at an enrollment capacity of up to 420 students. Vehicle trip estimates associated with the school addition were added to the 2022-without-project traffic volume forecasts. Level of service analyses were performed to determine the proposed project's impact on traffic operations in the study area. Parking demand and the potential change to on-street parking utilization was also estimated.

#### 3.1. Transportation Network

No changes to the surrounding roadway network, site frontages or site access are proposed.

#### 3.2. Traffic Volumes

The proposed project could result in some new vehicular, pedestrian, and bicycle activity on the surrounding transportation network. With the classroom addition, the school is expected to have an enrollment capacity of up to 420 students, an increase of 51 students from the school's current enrollment and capacity. The school is expected to generate an increase in daily and peak hour traffic compared to existing conditions. The following describes the method used to estimate project-generated traffic.

##### 3.2.1. School Trip Generation

Trip generation estimates for school projects are generally developed using one of two methods. For new schools, rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*<sup>20</sup> can be applied. ITE has compiled surveys of vehicle trip generation for existing sites throughout the United States, and has developed rates and equations based on variables such as number of students and school-building sizes. However, ITE's trip generation rates likely include suburban school sites in neighborhoods that are less dense than that surrounding the Leschi Elementary site and with substantial on-site parking. As a result, they may not reflect the more urban conditions of this school site.

For modernizations and/or expansions of existing schools, actual counts of the existing school can be used. This method works best for schools located in areas where school-related traffic can easily be isolated and identified, and traffic counts can be used to develop rates specifically for that school. Due to the COVID-19 pandemic crisis and stay-at-home order issued in March 2020 by Governor Inslee, all Washington State schools were closed for the remainder of the 2019-20 school year. As a result, it was not possible to collect trip generation data for the existing Leschi Elementary School. However, trip generation data have been collected for other elementary schools in Seattle that were being modernized, replaced or redeveloped. For this analysis, average morning arrival and afternoon dismissal peak hour trip generation rates were derived from video trip generation counts at five existing Seattle Schools: Schmitz Park (before it was closed), Arbor Heights, Loyal Heights, Olympic Hills, and Thornton Creek. The average morning peak hour trip generation rate was found to be 0.65 trips per student; the afternoon peak hour rate was found to be 0.47 trips per student. These rates are comparable to or higher than the average rates published for Elementary Schools (Land Use 520) in the *Trip Generation Manual* (0.67 trips per student in the morning peak hour and 0.34 trips per student in the afternoon peak hour). Since these rates were derived from counts at other Seattle elementary schools and reflect current trends related to family-vehicle drop-off and pick-up activities, they are most appropriate for use in evaluating the future conditions with the Leschi Elementary School classroom addition project and added enrollment capacity.

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<sup>20</sup> ITE, 10<sup>th</sup> Edition, September 2017.



## Leschi Elementary School Classroom Addition Transportation Technical Report

The derived rates were applied to the proposed new enrollment capacity at Leschi Elementary (420 students). Table 4 presents the resulting trip estimates for the expanded Leschi Elementary School. These estimates include school bus trips, employee trips, and family-vehicle trips. No change to the number of school buses serving the site is expected. As shown, the added enrollment capacity is estimated to increase trip generation at and around the site by 33 trips (18 in, 15 out) in the morning peak hour and by 24 trips (12 in, 12 out) in the afternoon peak hour.

Table 4. Leschi Elementary School Project – Trip Generation Estimates

Site Condition	Enrollment	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Leschi ES With Classroom Addition	420 students <sup>a</sup>	150	123	273	97	100	197
Existing Leschi Elementary School	369 students <sup>b</sup>	132	108	240	85	88	173
<b>Net Change</b>	<b>51 students</b>	<b>18</b>	<b>15</b>	<b>33</b>	<b>12</b>	<b>12</b>	<b>24</b>

Source: Heffron Transportation, Inc., June 2020.

a. Proposed future capacity of the school with classroom addition.

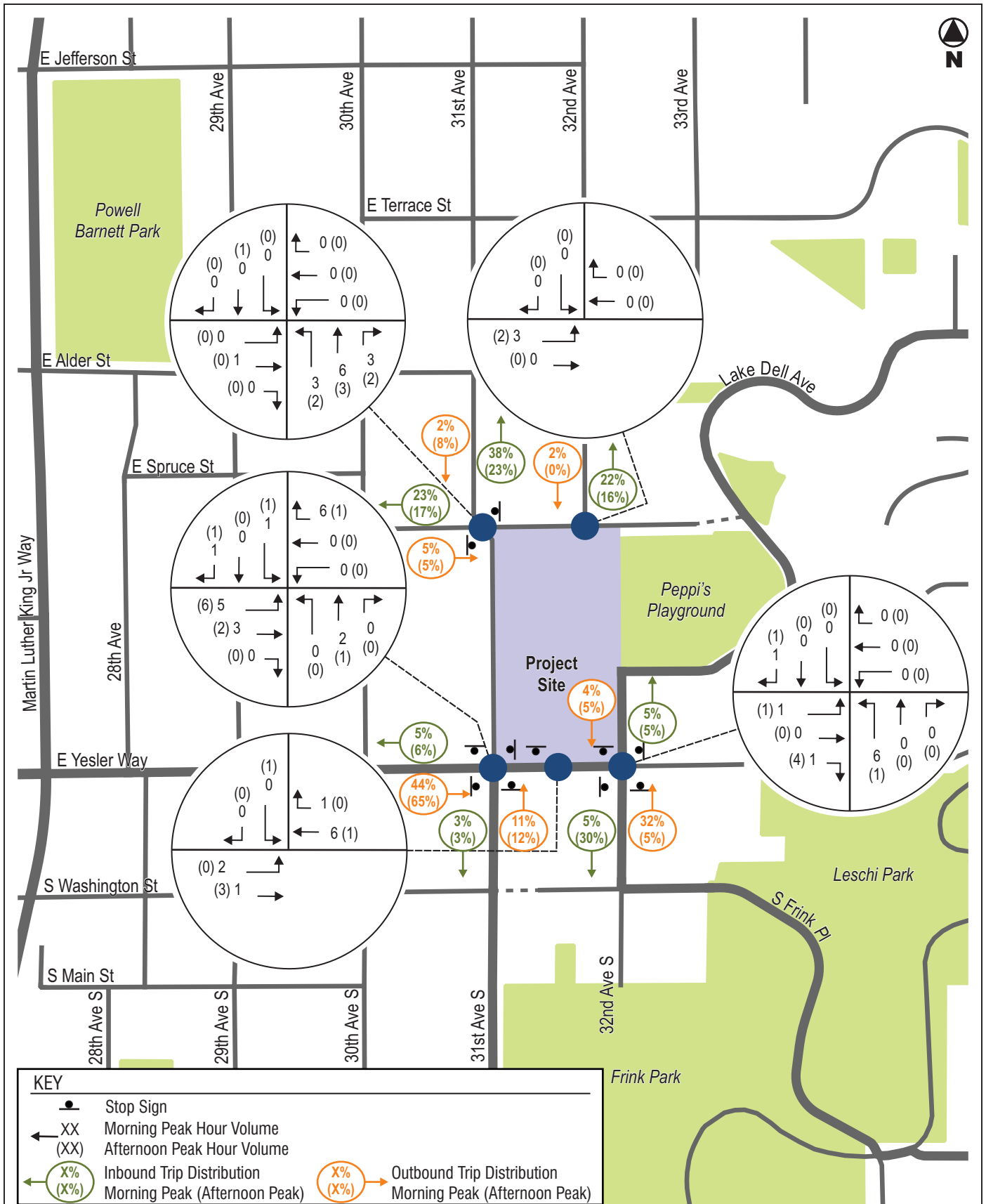
b. Enrollment and capacity of the existing school at the time of analysis (June 2020).

### 3.2.2. Trip Distribution and Assignment

The expanded Leschi Elementary School is expected to accommodate growth within the existing enrollment area for the school. Trip distribution patterns for the new school trips were developed based on the existing and expected future travel characteristics of the local roadway network including the location of parking supply, student drop-off/pick-up areas, bus loading areas, and the access driveways. Most of the morning and afternoon peak hour trips typically consist of passenger vehicles (for student drop off and pick up) and school buses. Some trips are also generated by teachers or staff.

School buses would continue to use the load/unload zone on the south (eastbound) side of E Spruce Street. Passenger-vehicle load/unload for students is expected to continue along the east side of 31<sup>st</sup> Avenue adjacent to the site and on roadways in the vicinity of the school. Figure 8 shows the traffic distribution patterns and assignments of net new morning and afternoon peak hour trips. The net new peak hour school trips were added to the forecast 2022 without-project traffic volumes to reflect future conditions with the renovated school. The forecast 2022 with-project morning and afternoon peak hour traffic volumes are shown on Figure 9.

