James Madison Middle School Athletic Field Improvements and Classroom Addition Projects

Draft SEPA Checklist

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

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While the James Madison Middle School Athletic Field Improvements and Classroom Addition Projects Draft State Environmental Policy Act (SEPA) Checklist is accessible and ADA

compliant, the attached figures and appendices which support the checklist contain complex material that are not accessible. The following is a description of what is contained in the figures and appendices:

- Figure 1, Madison Middle School Vicinity, Seattle, Washington
  Figure 1 is an aerial photograph of the Madison Middle School site including its surrounding neighborhood to approximately 800 feet in the four compass directions from the athletic field. The project site is outlined in red. There is an inset map showing where the site is located within the city of Seattle.

- Figure 2, Madison Middle Proposed Light Poles and Building Addition
  Figure 2 is a close-up aerial view of the athletic field showing where the proposed light poles will be located around its perimeter. The length of the field is oriented north to south. The pole locations are indicated with yellow triangles pointing in the direction of the field. There are three light poles proposed along the west and three along the east edges of the field for a total of six light poles. The proposed classroom addition footprint is located north of the existing school and south of SW Hinds Street.

- Figure 3, Madison Middle Proposed Classroom Addition Site Plan
  Figure 3 is a site plan view showing the classroom addition within the context of the whole site. There is also an enlarged site plan view showing proposed classroom addition and surrounding site improvements.

- Figure 4, Madison Middle Proposed Athletic Field Layout Plan
  Figure 4 is a site plan showing the proposed synthetic turf field game lines, surrounding rubberized running track, field light locations, goal posts, and 6-feet tall chain link fencing.

- Appendix A: Traffic Impact Analysis
  Appendix A consists of a report titled, "Transportation Technical Report for the Madison Middle School Classroom Addition and Field Improvements" prepared by Heffron Transportation, Inc. dated Oct. 20, 2020. The report provides a project description, background conditions related to the transportation network, traffic volumes, level of services, parking, traffic safety, transit facilities, and non-motorized facilities. The report addresses impacts of the proposed lighting project on the same and concludes with a summary and recommendations. Attached to the end of the report are Appendix A – Level of Service Definitions, and Appendix B – Parking Utilization Study Data. 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.

- Appendix B: Existing Noise Conditions and Potential Post-Project Noise Conditions
  Appendix B is a noise evaluation prepared by Environmental Science Associates (ESA). It documents existing evening noise conditions and presents results of noise monitoring and technical analysis of environmental noise impacts that may result from implementation of the athletic field lighting project. It includes the methodology used to gather information, a description of the existing noise environment, anticipated noise and potential effects, and concludes with the results of the noise assessment. The report includes tables that organize noise measurement data that illustrate the report's findings. Figure 1 – Madison Middle School, Noise Monitoring Location, follows the report. The figure is an aerial view of the athletic field and its surrounding area showing the locations of the five land-use zones that make up the neighborhood and the two sites where noise measurements were taken.

- Appendix C: Light and Glare Report
  Appendix C is the Light and Glare Report, prepared by Stantec dated April 22, 2020. The report provides a description of existing conditions, existing light and glare sources in and around the Madison Middle School area, the lighting equipment proposed for this project, a discussion of glare, spill light and skyglow and their impacts to the environment, and ends with how the proposed lighting will be controlled. The report includes photographs to illustrate and support discussions in the text portion of the report. The report also includes two drawings titled, "Spill Light Calcs." The drawings have identical backgrounds showing an aerial photograph of the field overlaid with an evenly spaced grid of numbers representing spill light calculations at various points across the field. The first drawing shows calculations based on the proposed light pole heights of 70-feet tall. For comparison purposes, the second drawing shows spill light calculations based on the light pole height of 29 feet.

- Appendix D: Arborist Report – Tree Inventory near New Classroom Addition
  Appendix D is a Tree Inventory and Arborist Report prepared by Tree Solutions Inc., dated Aug. 21, 2020. The report presents the results of the project's arborist investigation of the project site near the proposed classroom addition. The purpose of this report was to inventory the trees near the proposed building addition site, evaluate the condition of each tree, and make recommendations to minimize the impact of construction on the trees. The report also documents one tree in right-of-way. There are figures, photos and tables throughout this document, including in the appendices, which graphically depict and organize data to support the findings in the

report. Attached to the end of the report, there is Appendix A – Glossary, Appendix B – References, Appendix C – Site Plan Sections, Appendix D – Photographs, Appendix E – Assumptions & Limiting Conditions, Appendix F – Methods, and Appendix G – Tree Protection Specifications.

- Appendix E: View Analysis Photo Pages
  Appendix E is a Field Improvement View Analysis Photo Pages, dated July 24, 2020. The photographs show existing view conditions present at the Madison Middle School Athletic Field.

This concludes the description of the draft SEPA checklist figures and appendices for the James Madison Middle School Athletic Field Improvements and Classroom Addition Projects.

Madison Middle School Athletic Field Improvements and Classroom Addition Projects

Draft SEPA Checklist

October 2020

PREPARED FOR:

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ENVIRONMENTAL CHECKLIST

NOTE: *Seattle Public Schools (SPS) has proposed two separate projects at Madison Middle School—Athletic Field Improvements and Lighting and a Classroom Addition. SPS has published a draft SEPA Checklist for the Madison Middle School Athletic Field Improvements and has solicited public comment on the project and the environmental review. However, the timing of the athletic field improvements and the classroom addition projects have changed so that they will now likely overlap, including with overlapping construction activities. To ensure that the public has an opportunity to review the projects together, Seattle Public Schools is combining the environmental review of the projects to evaluate the potentially combined impacts. The public comments received by SPS on the Draft Madison Middle School Athletic Field Improvements project have been considered in this draft SEPA Checklist and SPS will provide responses to comments already received on the athletic field improvements—as well as any new comments received on the combined projects—in the final SEPA checklist for the combined projects.*

A. BACKGROUND

1. Name of the proposed project, if applicable:

Madison Middle School Athletic Field Improvements and Classroom Addition Projects

2. Name of Applicant:

Seattle Public Schools (SPS)

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

Athletic Field Improvements:

Conrad Plyler
Seattle Public Schools
2445 3rd Ave S
Seattle, WA 98134
(206) 252-0662

Classroom Addition:

Vince Gonzales
Seattle Public Schools
2445 3rd Ave S
Seattle, WA 98134
206-252-0151

4. Date checklist prepared:

October 2020

5. Agency requesting checklist:

Seattle Public Schools (SPS)

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

SPS plans to replace the athletic field with a synthetic turf field and install the field lighting in the fall 2021 to spring 2022. Installation is anticipated to take approximately 1-2 months.

Construction of the classroom addition 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 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.

SPS does not have any plans for future additions or expansions related to this site.

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

Madison Middle School Field Athletic Field Improvements and Classroom Addition Projects Cultural Resources Assessment, Short Report, ESA, October 2020

Geotechnical Engineering Investigations, Proposed Athletic Field Improvements Madison Middle School, Krazan & Associates, Inc., December 12, 2019

Geotechnical Engineering Investigations, Proposed Madison Middle School Classroom Addition. Krazan & Associates, Inc. March 2020.

Madison Middle School Athletic Field Lighting Project – Existing Noise Conditions and Potential Post-Project Noise Conditions, ESA, April 22, 2020

Transportation Technical Report for the Madison Middle School Classroom Addition and Field Improvement, Heffron Transportation, Inc., October 10, 2020

Madison Middle School Athletic Field Lighting, Light and Glare Report, DA Hogan and Stantec, April 22, 2020

Madison Middle School Field Improvements View Analysis Photo Pages, ESA, July 24, 2020

Arborist Report for Madison Middle School Classroom Addition, Tree Solutions, August 2020.

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.

SPS and Seattle Department of Parks and Recreation (Parks) have entered into a Joint Use Agreement for Parks' use of school fields for the time period of 2016 - 2019 that has been extended through August 9, 2021.

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

The following permits/approvals may be required for the field improvements:

- Special Exception (Master Use Permit (MUP)), City of Seattle
- Construction Stormwater General Permit, WA State Department of Ecology
- Building Permit, City of Seattle
- Construction Permit, City of Seattle
- Street Improvements Permit, City of Seattle

The following permits/approvals may be required for the classroom addition:

- Building Permit, City of Seattle
- Landmarks Review
- Street Improvements Permit, City of Seattle
- Electrical Permit, City of Seattle
- Construction Stormwater General Permit, WA State Department of Ecology
- Health Department Review

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.

The proposed field improvements would convert the existing grass field to a synthetic turf field, resurface the existing track, and install six new light poles.

SPS and the Seattle Department of Parks and Recreation (Parks) have been working together to develop plans for installing lights at athletic fields around the City. Lighting is being installed as mitigation for the impacts of SPS's change in school start times. In fall 2016, SPS changed start times so that high school students start at 8:50 a.m. and are dismissed at 3:20 p.m., approximately 1 hour later than the previous schedule. The later dismissal time for high schools means that school athletic fields are used for school practice and games later in the day, reducing the time that unlighted fields are available for community use under the Joint Use Agreement with Parks. This was identified as a significant adverse impact in the Change in School Start Times Programmatic Environmental Impact Statement (EIS) (SPS, 2016).

The proposed lighting at Madison Middle School would be located at the athletic field to the west of the school (Figures 2 and 4). Lighting of the field would allow SPS and Parks to schedule events later in the evening than currently possible, extending the use of the field during certain times of the year. The field would assist in relieving the demand for all-season, multi-use, lighted fields in the City.

SPS proposes to light the athletic field at Madison Middle School to allow for both SPS use and community use. The athletic field at Madison Middle School accommodates soccer and football activities, with a surrounding track. Light fixtures would be installed on six galvanized steel poles around the perimeter of the field. The poles would be 70 feet tall.

SPS and Parks propose to schedule events at the lighted field from dusk until 10 p.m. The proposal would not change the school enrollment or any other facilities on the site, but would allow increased use of the athletic fields for scholastic and non-scholastic recreational activities schedules to end by 9:45 p.m., with lights automatically turned off at 10:00 p.m. In setting the cutoff time for lights, SPS considered the following:

> Parks has adopted Policy # 060-P 7.1.1, Use and Scheduling of Outdoor Athletic Facilities, which became effective on July 1, 2002. For lighted fields, Parks' policy is to schedule play until 10:45 p.m., except on fields where residences adjoin the length of the field on two or more sides (unless arterials, significant topography, and/or other buffers are found between the field and adjacent residences on one or both sides). Fields that meet these criteria are scheduled until 10:00 p.m. Unless security lighting is available, lights at all fields will be turned off 15 minutes after the end of scheduled play to allow players to leave the site safely (Policy # 060-P 7.7.1, Section 4.3.3). Because residences adjoin Madison Middle School on all sides, events at those fields would be scheduled until 9:45 p.m.

Other lighting considerations include:

- There is potential for the field to be used before school starts in the morning.
- The lights will not be turned on when no one is using the field.

In addition to the lighting, SPS proposes to convert the existing under-drained, irrigated, sand-based grass playing surface with a similarly under-drained synthetic turf surface. The District's experience is that replacing the field will allow all scheduled activities to occur without weather delays or cancellations. In order to accommodate the currently programmed football and soccer uses in better alignment with current standards (the National Federation of High School Associations, or NFHS, establishes recommendations which are adopted by the "local" Association, in this case the Washington Interscholastic Activities Association or WIAA), the project proposes to expand the width of the field by approximately 6.5 feet. To better support track and field activities, the western lanes of the surrounding rubberized track will be increased by 2.0 feet. To accomplish this, the existing chain link fence along the west edge and top-of-slope will be moved west about 0.7 foot.

SPS is also proposing a two-story addition to Madison Middle School that would add six core academic classrooms as well as two science classrooms to the site (eight classrooms overall) totaling approximately 12,200 square feet (Figure 3). There are currently (2) existing portables in the area near the addition. During construction, these two portables will be relocated to the existing parking lot to the east. When complete,

the four existing portable classrooms currently located on the northern portion of the site would all be removed. Curb cuts and sidewalk improvements will be made along SW Hinds Street intersections of 47th Avenue SW, 46th Avenue SW, and 45th Avenue SW to include two-directional ADA ramps in line with the existing sidewalk.

The addition would increase the school's enrollment capacity by 100 seats, with the total capacity of the school expanded to 1,139 seats.

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 3429 45th Ave SW, Seattle, WA 98116, with the outdoor sports, athletics, and physical educational facilities, along with surface water management facilities, occupying the west half of the campus. The proposed location of the eight-classroom addition is to the north of the existing school near the intersection of SW Hinds and 46th Ave SW (Figure 1). The site is bounded on all sides by a residential neighborhood. The site is located in the northwest quarter of Section 14, Township 24, Range 3. The site is made up of two parcels (927830-0010 and 927830-0005) totaling 8.9 acres with the following legal description:

W S 5-ACRE TRACTS # 5 LESS STREET

Figure 1 shows the project vicinity. **Figure 2** shows the athletic field and the proposed layout for the lighting poles and classroom addition. **Figure** 3 shows the site plan for the proposed classroom addition. **Figure 4** shows the proposed athletic field layout plan.

B. ENVIRONMENTAL ELEMENTS

1. Earth

Two geotechnical investigations were performed at the project site by Krazan & Associates, Inc. (2019 and 2020). The work included a review of existing subsurface information for the property, as well as drilling six soil borings in the vicinity of the field improvements (2019) and four in the vicinity of the proposed classroom addition (2020). Information from these reports is summarized in this section and incorporated throughout the SEPA Checklist as appropriate.

a. General description of the site (underline):

Flat, rolling, hilly, steep slopes, mountainous, other _____

The ground surface slopes down from the school buildings to the playing field at an angle of about 23 degrees. Directly west of the athletic field, the ground

slopes down to the west at an angle of approximately 22 degrees. A concrete wall up to about 13 feet in height is located near the toe of the lower slope west of the athletic field and just above 47th Avenue SW (Krazan and Associates, 2019).

The elevation of the area proposed for the classroom addition varies due to sloping ground on the north and west sides of the area. However, the area for the proposed classroom addition is nearly level (Krazan and Associates, 2020).

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). Steep slopes are located to the west of the of the proposed addition and the existing Madison Middle School leading down to the athletic field, as well as to the west of the athletic field along the retaining wall (SDCI, 2020).

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 soils (0 to 5 percent slopes) and Urban Land – Alderwood complex soils (12 to 35 percent slopes).

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

According to the 2019 geotechnical report prepared by Krazan & Associates, Inc., the areas of sloping ground at the site have a low risk for movement and erosion under static conditions, provided that vegetation cover is maintained on the slopes and that surface water is directed away from the sloping areas. Additionally, cracks have been observed in the retaining wall located to the west of the athletic field, so it is likely that some settling has occurred over time.

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

Conversion of the grass field to synthetic turf will result in an estimated 75,000 square feet of new or replaced surfaces on the field and track and the base and drainage infrastructure conditions required for them. Below is an estimate of earthwork volumes required for the field improvements.

- Stripping of existing vegetation (sod) and other surfacing materials to a depth of 0.25 foot will result in an estimated 680 cubic yards of material removed.

- Excavation of up to 1.9 feet of excess on-site soils will result in approximately 3,900cubic yards of export.
- Import of engineered aggregates and other bulk materials is estimated at 3,140cubic yards.

Approximately 0.3 acre of the site would be excavated and filled for the construction of the addition, involving approximately 1,200 cubic yards of material. The existing ground surface topography will remain essentially the same with only minor grading to facilitate surface drainage. Excavation quantities for the classroom addition are estimated as follows:

- Cut = 975 cubic yards (to be reused as structural fill)
- Fill = 272 cubic yards (to be exported in full)

Clearing for the addition would occur over a small portion of the site (approximately 12,750 square feet).

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

The NRCS indicates that the Alderwood complex soils with 0 to 5 percent slopes have a slight risk of soil erosion when exposed, and the Alderwood complex soils with 12 to 35 percent slopes have a severe risk of soil erosion when exposed.

As with any construction project, erosion can occur during construction. Measures described below will be implemented to minimize the erosion potential.

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

Per the City's 2016 Stormwater Manual, under-drained natural or synthetic fields are considered to be pollution-generating hard surfaces and are modeled as 100% impervious. The new synthetic turf field would be approximately 66,350 square feet (approximately 1.5 acres), which is approximately 2,350 square feet larger than the existing grass field. Grass and existing vegetation would be retained in the area surrounding the proposed field and nearby steep slopes.

The construction of the addition would add an estimated 6,330 square feet of impervious surface area on the site, bringing the total impervious surface area on the school site to 8.9 acres.

Following construction of both the field improvements and the classroom addition, roughly 56.3% of the entire school site will be covered impervious surfaces.

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

The contractor is responsible for maintaining the stability of the temporary cut slopes and minimizing slope erosion during construction. The temporary cut slopes should be covered with plastic sheeting to help minimize erosion during wet weather and the slopes should be closely monitored until the permanent retaining systems are complete. Best management practices (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 may 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.

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

There are no off-site sources of emissions or 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 BMPs 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.

There are no known surface water bodies on or in the immediate vicinity of the site.

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

The project 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 amount of 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 project would not require surface water withdrawals or diversions.

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

According 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 the discharge of waste materials to 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 new athletic field will generate additional stormwater due to its increased size and less-pervious nature. Stormwater generated from the field will be routed into an on-site water quality treatment system before entering the City's existing storm drainage system in compliance with city and state regulations.

The roof and surrounding impervious surfaces of the classroom addition would generate stormwater, however portables on site currently generate stormwater. The new addition will create approximately 6,330 square feet of additional impervious surface area. Stormwater generated onsite would be routed into the City's existing storm drainage system located in Hinds Street. Per the City's GIS, the City's drainage system discharges to Schmitz creek 1.2 miles downstream (at Alki Beach) and Puget Sound 1.3 miles downstream.

The project will comply with all City and state code requirements for stormwater discharge.

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

It is unlikely that sediment generated during field lighting installation, field construction, and the classroom addition construction could leave the site with the implementation of construction best management practices. The proposed synthetic turf field will be constructed with natural cork and sand infill. Once the field, track, and classroom addition are constructed and the light poles are installed, all disturbed areas 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 proposed project would not alter or affect drainage patterns in the vicinity of the project.

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 maximum 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.

Under-drained athletic fields within the City of Seattle are considered pollution generating hard surface. As such, the project is required to implement On-site Stormwater Management (OSM) Best Management Practices (BMPs) to the maximum extent feasible since the fields exceeds the code threshold of more than 1,500 square feet (SF) of new plus replaced hard surface. Basic water quality treatment will be provided since the project includes greater than 5,000 SF of new plus replaced pollution generating hard surface.

The project is proposing 120 linear feet (LF) of 48-inch detention tank to meet the Flow Control requirements for the new and replaced impervious services from the classroom addition. The classroom addition will provide 396 square feet of bioretention cells, and all new pavements will be pervious to meet Onsite Stormwater Management. These stormwater techniques are designed to slow stormwater discharges from the site, mimicking

Storm drainage design the field improvements and classroom addition projects will be in accordance with the City of Seattle Director's Rule 17-2017 DPD/DWW-200 SPU and with the 2017 City of Seattle Stormwater Manual.

4. Plants

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

_X_ deciduous tree: alder, maple, aspen, other

_X_ evergreen tree: fir, cedar, pine, other

____ shrubs

_X_ 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?

The proposed field replacement would remove the existing grass field and replace it with synthetic turf.

The proposed classroom addition would remove a small grassy area, some shrubbery and four non-exceptional trees. Exceptional trees are defined by the City of Seattle in SMC 25.11.020 as "a tree or group of trees that because of its unique historical, ecological, or aesthetic value constitutes an important community resource, and is deemed as such by the Director according to standards promulgated by the Seattle Department of Construction and Inspections." No exceptional trees would be removed as a result of this project.

Tree protection measures would be applied to an existing 53-foot silver maple tree located in the right-of-way near the northeastern portion of the site to protect this tree from damage during construction of the sidewalk improvements.

The four trees planned for removal are marked with an "X" on Figure 3. None of the trees to be removed are exceptional. Disturbed areas of the site will be landscaped following completion of construction.

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, 2019).

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

Any areas disturbed by construction would be immediately revegetated following completion. Tree protection measures as outlined in Appendix D

would be implemented for the Silver maple located on the northeastern portion of the parcel.

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

No plant surveys were conducted for this checklist, however, Scotch broom, a Class B Noxious weed, has been observed on the project site.

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, 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. The athletic field, classroom addition area, and surrounding vicinity do not provide quality habitat for wildlife: shrub and vegetated areas of the site are isolated habitat patches within a larger matrix of residential buildings, pavement, and cleared areas at the existing school and surrounding

residential neighborhoods. These small vegetated areas do not provide a contiguous connection to other habitat areas and do not function as a wildlife corridor. Wildlife using the site and surrounding areas are accustomed to ambient urban lighting from the surrounding residences, street lights, and the existing school. Wildlife using the site and surrounding area are also accustomed to current noise levels from surrounding residence and the existing school, making it unlikely that noise from the proposed athletic field and events would present an issue. Wildlife could temporarily avoid the area during athletic events, but would likely return after athletic events have ended. Light spill from the athletic field would be reduced by the taller light poles, and would not shine on trees or shrubby areas around the edge of field where wildlife might be located.

There is evidence that migrating birds become disoriented by lighted towers and collide with the towers, or the guy wires supporting the towers. The literature does not report bird fatalities at lighted towers less than 200 feet tall, and the U.S. Fish and Wildlife Service guidelines for siting towers do not address those less than 200 feet tall. The proposed athletic field light towers would be less than 100 feet tall, and would not use guy wires. It is unlikely that the proposed athletic field light towers would present problems for migrating birds, since the average migration elevation is 1,000 to 2,000 feet.

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

No animal surveys were conducted for this checklist. Invasive animal species likely to be in the area include rats and opossums, typical of an urban 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 athletic field lights and 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 new athletic field, lighting poles and associated equipment would not block the use of solar energy by adjacent properties. No aspect of the project would interfere with solar energy use by others.

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:

To conserve energy, the athletic field lights would use high efficiency light emitting diode (LED) floodlights. The LED floodlights would reduce the electrical

energy load used for lighting by approximately 33 percent compared to floodlights that use metal halide lamps.

A fully programmable control system with remote operation will allow the fields to be lighted independently and to automatically turn off after play is completed. This feature ensures that lights would be on only during the hours that events are scheduled on the field. If necessary, the lights could also be operated manually through separate switches that would be installed.

The control system will be connected to the Seattle Public Schools energy management system. The lighting controls will be operated and programmed by SPS staff only. Automated control of the lighting system will be located at the central office. Manual controls will be located inside a locked electrical cabinet on site with keyed access by SPS staff only. Public use of the lighting system is scheduled through the Seattle Parks Department, who then puts in a request to SPS to program the lights to turn on.

Additionally, the new athletic field lighting would be in compliance with the Washington State Energy Code and the City of Seattle Energy Code.
The classroom addition will meet all City and state energy requirements and implement the following energy saving features:

- Incorporate occupancy sensors.
- Employ natural daylighting.
- Utilize existing on-site ground source heating and high efficiency HVAC equipment.
- Use high efficiency fiberglass windows.
- Providing enhanced building envelope performance.
- Use high efficiency LED lighting.

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.

Accidental spills of hazardous materials from equipment and vehicles could occur during construction. Construction activities would require construction vehicles and equipment, so there is a potential for spills. The contractors will 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 Madison Middle 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. It is possible that the existing 1929 building could contain materials such as asbestos-containing materials, lead-containing paint/components, PCB light ballasts, and/or mercury-containing light tubes. It is not expected that construction would disturb any hazardous materials within 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. To combat the use of the field as a dog park in the future, SPS will install more signage around the field prohibiting dogs on the field.

b. Noise

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

There are no existing sources of noise in the area that would adversely affect the proposal. Madison Middle School is surrounded by single-family residential, with homes located to the north, west, and south of the athletic field across SW Hinds Street, 47th Avenue SW, and SW Spokane Street. Predominant noise sources in the project area include vehicular traffic, overhead air traffic and sports activities from the athletic field, none of which would affect the proposed projects.

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.

The City of Seattle Noise Ordinance (SMC Chapter 25.08) regulates noise in the City. Noise is typically defined as an unwanted sound that can disrupt quality of life (EPA, 2019). Noise is typically measured in units called decibels (dB). For the purposes of environmental analysis noise is commonly quantified as "A weighted" decibels (dBA), which corresponds to the frequencies that are audible to the human ear. Use of the dBA frequency is consistent with SMC 25.08.090. Leq or the "equivalent sound level" is used to describe noise over a specified period of time in terms of a single numerical value. The Leq of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The Leq may also be referred to as the average sound level.

The City sets exterior sound level limits according to the land use of both the property generating the noise (the source) and the property receiving the noise (SMC 25.08.410). From one property to another when both properties within a residential district, the maximum allowable noise during daytime and evening hours (7:00 a.m. to 10:00 p.m.) is limited to 55 Leq (dBA). The code allows for short duration increases of up to 15 dBA over the 55 dBA limit, as long as the hourly Leq exterior sound level limit is not exceeded (SMC 25.08.410.B).

The code further regulates noises considered "unreasonable" including "loud and raucous, and frequent repetitive or continuous sounds made by the amplified or unamplified human voice" between the hours of 10:00 p.m. and 7:00 a.m. During these hours, maximum allowable noise from one property to another within residential districts is reduced to 45 Leq (dBA). Madison Middle School, including the athletic field, and surrounding residences are all located within residential districts per City of Seattle Zoning and would adhere to the Seattle Noise Ordinance.

Long-term noise impacts would result from increased traffic associated with the athletic events at the fields and additional student enrollment. Increased noise from field use, including cheering, whistles, and voices of the sports participants, would also occur during the extended hours of field use allowed by the lighting. Hours of increased noise would be from dusk to 10:00 p.m. every day during the darker wintertime afternoon/evenings of the year to accommodate both SPS and Parks activities.

While the increase in environmental noise and the character of noise is anticipated to be noticeable for residences to the north and west of the field, late evening athletic activities occurring before 10:00 p.m. are

anticipated to be consistent with environmental noise limits of the Seattle Noise Ordinance (SMC 25.08), since the events alone are not expected to exceed the environmental noise limit. For residences to the east and south of the athletic field, further separated from the athletic field by Madison Middle School buildings and an extended setback, changes in the noise environment resulting from the project are not anticipated to be perceptible.

Additional information about existing evening noise conditions at Madison Middle School and results of noise monitoring and technical analysis of environmental noise impacts that may result from implementation of the athletic field lighting project are included in the Noise Memorandum found in Appendix B of this Checklist.

Additionally, during construction, vehicle and equipment operation could cause noise impacts to nearby residents. Constructions 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.

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

SPS and Parks would schedule evening games to end by 9:45 p.m. to minimize noise impacts on the neighborhood. Security lighting would be provided for an additional 15 minutes (until 10:00 p.m.) to allow players to safely leave the field.

No public address system would be used at the athletic fields, and SPS will prohibit the use of portable speakers on the athletic fields.

To reduce short-term noise impacts during construction, contractors would comply with all local and state noise regulations. Contractors may also implement the following measures to reduce or control noise impacts:

- Minimize the idling time of equipment and vehicle operation.
- Operate equipment only during hours approved by the City of Seattle.
- Use well-maintained and properly-functioning equipment and vehicles.
- Locate stationary equipment away from receiving properties

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 two large rectangular buildings with portable classrooms to the north, a parking lot, and a soccer/football field with a surrounding track.

The school is located in a predominantly single-family residential neighborhood. The project would not affect the current land uses. The site has been used as a school and would continue to be used as a school.

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 working forest lands. No agricultural or forest land would be converted to other uses. The site has been developed as a school since 1929 (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 on site include the two school buildings, four free-standing portable buildings, a soccer/football field and track, and parking lots. Additionally, a storage unit and trailer are located near the southwest corner of the athletic field.

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

No structures would be demolished as part of the projects, however, the four existing portables would be removed from the site after completion of the classroom addition. Minor interior modifications will occur to accommodate the addition.

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, 2019).

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, 2019a).

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 to the east and west of the athletic field.

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

With the classroom addition, the school's enrollment capacity would increase to 1,139 students, 100 more students than the school's current capacity. The school is expected to add four new employees, increasing from 87 to 91. No people would reside or work in athletic field element of the completed project.

The proposed field lighting would allow for increased use of the field during the late fall, winter and spring months when daylight is limited. Average attendance/participation is expected to range from 118 to 135 persons per scholastic athletic event and 50 to 60 for non-scholastic athletic activities. The combined peak number of added attendees and participants on site that would occur for a short time between consecutive activities is estimated to range from 168 to 195 persons (Heffron Transportation, 2020).

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

The completed project would not displace any people.

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

No displacement would occur; therefore, no mitigation measures are proposed.

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

The proposed height of the light poles is taller than permitted by Seattle Municipal Code in a single-family residential area. The height limit for light poles in residential areas is 30 feet and the proposed poles would be 70 feet (SMC 23.76). SMC 23.51B.002(D)(6) permits light poles at public school athletic fields to exceed the maximum permitted height up to a maximum of 100 feet if

the Director of the SDCI determines that the additional height is necessary to ensure adequate illumination and that light and glare are minimized to the extent practicable. Section B.11 of this Checklist describes how the taller poles reduce light and glare impacts.

The proposed addition would add eight additional classrooms and student capacity to the existing Madison Middle 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 part 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.

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

The project would not result in any impacts to housing; therefore, no mitigation has 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 athletic field lighting system would consist of six 70 foot galvanized steel poles with LED shielded floodlights. Three lights would be located on each side of the athletic field (Figures 2 and 4).

The highest point of the school is the ornamental front entrance of the original main building, and is approximately 60.4 feet tall. The tallest point of the proposed addition is roughly 40 feet high. The exterior of the building would be metal panel, which would complement the aesthetics of the existing structures on site. The building height of the new addition is in compliance with Seattle Municipal Code.

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

Views across the athletic fields would be altered by the new light poles. The light poles would be visible, but would not obstruct any views and there are no protected views around the site. Views from residents on the west would remain the same. Appendix E contains current photos of the field area, and similar light poles recently installed at Ballard High School.

Views of the school from the northern side of SW Hinds Street would be slightly altered due to the presence of the addition, which will be approximately 25-feet taller than the portables currently on site. Views of the landmark structure may be obscured from some vantage points on SW Hinds Street; however, it is expected that the upper portion of the landmark structure will be visible due to the site topography and lower height of the addition. 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.

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

The steel poles for the field lights are designed to minimize the size and bulk of the lighting system. The floodlights and brackets are designed to minimize quantity, size, and bulk.

11. Light and Glare

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

The proposed lighting for the field would include 20 - 900 Watt and 8 - 600 watt shielded LED floodlights mounted on six galvanized steel poles located on the two sides of the field. The poles would be 70 feet tall. The four corner poles will have one additional 575 watt shielded LED floodlight mounted at a height of 16 feet above grade and aimed above the field. The two mid-field poles will have two additional 575 watt shielded LED floodlights mounted at a height of 16 feet above grade and aimed above the field. One additional low wattage "full cutoff" area light will be mounted at a height of 30 feet above grade on each pole. For examples of the LED and associated shields, please refer to the *Madison Middle School Athletic Fields Lighting, Light and Glare Report* (Appendix C).

The height of the poles has been proposed in order to minimize light spillage outside the athletic complex. The lights would comply with the guidelines established by Parks (Parks, 2002). SPS and Parks propose to schedule events at the lighted fields from dusk until 10 p.m. While not currently planned, the fields may also be lit in the morning hours of winter to allow high school practice. Such future field use would be conducted in compliance with noise ordinance requirements. The proposal would not change the school enrollment or any

other facilities on the site, but would allow increased use of the athletic fields for scholastic and non-scholastic recreational activities schedules to end by 9:45 p.m., with lights automatically turned off at 10:00 p.m.

The sports field lighting would be designed to a Class IV lighting level, as prescribed by the Illuminating Engineering Society of North America (IESNA) standard Recommended Practice for Sports Lighting (RP)-8. The field would be lighted to an average maintained lighting level of 29 foot-candles using a 0.95 Light Loss Factor.

Current City of Seattle guidelines recommend that athletic field spill light not exceed 1.0 foot-candles initial at residential property lines. To comply with this requirement, the District will obtain a special exception to the height limit from the Seattle Department of Construction and Inspections. This special exception will ensure adequate illumination for safe play and reduce the amount of impacts from light and glare into the neighborhood.

The lighting systems would operate from dusk to the pre-set curfew time. The lighting systems would be operated by a fully programmable control system with remote operation. The lights for the field would be operated separately so that they could be turned off when not in use. The area lights would be on a separate zone and would remain on for a short time after each event to provide ample light for egress from the site following the completion of scheduled field use each evening.

The new lighting system will increase the overall light and glare in the area during evening hours. The proposal will produce direct glare, reflected glare, spill light (light trespass) and sky glow. A definition of the terms used is as follows:

glare is the sensation produced by luminance within the visual field that is sufficiently greater than the luminance to which the eyes are adapted to, causing annoyance, discomfort, or loss in visual performance and visibility.

direct glare describes when an observer can see directly into a luminaire's light source, where the lamp or the reflector are visible.

foot candles a measurement of the light intensity, the illuminance being a one-square foot surface from a uniform source of light.

luminance refers to direct glare and reflected glare.

reflected glare describes when light reflected from a surface causes disability glare. It is assumed that the surface is not intentionally a light source. Surfaces attributable to reflected glare will have a higher luminance than adjacent or nearby surfaces.

spill light is light from a source, which does not strike the area intended for illumination. Spill light can be characterized by foot-candles (fc) calculated or measured in a horizontal or vertical plane.

light trespass is when spill light extends beyond the property line of the owner of a light source, and onto or above another owner's property.

sky glow is the haze or glow of light emitted above the lighting installation and reduces the ability to view the darkened night sky. This is a combination of light emitted directly from the light source, light reflected upward from the illuminated surface, and light reflected from airborne particles between the light source and the illuminated surface.

Direct glare would be visible from all directions overlooking the athletic field. The amount of glare visible depends on proximity to the site, orientation of the floodlights, distribution of intervening buildings, terrain or vegetation that would block the glare. Due to their proximity to the field at a lower elevation to the field, three residential properties directly to the west of the field near the center of the field would be exposed to low to moderate levels of direct glare. These properties are close to the fields with direct exposure to the light poles and floodlight assemblies. The direct glare visible at these residences is due to a small portion of light from one or two floodlights at each pole on the east side of the field.

Other adjacent residential properties located on the west, north and south sides of the field will have low to minimal exposure to direct glare. Residential properties that are located farther away from the field will have minimal to no direct glare impacts.

Reflected glare would be visible from all directions overlooking the site, depending direct views into the site, exposure to poles\floodlights, distribution of intervening buildings, terrain or vegetation that would block the glare. Of the surfaces that are visible from offsite locations, the synthetic athletic field surface would be the greatest contributor to reflected glare. The reflected light off the floodlight housings, floodlight visors and poles would be a lesser contributor.

The residential properties that are at a higher elevation above the field to the north and south have the greatest amount of exposure to reflected glare. These properties are close to the fields with direct exposure to the field surfaces, adjacent grass\pavement surfaces, light poles, and floodlight assemblies. The main component of the impact is the light reflected off the synthetic turf field surface.

Residential properties that are located farther away from the field or below the field will have low to minimal reflected glare impacts. These properties will have limited to no direct views of the playing surface due to their location away from the fields. The reflected glare impact associated with the poles and floodlights is much less from more remote viewing points, as the impact is reduced at

greater distances. This is true even though reflected glare from the floodlights and tops of the poles will be visible at greater distances due to their elevation above the field.

The athletic field lighting system will generate minimal amounts of spill light. Spill light impacts will be primarily located at residential properties directly west of the proposed field across 47th Avenue SW. The maximum amount of spill light at this location is 0.70 foot-candles. The spill light generated is well below the recommended maximum of 1.0 foot-candles per City of Seattle.

The athletic field lighting system would generate a minimal amount of "sky glow" at locations near the fields. Sky glow would be very minor during heavy low overcast skies and small amounts of sky glow would be evident during conditions of low to heavy fog.

The classroom addition would not produce any light or glare.

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

The illumination system would not pose a safety hazard or interfere with views from off-site locations.

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

No off-site sources of light or glare would affect this proposal.

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

The lighting systems selected for the proposed athletic field is designed to minimize light and glare impacts. To reduce the amount of glare, spill light and sky glow that is visible off-site the floodlights would need to be mounted higher than the 30 feet permitted by City code (SMC 23.76). The increased mounting height of 70 feet would reduce the maximum spill light at the residential property lines and meet recommended practice of maximum of 1.0 foot-candles set by the City of Seattle.

After installation and testing of the floodlighting system additional adjustments to the floodlight shielding and floodlight aiming will be completed as necessary to further reduce glare\spill light.

SPS has proposed to use an athletic field lighting system designed to mitigate the negative impacts of light and glare. The proposed system consists of the latest technology available on the market for shielded LED floodlights designed for the lighting of athletic fields.

The use of high efficiency LED arrays provide more precise control of light to be delivered to the field. The reflector and shielding design further reduce the amount of light transmitted off site and into the atmosphere. The floodlights utilize an additional external visor mounted to the floodlight that extends in front of the floodlight. The floodlight design is similar to "full cutoff" style lights as they dramatically limit the amount of light that is emitted above the plane of the floodlight. The proposed lighting system is similar to recently lighted fields at Roosevelt High School and Ballard High School.

A fully programmable automatic lighting controller will be provided. The controller will be able to be operated remotely to be able to turn lights off when the field is not in use.

12. Recreation

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

Recreation opportunities on the Madison Middle School site include a soccer/football field surrounded by a track. Slopes leading down to the field are used by nearby residents for sledding in the winter. Additionally, the athletic field is currently used as an unauthorized dog park.

Other nearby recreational opportunities include:

- Schmitz Preserve Park, located approximately 0.2 mile to the west featuring an old growth forest and hiking trails.
- Schmitz Park Elementary School, which is located approximately 0.2 mile to the west features a play structure, small playfield and large concrete play area.
- Hiwatha Playfield, located approximately 0.4 mile to the northeast, features a lighted baseball and soccer/football field, tennis courts, play structure and a wading pool.

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

The proposed field improvements would temporarily displace all existing recreational uses on the field while construction takes place (approximately 1 – 2 months). The proposed area for the classroom addition is not actively used for recreation due to the presence of the portables and the slope of the grass area. This slope is reportedly used for sledding in the winter, which would be unavailable during construction. Activities will resume following completion of construction.

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

This project would increase the number of available hours for use of Madison's athletic field. The proposed lighting project is intended to mitigate for the impacts of reduced Parks use of SPS athletic fields caused by the later start times of high schools (see Section A.11). SPS will post additional signage prohibiting dogs on the field. No additional mitigation measures are required.

13. Historic and Cultural Preservation

A Cultural Resources Short Report for the Madison Middle School site was developed by ESA (ESA, 2020). Cultural resources reports are exempt from public disclosure under RCW 42.56.300. Information from the review is summarized in this section.

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.

Madison Middle School opened in 1929. Its three story floor plan with gothic details is unique in the district. It is a designated City of Seattle Landmark. The structure has been recorded on Washington State Historic Property Inventory Forms, and it is also listed on the National Register of Historic Places (NRHP). Additions to the property were made in 1931 and 1971, as well as modernization and additions in 2004. The field area and classroom addition areas does not contain any structures; however, it is adjacent to 34 historic aged single family homes. Of these, a single dwelling at 3258 45th Ave SW has been evaluated and listed on the NRHP. It has been listed for its unique 1½ story Tudor revival architectural style. None of the other 33 historic aged structures are listed on local, state, or national historic registers (ESA, 2020).

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.

The project is located within the traditional territory of the Southern Coast Salish people, whose members include but are not limited to the Duwamish and Suquamish people. Oral traditions support the presence of Southern Coast Salish people in this portion of Puget Sound since time immemorial. One published Indigenous place name was identified near the Study Area: dəxʷqutəb, or "place of disease" for a depression "a mile or more inland from Duwamish Head" on the top of the ridge. The study area is approximately 1.50 miles inland from Duwamish Head.

No previously recorded archaeological sites, cemeteries, or traditional cultural properties are located within the project area. ESA considers the project area to

be low risk for containing subsurface precontact and historic period archaeological resources due to past development of the site (ESA, 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.

ESA conducted a literature review and reviewed the geotechnical report. The literature review study area examined included the parcel containing the school and those immediately adjacent. Information reviewed included any previous archaeological survey reports, ethnographic studies, historic maps, government landowner records, aerial photographs, regional histories, geologic maps, soils surveys, and environmental reports. These records were reviewed in order to determine the presence of any potentially significant cultural resources, including Traditional Cultural Properties (TCPs), within the project area. Relevant documents were examined at the Washington State Department of Archaeology and Historic Preservation (DAHP), the University of Washington Libraries, online, and within ESA's research library (ESA, 2020).

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.

