

TRANSPORTATION TECHNICAL REPORT

for the

Ferrucci Junior High School Classroom Addition

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Puyallup School District

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1. INTRODUCTION

This report presents the transportation impact analysis for Ferrucci Junior High School located at 3213 Wildwood Park Drive in Puyallup, Washington. The Puyallup School District (District) plans to construct a new addition to replace existing portables and reconfigure the site to improve site operations, circulation and parking. It includes a description of existing and proposed conditions in the site vicinity, projected trip generation and distribution patterns, operational analysis at the site access driveways, and an assessment of the project's impacts to other transportation facilities.

The analysis scope, study area, and assumptions were coordinated with the City of Puyallup (City) Traffic Engineer¹ after submittal of a *Transportation Analysis Scoping* memorandum.²

1.1. Project Description

1.1.1. Existing School

Ferrucci Junior High School serves students in grades 7, 8, and 9 and is located on the north side of Wildwood Park Drive. The site is bounded on the north, west, and east sides by single-family residential properties. The northwest corner of the site has short segments of frontages on 17th Street Place SE and 31st Avenue SE; there is a District-owned pedestrian pathway that connects between the north edge of the site and 31st Avenue SE. There are also pedestrian pathways that connect to residential areas to the east, southeast, and southwest, which are described later in Section 2.6 of this report.

The existing campus has a permanent main school building and 12 portable classrooms with a total floor area of 98,536 square feet (sf) (88,104-sf in the permanent building and 10,432-sf in portables).³ Current-year (winter 2020) enrollment at the school is 727 students,⁴ which is about 70% of the school's capacity. The school has a total of 68 employees (43 full-time and 35 part-time).⁵

The school building, portables, on-site parking, and vehicular load/unload areas are located on the southwestern portion of the site; the north and east portions of the site are occupied by playfields and a stand of trees. The main parking lot located west of the school building has a total of 85 striped spaces and is accessed from the westernmost site driveway on Wildwood Park Drive. The existing on-site school-bus load/unload area is aligned along the south side of building parallel to Wildwood Park Drive and does not currently have adequate curb-side capacity to accommodate all school buses (some buses are stacked side-by-side for load/unload). The bus load/unload area is accessed from the easternmost driveway on Wildwood Park Drive, and all egressing buses mix with automobile traffic to leave the site using the westernmost driveway.

There are two disabled-permit parking stalls located at the southeastern corner of the school building and a gravel area between the building and the southeastern playfield that is used for some staff parking (room for 12 to 14 cars) on school days and field-related parking weekends and evenings. Figure 1 shows the site vicinity and current enrollment area for the school.

The current school hours are 7:30 A.M. to 2:00 P.M. on most Tuesdays through Fridays (Mondays have a late start at 8:30 A.M.).

¹ Bryan Roberts, PE, phone communications, May and June 2020.

² Heffron Transportation, Inc., March 26, 2020.