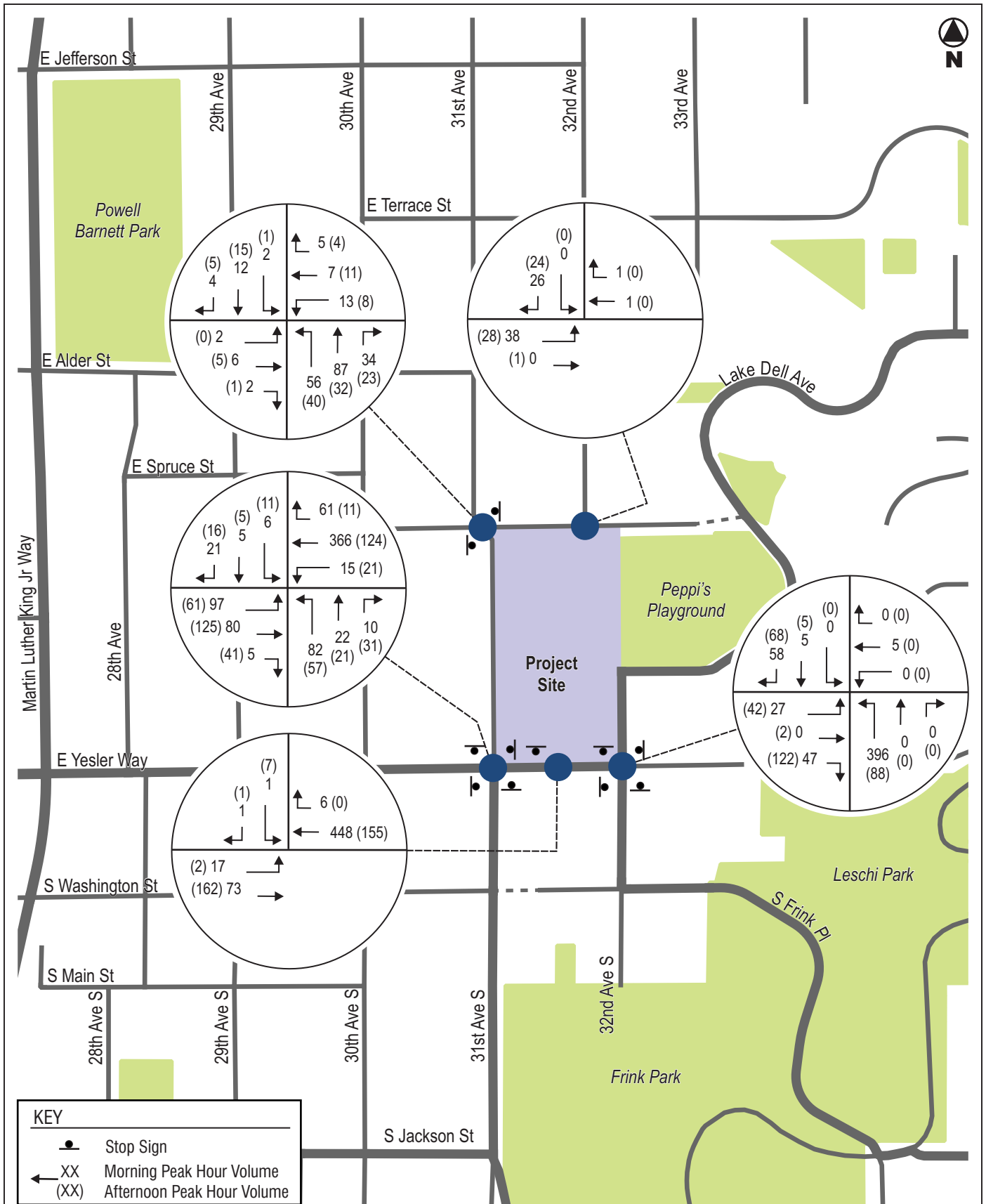




## Leschi Elementary School Classroom Addition

Figure 8  
Project Trip Distribution and Assignment  
Morning and Afternoon Peak Hours





# Leschi Elementary School Classroom Addition

Figure 9  
Forecast 2022 With-Project Traffic Volumes  
Morning and Afternoon Peak Hours





### 3.3. Traffic Operations

Intersection levels of service for future with-project conditions were evaluated using the same methodology described previously. The additional enrollment capacity could result in increased pedestrian trips and could increase the number of pedestrian crossings at the nearby study intersections. The operational analyses accounted for potential increases in pedestrian crossing activity and the peaking characteristics of school traffic (school drop-off and pick-up primarily occurs during about 20 minutes in the peak hour).

Table 5 shows the results of the analysis; levels of service for the without-project conditions are shown for comparison. The proposed project is expected to add negligible delay (less than one second) to the study area intersections and is not expected to change the overall level of service at any of the analysis intersections. All would continue to operate at LOS B or better overall with the project during both analysis periods. The two one-way site access driveways are forecast to continue operating at LOS A overall with all movements operating at LOS B or better with the project during both peak hours.

**Table 5. Level of Service Summary – Forecast 2022 Conditions Without- and With-Project**

Intersections	Morning Peak Hour (7:15–8:15 A.M.)				Afternoon Peak Hour (2:00–3:00 P.M.)			
	Without Project		With Project		Without Project		With Project	
	LOS <sup>1</sup>	Delay <sup>2</sup>	LOS	Delay	LOS	Delay	LOS	Delay
<b>All-Way-Stop Controlled</b>								
E Yesler Way / 32 <sup>nd</sup> Ave / 32 <sup>nd</sup> Ave S	B	11.3	B	11.5	A	8.0	A	8.0
E Yesler Way / 31 <sup>st</sup> Ave / 31 <sup>st</sup> Ave S	B	13.9	B	14.2	A	9.5	A	9.7
<b>Two-Way-Stop Controlled</b>								
E Spruce St / 31 <sup>st</sup> Ave <sup>3</sup>	A	3.9	A	4.0	A	4.2	A	4.1
Northbound Left	A	7.5	A	7.6	A	7.4	A	7.5
Eastbound Movements	B	10.4	B	10.5	B	10.3	B	10.4
Westbound Movements	B	13.7	B	14.1	B	13.1	B	13.6
Southbound Left	A	7.6	A	7.6	A	7.5	A	7.5
E Spruce St / 32 <sup>nd</sup> Ave <sup>3</sup>	A	7.6	A	7.6	A	7.6	A	7.6
Westbound Left Turn	A	7.4	A	7.4	A	7.5	A	7.5
Northbound Movements	A	8.5	A	8.5	A	8.5	A	8.5

Source: Heffron Transportation, Inc., June 2020.

1. Level of service.
2. Average seconds of delay per vehicle.
3. Intersection is currently uncontrolled. Evaluated as east-west stop-controlled for future conditions based on plans outlined in City's Your Voice, Your Choice program.



### **3.4. Parking Supply and Demand**

No permanent changes are proposed to the existing on-site or nearby on-street parking supply. The following sections describe potential project-related impacts to school-day and event parking conditions.

#### **3.4.1. School Day Parking**

School-day parking at elementary schools is primarily influenced by staffing levels and family-volunteer activity. With the proposed classroom addition and the school operating at its planned capacity of 420 students, the school could have an additional 6 to 11 employees. Future parking demand estimates were developed based on studies at similar elementary schools in the area and rates published by ITE. Observations performed by Heffron Transportation at numerous Seattle elementary schools indicate school-day peak parking demand rates ranging from 1.06 to 1.23 vehicles parked per employee. ITE's *Parking Generation*<sup>21</sup> includes rates of 0.13-vehicles-per-student and 0.95-vehicles-per-employee for elementary schools. These rates account for parking demand generated by all users, including employees and visitors.

Based on the current number of employees, the school may generate peak demand of 55 to 71 vehicles with variations likely depending on the number of part-time staff and visitors/volunteers on site at any given time. After accounting for demand that occurs on-site, the existing school is estimated to generate demand of 15 to 38 vehicles in on-street spaces surrounding the site midday on school days. Based on the range of rates available, the 6 to 11 employees that may be added with the proposed classroom addition, could increase peak parking demand by 6 to 14 vehicles. As presented previously, on-street parking within the site vicinity averaged 65% occupied midday, with about 120 unused spaces. This occupancy level reflected conditions with the school closed and many local residents likely remaining home due to the COVID-19 pandemic. Assuming morning residential demand in the vicinity under normalized conditions would be reduced to about 80% of the level observed in June 2020 and accounting for on-street parking demand associated with the school (both existing and with the classroom addition), overall school-day utilization is expected to remain between 59% and 73%. This is within the range of acceptable parking utilization by the City, and the impacts would not be considered significant.

#### **3.4.2. Evening Event Parking**

Leschi Elementary School would continue to host events periodically throughout the school year. The school currently holds 1 to 2 larger events per month and 3 to 4 evening meetings (e.g. PTA and Equity Team) per month. The project is not expected to increase the frequency of these events, but with slightly larger enrollment, some events could draw proportionately larger attendances. The on-street parking survey results indicated an average of 107 unused on-street parking spaces in the school vicinity on evenings without events at the school. The school would continue to use the hard-surface play area for parking during large events. Based on parking demand observations for large events at other Seattle elementary schools, the higher level of enrollment could increase event demand by 15 to 20 vehicles. This would not likely have a noticeable effect on overall parking occupancy in the site vicinity during events and the impacts would not be considered significant.

### **3.5. Traffic Safety**

The collision data provided for the study area did not indicate any unusual collision patterns that would impact or be impacted by the proposed project. The project could increase traffic at the study-area intersections and statistically, the number of collisions could increase as traffic increases. However, the project does not include any changes to the roadway network that are expected to result in new adverse safety concerns.

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<sup>21</sup> ITE, 5<sup>th</sup> Edition, January 2019.