No impacts to archaeological resources are anticipated as a result of this project. No direct changes are proposed to the existing primary structure of Madison Middle School; the construction will expand the existing addition. However, the minor changes in setting and view shed due to the construction of the addition will be assessed as part of adjacency review by the Seattle Landmarks Board. If the project is determined to have an impact, then mitigation will be determined by the landmarks board. In order to account for unanticipated discoveries during construction, SPS has developed an inadvertent discovery plan (IDP). The IDP sets forth procedures and protocols to follow in the event of an archaeological resources discovery, 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. Based on the results of the cultural resources technical report, no on-site archaeological monitoring is recommended during project construction.

14. Transportation

A *Transportation Technical Report* (Heffron Transportation, Inc., October, 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 Madison Middle School site is bounded on the east by 45th Avenue SW, on the south by SW Spokane Street, on the west by 47th Avenue SW, and on the north by SW Hinds Street. The school building occupies the eastern portion of the site and the athletic field is located on the western portion.

There are three surface parking lots located on the site. A 43-space lot, located at the southeast corner, is accessed from SW Spokane Street. A 19-space lot at the northeast corner is accessed from SW Hinds Street. A small northwest lot is located directly to the west of that lot; it provides access to the school's truck loading dock and has a separate driveway on SW Hinds Street. It does not have formal marked parking spaces, but field observations indicate that it is regularly used for parking of up to 5 vehicles. In summer 2018, SPS installed two portable classrooms in an unpaved area on the west side of the northwest lot and two additional portable classrooms in the northeast surface lot, which currently displace six parking spaces and reduce the total on-site supply from 67 to 61 spaces. The project would not change access to the school site.

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?

King County Metro Transit (Metro) provides bus service within the site vicinity. The nearest stops are about 750 feet from the site. Stops on California Avenue SW at SW Hinds Street serve Metro Routes 50, 55 and 128. Stops on 49th Avenue SW at S Hinds Street serve Route 57. These routes provide direct connection to and from the Admiral District, Alaska Junction, Alki, Genesee Hill, Downtown, Beacon Hill, and Othello neighborhoods.

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

The project would not add or eliminate any parking spaces. However, as noted above, in summer 2018, SPS installed two portable classrooms in an unpaved area on the west side of the northwest lot and two additional portable classrooms in the northeast surface lot. The two portables in the parking lot currently displace six parking spaces and reduce the total on-site supply from 67 to 61 spaces. During construction of the proposed classroom addition, the two existing portables currently located west of the loading/service area would be relocated into the northern parking lot making an additional nine spaces unavailable to staff or visitors. A total of 4 out of 19 parking spaces are likely to remain in the north lot during this construction period. After the classroom addition project is complete, all four portables are expected to be removed and

all spaces in the north parking lot would be made available to staff and/or visitors.

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

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 project consists of two elements—1) a classroom addition, and 2) field improvements and lighting.

The eight-classroom addition element is proposed on the north side of the main school building near SW Hinds Street. Once the classroom addition is complete, SPS plans to remove the existing portable classrooms from the site. The total capacity of the school would be increased to 1,139 students (a net increase of 100 students compared to current capacity). Based on daily trip generation rates published for middle schools by the Institute of Transportation Engineers and adjusted to reflect higher peak period rates observed at the site, the planned capacity increase of 100 students could generate about 240 trips per day (120 in, 120 out). The peak traffic volumes are expected to occur in the morning just before classes begin (between 8:00 and 9:00 A.M.) and in the afternoon around dismissal (between 3:15 and 4:15 P.M.).

The field improvement and lighting element could generate between 240 to 300 additional trips per day during part of the year—during other times, the natural turf field and natural lighting conditions allow some recreational use. Peak volumes (estimated at about 85 trips per hour associated with scholastic athletics) added due to the field improvements could occur in PM peak hour as a high school athletic practice ends (up to 55 outbound trips) and the spectators and participants of a recreational game arrive (estimated at 25 trips in and 5 trips out). Potential traffic impacts of morning field use are expected to be minimal because of the limited participants (students only, no spectators) and limited number of days that lights would be needed.

The number of school-bus and delivery trips that already occur at the site are not expected to change with the classroom addition element. Based on observations of traffic at other athletic fields, none of the new trips associated with the athletic field improvement element are expected to be trucks (commercial or non-passenger vehicles). However, participants in some scholastic athletic practices could be transported to and from the site (e.g. school buses), including the transportation of students from the West Seattle High School.

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:

Based on the analyses presented in the referenced *Transportation Technical Report*, the project would not result in significant adverse impacts to traffic or parking within the study area; however, the following measures are recommended to reduce the traffic and parking impacts associated with the project elements.

On-Site Parking – SPS and Madison Middle School should ensure that the on-site parking lots are open and available for users during all times that the field is scheduled for use.

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 both the classroom addition and athletic field and track project. It would define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP would 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) would not occur during morning arrival or afternoon dismissal periods for the school. The CTMP may 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.

Lighting the field would add activities to the facility during evening hours during winter months. Scheduling of night games may require additional security, however attendance at these events is anticipated to be small.

The classroom addition is not anticipated to result in the need for any additional public services.

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

According to the current Joint Use Agreement with Parks (extended through August 9, 2021), SPS would provide and schedule all necessary staff for all SPS owned fields including field attendants, supervision, and security for the fields. This includes, but is not limited to, unlocking gates, bathrooms, storage rooms and security support.

16. Utilities

a. Underline utilities currently available at the site:

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

Existing utilities currently at the site include natural gas, water, refuse service, telephone, storm drain, sanitary sewer and electricity.

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.

The new field lights require additional electricity which would be provided by an existing electrical panel at the school. Electricity, telephone, and natural gas would continue to be provided to the school. SPS would work with Seattle City Light, Puget Sound Energy, and its telephone provider to coordinate the extension of utilities to the new classrooms, if needed.

Sewer from the addition will be piped to an existing side sewer. Stormwater will discharge to existing storm drainage line located onsite. Domestic water and fire services will be extended from the existing building.

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: *Vincent R.Gonzales*

Name of signee: Vincent R. Gonzales

Position and Agency/Organization: Project Manager, Seattle Public Schools

Date Submitted: 11/10/2020

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SOURCE: King County, 2017; ESA, 2020

Figure 1
Madison Middle School Vicinity
Seattle, Washington

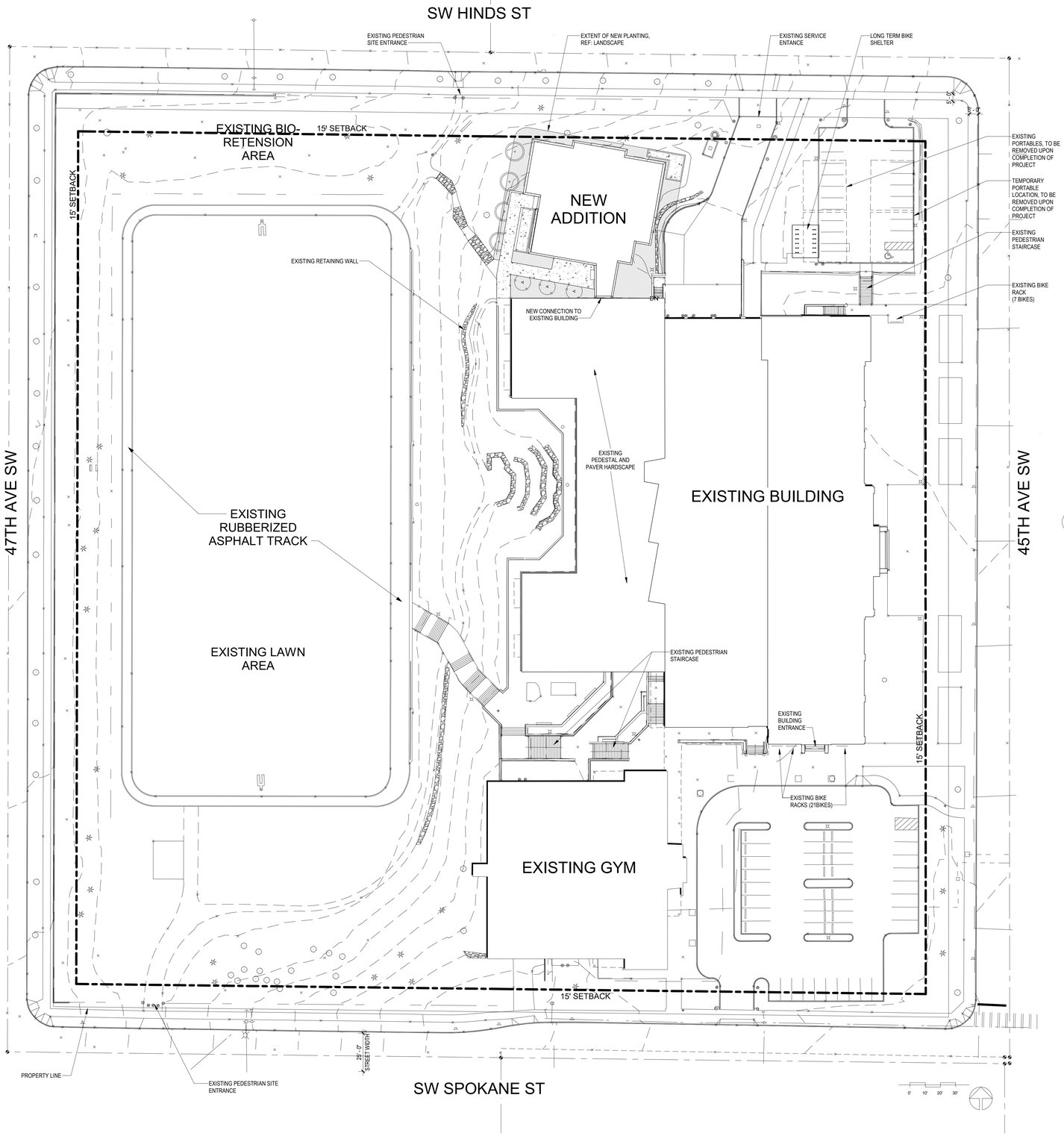
SOURCE: King County, 2017; ESA, 2020

Figure 2

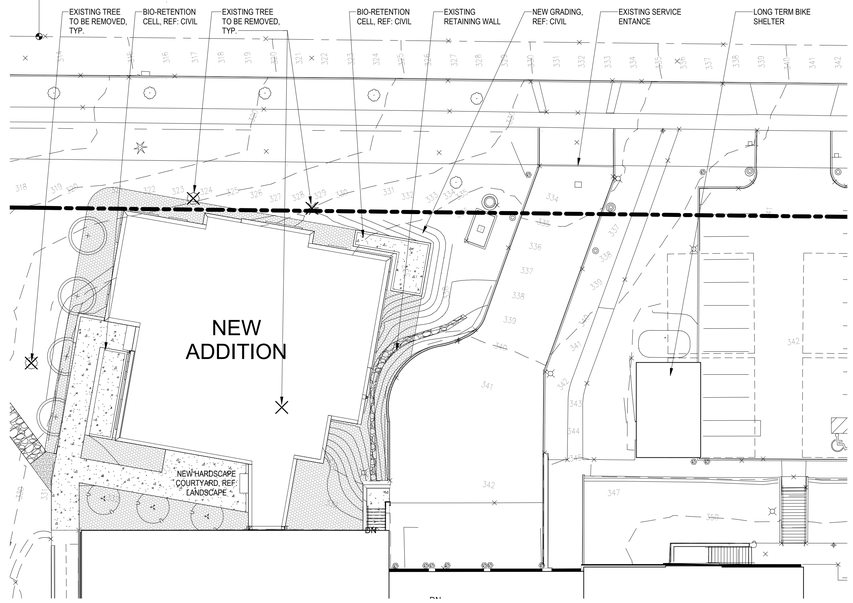
Madison Middle School Proposed Light Poles and Classroom Addition

Seattle, WA

ESA



1 ARCHITECTURAL SITE PLAN
SCALE: 1" = 30'-0"



2 ENLARGED ARCHITECTURAL SITE PLAN
SCALE: 1" = 20'-0"

10/2/2020 5:44:32 PM Designer

ARCHITECT

studio MENG STRAZZARA

ARCHITECTURE PLANNING CONSULTING

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2001 Western Ave, Suite # 200
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CONSULTANT

CLIENT/OWNER

SEATTLE PUBLIC SCHOOLS

TITLE

MADISON MS CLASSROOM ADDITION

3429 45TH AVE SW, SEATTLE WA 98116

STAMP

ISSUED:	DATE:
SD SET	07.15.2020
DD SET	09.02.2020

ARCHITECTURAL SITE PLAN

Permit #:	-
MUP#:	-
Owner's Project #:	-
Architect's Project #:	-
Drawn By	Author
Checked By	Checker

Figure 3.
Classroom Addition Site Plan

REVISION	DATE

SEATTLE PUBLIC SCHOOLS

MADISON MIDDLE SCHOOL ATHLETIC FIELD IMPROVEMENTS

DA HOGAN
119 1st Avenue South, Suite 110
Seattle, Washington 98104
p. 206.285.0400
f. 206.285.0480

- A SYNTHETIC TURF FIELD WITH FOOTBALL AND SOCCER MARKING
- B RESPRAY EXISTING 3-42" LANE RUBBERIZED RUNNING TRACK
- C RUBBERIZED RUNNING TRACK OVER PROPOSED PEA ROCK / POLYURETHANE PAVING
- D PROPOSED FIELD LIGHT POLE LOCATIONS
- E FOOTBALL GOAL POST
- F 6' HT. CHAIN LINK FENCE IN CONCRETE CURB
- G EXITING SITE LANDSCAPING

LAYOUT LEGEND

- SYNTHETIC TURF AND PERMEABLE AGGREGATE 66,350 SF
- RE-SPRAY EXISTING RUBBERIZED SURFACING AND POROUS ASPHALT PAVING BASE 7,118.5 SF
- NEW RUBBERIZED SURFACING OVER PEA ROCK URETHANE BASE 3,562.5 SF
- PROPOSED LIGHT POLE LOCATION (P5)
- CHAINLINK FENCE AND CONCRETE CURB
- CHAINLINK FENCE
- EXISTING CHAINLINK FENCE TO REMAIN
- CONCRETE CURBING
- LIMIT OF SYNTHETIC TURF AND CONCRETE EDGE ANCHOR

NORTH

0 20' 40'

SCALE: 1" = 20'

PERMIT SET

DATE	11-15-19
SCALE	1"=20'
DRAWN	CPW
CHECKED	JAB/ DLA

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LAYOUT PLAN

SHEET

Figure 4.
Athletic Field Layout Plan

File: M-0.1 Madison MS CURRENT 24x36.dwg Plotted by: ranself Date: 21-Nov-19 12:08:30pm

Appendix A: Transportation Technical Report

TRANSPORTATION TECHNICAL REPORT

for the

Madison Middle School Classroom Addition and Field Improvements

PREPARED FOR:

Seattle Public Schools

PREPARED BY:

heffron transportation inc

6544 NE 61st Street, Seattle, WA 98115
ph: (206) 523-3939 ◆ fx: (206) 523-4949

October 20, 2020

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1. INTRODUCTION

This report presents the transportation impact analyses for the Seattle Public Schools' (SPS) proposed classroom addition and field improvement project at Madison Middle School. The scope of analysis and approach were based on extensive past experience performing transportation impact analyses for school projects throughout western Washington, including numerous analyses prepared for Seattle Public Schools. 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 with remote learning in place, due to the COVID-19 pandemic crisis. Therefore, the analyses were prepared using traffic and parking data collected at the site and in the vicinity prior to school closures as part of other analyses efforts.

1.1. Project Description

SPS is proposing improvements at Madison Middle School, located at 3429–45th Avenue SW in West Seattle. The project includes two components—a classroom addition to address capacity needs in the existing building and athletic field improvements and lighting. The following sections describe the existing school site and the proposal.

1.1.1. Existing Site

The Madison Middle School site is bounded on the east by 45th Avenue SW, on the south by SW Spokane Street, on the west by 47th Avenue SW, and on the north by SW Hinds Street. The school building occupies the eastern portion of the site and the athletic field is located on the western portion. The existing permanent buildings have about 132,295 square feet (sf) of floor area.[1] SPS installed four portable classrooms prior to the 2018-19 academic year to accommodate increased student enrollment. The school's existing outdoor athletic field is a narrow natural-turf football/soccer field within a rubberized running track (marked with three lanes on the east side and unmarked with narrower width on the remaining three sides).

There are two striped surface parking lots located on the site. The 43-space South Lot is located at the southeast corner of the site and accessed from SW Spokane Street. The 19-space North Lot is located at the northeast corner of the site and accessed from SW Hinds Street. A small Service Area is located directly to the west of the North Lot and provides access to the school's truck loading dock. It has a separate driveway on SW Hinds Street. The Service Area does not have formal marked parking spaces, but field observations indicate that it is regularly used for parking of up to 5 vehicles. In 2018, two portable classrooms were placed in an unpaved area west of the Service Area. Two additional portable classrooms were placed in the North Lot and displaced six parking spaces—reducing the total on-site supply from 67 to 61 spaces.

According to information published in *Building for Learning, Seattle Public Schools Histories, 1862-2000*,[2] the school on the site opened in 1929 as James Madison Intermediate School with capacity for 1,300 students and an option to expand to 1,750 students. Initially serving 7th and 8th grade students, 9th grade was added in 1931 and enrollment increased to 1,212 students. By 1961 enrollment had increased to

[1] Existing total building area from King County Assessor, online property report, accessed April 2020.
[2] Nile Thompson and Carolyn J. Marr; *Building for Learning, Seattle Public Schools Histories, 1862-2000;* 2002.

1,650 students, but began to decline when some students were shifted to other locations. From 1982 to 1989, the school served only 7th and 8th grade students; it became James Madison Middle School in 1989. In 2004 and 2005, two buildings (both constructed in 1929) were demolished and replaced with a new 40,000 sf building that extends west of the main three-story building along the western slope. The original three-story main building and gymnasium (built in 1972) were modernized as part of that project.

During the 2018-19 and 2019-20 school years, when traffic and parking data were collected for this analysis, enrollment ranged from 872 students (May 2018) to 989 students (October 2019).[3] The school currently has 87 full-time employees.[4] The existing permanent school capacity is 1,039 students[5] including the portables added in 2018.

1.1.2. Proposed Site Changes

The proposed project includes the following two elements.

Classroom Addition – This element would construct an addition with six core-academic classrooms and two science classrooms. The addition of about 12,800 sf is planned on the north side of the main school building near SW Hinds Street in a location where there are currently two of four portable classrooms on site. During construction, two portables will be relocated to existing parking lot to the east. When complete, all four existing portable classrooms would be removed. The total capacity of the school would be increased to 1,139 students (a net increase of about 100 students compared to current capacity). With the classroom addition, the school is expected to add four new employees, increasing from 87 to 91.[6] Figure 1 shows the site plan with the location of the proposed classroom addition.

Athletic Field Improvements – This element would replace the existing natural-turf field with synthetic turf, resurface the rubberized running track, and install field lights. This element would not change school enrollment or any other facilities on the site, but would allow increased use of the athletic field for scholastic and non-scholastic recreational activities. The site plan with the location of the proposed lights is shown on Figure 2.

No other changes are proposed with either element that would affect the overall site, assembly spaces, buildings, on-site parking lots, or site access driveways. The school-bus load/unload zones adjacent to the school on 45th Avenue SW would remain unchanged.

The field improvements are planned to be completed by fall 2021 or early 2022. The classroom addition construction is planned to begin in summer 2021 with occupancy by fall 2022. During school-year construction, students would remain in the building. Future analyses of without- and with-project conditions for both project elements presented in this report reflect year 2022 conditions when both are expected to be completed and in use.

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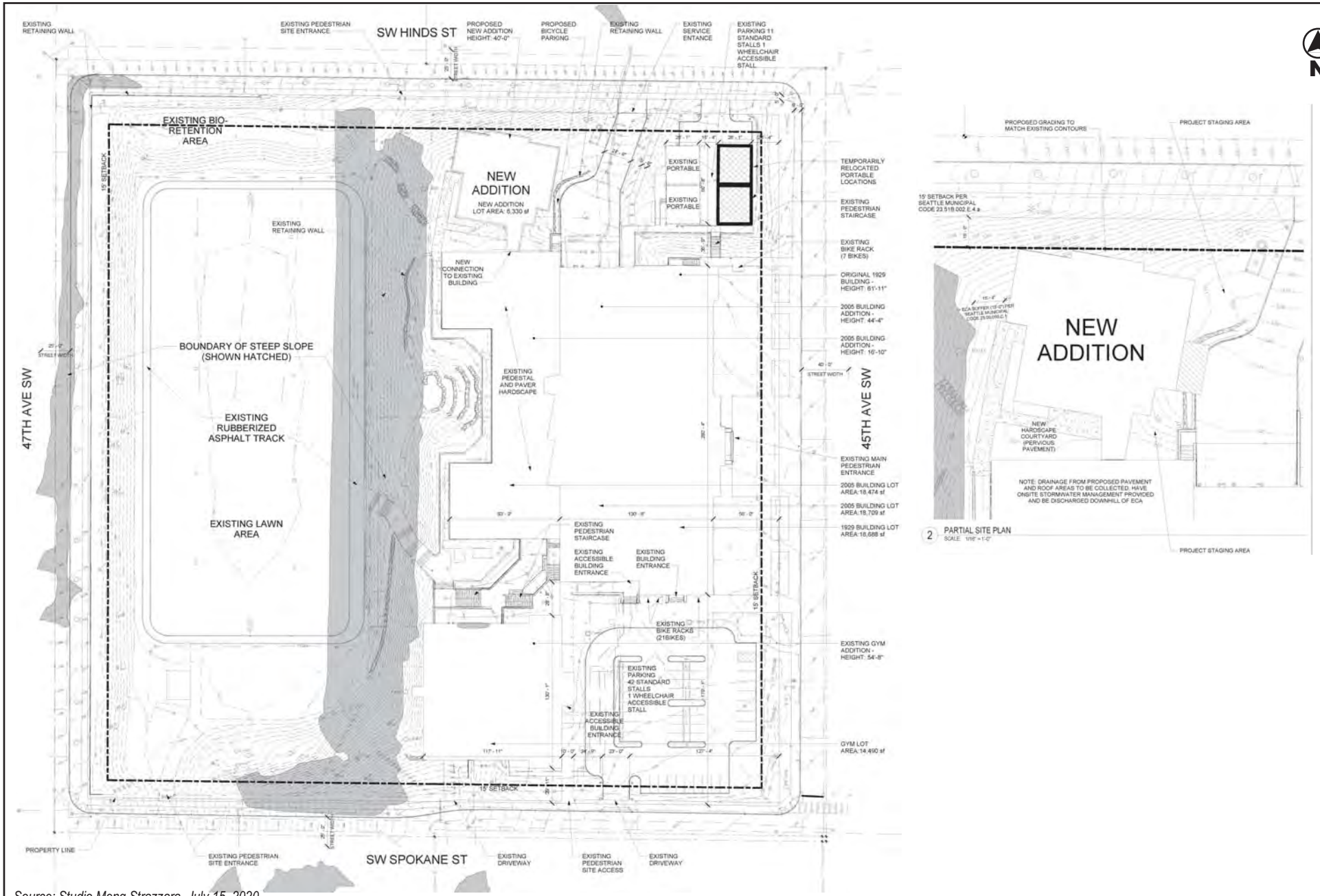
3 Seattle Public Schools, P223 Enrollment Data for Basic Enrollment report, May 2018, October 2019, and February 2020.
4 R. Gary, Madison Middle School Principal, May 2020.
5 Seattle Public Schools, School Capacity Summary, Updated October 16, 2019. Reflects number of students that will fit into the school based on the number of teaching spaces and class sizes in the Weighted Staffing Standards (WSS) model.
6 R. Gary, Madison Middle School Principal, May 2020.



Source: Studio Meng Strazzara, July 15, 2020.

Madison Middle School
Classroom Addition and Field Improvements

Figure 1

Site Plan and Proposed Classroom Addition Location

heffron transportation inc

Source: DA Hogan, Layout Plan, Sheet M-1.1, November 15, 2019

Madison Middle School
Classroom Addition and Field Improvements

Figure 2

Field Improvements and Lighting Plan

heffron transportation inc

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 Madison Middle School would operate at its current enrollment capacity. 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.

Seven off-site intersections plus the site access driveways were selected for study based on traffic counts and field observations of the travel routes used by family drivers, buses, and staff to access and egress the site area. Potential increases in traffic from the two project elements—the classroom addition and the field improvements—would occur at different times of day. The classroom addition and the added enrollment capacity created would primarily result in new trips during the morning arrival and afternoon dismissal periods, but not during the PM peak or early evening hours. The field improvements and lighting would primarily result in added trips in the PM peak and early evening hours when new activity could occur, but not during the morning arrival or afternoon dismissal peak hours. The following study area intersections were identified for analysis for the morning, afternoon, PM peak, and early-evening peak hours.

- SW Hinds Street / 47th Avenue SW
- SW Hinds Street / 45th Avenue SW
- SW Spokane Street / 47th Avenue SW
- SW Spokane St / 45th Avenue SW
- SW Spokane Street / California Avenue SW
- SW Charlestown Street / 45th Avenue SW
- SW Charlestown Street / California Avenue SW

2.1. Transportation Network

2.1.1. Existing Network

The surrounding area predominantly consists of single-family residences, with commercial development along California Avenue SW, two blocks to the east. Key roadways that serve the site are described below. Roadway classifications were obtained from the City of Seattle's (City's) *Street Classification Maps*.[7] Speed limits are 25 miles per hour (mph) on arterials (unless otherwise marked) and 20 mph on local access streets. Figure 3 shows the project site location and vicinity. The following describes key roadways in the site vicinity.

45th Avenue SW is a north-south local access street that has one travel lane in each direction and sidewalk, curb, and gutter on both sides. Parking is allowed on both sides along most of its length, but the segment adjacent to the school is restricted to school bus load/unload only from 7:00 to 9:00 A.M., and 2:00 to 4:00 P.M. In the vicinity of the school it is signed as a School Zone with speed limit of 20 mph when children are present.

SW Spokane Street is an east-west local access street connects between 42nd Avenue SW and 51st Avenue SW. It has sidewalk, curb, and gutter on both sides. With the exception of one wider segment adjacent to the school, the travel way along its length is effectively restricted to one lane for both directions of travel when on-street parking occurs on both sides.

47th Avenue SW is a north-south local access street that has sidewalk, curb, gutter, and parking on both sides. Due to its width, the travel way is effectively restricted to one lane for both directions of travel when on-street parking occurs on both sides. In the vicinity of the school it is signed as a School Zone with speed limit of 20 mph when children are present.

[7] Seattle Department of Transportation (SDOT), Street Classification Maps, accessed April 2020.

Madison Middle School

Classroom Addition and Field Improvements

Figure 3

Site Location and Vicinity

heffron transportation inc

SW Hinds Street is an east-west local access street that connects between 49th Avenue SW and California Avenue SW. In the vicinity of the school, it has sidewalk, curb, gutter, and parking on both sides. Due to its width, the travel way is effectively restricted to one lane for both directions of travel when on-street parking occurs on both sides. In the vicinity of the school it is signed as a School Zone with speed limit of 20 mph when children are present.

49th Avenue SW is a Collector Arterial between SW Admiral Way and SW Charlestown Street. It has sidewalk, curb, and gutter on both sides. Parking is allowed on the west side of the street.

California Avenue SW is a Minor Arterial between SW Admiral Way and Fauntleroy Way SW, and a Collector Arterial to the north and south of that section. It has one travel lane in each direction and a center two-way left-turn lane. There is sidewalk, curb, and gutter on both sides. Parking is generally allowed on both sides; some sections adjacent to the commercial development have time restrictions or are signed as loading zones.

SW Charlestown Street is an east-west roadway that connects between 55th Avenue SW and California Avenue SW. To the west of California Avenue SW, it is a Collector Arterial; to the east it is a local access street. It has sidewalk, curb, gutter, and parking on both sides.

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 Madison Middle School by 2022 when both project elements are planned to be completed and in use.

City of Seattle's Proposed 2020-2025 Proposed Capital Improvement Program (CIP)[8] – No improvements to the transportation network were identified in the site vicinity.

Adopted Seattle Bicycle Master Plan (BMP)[9] – The plan proposes future improvements along several roadways within the site vicinity. Neighborhood greenways (low-speed, low-volume streets that are designed to be shared by pedestrian, bicycle, and vehicular traffic) are recommended along SW Hinds Street, 48th Avenue SW, and 45th Avenue SW; an in-street local connector (a bicycle facility with minor separation) is recommended along SW Charlestown Street, and California Avenue SW is identified as an existing shared-street. The *Seattle Bicycle Master Plan – 2019-2024 Implementation Plan*[10], which defines the priorities of the projects, does not identify any of these projects for implementation by 2022 when the project elements would be completed and in use.

Seattle's Neighborhood Greenway Network[11] – Neighborhood greenway information provided by the Seattle Department of Transportation (SDOT) indicates no additional greenways currently in design or planning stages in the site vicinity.

Levy to Move Seattle – Workplan Report[12] – 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.

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8 City of Seattle, 2019.
9. City of Seattle, March 2015.
10 SDOT, June 13, 2019.
11 https://www.seattle.gov/transportation/projects-and-programs/programs/greenways-program, Map updated January 24, 2020, Accessed February 2020.
12 SDOT, November 2018.

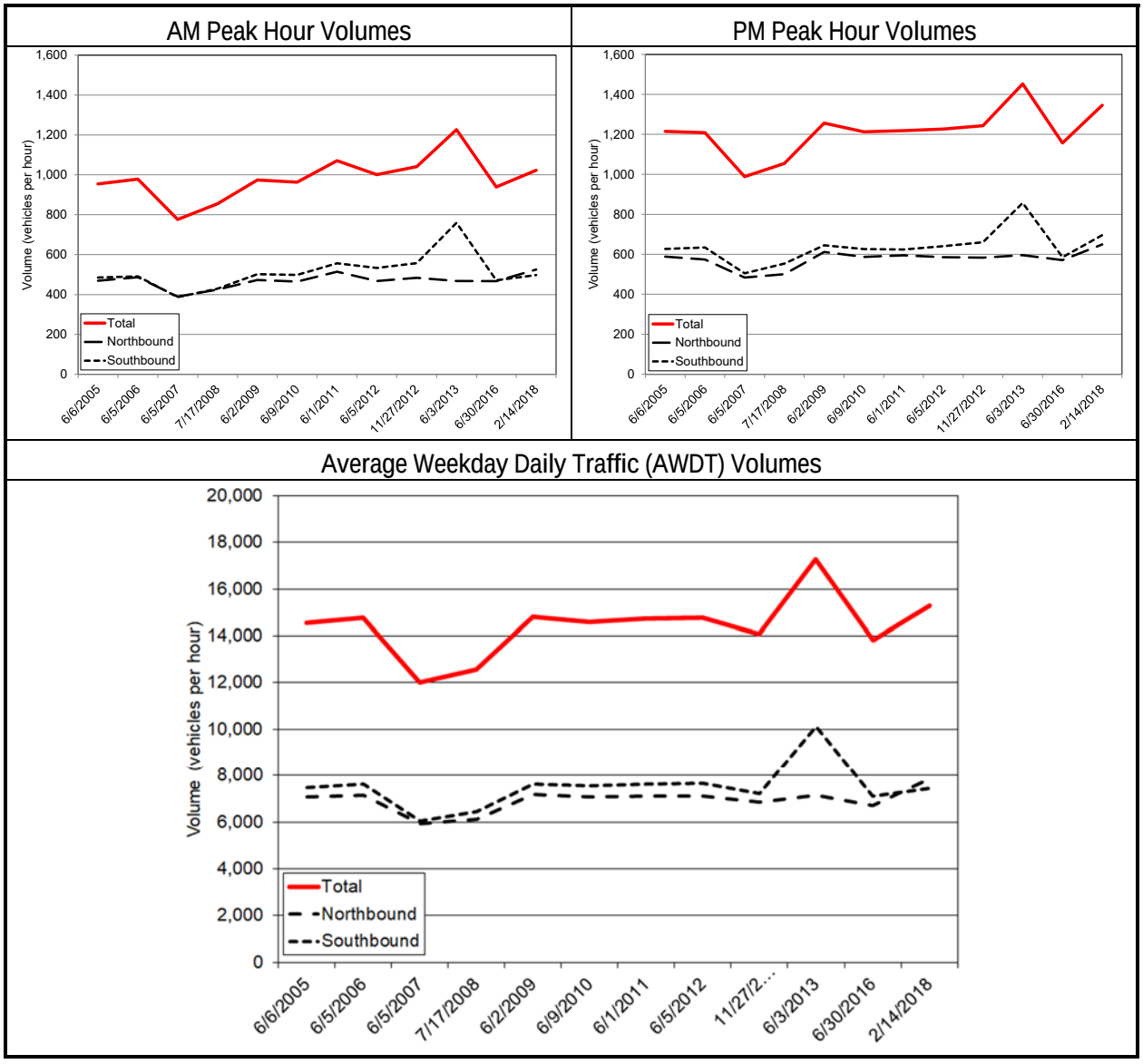
None of the planning documents included any transportation improvements that would affect the roadway network operations or intersection capacity within the study area by 2022. Therefore, the existing roadway and intersection configurations were assumed to remain unchanged the 2022 analysis presented in this report.

2.2. Traffic Volumes

2.2.1. Historical Traffic Volumes

Review of historical daily traffic counts collected by SDOT on California Avenue SW near SW Charlestown Street between 2005 and 2018 found that traffic volumes grew by less than 1% per year.[13] Volumes were relatively steady with a decline in 2007 and 2008 (at the time of the economic slowdown) and recovery by 2012. Figure 4 shows the AM and PM peak hour and daily volumes from 2005 to 2018.

Figure 4. Traffic Volumes on California Avenue SW at SW Charlestown Street – 2005 to 2018

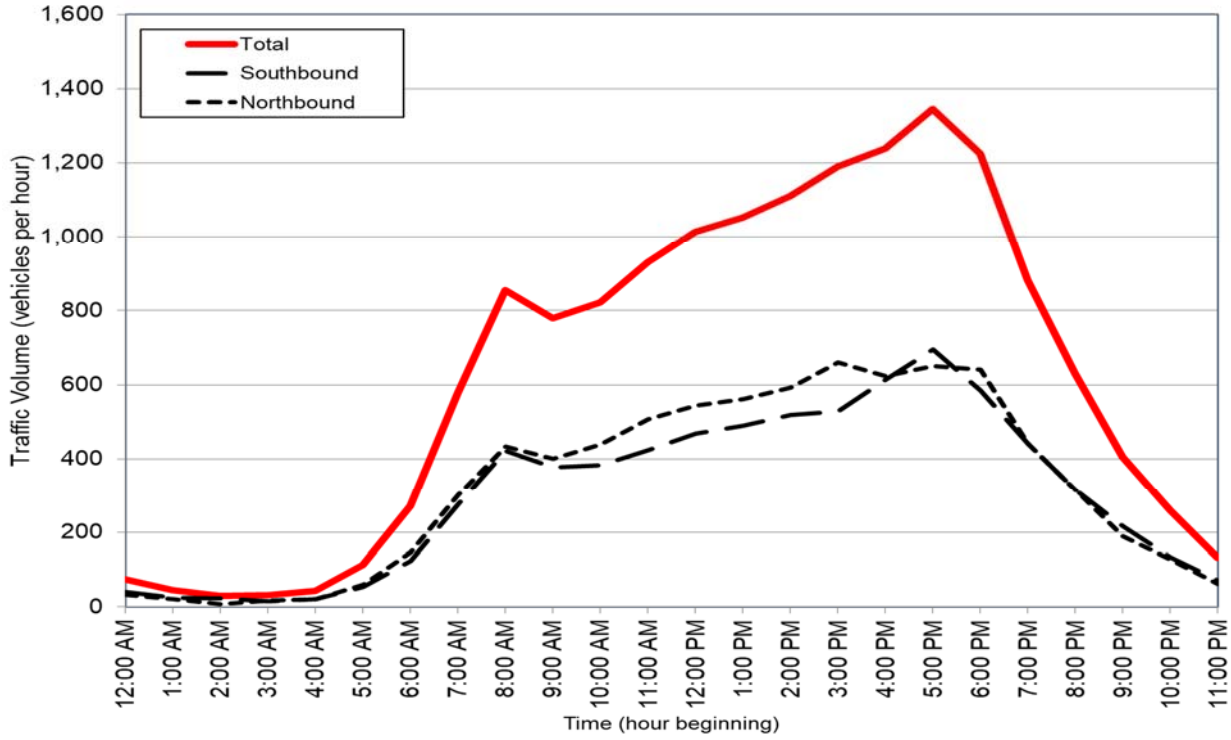


Source: SDOT Traffic Count Database, March 2020.

[13] SDOT, 24-hour machine count database, 2012 – 2018.

Traffic count data on California Avenue SW north of SW Charlestown Street were also compiled to determine how volume changes by time of day. SDOT's most recent data were collected in February 2018. Figure 5 shows that traffic volumes on California Avenue SW does **not** follow the traditional commuter patterns in Seattle where volumes peak in the morning and afternoon with lower volumes midday. Instead, volumes on this street have a mild morning peak and then a steady increase to the commuter PM peak hour.

Figure 5. Hourly Traffic Volumes on SW California Ave n/o SW Charlestown St – Feb. 2018



Source: Average weekday volumes from counts performed by SDOT on California Ave SW n/o SW Charlestown St, Feb. 14-15, 20, 2018.

2.2.2. Existing Traffic Volumes

As part of the analysis effort for the field improvements and lighting project element, weekday PM peak period and early evening turning movement traffic counts were conducted on Tuesday, January 28, 2020, prior to the COVID-related statewide closures. Counts were conducted at the seven study area intersections and the site access driveway on SW Spokane Street. All counts were performed from 4:00 to 8:00 P.M. and include the period in which the proposed field improvements and lights could result in increased traffic at the school site. Counts of the main site driveway and intersections surrounding the site reflect conditions with typical afternoon and early evening activities, but no large event. During the analysis hours, school-generated traffic at the access driveway on SW Spokane Street was 82 trips (35 in, 47 out) during the PM peak hour and 35 trips (16 in, 19 out) during the early evening (6:00 to 7:00 P.M.) hour. These trips were most likely associated with some of the activities at the school, such as athletic practices ending and possibly some staff leaving for the day. Trips are also often related to community use of school facilities (e.g. use of the gymnasium or meeting spaces for groups such as Boy Scouts and Girl Scouts) or athletic fields. Additional school-generated traffic during these hours also likely occurred to and from on-street parking surrounding the site and was captured in the study-area traffic counts.

Due to the statewide school closures that were in effect at the time the classroom addition element was initiated, it was not possible to collect new traffic data during the additional analysis periods (morning and afternoon peak hours) in which it would be expected to generate new trips. However, traffic data collected for other projects in the vicinity were available and were compiled for use in this analysis.

During the 2019-20 academic year, the school day at Madison Middle School started at 8:55 A.M. and ended at 3:45 P.M. (with early release at 2:30 P.M. Wednesdays). Traffic counts were performed for another project at four of the study area intersections—45th Avenue SW at SW Hinds and Spokane Streets, and California Avenue SW at SW Spokane and SW Charlestown Streets. Morning counts were performed from 7:00 to 9:00 A.M. on Thursday, October 31, 2019. Counts were performed at the same times at the 49th Avenue SW intersections with SW Hinds and Spokane Streets, to the west of the study area. Counts were also conducted at the same locations on the same day from 1:30 to 3:30 P.M.

The morning counts captured the peak hour for school traffic and demonstrate that it occurs from 8:00 to 9:00 A.M. Morning peak hour volumes at three intersections—the 47th Avenue SE intersections at SW Hinds and Spokane Streets as well as the SW Charlestown Street / 45th Avenue SW intersection—were derived from the available surrounding data.

Based on the school's dismissal time and on data collected near other Seattle middle schools, the afternoon peak hour for Madison Middle School likely occurs from 3:15 to 4:15 P.M. The afternoon counts described above captured part of the school's afternoon peak hour, but not the 30 minutes around the 3:45 P.M. dismissal. Examination of the morning and afternoon data clearly show that background (non-school) traffic volumes at intersections closest to the site are very low with total entering volumes of 100 vehicles or less per hour. During the school peak arrival and dismissal periods, most of the traffic at these locations is school-generated. Farther from the site, the volumes at intersections along SW Charlestown Street and California Avenue SW reflect the typical patterns illustrated previously in Figure 5. Therefore, afternoon peak hour traffic volumes were estimated based on a combination of: 1) the available morning and afternoon data, 2) 24-hour counts in the vicinity, 3) extensive data collected for SPS and other Puget-Sound-area middle schools, and 4) data published by the Institute of Transportation Engineers [ITE] in its *Trip Generation Manual*.[14]

Published ITE data indicate that afternoon peak hour trip generation by middle schools is about 50% of the morning peak hour trip generation. This relationship is supported by data collected at other Seattle middle schools (Washington and Hamilton), where afternoon peak hour traffic was observed to be 49% of the morning peak hour volumes. It is further reinforced by data from nine Puget-Sound-area middle / junior-high schools in five public school districts (Sumner-Bonney-Lake, Issaquah, Edmonds, Puyallup, and Northshore), where afternoon traffic generation was consistently 50% of morning traffic. However, to reflect potential worst-case conditions, the higher morning volumes counted near the site were also assumed to occur in the afternoon. Volumes farther from the site were derived using the available PM peak hour turning movement counts and data from seven-day machine counts on California Avenue SW (at SW Dakota Street) and SW Charlestown Street (east of 52nd Avenue SW). The machine data were collected in 2019[15] and indicate that volumes during the school's afternoon peak hour (3:15 to 4:15 P.M.) hour are between 85% and 95% of the commuter PM peak hour volumes. For this analysis, the afternoon peak hour volumes were estimated by reducing the PM peak hour volumes by 5%.

