

TECHNICAL MEMORANDUM

Project: Issaquah Middle School #6
Subject: Parking Analysis
Date: October 2, 2019
Authors: Jennifer Barnes, P.E., Associate Principal

This memorandum presents parking analysis completed for the Issaquah School District's (District) proposed new middle school (Middle School #6). It includes estimates of parking demand on a typical school day and during special events, assessment of potential parking impacts during each of these periods, and recommendations for potential mitigation measures to address parking impacts. Please contact Jennifer Barnes at (206) 324-3623 with any questions regarding this memorandum.

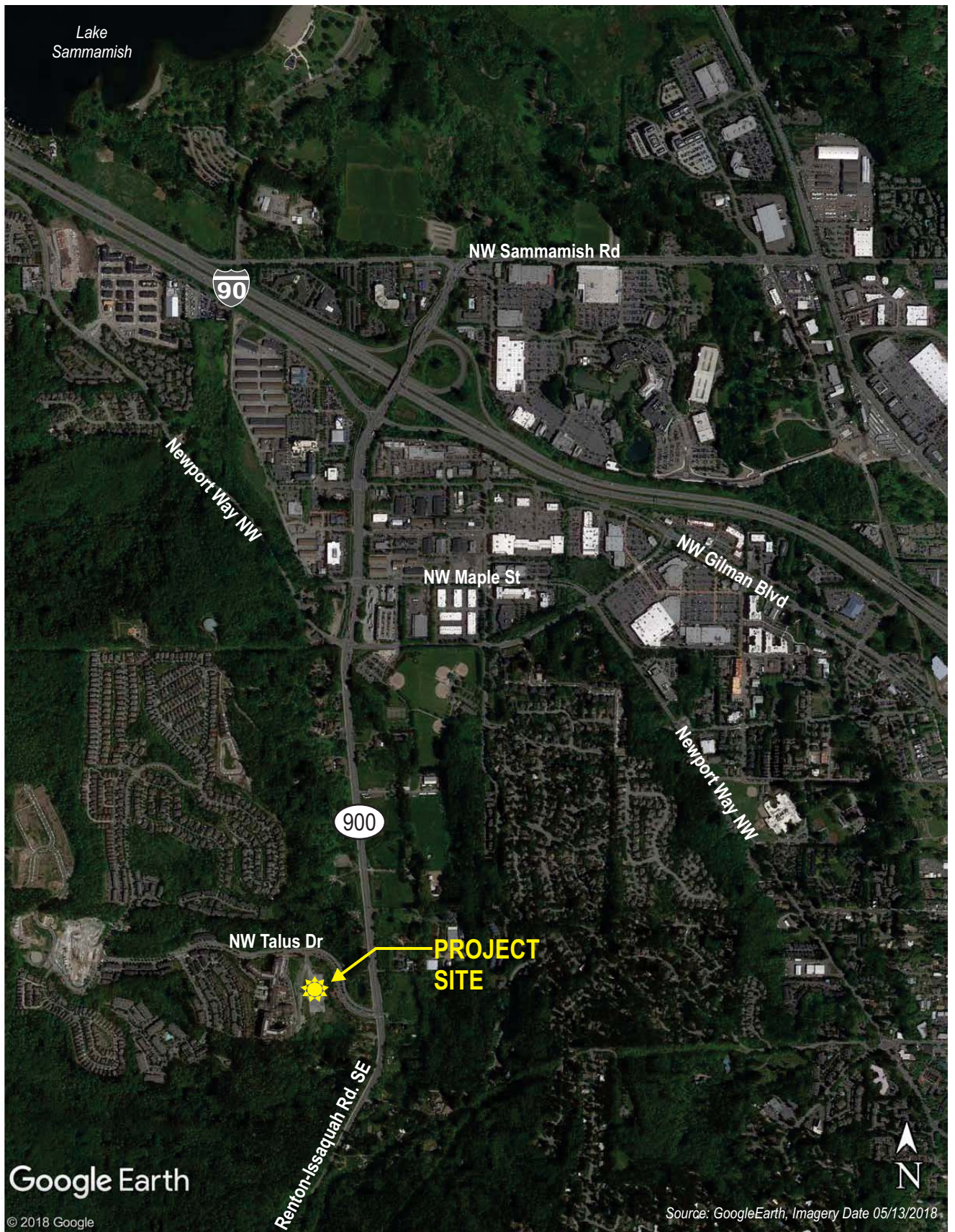
1. Project Description

The District proposes to construct a new middle school (serving grades 6 through 8) on property located west of the State Route (SR) 900 / NW Talus Drive intersection, in the Talus community of Issaquah. The site location is shown on Figure 1.