### **3.6. Transit**

A small number of transit trips may be generated by the teachers or staff at the site; however, the traffic estimates do not rely on reductions in auto trips to account for any staff transit usage. The nearest stops are directly in front of the school on E Yesler Way at 32<sup>nd</sup> Avenue. The project would not increase the number of school buses serving the site. The project is not expected to result in adverse impacts to transit facilities or service.

### **3.7. Non-Motorized Facilities**

Leschi Elementary School, with increased enrollment capacity, is expected to generate some additional pedestrian trips within the site vicinity. It is anticipated that some increase in pedestrian activity could occur along 31<sup>st</sup> Avenue, E Spruce Street, and E Yesler Way adjacent to the school. There may also be increases in bicycle trips within the site vicinity. The site frontages already have sidewalks and marked crosswalks along primary school walking routes. No significant adverse impacts to non-motorized access or facilities is expected, and no improvements to non-motorized facilities would be required.

### **3.8. Short-Term Construction Impacts**

The school would be open and operating during construction, which is planned to start in summer 2021, and end in fall 2022 when the addition is planned to be ready for occupancy.

#### **3.8.1. Construction-Period Access Operations**

The proposed classroom addition would be constructed on the north side of the existing building; access from the northeastern part of the site may be limited or closed during construction. The existing school-bus load/unload zone on E Spruce Street is not expected to be affected. During construction, pedestrians (including students) would be routed around or directed to avoid construction areas using temporary walkways, fencing, and signage.

#### **3.8.2. Construction-Period Parking Conditions**

Construction personnel are expected to park on-street in the site vicinity. Although parking demand generated by construction workers may be noticeable to local residents, the parking occupancy on the surrounding roadways was found to be about 65% utilized during weekdays with an average of about 120 unused spaces, which is expected to accommodate the temporary added demand during construction and is not expected to result in significant adverse impacts to study-area parking conditions.

#### **3.8.3. Construction-Period Earthwork and Employee Activity**

The construction effort would include some demolition and earthwork (excavation and fill for foundations and grading) estimated to require removal of about 1,000 cubic yards (cy) of material and import of about 100 cy of fill. Assuming an average of 20-cubic yards per truck (truck/trailer combination), the excavation and fill would generate about 55 truckloads (55 trucks in, 55 trucks out). Most of the transport activities are likely to occur during summer 2021. If consolidated to one week, this would correspond to an average of 22 truck trips per day (11 in, 11 out) and 2 or 3 truck trips per hour over five days. This volume of truck traffic may be noticeable to residents living adjacent to the site, but would be short in duration and would not result in significant traffic impacts.

The construction effort would also involve employee and equipment trips to and from the site. Construction workers usually arrive before the morning peak traffic period and depart prior to the commuter PM peak period; school construction work shifts are usually from 7:00 A.M. to 3:30 P.M., with workers arriving between 6:30 and 6:45 A.M., but work not starting until 7:00 A.M. Generally, it is preferred that employee arrival and departures as well as transport and delivery of materials not occur during student arrival or dismissal times to avoid conflicts. The number of workers at the project site at any one time would vary depending upon the construction element being implemented.



## 4. SUMMARY AND RECOMMENDATION

The following sections summarize the findings and recommendations of the analysis.

### 4.1. Short-Term Conditions – Construction

- Construction is planned to begin in summer 2021 with occupancy of the new classrooms by fall 2022. During construction, the students would remain in the building.
- During construction, pedestrians (including students) would be routed around or directed to avoid construction area using temporary walkways, fencing, and signage. Movements around the northeastern portion of the campus would likely be partially restricted.
- Construction personnel are expected to park on-street in the site vicinity. Unused on-street supply is expected to accommodate the temporary added demand during the construction period.
- Earthwork transport during construction is estimated to require an average of 22 truck trips per day (11 in, 11 out) and 2 or 3 truck trips per hour, which may be noticeable to residents living adjacent to the site, but would not result in significant traffic impacts.

Because construction would occur while students remain at Leschi Elementary School, it is recommended that the contractor and SPS develop a Construction Transportation Management Plan. Details to be included in this plan are described in Section 4.3.

### 4.2. Long-Term Conditions – Operations

- The proposed classroom addition at Leschi Elementary School is expected to increase student capacity to 420 (51 more than its current capacity of 369) and add 6 to 11 employees (an increase from 58 to between 64 and 69).
- The proposed classroom addition is projected to generate a net increase of 33 vehicle trips (18 in, 15 out) during the morning peak hour (from 7:15 to 8:15 A.M.) and 24 vehicle trips (12 in, 12 out) during the afternoon peak hour (from 2:00 to 3:00 P.M.).
- The additional traffic and pedestrian activity generated by the proposed classroom addition is expected to add small amounts of delay to several of the study area intersections and turning movements during morning and afternoon peak hours; however, the study area intersections would operate at LOS B or better overall and increases in average delay per vehicle for individual movements are forecast to be about five seconds or less at all locations. Similar to existing conditions, some traffic congestion is expected during morning arrival and afternoon dismissal periods along the roadways that surround the site, especially 31<sup>st</sup> Avenue and E Spruce Street.
- At the proposed enrollment capacity of 420 students, school-day parking demand may increase by between 6 and 14 vehicles depending on the number visitors and volunteers on site. On-street parking within the site vicinity was 64% to 72% occupied on weekdays with the school closed and higher numbers of residents at home. There were 94 to 125 unused parking spaces. Accounting for more normal residential demand in the vicinity and adding school demand, overall school-day utilization is expected to remain between 59% and 73% with the project.
- Occasional large evening events could draw proportionately larger attendances, but are not anticipated to have a noticeable effect on overall parking occupancy in the site vicinity and impacts would not be considered significant.

## Leschi Elementary School Classroom Addition Transportation Technical Report

As described previously, SDOT is planning to implement several roadway enhancements as a response to higher vehicle speeds and volumes near Leschi Elementary School, including:

- Install speed humps along 31<sup>st</sup> and 32<sup>nd</sup> Avenues;
- Install school zone flashing beacons on Lake Dell and 31<sup>st</sup> Avenues;
- Install a marked crosswalk on the west leg of the E Spruce Street / 31<sup>st</sup> Avenue intersection;
- Implement east-west stop control at the E Spruce Street / 31<sup>st</sup> Avenue intersection; and
- Restrict parking within the E Spruce Street / 30<sup>th</sup> Avenue intersection.

Those improvements have been paused by SDOT due to the revenue impacts of the COVID-19 pandemic crisis.

Based the above findings, the classroom addition would not result in significant adverse impacts to long-term traffic operations or parking.

### 4.3. Recommendation

Even though the proposed Leschi Elementary School classroom addition project would not result in significant adverse impact to the transportation system in the site vicinity, the following measure is recommended to reduce the short-term construction related traffic and parking impacts of the project.

**Construction Transportation Management Plan (CTMP):** The District should require the selected contractor to develop a CTMP that addresses traffic and pedestrian control during construction of the classroom addition. It should define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP should direct trucks along the shortest route to arterials and away from residential streets to avoid unnecessary conflicts with resident and pedestrian activity. To the extent possible, truck movements (including earthwork transport and deliveries of materials to the site) should not occur during morning arrival or afternoon dismissal periods for the school. The CTMP could also include measures to keep adjacent streets clean on a daily basis at the truck exit points (such as street sweeping or on-site truck wheel cleaning) to reduce tracking dirt offsite.



## APPENDIX A

### LEVEL OF SERVICE DEFINITIONS



## Leschi Elementary School Classroom Addition Transportation Technical Report

Levels of service (LOS) are qualitative descriptions of traffic operating conditions. These levels of service are designated with letters ranging from LOS A, which is indicative of good operating conditions with little or no delay, to LOS F, which is indicative of stop-and-go conditions with frequent and lengthy delays. Levels of service for this analysis were developed using procedures presented in the *Highway Capacity Manual, Sixth Edition* (Transportation Research Board, 2016).

### Unsignalized Intersections

For unsignalized intersections, level of service is based on the average delay per vehicle for each turning movement. The level of service for all-way stop or roundabout-controlled intersections is based upon the average delay for all vehicles that travel through the intersection. The level of service for a one- or two-way, stop-controlled intersection, delay is related to the availability of gaps in the main street's traffic flow, and the ability of a driver to enter or pass through those gaps. Table A-2 shows the level of service criteria for unsignalized intersections from the *Highway Capacity Manual, Sixth Edition*.

Table A-2. Level of Service Criteria for Unsignalized Intersections

Level of Service	Average Control Delay per Vehicle
A	0 – 10 seconds
B	> 10 – 15 seconds
C	> 15 – 25 seconds
D	> 25 – 35 seconds
E	> 35 – 50 seconds
F	> 50 seconds

Source: Transportation Research Board, *Highway Capacity Manual*, Exhibit 20.2, 2016.