Figure 6 shows the existing morning and estimated afternoon peak hour traffic volumes for the study-area intersections; Figure 7 shows the existing PM and early evening peak hour volumes.

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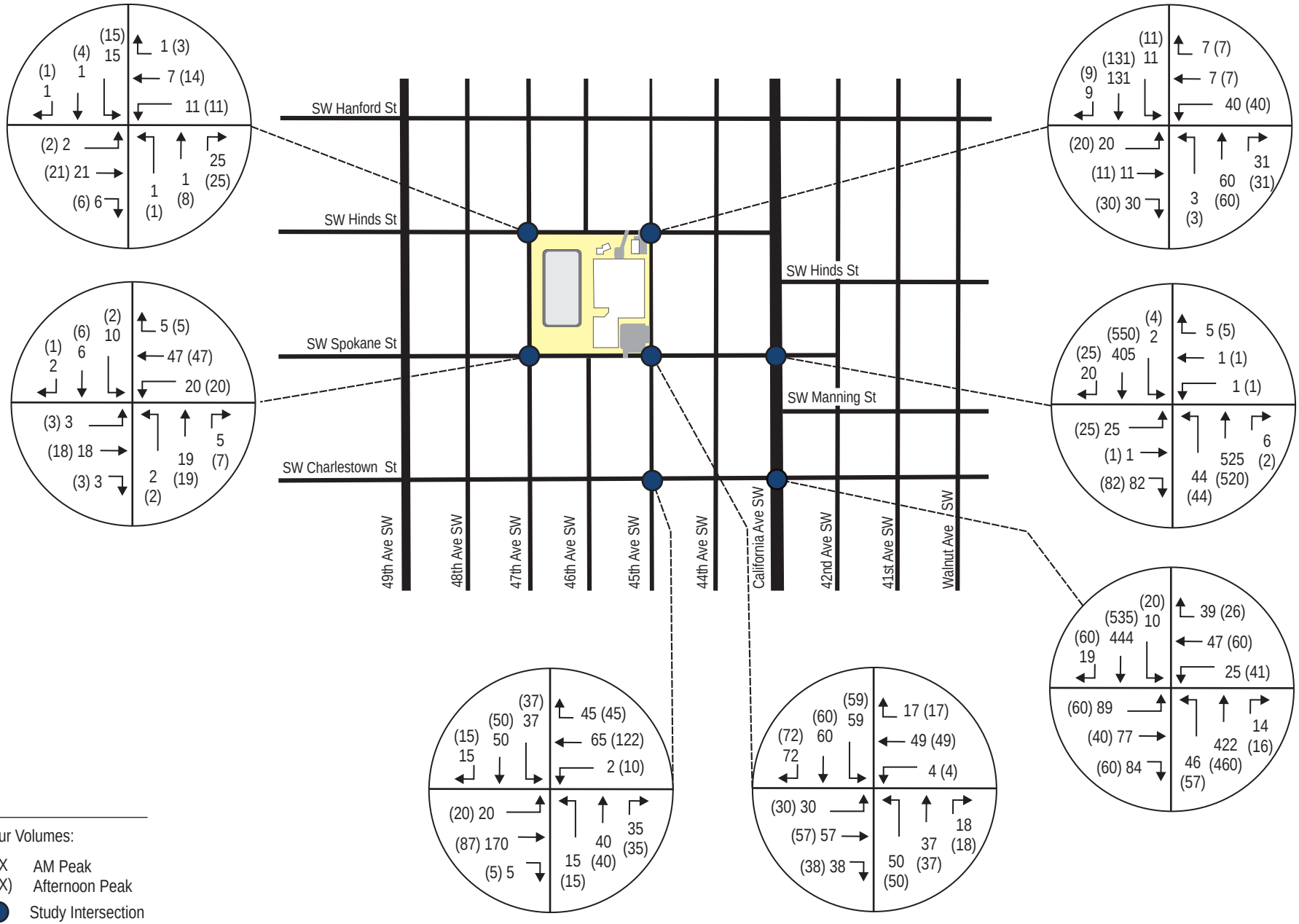
14 10th Edition, September 2017.

15 California Avenue SW counts by Idax Data Solution, March 8-14, 2019 and SW Charlestown Street counts by SDOT January 9-16, 2019.



Madison Middle School

Classroom Addition and Field Improvements

Figure 6
Existing Traffic Volumes
Morning and Afternoon Peak Hour

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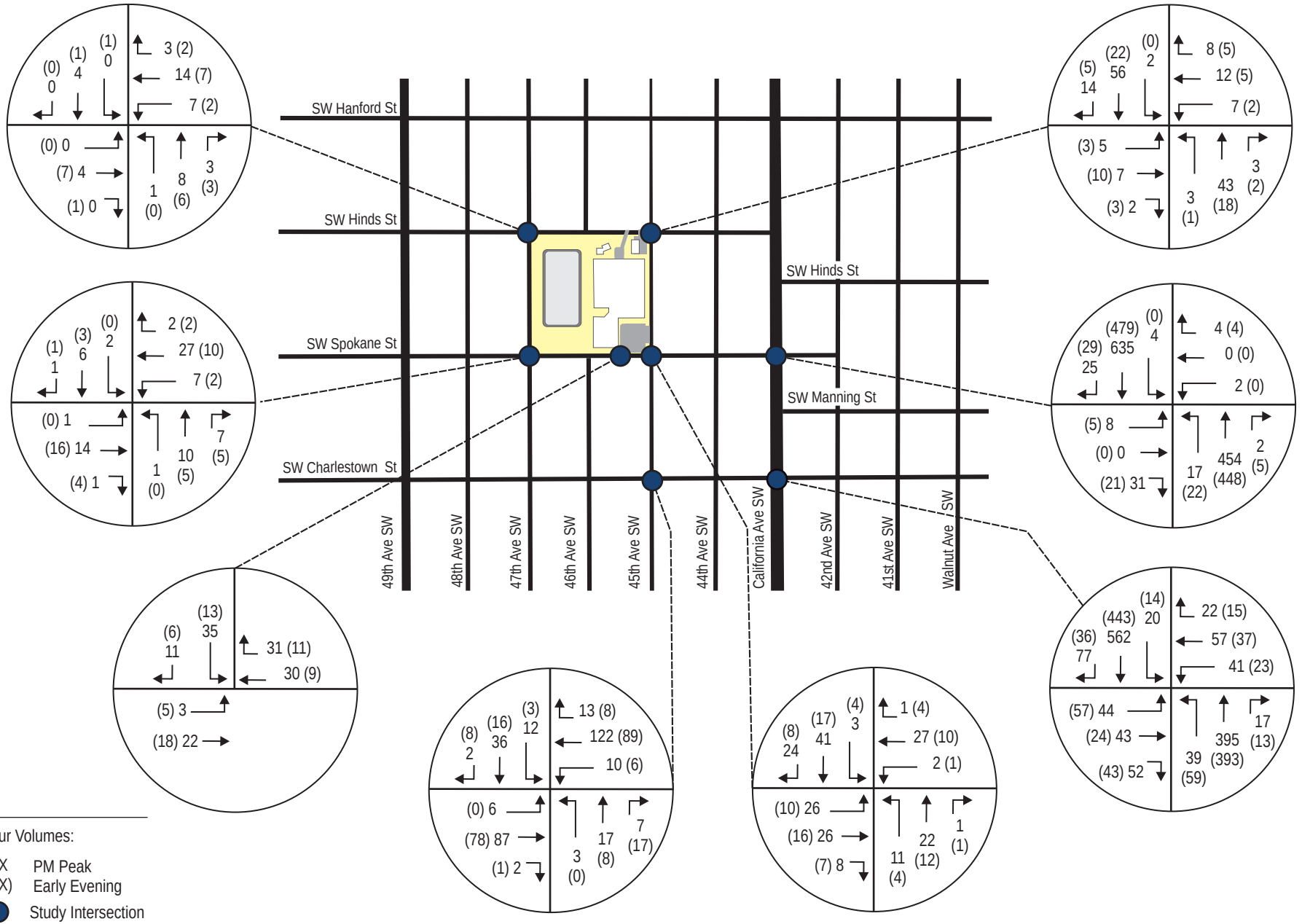

Madison Middle School

Classroom Addition and Field Improvements

Figure 7
Existing Traffic Volumes
PM Peak and Early Evening Hours

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2.2.3. Forecast Without-Project Traffic Volumes

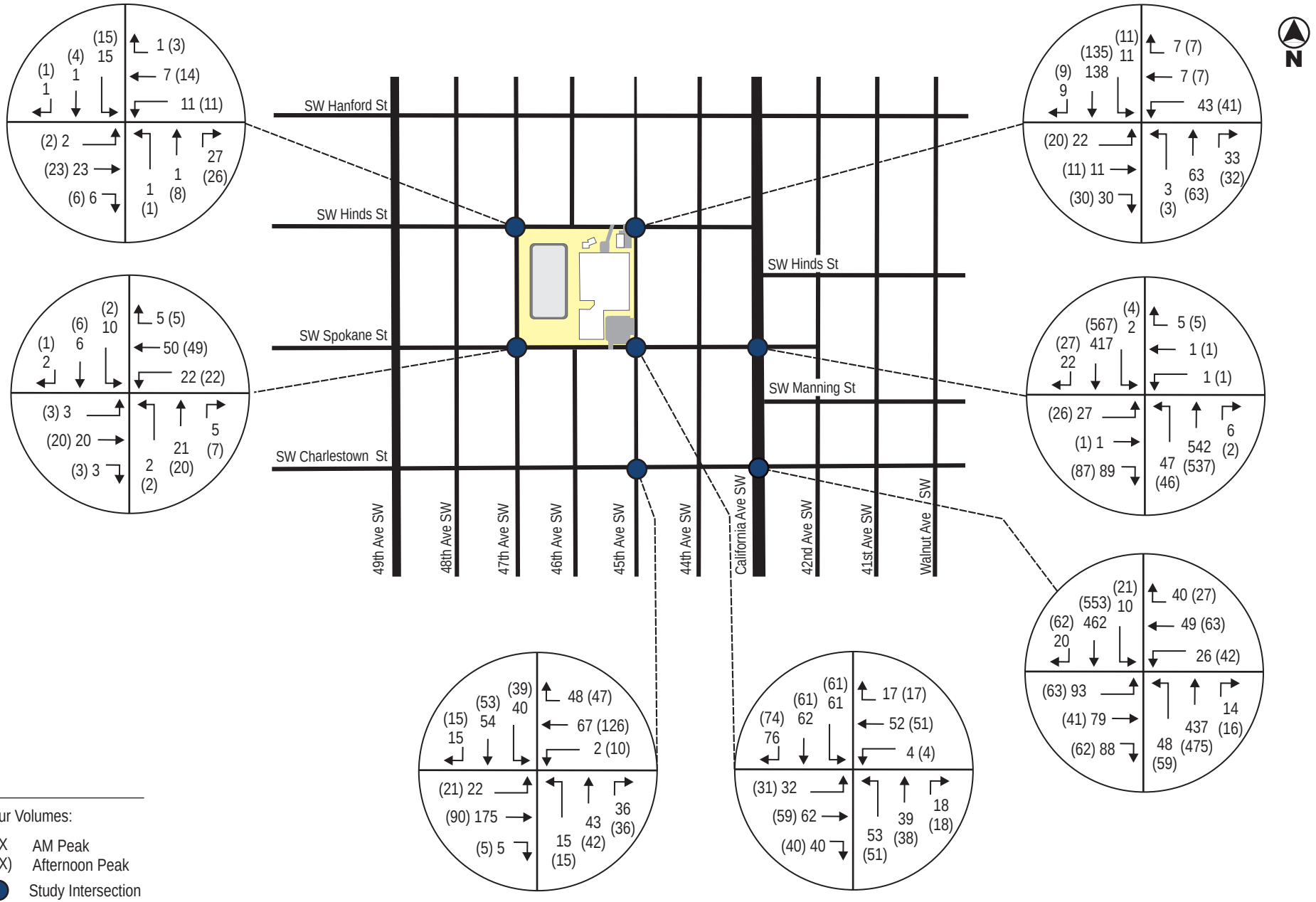
The field improvements are planned to be completed by fall 2021 or early 2022 and the classroom addition is planned to be completed and occupied by fall 2022. In order to reflect conditions with both elements completed, future analysis was completed for 2022.

Future without-project traffic forecasts were developed after review of study-area traffic growth patterns and potential for new pipeline development in the vicinity. The Seattle Department of Construction and 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. Although a number of developments have been completed in the last several years (particularly along California Avenue SW), no development projects were identified that are expected to add noticeable traffic to study-area intersections during the analysis peak hours by 2022. For example, a proposed development located at 4508 California Avenue SW (SDCI Project #3031518) plans 75 multifamily apartment units and 4,660 sf of commercial space. The traffic analysis for that project indicates it would generate 20 PM peak hour trips and 4 or fewer through the two study-area intersections on California Avenue SW.[16]

Based on recent growth trends described previously, a 1.0% annual growth rate was applied to the existing traffic volumes to reflect year 2022 volumes. This is consistent with rates used for traffic analyses of other developments in the vicinity and throughout Seattle and would account for planned development projects such as the one described above. In addition, morning and afternoon peak hour traffic at study area intersections was increased to reflect conditions with Madison Middle School enrolled at its existing capacity of 1,039 students (up from 989 students enrolled at the time of the existing traffic counts). The estimates of added school traffic were derived using rates described later in this report in Section 3.2.1.

Figure 8 shows the forecast 2022-without-project morning and afternoon hour traffic volumes; Figure 9 shows the 2022-without-project PM peak and early evening hour volumes.

[16] Transportation Engineering NorthWest, Transportation and Parking Analysis – 4508 California Ave (DCI Project #3031518), April 24, 2019.



Madison Middle School

Classroom Addition and Field Improvements

Figure 8
Forecast 2022-Without-Project Traffic Volumes
Morning and Afternoon Peak Hours

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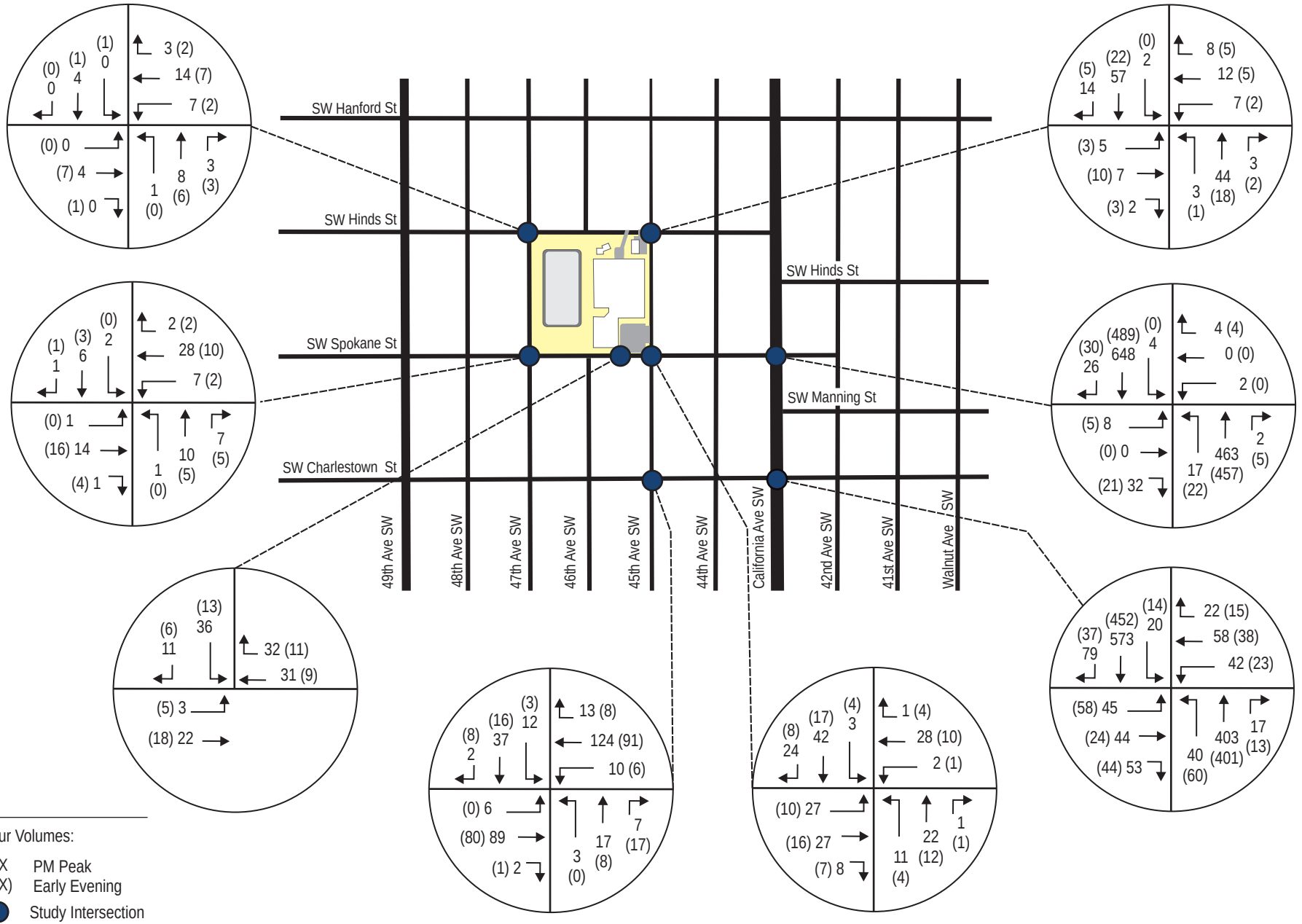

Madison Middle School

Classroom Addition and Field Improvements

Figure 9
Forecast 2022-Without-Project Traffic Volumes
PM Peak and Early Evening Hours

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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.*[17] Appendix A includes level of service thresholds and definitions for signalized and unsignalized intersections. Delay calculations rely on complex equations that consider a number of variables. For example, delay at signalized intersections is determined based on a combination of variables including: the quality of progression, cycle length, green ratio, and a volume-to-capacity ratio for the lane group or approach in question. Delay at unsignalized intersections is determined for vehicles that must stop or yield for oncoming traffic. That 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. All level-of-service calculations were performed using the *Synchro 10.3 (Build 122)* traffic operations analysis software. Input data for this analysis, including geometric characteristics were collected during field observations; signal timing was based on timing cards provided by SDOT. These conditions are expected to stay the same in the future analysis year. Results for unsignalized intersections were reported using the *HCM 6* module; levels of service for the signalized intersection were reported using the *Synchro* module which refines *Highway Capacity Manual* methods to account for more detailed driving behavior and signal operations.

Table 1 summarizes existing and forecast 2022-without-project levels of service at the study-area intersections for the four analysis hours (morning, afternoon, PM peak, and early evening). As shown, all intersections currently operate at LOS B or better overall and are expected to continue at those levels in 2022 without the project. The eastbound stop-controlled movement at SW Spokane Street / California Avenue SW currently operates at LOS D during the morning peak hour and LOS E during the afternoon peak hour. Projected growth in background traffic is expected to add some delay and may degrade that movement from LOS D to LOS E in the morning peak hour. However, all increases in average delay are estimated at less than six seconds, and for most movement are less than one second. All other movements at the two-way-stop and uncontrolled intersections operate at LOS C or better during all analysis periods.

[17] Transportation Research Board (TRB), 2016.

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

Intersection	Morning (8:00–9:00 A.M.)				Afternoon (3:15–4:15 P.M.)			
	Existing		2022 w/o Project		Existing (2020)		2022 w/o Project	
Signalized	LOS [1]	Delay [2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Charlestown St / California Ave SW	B	12.5	B	13.2	A	9.6	A	10.0
All-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Spokane Street / 45th Avenue SW	B	10.2	B	10.6	B	10.2	B	10.5
Two-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Hinds Street / 47th Avenue SW [3]	A	6.0	A	5.9	A	6.1	A	6.1
Northbound Movements	A	8.8	A	8.8	A	9.1	A	9.1
Eastbound Left-Turn	A	7.2	A	7.2	A	7.3	A	7.3
Westbound Left Turn	A	7.4	A	7.4	A	7.4	A	7.4
Southbound Movements	A	9.8	A	9.8	B	10.1	B	10.1
SW Hinds Street / 45th Avenue SW	A	5.7	A	5.9	A	5.7	A	5.7
Northbound Left Turn	A	8.2	A	8.3	A	8.2	A	8.3
Eastbound Movements	B	14.6	C	15.3	B	14.6	B	14.9
Westbound Movements	C	15.1	C	15.8	C	15.1	C	15.5
Southbound Left Turn	A	7.5	A	7.5	A	7.5	A	7.5
SW Spokane Street / 47th Avenue SW [3]	A	4.4	A	4.4	A	3.8	A	3.9
Northbound Movements	B	10.3	B	10.5	B	10.0	B	10.2
Eastbound Left-Turn	A	7.4	A	7.4	A	7.4	A	7.4
Westbound Left Turn	A	7.3	A	7.3	A	7.3	A	7.3
Southbound Movements	B	10.4	B	10.5	B	10.2	B	10.3
SW Spokane St / California Avenue SW	A	4.0	A	4.8	A	4.7	A	5.3
Northbound Left Turn	A	8.8	A	8.9	A	9.3	A	9.3
Eastbound Movements	D	32.0	E	37.9	E	38.6	E	43.9
Westbound Movements	C	23.6	D	25.0	C	22.1	C	22.9
Southbound Left Turn	A	9.2	A	9.3	A	8.8	A	8.9
SW Charlestown St / 45th Avenue SW	A	5.4	A	5.6	A	5.7	A	5.8
Northbound Movements	B	12.3	B	12.6	B	11.8	B	12.0
Eastbound Left-Turn	A	7.5	A	7.5	A	7.7	A	7.7
Westbound Left Turn	A	7.7	A	7.7	A	7.5	A	7.5
Southbound Movements	B	14.1	B	14.7	B	13.9	B	14.3

(Table 1 continues on following page)

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

Intersections	PM Peak Hour (5:00–6:00 P.M.)				Early Evening Hour (6:00–7:00 P.M.)			
	Existing		2022 w/o Project		Existing (2020)		2022 w/o Project	
Signalized	LOS [1]	Delay [2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Charlestown St / California Ave SW	A	9.5	A	9.7	A	8.1	A	8.1
All-Way-Stop Controlled	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
SW Spokane Street / 45th Avenue SW	A	7.9	A	7.9	A	7.2	A	7.2
Two-Way-Stop Controlled	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**	**LOS**	**Delay**
SW Hinds Street / 47th Avenue SW [3]	A	4.9	A	4.9	A	3.8	A	3.8
Northbound Movements	A	9.2	A	9.2	A	9.0	A	9.0
Eastbound Left-Turn	A	0.0	A	0.0	A	0.0	A	0.0
Westbound Left Turn	A	7.3	A	7.3	A	7.2	A	7.2
Southbound Movements	A	9.5	A	9.5	A	9.0	A	9.0
SW Hinds Street / 45th Avenue SW	A	2.6	A	2.6	A	3.7	A	3.7
Northbound Left Turn	A	7.4	A	7.4	A	7.3	A	7.3
Eastbound Movements	A	10.0	A	10.0	A	9.3	A	9.3
Westbound Movements	A	9.9	A	9.9	A	9.0	A	9.0
Southbound Left Turn	A	7.4	A	7.4	A	0.0	A	0.0
SW Spokane Street / 47th Avenue SW [3]	A	3.7	A	3.7	A	3.2	A	3.2
Northbound Movements	A	9.3	A	9.3	A	9.0	A	9.0
Eastbound Left-Turn	A	7.3	A	7.3	A	0.0	A	0.0
Westbound Left Turn	A	7.3	A	7.3	A	7.3	A	7.3
Southbound Movements	A	9.5	A	9.5	A	9.2	A	9.2
SW Spokane St / California Avenue SW	A	1.3	A	1.3	A	0.9	A	0.9
Northbound Left Turn	A	9.5	A	9.6	A	9.1	A	9.1
Eastbound Movements	C	21.5	C	22.1	C	17.3	C	17.7
Westbound Movements	C	19.9	C	20.4	B	11.8	B	11.9
Southbound Left Turn	A	8.5	A	8.5	A	0.0	A	0.0
SW Charlestown St / 45th Avenue SW	A	3.2	A	3.2	A	2.2	A	2.1
Northbound Movements	B	10.8	B	10.9	A	9.7	A	9.8
Eastbound Left-Turn	A	7.6	A	7.6	A	0.0	A	0.0
Westbound Left Turn	A	7.5	A	7.5	A	7.5	A	7.5
Southbound Movements	B	11.8	B	11.9	B	10.4	B	10.4

Source: Heffron Transportation, Inc., October 2020.

1. *Level of service.*
2. *Average seconds of delay per vehicle.*
3. *Uncontrolled intersection evaluated as stop-controlled for north-south legs.*

2.4. Parking Supply and Occupancy

On-street parking at and around the Madison Middle School site was surveyed in May 2018 as part of the analysis evaluating the placement of portables at the site. Parking was surveyed again in February 2020 as part of the referenced review evaluating proposed athletic field improvements and lighting. Both surveys were conducted 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 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.[18] 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.

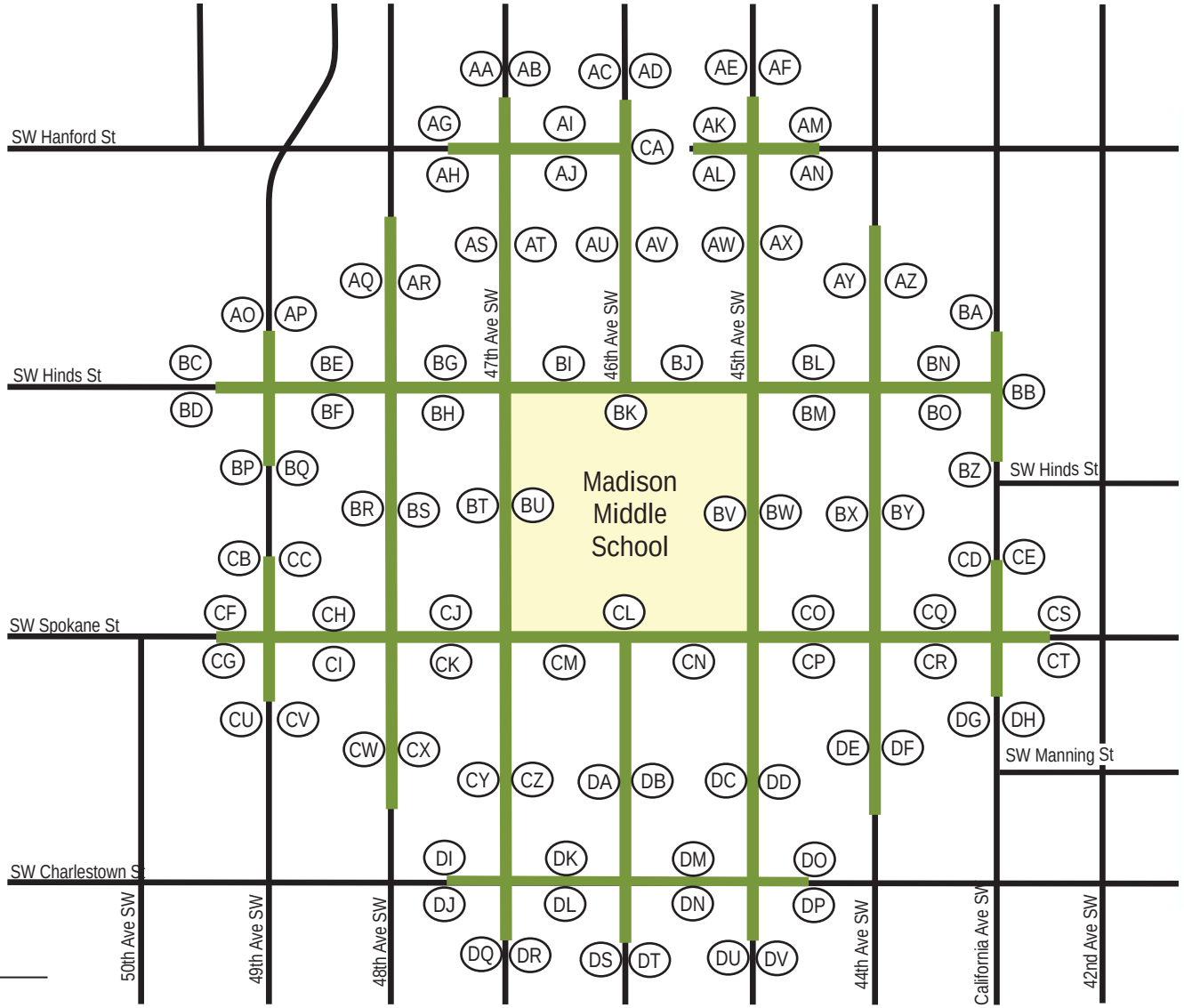
The study area for the on-street parking analysis included all roadways within an 800-foot *walking* distance from the school site, as is typically required by the City for evaluations of new development for SEPA review. The 800-foot walking distance results in a study area that extends just north of SW Hanford Street, just west of 49th Avenue SW, just south of SW Charlestown Street, and east to SW California Avenue. The study area consists primarily of residential land uses, with commercial development concentrated along sections of California Avenue SW. Much of the residential development has access to off-street parking, with several north-south alleys also present in the area. Details about parking supply and demand are provided in the following sections.

Existing On-Street Parking Supply

In the study area, most of the local access residential streets are at least 25 feet wide and parking is generally permitted on both sides of the street. The study area was separated into individual block faces. The study area and block face designations are shown on Figure 10. A block face consists of one side of a street between two cross-streets. For example, the west side of 45th Avenue SW between SW Hinds Street and SW Spokane Street is one block face (identified as block face 'BV').

Each block face was measured and analyzed to determine the number of on-street parking spaces. First, common street features—such as driveways, fire hydrants, and special parking zones—were noted and certain distances adjacent to the street features were measured. 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 of street between street features were converted to legal on-street parking spaces using values in the City's Tip #117. It should be noted that the curb-face values in Tip #117 reflect variable parking space lengths. Based on extensive experience preparing on-street parking utilization studies, the increased popularity of smaller cars (such as Smart 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. No adjustments were made to these values for this analysis and as a result, the reported supply may be conservatively low.

[18] Seattle Department of Planning and Development, Tip 117, *Parking Waivers for Accessory Dwelling Units*, Updated May 12, 2011.



Madison Middle School

Classroom Addition and Field Improvements

Figure 10
Study Area for
On-Street Parking Occupancy Surveys

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Two on-street parking surveys have been performed for the site vicinity, one in May 2018 and one in February 2020. The most recent on-street inventory estimated a total supply of 1,054 parking spaces within the study area; of these, 997 have no restrictions. This is slightly higher than the parking supply surveyed in May 2018 (which found 1,045 spaces) due to revisions to curb-side restrictions or availability (e.g. spaces temporarily not available due to construction). Detailed parking supply values by block face for both surveys is provided in Appendix B.

On-Street Parking Occupancy

Parking occupancy counts within the study area were performed in May 2018 and February 2020. In May 2018, weekday demand counts were performed during three periods. Mid-morning (between 9:30 and 10:30 A.M.) and mid-afternoon (1:00 to 2:00 P.M.) counts were conducted to reflect typical school day conditions. Evening (6:30 to 7:30 P.M.) counts were conducted to reflect conditions when after-school activities or events may take place. The highest level of after-school activity occurred on Thursday, May 17, during the school's Super Science Night. The results of the 2018 parking occupancy surveys are summarized in Table 2. In February 2020, occupancy counts were performed on school-day and weekend evenings during times when use of the improved and lighted athletic field could generate added parking demand. The counts were conducted in the early evening (between 5:45 and 6:45 P.M.) and later evening (between 8:15 and 9:15 P.M.) on Tuesday, February 4, and Thursday, February 6, Saturday, February 8, and Sunday, February 9, 2020. The counts for each day were compiled and averaged. The results of the 2020 parking occupancy surveys are summarized in Table 3. Detailed summaries of the on-street parking occupancy by block face for all counts are provided in Appendix B.

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 summarized in Table 2 and Table 3. As shown, utilization within the study area was consistently about 25% on school days and increased to about 35% on weekday and weekend evenings with no event at the school. With events at the school, utilization increased to 40% in 2018 and to 37% in 2020 with between 630 and 788 unused parking spaces. 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.

Table 2. On-Street Parking Demand Survey Results – May 2018

Element	Mid-Morning 9:30-10:30 A.M.			Mid-Afternoon 1:00-2:00 P.M.			Evening 6:30-7:30 P.M.			
							No Event			Event
Count Date	5/21	5/22	Avg.	5/16	5/17	Avg.	5/16	5/21	Avg.	5/17 [a]
Demand	265	257	261	269	260	265	352	342	347	415
Supply [c]	*1,045*			*1,045*			*1,045*			
Utilization	25%	25%	25%	26%	25%	25%	34%	33%	33%	40%

Source: Heffron Transportation, Inc., May 2018.

a. Event parking survey on May 17, 2018 reflected conditions with Super Science Night, 6:30 to 8:00 P.M. in school commons.

Table 3. On-Street Parking Occupancy Survey Results – February 2020

Periods / Survey Element	Weeknights			Weekend Evenings		
	Tue., 2/4 [a]	Thu., 2/6	Average	Sat., 2/8 [c]	Sun., 2/9	Average
Early Evening (5:45 to 6:45 P.M.)						
Supply	1,054	1,054	1,054	1,054	1,054	1,054
Occupancy	338	341	340	343	357	350
% Utilization	32%	32%	32%	33%	34%	34%
Evening (8:15 p.m. to 9:15 P.M.)						
Supply	1,054	1,054	1,054	1,054	1,054	1,054
Occupancy	385	361	373	355	384	370
% Utilization	37%	34%	36%	34%	36%	35%

Source: Heffron Transportation, Inc., February 2020.

a. Event posted on Madison Middle School PTSA Facebook page – "On February 4th from 6:30 P.M. to 8:00 P.M. in the Madison Library, Principal, Dr. Gary, will discuss teacher professional development as well as advanced placement programs at Madison for next year."

b. The total on-street parking supply surveyed in 2020 was slightly different than that surveyed in 2018. The changes were largely due to variations in the availability of some curb-side parking areas for activities such as construction staging.

2.4.2. Off-Street Parking

On-site parking lots are located on the north and south sides of the Madison Middle School campus. Currently, the lots have a total of 67 spaces (43 parking spaces in the South Lot, 19 spaces in the North, and 5 informal spaces in the Service Area), including four spaces that require disabled permits, and 57 general spaces. Although the North Lot has 19 striped spaces, six were unusable during the February 2020 survey due to the placement of portables, so 61 spaces were useable on site.

Parking demand counts of each lot were performed on the same days and times described previously for the on-street parking utilization study and are summarized in Table 4 for the May 2018 counts and in Table 5 for the February 2020 counts.

Table 4. Off-Street Parking Demand Survey Results – May 2018

Element		Mid-Morning 9:30-10:30 A.M.		Mid-Afternoon 1:00-2:00 P.M.		Evening 6:30-7:30 P.M.		
						No Event		Event
Count Date	Supply	5/21	5/22	5/16	5/17	5/16	5/21	5/17 [b]
Svc. Area [a]	*5*	5	4	4	4	4	2	5
North Lot	19	15	15	12	16	0	0	8
South Lot	43	36	36	35	37	5	0	42
Total	67	56	55	51	57	9	2	55
Unused		11	12	16	10	58	65	12

Source: Heffron Transportation, Inc., May 2018.

a. Provides access to truck loading dock with driveway on SW Hinds Street. Although it does not have formal marked parking spaces, field observations indicate that it is regularly used for parking of up to 5 vehicles.

b. Event parking survey on May 17, 2018 reflected conditions with Super Science Night, 6:30 to 8:00 P.M. in school commons.

Table 5. Off-Street Parking Demand Survey Results – February 2020

Periods / On-Site Lots	Supply	Weeknights			Weekend Evenings		
		Tues., 2/4 [b]	Thurs., 2/6	Average	Sat., 2/8	Sun., 2/9	Average
Early Evening (5:45 to 6:45 p.m.)							
Service Area [a]	5	3	2	3	Closed	Closed	Closed
North Lot	13	2	0	1	Closed	Closed	Closed
Main (South) Lot	43	13	15	14	Closed	0	0
Total	61	18	17	18	--	0	0
Unused Spaces		43	44	43	61	61	61
Evening (8:15 p.m. to 9:15 p.m.)							
Service Area [a]	5	2	2	2	Closed	Closed	Closed
North Lot	13	Closed	0	0	Closed	Closed	Closed
Main (South) Lot	43	31	5	18	Closed	0	0
Total	61	33	7	20	--	0	0
Unused Spaces		28	54	41	61	61	61

Source: Heffron Transportation, Inc., February 2020.

a. Provides access to truck loading dock with driveway on SW Hinds Street. Although it does not have formal marked parking spaces, field observations indicate that it is regularly used for parking of up to 5 vehicles.

b. Event posted on Madison Middle School PTSA Facebook page – "On February 4th from 6:30 P.M. to 8:00 P.M. in the Madison Library, Principal, Dr. Gary, will discuss teacher professional development as well as advanced placement programs at Madison for next year."

As shown, school-day demand within the on-site lots in May 2018 ranged from 51 to 57 vehicles during the day with 11 to 16 spaces unused. A similar level of on-site demand occurred during the evening of the school's Super Science Night (on May 17, 2018). During the other evenings, the on-site parking demand was fewer than 10 vehicles, with 58 to 65 unused spaces. During the evening counts performed in February 2020, the off-street parking lots had variable demand with more than 28 unused spaces at all times. It is also noted that during some of the observation periods, the parking lots were gated closed and unavailable for parking.

2.5. Traffic Safety

Collision data for the study area intersections and roadway segments were obtained from SDOT's *Open Data Portal* for the period between January 1, 2016, and the most recent records available as of February 14, 2020 (4.1 years).[19] 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 6 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 one or fewer collisions 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.

[19] SDOT, https://data-seattlecitygis.opendata.arcgis.com/datasets/collisions, *accessed February 14, 2020.*

Table 6. Collision Summary (January 1, 2016 through February 14, 2020)

Intersections	Rear-End	Side-Swipe	Right Turn	Left Turn	Right Angle	Ped / Cycle	Other	Total for 4.1 Years	Average/ Year
Signalized Intersections									
SW Charlestown St / California Ave SW	0	0	0	1	2	1	0	4	1.0
Unsignalized Intersections									
SW Hinds St / 47th Ave SW	0	0	0	0	0	0	0	0	0.0
SW Hinds St / 45th Ave SW	0	0	0	0	0	0	0	0	0.0
SW Spokane St / 47th Ave SW	0	0	0	0	0	0	1	1	0.2
SW Spokane St / MMS driveway	0	0	0	0	0	0	0	0	0.0
SW Spokane St / 45th Ave SW	0	0	0	0	0	0	0	0	0.0
SW Spokane St / California Ave SW	1	0	0	0	0	0	0	1	0.2
SW Charlestown St / 45th Ave SW	0	0	0	0	0	0	0	0	0.0

Source: SDOT, https://data-seattlecitygis.opendata.arcgis.com/datasets/collisions, February 14, 2020.

2.6. Transit Facilities and Service

King County Metro Transit (Metro) provides bus service within the site vicinity. The nearest stops are about 750 feet from the site. Stops on California Avenue SW at SW Hinds Street serve Metro Routes 50, 55 and 128. Stops on 49th Avenue SW at S Hinds Street serve Route 57. These routes provide direct connection to and from the Admiral District, Alaska Junction, Alki, Genesee Hill, Downtown, Beacon Hill, and Othello neighborhoods.