The school is planned for an enrollment capacity of 850 students with about 75 faculty and staff. However, to ensure a conservative analysis, an enrollment of up to 900 students was evaluated to account for possible unanticipated fluctuations. (Note: Preliminary analyses prepared for initial design concepts referenced a capacity range of 800 to 1,000 students; however, site constraints have resulted in a reduced number of classrooms and the District has confirmed the planned capacity at 850 students).

The proposed school facilities include an athletic field, commons, and a gymnasium. The main access driveway is proposed on NW Talus Drive at the approximate location of an existing temporary site access. This driveway would provide access to the family-vehicle load/unload area as well as on-site staff and visitor parking. A separate emergency-access/service driveway connection to the fire lane east of the school building is also proposed from NW Talus Drive. This access is planned for use only by emergency vehicles and occasional service vehicles and is expected to have access control (e.g., gates and/or removable bollards). A school-bus load/unload area is planned along the west side of the site with vehicle access from Falcon Way NW. A pedestrian bridge would provide connection between the school bus loading area and the school, over the main internal access road and queuing area for the family vehicle loading zone.

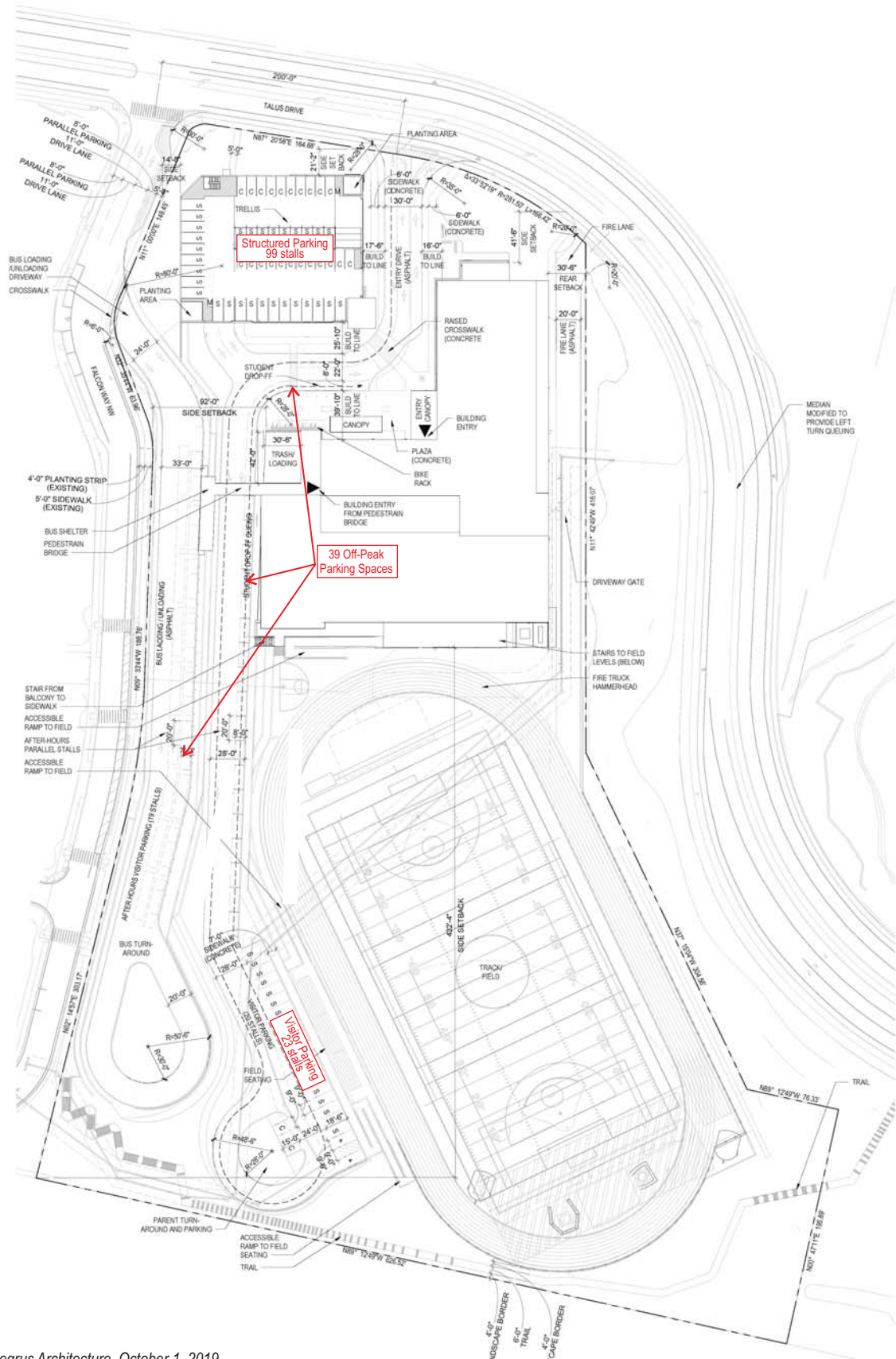
The preliminary site plan with planned parking configuration is shown on Figure 2. On-site parking is planned to include 122 long-term parking spaces (99 spaces within a garage, and 23 surface parking spaces), plus an additional 39 stalls in load/unload areas that would be available for off-peak hours use, for a total of 161 parking stalls.