## APPENDIX B

### PARKING UTILIZATION STUDY DATA







Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply								
				Unrestricted Parallel Parking	15 min School Load Only 7-10a, 1-4p Sat/Sun/Hol, No Parking All Other	School Bus Only 7-9a, 1-6p exc Sun/Hol	No Parking School Days, 7-9a and 2-4p	3 Min PLZ	Disabled	Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a-11:15p	Total Parking Spaces After 7:30p
AY	31st Ave	E Spruce St and E Alder St	W	7	0	0	0	0	0	7	7	7
AZ	31st Ave	E Spruce St and E Alder St	E	5	0	0	0	0	0	5	5	5
BA	32nd Ave	E Spruce St and E Alder S St	W	8	0	0	0	0	2	10	10	10
BB	32nd Ave	E Spruce St and E Alder S St	E	7	0	0	0	0	0	7	7	7
BC	E Spruce St	29th Ave and 30th N Ave	N	6	0	0	0	0	1	7	7	7
BD	E Spruce St	29th Ave and 30th N Ave	S	8	0	0	0	0	0	8	8	8
BE	29th Ave	E Yesler Way and E Spruce St	W	1	0	0	0	0	1	2	2	2
BF	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	0	0	0	0	0	0
BG	30th Ave	E Spruce S St and E Spruce N St	W	2	0	0	0	0	0	2	2	2
BH	30th Ave	E Spruce S St and E Spruce N St	E	0	0	0	0	0	0	0	0	0
BI	Lake Dell Ave	E Spruce St and E Alder St	NW	0	0	0	0	0	0	0	0	0
BJ	Lake Dell Ave	E Spruce St and E Alder St	SE	0	0	0	0	0	0	0	0	0
BK	E Spruce St	30th S Ave and 31st Ave	N	8	0	0	1	0	0	8	9	9
BL	E Spruce St	30th S Ave and 31st Ave	S	3	0	0	0	0	0	3	3	3
BM	E Spruce St	31st Ave and 32nd Ave	N	5	0	0	0	0	0	5	5	5
BN	E Spruce St	31st Ave and 32nd Ave	S	0	0	6	0	0	0	0	6	6
BO	E Spruce St	32nd Ave and Dead End 2	N	5	0	0	0	0	0	5	5	5
BP	E Spruce St	32nd Ave and Dead End 2	S	18	0	0	0	1	0	19	19	19
BQ	29th Ave	E Yesler Way and E Spruce St	W	3	0	0	0	0	0	3	3	3
BR	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	0	0	0	0	0	0
BS	30th Ave	E Yesler Way and E Spruce S St	W	24	0	0	0	0	0	24	24	24
BT	30th Ave	E Yesler Way and E Spruce S St	E	0	0	0	0	0	0	0	0	0
BU	31st Ave	E Yesler Way and E Spruce St	W	12	0	0	0	0	0	12	12	12
BV	31st Ave	E Yesler Way and E Spruce St	E	0	23	0	0	0	0	0	0	0

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply								
				Unrestricted Parallel Parking	15 min School Load Only 7-10a, 1-4p Sat/Sun/Hol, No Parking All Other	School Bus Only 7-9a, 1-6p exc Sun/Hol	No Parking School Days, 7-9a and 2-4p	3 Min PLZ	Disabled	Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p
BW	Lake Dell Ave	32nd Ave and E Spruce St	NW	0	0	0	0	0	0	0	0	0
BX	Lake Dell Ave	32nd Ave and E Spruce St	SE	0	0	0	0	0	0	0	0	0
BY	32nd Ave	E Yesler Way and Lake Dell Ave	W	0	0	0	0	0	0	0	0	0
BZ	32nd Ave	E Yesler Way and Lake Dell Ave	E	6	0	0	0	0	0	6	6	6
CA	E Yesler Way	28th Ave S and 29th Ave	N	0	0	0	0	0	0	0	0	0
CB	E Yesler Way	28th Ave S and 29th Ave	S	4	0	0	0	0	0	4	4	4
CC	E Yesler Way	29th Ave and 30th Ave	N	10	0	0	0	0	0	10	10	10
CD	E Yesler Way	29th Ave and 30th Ave	S	9	0	0	0	0	0	9	9	9
CE	E Yesler Way	30th Ave and 31st Ave	N	7	0	0	0	0	0	7	7	7
CF	E Yesler Way	30th Ave and 31st Ave	S	9	0	0	0	0	0	9	9	9
CG	E Yesler Way	31st Ave and 32nd Ave	N	3	0	0	0	0	0	3	3	3
CH	E Yesler Way	31st Ave and 32nd Ave	S	5	0	0	0	0	0	5	5	5
CI	E Yesler Way	32nd Ave and Dead End 1	N	4	0	0	0	0	0	4	4	4
CJ	E Yesler Way	32nd Ave and Dead End 1	S	4	0	0	0	0	0	4	4	4
CK	29th Ave S	E Yesler Way and S Washington St	W	3	0	0	0	0	0	3	3	3
CL	29th Ave S	E Yesler Way and S Washington St	E	0	0	0	0	0	0	0	0	0
CM	30th Ave S	E Yesler Way and S Washington St	W	7	0	0	0	0	0	7	7	7
CN	30th Ave S	E Yesler Way and S Washington St	E	9	0	0	0	0	0	9	9	9
CO	31st Ave S	E Yesler Way and S Washington St	W	0	0	0	0	0	0	0	0	0
CP	31st Ave S	E Yesler Way and S Washington St	E	0	0	0	0	0	0	0	0	0
CQ	32nd Ave S	E Yesler Way and S Washington St	W	6	0	0	0	0	0	6	6	6
CR	32nd Ave S	E Yesler Way and S Washington St	E	0	0	0	0	0	0	0	0	0
CS	S Washington St	29th Ave S and 30th Ave S	N	4	0	0	0	0	0	4	4	4
CT	S Washington St	29th Ave S and 30th Ave S	S	5	0	0	0	0	0	5	5	5

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply								
				Unrestricted Parallel Parking	15 min School Load Only 7-10a, 1-4p Sat/Sun/Hol, No Parking All Other	School Bus Only 7-9a, 1-6p exc Sun/Hol	No Parking School Days, 7-9a and 2-4p	3 Min PLZ	Disabled	Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p
CU	S Washington St	30th Ave S and 31st Ave S	N	1	0	0	0	0	1	2	2	2
CV	S Washington St	30th Ave S and 31st Ave S	S	7	0	0	0	0	0	7	7	7
CW	S Washington St	Dead End 6 and 32nd Ave S	N	3	0	0	0	0	0	3	3	3
CX	S Washington St	Dead End 6 and 32nd Ave S	S	2	0	0	0	0	0	2	2	2
CY	S Washington St	32nd Ave S and S Frink Pl	N	0	0	0	0	0	0	0	0	0
CZ	S Washington St	32nd Ave S and S Frink Pl	S	0	0	0	0	0	0	0	0	0
DA	S Frink Pl	S Washington St and Lake Washington Blvd S	NE	0	0	0	0	0	0	0	0	0
DB	S Frink Pl	S Washington St and Lake Washington Blvd S	SW	0	0	0	0	0	0	0	0	0
DC	30th Ave S	S Washington St and S Main St	W	5	0	0	0	0	0	5	5	5
DD	30th Ave S	S Washington St and S Main St	E	5	0	0	0	0	0	5	5	5
DE	31st Ave S	S Washington St and S Jackson St	W	0	0	0	0	0	0	0	0	0
DF	31st Ave S	S Washington St and S Jackson St	E	0	0	0	0	0	0	0	0	0
DG	32nd Ave S	S Washington St and Dead End 1	W	0	0	0	0	0	0	0	0	0
DH	32nd Ave S	S Washington St and Dead End 1	E	5	0	0	0	0	0	5	5	5
<b>TOTAL</b>				<b>334</b>	<b>23</b>	<b>6</b>	<b>1</b>	<b>1</b>	<b>5</b>	<b>340</b>	<b>347</b>	<b>347</b>



Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Occupancy								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a-11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M.			10:30 A.M. to 11:15 A.M.			7:30 P.M. to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
BA	32nd Ave	E Spruce St and E Alder S St	W	10	10	10	6	6	6	6	6	6	5	5	5
BB	32nd Ave	E Spruce St and E Alder S St	E	7	7	7	3	5	4	5	5	5	5	2	4
BC	E Spruce St	29th Ave and 30th N Ave	N	7	7	7	6	6	6	5	6	6	6	5	6
BD	E Spruce St	29th Ave and 30th N Ave	S	8	8	8	7	5	6	4	4	4	5	6	6
BE	29th Ave	E Yesler Way and E Spruce St	W	2	2	2	3	3	3	2	3	3	3	2	3
BF	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	0	0	0	0	0	0	0	0	0
BG	30th Ave	E Spruce S St and E Spruce N St	W	2	2	2	4	2	3	2	3	3	2	3	3
BH	30th Ave	E Spruce S St and E Spruce N St	E	0	0	0	0	0	0	0	0	0	0	0	0
BI	Lake Dell Ave	E Spruce St and E Alder St	NW	0	0	0	0	0	0	0	0	0	0	0	0
BJ	Lake Dell Ave	E Spruce St and E Alder St	SE	0	0	0	0	0	0	0	0	0	0	0	0
BK	E Spruce St	30th S Ave and 31st Ave	N	8	9	9	6	5	6	5	4	5	6	6	6
BL	E Spruce St	30th S Ave and 31st Ave	S	3	3	3	2	2	2	2	1	2	2	1	2
BM	E Spruce St	31st Ave and 32nd Ave	N	5	5	5	2	1	2	3	2	3	1	1	1
BN	E Spruce St	31st Ave and 32nd Ave	S	0	6	6	0	0	0	0	0	0	0	0	0
BO	E Spruce St	32nd Ave and Dead End 2	N	5	5	5	3	3	3	2	3	3	3	3	3
BP	E Spruce St	32nd Ave and Dead End 2	S	19	19	19	3	3	3	5	7	6	9	4	7
BQ	29th Ave	E Yesler Way and E Spruce St	W	3	3	3	3	3	3	2	3	3	3	3	3
BR	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	0	0	0	0	0	0	0	0	0
BS	30th Ave	E Yesler Way and E Spruce S St	W	24	24	24	21	18	20	20	17	19	18	16	17
BT	30th Ave	E Yesler Way and E Spruce S St	E	0	0	0	0	0	0	0	0	0	0	0	0
BU	31st Ave	E Yesler Way and E Spruce St	W	12	12	12	12	12	12	11	12	12	13	13	13
BV	31st Ave	E Yesler Way and E Spruce St	E	0	0	0	0	0	0	0	1	1	0	0	0
BW	Lake Dell Ave	32nd Ave and E Spruce St	NW	0	0	0	0	0	0	0	0	0	0	0	0
BX	Lake Dell Ave	32nd Ave and E Spruce St	SE	0	0	0	0	0	0	0	0	0	0	0	0
BY	32nd Ave	E Yesler Way and Lake Dell Ave	W	0	0	0	0	0	0	0	0	0	0	0	0
BZ	32nd Ave	E Yesler Way and Lake Dell Ave	E	6	6	6	4	5	5	5	6	6	5	5	5