SPS provides yellow bus, door-to-door, Metro, and cab service. Eligibility for District-provided transportation depends on several factors including grade level and proximity to assigned schools. Middle school students who reside within the boundaries of the Seattle School District and who live more than 2.0 miles from their assigned school are eligible for transportation. ORCA cards may be provided for students attending a school outside of their service area or linked service area, if they reside farther than 2.0 miles from the school. Exceptions are allowed for students who require specialized transportation services or who require medical transportation as approved by District Health Services.[20]

2.7. Non-Motorized Facilities

2.7.1. Existing Conditions

Sidewalks exist along all streets in the site vicinity. Crosswalks are present on 45th Avenue SW mid-block (at the school entrance) and across the north and west legs of the SW Spokane Street /45th Avenue SW intersection. Signed and marked crosswalks are also present on California Avenue SW, just north of SW Hinds Street and SW Spokane Street.

2.7.2. Planned Improvements

As described previously, the City has plans for neighborhood greenways (low-speed, low-volume streets that are designed to be shared by pedestrian, bicycle, and vehicular traffic) along SW Hinds Street, 48th Avenue SW, and 45th Avenue SW; an in-street local connector (a bicycle facility with minor separation) along SW Charlestown Street. However, these projects are not expected to be completed by 2022.

[20] Seattle Public Schools, *Transportation Service Standards 2019-20*, Effective September 1, 2019.

3. PROJECT IMPACTS

This section describes conditions expected to exist with both project elements completed and the school operating at an enrollment capacity of up to 1,139 students. Vehicle trip estimates associated with the two project elements were added to the 2022-without-project traffic volume forecasts. Level of service analyses were performed to estimate the proposed project's impact on traffic operations in the study area. Parking demand and the potential changes to on-street parking utilization were also estimated.

3.1. Transportation Network

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

3.2. Traffic Volumes

The proposed project elements 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 1,139 students, an increase of 100 students from the school's current capacity. This element is expected to generate additional trips during the morning and afternoon peak hours on typical school days. The classroom addition element is not expected to result in changes to typical weekday PM peak hour or early evening peak hour traffic volumes.

Traffic increases could also occur as a result of added field use made possible by the proposed play surface and lighting improvements. These increases are expected to primarily occur during the PM peak and early evening hours during times of the year when natural lighting does not currently allow for use of the existing field. The *Joint Use Agreement*[21] between SPS and Seattle Parks and Recreation allows for the shared use of school and park facilities throughout Seattle. Under this agreement, District-identified fields are reserved for school activities on weekdays after school (typically until 6:30 or 6:45 P.M.) and on Saturdays from 8:00 A.M. to noon, throughout the school year. Non-scholastic activities scheduled through Parks may occur outside of those periods. The field improvement and lighting element is not expected to result in changes to typical weekday morning arrival or afternoon dismissal peak hour traffic volumes.

The following sections describe the methods used to estimate project-generated traffic for each element.

3.2.1. School-Day Trip Generation – Classroom Addition

Trip generation estimates for school projects can be developed using one of two methods. For new schools, rates published in the Institute of Transportation Engineers' *Trip Generation Manual*[22] are typically applied. For modernizations and/or expansions of existing schools, it is preferred to use counts of traffic at the existing school. 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. There is an on-site load/unload loop at Madison Middle School and drivers also use on-street areas for student drop-off/pick-up. Due to the school building's location on the upper eastern portion of the block, most school-generated trips arrive and depart the area at or near the 45th Avenue SW intersections at SW Spokane Street and SW Hinds Street. Therefore, trip generation estimates were derived from the video traffic counts performed at surrounding intersections. The resulting estimates were compared to published trip generation rates.

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21 *An Agreement for the Joint Use of Facilities between the Seattle School District No. l and Seattle Parks and Recreation 2016-2019*, Extended to August 9, 2021.

22 ITE, 10th Edition, September 2017.

Based on the data collected, the school currently generates an estimated 0.78 trips per student in the morning peak hour. However, for the afternoon peak period, the available traffic counts did not capture the 30 minutes around the 3:45 P.M. dismissal. Therefore, an afternoon trip generation rate was estimated based on available data. As described previously, data from ITE's *Trip Generation Manual*, other SPS middle schools, and nine Puget-Sound-area middle / junior-high schools suggest afternoon peak hour trip generation rates of middle schools are 50% of the morning peak hour trip rates. Based on this relationship, an afternoon peak hour trip generation rate of 0.39-trips-per student was selected for Madison Middle School. The morning and afternoon rates derived for Madison Middle School are similar, though somewhat higher than the average rates published for Middle School / Junior High School (Land Use 522) in the *Trip Generation Manual* (0.70 trips per student in the morning peak hour and 0.35 trips per student in the afternoon peak hour). Since these rates were derived specifically for the existing school and are consistent with ITE and regional results, they are appropriate for use in evaluating future conditions with the classroom addition and added enrollment capacity.

The derived rates were applied to the existing and proposed enrollment capacity at Madison Middle School. Table 7 presents the resulting trip estimates for the expanded school. These estimates include school bus trips, employee trips, and family-vehicle trips. No change to the number of school buses is anticipated as a result of the classroom addition. As shown, the classroom addition is expected to increase trip generation at the site by 78 trips in the morning peak hour and by 39 trips in the afternoon peak hour.

Table 7. Madison Middle School Classroom Addition Element – Trip Generation Estimates

Site Condition	Enrollment	Morning Peak Hour			Afternoon Peak Hour		
		In	Out	Total	In	Out	Total
Proposed Madison Middle School w/ Addition	1,139 students [a]	461	425	886	203	239	442
Existing Madison Middle School	1,039 students [b]	420	388	808	185	218	403
Net Change	100 students	41	37	78	18	21	39

Source: Heffron Transportation, Inc., October 2020.

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

b. Enrollment (and capacity) of the existing school at the time of site traffic counts (2019-2020 school year).

3.2.2. Athletic Field Trip Generation

Scholastic Athletics Activities

Typical Event Types, Frequency, Times, and Participation

The Madison Middle School athletic field is used by students for daytime physical education classes, Monday through Friday from 8:55 A.M. until 3:45 P.M., as well as for athletic practices from 3:45 P.M. until about 5:30 P.M. Madison Middle School athletic programs that use the fields for after-school practices include girls' soccer and co-ed ultimate in the fall months (September to November), and boys' soccer and co-ed track in the spring months (March to May). Games and competitions are currently held off-site on Saturdays. There are no outdoor middle school scholastic sports during winter months. The proposed field lights could allow middle school activities to extend to 5:30 P.M. in late fall and early spring, which natural lighting does not allow.

With the proposed improvements, West Seattle High School may use the Madison Middle School field for soccer and football practices in the fall and soccer practices in spring.[23] It may also be used

[23] Email communication, E. Gold, D.A. Hogan, January 24, 2020.

occasionally for ultimate (frisbee). Due to the limited dimensions (not meeting minimum width requirements of the Washington Interscholastic Activities Association [WIAA]), the field is not expected to be used for high school soccer games. High school practices are typically between 3:45 and 6:45 P.M. The site is not expected to offer seating (such as the small portable bleachers that are often located near other fields) to accommodate spectators for practices. Instead, any spectators are likely to stand on sidelines or adjacent hillside. There are no WIAA sanctioned outdoor sports during winter months—some high schools, including West Seattle High School, have club activities such as ultimate, which could occur at the Madison Middle School field during fall, winter, or spring. The field lights are expected to allow for use of the field for the above described activities by West Seattle High School. Although no competitive high school games are expected to be played at the site, traffic and parking generation for those activities were assumed to evaluate the potential impacts of the project.

Participation levels and attendance for the scholastic athletic activities described above fluctuate based on the sport, level of competition, team success, and day of week. In Spring 2015, Heffron Transportation performed observations of participants and spectators for several high-school-level games/matches for another field lighting project. Table 8 summarizes the observed scholastic sports competitions, locations, opponents, date, time, numbers of participants (total from both schools), and ranges in numbers of spectators. As shown, most activities have between 30 and 60 participants (athletes, coaches, trainers, and support staff) with between about 35 and 135 spectators.

Table 8. Scholastic Athletic Events Observed – Spring 2015

Activity / Location / Teams	Date/Time of Observation	Participants [1]	Spectators [2]	Total
Varsity Baseball / Kennedy-Tyee	April 6, 2015; 4:00-6:00 P.M.	38	55 to 69	93 to 107
Varsity Soccer / Starfire-Hazen	April 6, 2015; 6:00 -7:00 P.M.	53	104 to 133	157 to 186
Varsity Soccer / Kennedy-Highline	April 16, 2015; 4:30 -6:00 P.M.	49	75 to 125	124 to 174
Lacrosse / Kennedy-Seattle Academy	April 25, 2015; 1:00-3:00 P.M.	57	78 to 80	135 to 137
Baseball C-Team / Kennedy-Nathan Hale	April 25, 2015; 1:00-3:00 P.M.	43	33 to 38	76 to 81
Varsity Soccer / Starfire / Kennedy-Tyee	April 28, 2015; 6:00-7:00 P.M.	49	74 to 75	123 to 124
Average of Observations		48	70 to 87	118 to 135

Source: Heffron Transportation, Inc., April 2015.

1. *Participants include players, substitutes, coaches, support staff (e.g. trainers), referees, ticket staff, press-box personnel, and concession staff.*
2. *Range of spectators observed during several counts during game.*

Traffic Generation

The proposed field improvements and lighting would allow for extended use during several months of the year. This would allow some activities that are currently scheduled elsewhere, due to field conflicts and darkness, to occur at the Madison Middle School site. As a result of later start and dismissal times for high schools implemented for the 2016-17 school year, after-school athletics are occurring later in the day and it is expected that some soccer practices and ultimate practices or games, as well as occasional football practices, could occur under the lights on the Madison Middle School field. This activity could result in new trips being generated during the commuter PM peak hour as a practice or could begin or end during that time, with participants and spectators arriving at or leaving the site. It is noted that this potential increase in activity and traffic due to the field lights would be limited to about two to four months per year, since natural lighting conditions during the remainder of the fall and spring do not require use of field lights until after most scholastic activities end.

The potential impact of added scholastic athletics (e.g. soccer, football, or ultimate practices) that would generate traffic during the commuter PM peak hour was evaluated. Traffic generation observations performed at Kennedy Catholic High School during and after the games confirmed the typical range of traffic generated by these types of activities—practices are likely to generate less traffic. Observations of traffic flows at Kennedy High School after games indicated that the athletic events generated trips at rates ranging from about 0.30 to 0.58 trips per participant / spectator. For a typical soccer, lacrosse, or ultimate event, this relates to between 25 and 55 trips leaving the site during the hour after a game. Due to the start and finish times of some games or practices, some or all of this traffic could occur during the commuter PM peak hour.

It is noted that the trip generation estimates reflect rates derived from locations where little or no transit access is provided and field users and spectators did not generally commute by transit. However, the Madison Middle School site vicinity is served by Metro transit bus routes. Some West Seattle High School students and family members and some school staff likely use these transit options for trips to and from the school. Therefore, the estimates assuming that all trips occur by vehicle are likely conservatively high for this site location.

Recreational (Non-Scholastic) Athletics Activities

Typical Event Types, Frequency, Times, and Participation

During times when the field is not reserved for use by Madison Middle School or other Seattle Public Schools activities, it would continue to be available to community users and would be scheduled through the Seattle Parks and Recreation Department. Due to its size and condition, the existing field only supports limited organized non-scholastic youth and micros soccer (for youth age 4 to 6). The Madison Middle School field is expected to continue to be used these activities without or with the lighting project. Athletic practices can be scheduled until at least 8:30 P.M. in late spring and summer. When not reserved for scholastic athletics, weekend games and practices can occur from 9:00 A.M. and last until about 4:00 P.M. in early spring, extending to 9:00 P.M. by May.

The field improvement element is expected to result in increased usage for non-scholastic recreational activities. Youth and adult athletics could be added during late fall, winter, and spring months and scheduled after 5:30 P.M. until 9:45 P.M. Some of these activities would be new to the site. The field could be scheduled consecutively on any given night. As a result, it is estimated that two youth and/or adult athletic activities could be added on an average weekday or weekend evening (during times when natural lighting conditions do not currently allow them).

Historical spectator and participant counts performed for youth and adult athletic activities were used to estimate potential traffic generation for these activities. Counts were performed at four youth baseball games and three youth soccer matches in 2000. These counts were supplemented with new counts performed at Ingraham High School in January 2017. The number of adults (driving age), including coaches and officials was between 30 and 60. Based on numerous observations, adult recreational soccer matches (men's and co-rec games) typically draw between 23 and 30 people (including participants, spectators, and referee). The participants and spectators at evening athletic activities were observed in January 2017 at Ingraham High School's fields. These activities consisted of a high-school sports practice and two non-scholastic recreational activities (one practice and one game). The observations, presented in Table 9, are representative of typical participant and spectator levels for the majority of new activities that would be made possible by the proposed field improvement element.

Table 9. Athletic Events Observed – Winter 2017

Activity / Location / Teams	Date/Time of Observation	Participants	Spectators	Total
Ultimate (Frisbee) / Ingraham HS / Practice	Jan 23, 2017; 6:45-7:30 P.M.	30	0	36
Soccer / Ingraham HS / SYSA Practice	Jan 23, 2017; 6:45-7:30 P.M.	80 to 88	20	100 to 108
Soccer / Ingraham HS / GSSL Game	Jan 23, 2017; 6:45–7:30 P.M.	22 to 27	0	22 to 27
Average of Observations		44 to 48	20	51 to 57

Source: Heffron Transportation, Inc., January 2017.

1. *Participants include players, coaches, support staff (e.g. trainers), referees, ticket staff, press-box personnel, and concession staff.*
2. *Range of spectators observed during several counts during game.*

Traffic Generation

On an average day, the proposed field improvement element would allow for two additional non-scholastic recreation athletic activities the field between 5:30 and 9:45 P.M. Based on data collected for adult and youth athletics, an average game or practice is estimated to generate approximately 60 vehicle trips (30 inbound and 30 outbound). This estimate assumes most adults drive to these activities in separate vehicles, which is typical for adult recreational soccer and is likely conservatively high for most youth sports activities, since some children typically carpool to athletic practices. The added trips would likely occur during the times between consecutively scheduled games. For example, if soccer practices or games were scheduled consecutively with the first activity beginning at 5:30 P.M. and the next at 7:00 P.M., the highest traffic generation would be expected during the 6:00 to 7:00 P.M. hour when participants and spectators from the first activity would leave the site and the spectators and participants from the next would arrive.

Combined Project Trip Generation for Analysis

Based on the analysis presented in the previous sections, the estimated worst case for traffic generation during the two analysis periods—the commuter PM peak hour and the early evening hour—were estimated. The worst-case increase in traffic during the commuter PM peak hour is expected to occur as a school athletic practice ends (up to 55 outbound trips) and the spectators and participants of a recreational game arrive (estimated at 25 in and 5 out). In total, this would result in an estimated 85 trips during the commuter PM peak hour.

During the early evening hour between 6:00 and 7:00 P.M., consecutive recreational activities on the field are estimated to generate a total of 60 trips (30 in, 30 out). The estimated net increases in field-lighting-related traffic are presented in Table 10.

Table 10. Madison Middle School Field Improvements Element – Trip Generation Estimates

	PM Peak Hour			Early Evening Hour (6:00 to 7:00 P.M.)		
Field	In	Out	Total	In	Out	Total
Soccer / Football Field	25	60	85	30	30	60

Source: Heffron Transportation, Inc., October 2020.

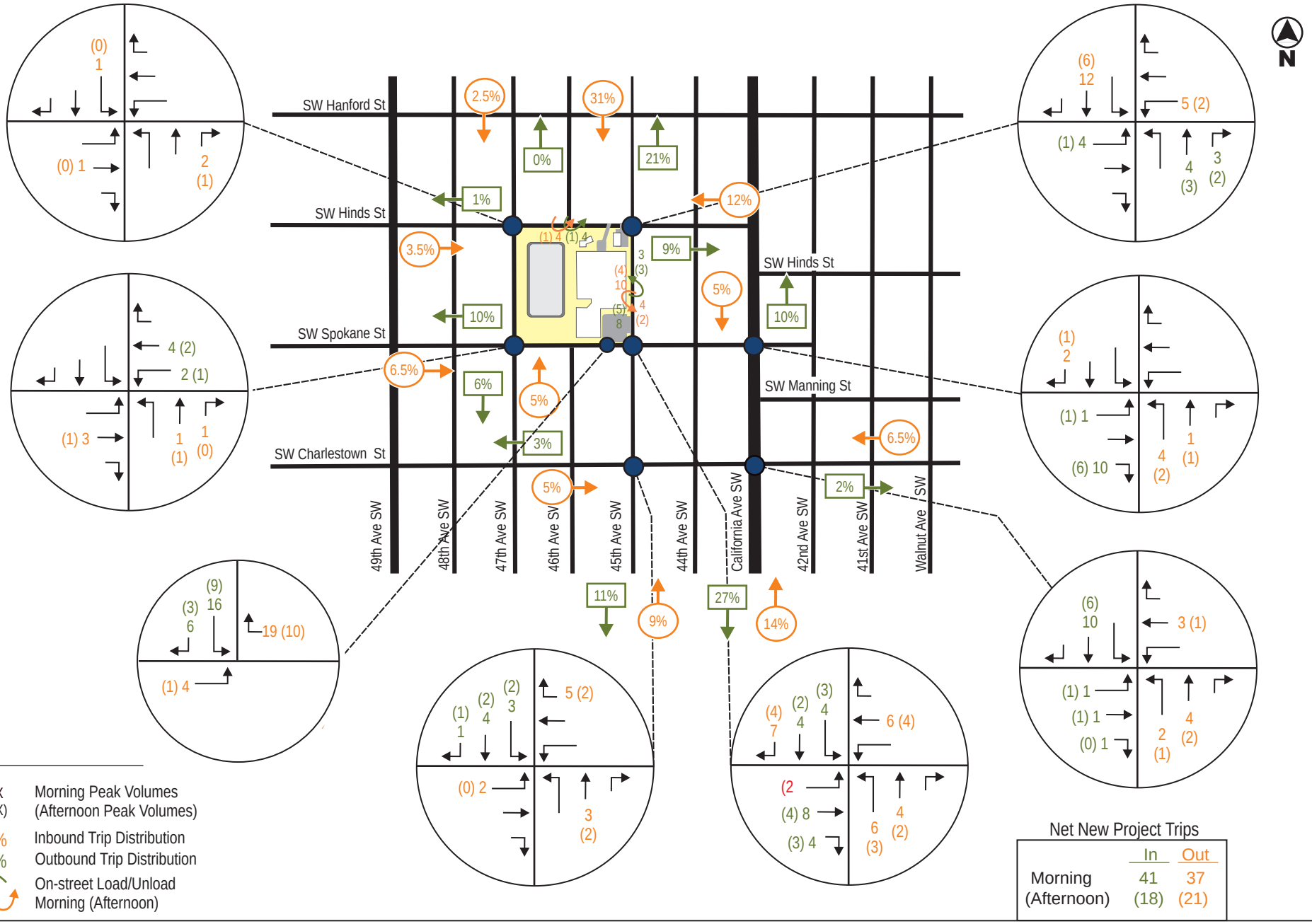
3.2.3. Trip Distribution and Assignment

The expanded Madison Middle School is expected to accommodate growth within the existing enrollment area for the school. Trip distribution patterns for the new trips were developed based on observed existing patterns surrounding the school during each of the four analysis hours. These distribution patterns reflect 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 new morning and afternoon peak hour trips associated with the classroom addition element would 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 west (southbound) side of 45th Avenue SW. Passenger-vehicle load/unload for students is expected to continue on-site and adjacent to the site on roadways in the vicinity of the school.

Most of the added PM peak and early evening peak hour trips would consist of field users traveling to and from scholastic and/or recreational athletic practices or games.

Figure 11 shows the traffic distribution patterns and assignments of net new trips for the morning and afternoon peak hours; Figure 12 shows the traffic distribution patterns and assignments of net new trips for the PM peak and early evening hours. 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. Figure 13 shows the forecast 2022 with-project traffic volumes for morning and afternoon peak hours; Figure 14 shows with-project volumes for the PM peak and early evening hours.

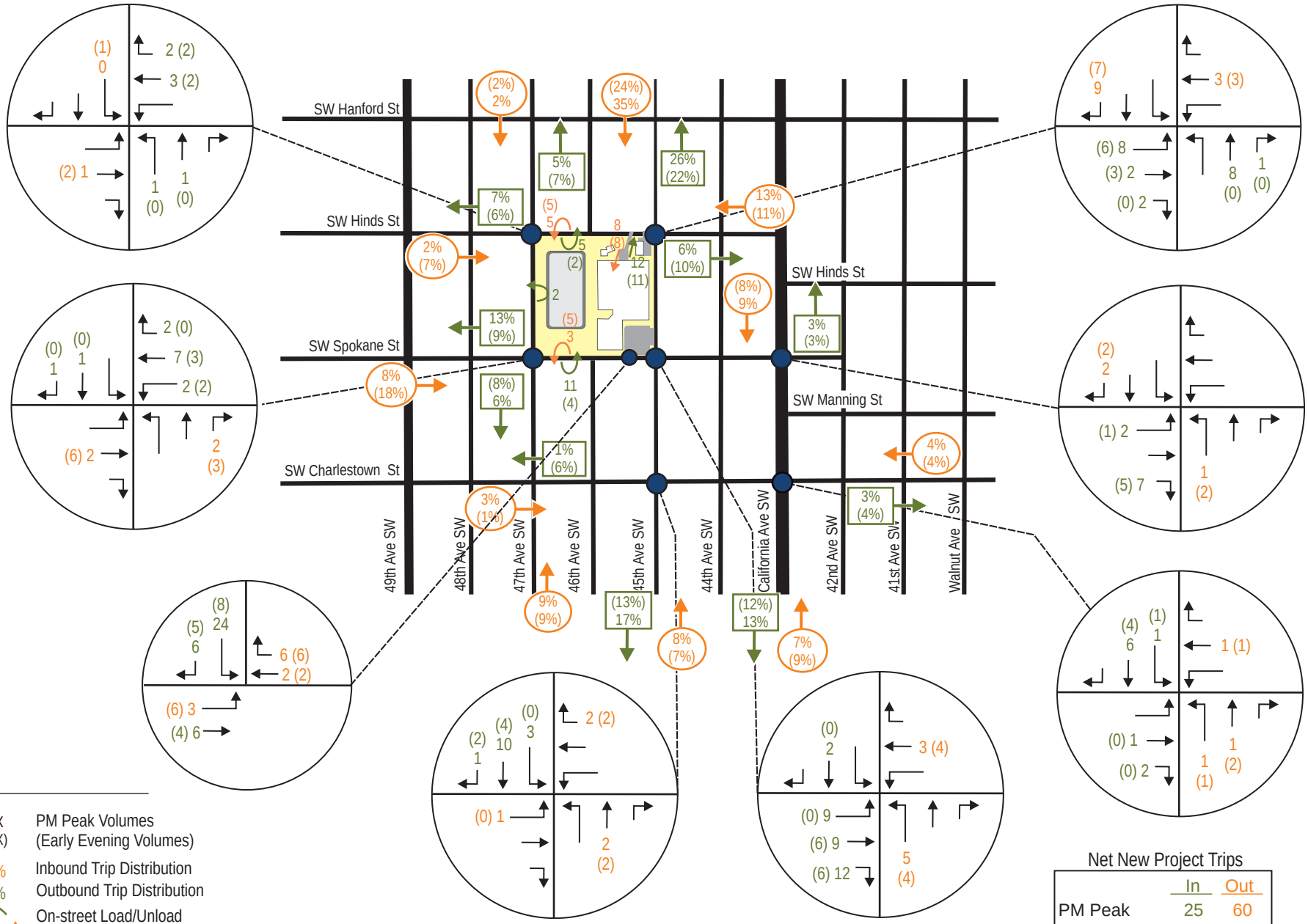


Madison Middle School

Classroom Addition and Field Improvements

Figure 11
Project Trip Distribution and Assignment
Morning and Afternoon Peak Hours

heffron transportation inc

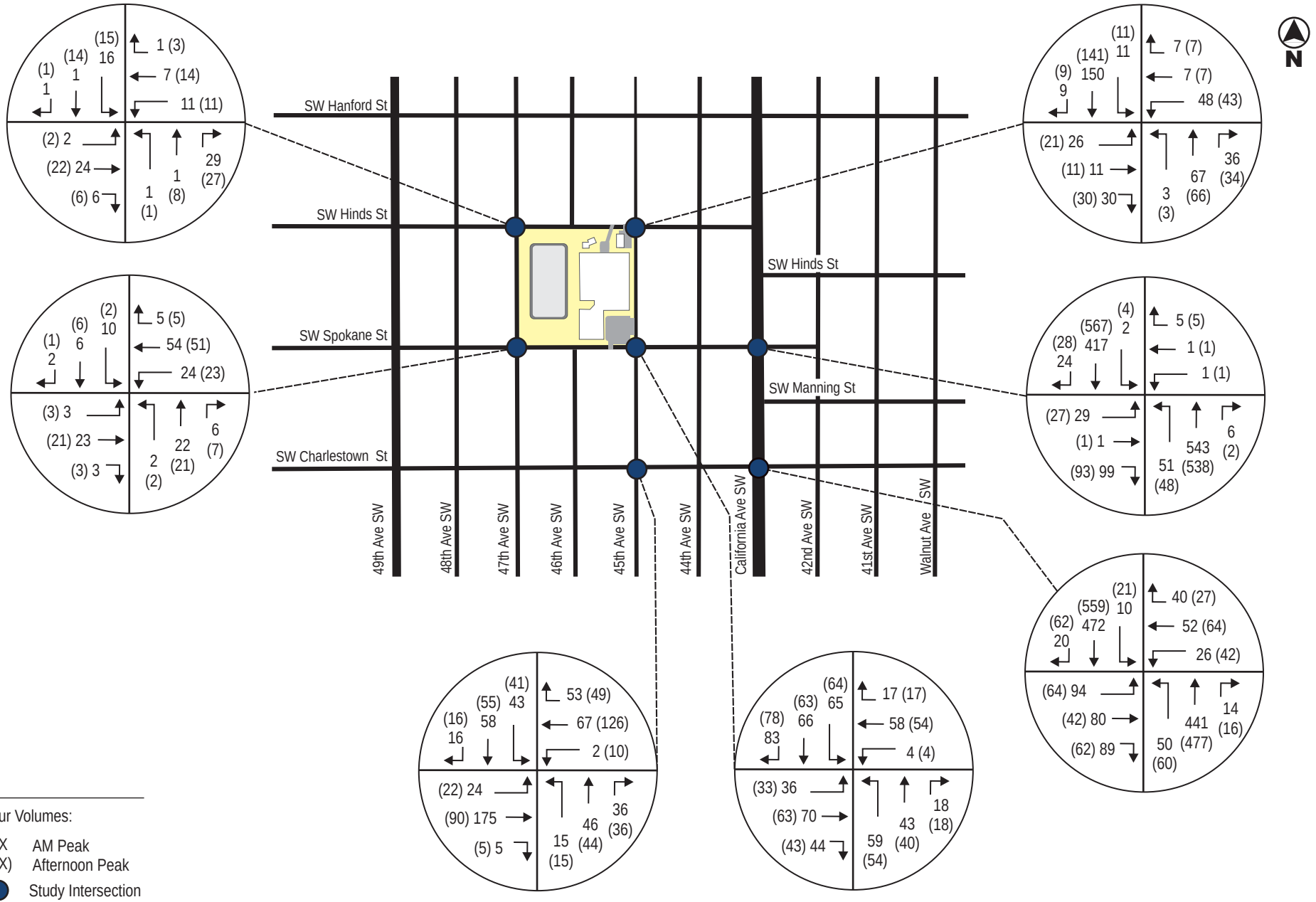


Madison Middle School

Classroom Addition and Field Improvements

Figure 12
Project Trip Distribution and Assignment
PM Peak and Early Evening Hour

heffron transportation inc

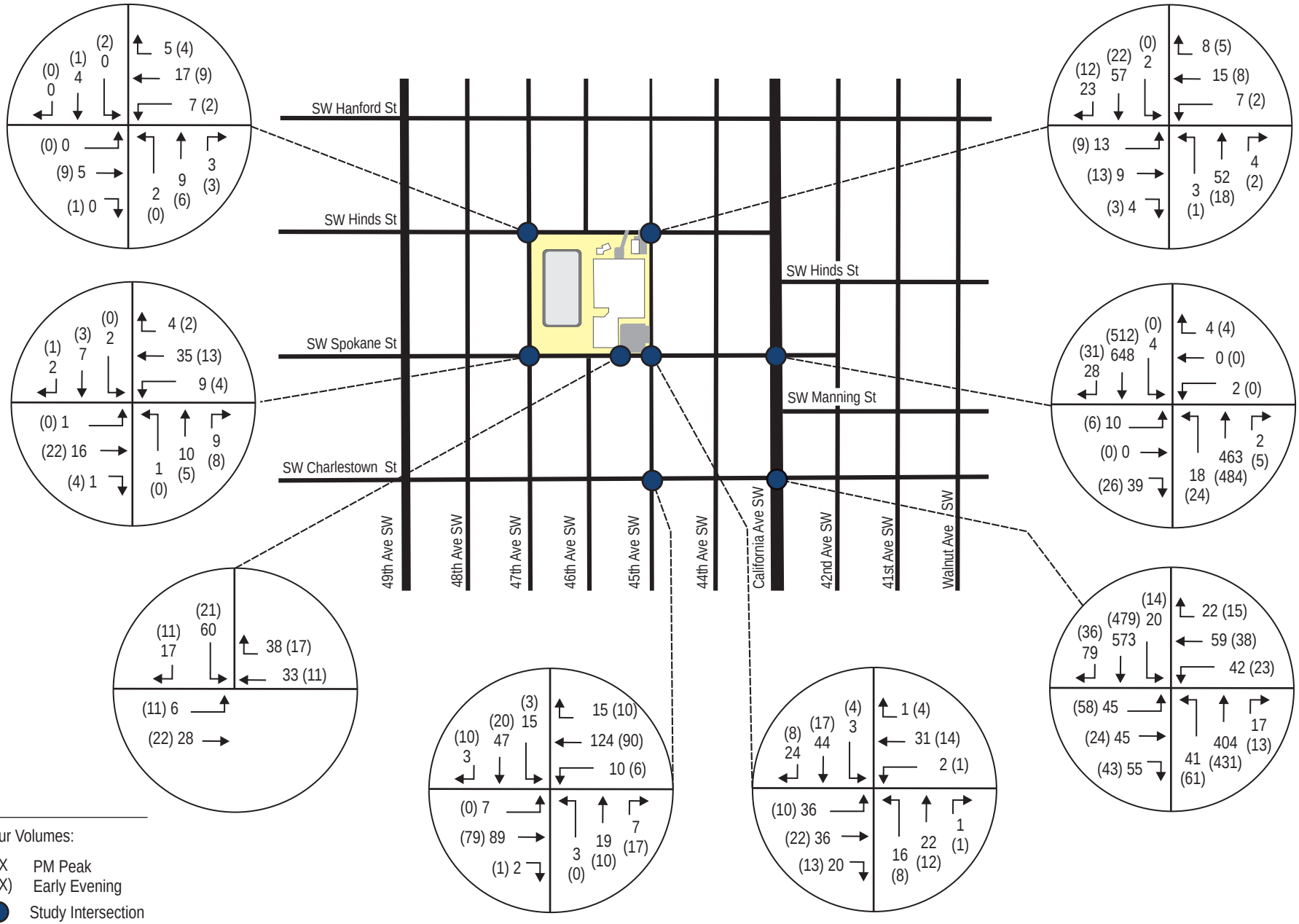


Madison Middle School

Classroom Addition and Field Improvements

Figure 13
Forecast 2022-With-Project Traffic Volumes
Morning and Afternoon Peak Hours

heffron transportation inc



Madison Middle School

Classroom Addition and Field Improvements

Figure 14
Forecast 2022-With-Project Traffic Volumes
PM Peak and Early Evening Hours

heffron transportation inc

3.3. Traffic Operations

Intersection levels of service for future with-project conditions were evaluated using the same methodology described previously. Table 11 shows the results of the analysis; levels of service for the without-project conditions are shown for comparison.

Table 11. Level of Service Summary – Forecast 2022 Conditions Without- and With-Project

Intersections	Morning Peak Hour (8:00–9:00 A.M.)				Afternoon Peak Hour (3:15–4:15 P.M.)			
	Without Project		With Project		Without Project		With Project	
Signalized	LOS [1]	Delay [2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Charlestown St / California Ave SW	B	13.2	B	13.5	A	10.0	B	10.1
All-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Spokane Street / 45th Avenue SW	B	10.6	B	11.4	B	10.5	B	10.9
Two-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Hinds Street / 47th Avenue SW [3]	A	5.9	A	6.0	A	6.1	A	6.1
Northbound Movements	A	8.8	A	8.8	A	9.1	A	9.1
Eastbound Left-Turn	A	7.2	A	7.2	A	7.3	A	7.3
Westbound Left Turn	A	7.4	A	7.4	A	7.4	A	7.4
Southbound Movements	A	9.8	A	9.9	B	10.1	B	10.1
SW Hinds Street / 45th Avenue SW	A	5.9	A	6.4	A	5.7	A	5.9
Northbound Left Turn	A	8.3	A	8.4	A	8.3	A	8.4
Eastbound Movements	C	15.3	C	16.7	B	14.9	C	15.8
Westbound Movements	C	15.8	C	17.0	C	15.5	C	16.2
Southbound Left Turn	A	7.5	A	7.6	A	7.5	A	7.6
SW Spokane Street / 47th Avenue SW [3]	A	4.4	A	4.3	A	3.9	A	3.8
Northbound Movements	B	10.5	B	10.6	B	10.2	B	10.2
Eastbound Left-Turn	A	7.4	A	7.4	A	7.4	A	7.4
Westbound Left Turn	A	7.3	A	7.4	A	7.3	A	7.3
Southbound Movements	B	10.5	B	10.7	B	10.3	B	10.3
SW Spokane St / California Avenue SW	A	4.8	A	5.7	A	5.3	A	6.0
Northbound Left Turn	A	8.9	A	8.9	A	9.3	A	9.4
Eastbound Movements	E	37.9	E	42.6	E	43.9	E	47.3
Westbound Movements	D	25.0	D	25.6	C	22.9	C	23.4
Southbound Left Turn	A	9.3	A	9.3	A	8.9	A	8.9
SW Charlestown St / 45th Avenue SW	A	5.6	A	6.0	A	5.8	A	6.0
Northbound Movements	B	12.6	B	12.8	B	12.0	B	12.2
Eastbound Left-Turn	A	7.5	A	7.6	A	7.7	A	7.7
Westbound Left Turn	A	7.7	A	7.7	A	7.5	A	7.5
Southbound Movements	B	14.7	C	15.3	B	14.3	B	14.6

(Table 11 continues on following page)

Table 11. Level of Service – Forecast 2022 Conditions Without- and With-Project (continued)

Intersections	PM Peak Hour (5:00–6:00 P.M.)				Early Evening Hour (6:00–7:00 P.M.)			
	Without Project		With Project		Without Project		With Project	
Signalized	LOS [1]	Delay [2]	LOS	Delay	LOS	Delay	LOS	Delay
SW Charlestown St / California Ave SW	A	9.7	A	9.7	A	8.1	A	8.3
All-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Spokane Street / 45th Avenue SW	A	7.9	A	8.3	A	7.2	A	7.3
Two-Way-Stop Controlled	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
SW Hinds Street / 47th Avenue SW [3]	A	4.9	A	4.6	A	3.8	A	3.4
Northbound Movements	A	9.2	A	9.3	A	9.0	A	9.0
Eastbound Left-Turn	A	0.0	A	0.0	A	0.0	A	0.0
Westbound Left Turn	A	7.3	A	7.3	A	7.2	A	7.2
Southbound Movements	A	9.5	A	9.5	A	9.0	A	9.0
SW Hinds Street / 45th Avenue SW	A	2.6	A	3.0	A	3.7	A	4.2
Northbound Left Turn	A	7.4	A	7.5	A	7.3	A	7.3
Eastbound Movements	A	10.0	B	10.3	A	9.3	A	9.3
Westbound Movements	A	9.9	B	10.1	A	9.0	A	9.2
Southbound Left Turn	A	7.4	A	7.4	A	0.0	A	0.0
SW Spokane Street / 47th Avenue SW [3]	A	3.7	A	3.6	A	3.2	A	3.2
Northbound Movements	A	9.3	A	9.3	A	9.0	A	9.0
Eastbound Left-Turn	A	7.3	A	7.3	A	0.0	A	0.0
Westbound Left Turn	A	7.3	A	7.3	A	7.3	A	7.3
Southbound Movements	A	9.5	A	9.6	A	9.2	A	9.2
SW Spokane St / California Avenue SW	A	1.3	A	1.6	A	0.9	A	1.1
Northbound Left Turn	A	9.6	A	9.6	A	9.1	A	9.3
Eastbound Movements	C	22.1	C	23.4	C	17.7	C	19.1
Westbound Movements	C	20.4	C	21.0	B	11.9	B	12.1
Southbound Left Turn	A	8.5	A	8.5	A	0.0	A	0.0
SW Charlestown St / 45th Avenue SW	A	3.2	A	3.7	A	2.1	A	2.4
Northbound Movements	B	10.9	B	11.0	A	9.8	A	9.8
Eastbound Left-Turn	A	7.6	A	7.6	A	0.0	A	0.0
Westbound Left Turn	A	7.5	A	7.5	A	7.5	A	7.5
Southbound Movements	B	11.9	B	12.2	B	10.4	B	10.4

Source: Heffron Transportation, Inc., October 2020.

1. *Level of service.*
2. *Average seconds of delay per vehicle.*
3. *Uncontrolled intersection evaluated as stop-controlled for north-south legs.*

As noted, the classroom addition element is expected to add some traffic during the morning and afternoon peak hours, but not the PM peak or early evening peak hours. The additional enrollment capacity could result in additional pedestrian crossings at the nearby study intersections during those hours and were accounted for in this analysis. The analysis also accounts for the typical peaking characteristics of school traffic. The field improvements element is expected to add some traffic during the PM peak and early evening peak hours, but not during morning or afternoon peak hours.

As shown, the proposed project is expected to add some delay to the study area intersections (all less than 5 seconds per vehicle during the school day and less than 1.5 seconds per vehicle in the evening) but is not expected to change the overall level of service at any of the analysis intersections. All intersections would continue to operate at LOS B or better overall. Eastbound movements at the SW Spokane St / California Avenue SW intersection are forecast to remain operating at LOS E; the project is forecast to add less than 5 seconds of average delay per vehicle to that movement. All other movements at this intersection and at the remaining two-way-stop and uncontrolled intersections would continue to operate at LOS D or better during all periods, with most forecast at LOS A or B. The analyses indicate a slight decline in total overall average delay at some intersections, which can occur when volumes increase on non-critical movements that have little or no delay, thus reducing the overall average delay.

3.4. Parking Supply and Occupancy

No permanent changes are proposed to the existing on-site or nearby on-street parking supply; however, construction of the classroom addition is expected to require relocation of portables into the northern parking lot and temporarily affect supply in that lot. The project is not expected to change the amount of automobile parking required according to Seattle Municipal Code (SMC); however, the SMC will require bicycle parking with 24 long-term stalls and 8 short term stalls (32 total). The project proposal includes new bicycle parking to meet the minimum requirement and no code departure requests are anticipated. The following sections discuss the potential effect of the project elements on school day and evening parking conditions.

3.4.1. School Day Parking

School-day parking at middle schools is primarily influenced by staffing levels and family-volunteer activity. With the classroom addition and the school operating at its planned capacity of 1,139 students, the school is expected to add four additional employees. Future parking demand estimates were developed based on parking rates derived for this site as well as rates published by ITE. Observations performed by Heffron Transportation at and around Madison Middle School indicate school-day parking demand rates of 0.66-vehicles-per-employee and 0.064-vehicles-per-student. These are below the published average rates in ITE's *Parking Generation*[24] of 1.40-vehicles-per-employee and 0.09-vehicles-per-student. The variation likely results from differences in the number of full- and part-time staff as well as the number of volunteers typically on site. Based on the range of rates, the proposed classroom addition is estimated to generate additional parking demand of between 3 and 21 vehicles, depending on the number of visitors and volunteers on site on a given day.

As detailed previously, on-street parking within the site vicinity was consistently about 25% occupied on school days with more than 775 unused parking spaces. Therefore, the unused spaces could easily accommodate the additional staff or volunteer parking demand that may be added due to the school addition and added enrollment capacity.

3.4.2. Evening Parking

Field Activities

The additional scholastic and non-scholastic athletics activities made possible by the field improvement element are expected to generate some additional parking demand that may occur on-site or on nearby

[24] ITE, 5th Edition, January 2019.

streets. Participants and spectators who drive to the site for scholastic and non-scholastic athletics may use on-site parking or on-street parking in the site vicinity.