MIDDLE SCHOOL #6
Issaquah School District

Figure 1
Site Location





Source: Integrus Architecture, October 1, 2019

MIDDLE SCHOOL #6

Issaquah School District

Figure 2
Parking Plan



2. City Parking Code Requirements

The Central Issaquah Development and Design Standards (CIDDS)¹ require the following parking supply for the proposed school.

$$\begin{array}{r} 194 \text{ stalls (2 spaces per 1,000 net square feet = } 96,839 / 1,000 \times 2) \\ - 9 \text{ stalls (5\% reduction allowed for electric vehicle charging stations)} \\ \hline 185 \text{ stalls} \end{array}$$

As described previously, the project proposes to construct 161 parking spaces; therefore, an Administrative Adjustment to Standards (AAS) will be required. The following sections present analysis of the parking demand expected during a typical school day and during evening events, and identify mitigation measures that could be implemented to ensure that the school-generated parking does not overflow to residential streets in the neighborhood.

3. Parking Demand Analysis

3.1. Typical School Day

Parking demand estimates for development projects are typically derived using rates and equations published in ITE's *Parking Generation Manual*.² For a Middle School/Junior High School (Land Use 522), the published equation is $Ln(P) = 0.56 Ln(X) + 0.59$, where X is number of students and P is peak parking demand; the average demand rate is 0.09 vehicles per student. At the assumed maximum enrollment level of 900 students, both the equation and rate project a school-day peak parking demand of 81 vehicles for Middle School #6.

School day parking counts were conducted at two existing middle schools in the Issaquah School District—Pacific Cascade Middle School and Pine Lake Middle School—that are similar in size to the proposed Middle School #6. The counts were conducted on days when school was in session between 10:00 A.M. and 2:00 P.M., the period in which peak daytime parking typically occurs for middle schools.³

Midday parking demand counts were conducted at Pacific Cascade Middle School—located at 24635-Issaquah-Fall City Road in Sammamish—on three school days in June 2019, between 10:00 and 11:00 A.M. At the time of the counts, the school's enrollment was 1,014 students. The number of vehicles parked on each survey day and the parking rate are summarized in Table 1. As shown, the observed demand values ranged between 0.07 and 0.09 parked vehicles per student, with an average rate of 0.08 parked vehicles per student. The highest observed rate, 0.09 average vehicles per student, is the same as the published ITE average rate.

At Pine Lake Middle School—located at 3200-228th Avenue SE in Sammamish—there are on-site cameras that photograph the school parking lot every day at about 1:00 P.M. Utilizing the time-lapse photographs, parking demand counts were compiled for three separate two-week periods (one period each in the fall, winter and spring) throughout the 2018/2019 school year. Results from six weeks of counts are summarized in Table 2. The student enrollment for this school year was 953 students.⁴ The table shows that the observed demand ranged between 0.06 and 0.08 parked vehicles per student, with an average rate of 0.08 parked vehicles per student. The highest observed rate, 0.08 average vehicles per student, is slightly lower than the published ITE average rate.