Project **Leschi ES Classroom Addition**[illegible]

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Occupancy								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M.			10:30 A.M. to 11:15 A.M.			7:30 P.M to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
DA	S Frink Pl	S Washington St and Lake Washington Blvd S	NE	0	0	0	0	0	0	0	0	0	0	0	0
DB	S Frink Pl	S Washington St and Lake Washington Blvd S	SW	0	0	0	0	0	0	0	0	0	0	0	0
DC	30th Ave S	S Washington St and S Main St	W	5	5	5	3	4	4	2	1	2	4	4	4
DD	30th Ave S	S Washington St and S Main St	E	5	5	5	2	3	3	2	2	2	3	1	2
DE	31st Ave S	S Washington St and S Jackson St	W	0	0	0	0	0	0	0	0	0	0	0	0
DF	31st Ave S	S Washington St and S Jackson St	E	0	0	0	0	0	0	0	0	0	0	0	0
DG	32nd Ave S	S Washington St and Dead End 1	W	0	0	0	0	0	0	0	0	0	0	0	0
DH	32nd Ave S	S Washington St and Dead End 1	E	5	5	5	2	1	2	1	2	2	2	2	2
TOTAL				340	347	347	245	246	246	222	231	227	251	230	241

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Utilization								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M			10:30 A.M. to 11:15 A.M.			7:30 P.M to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
AA	E Terrace St	31st Ave and 32nd Ave	N	2	2	2	50%	50%	50%	50%	50%	50%	50%	50%	50%
AB	E Terrace St	31st Ave and 32nd Ave	S	2	2	2	50%	50%	50%	0%	50%	25%	50%	50%	50%
AC	E Terrace St	32nd Ave and 33Rd Ave	N	2	2	2	50%	100%	75%	50%	50%	50%	50%	50%	50%
AD	E Terrace St	32nd Ave and 33Rd Ave	S	2	2	2	50%	50%	50%	50%	50%	50%	50%	50%	50%
AE	30th Ave	E Alder St and E Terrace St	W	3	3	3	100%	67%	83%	33%	33%	33%	67%	67%	67%
AF	30th Ave	E Alder St and E Terrace St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
AG	31st Ave	E Alder St and E Terrace St	W	9	9	9	111%	89%	100%	78%	67%	72%	89%	89%	89%
AH	31st Ave	E Alder St and E Terrace St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
AI	32nd Ave	E Alder N St and E Terrace St	W	7	7	7	57%	29%	43%	43%	43%	43%	86%	43%	64%
AJ	32nd Ave	E Alder N St and E Terrace St	E	6	6	6	67%	67%	67%	50%	50%	50%	67%	67%	67%
AK	33Rd Ave	E Alder St and E Terrace St	W	2	2	2	100%	100%	100%	150%	50%	100%	100%	100%	100%
AL	33Rd Ave	E Alder St and E Terrace St	E	2	2	2	0%	0%	0%	0%	0%	0%	0%	0%	0%
AM	E Alder St	32nd N Ave and 33Rd Ave	N	6	6	6	100%	83%	92%	83%	83%	83%	117%	67%	92%
AN	E Alder St	32nd N Ave and 33Rd Ave	S	6	6	6	67%	83%	75%	50%	67%	58%	67%	83%	75%
AO	32nd Ave	E Alder S St and E Alder N St	W	2	2	2	100%	100%	100%	100%	100%	100%	150%	150%	150%
AP	32nd Ave	E Alder S St and E Alder N St	E	2	2	2	0%	50%	25%	0%	50%	25%	0%	50%	25%
AQ	E Alder St	29th Ave and 30th Ave	N	1	1	1	100%	100%	100%	100%	100%	100%	100%	100%	100%
AR	E Alder St	29th Ave and 30th Ave	S	2	2	2	100%	100%	100%	50%	50%	50%	100%	100%	100%
AS	E Alder St	30th Ave and 31st Ave	N	4	4	4	100%	75%	88%	100%	100%	100%	100%	125%	113%
AT	E Alder St	30th Ave and 31st Ave	S	7	7	7	71%	57%	64%	71%	86%	79%	57%	43%	50%
AU	E Alder St	31st Ave and 32nd S Ave	N	6	6	6	0%	0%	0%	0%	0%	0%	0%	0%	0%
AV	E Alder St	31st Ave and 32nd S Ave	S	8	8	8	50%	50%	50%	25%	50%	38%	38%	50%	44%
AW	30th Ave	E Spruce N St and E Alder St	W	8	8	8	88%	100%	94%	100%	75%	88%	75%	75%	75%
AX	30th Ave	E Spruce N St and E Alder St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
AY	31st Ave	E Spruce St and E Alder St	W	7	7	7	86%	114%	100%	114%	100%	107%	57%	143%	100%
AZ	31st Ave	E Spruce St and E Alder St	E	5	5	5	0%	0%	0%	0%	0%	0%	0%	0%	0%
BA	32nd Ave	E Spruce St and E Alder S St	W	10	10	10	60%	60%	60%	60%	60%	60%	50%	50%	50%



Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Utilization								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M			10:30 A.M. to 11:15 A.M.			7:30 P.M. to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
BB	32nd Ave	E Spruce St and E Alder S St	E	7	7	7	43%	71%	57%	71%	71%	71%	71%	29%	50%
BC	E Spruce St	29th Ave and 30th N Ave	N	7	7	7	86%	86%	86%	71%	86%	79%	86%	71%	79%
BD	E Spruce St	29th Ave and 30th N Ave	S	8	8	8	88%	63%	75%	50%	50%	50%	63%	75%	69%
BE	29th Ave	E Yesler Way and E Spruce St	W	2	2	2	150%	150%	150%	100%	150%	125%	150%	100%	125%
BF	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BG	30th Ave	E Spruce S St and E Spruce N St	W	2	2	2	200%	100%	150%	100%	150%	125%	100%	150%	125%
BH	30th Ave	E Spruce S St and E Spruce N St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BI	Lake Dell Ave	E Spruce St and E Alder St	NW	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BJ	Lake Dell Ave	E Spruce St and E Alder St	SE	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BK	E Spruce St	30th S Ave and 31st Ave	N	8	9	9	75%	63%	69%	56%	44%	50%	67%	67%	67%
BL	E Spruce St	30th S Ave and 31st Ave	S	3	3	3	67%	67%	67%	67%	33%	50%	67%	33%	50%
BM	E Spruce St	31st Ave and 32nd Ave	N	5	5	5	40%	20%	30%	60%	40%	50%	20%	20%	20%
BN	E Spruce St	31st Ave and 32nd Ave	S	0	6	6	NS	NS	NS	0%	0%	0%	0%	0%	0%
BO	E Spruce St	32nd Ave and Dead End 2	N	5	5	5	60%	60%	60%	40%	60%	50%	60%	60%	60%
BP	E Spruce St	32nd Ave and Dead End 2	S	19	19	19	16%	16%	16%	26%	37%	32%	47%	21%	34%
BQ	29th Ave	E Yesler Way and E Spruce St	W	3	3	3	100%	100%	100%	67%	100%	83%	100%	100%	100%
BR	29th Ave	E Yesler Way and E Spruce St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BS	30th Ave	E Yesler Way and E Spruce S St	W	24	24	24	88%	75%	81%	83%	71%	77%	75%	67%	71%
BT	30th Ave	E Yesler Way and E Spruce S St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BU	31st Ave	E Yesler Way and E Spruce St	W	12	12	12	100%	100%	100%	92%	100%	96%	108%	108%	108%
BV	31st Ave	E Yesler Way and E Spruce St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BW	Lake Dell Ave	32nd Ave and E Spruce St	NW	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BX	Lake Dell Ave	32nd Ave and E Spruce St	SE	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BY	32nd Ave	E Yesler Way and Lake Dell Ave	W	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
BZ	32nd Ave	E Yesler Way and Lake Dell Ave	E	6	6	6	67%	83%	75%	83%	100%	92%	83%	83%	83%
CA	E Yesler Way	28th Ave S and 29th Ave	N	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CB	E Yesler Way	28th Ave S and 29th Ave	S	4	4	4	100%	100%	100%	75%	50%	63%	75%	100%	88%