Average attendance/participation for practices at this site is expected to be below the range typically observed for games and matches (between 118 and 135 persons per scholastic athletic event) and 50 to 60 for non-scholastic athletic activities (such as well attended youth soccer matches). The combined peak number of added attendees and participants on site that would occur for a short time between consecutive activities is estimated to range from 168 to 195 persons. Observations for the Kennedy High School field improvements project in spring 2015 indicated that the athletic events generate parking demand at rates ranging from about 0.6 to 0.7 vehicle per participant/spectator. However, those rates do not reflect the higher levels of transit use that occur at and around the West Seattle High School site, due to its proximity to Metro transit stops and service. Mode-of-travel data for the site area were derived from 'Journey-to-Work' survey results from the year *2010 Census* compiled by the PSRC. These surveys were conducted 10 years ago and may underestimate current transit use. From these surveys, results for residents living in Transportation Analysis Zones (TAZs) 173 and 174 (the zones that include and surround Madison Middle School and West Seattle High School) indicate that at the time of the 2010 census, about 19% of residents living in these zones commuted by transit, walking, or biking; about 14% of employees working the area used one of those non-automobile modes. For high school students, the percentages are expected to be higher, since 40% to 50% are not old enough to drive. To reflect some use of transit by West Seattle High School students after scholastic athletic activities at the site, the observed demand rates from the other school sites were reduced by 30% for application at the site. No adjustments were made for the demand rates applied to non-scholastic adult or youth activities at this site. At the adjusted rates, the peak demand is estimated to range from about 80 to 108 vehicles during the short period between activities—between 5:15 and 5:45 P.M. Outside of these periods, total demand is expected to range from 30 to about 65 vehicles.

The parking demand estimates described above reflect parked vehicles of spectators as well as participants (e.g., coaches, players that driver, referees/umpires, trainers, support staff, etc.).

As described previously, the data collected from the on-site parking lots at Madison Middle School found between 28 and 61 unused spaces and on-street parking occupancy near the facility averaged 32% to 35% utilized with an average of nearly 700 unused spaces. The addition of 76 to 103 vehicles during the short overlapping peak periods could be accommodated by the unused supply and on-street-parking occupancy rates are expected to remain well below 85%—the level considered to be effectively full by the City of Seattle. This is expected even with the possible increase in demand from the planned classroom addition. Since one of the demand counts was performed on an evening with an event in the Madison Middle School library, those results reflect the potential parking availability for conditions with a typical concurrent event.

School Events

Madison Middle School would continue to host events periodically throughout the school year. Many of the events have relatively modest attendance and are held the school library including PTSA monthly board meetings and monthly general membership meetings, parent meetings for clubs, and film screening nights. Some larger events are held in the commons including: Math Night, Science Night, Multicultural Night, Jazz, Band, and Orchestra Concerts, and the Talent Show. The largest event held on site is typically annual Curriculum Night in late September. Several other larger events are held off site including, the drama productions (held in the West Seattle High School auditorium), the annual fundraising Gala (held at the Sanctuary at Admiral), and 8th-grade promotion ceremony (held at the West Seattle High School Gymnasium).

It is acknowledged that on occasional evenings when there are large events, utilization of the on-site lot and surrounding roadways is higher than the average non-event night levels. The data summarized in

Table 2 and Table 4 indicate that during the evening when Super Science Night was held, both on-street and on-site parking demand levels were higher than average. However, there were still unused spaces in the school lots, and 630 unused on-street spaces within the study area (on-street parking occupancy was measured to be 40%). With the larger enrollment capacity, these events could draw proportionately larger attendances. However, even when combined with the peak parking demand associated with concurrent use of the lighted athletic field, the on-street parking utilization is estimated to remain below 52%.

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 would 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.

3.6. Transit Facilities and Service

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. It is also likely that some of the new trips generated as a result of the field improvement and lighting project would occur by transit. These are expected to include students and family members that already commute to and from West Seattle High School by transit, and are expected to primarily occur outside of peak commute hours. The nearest stops are about 750 feet from the site on California Avenue SW at SW Hinds Street. The project is not expected to result in adverse impacts to transit facilities or service.

3.7. Non-Motorized Facilities

Madison Middle School, with increased enrollment capacity, is expected to generate some additional pedestrian trips within the site vicinity. It is anticipated that the largest increases in pedestrian activity would occur along 45th Avenue SW and SW Spokane Street adjacent to the school. There may also be increases in bicycle trips within the site vicinity due to the proposed project.

Based on observations of scholastic athletic activities, participants may drive or be driven/transported; however, since the field is located within about 0.5-mile walking distance from West Seattle High School, some student athletes may walk to and from the site or nearby transit stops to participate in practices. Spectators, such as parents or friends, typically arrive via automobile. Similarly, most of the new participants and spectators using the site for non-scholastic recreational activities are expected to arrive via automobile. However, some could arrive on foot or bicycle from the local neighborhood or nearby transit stops. As a result, the field improvement and lighting project proposed may result in some increases in pedestrian or bicycle activity to the site beyond what occurs at the site today.

The frontage of the site already has sidewalks, and there are numerous marked crosswalks along primary school walking routes; therefore, no adverse impacts are expected for the number of pedestrians that could walk to the school building or the field. No significant adverse impacts to non-motorized access or facilities is expected, and no improvements to non-motorized facilities would be required to accommodate the project.

3.8. Short-Term Impacts from Construction

The field improvements are planned to be completed by fall 2021 or early 2022; the classroom addition construction is planned to begin in summer 2021 with occupancy by fall 2022. For a few months in summer 2021, construction activities of both elements are likely to would overlap. During construction activities that occur while school is in session, the students would remain in the building.

3.8.1. Construction-Period Access Operations

The proposed new classroom addition would be constructed on the northern portion of the site. Preliminary planning suggests that two existing portables currently located west of the loading/service area would be relocated into the northern parking lot. Staging would be located immediately northeast and southeast of proposed building addition. Building access from the northwestern part of the site would be limited or closed. The curb-side frontage on SW Hinds Street may also be unavailable for parking or have reduced capacity during construction. The existing school-bus load/unload zone would remain and is not expected to be affected.

During construction, pedestrians (including students) would be routed around or directed to avoid construction area using temporary walkways, fencing, and signage. Movements around the northwestern portion of the campus would likely be partially restricted.

3.8.2. Construction-Period Parking Conditions

As noted above, temporary relocation of two portable classrooms is expected to occur within the existing northern surface parking lot, making an additional nine spaces unavailable to staff or visitors—a total of 4 out of 19 parking spaces are likely to remain in the north lot during this construction period. During the construction effort, staff parking demand from the lot (estimated at about 12 vehicles) would be temporarily displaced to on-street parking in the surrounding neighborhood. In addition, construction personnel are expected to park on-street in the site vicinity. Although parking demand displaced from the lot and generated by construction workers would likely be noticeable to local residents, the parking occupancy on the surrounding roadways was found to be about 25% utilized during weekdays with 775 or more unused spaces. Therefore, the unused supply is expected to accommodate the temporary added demand during the construction period and it is not expected to result in significant adverse impacts to study-area parking conditions.

3.8.3. Construction-Period Earthwork Activity

Field Improvement Element

Construction is planned to occur over 16 to 20 weeks and would include excavation and export of material (removal of the existing field, subsurface drainage, and track) and import of fill for the new facility. The project is estimated to require removal of about 5,220 cubic yards (cy) of material and import of about 3,830 cy of fill. This effort is expected to occur with a combination of hauling trips with some export-only, some import-only, and some back-haul trips (when an import truck is reloaded at the site to haul export material). The project design team estimates that, with use of 24-cubic yard trucks (truck/trailer combinations), the haul effort would generate 242 truckloads (242 trucks in and 242 trucks out) intermittently over 8 to 12 weeks. If assumed to be the shorter eight-week period, the transport would generate an average of about 12 truck trips per day (6 in, 6 out) and 1 or 2 truck trips per hour.

Classroom Addition Element

The construction effort would include some earthwork that would consist of excavation and fill for foundations and grading. It is estimated to require removal of about 275 cy of material from the site. Assuming an average of 20-cubic yards per truck (truck/trailer combination), the excavation and fill would generate about 14 truckloads (14 trucks in and 14 trucks out). The earthwork activities are likely to occur between July and September 2021. If the export effort were compressed into one week, this would correspond to an average of about 6 truck trips per day (3 in, 3 out) and average less than 1 truck trip per hour.

Cumulative Conditions

If earthwork activities for the two project elements overlap, the transport could generate an average up to 18 truck trips per day (9 in, 9 out) and average and 2 to 3 truck trips per hour. This volume of truck traffic may be noticeable to residents living near the truck access points, but would not result in significant impacts to traffic operations in the site vicinity.

3.8.4. Construction-Period Employee Activity

The construction of the project would also generate employee and equipment trips to and from the site. It is anticipated that construction workers would arrive at the construction site before the AM peak traffic period on local area streets and depart the site prior to the PM peak period; construction work shifts for schools 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 construction employee arrival and departures as well as transport and delivery of materials for construction 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.

During the construction effort, construction personnel may park on site (if working when school is not in session such as during summer) or on-street in the site vicinity. School-day parking occupancy evaluated in May 2018 as part of the parking code departure process found parking occupancy averaged 25% with 780 or more unused on-street spaces). The unused supply would accommodate the temporary added demand during construction.

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 field improvements completed by fall 2021 or early 2022 and occupancy of the new classrooms by fall 2022. During construction activities that occur while school is in session, the students would remain in the building.

- The existing northern parking lot would be used to temporarily house two portable classrooms relocated from elsewhere on the site. Building access from the northwestern part of the site may be closed or limited. The frontage along the south side of SW Hinds Street may be unavailable or have reduced parking capacity during construction.

- During construction, pedestrians (including students) would be routed around or directed to avoid construction area using temporary walkways, fencing, and signage. Movements around the northwestern portion of the campus would likely be partially restricted.

- Temporary relocation of two portable classrooms is expected to occur within the existing northern surface parking lot, making an additional nine spaces unavailable to staff or visitors—a total of 4 out of 19 parking spaces are likely to remain in the north lot during this construction period. During the construction effort, staff parking demand from the lot (estimated at about 12 vehicles) would be temporarily displaced to on-street parking in the surrounding neighborhood. Construction personnel are also 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.

- If earthwork activities for the two project elements overlap, the transport could generate an average up to 18 truck trips per day (9 in, 9 out) and average and 2 to 3 truck trips per hour. This activity would not result in significant impacts to traffic operations.

Because construction would occur while students remain at Madison Middle 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 Madison Middle School is expected to increase student capacity to 1,139 (up from its current capacity of 1,039) and add four employees (an increase from 87 to 91).

- The project would allow increased use of the athletic field for scholastic and non-scholastic recreational activities. Usage levels of the facility are expected to increase with the added ability to hold practices and recreational games later in the day during the school year. The primary increase in field use due to the lighting project would be non-scholastic recreational athletics scheduled through Seattle Parks and Recreation such as youth and adult soccer and ultimate. The field lights could increase weeknight and weekend use during winter months from sunset until 9:45 P.M. (lights would be scheduled to turn off at 10 P.M.).

- Madison Middle School use of the field, which already occurs until about 5:30 P.M. when natural light allows, could be extended to other parts of the year (late fall and early spring). West Seattle High School use of the field for practices could also require use of the lights (especially at the start of the Spring sports season in late February and early March).

- The proposed project is forecast to generate a net increase of 78 trips (41 in, 37 out) during the morning peak hour (from 8:00 to 9:00 A.M.), 39 trips (18 in, 21 out) during the afternoon peak hour (from 3:15 to 4:15 P.M.), 85 trips (25 in, 60 out) during the commuter PM peak hour (from 5:00 to 6:00 P.M.), and up to 60 trips (30 trips in, 30 trips out) during the early evening hour (from 6:00 to 7:00 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 are forecast to be less than five seconds 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 45th Avenue SW and SW Spokane Street.

- At the proposed enrollment capacity of 1,139 students, school-day parking demand may increase by between 3 and 21 vehicles depending on the number visitors and volunteers on site. On-street parking within the site vicinity was consistently about 25% occupied on school days with more than 775 unused parking spaces. Therefore, the unused spaces could easily accommodate the additional staff or volunteer parking demand.

- In the evening, the peak parking demand generated by the improved athletic field is estimated to range from about 80 to 108 vehicles during the short period between consecutive activities. Outside of these periods, total demand is expected to range from about 30 to 65 vehicles when activities are occurring on the field. On-street parking within the site vicinity was 32% to 35% occupied during evenings with more than 680 unused parking spaces. Therefore, the unused spaces could easily accommodate the parking demand generated by field activities.

- 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. This is expected even with the possible increase in demand associated with the field improvement and lighting element of project.

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

4.3. Recommendations

Although the proposed classroom addition and field improvements project would not result in significant adverse impacts to the transportation system in the site vicinity, the following measures are recommended to reduce the traffic and parking impacts associated with the project elements.

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 would define truck routes, lane closures, walkway closures, and parking or load/unload area disruptions, as necessary. To the extent possible, the CTMP would 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) would not occur during morning arrival or afternoon dismissal periods for the school. The CTMP may 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.

On-Site Parking – The District and Madison Middle School should ensure that the on-site parking lots are open and available for users during all times that the field is scheduled for use.

APPENDIX A

LEVEL OF SERVICE DEFINITIONS

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).

Signalized Intersections

Level of service for signalized intersections is defined in terms of average delay for all vehicles that travel through the intersection. Delay can be a cause of driver discomfort, frustration, inefficient fuel consumption, and lost travel time. Specifically, level-of-service criteria are stated in terms of the average delay per vehicle in seconds. Delay is a complex measure and is dependent on a number of variables including: number and type of vehicles by movement, intersection lane geometry, signal phasing, the amount of green time allocated to each phase, transit stops and parking maneuvers. Table A-1 shows the level of service criteria for signalized intersections from the *Highway Capacity Manual, Sixth Edition.*

Table A-1. Level of Service for Signalized Intersections

Level of Service	Average Control Delay Per Vehicle
A	≤ 10 seconds
B	> 10 – 20 seconds
C	> 20 – 35 seconds
D	> 35 – 55 seconds
E	> 55 – 80 seconds
F	> 80 seconds

Source: Transportation Research Board, Highway Capacity Manual, Exhibit 19.8, 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 **Madison Middle School Classroom Addition and Field Improvements**

May 2018 Survey

				Parking Supply												
Block Face ID	Street Name	St Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Parking Spaces**
AA	47th Avenue SW	800' boundary and SW Hanford St	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
AB	47th Avenue SW	800' boundary and SW Hanford St	E	1	0	0	0	0	0	0	0	0	0	0	0	**1**
AC	46th Avenue SW	800' boundary and SW Hanford St	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AD	46th Avenue SW	800' boundary and SW Hanford St	E	6	0	0	0	0	0	0	0	0	0	0	0	**6**
AE	45th Avenue SW	800' boundary and SW Hanford St	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AF	45th Avenue SW	800' boundary and SW Hanford St	E	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AG	SW Hanford Street	800 ' boundary 47th Ave SW	N	4	0	0	0	0	0	0	0	0	0	0	0	**4**
AH	SW Hanford Street	800 ' boundary 47th Ave SW	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AI	SW Hanford Street	47th Ave SW and 46th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
AJ	SW Hanford Street	47th Ave SW and 46th Ave SW	S	8	0	0	0	0	0	0	0	0	0	0	0	**8**
AK	SW Hanford Street	800' boundary and 45th Ave SW	N	4	0	0	0	0	0	0	0	0	0	0	0	**4**
AL	SW Hanford Street	800' boundary and 45th Ave SW	S	5	0	0	0	0	0	0	0	0	0	0	0	**5**
AM	SW Hanford Street	45th Ave SW and 800' boundary	N	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AN	SW Hanford Street	45th Ave SW and 800' boundary	S	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AO	49th Avenue SW	800 ' boundary and SW Hinds St	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AP	49th Avenue SW	800 ' boundary and SW Hinds St	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
AQ	48th Avenue SW	800 ' boundary and SW Hinds St	W	12	0	0	0	0	0	0	0	0	0	0	0	**12**
AR	48th Avenue SW	800 ' boundary and SW Hinds St	E	8	0	0	0	0	0	0	0	0	0	0	0	**8**
AS	47th Avenue SW	SW Hanford St and SW Hinds St	W	18	0	0	0	0	0	0	0	0	0	0	0	**18**
AT	47th Avenue SW	SW Hanford St and SW Hinds St	E	19	0	0	0	0	0	0	0	0	0	0	0	**19**
AU	46th Avenue SW	SW Hanford St and SW Hinds St	W	29	0	0	0	0	0	0	0	0	0	0	0	**29**
AV	46th Avenue SW	SW Hanford St and SW Hinds St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
AW	45th Avenue SW	SW Hanford St and SW Hinds St	W	21	0	0	0	0	0	0	0	0	0	0	0	**21**

Project **Madison Middle School Classroom Addition and Field Improvements**

May 2018 Survey

				Parking Supply												
Block Face ID	Street Name	St Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Parking Spaces**
AX	45th Avenue SW	SW Hanford St and SW Hinds St	E	25	0	0	0	0	0	0	0	0	0	0	1	**26**
AY	44th Avenue SW	800 ' boundary and SW Hinds St	W	21	0	0	0	0	0	0	0	0	0	0	0	**21**
AZ	44th Avenue SW	800 ' boundary and SW Hinds St	E	17	0	0	0	0	0	0	0	0	0	0	0	**17**
BA	California Avenue SW	800 ' boundary and SW Hinds St	W	0	0	0	2	0	0	0	1	0	0	0	0	**3**
BB	California Avenue SW	800 ' boundary and 800 ' boundary	E	0	0	3	4	0	0	0	0	0	0	0	0	**7**
BC	SW Hinds Street	800 ' boundary and 49th Ave SW	N	2	0	0	0	0	0	0	0	0	0	0	0	**2**
BD	SW Hinds Street	800 ' boundary and 49th Ave SW	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
BE	SW Hinds Street	49th Ave SW and 48th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BF	SW Hinds Street	49th Ave SW and 48th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BG	SW Hinds Street	48th Ave SW and 47th Ave SW	N	8	0	0	0	0	0	0	0	0	0	0	0	**8**
BH	SW Hinds Street	48th Ave SW and 47th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BI	SW Hinds Street	47th Ave SW and 46th Ave SW	N	8	0	0	0	0	0	0	0	0	0	0	0	**8**
BJ	SW Hinds Street	46th Ave SW and 45th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BK	SW Hinds Street	47th Ave SW and 45th Ave SW	S	23	0	0	0	0	0	0	0	0	0	0	0	**23**
BL	SW Hinds Street	45th Ave SW and 44th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BM	SW Hinds Street	45th Ave SW and 44th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BN	SW Hinds Street	44th Ave SW and California Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BO	SW Hinds Street	44th Ave SW and California Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
BP	49th Avenue SW	SW Hinds St and 800 ' boundary	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
BQ	49th Avenue SW	SW Hinds St and 800 ' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR	48th Avenue SW	SW Hinds St and SW Spokane St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**
BS	48th Avenue SW	SW Hinds St and SW Spokane St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
BT	47th Avenue SW	SW Hinds St and SW Spokane St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**

Project **Madison Middle School Classroom Addition and Field Improvements**

May 2018 Survey

				Parking Supply												
Block Face ID	Street Name	St Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Parking Spaces**
BU	47th Avenue SW	SW Hinds St and SW Spokane St	E	27	0	0	0	0	0	0	0	0	0	0	0	**27**
BV	45th Avenue SW	SW Hinds St and SW Spokane St	W	0	0	0	0	0	0	0	0	30	0	0	0	**30**
BW	45th Avenue SW	SW Hinds St and SW Spokane St	E	25	0	0	0	0	0	0	0	0	0	0	2	**27**
BX	44th Avenue SW	SW Hinds St and SW Spokane St	W	27	0	0	0	0	0	0	0	0	0	0	0	**27**
BY	44th Avenue SW	SW Hinds St and SW Spokane St	E	26	0	0	0	0	0	0	0	0	0	0	0	**26**
BZ	California Avenue SW	SW Hinds St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
CA	SW Hanford Street	End of block	--	0	3	0	0	0	0	0	0	0	0	0	0	**3**
CB	49th Avenue SW	800 ' boundary and SW Spokane St	W	6	0	0	0	0	0	0	0	0	0	0	0	**6**
CC	49th Avenue SW	800 ' boundary and SW Spokane St	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CD	California Avenue SW	800 ' boundary and SW Spokane St	W	4	0	0	1	0	0	0	0	0	0	0	0	**5**
CE	California Avenue SW	800 ' boundary and SW Spokane St	E	0	0	0	0	0	0	1	0	0	0	0	0	**1**
CF	SW Spokane Street	800 ' boundary and 49th Ave SW	N	0	0	0	0	0	0	0	0	0	4	0	0	**4**
CG	SW Spokane Street	800 ' boundary and 49th Ave SW	S	3	0	0	0	0	0	0	0	0	0	0	0	**3**
CH	SW Spokane Street	49th Ave SW and 48th Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CI	SW Spokane Street	49th Ave SW and 48th Ave SW	S	6	0	0	0	0	0	0	0	0	0	0	0	**6**
CJ	SW Spokane Street	48th Ave SW and 47th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
CK	SW Spokane Street	48th Ave SW and 47th Ave SW	S	8	0	0	0	0	0	0	0	0	0	0	0	**8**
CL	SW Spokane Street	47th Ave SW and 45th Ave SW	N	23	0	0	0	0	0	0	0	0	0	0	0	**23**
CM	SW Spokane Street	47th Ave SW and 46th Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CN	SW Spokane Street	46th Ave SW and 45th Ave SW	S	7	0	0	0	0	0	0	0	0	0	0	0	**7**
CO	SW Spokane Street	45th Ave SW and 44th Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CP	SW Spokane Street	45th Ave SW and 44th Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CQ	SW Spokane Street	44th Ave SW and California Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**

Project **Madison Middle School Classroom Addition and Field Improvements**

May 2018 Survey

				Parking Supply												
Block Face ID	Street Name	St Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Parking Spaces**
CR	SW Spokane Street	44th Ave SW and California Ave SW	S	5	0	0	0	3	0	0	0	0	0	0	0	**8**
CS	SW Spokane Street	California Ave SW and 800' boundary	N	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CT	SW Spokane Street	California Ave SW and 800' boundary	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
CU	49th Avenue SW	SW Spokane St and 800' boundary	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
CV	49th Avenue SW	SW Spokane St and 800' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CW	48th Avenue SW	SW Spokane St and 800' boundary	W	20	0	0	0	0	0	0	0	0	0	0	0	**20**
CX	48th Avenue SW	SW Spokane St and 800' boundary	E	17	0	0	0	0	0	0	0	0	0	0	0	**17**
CY	47th Avenue SW	SW Spokane St and SW Charlestown St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**
CZ	47th Avenue SW	SW Spokane St and SW Charlestown St	E	28	0	0	0	0	0	0	0	0	0	0	0	**28**
DA	46th Avenue SW	SW Spokane St and SW Charlestown St	W	20	0	0	0	0	0	0	0	0	0	0	0	**20**
DB	46th Avenue SW	SW Spokane St and SW Charlestown St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
DC	45th Avenue SW	SW Spokane St and SW Charlestown St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**
DD	45th Avenue SW	SW Spokane St and SW Charlestown St	E	28	0	0	0	0	0	0	0	0	0	0	0	**28**
DE	44th Avenue SW	SW Spokane St and 800' boundary	W	22	0	0	0	0	0	0	0	0	0	0	0	**22**
DF	44th Avenue SW	SW Spokane St and 800' boundary	E	19	0	0	0	0	0	0	0	0	0	0	0	**19**
DG	California Avenue SW	SW Spokane St and 800' boundary	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
DH	California Avenue SW	SW Spokane St and 800' boundary	E	5	0	0	0	0	0	0	0	0	0	0	0	**5**
DI	SW Charlestown Street	47th Ave SW and 46th Ave SW	N	3	0	0	0	0	0	0	0	0	0	0	0	**3**
DJ	SW Charlestown Street	47th Ave SW and 46th Ave SW	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DK	SW Charlestown Street	800 ' boundary and 47th Ave SW	N	7	0	0	0	0	0	0	0	0	0	0	0	**7**
DL	SW Charlestown Street	800 ' boundary and 47th Ave SW	S	12	0	0	0	0	0	0	0	0	0	0	0	**12**
DM	SW Charlestown Street	46th Ave SW and 45th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
DN	SW Charlestown Street	46th Ave SW and 45th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**

Project **Madison Middle School Classroom Addition and Field Improvements**

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				Parking Supply												
Block Face ID	Street Name	St Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Parking Spaces**
DO	SW Charlestown Street	45th Ave SW and 800' boundary	N	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DP	SW Charlestown Street	45th Ave SW and 800' boundary	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DQ	47th Avenue SW	SW Charlestown St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DR	47th Avenue SW	SW Charlestown St and 800' boundary	E	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DS	46th Avenue SW	SW Charlestown St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DT	46th Avenue SW	SW Charlestown St and 800' boundary	E	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DU	45th Avenue SW	SW Charlestown St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DV	45th Avenue SW	SW Charlestown St and 800' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			TOTAL	**990**	**3**	**3**	**7**	**3**	**0**	**1**	**1**	**30**	**4**	**0**	**3**	**1045**

Project **Madison Middle School Classroom Addition and Field Improvements**

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				Parking Supply	Parking Demand									Parking Utilization								
					Weekday Daytime				Weekday Evening			Weekend		Weekday				Weekday Evening			Weekend	
					10:00 AM		1:30 PM		7:00 PM			10:30 AM		10:00 AM		1:30 PM		7:00 PM			10:30 AM	
Block Face ID	Street Name	St Segment	Side of Street	Total Parking Spaces	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)
AA	47th Avenue SW	800' boundary and SW Hanford St	W	**1**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
AB	47th Avenue SW	800' boundary and SW Hanford St	E	**1**	0	0	0	0	1	0	0	0	0	0%	0%	0%	0%	100%	0%	0%	0%	0%
AC	46th Avenue SW	800' boundary and SW Hanford St	W	**3**	1	1	2	1	3	1	1	1	1	33%	33%	67%	33%	100%	33%	33%	33%	33%
AD	46th Avenue SW	800' boundary and SW Hanford St	E	**6**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
AE	45th Avenue SW	800' boundary and SW Hanford St	W	**3**	1	0	0	1	1	1	0	0	0	33%	0%	0%	33%	33%	33%	0%	0%	0%
AF	45th Avenue SW	800' boundary and SW Hanford St	E	**3**	0	0	1	1	1	1	1	1	1	0%	0%	33%	33%	33%	33%	33%	33%	33%
AG	SW Hanford Street	800 ' boundary 47th Ave SW	N	**4**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
AH	SW Hanford Street	800 ' boundary 47th Ave SW	S	**2**	1	0	1	1	1	1	1	1	1	50%	0%	50%	50%	50%	50%	50%	50%	50%
AI	SW Hanford Street	47th Ave SW and 46th Ave SW	N	**10**	2	1	1	1	2	2	2	1	0	20%	10%	10%	10%	20%	20%	20%	10%	0%
AJ	SW Hanford Street	47th Ave SW and 46th Ave SW	S	**8**	1	0	1	0	0	1	0	0	0	13%	0%	13%	0%	0%	13%	0%	0%	0%
AK	SW Hanford Street	800' boundary and 45th Ave SW	N	**4**	2	2	3	1	4	5	4	2	4	50%	50%	75%	25%	100%	125%	100%	50%	100%
AL	SW Hanford Street	800' boundary and 45th Ave SW	S	**5**	3	2	4	4	6	3	5	4	5	60%	40%	80%	80%	120%	60%	100%	80%	100%
AM	SW Hanford Street	45th Ave SW and 800' boundary	N	**2**	0	1	0	1	0	1	0	0	1	0%	50%	0%	50%	0%	50%	0%	0%	50%
AN	SW Hanford Street	45th Ave SW and 800' boundary	S	**3**	0	0	1	0	0	0	0	0	0	0%	0%	33%	0%	0%	0%	0%	0%	0%
AO	49th Avenue SW	800 ' boundary and SW Hinds St	W	**2**	0	0	0	2	0	2	1	0	0	0%	0%	0%	100%	0%	100%	50%	0%	0%
AP	49th Avenue SW	800 ' boundary and SW Hinds St	E	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
AQ	48th Avenue SW	800 ' boundary and SW Hinds St	W	**12**	7	6	4	4	7	5	8	6	6	58%	50%	33%	33%	58%	42%	67%	50%	50%
AR	48th Avenue SW	800 ' boundary and SW Hinds St	E	**8**	6	3	1	4	6	6	7	6	7	75%	38%	13%	50%	75%	75%	88%	75%	88%
AS	47th Avenue SW	SW Hanford St and SW Hinds St	W	**18**	2	4	2	3	8	5	4	1	0	11%	22%	11%	17%	44%	28%	22%	6%	0%
AT	47th Avenue SW	SW Hanford St and SW Hinds St	E	**19**	7	6	7	5	10	8	9	8	7	37%	32%	37%	26%	53%	42%	47%	42%	37%
AU	46th Avenue SW	SW Hanford St and SW Hinds St	W	**29**	11	9	9	6	17	16	16	14	14	38%	31%	31%	21%	59%	55%	55%	48%	48%
AV	46th Avenue SW	SW Hanford St and SW Hinds St	E	**23**	2	4	3	5	5	3	6	5	5	9%	17%	13%	22%	22%	13%	26%	22%	22%
AW	45th Avenue SW	SW Hanford St and SW Hinds St	W	**21**	7	9	5	5	9	11	8	9	9	33%	43%	24%	24%	43%	52%	38%	43%	43%
AX	45th Avenue SW	SW Hanford St and SW Hinds St	E	**26**	3	4	3	5	8	7	6	7	6	12%	15%	12%	19%	31%	27%	23%	27%	23%
AY	44th Avenue SW	800 ' boundary and SW Hinds St	W	**21**	9	9	7	8	10	9	10	7	8	43%	43%	33%	38%	48%	43%	48%	33%	38%
AZ	44th Avenue SW	800 ' boundary and SW Hinds St	E	**17**	8	9	6	8	12	12	10	8	6	47%	53%	35%	47%	71%	71%	59%	47%	35%
BA	California Avenue SW	800 ' boundary and SW Hinds St	W	**3**	1	2	2	2	3	3	2	1	1	33%	67%	67%	67%	100%	100%	67%	33%	33%
BB	California Avenue SW	800 ' boundary and 800 ' boundary	E	**7**	6	5	4	5	6	8	6	6	5	86%	71%	57%	71%	86%	114%	86%	86%	71%
BC	SW Hinds Street	800 ' boundary and 49th Ave SW	N	**2**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
BD	SW Hinds Street	800 ' boundary and 49th Ave SW	S	**2**	2	1	2	2	1	2	2	1	1	100%	50%	100%	100%	50%	100%	100%	50%	50%
BE	SW Hinds Street	49th Ave SW and 48th Ave SW	N	**10**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
BF	SW Hinds Street	49th Ave SW and 48th Ave SW	S	**10**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
BG	SW Hinds Street	48th Ave SW and 47th Ave SW	N	**8**	0	1	1	1	1	2	2	1	2	0%	13%	13%	13%	13%	25%	25%	13%	25%
BH	SW Hinds Street	48th Ave SW and 47th Ave SW	S	**10**	2	2	4	3	2	2	2	2	3	20%	20%	40%	30%	20%	20%	20%	20%	30%
BI	SW Hinds Street	47th Ave SW and 46th Ave SW	N	**8**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
BJ	SW Hinds Street	46th Ave SW and 45th Ave SW	N	**10**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
BK	SW Hinds Street	47th Ave SW and 45th Ave SW	S	**23**	0	0	0	0	1	3	3	1	0	0%	0%	0%	0%	4%	13%	13%	4%	0%
BL	SW Hinds Street	45th Ave SW and 44th Ave SW	N	**10**	4	4	3	2	4	7	4	3	8	40%	40%	30%	20%	40%	70%	40%	30%	80%
BM	SW Hinds Street	45th Ave SW and 44th Ave SW	S	**10**	5	4	5	4	6	5	5	3	7	50%	40%	50%	40%	60%	50%	50%	30%	70%
BN	SW Hinds Street	44th Ave SW and California Ave SW	N	**10**	9	10	8	9	8	10	9	7	4	90%	100%	80%	90%	80%	100%	90%	70%	40%
BO	SW Hinds Street	44th Ave SW and California Ave SW	S	**9**	8	8	7	8	9	10	9	8	4	89%	89%	78%	89%	100%	111%	100%	89%	44%
BP	49th Avenue SW	SW Hinds St and 800 ' boundary	W	**3**	1	1	1	2	3	3	3	2	2	33%	33%	33%	67%	100%	100%	100%	67%	67%
BQ	49th Avenue SW	SW Hinds St and 800 ' boundary	E	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS

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				Parking Supply	Parking Demand									Parking Utilization								
					Weekday Daytime				Weekday Evening			Weekend		Weekday				Weekday Evening			Weekend	
					10:00 AM		1:30 PM		7:00 PM			10:30 AM		10:00 AM		1:30 PM		7:00 PM			10:30 AM	
Block Face ID	Street Name	St Segment	Side of Street	Total Parking Spaces	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)
BR	48th Avenue SW	SW Hinds St and SW Spokane St	W	**31**	3	3	4	2	7	6	5	6	6	10%	10%	13%	6%	23%	19%	16%	19%	19%
BS	48th Avenue SW	SW Hinds St and SW Spokane St	E	**23**	5	4	6	6	13	12	7	7	7	22%	17%	26%	26%	57%	52%	30%	30%	30%
BT	47th Avenue SW	SW Hinds St and SW Spokane St	W	**31**	5	7	6	6	13	8	11	9	9	16%	23%	19%	19%	42%	26%	35%	29%	29%
BU	47th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	0	0	1	0	0	0	0	0	2	0%	0%	4%	0%	0%	0%	0%	0%	7%
BV	45th Avenue SW	SW Hinds St and SW Spokane St	W	**30**	1	0	0	0	8	20	0	0	10	3%	0%	0%	0%	27%	67%	0%	0%	33%
BW	45th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	10	10	10	11	11	21	10	8	12	37%	37%	37%	41%	41%	78%	37%	30%	44%
BX	44th Avenue SW	SW Hinds St and SW Spokane St	W	**27**	15	9	8	6	13	16	16	13	15	56%	33%	30%	22%	48%	59%	59%	48%	56%
BY	44th Avenue SW	SW Hinds St and SW Spokane St	E	**26**	12	13	14	10	11	13	13	9	15	46%	50%	54%	38%	42%	50%	50%	35%	58%
BZ	California Avenue SW	SW Hinds St and 800' boundary	W	**2**	3	3	4	2	6	6	5	1	2	150%	150%	200%	100%	300%	300%	250%	50%	100%
CA	SW Hanford Street	End of block	--	**3**	3	2	3	3	0	2	3	3	3	100%	67%	100%	100%	0%	67%	100%	100%	100%
CB	49th Avenue SW	800 ' boundary and SW Spokane St	W	**6**	0	0	1	0	0	0	1	0	0	0%	0%	17%	0%	0%	0%	17%	0%	0%
CC	49th Avenue SW	800 ' boundary and SW Spokane St	E	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CD	California Avenue SW	800 ' boundary and SW Spokane St	W	**5**	2	1	2	3	3	4	2	3	4	40%	20%	40%	60%	60%	80%	40%	60%	80%
CE	California Avenue SW	800 ' boundary and SW Spokane St	E	**1**	0	0	0	0	0	0	0	1	1	0%	0%	0%	0%	0%	0%	0%	100%	100%
CF	SW Spokane Street	800 ' boundary and 49th Ave SW	N	**4**	0	0	0	0	0	0	0	1	0	0%	0%	0%	0%	0%	0%	0%	25%	0%
CG	SW Spokane Street	800 ' boundary and 49th Ave SW	S	**3**	3	3	1	2	2	2	3	0	2	100%	100%	33%	67%	67%	67%	100%	0%	67%
CH	SW Spokane Street	49th Ave SW and 48th Ave SW	N	**9**	0	0	0	0	1	1	2	1	1	0%	0%	0%	0%	11%	11%	22%	11%	11%
CI	SW Spokane Street	49th Ave SW and 48th Ave SW	S	**6**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
CJ	SW Spokane Street	48th Ave SW and 47th Ave SW	N	**10**	1	2	0	0	0	1	1	0	1	10%	20%	0%	0%	0%	10%	10%	0%	10%
CK	SW Spokane Street	48th Ave SW and 47th Ave SW	S	**8**	0	0	0	0	0	0	1	1	1	0%	0%	0%	0%	0%	0%	13%	13%	13%
CL	SW Spokane Street	47th Ave SW and 45th Ave SW	N	**23**	5	4	4	5	0	4	0	0	7	22%	17%	17%	22%	0%	17%	0%	0%	30%
CM	SW Spokane Street	47th Ave SW and 46th Ave SW	S	**9**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
CN	SW Spokane Street	46th Ave SW and 45th Ave SW	S	**7**	2	4	4	5	0	5	0	0	5	29%	57%	57%	71%	0%	71%	0%	0%	71%
CO	SW Spokane Street	45th Ave SW and 44th Ave SW	N	**9**	0	1	0	0	0	6	2	2	6	0%	11%	0%	0%	0%	67%	22%	22%	67%
CP	SW Spokane Street	45th Ave SW and 44th Ave SW	S	**9**	0	0	1	1	0	6	0	0	8	0%	0%	11%	11%	0%	67%	0%	0%	89%
CQ	SW Spokane Street	44th Ave SW and California Ave SW	N	**9**	5	8	7	8	9	11	7	7	9	56%	89%	78%	89%	100%	122%	78%	78%	100%
CR	SW Spokane Street	44th Ave SW and California Ave SW	S	**8**	6	5	7	6	4	10	5	7	7	75%	63%	88%	75%	50%	125%	63%	88%	88%
CS	SW Spokane Street	California Ave SW and 800' boundary	N	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CT	SW Spokane Street	California Ave SW and 800' boundary	S	**2**	2	2	2	1	3	2	1	1	2	100%	100%	100%	50%	150%	100%	50%	50%	100%
CU	49th Avenue SW	SW Spokane St and 800' boundary	W	**1**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
CV	49th Avenue SW	SW Spokane St and 800' boundary	E	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
CW	48th Avenue SW	SW Spokane St and 800' boundary	W	**20**	4	5	4	4	7	6	7	5	5	20%	25%	20%	20%	35%	30%	35%	25%	25%
CX	48th Avenue SW	SW Spokane St and 800' boundary	E	**17**	2	2	2	3	2	3	2	3	2	12%	12%	12%	18%	12%	18%	12%	18%	12%
CY	47th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	7	8	10	8	12	11	14	10	9	23%	26%	32%	26%	39%	35%	45%	32%	29%
CZ	47th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	5	4	4	4	7	8	10	9	6	18%	14%	14%	14%	25%	29%	36%	32%	21%
DA	46th Avenue SW	SW Spokane St and SW Charlestown St	W	**20**	9	7	9	8	10	7	12	9	13	45%	35%	45%	40%	50%	35%	60%	45%	65%
DB	46th Avenue SW	SW Spokane St and SW Charlestown St	E	**23**	7	5	8	9	9	7	8	9	9	30%	22%	35%	39%	39%	30%	35%	39%	39%
DC	45th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	8	9	6	9	6	11	8	7	5	26%	29%	19%	29%	19%	35%	26%	23%	16%
DD	45th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	9	7	13	10	12	15	13	14	16	32%	25%	46%	36%	43%	54%	46%	50%	57%
DE	44th Avenue SW	SW Spokane St and 800' boundary	W	**22**	4	7	11	8	12	14	10	8	22	18%	32%	50%	36%	55%	64%	45%	36%	100%
DF	44th Avenue SW	SW Spokane St and 800' boundary	E	**19**	8	5	13	4	7	10	9	12	20	42%	26%	68%	21%	37%	53%	47%	63%	105%
DG	California Avenue SW	SW Spokane St and 800' boundary	W	**1**	0	1	0	1	0	0	0	0	1	0%	100%	0%	100%	0%	0%	0%	0%	100%
DH	California Avenue SW	SW Spokane St and 800' boundary	E	**5**	2	4	1	4	2	4	1	1	4	40%	80%	20%	80%	40%	80%	20%	20%	80%