¹ City of Issaquah, CIDDS, Section 8.0 Parking Standards, Table 8.10-1, last updated 10-25-17 (Ordinance 2809).

² ITE, 5th Edition, January 2019.

³ Ibid.

⁴ Pine Lake Middle School enrollment provided by the Issaquah School District for October 2018.

The parking counts conducted at Pacific Cascade and Pine Lake Middle Schools indicate that the published ITE average rate of 0.09 parked vehicles per student reflects the high end of typical school day parking demand at Issaquah School District middle schools. Therefore, the estimated demand of 81 vehicles for Middle School #6 is reasonable and could be accommodated by the planned on-site supply of 122 long-term spaces. At this level, an average of 41 spaces would be available for daytime event parking in the garage and surface lots; during midday, the additional 39 spaces in the student loading areas would also be available, for a total of 80 spaces.

Table 1. School Day Parking Demand – Pacific Cascade Middle School (June 2019)

Day of Count ^a	Number of Parked Vehicles
Tuesday, June 11, 2019	93
Wednesday, June 12, 2019	75
Thursday, June 13, 2019	77
Average Count	82
On-Site Parking Supply (spaces)	156
Parking Demand Rate (parked vehicles per student) ^b	
Average Rate	0.08
Observed Range of Rates	0.07 – 0.09

Source: Heffron Transportation, Inc., June 2019.

a. All parking counts were conducted between 10:00 and 11:00 A.M.

b. Rates were derived by dividing the observed parking counts by the PCMS June 2019 enrollment of 1,014 students.

Table 2. School Day Parking Demand – Pine Lake Middle School (2018/2019 School Year)

Day of Count ^a	Number of Parked Vehicles	Day of Count ^a	Number of Parked Vehicles
Fall 2018			
Monday, October 15, 2018	65	Monday, October 22, 2018	66
Tuesday, October 16, 2018	71	Tuesday, October 23, 2018	69
Wednesday, October 17, 2018	79	Wednesday, October 24, 2018	72
Thursday, October 18, 2018	69	Thursday, October 25, 2018	71
Friday, October 19, 2018	67	Friday, October 26, 2018	58
Average for Week	70	Average for Week	67
Winter 2019			
Monday, January 7, 2019	70	Monday, January 14, 2019	64
Tuesday, January 8, 2019	69	Tuesday, January 15, 2019	66
Wednesday, January 9, 2019	62	Wednesday, January 16, 2019	65
Thursday, January 10, 2019	66	Thursday, January 17, 2019	80
Friday, January 11, 2019	66	Friday, January 18, 2019	64
Average for Week	67	Average for Week	68
Spring 2019			
Monday, June 3, 2019	62	Monday, June 10, 2019	57
Tuesday, June 4, 2019	62	Tuesday, June 11, 2019	62
Wednesday, June 5, 2019	64	Wednesday, June 12, 2019	63
Thursday, June 6, 2019	66	Thursday, June 13, 2019	60
Friday, June 7, 2019	64	Friday, June 14, 2019	64
Average for Week	64	Average for Week	61
On-Site Parking Supply	135 spaces		
Average Demand Count	66 parked vehicles		
Parking Demand Rate ^b	0.07 parked vehicle / student		
Average Rate	0.07 parked vehicle / student		
Observed Range of Rates	0.06 – 0.08 parked vehicle / student		

Source: Heffron Transportation, Inc., August 2019.

- a. All parking counts were conducted from photographs taken at approximately 1:00 P.M.
- b. Rates were derived by dividing the observed parking counts by the PLMS enrollment of 953 students (enrollment provided by the Issaquah School District for October 2018).

3.2. Special Event Parking

The highest parking demand for schools typically occurs during special events. Special events most often occur in the early evenings; however, some may occur on school days or on weekends. Table 3 summarizes the expected types, sizes, and frequencies of events at the proposed Middle School #6. The event scheduled was estimated by the District, based upon the typical event schedule for Pine Lake Middle School (summarized in Attachment A).