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Utilization								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M.			10:30 A.M. to 11:15 A.M.			7:30 P.M. to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
CC	E Yesler Way	29th Ave and 30th Ave	N	10	10	10	70%	80%	75%	50%	70%	60%	100%	50%	75%
CD	E Yesler Way	29th Ave and 30th Ave	S	9	9	9	89%	100%	94%	100%	100%	100%	100%	89%	94%
CE	E Yesler Way	30th Ave and 31st Ave	N	7	7	7	29%	71%	50%	29%	57%	43%	86%	43%	64%
CF	E Yesler Way	30th Ave and 31st Ave	S	9	9	9	56%	67%	61%	44%	56%	50%	78%	89%	83%
CG	E Yesler Way	31st Ave and 32nd Ave	N	3	3	3	100%	133%	117%	33%	100%	67%	100%	100%	100%
CH	E Yesler Way	31st Ave and 32nd Ave	S	5	5	5	100%	80%	90%	100%	60%	80%	100%	80%	90%
CI	E Yesler Way	32nd Ave and Dead End 1	N	4	4	4	25%	25%	25%	50%	50%	50%	50%	50%	50%
CJ	E Yesler Way	32nd Ave and Dead End 1	S	4	4	4	200%	200%	200%	175%	150%	163%	200%	200%	200%
CK	29th Ave S	E Yesler Way and S Washington St	W	3	3	3	133%	133%	133%	100%	133%	117%	100%	100%	100%
CL	29th Ave S	E Yesler Way and S Washington St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CM	30th Ave S	E Yesler Way and S Washington St	W	7	7	7	114%	129%	121%	114%	114%	114%	129%	86%	107%
CN	30th Ave S	E Yesler Way and S Washington St	E	9	9	9	78%	78%	78%	67%	56%	61%	67%	56%	61%
CO	31st Ave S	E Yesler Way and S Washington St	W	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CP	31st Ave S	E Yesler Way and S Washington St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CQ	32nd Ave S	E Yesler Way and S Washington St	W	6	6	6	67%	67%	67%	50%	67%	58%	67%	50%	58%
CR	32nd Ave S	E Yesler Way and S Washington St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CS	S Washington St	29th Ave S and 30th Ave S	N	4	4	4	25%	50%	38%	25%	75%	50%	50%	75%	63%
CT	S Washington St	29th Ave S and 30th Ave S	S	5	5	5	80%	60%	70%	80%	60%	70%	80%	80%	80%
CU	S Washington St	30th Ave S and 31st Ave S	N	2	2	2	250%	200%	225%	250%	200%	225%	100%	150%	125%
CV	S Washington St	30th Ave S and 31st Ave S	S	7	7	7	57%	71%	64%	86%	86%	86%	71%	57%	64%
CW	S Washington St	Dead End 6 and 32nd Ave S	N	3	3	3	133%	100%	117%	100%	133%	117%	67%	133%	100%
CX	S Washington St	Dead End 6 and 32nd Ave S	S	2	2	2	50%	150%	100%	100%	100%	100%	100%	50%	75%
CY	S Washington St	32nd Ave S and S Frink Pl	N	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CZ	S Washington St	32nd Ave S and S Frink Pl	S	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DA	S Frink Pl	S Washington St and Lake Washington Blvd S	NE	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DB	S Frink Pl	S Washington St and Lake Washington Blvd S	SW	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DC	30th Ave S	S Washington St and S Main St	W	5	5	5	60%	80%	70%	40%	20%	30%	80%	80%	80%

Project **Leschi ES Classroom Addition**

Block Face ID	Street Name	Street Segment	Side of Street	Parking Supply			Parking Utilization								
				Total Parking Spaces Between 7:00a-7:45a	Total Parking Spaces Between 10:30a- 11:15p	Total Parking Spaces After 7:30p	Morning			Midday			Evening		
							7:00 A.M. to 7:45 A.M			10:30 A.M. to 11:15 A.M.			7:30 P.M to 8:15 P.M.		
							Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average	Weds 6/24/2020	Thurs 6/25/2020	Average
DD	30th Ave S	S Washington St and S Main St	E	5	5	5	40%	60%	50%	40%	40%	40%	60%	20%	40%
DE	31st Ave S	S Washington St and S Jackson St	W	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DF	31st Ave S	S Washington St and S Jackson St	E	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DG	32nd Ave S	S Washington St and Dead End 1	W	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
DH	32nd Ave S	S Washington St and Dead End 1	E	5	5	5	40%	20%	30%	20%	40%	30%	40%	40%	40%
TOTAL				340	347	347	72%	72%	72%	64%	67%	65%	72%	66%	69%

## **APPENDIX B: GREENHOUSE GAS EMISSION WORKSHEET**

**Section I: Buildings**

Type (Residential) or Principal Activity (Commercial)	# Units	Square Feet (in thousands of square feet)	Emissions <b>Per Unit</b> or <b>Per Thousand Square Feet</b> (MTCO2e)			<b>Lifespan Emissions (MTCO2e)</b>
			Embodied	Energy	Transportation	
Single-Family Home.....	0	0	98	672	792	0
Multi-Family Unit in Large Building .....	0	0	33	357	766	0
Multi-Family Unit in Small Building .....	0	0	54	681	766	0
Mobile Home.....	0	0	41	475	709	0
Education .....	0	7.2	39	646	361	7534
Food Sales .....	0	0.0	39	1,541	282	0
Food Service .....	0	0.0	39	1,994	561	0
Health Care Inpatient .....	0	0.0	39	1,938	582	0
Health Care Outpatient .....	0	0.0	39	737	571	0
Lodging .....	0	0.0	39	777	117	0
Retail (Other Than Mall).....	0	0.0	39	577	247	0
Office .....	0	0.0	39	723	588	0
Public Assembly .....	0	0.0	39	733	150	0
Public Order and Safety .....	0	0.0	39	899	374	0
Religious Worship .....	0	0.0	39	339	129	0
Service .....	0	0.0	39	599	266	0
Warehouse and Storage .....	0	0.0	39	352	181	0
Other .....	0	0.0	39	1,278	257	0
Vacant .....		0.0	39	162	47	0

**Section II: Pavement.....**

Pavement.....						0
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**Total Project Emissions:**

**7534**

Definition of Building Types

Type (Residential) or Principal Activity (Commercial)	Description
Single-Family Home.....	Unless otherwise specified, this includes both attached and detached buildings
Multi-Family Unit in Large Building .....	Apartments in buildings with more than 5 units
Multi-Family Unit in Small Building .....	Apartments in building with 2-4 units
Mobile Home.....	
Education .....	Buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."
Food Sales .....	Buildings used for retail or wholesale of food.
Food Service .....	Buildings used for preparation and sale of food and beverages for consumption.
Health Care Inpatient .....	Buildings used as diagnostic and treatment facilities for inpatient care.
Health Care Outpatient .....	Buildings used as diagnostic and treatment facilities for outpatient care. Doctor's or dentist's office are included here if they use any type of diagnostic medical equipment (if they do not, they are categorized as an office building).
Lodging .....	Buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.
Retail (Other Than Mall).....	Buildings used for the sale and display of goods other than food.
Office .....	Buildings used for general office space, professional office, or administrative offices. Doctor's or dentist's office are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).
Public Assembly .....	Buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.
Public Order and Safety .....	Buildings used for the preservation of law and order or public safety.
Religious Worship .....	Buildings in which people gather for religious activities, (such as chapels, churches, mosques, synagogues, and temples).
Service .....	Buildings in which some type of service is provided, other than food service or retail sales of goods
Warehouse and Storage .....	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).
Other .....	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.
Vacant .....	Buildings in which more floorspace was vacant than was used for any single commercial activity at the time of interview. Therefore, a vacant building may have some occupied floorspace.

Sources: .....

Residential 2001 Residential Energy Consumption Survey  
Square footage measurements and comparisons  
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

Commercial Commercial Buildings Energy Consumption Survey (CBECS),  
Description of CBECS Building Types  
<http://www.eia.doe.gov/emeu/cbeecs/pba99/bldgtypes.html>

Embodied Emissions Worksheet

Section I: Buildings

Type (Residential) or Principal Activity (Commercial)	# thousand sq feet/ unit or building	Life span related embodied GHG missions (MTCO2e/ unit)	Life span related embodied GHG missions (MTCO2e/ thousand square feet) - See calculations in table below
Single-Family Home.....	2.53	98	39
Multi-Family Unit in Large Building .....	0.85	33	39
Multi-Family Unit in Small Building .....	1.39	54	39
Mobile Home.....	1.06	41	39
Education .....	25.6	991	39
Food Sales .....	5.6	217	39
Food Service .....	5.6	217	39
Health Care Inpatient .....	241.4	9,346	39
Health Care Outpatient .....	10.4	403	39
Lodging .....	35.8	1,386	39
Retail (Other Than Mall).....	9.7	376	39
Office .....	14.8	573	39
Public Assembly .....	14.2	550	39
Public Order and Safety .....	15.5	600	39
Religious Worship .....	10.1	391	39
Service .....	6.5	252	39
Warehouse and Storage .....	16.9	654	39
Other .....	21.9	848	39
Vacant .....	14.1	546	39

Section II: Pavement.....