Project **Madison Middle School Classroom Addition and Field Improvements**

May 2018 Survey

				Parking Supply	Parking Demand									Parking Utilization								
					Weekday Daytime				Weekday Evening			Weekend		Weekday				Weekday Evening			Weekend	
					10:00 AM		1:30 PM		7:00 PM			10:30 AM		10:00 AM		1:30 PM		7:00 PM			10:30 AM	
Block Face ID	Street Name	St Segment	Side of Street	Total Parking Spaces	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)	Mon 5/21/18	Tues 5/22/18	Wed 5/16/18	Thurs 5/17/18	Wed 5/16/18	Thurs 5/17/18 (Science Night)	Mon 5/21/18	Sat 5/26/18	Sun 5/27/18 (Church service)
DI	SW Charlestown Street	47th Ave SW and 46th Ave SW	N	**3**	1	0	1	0	2	1	0	1	1	33%	0%	33%	0%	67%	33%	0%	33%	33%
DJ	SW Charlestown Street	47th Ave SW and 46th Ave SW	S	**2**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	SW Charlestown Street	800 ' boundary and 47th Ave SW	N	**7**	1	0	1	0	1	0	0	1	0	14%	0%	14%	0%	14%	0%	0%	14%	0%
DL	SW Charlestown Street	800 ' boundary and 47th Ave SW	S	**12**	0	0	0	3	0	0	0	0	0	0%	0%	0%	25%	0%	0%	0%	0%	0%
DM	SW Charlestown Street	46th Ave SW and 45th Ave SW	N	**10**	1	1	1	1	0	3	3	2	2	10%	10%	10%	10%	0%	30%	30%	20%	20%
DN	SW Charlestown Street	46th Ave SW and 45th Ave SW	S	**10**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
DO	SW Charlestown Street	45th Ave SW and 800' boundary	N	**2**	1	1	1	1	1	1	1	1	1	50%	50%	50%	50%	50%	50%	50%	50%	50%
DP	SW Charlestown Street	45th Ave SW and 800' boundary	S	**2**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
DQ	47th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	0	1	0	0	0	0	1	0	0	0%	50%	0%	0%	0%	0%	50%	0%	0%
DR	47th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	0	0	0	1	2	2	1	1	1	0%	0%	0%	50%	100%	100%	50%	50%	50%
DS	46th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	2	1	1	1	1	1	1	1	1	100%	50%	50%	50%	50%	50%	50%	50%	50%
DT	46th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
DU	45th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	0	0	0	0	0	0	0	0	0	0%	0%	0%	0%	0%	0%	0%	0%	0%
DV	45th Avenue SW	SW Charlestown St and 800' boundary	E	**0**	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS
			TOTAL	**1045**	**265**	**257**	**269**	**260**	**352**	**415**	**342**	**290**	**371**	**25%**	**25%**	**26%**	**25%**	**34%**	**40%**	**33%**	**28%**	**36%**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Parking Supply												
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Spaces**
AA	47th Avenue SW	800' boundary and SW Hanford St	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
AB	47th Avenue SW	800' boundary and SW Hanford St	E	1	0	0	0	0	0	0	0	0	0	0	0	**1**
AC	46th Avenue SW	800' boundary and SW Hanford St	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AD	46th Avenue SW	800' boundary and SW Hanford St	E	6	0	0	0	0	0	0	0	0	0	0	0	**6**
AE	45th Avenue SW	800' boundary and SW Hanford St	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AF	45th Avenue SW	800' boundary and SW Hanford St	E	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AG	SW Hanford Street	800 ' boundary 47th Ave SW	N	4	0	0	0	0	0	0	0	0	0	0	0	**4**
AH	SW Hanford Street	800 ' boundary 47th Ave SW	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AI	SW Hanford Street	47th Ave SW and 46th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
AJ	SW Hanford Street	47th Ave SW and 46th Ave SW	S	8	0	0	0	0	0	0	0	0	0	0	0	**8**
AK	SW Hanford Street	800' boundary and 45th Ave SW	N	4	0	0	0	0	0	0	0	0	0	0	0	**4**
AL	SW Hanford Street	800' boundary and 45th Ave SW	S	5	0	0	0	0	0	0	0	0	0	0	0	**5**
AM	SW Hanford Street	45th Ave SW and 800' boundary	N	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AN	SW Hanford Street	45th Ave SW and 800' boundary	S	3	0	0	0	0	0	0	0	0	0	0	0	**3**
AO	49th Avenue SW	800 ' boundary and SW Hinds St	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
AP	49th Avenue SW	800 ' boundary and SW Hinds St	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
AQ	48th Avenue SW	800 ' boundary and SW Hinds St	W	16	0	0	0	0	0	0	0	0	0	0	0	**16**
AR	48th Avenue SW	800 ' boundary and SW Hinds St	E	7	0	0	0	0	0	0	0	0	0	0	0	**7**
AS	47th Avenue SW	SW Hanford St and SW Hinds St	W	18	0	0	0	0	0	0	0	0	0	0	0	**18**
AT	47th Avenue SW	SW Hanford St and SW Hinds St	E	19	0	0	0	0	0	0	0	0	0	0	0	**19**
AU	46th Avenue SW	SW Hanford St and SW Hinds St	W	29	0	0	0	0	0	0	0	0	0	0	0	**29**
AV	46th Avenue SW	SW Hanford St and SW Hinds St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
AW	45th Avenue SW	SW Hanford St and SW Hinds St	W	21	0	0	0	0	0	0	0	0	0	0	0	**21**
AX	45th Avenue SW	SW Hanford St and SW Hinds St	E	25	0	0	0	0	0	0	0	0	0	0	1	**26**
AY	44th Avenue SW	800 ' boundary and SW Hinds St	W	21	0	0	0	0	0	0	0	0	0	0	0	**21**
AZ	44th Avenue SW	800 ' boundary and SW Hinds St	E	17	0	0	0	0	0	0	0	0	0	0	0	**17**
BA	California Avenue SW	800 ' boundary and SW Hinds St	W	0	0	0	2	0	0	0	1	0	0	0	0	**3**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Parking Supply												
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Spaces**
BB	California Avenue SW	800 ' boundary and 800 ' boundary	E	0	0	3	4	0	0	0	0	0	0	0	0	**7**
BC	SW Hinds Street	800 ' boundary and 49th Ave SW	N	3	0	0	0	0	0	0	0	0	0	0	0	**3**
BD	SW Hinds Street	800 ' boundary and 49th Ave SW	S	3	0	0	0	0	0	0	0	0	0	0	0	**3**
BE	SW Hinds Street	49th Ave SW and 48th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BF	SW Hinds Street	49th Ave SW and 48th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BG	SW Hinds Street	48th Ave SW and 47th Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
BH	SW Hinds Street	48th Ave SW and 47th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BI	SW Hinds Street	47th Ave SW and 46th Ave SW	N	8	0	0	0	0	0	0	0	0	0	0	0	**8**
BJ	SW Hinds Street	46th Ave SW and 45th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BK	SW Hinds Street	47th Ave SW and 45th Ave SW	S	23	0	0	0	0	0	0	0	0	0	0	0	**23**
BL	SW Hinds Street	45th Ave SW and 44th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BM	SW Hinds Street	45th Ave SW and 44th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BN	SW Hinds Street	44th Ave SW and California Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
BO	SW Hinds Street	44th Ave SW and California Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
BP	49th Avenue SW	SW Hinds St and 800 ' boundary	W	4	0	0	0	0	0	0	0	0	0	0	0	**4**
BQ	49th Avenue SW	SW Hinds St and 800 ' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
BR	48th Avenue SW	SW Hinds St and SW Spokane St	W	27	0	0	0	0	0	0	0	0	0	0	0	**27**
BS	48th Avenue SW	SW Hinds St and SW Spokane St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
BT	47th Avenue SW	SW Hinds St and SW Spokane St	W	29	0	0	0	0	0	0	0	0	0	0	0	**29**
BU	47th Avenue SW	SW Hinds St and SW Spokane St	E	27	0	0	0	0	0	0	0	0	0	0	0	**27**
BV	45th Avenue SW	SW Hinds St and SW Spokane St	W	0	0	0	0	0	0	0	0	30	0	0	0	**30**
BW	45th Avenue SW	SW Hinds St and SW Spokane St	E	25	0	0	0	0	0	0	0	0	0	0	2	**27**
BX	44th Avenue SW	SW Hinds St and SW Spokane St	W	27	0	0	0	0	0	0	0	0	0	0	0	**27**
BY	44th Avenue SW	SW Hinds St and SW Spokane St	E	26	0	0	0	0	0	0	0	0	0	0	0	**26**
BZ	California Avenue SW	SW Hinds St and 800' boundary	W	2	0	0	4	0	1	0	0	0	0	0	0	**7**
CA	SW Hanford Street	End of block	--	0	3	0	0	0	0	0	0	0	0	0	0	**3**
CB	49th Avenue SW	800 ' boundary and SW Spokane St	W	5	0	0	0	0	0	0	0	0	0	0	0	**5**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Parking Supply												
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Spaces**
CC	49th Avenue SW	800 ' boundary and SW Spokane St	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CD	California Avenue SW	800 ' boundary and SW Spokane St	W	4	0	0	1	0	0	0	0	0	0	0	0	**5**
CE	California Avenue SW	800 ' boundary and SW Spokane St	E	0	0	0	0	0	0	1	0	0	0	0	0	**1**
CF	SW Spokane Street	800 ' boundary and 49th Ave SW	N	0	0	0	0	0	0	0	0	0	4	0	0	**4**
CG	SW Spokane Street	800 ' boundary and 49th Ave SW	S	3	0	0	0	0	0	0	0	0	0	0	0	**3**
CH	SW Spokane Street	49th Ave SW and 48th Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CI	SW Spokane Street	49th Ave SW and 48th Ave SW	S	8	0	0	0	0	0	0	0	0	0	0	0	**8**
CJ	SW Spokane Street	48th Ave SW and 47th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
CK	SW Spokane Street	48th Ave SW and 47th Ave SW	S	8	0	0	0	0	0	0	0	0	0	0	0	**8**
CL	SW Spokane Street	47th Ave SW and 45th Ave SW	N	23	0	0	0	0	0	0	0	0	0	0	0	**23**
CM	SW Spokane Street	47th Ave SW and 46th Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CN	SW Spokane Street	46th Ave SW and 45th Ave SW	S	7	0	0	0	0	0	0	0	0	0	0	0	**7**
CO	SW Spokane Street	45th Ave SW and 44th Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CP	SW Spokane Street	45th Ave SW and 44th Ave SW	S	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CQ	SW Spokane Street	44th Ave SW and California Ave SW	N	9	0	0	0	0	0	0	0	0	0	0	0	**9**
CR	SW Spokane Street	44th Ave SW and California Ave SW	S	5	0	0	0	3	0	0	0	0	0	0	0	**8**
CS	SW Spokane Street	California Ave SW and 800' boundary	N	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CT	SW Spokane Street	California Ave SW and 800' boundary	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
CU	49th Avenue SW	SW Spokane St and 800' boundary	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
CV	49th Avenue SW	SW Spokane St and 800' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
CW	48th Avenue SW	SW Spokane St and 800' boundary	W	21	0	0	0	0	0	0	0	0	0	0	0	**21**
CX	48th Avenue SW	SW Spokane St and 800' boundary	E	17	0	0	0	0	0	0	0	0	0	0	0	**17**
CY	47th Avenue SW	SW Spokane St and SW Charlestown St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**
CZ	47th Avenue SW	SW Spokane St and SW Charlestown St	E	28	0	0	0	0	0	0	0	0	0	0	0	**28**
DA	46th Avenue SW	SW Spokane St and SW Charlestown St	W	20	0	0	0	0	0	0	0	0	0	0	0	**20**
DB	46th Avenue SW	SW Spokane St and SW Charlestown St	E	23	0	0	0	0	0	0	0	0	0	0	0	**23**
DC	45th Avenue SW	SW Spokane St and SW Charlestown St	W	31	0	0	0	0	0	0	0	0	0	0	0	**31**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Parking Supply												
Block Face ID	Street Name	Street Segment	Side of Street	Unrestricted Parallel	Unrestricted Angle	1-Hour Parking 7a - 6p Except Sun/Hol	2-Hour Parking 7a - 6p Except Sun/Hol	4-Hour Parking 7a - 6p Except Sun/Hol	30-minute l/ul only	30 minute l/ul only 8a - 4p, exc Sat, Sun, & Hol	3 minute l/ul 7a-6p, exc Sun & Hol	School Bus Only 7-9a, 2-4p	No Parking 7-10a, 1-4p, exc Sat, Sun, & Hol	3-minute Passenger Load Only	Disabled	**Total Spaces**
DD	45th Avenue SW	SW Spokane St and SW Charlestown St	E	28	0	0	0	0	0	0	0	0	0	0	0	**28**
DE	44th Avenue SW	SW Spokane St and 800' boundary	W	22	0	0	0	0	0	0	0	0	0	0	0	**22**
DF	44th Avenue SW	SW Spokane St and 800' boundary	E	19	0	0	0	0	0	0	0	0	0	0	0	**19**
DG	California Avenue SW	SW Spokane St and 800' boundary	W	1	0	0	0	0	0	0	0	0	0	0	0	**1**
DH	California Avenue SW	SW Spokane St and 800' boundary	E	5	0	0	0	0	0	0	0	0	0	0	0	**5**
DI	SW Charlestown Street	47th Ave SW and 46th Ave SW	N	3	0	0	0	0	0	0	0	0	0	0	0	**3**
DJ	SW Charlestown Street	47th Ave SW and 46th Ave SW	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DK	SW Charlestown Street	800 ' boundary and 47th Ave SW	N	7	0	0	0	0	0	0	0	0	0	0	0	**7**
DL	SW Charlestown Street	800 ' boundary and 47th Ave SW	S	12	0	0	0	0	0	0	0	0	0	0	0	**12**
DM	SW Charlestown Street	46th Ave SW and 45th Ave SW	N	10	0	0	0	0	0	0	0	0	0	0	0	**10**
DN	SW Charlestown Street	46th Ave SW and 45th Ave SW	S	10	0	0	0	0	0	0	0	0	0	0	0	**10**
DO	SW Charlestown Street	45th Ave SW and 800' boundary	N	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DP	SW Charlestown Street	45th Ave SW and 800' boundary	S	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DQ	47th Avenue SW	SW Charlestown St and 800' boundary	W	3	0	0	0	0	0	0	0	0	0	0	0	**3**
DR	47th Avenue SW	SW Charlestown St and 800' boundary	E	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DS	46th Avenue SW	SW Charlestown St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DT	46th Avenue SW	SW Charlestown St and 800' boundary	E	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DU	45th Avenue SW	SW Charlestown St and 800' boundary	W	2	0	0	0	0	0	0	0	0	0	0	0	**2**
DV	45th Avenue SW	SW Charlestown St and 800' boundary	E	0	0	0	0	0	0	0	0	0	0	0	0	**0**
			TOTAL	**994**	**3**	**3**	**11**	**3**	**1**	**1**	**1**	**30**	**4**	**0**	**3**	**1054**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Occupancy											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
AA	47th Avenue SW	800' boundary and SW Hanford St	W	**1**	0	0	0	0	0	0	0	0	0	0	0	0
AB	47th Avenue SW	800' boundary and SW Hanford St	E	**1**	1	1	1	1	1	1	1	1	1	1	1	1
AC	46th Avenue SW	800' boundary and SW Hanford St	W	**3**	2	0	1	2	0	1	0	0	0	0	0	0
AD	46th Avenue SW	800' boundary and SW Hanford St	E	**6**	0	0	0	0	0	0	0	0	0	0	0	0
AE	45th Avenue SW	800' boundary and SW Hanford St	W	**3**	2	1	2	1	2	2	2	2	2	2	2	2
AF	45th Avenue SW	800' boundary and SW Hanford St	E	**3**	2	2	2	2	1	2	2	2	2	2	2	2
AG	SW Hanford Street	800 ' boundary 47th Ave SW	N	**4**	0	0	0	0	0	0	0	0	0	0	0	0
AH	SW Hanford Street	800 ' boundary 47th Ave SW	S	**2**	1	1	1	1	1	1	1	1	1	1	1	1
AI	SW Hanford Street	47th Ave SW and 46th Ave SW	N	**10**	1	1	1	1	1	1	0	2	1	1	1	1
AJ	SW Hanford Street	47th Ave SW and 46th Ave SW	S	**8**	0	0	0	0	0	0	0	0	0	0	0	0
AK	SW Hanford Street	800' boundary and 45th Ave SW	N	**4**	1	2	2	2	2	2	1	4	3	1	2	2
AL	SW Hanford Street	800' boundary and 45th Ave SW	S	**5**	5	4	5	5	5	5	3	5	4	3	4	4
AM	SW Hanford Street	45th Ave SW and 800' boundary	N	**2**	1	0	1	0	1	1	1	0	1	2	0	1
AN	SW Hanford Street	45th Ave SW and 800' boundary	S	**3**	2	2	2	1	2	2	1	2	2	1	2	2
AO	49th Avenue SW	800 ' boundary and SW Hinds St	W	**2**	0	0	0	0	0	0	0	0	0	0	0	0
AP	49th Avenue SW	800 ' boundary and SW Hinds St	E	**0**	0	0	0	0	0	0	0	0	0	0	0	0
AQ	48th Avenue SW	800 ' boundary and SW Hinds St	W	**16**	8	5	7	6	6	6	9	7	8	10	9	10
AR	48th Avenue SW	800 ' boundary and SW Hinds St	E	**7**	4	6	5	6	7	7	8	6	7	7	7	7
AS	47th Avenue SW	SW Hanford St and SW Hinds St	W	**18**	6	3	5	5	4	5	4	5	5	3	6	5
AT	47th Avenue SW	SW Hanford St and SW Hinds St	E	**19**	7	7	7	8	8	8	6	3	5	6	5	6
AU	46th Avenue SW	SW Hanford St and SW Hinds St	W	**29**	9	16	13	10	13	12	12	14	13	13	14	14
AV	46th Avenue SW	SW Hanford St and SW Hinds St	E	**23**	8	7	8	12	7	10	8	9	9	9	10	10
AW	45th Avenue SW	SW Hanford St and SW Hinds St	W	**21**	10	11	11	8	12	10	11	10	11	10	12	11
AX	45th Avenue SW	SW Hanford St and SW Hinds St	E	**26**	11	9	10	13	10	12	12	11	12	13	8	11
AY	44th Avenue SW	800 ' boundary and SW Hinds St	W	**21**	9	8	9	11	14	13	11	9	10	13	13	13
AZ	44th Avenue SW	800 ' boundary and SW Hinds St	E	**17**	8	10	9	10	14	12	10	9	10	11	9	10
BA	California Avenue SW	800 ' boundary and SW Hinds St	W	**3**	3	3	3	3	3	3	1	3	2	2	3	3

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Occupancy											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
BB	California Avenue SW	800 ' boundary and 800 ' boundary	E	**7**	6	6	6	6	4	5	6	6	6	6	6	6
BC	SW Hinds Street	800 ' boundary and 49th Ave SW	N	**3**	0	0	0	0	1	1	1	0	1	0	0	0
BD	SW Hinds Street	800 ' boundary and 49th Ave SW	S	**3**	1	1	1	1	1	1	1	1	1	1	1	1
BE	SW Hinds Street	49th Ave SW and 48th Ave SW	N	**10**	1	2	2	1	1	1	1	1	1	1	1	1
BF	SW Hinds Street	49th Ave SW and 48th Ave SW	S	**10**	0	0	0	0	1	1	0	1	1	0	1	1
BG	SW Hinds Street	48th Ave SW and 47th Ave SW	N	**9**	2	2	2	2	2	2	1	2	2	2	2	2
BH	SW Hinds Street	48th Ave SW and 47th Ave SW	S	**10**	1	1	1	2	1	2	1	0	1	1	1	1
BI	SW Hinds Street	47th Ave SW and 46th Ave SW	N	**8**	0	0	0	1	0	1	0	0	0	0	0	0
BJ	SW Hinds Street	46th Ave SW and 45th Ave SW	N	**10**	1	2	2	0	0	0	0	0	0	0	0	0
BK	SW Hinds Street	47th Ave SW and 45th Ave SW	S	**23**	0	0	0	0	0	0	0	0	0	0	0	0
BL	SW Hinds Street	45th Ave SW and 44th Ave SW	N	**10**	5	4	5	4	3	4	2	3	3	2	4	3
BM	SW Hinds Street	45th Ave SW and 44th Ave SW	S	**10**	5	7	6	4	6	5	5	5	5	3	5	4
BN	SW Hinds Street	44th Ave SW and California Ave SW	N	**10**	7	7	7	6	8	7	9	7	8	9	10	10
BO	SW Hinds Street	44th Ave SW and California Ave SW	S	**9**	6	10	8	8	7	8	9	10	10	10	11	11
BP	49th Avenue SW	SW Hinds St and 800 ' boundary	W	**4**	1	2	2	1	2	2	2	2	2	2	2	2
BQ	49th Avenue SW	SW Hinds St and 800 ' boundary	E	**0**	0	0	0	0	0	0	0	0	0	0	0	0
BR	48th Avenue SW	SW Hinds St and SW Spokane St	W	**27**	8	9	9	9	8	9	9	10	10	10	11	11
BS	48th Avenue SW	SW Hinds St and SW Spokane St	E	**23**	9	9	9	11	11	11	9	9	9	11	10	11
BT	47th Avenue SW	SW Hinds St and SW Spokane St	W	**29**	10	12	11	11	14	13	12	12	12	12	14	13
BU	47th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	0	0	0	0	0	0	0	0	0	0	0	0
BV	45th Avenue SW	SW Hinds St and SW Spokane St	W	**30**	1	0	1	12	0	6	0	0	0	0	0	0
BW	45th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	12	11	12	15	8	12	13	8	11	13	12	13
BX	44th Avenue SW	SW Hinds St and SW Spokane St	W	**27**	9	9	9	13	11	12	10	9	10	13	10	12
BY	44th Avenue SW	SW Hinds St and SW Spokane St	E	**26**	12	10	11	13	13	13	7	16	12	9	17	13
BZ	California Avenue SW	SW Hinds St and 800' boundary	W	**7**	6	6	6	6	6	6	5	7	6	6	6	6
CA	SW Hanford Street	End of block	--	**3**	3	3	3	3	3	3	3	3	3	2	3	3
CB	49th Avenue SW	800 ' boundary and SW Spokane St	W	**5**	0	0	0	0	0	0	2	2	2	0	2	1

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

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					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
CC	49th Avenue SW	800 ' boundary and SW Spokane St	E	**0**	0	0	0	0	0	0	0	0	0	0	0	0
CD	California Avenue SW	800 ' boundary and SW Spokane St	W	**5**	2	2	2	2	2	2	1	0	1	0	0	0
CE	California Avenue SW	800 ' boundary and SW Spokane St	E	**1**	0	0	0	0	0	0	0	0	0	0	0	0
CF	SW Spokane Street	800 ' boundary and 49th Ave SW	N	**4**	0	0	0	0	0	0	0	0	0	0	0	0
CG	SW Spokane Street	800 ' boundary and 49th Ave SW	S	**3**	0	1	1	2	1	2	1	1	1	2	2	2
CH	SW Spokane Street	49th Ave SW and 48th Ave SW	N	**9**	0	0	0	1	1	1	0	2	1	1	2	2
CI	SW Spokane Street	49th Ave SW and 48th Ave SW	S	**8**	1	1	1	1	1	1	1	1	1	1	1	1
CJ	SW Spokane Street	48th Ave SW and 47th Ave SW	N	**10**	2	2	2	3	2	3	3	2	3	3	3	3
CK	SW Spokane Street	48th Ave SW and 47th Ave SW	S	**8**	0	0	0	0	0	0	0	0	0	0	0	0
CL	SW Spokane Street	47th Ave SW and 45th Ave SW	N	**23**	1	2	2	5	1	3	0	0	0	0	0	0
CM	SW Spokane Street	47th Ave SW and 46th Ave SW	S	**9**	0	0	0	0	0	0	0	0	0	0	0	0
CN	SW Spokane Street	46th Ave SW and 45th Ave SW	S	**7**	0	1	1	2	1	2	1	1	1	1	1	1
CO	SW Spokane Street	45th Ave SW and 44th Ave SW	N	**9**	4	4	4	5	4	5	3	2	3	4	2	3
CP	SW Spokane Street	45th Ave SW and 44th Ave SW	S	**9**	1	0	1	2	0	1	1	3	2	1	2	2
CQ	SW Spokane Street	44th Ave SW and California Ave SW	N	**9**	9	10	10	7	7	7	5	9	7	6	9	8
CR	SW Spokane Street	44th Ave SW and California Ave SW	S	**8**	5	9	7	5	5	5	4	6	5	2	3	3
CS	SW Spokane Street	California Ave SW and 800' boundary	N	**0**	0	0	0	0	0	0	0	0	0	0	0	0
CT	SW Spokane Street	California Ave SW and 800' boundary	S	**2**	3	3	3	3	3	3	2	2	2	2	2	2
CU	49th Avenue SW	SW Spokane St and 800' boundary	W	**1**	1	0	1	0	0	0	0	0	0	0	0	0
CV	49th Avenue SW	SW Spokane St and 800' boundary	E	**0**	0	0	0	0	0	0	0	0	0	0	0	0
CW	48th Avenue SW	SW Spokane St and 800' boundary	W	**21**	5	10	8	7	10	9	11	11	11	9	9	9
CX	48th Avenue SW	SW Spokane St and 800' boundary	E	**17**	3	2	3	2	2	2	2	2	2	5	2	4
CY	47th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	11	7	9	16	16	16	19	17	18	16	17	17
CZ	47th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	13	12	13	14	11	13	13	3	8	11	13	12
DA	46th Avenue SW	SW Spokane St and SW Charlestown St	W	**20**	9	9	9	9	9	9	7	10	9	10	10	10
DB	46th Avenue SW	SW Spokane St and SW Charlestown St	E	**23**	10	8	9	10	7	9	12	12	12	12	11	12
DC	45th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	6	7	7	10	7	9	6	9	8	8	9	9

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Occupancy											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
DD	45th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	7	7	7	3	8	6	7	10	9	6	11	9
DE	44th Avenue SW	SW Spokane St and 800' boundary	W	**22**	11	10	11	13	14	14	10	13	12	12	16	14
DF	44th Avenue SW	SW Spokane St and 800' boundary	E	**19**	12	10	11	12	13	13	12	11	12	9	8	9
DG	California Avenue SW	SW Spokane St and 800' boundary	W	**1**	1	0	1	0	0	0	1	0	1	0	0	0
DH	California Avenue SW	SW Spokane St and 800' boundary	E	**5**	5	3	4	4	2	3	0	3	2	3	2	3
DI	SW Charlestown Street	47th Ave SW and 46th Ave SW	N	**3**	1	2	2	1	2	2	2	1	2	1	1	1
DJ	SW Charlestown Street	47th Ave SW and 46th Ave SW	S	**2**	0	0	0	0	0	0	0	0	0	0	0	0
DK	SW Charlestown Street	800 ' boundary and 47th Ave SW	N	**7**	0	0	0	0	0	0	0	0	0	0	0	0
DL	SW Charlestown Street	800 ' boundary and 47th Ave SW	S	**12**	0	0	0	0	0	0	0	0	0	0	0	0
DM	SW Charlestown Street	46th Ave SW and 45th Ave SW	N	**10**	3	3	3	3	3	3	2	2	2	2	3	3
DN	SW Charlestown Street	46th Ave SW and 45th Ave SW	S	**10**	0	0	0	0	0	0	0	0	0	0	0	0
DO	SW Charlestown Street	45th Ave SW and 800' boundary	N	**2**	1	2	2	2	2	2	2	2	2	1	2	2
DP	SW Charlestown Street	45th Ave SW and 800' boundary	S	**2**	0	0	0	0	0	0	0	0	0	0	0	0
DQ	47th Avenue SW	SW Charlestown St and 800' boundary	W	**3**	0	0	0	0	0	0	0	0	0	0	0	0
DR	47th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	2	0	1	2	0	1	2	2	2	2	2	2
DS	46th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	0	1	1	1	1	1	1	1	1	1	1	1
DT	46th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	1	0	1	0	0	0	0	0	0	0	0	0
DU	45th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	1	1	1	1	1	1	0	0	0	0	0	0
DV	45th Avenue SW	SW Charlestown St and 800' boundary	E	**0**	0	0	0	0	0	0	0	0	0	0	0	0
			TOTAL	**1054**	**338**	**341**	**340**	**385**	**361**	**373**	**343**	**357**	**350**	**355**	**384**	**370**

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Utilization											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
AA	47th Avenue SW	800' boundary and SW Hanford St	W	**1**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AB	47th Avenue SW	800' boundary and SW Hanford St	E	**1**	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
AC	46th Avenue SW	800' boundary and SW Hanford St	W	**3**	67%	0%	33%	67%	0%	33%	0%	0%	0%	0%	0%	0%
AD	46th Avenue SW	800' boundary and SW Hanford St	E	**6**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AE	45th Avenue SW	800' boundary and SW Hanford St	W	**3**	67%	33%	50%	33%	67%	50%	67%	67%	67%	67%	67%	67%
AF	45th Avenue SW	800' boundary and SW Hanford St	E	**3**	67%	67%	67%	67%	33%	50%	67%	67%	67%	67%	67%	67%
AG	SW Hanford Street	800 ' boundary 47th Ave SW	N	**4**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AH	SW Hanford Street	800 ' boundary 47th Ave SW	S	**2**	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
AI	SW Hanford Street	47th Ave SW and 46th Ave SW	N	**10**	10%	10%	10%	10%	10%	10%	0%	20%	10%	10%	10%	10%
AJ	SW Hanford Street	47th Ave SW and 46th Ave SW	S	**8**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AK	SW Hanford Street	800' boundary and 45th Ave SW	N	**4**	25%	50%	38%	50%	50%	50%	25%	100%	63%	25%	50%	38%
AL	SW Hanford Street	800' boundary and 45th Ave SW	S	**5**	100%	80%	90%	100%	100%	100%	60%	100%	80%	60%	80%	70%
AM	SW Hanford Street	45th Ave SW and 800' boundary	N	**2**	50%	0%	25%	0%	50%	25%	50%	0%	25%	100%	0%	50%
AN	SW Hanford Street	45th Ave SW and 800' boundary	S	**3**	67%	67%	67%	33%	67%	50%	33%	67%	50%	33%	67%	50%
AO	49th Avenue SW	800 ' boundary and SW Hinds St	W	**2**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
AP	49th Avenue SW	800 ' boundary and SW Hinds St	E	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
AQ	48th Avenue SW	800 ' boundary and SW Hinds St	W	**16**	50%	31%	41%	38%	38%	38%	56%	44%	50%	63%	56%	59%
AR	48th Avenue SW	800 ' boundary and SW Hinds St	E	**7**	57%	86%	71%	86%	100%	93%	114%	86%	100%	100%	100%	100%
AS	47th Avenue SW	SW Hanford St and SW Hinds St	W	**18**	33%	17%	25%	28%	22%	25%	22%	28%	25%	17%	33%	25%
AT	47th Avenue SW	SW Hanford St and SW Hinds St	E	**19**	37%	37%	37%	42%	42%	42%	32%	16%	24%	32%	26%	29%
AU	46th Avenue SW	SW Hanford St and SW Hinds St	W	**29**	31%	55%	43%	34%	45%	40%	41%	48%	45%	45%	48%	47%
AV	46th Avenue SW	SW Hanford St and SW Hinds St	E	**23**	35%	30%	33%	52%	30%	41%	35%	39%	37%	39%	43%	41%
AW	45th Avenue SW	SW Hanford St and SW Hinds St	W	**21**	48%	52%	50%	38%	57%	48%	52%	48%	50%	48%	57%	52%
AX	45th Avenue SW	SW Hanford St and SW Hinds St	E	**26**	42%	35%	38%	50%	38%	44%	46%	42%	44%	50%	31%	40%
AY	44th Avenue SW	800 ' boundary and SW Hinds St	W	**21**	43%	38%	40%	52%	67%	60%	52%	43%	48%	62%	62%	62%
AZ	44th Avenue SW	800 ' boundary and SW Hinds St	E	**17**	47%	59%	53%	59%	82%	71%	59%	53%	56%	65%	53%	59%
BA	California Avenue SW	800 ' boundary and SW Hinds St	W	**3**	100%	100%	100%	100%	100%	100%	33%	100%	67%	67%	100%	83%

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Utilization											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
BB	California Avenue SW	800 ' boundary and 800 ' boundary	E	**7**	86%	86%	86%	86%	57%	71%	86%	86%	86%	86%	86%	86%
BC	SW Hinds Street	800 ' boundary and 49th Ave SW	N	**3**	0%	0%	0%	0%	33%	17%	33%	0%	17%	0%	0%	0%
BD	SW Hinds Street	800 ' boundary and 49th Ave SW	S	**3**	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%	33%
BE	SW Hinds Street	49th Ave SW and 48th Ave SW	N	**10**	10%	20%	15%	10%	10%	10%	10%	10%	10%	10%	10%	10%
BF	SW Hinds Street	49th Ave SW and 48th Ave SW	S	**10**	0%	0%	0%	0%	10%	5%	0%	10%	5%	0%	10%	5%
BG	SW Hinds Street	48th Ave SW and 47th Ave SW	N	**9**	22%	22%	22%	22%	22%	22%	11%	22%	17%	22%	22%	22%
BH	SW Hinds Street	48th Ave SW and 47th Ave SW	S	**10**	10%	10%	10%	20%	10%	15%	10%	0%	5%	10%	10%	10%
BI	SW Hinds Street	47th Ave SW and 46th Ave SW	N	**8**	0%	0%	0%	13%	0%	6%	0%	0%	0%	0%	0%	0%
BJ	SW Hinds Street	46th Ave SW and 45th Ave SW	N	**10**	10%	20%	15%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BK	SW Hinds Street	47th Ave SW and 45th Ave SW	S	**23**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BL	SW Hinds Street	45th Ave SW and 44th Ave SW	N	**10**	50%	40%	45%	40%	30%	35%	20%	30%	25%	20%	40%	30%
BM	SW Hinds Street	45th Ave SW and 44th Ave SW	S	**10**	50%	70%	60%	40%	60%	50%	50%	50%	50%	30%	50%	40%
BN	SW Hinds Street	44th Ave SW and California Ave SW	N	**10**	70%	70%	70%	60%	80%	70%	90%	70%	80%	90%	100%	95%
BO	SW Hinds Street	44th Ave SW and California Ave SW	S	**9**	67%	111%	89%	89%	78%	83%	100%	111%	106%	111%	122%	117%
BP	49th Avenue SW	SW Hinds St and 800 ' boundary	W	**4**	25%	50%	38%	25%	50%	38%	50%	50%	50%	50%	50%	50%
BQ	49th Avenue SW	SW Hinds St and 800 ' boundary	E	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
BR	48th Avenue SW	SW Hinds St and SW Spokane St	W	**27**	30%	33%	31%	33%	30%	31%	33%	37%	35%	37%	41%	39%
BS	48th Avenue SW	SW Hinds St and SW Spokane St	E	**23**	39%	39%	39%	48%	48%	48%	39%	39%	39%	48%	43%	46%
BT	47th Avenue SW	SW Hinds St and SW Spokane St	W	**29**	34%	41%	38%	38%	48%	43%	41%	41%	41%	41%	48%	45%
BU	47th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
BV	45th Avenue SW	SW Hinds St and SW Spokane St	W	**30**	3%	0%	2%	40%	0%	20%	0%	0%	0%	0%	0%	0%
BW	45th Avenue SW	SW Hinds St and SW Spokane St	E	**27**	44%	41%	43%	56%	30%	43%	48%	30%	39%	48%	44%	46%
BX	44th Avenue SW	SW Hinds St and SW Spokane St	W	**27**	33%	33%	33%	48%	41%	44%	37%	33%	35%	48%	37%	43%
BY	44th Avenue SW	SW Hinds St and SW Spokane St	E	**26**	46%	38%	42%	50%	50%	50%	27%	62%	44%	35%	65%	50%
BZ	California Avenue SW	SW Hinds St and 800' boundary	W	**7**	86%	86%	86%	86%	86%	86%	71%	100%	86%	86%	86%	86%
CA	SW Hanford Street	End of block	--	**3**	100%	100%	100%	100%	100%	100%	100%	100%	100%	67%	100%	83%
CB	49th Avenue SW	800 ' boundary and SW Spokane St	W	**5**	0%	0%	0%	0%	0%	0%	40%	40%	40%	0%	40%	20%

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Utilization											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
CC	49th Avenue SW	800 ' boundary and SW Spokane St	E	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CD	California Avenue SW	800 ' boundary and SW Spokane St	W	**5**	40%	40%	40%	40%	40%	40%	20%	0%	10%	0%	0%	0%
CE	California Avenue SW	800 ' boundary and SW Spokane St	E	**1**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CF	SW Spokane Street	800 ' boundary and 49th Ave SW	N	**4**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CG	SW Spokane Street	800 ' boundary and 49th Ave SW	S	**3**	0%	33%	17%	67%	33%	50%	33%	33%	33%	67%	67%	67%
CH	SW Spokane Street	49th Ave SW and 48th Ave SW	N	**9**	0%	0%	0%	11%	11%	11%	0%	22%	11%	11%	22%	17%
CI	SW Spokane Street	49th Ave SW and 48th Ave SW	S	**8**	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%	13%
CJ	SW Spokane Street	48th Ave SW and 47th Ave SW	N	**10**	20%	20%	20%	30%	20%	25%	30%	20%	25%	30%	30%	30%
CK	SW Spokane Street	48th Ave SW and 47th Ave SW	S	**8**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CL	SW Spokane Street	47th Ave SW and 45th Ave SW	N	**23**	4%	9%	7%	22%	4%	13%	0%	0%	0%	0%	0%	0%
CM	SW Spokane Street	47th Ave SW and 46th Ave SW	S	**9**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CN	SW Spokane Street	46th Ave SW and 45th Ave SW	S	**7**	0%	14%	7%	29%	14%	21%	14%	14%	14%	14%	14%	14%
CO	SW Spokane Street	45th Ave SW and 44th Ave SW	N	**9**	44%	44%	44%	56%	44%	50%	33%	22%	28%	44%	22%	33%
CP	SW Spokane Street	45th Ave SW and 44th Ave SW	S	**9**	11%	0%	6%	22%	0%	11%	11%	33%	22%	11%	22%	17%
CQ	SW Spokane Street	44th Ave SW and California Ave SW	N	**9**	100%	111%	106%	78%	78%	78%	56%	100%	78%	67%	100%	83%
CR	SW Spokane Street	44th Ave SW and California Ave SW	S	**8**	63%	113%	88%	63%	63%	63%	50%	75%	63%	25%	38%	31%
CS	SW Spokane Street	California Ave SW and 800' boundary	N	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CT	SW Spokane Street	California Ave SW and 800' boundary	S	**2**	150%	150%	150%	150%	150%	150%	100%	100%	100%	100%	100%	100%
CU	49th Avenue SW	SW Spokane St and 800' boundary	W	**1**	100%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CV	49th Avenue SW	SW Spokane St and 800' boundary	E	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
CW	48th Avenue SW	SW Spokane St and 800' boundary	W	**21**	24%	48%	36%	33%	48%	40%	52%	52%	52%	43%	43%	43%
CX	48th Avenue SW	SW Spokane St and 800' boundary	E	**17**	18%	12%	15%	12%	12%	12%	12%	12%	12%	29%	12%	21%
CY	47th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	35%	23%	29%	52%	52%	52%	61%	55%	58%	52%	55%	53%
CZ	47th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	46%	43%	45%	50%	39%	45%	46%	11%	29%	39%	46%	43%
DA	46th Avenue SW	SW Spokane St and SW Charlestown St	W	**20**	45%	45%	45%	45%	45%	45%	35%	50%	43%	50%	50%	50%
DB	46th Avenue SW	SW Spokane St and SW Charlestown St	E	**23**	43%	35%	39%	43%	30%	37%	52%	52%	52%	52%	48%	50%
DC	45th Avenue SW	SW Spokane St and SW Charlestown St	W	**31**	19%	23%	21%	32%	23%	27%	19%	29%	24%	26%	29%	27%

Project **Madison Middle School Classroom Addition and Field Improvements**

February 2020 Survey

				Supply	Parking Utilization											
					Weekday						Weekend					
					5:45 PM			8:15 PM			5:45 PM			8:15 PM		
Block Face ID	Street Name	Street Segment	Side of Street	Total Spaces	Tues 2/4	Thurs 2/6	Average	Tues 2/4	Thurs 2/6	Average	Sat 2/8	Sun 2/9	Average	Sat 2/8	Sun 2/9	Average
DD	45th Avenue SW	SW Spokane St and SW Charlestown St	E	**28**	25%	25%	25%	11%	29%	20%	25%	36%	30%	21%	39%	30%
DE	44th Avenue SW	SW Spokane St and 800' boundary	W	**22**	50%	45%	48%	59%	64%	61%	45%	59%	52%	55%	73%	64%
DF	44th Avenue SW	SW Spokane St and 800' boundary	E	**19**	63%	53%	58%	63%	68%	66%	63%	58%	61%	47%	42%	45%
DG	California Avenue SW	SW Spokane St and 800' boundary	W	**1**	100%	0%	50%	0%	0%	0%	100%	0%	50%	0%	0%	0%
DH	California Avenue SW	SW Spokane St and 800' boundary	E	**5**	100%	60%	80%	80%	40%	60%	0%	60%	30%	60%	40%	50%
DI	SW Charlestown Street	47th Ave SW and 46th Ave SW	N	**3**	33%	67%	50%	33%	67%	50%	67%	33%	50%	33%	33%	33%
DJ	SW Charlestown Street	47th Ave SW and 46th Ave SW	S	**2**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DK	SW Charlestown Street	800 ' boundary and 47th Ave SW	N	**7**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DL	SW Charlestown Street	800 ' boundary and 47th Ave SW	S	**12**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DM	SW Charlestown Street	46th Ave SW and 45th Ave SW	N	**10**	30%	30%	30%	30%	30%	30%	20%	20%	20%	20%	30%	25%
DN	SW Charlestown Street	46th Ave SW and 45th Ave SW	S	**10**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DO	SW Charlestown Street	45th Ave SW and 800' boundary	N	**2**	50%	100%	75%	100%	100%	100%	100%	100%	100%	50%	100%	75%
DP	SW Charlestown Street	45th Ave SW and 800' boundary	S	**2**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DQ	47th Avenue SW	SW Charlestown St and 800' boundary	W	**3**	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DR	47th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	100%	0%	50%	100%	0%	50%	100%	100%	100%	100%	100%	100%
DS	46th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	0%	50%	25%	50%	50%	50%	50%	50%	50%	50%	50%	50%
DT	46th Avenue SW	SW Charlestown St and 800' boundary	E	**2**	50%	0%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DU	45th Avenue SW	SW Charlestown St and 800' boundary	W	**2**	50%	50%	50%	50%	50%	50%	0%	0%	0%	0%	0%	0%
DV	45th Avenue SW	SW Charlestown St and 800' boundary	E	**0**	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
			TOTAL	**1054**	**32%**	**32%**	**32%**	**37%**	**34%**	**35%**	**33%**	**34%**	**33%**	**34%**	**36%**	**35%**

Appendix B: Existing Noise Conditions and Potential Post-Project Noise Conditions

ESA

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memorandum

date April 22, 2020

to Conrad Plyler, Seattle Public Schools

from Aaron Booy and Madeline Remmen, ESA

subject Madison Middle School Athletic Field Improvements Project – Existing Noise Conditions and Potential Post-Project Noise Conditions

Seattle Public Schools (SPS) is proposing to install athletic field lighting at multiple school locations in the Seattle School District (District) under the Buildings, Technology and Academics/Athletics IV Program (BTA IV) and Building Excellence V (BEX V) funding. The existing multipurpose athletic field at Madison Middle School, located at 3429 45th Ave SW, in the North Admiral neighborhood of Seattle, has been identified for field lighting under this funding program.