Parking demand was then estimated based on Heffron Transportation observations at numerous other schools. Those observations have found that parent-only meetings (such as a PTSA meeting) typically have vehicle occupancy rates of one person per vehicle. However, larger evening events typically have between 3 and 3.5 attendees per parked vehicle, while smaller events may average closer to 2 attendees per parked vehicle.⁵ These rates account for multiple attendees who arrive in one vehicle (e.g. students with families) and participants who may be dropped off at an event without generating parking demand. The potential parking demand for each event is presented in Table 3.

As requested by the City, parking demand was observed at Pacific Cascade Middle School during an afternoon special event—the 8th-Grade Promotion Ceremony, held on Monday, June 24, 2019—which is the largest event held when school is in session. The counts found a peak parking demand of 427 vehicles during this event, which included vehicles parked on-site, as well as vehicles parked off-site on vicinity streets. The demand reflected typical school-day demand from teachers, staff, and visitors as well as event-generated demand. After subtracting estimated average school-day demand (about 82 vehicles, as described previously in Table 1), the event is estimated to have generated about 345 vehicles. As reflected in these counts, it is expected that 8th Grade promotion would have the highest parking impact of all middle school events. As a daytime event, it is likely that a greater number of parents and other family members travel from separate work places and other origins in separate vehicles; additionally, parked vehicles generated by this event typically occur concurrently with regular school day parking.

The table shows that other than the 8th grade promotion, the only other regular daytime event during the school year would be Parent Teacher Student Association (PTSA) meetings that would occur once every month or two. These meetings typically have about 20 participants, and the parking demand they would generate could be accommodated with available supply (estimated to average about 80 spaces as described in the previous section).

For most of the larger afternoon/evening events summarized in Table 3, the ability of the proposed on-site parking to accommodate demand would be dependent on the vehicle occupancy. At the higher end of the typical range (e.g., 3 attendees per parked vehicle), parking generated by the event could be accommodated entirely on site. However, with lower occupancies (e.g., 2 attendees per parked vehicle), additional off-site parking would be needed.

For all events anticipated to have 300 or more attendees, it is recommended that the District and School implement parking management measures to ensure that parking overspill does not occur on nearby streets. It should be noted that if the proposed parking were to meet CIDDs requirements described previously and included 24 additional spaces, this would not affect the number of events for which parking management would be required. All events identified in the shaded rows in Table 3 would still have potential parking impacts for which management measures would be warranted. Recommended measures to address event parking impacts are described in the following section.

⁵ These rates were most recently corroborated with parking counts conducted by Heffron Transportation at the Northshore Performing Arts Center (NPAC), located at the Bothell High School campus, which hosts music and performance events for all Northshore District schools; the counts found average parking rates of 1.9 to 3.2 parked vehicles per attendee at two music events in May 2018.

Table 3. Expected Special Events and Parking Demand – Middle School #6

Event	Approximate Attendance (per occurrence)	Total # of Occurrences (time of year)	Estimated Parking Demand ^a	Accommodated On- Site? ^b
Daytime Events^b				
B to Business days	20 people every 20 minutes ½ each day	2 days (early August)	20 – 40	Yes
PTSA meetings monthly	20	6 (September – June)	20	Yes
8 th Grade Promotion	650	1 (June)	220 - 325	With Parking Management
Late Afternoon/Evening Events^c				
Curriculum night(s)	500	2 (September)	160 - 250	With Parking Management
Back to school fun activity	400	1 (September)	130 - 200	With Parking Management
Parent Information Nights	100	3 (October, January, March)	35 - 50	Yes
Season 1 sports – Gym Volleyball	100	5 (September – November)	35 - 50	Yes
Season 1 sports – Track & Field	100	3 (September – November)	35 - 50	Yes
Season 2 sports – Gym Boys Basketball	100	5 (December – February)	35 - 50	Yes
Season 2 sports – Field Girls Soccer	100	4 (December – February)	35 - 50	Yes
5 th Grade Parent Night	600	1 (March)	200 - 300	With Parking Management
Season 3 sports – Girls Basketball	100	5 (February – April)	35 - 50	Yes
Season 3 sports – Gym Wrestling	100	4 (February – April)	35 - 50	Yes
Season 4 sports – Boys and Girls Track	500	4 (April – June)	165 – 250	With Parking Management
Music concert, Band, Orchestra and Choir	200 – 500	15 (December – June)	100 - 250	With Parking Management
Drama performances	150	6 (December & April)	50 – 75	Yes

Source: Heffron Transportation, Inc., compiled from information provided by the Issaquah School District, September 2019.