All Types of Pavement.....			50
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	Columns and Beams	Intermediate Floors	Exterior Walls	Windows	Interior Walls	Roofs		
Average GWP (lbs CO2e/sq ft): Vancouver, Low Rise Building	5.3	7.8	19.1	51.2	5.7	21.3		
Average Materials in a 2,272-square foot single family home	0.0	2269.0	3206.0	285.0	6050.0	3103.0	Total Embodied Emissions (MTCO2e)	Total Embodied Emissions (MTCO2e/ thousand sq feet)
MTCO2e	0.0	8.0	27.8	6.6	15.6	30.0	88.0	38.7

Sources

All data in black text

King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

Residential floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)  
Square footage measurements and comparisons  
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

Floorspace per building

EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)  
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003  
[http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed\\_tables\\_2003/2003set9/2003excel/c3.xls](http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls)

Average GWP (lbs CO2e/sq ft): Vancouver,  
Low Rise Building

Athena EcoCalculator  
Athena Assembly Evaluation Tool v2.3- Vancouver Low Rise Building  
Assembly Average GWP (kg) per square meter  
<http://www.athenasmi.ca/tools/ecoCalculator/index.html>  
Lbs per kg 2.20  
Square feet per square meter 10.76

Average Materials in a 2,272-square foot  
single family home

Buildings Energy Data Book: 7.3 Typical/Average Household  
Materials Used in the Construction of a 2,272-Square-Foot Single-Family Home, 2000  
[http://buildingsdatabook.eren.doe.gov/?id=view\\_book\\_table&TableID=2036&t=xls](http://buildingsdatabook.eren.doe.gov/?id=view_book_table&TableID=2036&t=xls)  
See also: NAHB, 2004 Housing Facts, Figures and Trends, Feb. 2004, p. 7.

Average window size

Energy Information Administration/Housing Characteristics 1993  
Appendix B, Quality of the Data. Pg. 5.  
<ftp://ftp.eia.doe.gov/pub/consumption/residential/rx93hcf.pdf>

**Embodied GHG Emissions.....Worksheet Background Information**

*Buildings*

Embodied GHG emissions are emissions that are created through the extraction, processing, transportation, construction and disposal of building materials as well as emissions created through landscape disturbance (by both soil disturbance and changes in above ground biomass).

Estimating embodied GHG emissions is new field of analysis; the estimates are rapidly improving and becoming more inclusive of all elements of construction and development.

The estimate included in this worksheet is calculated using average values for the main construction materials that are used to create a typical family home. In 2004, the National Association of Home Builders calculated the average materials that are used in a typical 2,272 square foot single-family household. The quantity of materials used is then multiplied by the average GHG emissions associated with the life-cycle GHG emissions for each material.

This estimate is a rough and conservative estimate; the actual embodied emissions for a project are likely to be higher. For example, at this stage, due to a lack of comprehensive data, the estimate does not include important factors such as landscape disturbance or the emissions associated with the interior components of a building (such as furniture).

King County realizes that the calculations for embodied emissions in this worksheet are rough. For example, the emissions associated with building 1,000 square feet of a residential building will not be the same as 1,000 square feet of a commercial building. However, discussions with the construction community indicate that while there are significant differences between the different types of structures, this method of estimation is reasonable; it will be improved as more data become available.

Additionally, if more specific information about the project is known, King County recommends two online embodied emissions calculators that can be used to obtain a more tailored estimate for embodied emissions: [www.buildcarbonneutral.org](http://www.buildcarbonneutral.org) and [www.athenasmi.ca/tools/ecoCalculator/](http://www.athenasmi.ca/tools/ecoCalculator/).

*Pavement*

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle. For specifics, see the worksheet.

**Special Section: Estimating the Embodied Emissions for Pavement**

Four recent life cycle assessments of the environmental impacts of roads form the basis for the per unit embodied emissions of pavement. Each study is constructed in slightly different ways; however, the aggregate results of the reports represent a reasonable estimate of the GHG emissions that are created from the manufacture of paving materials, construction related emissions, and maintenance of the pavement over its expected life cycle.

The results of the studies are presented in different units and measures; considerable effort was undertaken to be able to compare the results of the studies in a reasonable way. For more details about the below methodology, contact [matt.kuharic@kingcounty.gov](mailto:matt.kuharic@kingcounty.gov).

The four studies, Meil (2001), Park (2003), Stripple (2001) and Treolar (2001) produced total GHG emissions of 4-34 MTCO2e per thousand square feet of finished paving (for similar asphalt and concrete based pavements). This estimate does not including downstream maintenance and repair of the highway. The average (for all concrete and asphalt pavements in the studies, assuming each study gets one data point) is ~17 MTCO2e/thousand square feet.

Three of the studies attempted to thoroughly account for the emissions associated with long term maintenance (40 years) of the roads. Stripple (2001), Park et al. (2003) and Treolar (2001) report 17, 81, and 68 MTCO2e/thousand square feet, respectively, after accounting for maintenance of the roads.

Based on the above discussion, King County makes the conservative estimate that 50 MTCO2e/thousand square feet of pavement (over the development's life cycle) will be used as the embodied emission factor for pavement until better estimates can be obtained. This is roughly equivalent to 3,500 MTCO2e per lane mile of road (assuming the lane is 13 feet wide).

It is important to note that these studies estimate the embodied emissions for roads. Paving that does not need to stand up to the rigors of heavy use (such as parking lots or driveways) would likely use less materials and hence have lower embodied emissions.

Sources:

Meil, J. A Life Cycle Perspective on Concrete and Asphalt Roadways: Embodied Primary Energy and Global Warming Potential. 2006. Available: [http://www.cement.ca/cement.nsf/eee9ec7bbd630126852566c40052107b/6ec79dc8ae03a782852572b90061b914/\\$FILE/ATTK0WE3/athena%20report%20Feb.%202%202007.pdf](http://www.cement.ca/cement.nsf/eee9ec7bbd630126852566c40052107b/6ec79dc8ae03a782852572b90061b914/$FILE/ATTK0WE3/athena%20report%20Feb.%202%202007.pdf)

Park, K, Hwang, Y., Seo, S., M.ASCE, and Seo, H. , "Quantitative Assessment of Environmental Impacts on Life Cycle of Highways," Journal of Construction Engineering and Management , Vol 129, January/February 2003, pp 25-31, (DOI: 10.1061/(ASCE)0733-9364(2003)129:1(25)).

Stripple, H. Life Cycle Assessment of Road. A Pilot Study for Inventory Analysis. Second Revised Edition. IVL Swedish Environmental Research Institute Ltd. 2001. Available: <http://www.ivl.se/rapporter/pdf/B1210E.pdf>

Treolar, G., Love, P.E.D., and Crawford, R.H. Hybrid Life-Cycle Inventory for Road Construction and Use. Journal of Construction Engineering and Management. P. 43-49. January/February 2004.



# Energy Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	Energy consumption per building per year (million Btu)	Carbon Coefficient for Buildings	MTCO2e per building per year	Floorspace per Building (thousand square feet)	MTCE per thousand square feet per year	MTCO2e per thousand square feet per year	Average Building Life Span	Lifespan Energy Related MTCO2e emissions per unit	Lifespan Energy Related MTCO2e emissions per thousand square feet
Single-Family Home.....	107.3	0.108	11.61	2.53	4.6	16.8	57.9	672	266
Multi-Family Unit in Large Building .....	41.0	0.108	4.44	0.85	5.2	19.2	80.5	357	422
Multi-Family Unit in Small Building .....	78.1	0.108	8.45	1.39	6.1	22.2	80.5	681	489
Mobile Home.....	75.9	0.108	8.21	1.06	7.7	28.4	57.9	475	448
Education .....	2,125.0	0.124	264.2	25.6	10.3	37.8	62.5	16,526	646
Food Sales .....	1,110.0	0.124	138.0	5.6	24.6	90.4	62.5	8,632	1,541
Food Service .....	1,436.0	0.124	178.5	5.6	31.9	116.9	62.5	11,168	1,994
Health Care Inpatient .....	60,152.0	0.124	7,479.1	241.4	31.0	113.6	62.5	467,794	1,938
Health Care Outpatient .....	985.0	0.124	122.5	10.4	11.8	43.2	62.5	7,660	737
Lodging .....	3,578.0	0.124	444.9	35.8	12.4	45.6	62.5	27,826	777
Retail (Other Than Mall).....	720.0	0.124	89.5	9.7	9.2	33.8	62.5	5,599	577
Office .....	1,376.0	0.124	171.1	14.8	11.6	42.4	62.5	10,701	723
Public Assembly .....	1,338.0	0.124	166.4	14.2	11.7	43.0	62.5	10,405	733
Public Order and Safety .....	1,791.0	0.124	222.7	15.5	14.4	52.7	62.5	13,928	899
Religious Worship .....	440.0	0.124	54.7	10.1	5.4	19.9	62.5	3,422	339
Service .....	501.0	0.124	62.3	6.5	9.6	35.1	62.5	3,896	599
Warehouse and Storage .....	764.0	0.124	95.0	16.9	5.6	20.6	62.5	5,942	352
Other .....	3,600.0	0.124	447.6	21.9	20.4	74.9	62.5	27,997	1,278
Vacant .....	294.0	0.124	36.6	14.1	2.6	9.5	62.5	2,286	162

## Sources

All data in black text

King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

## Energy consumption for residential buildings

2007 Buildings Energy Data Book: 6.1 Quad Definitions and Comparisons (National Average, 2001)  
Table 6.1.4: Average Annual Carbon Dioxide Emissions for Various Functions  
<http://buildingsdatabook.eren.doe.gov/>  
Data also at: [http://www.eia.doe.gov/emeu/recs/recs2001\\_ce/ce1-4c\\_housingunits2001.html](http://www.eia.doe.gov/emeu/recs/recs2001_ce/ce1-4c_housingunits2001.html)

## Energy consumption for commercial buildings and Floorspace per building

EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)  
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003  
[http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed\\_tables\\_2003/2003set9/2003excel/c3.xls](http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls)

Note: Data in plum color is found in both of the above sources (buildings energy data book and commercial buildings energy consumption survey).