The height limit for light poles in residential areas is 30 feet (Seattle Municipal Code [SMC] 23.46.020). The proposed pole heights for each of six poles at the Madison Middle School athletic field would be 70 feet. City code permits light poles at public school athletic fields to exceed the maximum permitted height up to a maximum of 100 feet if the Director of Seattle Department of Construction and Inspections (SDCI) determines that the additional height is necessary to ensure adequate illumination and that light and glare are minimized to the extent practicable (SMC 23.51B.002(D)(6)). When a lighting project associated with the exception for taller poles extends the duration of use of the athletic field, SPS must address and mitigate potential impacts, including increased duration of noise, traffic, and parking demand. This memorandum was prepared to document the existing evening noise conditions at Madison Middle School and presents results of noise monitoring and technical analysis of environmental noise impacts that may result from implementation of the athletic field lighting project at Madison Middle School. The memorandum also evaluates compliance with the environmental sound level limits established by SMC 25.08.410.

Methods

Methods for gathering information needed to support review of existing and potential post-project environmental noise included a field survey and analysis of measurement results. ESA's noise specialists documented existing noise levels at Madison Middle School, providing documentation of existing environmental noise conditions and the basis for analysis of potential project impacts. Noise levels at Miller Playfield, an existing lighted athletic field that adjoins the Edmond S Meany Middle School site to the north, were recorded during a scheduled athletic event to provide a point of comparison for the noise environment associated with a lighted athletic field facility.

Noise measurements were completed on January 28, 2020, February 3, 2020 and February 11, 2020 at Madison Middle School and on February 3, 2020 and February 11, 2020 at Miller Playfield. The areas immediately surrounding Madison Middle School are characterized as single-family residential, with homes located to the north, west, and south of the athletic field across SW Hinds Street, 47th Avenue SW, and SW Spokane Street, respectively. The areas surrounding Miller Playfield are characterized predominantly as single-family and multi-family residential land uses. The closest residential uses are located to the east of the athletic field, across 21st Avenue E.

Miller Playfield, which adjoins Meany Middle School, was used as a point of comparison because the surrounding land uses are similar to Madison Middle School, especially with consideration of the closest proximity residences and the similar character of the respective local access roadways at the two schools. In addition, evening athletic activities anticipated to occur at Madison Middle School would be similar to activities that currently occur at Miller Playfield.

Measurement locations were chosen to record outdoor environmental sound levels near representative noise sensitive receivers (residential properties), in areas adjacent to the school athletic fields. Measurement locations were established within right-of-way areas approximating, to the greatest extent possible, the setback between the respective athletic fields and the nearest adjacent residential properties. The time period for measurements was also identified to be representative of existing conditions during evening and early nighttime hours, the period of time during which the noise environment surrounding the Madison Middle School athletic field is anticipated to change due to the field lighting project. Short-term measurements were conducted between 6:45 p.m. and 10:00 p.m. The results are intended to inform the understanding of existing noise conditions and the potential late evening noise level increase that could be associated with lighting Madison Middle School's athletic field.

A Larson Davis Sound Track LXT sound level meter was used for all the short-term noise measurements completed. Figure 1 shows the noise measurement locations immediately north of the athletic field fronting the residence at 4604 SW Hinds Street (Site 1) and west fronting the residence at 3447 47th Avenue SW (Site 2, Figure 1). The noise measurement location at Miller Playfield for all measurements was fronting the residence at 226 21st Avenue E, immediately east of the athletic field on the eastern side of 21st Avenue E.

For all measurements, the noise meter was located approximately 5 feet above ground surface, with multiple 15 minute measurements completed at each short-term survey location. The precision sound level meter was calibrated immediately prior to each measurement date to ensure accuracy. The meters were programmed to record the average (Leq), maximum (Lmax), L10, and L90 noise levels over a 15-minute period. The Leq noise level is a standard measure that provides the equivalent steady-state noise level that is representative of variable noise experienced over a given period of time. L10 and L90 are standard measurements that represent the noise levels that are equaled or exceeded for 10 percent and 90 percent of the time for each measurement, respectively. Measurements were completed adjacent to Madison Middle School athletic field on three occasions. Measurements were also completed adjacent to the existing lighted field at Miller Playfield. Summarized results for each location are shown in Table 1 below.

All noise monitoring days were specifically chosen to avoid recent or active precipitation (rain and wet pavement increase environmental noise associated with vehicular traffic). Weather was typical for the

months during which measurements were completed, with no significant winds or unseasonal temperatures. Additionally, no atypical activities generating significant noise were occurring at Madison Middle School, Miller Playfield, or surrounding uses during any of the monitoring periods.

Existing Noise Environment

The results of the short-term noise measurements at Madison Middle School generally reflect existing evening / early nighttime noise conditions, which are quiet[1] and influenced by activities surrounding residential land uses and roadways near the school field site. Two-way local access roadways (45th Avenue SW, SW Spokane Street, 47th Avenue SW and SW Hinds Street) surround Madison Middle School, with single family residential land uses on the opposite side of all streets. Results of noise measurements are presented in Table 1.

Based on short-term noise measurements adjacent to the Madison Middle School athletic field on, January 28, 2020, February 3, 2020 and February 11, 2020 the predominant existing noise sources observed in the project area were vehicular traffic and overhead air traffic. Occasional domestic activity from adjacent residential properties also was noted as contributing to the existing noise environment. Vehicular traffic on SW Hinds Street and 47th Avenue SW was observed. All roadways directly adjacent to the school are designated as local access streets. The speed limit surrounding Madison Middle School is 20 mph at all times.

Table 1. Noise Measurements (dBA)

Short-term Measurement Period	Leq	Lmax	L10	L90	Observations
Madison Middle School Site 1					
Site 1, February 3, 2020					
#1 – 7:19 – 7:32 p.m	53.2	72.6	50.8	35.5	Cars, dogs barking, airplanes, cars honking in distance
#2: 7:36 – 7:51 p.m	51.4	70.3	48.8	37.1	Cars, airplanes, dog walker, cars honking, people talking
Site 1, February 11, 2020					
#1- 7:25 - 7:40 p.m.	51.3	70.7	45.5	37.3	Cars, people walking and talking, car doors shutting, sirens
#2- 9:46 - 10:00 p.m.	37.5	48.0	37.4	33.1	Cars, airplanes, distance train horn and back up beeping

[1] Noise levels considered quiet are based off of the HUD Exchange Noise Guidebook published in 2009 and available at: https://www.hudexchange.info/resource/313/hud-noise-guidebook/

Short-term Measurement Period	Leq	Lmax	L10	L90	Observations
Madison Middle School Site 2					
January 28, 2020					
#1 – 6:47 – 7:02 p.m.	48.1	67.6	49.8	35.7	Cars, airplane, child shouting in distance, dog barking/howling, neighbors leaving and driving away
#2: 7:15 – 7:30 p.m.	48.8	67.6	47.0	36.7	People walking and talking, cars, dog barking/yowling, car playing music, neighbors arriving home
February 11, 2020					
#1 – 7:46 – 8:01 p.m.	48.8	69.4	43.7	35.9	Cars, airplanes, dogs barking, people walking and talking, car doors shutting
#2: 9:27 – 9:42 p.m.	37.4	52.3	39.8	32.1	Airplanes, car, dog walker on athletic field, distant train horn
Miller Playfield (Meany Middle School adjoins to the north) - during adult soccer games					
February 3, 2020					
#1 – 8:22 – 8:36 p.m.	54.7	72.0	59.5	46.4	Traffic (cars and busses on E Thomas St.), airplanes, yelling on field, sports whistle, dog walkers on sidewalk
#2 - 8:40 – 8:55 p.m.	56.0	68.6	60.0	45.3	Traffic (cars and busses E Thomas St.), airplanes, yelling on field, sports whistle
February 11, 2020					
#1 – 8:30 – 8:45	58.4	72.3	61.8	48.2	Traffic (cars and busses on E Thomas St.), airplanes, yelling on field, sports whistle, people walking and talking on sidewalk, sirens
#2 – 8:46 – 9:01	55	64.8	58.9	48.0	Traffic (cars and busses on E Thomas St.), airplanes, yelling on field, sports whistle, people walking and talking on sidewalk, sirens, distant train horn, skate boarders

Notes:

- Noise is typically measured in units called decibels (dB). For the purposes of environmental analysis noise is commonly quantified as "A weighted" decibels (dBA), which corresponds to the frequencies that are audible to the human ear. Use of the dBA frequency is consistent with SMC 25.08.090).
- Leq or the "equivalent sound level" is used to describe noise over a specified period of time in terms of a single numerical value. The Leq of a time-varying signal and that of a steady signal are the same if they deliver the same acoustic energy over a given time. The Leq may also be referred to as the average sound level.
- Lmax is the instantaneous maximum noise level during a given period of time; Lmax events commonly occur momentarily, such as a loud passing motorcycle or child yelling nearby the noise meter, and within an urban environment with variable noise sources are inherently higher than the Leq level measured for a given period of time.
- L10 and L90 are standard measures that represent the noise levels that are equaled or exceeded 10 percent and 90 percent of a specified time period, respectively.

The existing evening and early nighttime noise environment at Madison Middle School is generally quiet, ranging from 37.5 to 53.2 Leq (dBA) at Site 1 and 37.4 to 48.8 Leq (dBA) at Site 2. Measurements taken later in the evening showed a distinct drop in Leq at both sites; noise levels were below 40 Leq (dBA) after 9:00 pm. These noise levels are consistent with evening and nighttime hours within urban environments, especially for areas primarily supporting residential uses, adjacent to school and park facilities, and not located within 0.25 mile of any major freeway. Within this range, the higher measurements occurred when cars drove by the noise monitoring site on SW Hinds Street and 47th Avenue SW. The peak sound levels (measured Lmax levels reported in Table 1) ranged from 48.0 to 72.6 dBA at Site 1 and 52.3 to 69.4 dBA at Site 2. Measurements recorded between 6:45pm and 8:00pm had higher Lmax's between 67.6 and 72.6 dBA.

The results of the short-term noise measurements at Miller Playfield generally reflect existing noise conditions, which are also generally quiet and primarily influenced by vehicular traffic and overhead air traffic. Active soccer games occurring on the lighted playfield and domestic activities surrounding and within the residential land uses also contributed to the noise environment. Noise generating activity from athletic field activities included occasional yelling, whistles, and ball kicking. The roadway south of the lighted athletic field (E Thomas Street) is classified as a Minor Arterial (SDOT, 2020), and from observations during noise measurements showed generally higher traffic volumes and somewhat faster speeds (posted speed limit of 25 mph) than the local access roadways surrounding Madison Middle School. 21st Avenue E, which passes between the project athletic field and the residences to the east, is designated as a local access street, and during noise measurements had lower levels of vehicular traffic which is more similar to roads surrounding Madison Middle School. 21st Avenue E is a one-way street for vehicular traffic in the southbound direction.

Anticipated Noise and Potential Effects

The City of Seattle Noise Ordinance (SMC Chapter 25.08) regulates noise in the City. Noise is typically defined as an unwanted sound that can disrupt quality of life (EPA, 2019). The City sets exterior sound level limits according to the land use of both the property generating the noise (the source) and the property receiving the noise (Table 2; SMC Chapter 25.08.41). From one property to another when both properties are within a residential district, the maximum allowable noise during weekday daytime and evening hours (7:00 a.m. to 10:00 p.m.) is limited to 55 Leq (dBA). This is the maximum noise that may be generated from a specific property that is experienced by another property (not the cumulative noise from all surrounding properties and activities). Normal vehicular traffic, including garbage trucks, are exempt from the noise requirements set forth in SMC 25.08. The code further regulates noises considered "unreasonable" including "loud and raucous, and frequent repetitive or continuous sounds made by the amplified or unamplified human voice" between the hours of 10:00 p.m. and 7:00 a.m. During these nighttime hours, maximum allowable noise from one property to another within residential districts is reduced to 45 Leq (dBA). Madison Middle School, including the athletic field and surrounding residences, are located within residential districts per City of Seattle Zoning.

Table 2. Exterior Sound Level Limits

District of Sound Source	Residential Receiving Property (Experiencing the Noise)	
	7a.m. – 10 p.m. Limit (Leq)	10 p.m.– 7a.m. Limit (Leq)
Residential	55 dBA	45 dBA
Commercial	57 dBA	47 dBA
Industrial	60 dBA	50 dBA

Source: SMC Chapter 25.08.410

For noise sources that are not continuous, higher levels are allowed for short durations. Seattle Municipal Code specifies that shorter duration noises up to 15 dBA above the continuous limit are allowable, as long as the hourly Leq exterior sound level limit is not exceeded (SMC 25.08.410.B).

Potential noise impacts to residential properties surrounding Madison Middle School athletic field were predicted based on review of existing conditions and anticipated noise from proposed late evening athletic activities. The existing lighted Miller Playfield, adjoining Meany Middle School to the north, was selected as the point of comparison because surrounding conditions are similar and applicable for estimating future noise that would be expected surrounding the Madison athletic field. Similarities in surrounding uses, roadways, and associated environmental noise, especially at the locations selected for noise monitoring measurements, is appropriate for making reasonable comparison of conditions between the two fields and determining the potential implications of the Madison field lighting project. However, since E Thomas Street is a Minor Arterial adjacent to Miller Playfield, noise levels associated with vehicular traffic at this location may be slightly higher than those that would be experienced at Madison Middle School, which is exclusively surrounded by local access roads.

For purposes of this evaluation, a noise impact would potentially occur where the anticipated noise from late evening athletic events occurring with field lighting would exceed the exterior sound level limits established by SMC 25.08.410. To consider implications of the project, ESA also assessed the potential for cumulative exceedances of the exterior noise level limit. The addition of field lighting would extend field use in the evening and have the potential to change the character of noise experienced at nearest residential receptors.

The nearest residential receptors to the north of the field at Madison Middle School are setback approximately 130 feet, compared to the approximate 80-foot setback at Miller Playfield. The closer setback at Miller Playfield and presence of increased vehicular traffic noise due to the proximity of Thomas Street, resulted in noise levels that ranged from 54.7 to 58.4 Leq (dBA) at nearby residences. Considering the additional setback to the north of the Madison athletic field, and the other contributing environmental noise sources, it is anticipated future noise levels experienced by the nearest residential properties to the north would likely be lower at Madison Middle School.

For residences to the north of the field along SW Hinds Street (as represented by Site 1 measurements), it is anticipated that the contribution of noise directly from athletic activities occurring at all times when field lights are in use would be below the 55 Leq (dBA) threshold. It is anticipated that the cumulative

noise associated with athletic events, vehicular traffic, overhead air traffic and other noise generating activities in the project area would occur at or slightly above the 55 Leq (dBA) limit; however, the contribution of noise generated from athletic events alone is not anticipated to exceed the 55 Leq (dBA) limit. Evening athletic activities occurring with field lighting would likely result in a noticeable change in the existing noise environment for the residences to the north, but would not result in an exceedance of the noise ordinance established by the SMC.

For residences to the west of the field along the west side of 47th Avenue SW (as represented by Site 2 measurements), it is not anticipated that the cumulative noise environment would increase to above 55 Leq (dBA) with the addition of field lighting. A 13-foot retaining wall and additional grass slope are located directly below the field to the west, with 47th Avenue SW and adjoining residences located more than 20 feet lower than the elevation of the field. The retaining wall and slope create a line-of-site barrier between the athletic field area and the residences to the west, with associated noise attenuation. The retaining wall and grade difference will remain with the proposed project, continuing to decrease the amount of noise from athletic field activities experienced by residential receptors located along 47th Avenue SW. Any change in the noise environment from additional late evening athletic activities would be less noticeable for residences located along 47th Avenue SW. Instantaneous noise from whistles or shouts may be audible, potentially changing the character of noise experienced at these residential receptors; however, the contribution of noise directly from lighted athletic field activities are anticipated to be substantially below the 55 Leq (dBA) limit established by the Seattle Noise Ordinance. All athletic activities would be scheduled to end by 9:45 p.m., and field lights would be turned off by 10:00 p.m.

Measurement of conditions at Sites 1 and 2 collected after 9:00 pm showed a drop in the existing noise levels to below 40 Leq (dBA), due to less vehicular traffic along SW Hinds Street and 47th Avenue SW and less domestic noise from nearby residences. This quieter existing environment may result in field activity noise being more noticeable at the residences later in the evening, however, it is anticipated that the cumulative noise environment would remain well below 55 Leq (dBA) during this time period.

Changes in the noise environment for residences to the south of the project athletic field are not anticipated to be perceptible, due to a minimum setback of approximately 180 feet for residences south of SW Spokane Street. Changes in the noise environment for residences to the east of the project athletic field are setback more than 425 feet and are generally behind the Madison Middle School buildings – no changes in the noise environment would occur for these residences.

While the character of environmental noise and specific events (whistles, loud yells) during athletic activities would likely be perceptible at adjacent residential properties, especially those immediately surrounding the athletic field, these activities would all be of short duration (generally no more than a few seconds for any given event). Based on measurements at Miller Playfield during soccer games, discrete events are not anticipated to exceed approximately 60 dBA. The highest noise levels for discrete events were associated with a loud vehicle on an adjacent street and overhead air traffic (not associated with athletic field activities), while the loudest athletic event noise levels were associated with yelling on the field. These levels would be within the limits established by SMC 25.08.410.B, which allows for short duration noises up to 15 dBA above the continuous limit as long as the hourly Leq exterior sound level limit is not exceeded.

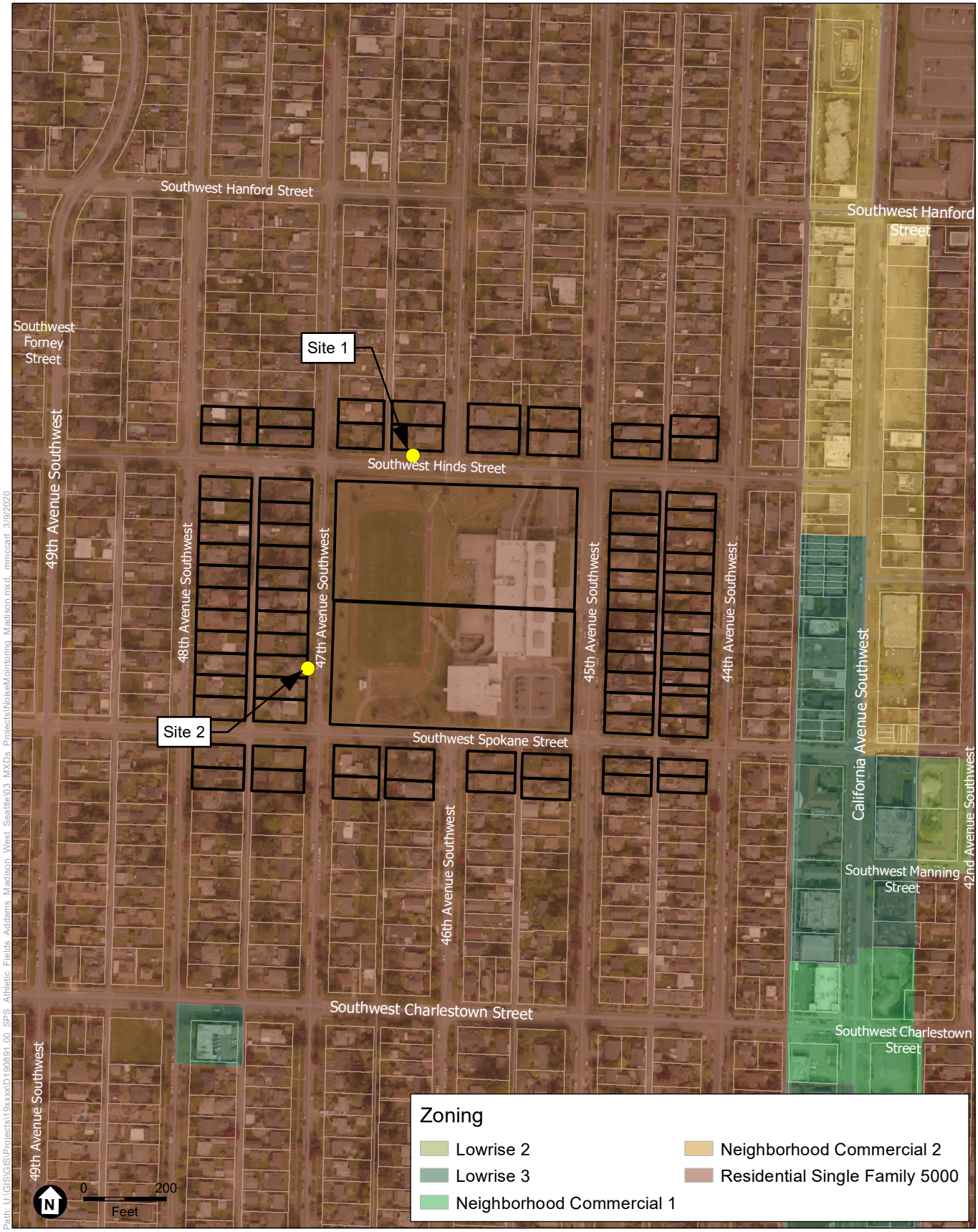
Conclusions

This assessment shows that evening use of a lighted athletic field at Madison Middle School would result in a slight change to the overall noise environment, with the cumulative noise from athletic events, vehicular traffic, overhead air traffic and other noise generating activities generally remaining below 55 Leq (dBA) during evening hours. To the north of the athletic field, residences may experience cumulative environmental noise during early evening hours at or slightly above 55 Leq (dBA); however, the predominant noise source would remain vehicular traffic along SW Hinds Street. While the increase in environmental noise, and the character of noise, is anticipated to be noticeable for these residences during late evening athletic activities occurring before 10:00 p.m., the noise contributed by athletic activities is anticipated to be consistent with environmental noise limits of the Seattle Noise Ordinance (SMC 25.08). The contribution of noise generated from athletic events alone is not anticipated to exceed the 55 Leq (dBA) maximum environmental noise limit as experienced at the property line of any nearby residences. For residences located to the west of the field along 47th Avenue SW, both the contribution of noise directly from athletic events and cumulative environmental noise levels from all sources are expected to remain below 55 dBA (Leq). For residences to the east and south of the school, further separated from the athletic field by Madison Middle School buildings and an extended setback, changes from the project are not predicted to be noticeable.

References

EPA (Environmental Protection Agency). 2019. Clean Air Act Overview. Available at: https://www.epa.gov/clean-air-act-overview/clean-air-act-title-iv-noise-pollution Accessed on February 14, 2020.

SDOT (Seattle Department of Transportation). 2020. Seattle Roadway Classification Map. Available at: http://seattlecitygis.maps.arcgis.com/apps/webappviewer/index.html?id=a808f790a24e474d86ecde00dae81cee Accessed on February 13, 2020.



SOURCE: NAIP, 2015; OSM, 2016; King County, 2013

D190891 SPS Athletic Field Noise Monitoring

Figure 1
Madison Middle School
Noise Monitoring Location

ESA

Appendix C: Light and Glare Report

Madison Middle School
Athletic Field Lighting

Light and Glare Report

April 22, 2020

Prepared for:

Seattle Public Schools
Capital Projects
Seattle, Washington

Prime Consultant:

DA HOGAN

Lighting Consultant:

Stantec

Proposal

The existing athletic field at Madison Middle School is proposed to be lighted.

The design levels for the field lighting are proposed at a Class IV level of play. Class IV is the lowest recommended level listed in RP-8 (Recommended Practice for Sports Lighting) by the Illuminating Engineering Society of North America. The field is designed to an average maintained lighting level of 29 foot-candles. The lighting system is designed using a .95 design factor to achieve the initial lighting levels.

These lighting design levels meet current practices for both the City of Seattle and Seattle School District for the lighting of athletic fields. The proposed lighting levels will be consistent with recently lighted fields at Roosevelt High School and Ballard High School.

Existing Codes and Policies

Section 23.51B.002 (Public schools in residential zones) of the Seattle Municipal Code limits the height of lighting standards in Single Family and Lowrise zones. Section D-6-a permits light standards up to a maximum height of 100 feet, "if the Director determines that the additional height is necessary to ensure adequate illumination and that impacts from light and glare are minimized to the greatest extent practicable". In addition, Section 23.46.020 (Light and glare standards) paragraph A of the Seattle Municipal Code also requires that "Exterior lighting be shielded or directed away from adjacent uses". Also, current City of Seattle guidelines recommend that athletic field spill light not exceed 1.0 foot-candles initial at residential property lines.

To comply with existing codes an exemption to the height limit is requested. This exemption will ensure adequate illumination and reduce the amount of impacts from light and glare into the neighborhood.

Existing Conditions

A survey of the existing site was conducted on February 21st, 2020. The school site is located within a residential community between 45th Avenue SW - 47th Avenue SW (East to West) and SW Hinds Street -SW Spokane Street (North to South). The field is located on the west side of the school site. The field is adjacent to residential homes across 47th Avenue SW, SW Hinds Street, and SW Spokane Street.

The school site slopes down from west to east. The field is at a higher elevation than the homes located to the west of the field on the opposite side of 47th Avenue SW. The main school building is at a higher elevation to the east of the existing fields.

Field View From NE Corner of Field

Field View From NE Corner of Field

View Down 47th Avenue SW

Existing Homes West Side of 47th Avenue SW

View of Wall From 47th Avenue SW

School View From SW Hinds Street

Existing Light and Glare

A survey of the existing lighting in the area was conducted on February 21st, 2020. Light readings were taken on the school site surrounding the fields and on several residential streets.

The existing light sources on the school site consist of parking lot lighting, building perimeter lighting, school covered area lighting and portable building lighting on the northwest side of the main school building. The primary components of the lighting are the parking lot lights, building perimeter lights and school covered area lights. The parking lot lights, and main school building perimeter lights were not turned on during this site visit.

Existing Portable Building Wall Pack Lights

Existing Covered Area Lights Under School Building

The existing light sources surrounding the site are typical for a suburban residential area. The primary component of the lighting is associated with streetlights surrounding the school. The streetlights along SW Hinds Street, NW 47th Street, SW Spokane Street are LED cobra head style mounted to existing utility poles at an approximate height of 20' above grade. The balance of the lighting is associated with adjacent residential properties with porch\yard lights and interior lighting visible through windows.

The exception for existing light sources surrounding the site are the higher wattage streetlights and high wattage Hiawatha Playfield flood lights located three blocks to the east at California Avenue SW.


Existing Street Lighting SW Hinds Street


Existing Street Lighting 47th Avenue SW


Existing Yard Light 47th Avenue SW


Existing Street SW Spokane


Existing Street Lighting California Avenue SW


Existing Field Lighting Hiawatha Playfield

Various measured lighting levels on and surrounding the site are as follows (Foot-Candles).

Wall Pack Light on Portable Building	10.0 ft-c (Max Horizontal)
Streetlight – SW Hinds Street	1.8 ft-c (Max Horizontal)
Streetlight – 47th Avenue SW	2.4 ft-c (Max Horizontal)
Streetlight – SW Spokane Street	2.0 ft-c (Max Horizontal)
Streetlight – California Avenue SW	4.8 ft-c (Max Horizontal)
Hiawatha Playfield	12.0 – 330.0 ft-c (Horizontal)

Proposed Equipment

The athletic field lighting system will consist of six 70' tall galvanized steel poles with LED shielded floodlights. The proposed lighting for the field consists of 20 - 900 watt and 8 – 600 watt shielded LED floodlights. The floodlights will be mounted at the top of the poles. The four corner poles will have 1 additional 575 watt shielded LED floodlight mounted at a height of 16'above grade and aimed above the field. The two mid-field poles will have 2 additional 575 watt shielded LED floodlights mounted at a height of 16'above grade and aimed above the field. One additional low wattage "full cutoff" area light will be mounted at a height of 30' above grade on each pole.

Seattle Public Schools has proposed to use an athletic field lighting system designed to mitigate the negative impacts of light and glare. The proposed system consists of the latest technology available on the market for shielded LED floodlights designed for the lighting of athletic fields.

The use of high efficiency LED arrays provide more precise control of light to be delivered to the field. The reflector and shielding design further reduce the amount of light transmitted off site and into the atmosphere. The floodlights utilize an additional external visor mounted to the floodlight that extends in front of the floodlight. The floodlight design is similar to "full cutoff" style lights as they dramatically limit the amount of light that is emitted above the plane of the floodlight. The proposed lighting system is similar to recently lighted fields at Roosevelt High School and Ballard High School.


Shielded LED Floodlight used at Roosevelt\Ballard HS Fields


Unshielded LED Floodlight

Analysis

The proposed lighting system will increase the amount of light in the area during evening hours. The primary impacts of the lighting system are direct glare, reflected glare, spill light (light trespass), and "sky glow".

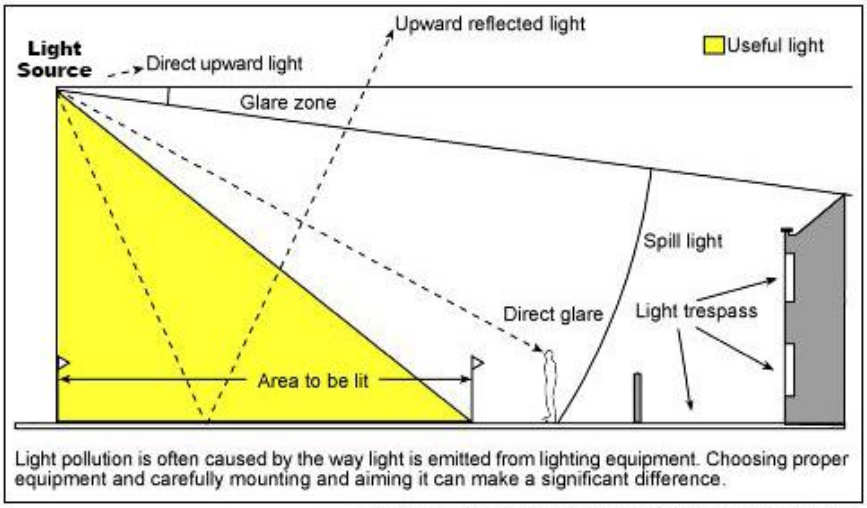


Diagram illustrating Direct-Glare, Spill Light and Light Trespass

GLARE

The athletic field lighting system will generate visible glare. The primary sources of glare from the proposed lighting system consist of direct glare from the floodlights and reflected glare (luminance) off the poles, floodlights, athletic field surface, and surfaces around the playing field.

The amount of glare that is present correlates directly to how much of the floodlight lamp and reflector can be observed. The intent of Seattle Municipal Code Section 23.24.020 is to have floodlight luminaires directed as far down as possible to reduce the amount of glare that is visible from off-site locations.

To reduce the amount of glare that is visible off-site the floodlights will need to be mounted higher than 30 feet. At a height of 30 feet the visibility of the high wattage LED's and reflectors from the adjacent residences is excessive. With the increased mounting heights floodlights will have steeper aiming angles resulting in more effective use of the floodlight shields. A smaller portion of the floodlight reflectors and lamps will be visible off site with the increased height.

Direct glare will be visible from all directions overlooking the site. The amount of glare visible depends on proximity to the site, orientation of the floodlights, distribution of intervening buildings, terrain or vegetation that would block the glare. The impacts of direct glare are extremely difficult to quantify, as varying conditions such as existing ambient light levels and current atmospheric conditions will vary the impact. Elevation differences between the level of the sports field lights and the viewpoint is a key determinant in the existence of glare at any given viewing location.

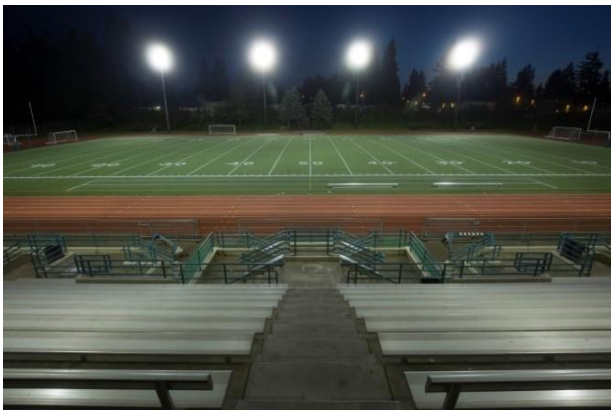
To maximize glare reduction, the owner is providing additional mitigation with the use of "full cutoff" style LED floodlights that provide the most advanced light control and shielding currently available in the sports lighting industry. Additional reduction in direct glare is also provided by internal shielding of the LED diodes. The additional shielding nearly eliminates direct view of the very bright LED's from off-site viewing locations.

Off-site exposure to low and moderate levels of direct glare is primarily to the three residences directly west of the proposed field across 47th Avenue SW. These properties are at a lower elevation to the field with direct exposure to the light poles and floodlight assemblies. The direct glare visible at these residences is primarily from the floodlights on the east side of the field aimed towards the west. There will be low levels of direct glare from a small portion of the light from floodlights on the west side of the field aimed away from 47th Avenue SW. Other adjacent residential properties located on the north and south sides of the field will have low to minimal exposure to direct glare. Residential properties that are located farther away from the field will have minimal to no direct glare impacts.

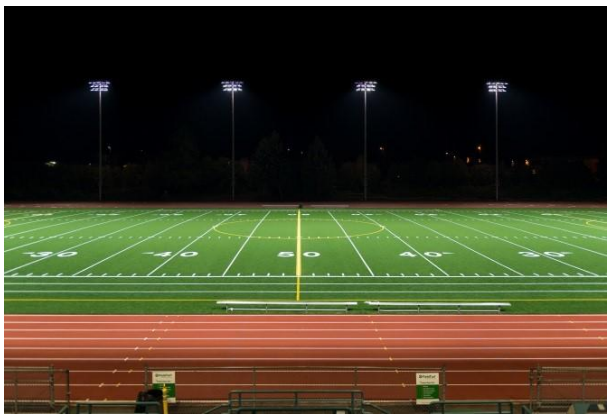
Reflected glare would be visible from all directions overlooking the site, depending direct views into the site, exposure to poles\floodlights, distribution of intervening buildings, terrain or vegetation that would block the glare. Of the surfaces that are visible from off site locations, the synthetic athletic field surface would be the greatest contributor to reflected glare. The amount of light reflected from synthetic turf is generally equivalent to natural turf. It may be slightly higher depending on how the surfaces wear, direction of how the fibers lay and which direction they are viewed from. The difference in amount of reflected glare visible between the surfaces is minimal. The reflected light off the floodlight housings, floodlight visors and poles would be a lesser contributor.

The residential properties are at a higher elevation above the field to the north and south have the greatest amount of exposure to reflected glare. These properties are close to the fields with direct exposure to the field surfaces, adjacent grass\pavement surfaces, light poles, and floodlight assemblies. The main component of the impact is the light reflected off the synthetic turf field surface.

Residential properties that are located farther away from the field or below the field will have low to minimal reflected glare impacts. These properties will have limited to no direct views of the playing surface due to their location away from the fields. The reflected glare impact associated with the poles and floodlights is much less from more remote viewing points, as the impact is reduced at greater distances. This is true even though reflected glare from the floodlights and tops of the poles will be visible at greater distances due to their elevation above the field.



Direct glare from unshielded floodlights (Edmonds-Woodway HS) , Reflected glare from synthetic turf surface



Direct glare reduction with use of shielded LED floodlights Reflected glare from synthetic turf surface

The increased mounting heights for the athletic field lighting poles will dramatically decrease the overall amount of glare visible from off-site locations as compared to using 30' pole height. The use of the latest generation of shielded floodlights will dramatically reduce the amount of visible glare compared to standard shielded and unshielded LED floodlighting systems. It is critical that taller poles are used to minimize glare as much as practical. At 30-foot mounting heights the surrounding residences will be more fully exposed to excessive levels of direct glare from the floodlights. Glare impacts will be evaluated after construction of the lighting system and adjustments to the shielding and aiming of the floodlights will be implemented as necessary.

SPILL LIGHT

The athletic field lighting system will generate minimal amounts of spill light. Spill light impacts will be primarily located at residential properties directly west of the proposed field across 47th Avenue SW. The maximum amount of spill light at this location is 0.70 foot-candles.

The increase in pole height from 30 feet to 70 feet tall will dramatically reduce the amount of spill light generated by the lighting system. The higher pole heights allow the floodlights to be aimed down to the athletic field and away from the adjacent properties. This height also provides for greater effectiveness of the internal\external shielding on the floodlights to control the emitted light and prevent light escaping beyond the site.

The increased mounting heights increase the angle of aiming below the horizontal level of the floodlights. At a mounting height of 30 feet this project would require aiming angles of 12.5 degrees (worst case) and 21.8 degrees (best case) below the horizontal plane of the floodlight. The increased mounting height to 700 feet will provide for aiming angles of 27.4 degrees (worst case) and 43.0 degrees (best case) below the horizontal plane of the floodlight.

The use of steeper aiming angles allows for less direct light to be delivered beyond the boundaries of the playing surface. The external shielding blocks more direct light and more light is delivered to the field with the use of increased mounting heights. The proposed taller mounting heights are typical for this application and similar to many existing installations throughout the City. The use of shorter mounting heights is typical to the lighting of driving ranges which requires that light is delivered over hundreds of feet down range to light the back of a golf ball to distances over 300 feet.

The vertical spill light from the field lighting has been calculated along the adjacent residential property lines on the north, south and west sides of the site. The light readings are calculated in foot-candles. The calculated light readings do not account for the existing trees and vegetation that will provide some screening to reduce spill light at the property lines

At the standard mounting height of 70 feet the maximum amount of measurable light delivered along the west residential property line is 0.70 foot-candles. At the standard mounting height of 70 feet the amount of measurable light delivered along the north residential property line is 0.13 foot-candles. At the standard mounting height of 70 feet the amount of measurable light delivered along the south residential property line is 0.10 foot-candles.

At the non-standard mounting height of 30 feet the maximum amount of measurable light delivered along the west residential property line is 5.42 foot-candles. At the non-standard mounting height of 30 feet the amount of measurable light delivered along the north residential property line is 1.04 foot-candles. At the non-standard mounting height of 30 feet the amount of measurable light delivered along the south residential property line is 0.26 foot-candles.

The increased mounting height will dramatically reduce the maximum spill light at the residential property lines as compared to using 30' pole height. Increased mounting height also reduces spill light to meet recommended practice of maximum of 1.0 foot-candles set by the City of Seattle. Spill light impacts will be evaluated after construction of the lighting system and adjustments to the shielding and aiming of the floodlights will be implemented as necessary.

SKY GLOW

The athletic field lighting system will generate a minimal amount of "sky glow". The "sky glow" impacts will be at locations near the fields.

The amount of "sky glow" that is visible from a lighting system is difficult to quantify. There is no current method to calculate "sky glow" but it is recognized that there is a direct correlation to the amount of direct and reflected light that is emitted into the atmosphere. The amount of visible "sky glow" is dependent on a multitude of factors. Several factors include the amount of ambient light that exists, darkness of the night sky, amount of moonlight, atmospheric conditions, level of cloud ceiling, amount particulate matter, location of the observer and age of the observer.