- Estimated parking demand reflects 1 meeting participant or approximately 2 to 3 event attendees per parked vehicle.
- "With Parking Management" indicates that some measures may be needed to accommodate the total parking generated by the event. Potential measures are described in Section 4.
- Available parking spaces for daytime events estimated to be about 49 spaces—130 garage & surface lot spaces minus average peak school-generated demand of 81 parked vehicles.
- Available parking spaces for late afternoon/evening events estimated to be 160 spaces—130 garage & surface lot spaces plus about 30 spaces in load/unload areas that would be available for parking after regular school hours.

4. Recommended Parking Management Measures

Analysis presented in this study found that the proposed on-site parking supply for Middle School #6 would be adequate to accommodate typical school day parking, and with the exception of the 8th grade promotion ceremony, would also be sufficient to accommodate daytime meetings that would occur occasionally throughout the year.

Parking management would be needed for evening events with more than 300 expected attendees. It is recommended that the District and School develop and implement a parking management plan to mitigate parking impacts associated with large events. The following measures could be considered.

- Identify an off-site parking location for large events. The District could potentially work with Sound Transit to utilize parking at the Issaquah Transit Center, located less than one mile to the north of the school site at SR 900/Newport Way NW, or lease parking from a vicinity business that is closed in the evening and has parking supply available.
- Provide a shuttle between the off-site parking and the school during large events. This would likely be provided using District yellow school buses.
- Develop a parking permit system for each large event that would identify who would be allowed to park on site and who would be required to park off site. No more than 161 on-site permits should be issued for each event (including parking for attendees and staff, and accounting for accessible stalls). The priority for on-site parking could be rotated (e.g., by grade or alphabetically) between events. In addition to managing the number of vehicles accessing the school campus to park, this type of system could incentivize carpools between the campus priority and non-priority permit holders for a given event.
- Provide staff enforcement of permit restrictions at on-site parking entry points. (Vehicles entering to drop students off without parking would be allowed, regardless of their permit group).
- Develop a parking communication plan that would be distributed to all school faculty, staff, and families prior to the start of the school year, and would be available to the school population and other community members via the school's web site. In addition to detailing the parking procedures for larger events, the plan should emphasize the school's "good neighbor" policies by which all school-generated parking would occur on campus or at the designated off-site location. The plan should also provide contact information for a school official to whom any questions or complaints related to parking can be directed.
- Separate large events between different evenings to the extent feasible (e.g. separate by one or more grade level) to reduce the number of events for which permit management and shuttle service would be required.
- Consider holding 8th Grade Promotion during the evening instead of the school day; this would reduce overall parking demand by separating it from school-day parking demand, and could allow higher vehicle occupancies with more family members traveling from home instead of work places. There would also be more off-site parking options in the evening compared to a weekday. Alternatively, the District could consider holding the ceremony at an off-site facility that has capacity to accommodate the anticipated size.

JAB/mch

ATTACHMENT A
Pine Lake Middle School Event Summary

Table A-1. Summary of Special Events during Typical School Year – Pine Lake Middle School

Event	Approximate Attendance (per occurrence)	Total # of Occurrences (time of year)
Daytime Events		
B to Business days	20 people every 20 minutes ½ each day	2 days (early August)
PTSA meetings monthly	20	6 (September – June)
8 th Grade Promotion	700	1 (June)
Later Afternoon/Evening Events		
Curriculum night	1,000	1 (September)
Back to school fun activity	400	1 (September)
Parent Information Nights	100	3 (October, January, March)
Season 1 sports – Gym Volleyball	100	5 (September – November)
Season 1 sports – Track & Field	100	8 (September – November)
Season 2 sports – Gym Boys Basketball	100	5 (December – February)
Season 2 sports – Field Girls Soccer	100	4 (December – February)
5 th grade parent night	600	1 (March)
Season 3 sports – Gyn Girls Basketball	100	5 (February – April)
Season 3 sports – Gym Wrestling	100	4 (February – April)
Season 4 sports – Boys and Girls Track	500	4 (April – June)
Music concert, Band, Orchestra and Choir	500	15 (December – June)
Drama performances	120	6 (December & April)

Source: Issaquah School District, August 2019.