## Carbon Coefficient for Buildings

Buildings Energy Data Book (National average, 2005)  
Table 3.1.7. 2005 Carbon Dioxide Emission Coefficients for Buildings (MMTCE per Quadrillion Btu)  
[http://buildingsdatabook.eere.energy.gov/?id=view\\_book\\_table&TableID=2057](http://buildingsdatabook.eere.energy.gov/?id=view_book_table&TableID=2057)  
Note: Carbon coefficient in the Energy Data book is in MTCE per Quadrillion Btu.  
To convert to MTCO2e per million Btu, this factor was divided by 1000 and multiplied by 44/12.

## Residential floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)  
Square footage measurements and comparisons  
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

average lief span of buildings,  
estimated by replacement time method

	Single Family Homes	Multi-Family Units in Large and Small Buildings	All Residential Buildings
New Housing Construction, 2001	1,273,000	329,000	1,602,000
Existing Housing Stock, 2001	73,700,000	26,500,000	100,200,000
Replacement time:	57.9	80.5	62.5

(national  
average, 2001)

Note: Single family homes calculation is used for mobile homes as a best estimate life span.  
Note: At this time, KC staff could find no reliable data for the average life span of commercial buildings.  
Therefore, the average life span of residential buildings is being used until a better approximation can be ascertained.

Sources:

New Housing  
Construction,  
2001  
Quarterly Starts and Completions by Purpose and Design - US and Regions (Excel)  
[http://www.census.gov/const/quarterly\\_starts\\_completions\\_cust.xls](http://www.census.gov/const/quarterly_starts_completions_cust.xls)  
See also: <http://www.census.gov/const/www/newresconstindex.html>

Existing  
Housing Stock,  
2001  
Residential Energy Consumption Survey (RECS) 2001  
Tables HC1:Housing Unit Characteristics, Million U.S. Households 2001  
Table HC1-4a. Housing Unit Characteristics by Type of Housing Unit, Million U.S. Households, 2001  
Million U.S. Households, 2001  
[http://www.eia.doe.gov/emeu/recs/recs2001/hc\\_pdf/housunits/hc1-4a\\_housingunits2001.pdf](http://www.eia.doe.gov/emeu/recs/recs2001/hc_pdf/housunits/hc1-4a_housingunits2001.pdf)

Transportation Emissions Worksheet

Type (Residential) or Principal Activity (Commercial)	# people/ unit or building	# thousand sq feet/ unit or building	# people or employees/ thousand square feet	vehicle related GHG emissions (metric tonnes CO2e per person per year)	MTCO2e/ year/ unit	MTCO2e/ year/ thousand square feet	Average Building Life Span	Life span transportation related GHG emissions (MTCO2e/ per unit)	Life span transportation related GHG emissions (MTCO2e/ thousand sq feet)
Single-Family Home.....	2.8	2.53	1.1	4.9	13.7	5.4	57.9	792	313
Multi-Family Unit in Large Building .....	1.9	0.85	2.3	4.9	9.5	11.2	80.5	766	904
Multi-Family Unit in Small Building .....	1.9	1.39	1.4	4.9	9.5	6.8	80.5	766	550
Mobile Home.....	2.5	1.06	2.3	4.9	12.2	11.5	57.9	709	668
Education .....	30.0	25.6	1.2	4.9	147.8	5.8	62.5	9247	361
Food Sales .....	5.1	5.6	0.9	4.9	25.2	4.5	62.5	1579	282
Food Service .....	10.2	5.6	1.8	4.9	50.2	9.0	62.5	3141	561
Health Care Inpatient .....	455.5	241.4	1.9	4.9	2246.4	9.3	62.5	140506	582
Health Care Outpatient .....	19.3	10.4	1.9	4.9	95.0	9.1	62.5	5941	571
Lodging .....	13.6	35.8	0.4	4.9	67.1	1.9	62.5	4194	117
Retail (Other Than Mall).....	7.8	9.7	0.8	4.9	38.3	3.9	62.5	2394	247
Office .....	28.2	14.8	1.9	4.9	139.0	9.4	62.5	8696	588
Public Assembly .....	6.9	14.2	0.5	4.9	34.2	2.4	62.5	2137	150
Public Order and Safety .....	18.8	15.5	1.2	4.9	92.7	6.0	62.5	5796	374
Religious Worship .....	4.2	10.1	0.4	4.9	20.8	2.1	62.5	1298	129
Service .....	5.6	6.5	0.9	4.9	27.6	4.3	62.5	1729	266
Warehouse and Storage .....	9.9	16.9	0.6	4.9	49.0	2.9	62.5	3067	181
Other .....	18.3	21.9	0.8	4.9	90.0	4.1	62.5	5630	257
Vacant .....	2.1	14.1	0.2	4.9	10.5	0.7	62.5	657	47

**Sources**

All data in black text

King County, DNRP. Contact: Matt Kuharic, matt.kuharic@kingcounty.gov

# people/ unit

Estimating Household Size for Use in Population Estimates (WA state, 2000 average)  
Washington State Office of Financial Management  
Kimpel, T. and Lowe, T. Research Brief No. 47. August 2007  
<http://www.ofm.wa.gov/researchbriefs/brief047.pdf>  
Note: This analysis combines Multi Unit Structures in both large and small units into one category; the average is used in this case although there is likely a difference

Residential floorspace per unit

2001 Residential Energy Consumption Survey (National Average, 2001)  
Square footage measurements and comparisons  
<http://www.eia.doe.gov/emeu/recs/sqft-measure.html>

# employees/thousand square feet

Commercial Buildings Energy Consumption Survey commercial energy uses and costs (National Median, 2003)  
Table B2 Totals and Medians of Floorspace, Number of Workers, and Hours of Operation for Non-Mall Buildings, 2003  
[http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed\\_tables\\_2003/2003set1/2003excel/b2.xls](http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set1/2003excel/b2.xls)

Note: Data for # employees/thousand square feet is presented by CBECS as square feet/employee.  
In this analysis employees/thousand square feet is calculated by taking the inverse of the CBECS number and multiplying by 1000.

vehicle related GHG emissions

Estimate calculated as follows (Washington state, 2006)\_

56,531,930,000 2006 Annual WA State Vehicle Miles Traveled

Data was daily VMT. Annual VMT was 365\*daily VMT.  
<http://www.wsdot.wa.gov/mapsdata/tdo/annualmileage.htm>

6,395,798 2006 WA state population

<http://quickfacts.census.gov/qfd/states/53000.html>

8839 vehicle miles per person per year

0.0506 gallon gasoline/mile

This is the weighted national average fuel efficiency for all cars and 2 axle, 4 wheel light trucks in 2005. This includes pickup trucks, vans and SUVs. The 0.051 gallons/mile used here is the inverse of the more commonly known term “miles/per gallon” (which is 19.75 for these cars and light trucks).  
Transportation Energy Data Book. 26th Edition. 2006. Chapter 4: Light Vehicles and Characteristics. Calculations based on weighted average MPG efficiency of cars and light trucks.  
[http://cta.ornl.gov/data/tedb26/Edition26\\_Chapter04.pdf](http://cta.ornl.gov/data/tedb26/Edition26_Chapter04.pdf)  
Note: This report states that in 2005, 92.3% of all highway VMT were driven by the above described vehicles.  
[http://cta.ornl.gov/data/tedb26/Spreadsheets/Table3\\_04.xls](http://cta.ornl.gov/data/tedb26/Spreadsheets/Table3_04.xls)

24.3 lbs CO2e/gallon gasoline

The CO2 emissions estimates for gasoline and diesel include the extraction, transport, and refinement of petroleum as well as their combustion.  
Life-Cycle CO2 Emissions for Various New Vehicles. RENew Northfield.  
Available: <http://renewnorthfield.org/wpcontent/uploads/2006/04/CO2%20emissions.pdf>  
Note: This is a conservative estimate of emissions by fuel consumption because diesel fuel, with a emissions factor of 26.55 lbs CO2e/gallon was not estimated.

2205

4.93 lbs/metric tonne

vehicle related GHG emissions (metric tonnes CO2e per person per year)

average lief span of buildings, estimated  
by replacement time method

See Energy Emissions Worksheet for Calculations

Commercial floorspace per unit

EIA, 2003 Commercial Buildings Energy Consumption Survey (National Average, 2003)  
Table C3. Consumption and Gross Energy Intensity for Sum of Major Fuels for Non-Mall Buildings, 2003  
[http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed\\_tables\\_2003/2003set9/2003excel/c3.xls](http://www.eia.doe.gov/emeu/cbecs/cbecs2003/detailed_tables_2003/2003set9/2003excel/c3.xls)