To reduce the amount of "sky glow" that is visible the floodlights will need to be mounted higher than 30 feet. At a height of 30 feet the amount of direct light emitted into the atmosphere is excessive. With the increased mounting heights floodlights will have steeper aiming angles resulting in more effective use of the external shields. Most of the total light output will be directed down to the field with the increased mounting height.

To maximize "sky glow" reduction the owner is providing additional mitigation with the use of "full cutoff" style LED floodlights that provide the most advanced light control and shielding currently available in the sports lighting industry. The use of this equipment will also block a significant amount of direct light that is emitted into the atmosphere.

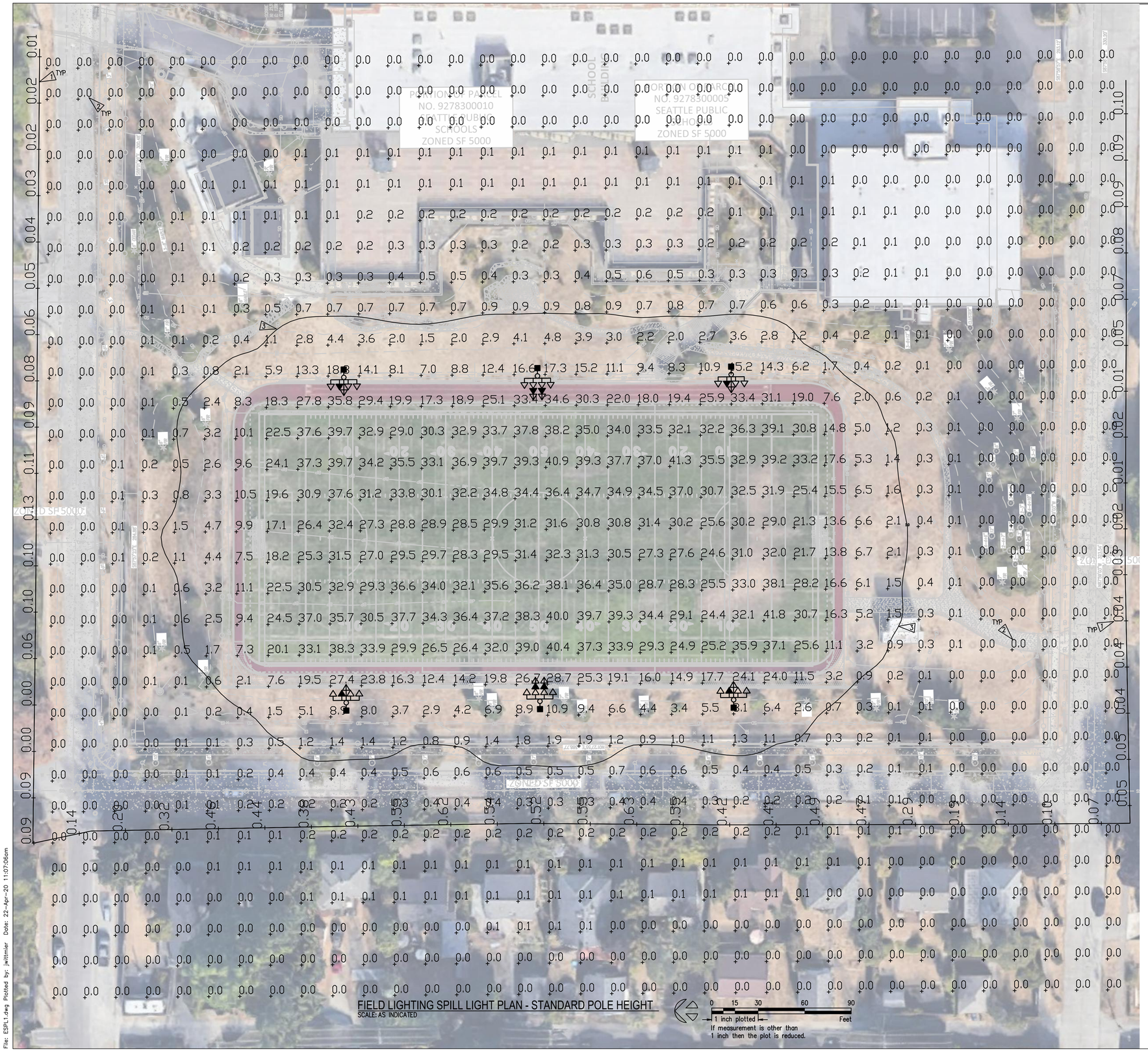
Based on the existing conditions and the limited impact expected for the project, the impact of the project on "sky-glow" evident in the surrounding area will likely be small. "The appearance of "sky-glow" will be very minor with heavy low overcast skies and be most prevalent during conditions of dense fog.

Due to the dramatic reductions in the amount of up-light generated there will be a zone of darkness above the field. This creates a safety hazard for baseball play to safely track balls hit high into the air. This will require the use of up-lights for the lighting system similar to the up-lights used at the recently lighted fields at Roosevelt High School and Ballard High School. These will provide the minimal amount of light necessary for safe play.

The increased mounting heights for the athletic field lighting poles will decrease the overall amount of "sky-glow" visible as compared to using 30' pole height. The use of the latest generation of shielded floodlights will dramatically reduce the amount of direct light emitted into the atmosphere compared to the older shielded floodlighting systems. It is critical that taller poles are used to minimize "sky-glow". The amount of "sky-glow" visible will be localized to the area above the field and immediate vicinity. The amount of "sky-glow" generated will be typical of the recently lighted field using LED floodlights at Ballard High School and Roosevelt High School and will be much less as compared to the amount generated using 30' poles.

<u>Controls</u>

The new athletic field lighting system will be connected to a fully programmable control system with remote operation. There will be separate switches installed to manually operate the lights at the site if necessary. The field lights will be on a separate lighting zone with a separate switch. This will allow the field lights to be turned off after play is completed. The area lights are on a separate zone and will remain on for a short time after each event to provide ample light for egress from the site.



FLAG NOTES:

1. VERTICAL SPILL LIGHT CALCULATION IN FOOT-CANDLES AT A HEIGHT OF 3'-0" ABOVE GRADE.
2. HORIZONTAL SPILL LIGHT CALCULATION IN FOOT-CANDLES AT A HEIGHT OF 3'-0" ABOVE GRADE.
3. ISO FOOT-CANDLE LINE AT 1.0 FOOT-CANDLES.

LEGEND:

- ○ FLOODLIGHT POLE
- △ FLOODLIGHT WITH GLARE CONTROL SHIELDING, 900 WATT LED, 480 VOLT
- ▲ FLOODLIGHT WITH GLARE CONTROL SHIELDING, 600 WATT LED, 480 VOLT
- ⚠ BALL TRACKING LIGHT WITH GLARE CONTROL SHIELDING, 575 WATT LED, 480 VOLT
- ■ AREA LUMINAIRE, 130 WATT LED, 480 VOLT, FULL CUTOFF

POLE AND FLOODLIGHT SCHEDULE

POLE	HEIGHT	FLOODLIGHTS	TRACKING	AREA LIGHTS
F1	70'	4	1	1
F2	70'	6	2	1
F3	70'	4	1	1
F4	70'	4	1	1
F5	70'	6	2	1
F6	70'	4	1	1
		28	8	6

FIELD LIGHTING SPILL LIGHT PLAN - STANDARD POLE HEIGHT
SCALE: AS INDICATED

0 15 30 60 90
1 inch plotted — Feet
If measurement is other than 1 inch then the plot is reduced.

Stantec
4100 194th Street SW Suite 400
Lynnwood Washington 98036-4613
(206) 667-0555

REVISION	DATE

SEATTLE PUBLIC SCHOOLS

ATHLETIC FIELD IMPROVEMENTS AT MADISON MIDDLE SCHOOL & WEST SEATTLE HIGH SCHOOL

DA HOGAN
119 1st Avenue South, Suite 110
Seattle, Washington 98104
p. 206.285.0400
f. 206.285.0480

CHRISTOPHER FONTE — STATE OF WASHINGTON — 31353 — REGISTERED PROFESSIONAL ENGINEER

NORTH

PROGRESS SET

DATE	4-22-20
SCALE	AS INDICATED
DRAWN	JTW
CHECKED	CBF

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FIELD LIGHTING SPILL LIGHT PLAN - STANDARD POLE HEIGHT

SHEET

ESPL1

File: ESPL1.dwg Plotted by: jwittmer Date: 22-Apr-20 11:07:06am
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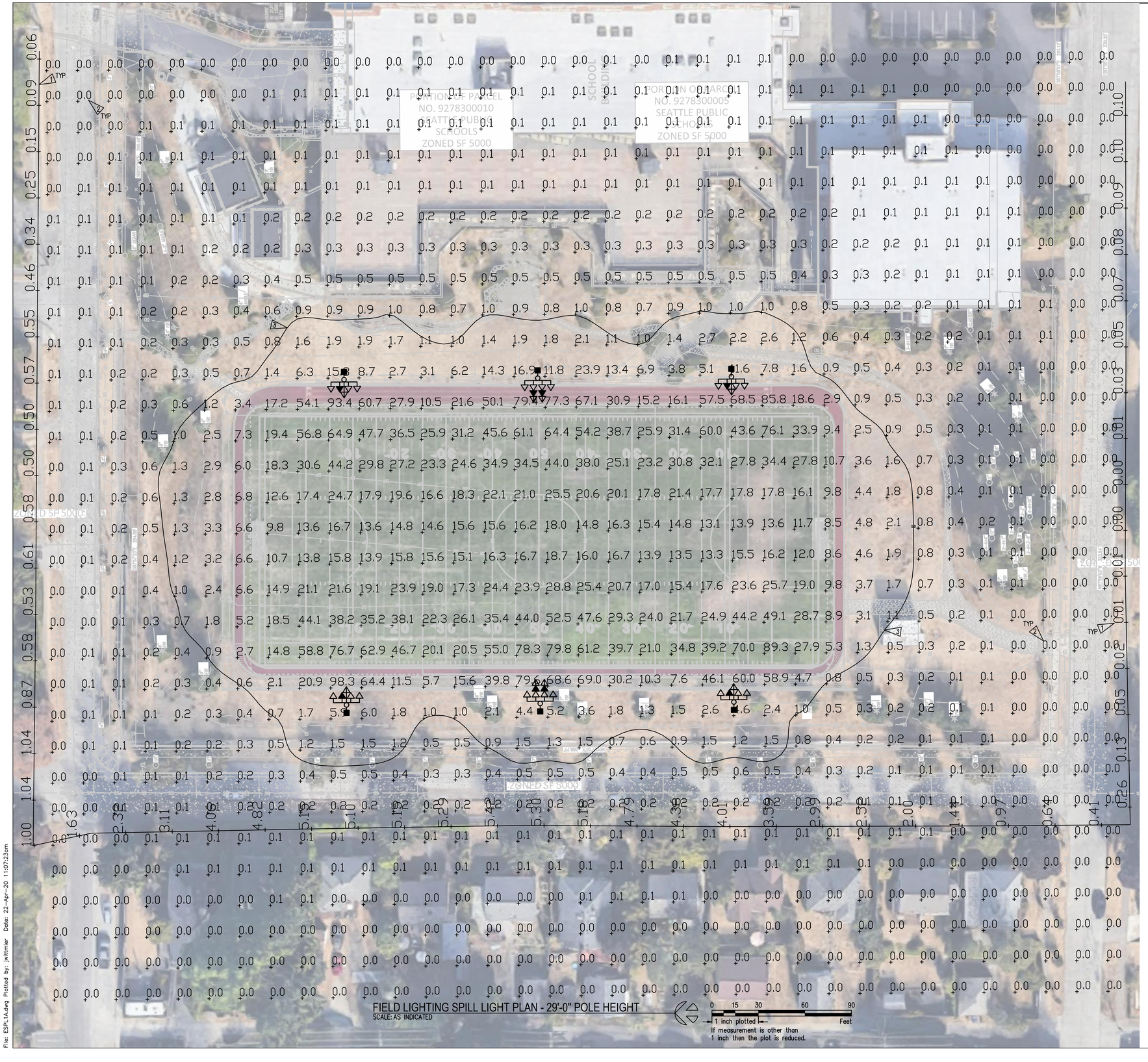

FLAG NOTES:

1. VERTICAL SPILL LIGHT CALCULATION IN FOOT-CANDLES AT A HEIGHT OF 3'-0" ABOVE GRADE.
2. HORIZONTAL SPILL LIGHT CALCULATION IN FOOT-CANDLES AT A HEIGHT OF 3'-0" ABOVE GRADE.
3. ISO FOOT-CANDLE LINE AT 1.0 FOOT-CANDLES.

LEGEND:

- ○ FLOODLIGHT POLE
- △ FLOODLIGHT WITH GLARE CONTROL SHIELDING, 900 WATT LED, 480 VOLT
- ▲ FLOODLIGHT WITH GLARE CONTROL SHIELDING, 600 WATT LED, 480 VOLT
- ⚠ BALL TRACKING LIGHT WITH GLARE CONTROL SHIELDING, 575 WATT LED, 480 VOLT
- ■ AREA LUMINAIRE, 130 WATT LED, 480 VOLT, FULL CUTOFF

POLE AND FLOODLIGHT SCHEDULE

POLE	HEIGHT	FLOODLIGHTS	TRACKING	AREA LIGHTS
F1	29'	4	1	1
F2	29'	6	2	1
F3	29'	4	1	1
F4	29'	4	1	1
F5	29'	6	2	1
F6	29'	4	1	1
		28	8	6

Stantec
4100 194th Street SW Suite 400
Lynnwood Washington 98036-4613
(206) 667-0555

REVISION	DATE

SEATTLE PUBLIC SCHOOLS

ATHLETIC FIELD IMPROVEMENTS AT MADISON MIDDLE SCHOOL & WEST SEATTLE HIGH SCHOOL

DA HOGAN
119 1st Avenue South, Suite 110
Seattle, Washington 98104
p. 206.285.0400
f. 206.285.0480

CHRISTOPHER F. HOGAN — STATE OF WASHINGTON — 31353 — REGISTERED PROFESSIONAL ENGINEER

NORTH

PROGRESS SET

DATE	4-22-20
SCALE	AS INDICATED
DRAWN	JTW
CHECKED	CBF

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FIELD LIGHTING SPILL LIGHT PLAN -29' POLE HEIGHT

SHEET

ESPL1A

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Appendix D: Arborist Report – Tree Inventory near New Classroom Addition

Tree Solutions Inc
Consulting Arborists

Project No. TS - 7299

Arborist Report - DRAFT

To:	James Madison Middle School, Seattle Public Schools
Site:	3429 45th Ave SW, Seattle, WA 98116, USA
Re:	Tree Inventory Near New Classroom Addition
Date:	August 21, 2020
Project Arborist:	Sean Dugan, Registered Consulting Arborist # 5459B ISA Board Certified Master Arborist #PN- 5459B ISA Qualified Tree Risk Assessor
Referenced Documents:	Civil Site Plan C-100 (Studio Meng Strazzara, 07.15.2020) Street Improvement Plan C-200 (Studio Meng Strazzara, 07.15.2020)

Summary

We inventoried and assessed two trees. Based on the city of Seattle Municipal Code (SMC 25.11), trees measuring 6 inches or greater in diameter at standard height (DSH) are required to be assessed for development projects. Only one tree is located on the site in the location of a proposed new classroom addition. The second tree is in the city right-of-way (ROW). Neither tree meets the exceptional tree criteria outlined in the Seattle Director's Rule 16-2008.[1]

The onsite tree will need to be removed to accommodate the proposed addition. The tree in the ROW will likely only experience minor issues from proposed sidewalk improvements, including curb cuts and addition of bulbouts. Tree protection measures will need to be applied.

The tree has sections of dieback that are likely the result of climate conditions and maintenance. Dead parts over the sidewalk and roadway should be removed by a qualified arborist if the tree is retained. There appears to be sections with Sooty Bark Disease in the canopy. This should be further analyzed to determine if the tree should be retained or what appropriate management procedures should be implemented.

Assignment and Scope of Work

This report documents the site visit by Sean Dugan of Tree Solutions Inc. on August 4th, 2020 to the above referenced site. Included are observations, data collected, an evaluation of proposed construction impacts and recommendations. Vince Gonzales, Capital Project Manager with Seattle Public Schools, requested these services to acquire information for project planning.

We were asked to evaluate two trees; one tree is on the site in the location of a proposed new classroom addition; one is in the adjacent ROW. We were asked to identify any exceptional trees, as defined by Seattle Director's Rule 16-2008, with reference to plans provided to us by Studio Meng

[1] Sugimura, D.W. "DPD Director's Rule 16-2008". Seattle, WA, 2009

Strazzara dated July 15, 2020. We were asked to produce an Arborist Report outlining our findings and provide development recommendations.

Observations and Discussion

Site

The parcel number where development is proposed is 92783000010 and the overall square footage of the site is 193,530 square feet. The Site fronts SW Hinds ST and 45th Ave SW in West Seattle. The site is currently developed with multiple structures including the main building and several portable buildings. The northeast corner of the site is proposed to have several portable structures removed and a new classroom addition constructed (see Appendix C Figure 1). There are no environmental critical areas in the area proposed for development.

Trees

I have included sections of site plans in Appendix C to serve as the site map. Detailed information about each tree can be found in Table 1. Tree Inventory.

Site Trees

I was asked to assess all trees in the proposed development area that have a diameter at standard height of 6 inches and greater. I observed one Douglas-fir (*Pseudotsuga menziesii*) tree in this location, which can be seen in Appendix C - Figure 1. Photos of the tree can be found in Appendix D Photos 1 & 2. Based on the location of the tree and the proposed development, the tree will need to be removed.

Adjacent Site Trees

I was asked to assess a mature Silver maple (*Acer saccharinum*) tree located in the adjacent ROW (see Appendix C – Figure 2). The tree is in fair health condition with sections of dieback throughout the canopy, especially along the canopy edge (see Appendix D Photo 3 & 6).

Table 1. Tree Inventory

Tree ID	Common Name	Botanical Name	DSH *	Dripline Radius **	Health/ Structure	Exceptional	Notes
483	Douglas-fir	*Pseudotsuga menziesii*	8.5	NEWS - 9	Good/ Good	No	Compacted soils: basal area leans west, self-corrected
Adjacent Site Tree – Right of Way							
482	Silver maple	*Acer saccharinum*	50.5	N-44 E-42 W-40 S-41	Fair/Good	No - ROW	Compacted soils; walk lifted and cracked potentially from roots; dieback in outer canopy, brittle dead wood over walkway and road; wound on lower east side trunk with insect frass and decay – minor issue; crack and wounds on lower east side, possible canker; Possible sooty bark disease on the south side of canopy below section of dieback

Tree ID is numerical if on-site and alphabetical if off-site or on adjacent property.
** DSH is Diameter at standard height (inches)*
*** Dripline was measured from the center of the trunk to the outermost limits of the canopy (feet)*

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The tree is located near a sidewalk that has lifted and cracked areas that appear to be the result of tree roots below the pavement (see Appendix D Photos 4 & 5). Sections of pavement that have been damaged are within the area proposed for improvement with new curb cuts and a bulbout of the curb and walkway (see Appendix C Figure 2).

The overall area of proposed development within the root zone of this tree is minor and is unlikely to result in significant negative impacts if the Tree Protection Specification outlined in Appendix G is followed. In addition, rules established by the city of Seattle's Department of Transportation shall be followed to further ensure the tree remains viable during and following construction. This includes notifying the city and gaining approval if any root measured two inches in diameter and greater are proposed to be removed.

I observed issues of concern for the tree not related to site development. The dieback throughout the canopy is likely related to annual drought patterns and high temperatures. The tree is fully exposed to the sun and has pavement below the canopy to the east and north, which increases temperatures. The minimal maintenance observed in the root zone suggests a lack of supplemental irrigation.

Below one of the sections of dieback I observed several areas where bark has sloughed off and there are what appears to be black fungal masses (see Appendix C Photo 7). This may be due to the presence of Sooty Bark Disease (*Cryptostroma corticale),* which is a fungus that results in canopy dieback and can lead to death. This disease, which attacks maple trees, has only recently been discovered in our region. Advanced testing would be necessary to confirm if it is present.

The fungal spores of this disease can cause what is known as hypersensitivity pneumonitis, a disease found among paper mill workers who dubbed it "Maple Bark Stripper's Disease". Recommendations to protect both people and trees from infection include keeping the public away when working on infected trees. If present, the school district, and Seattle Department of Transportation need to communicate when maintenance pruning is planned to ensure student safety.

Recommendations

- Obtain the appropriate permits necessary prior to the commencement of site work.
- Apply tree protection specification measures, outlined in this report, around tree 482 prior to site development.
- Crown clean dead portions of the canopy over the walkway and road that may present an elevated risk potential. Anny parts over 2 inches in diameter pruned from the tree will require a permit from SDOT. All pruning should be conducted by an ISA certified arborist and following current ANSI A300 specifications.[2]
- Confirm the possible presence of Sooty Bark Disease.
- Coordinate with SDOT regarding their management approach if this disease is present.

[2] Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) – 2017 Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Respectfully submitted,

Sean Dugan, Principal Consulting Arborist
Tree Solutions Inc.

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Appendix A **Glossary**

ANSI A300: American National Standards Institute (ANSI) standards for tree care

DBH or DSH: diameter at breast or standard height; the diameter of the trunk measured 54 inches (4.5 feet) above grade (Council of Tree and Landscape Appraisers 2019)

ISA: International Society of Arboriculture

Regulated Tree: A tree required by municipal code to be identified in an arborist report.

Visual Tree Assessment (VTA): method of evaluating structural defects and stability in trees by noting the pattern of growth. Developed by Claus Mattheck (Harris, *et al* 1999)

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Appendix B **References**

Accredited Standards Committee A300 (ASC 300). ANSI A300 (Part 1) Tree, Shrub, and Other Woody Plant Management – Standard Practices (Pruning). Londonderry: Tree Care Industry Association, 2017.

Council of Tree and Landscape Appraisers, Guide for Plant Appraisal, 10th Edition, Second Printing. Atlanta, GA: The International Society of Arboriculture (ISA), 2019.

Mattheck, Claus and Helge Breloer, The Body Language of Trees.: A Handbook for Failure Analysis. London: HMSO, 1994.

Rippey, Chris. May 2020. Pacific Northwest International Society of Arboriculture. (accessed August 5, 2020). https://pnwisa.org/2020/05/sooty-bark-disease-of-maple/

Seattle Municipal Code 25.09.070. Standards for Trees and Vegetation in Critical Areas.

Seattle Municipal Code 25.11.050. General Provisions for Exceptional Trees.

Sugimura, D.W. "DPD Director's Rule 16-2008". Seattle, WA, 2009

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Appendix C **Site Plan Sections**

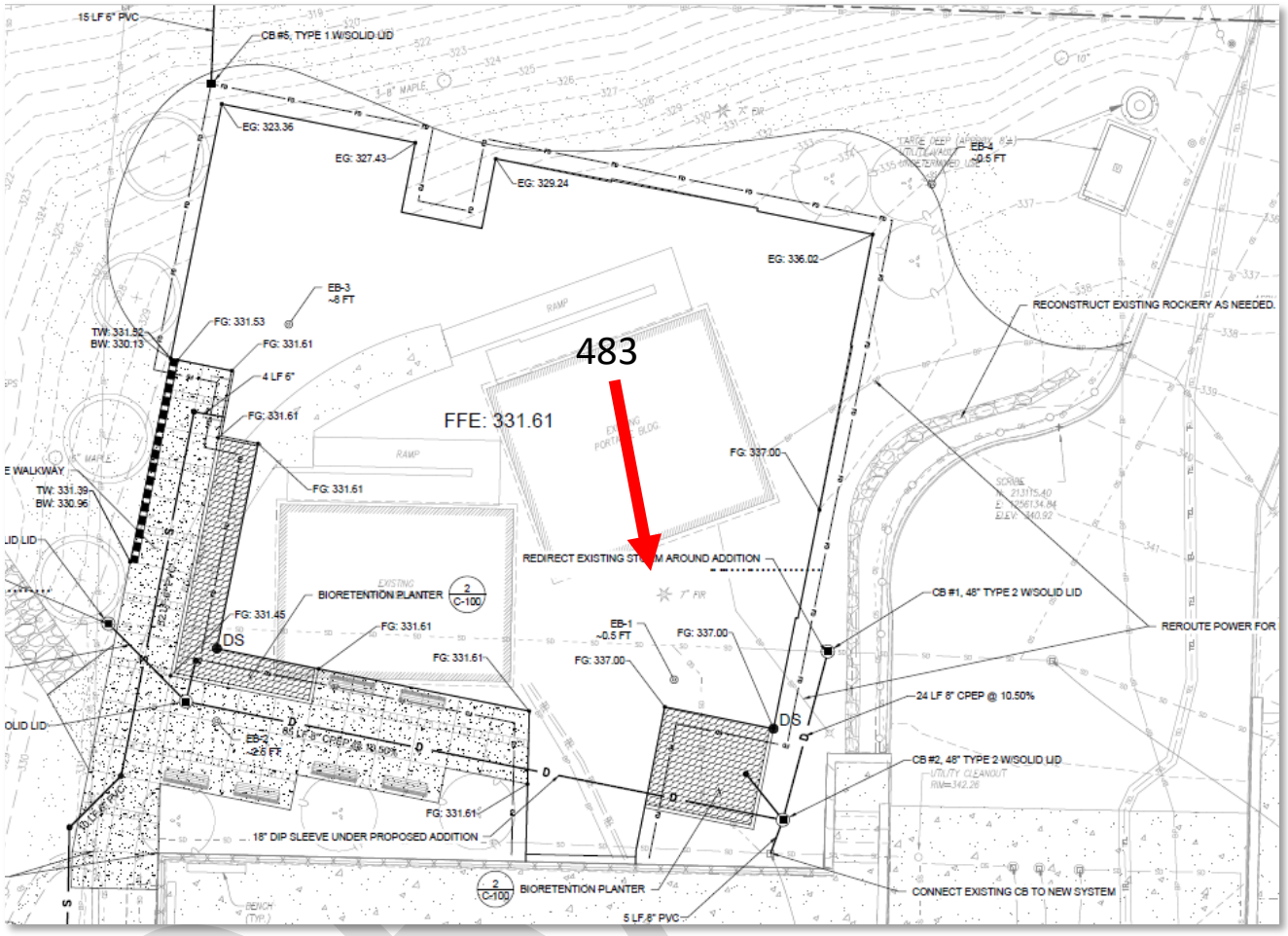

Figure 1. Section of the Civil Site Plan C-100 showing the location of tree 483 (Dated 07.15.2020). This tree is within the building envelop and will need to be removed for the construction of the proposed new classroom addition.

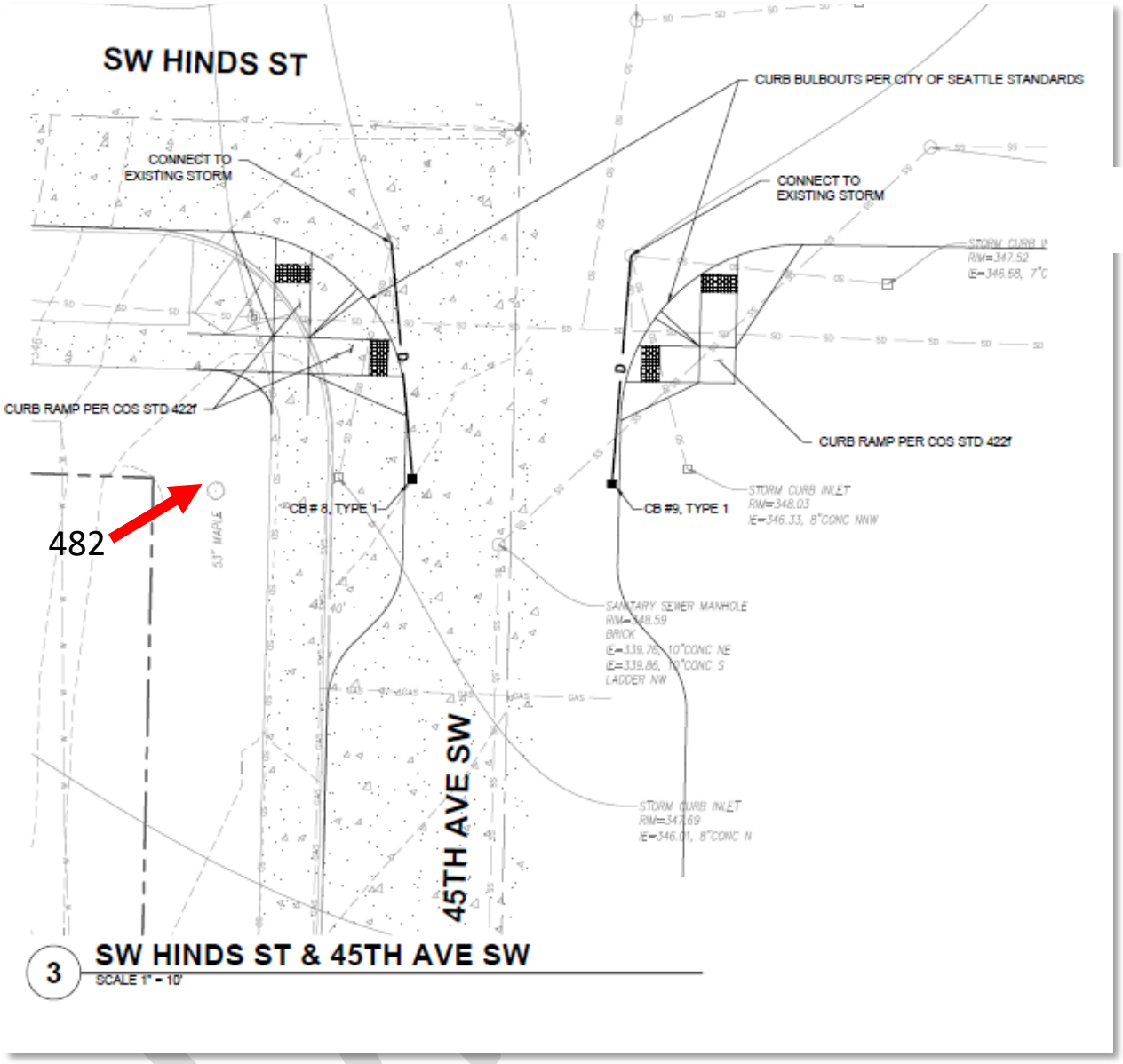

Figure 2. Section of the Street Improvement Plan C-200 showing the location of tree 482 (Dated 07.15.2020). The tree is located off of the property in the city right-of-way. New curb cuts are proposed to the northeast of the tree within the existing walkway and a proposed curb bulbout.

Appendix D **Photographs**

Photograph 1. View of tree 483 looking to the north.

Photograph 2. View looking to the north at the base of tree 483.

Photograph 3. View looking to the northeast at tree 482 located in the ROW. There is a significant level of dieback throughout the outer canopy.

Photograph 4. View looking south at the base of the tree and root zone area. It appears that the adjacent walkway had been replaced at some point in the past based on the age of the concrete and the structure of the roots. There is minimal maintenance within the root system of the tree.

Photograph 5. View of the pavement east of tree 482 looking north. Areas of the walk are lifting and cracking, which is likely the result of roots below. The walkway to the north is proposed for new curb cuts and walkway replacement.

Photograph 6. View of dieback in the canopy.

Photograph 7. View along the midsection of a lead below a dead portion of the canopy. This is potentially sooty bark disease (*Cryptostroma corticale*), which has recently been identified in the region.

Appendix E **Assumptions & Limiting Conditions**

1 Consultant assumes that the site and its use do not violate, and is in compliance with, all applicable codes, ordinances, statutes or regulations.

2 The consultant may provide a report or recommendation based on published municipal regulations. The consultant assumes that the municipal regulations published on the date of the report are current municipal regulations and assumes no obligation related to unpublished city regulation information.

3 Any report by the consultant and any values expressed therein represent the opinion of the consultant, and the consultant's fee is in no way contingent upon the reporting of a specific value, a stipulated result, the occurrence of a subsequent event, or upon any finding to be reported.

4 All photographs included in this report were taken by Tree Solutions, Inc. during the documented site visit, unless otherwise noted. Sketches, drawings and photographs (included in, and attached to, this report) are intended as visual aids and are not necessarily to scale. They should not be construed as engineering drawings, architectural reports or surveys. The reproduction of any information generated by architects, engineers or other consultants and any sketches, drawings or photographs is for the express purpose of coordination and ease of reference only. Inclusion of such information on any drawings or other documents does not constitute a representation by the consultant as to the sufficiency or accuracy of the information.

5 Unless otherwise agreed, (1) information contained in any report by consultant covers only the items examined and reflects the condition of those items at the time of inspection; and (2) the inspection is limited to visual examination of accessible items without dissection, excavation, probing, climbing, or coring.

6 These findings are based on the observations and opinions of the authoring arborist, and do not provide guarantees regarding the future performance, health, vigor, structural stability or safety of the plants described and assessed.

7 Measurements are subject to typical margins of error, considering the oval or asymmetrical cross-section of most trunks and canopies.

8 Tree Solutions did not review any reports or perform any tests related to the soil located on the subject property unless outlined in the scope of services. Tree Solutions staff are not and do not claim to be soils experts. An independent inventory and evaluation of the site's soil should be obtained by a qualified professional if an additional understanding of the site's characteristics is needed to make an informed decision.

9 Our assessments are made in conformity with acceptable evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.

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Appendix F **Methods**

Measuring

I measured the diameter of each tree at 54 inches above grade, diameter at standard height (DSH). If a tree had multiple stems, I measured each stem individually at standard height and determined a single-stem equivalent diameter by using the method outlined in the city of Seattle Director's Rule 16-2008 or the Guide for Plant Appraisal, 10th Edition Second Printing published by the Council of Tree and Landscape Appraisers. A tree is regulated based on this single-stem equivalent diameter value. Because this value is calculated in the office following field work, some trees in our data set may have diameters smaller than 6 inches. These trees are included in the tree table for informational purposes only and not factored into tree totals discussed in this report.

Tagging

I tagged each tree with a circular aluminum tag at eye level. I assigned each tree a numerical identifier on our map and in our tree table, corresponding to this tree tag. I used alphabetical identifiers for trees off-site.

Evaluating

I evaluated tree health and structure utilizing visual tree assessment (VTA) methods. The basis behind VTA is the identification of symptoms, which the tree produces in reaction to a weak spot or area of mechanical stress. A tree reacts to mechanical and physiological stresses by growing more vigorously to re-enforce weak areas, while depriving less stressed parts. An understanding of the uniform stress allows the arborist to make informed judgments about the condition of a tree.

Rating

When rating tree health, I took into consideration crown indicators such as foliar density, size, color, stem and shoot extensions. When rating tree structure, I evaluated the tree for form and structural defects, including past damage and decay. Tree Solutions has adapted our ratings based on the Purdue University Extension formula values for health condition (*Purdue University Extension bulletin FNR-473-W - Tree Appraisal*). These values are a general representation used to assist arborists in assigning ratings.

Excellent - Perfect specimen with excellent form and vigor, well-balanced crown. Normal to exceeding shoot length on new growth. Leaf size and color normal. Trunk is sound and solid. Root zone undisturbed. No apparent pest problems. Long safe useful life expectancy for the species.

Good - Imperfect canopy density in few parts of the tree, up to 10% of the canopy. Normal to less than ¾ typical growth rate of shoots and minor deficiency in typical leaf development. Few pest issues or damage, and if they exist, they are controllable, or tree is reacting appropriately. Normal branch and stem development with healthy growth. Safe useful life expectancy typical for the species.

Fair - Crown decline and dieback up to 30% of the canopy. Leaf color is somewhat chlorotic/necrotic with smaller leaves and "off" coloration. Shoot extensions indicate some stunting and stressed growing conditions. Stress cone crop clearly visible. Obvious signs of pest problems contributing to lesser condition, control might be possible. Some decay areas found in main stem and branches. Below average safe useful life expectancy

Poor - Lacking full crown, more than 50% decline and dieback, especially affecting larger branches. Stunting of shoots is obvious with little evidence of growth on smaller stems. Leaf size and color reveals overall stress in the plant. Insect or disease infestation may be severe and uncontrollable. Extensive decay or hollows in branches and trunk. Short safe useful life expectancy.

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Appendix G **Tree Protection Specifications**

1. This specification must be followed for all trees that are in close proximity to any clearing and grading limits.
2. Educate all workers on site about tree protection techniques and requirements during preconstruction meetings and by sharing and posting this Tree Protection Specification.
3. Tree Protection Zone (TPZ) fencing or other barriers shall be installed along all working limits to protect the drip line area of trees that are to be preserved. TPZ fencing shall be a minimum of a 4-foot tall orange plastic fencing anchored with steel stakes or a 6-foot tall chain link fence, depending on the project needs. One entry point into the TPZ to gain access to the tree shall be provided for all trees, especially those surrounded by a chain link fence. Damaged barriers shall be re-established or replaced.
4. TPZ fencing shall not be moved without authorization from the project arborist or the site supervisor. All fencing is to be left in place until the completion of the project. Tree protection signage shall be attached to fencing only.
5. A 4 to 6-inch deep layer of coarse arborist woodchips or hog fuel mulch shall be layered over the top of any exposed soil surface that will not be disturbed. The mulch shall be kept 12-inches away from the base of any tree. Alternative mulch may be used with the prior approval of the project arborist.
6. Within the TPZ areas, no parking, materials storage, dumping, or staging.
7. Where the project arborist has determined that roots of a preserved tree may be encountered during excavation or grading, a Certified Arborist shall be on site to supervise the potential negative impacts.
8. Excavation within ten feet of any tree should occur using pneumatic air equipment and if possible, a vacuum truck to remove the soil.
9. Outside of ten feet excavation equipment shall be the smallest needed to do the job and have flat front bucket to be used when lowering the grade in tree protection zones that may contact roots of a preserved tree.
10. Excavation should occur at perpendicular angles that will reduce the potential to tear and break roots further back towards the tree. Otherwise, the use of handheld tools will need to be used in conjunction with the excavation equipment whenever a root greater than 1 inch in diameter is encountered.
11. Any root greater than 1-inches in diameter that is encountered shall be cleared out with handheld tools and carefully cut with a sharp tool and not torn with a backhoe. Avoid, when feasible, cutting any root greater than 4 inches in diameter.
12. Roots cut shall be immediately covered with soil or mulch and kept moist. When roots must be exposed around concrete forms before backfilling can occur, cover the roots with wet burlap and a white plastic sheeting.
13. Where access for machinery or any vehicle is required within the TPZ of any preserved tree, the soil should be protected from compaction. Acceptable methods include an 18-inch-deep layer of wood chips or hog fuel, 1-inch thick plywood, Alturna Mats, or steel sheets be placed over the soil surface. If asphalt exists over the TPZ it should be retained in place as long as feasible to protect the underlying soil.
14. Do not trench for utilities installation or repair, or for irrigation system installation within the TPZ without consent of the project arborist. Alter routes of underground infrastructure or use alternate methods such as pipe boring, air excavation, or HVAC to work around roots will need to be considered if substantial roots or root mats will be negatively compromised.
15. Supplemental irrigation for all protected trees is required during the summer months or prolonged periods of dry weather. In the absence of adequate rainfall, apply at least 1 inch of water per week by deep soaking methods.

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16. Monitoring of all trees, especially those exposed to new environmental conditions such as exposure to wind, sun, or deep shade, should be monitored during construction and annually for several seasons following construction to check for adverse changes to the tree health or stability.

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Appendix E: View Analysis Photo Pages

FIELD IMPROVEMENTS VIEW ANALYSIS PHOTO PAGES

Madison Middle School Athletic Field

July 24, 2020

Following are three representative photographs of the existing view conditions present at the Madison Middle School Athletic field.

Also included are representative photographs of the field lighting recently installed by Seattle Public Schools at Ballard High School, which will be similar in height and style to the lighting proposed at Madison Middle School athletic field. The lights at Ballard High School on the west side of the field are 70 feet tall and on the east side of the field are 90 feet tall. For the lighting proposed at Madison Middle School athletic field, the six light poles would all be 70 feet tall.

Photo 1. View of Madison Middle School athletic field, taken from the northeast corner of the field, looking southwest. July 24, 2020.

Photo 2. View of Madison Middle School athletic field, taken from the southwest corner of the field, looking northeast across field. July 24, 2020.

Photo 3. View of Madison Middle School athletic field, taken from the south side of the field looking north across the field. July 24, 2020

Photo 4. View of Ballard High School athletic field, taken from the north side of the field, looking south across field. Representative light poles around the field edges. December 17, 2019**.**

Photo 5. View of Ballard High School athletic field, taken from the northwest corner of the field, looking south across field. Representative light poles around the field edges. Mt. Rainier and Seattle skyline in the distance. December 17, 2019.