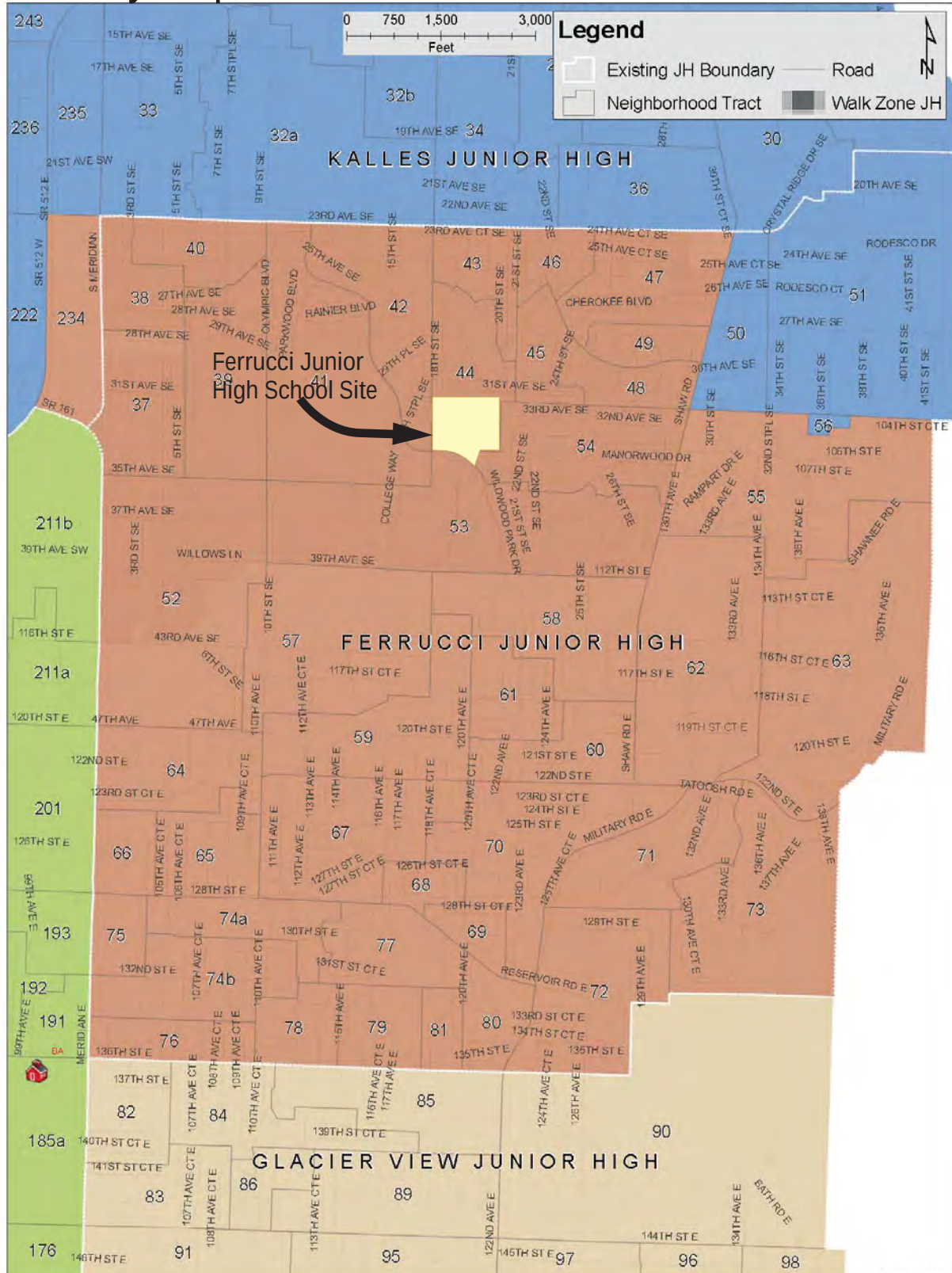
³ Puyallup School District, *2019-2024 Capital Facilities Plan*, October 7, 2019.

⁴ Office of Superintendent of Public Instruction (OSPI), Online Washington School Report Card, accessed Feb. 2020.

⁵ Email communication, B. Wilson – Principal, Ferrucci Junior High School, July 2020.



Puyallup School District Attendance Areas



Source: Puyallup School District, November 2018.

11/15/2018

Ferrucci Junior High Classroom Addition

Figure 1
Site Vicinity and Current Enrollment Area



1.1.2. Proposed Project

The District proposes to construct additions to the main permanent school building totaling about 21,450 sf, (a classroom addition of 17,746 sf and a commons addition of 3,703 sf) and remodel some existing internal spaces (totaling about 9,800 sf). The project would result in a net increase of eight classrooms within the permanent building and eight of the 12 existing portables would be also removed from the site. When complete, the school is expected to have a total of 113,030 sf (including 109,553 sf in the permanent building and 3,477 sf in the four remaining portables). With no net change in the total number of classrooms, the overall school capacity would remain unchanged. When fully enrolled, the school could have about 83 employees (15 more than the current level).⁶ The enrollment area is assumed to remain the same as current; however, it is acknowledged that the school district can adjust enrollment areas in the future to balance attendance among schools as demographics change.

As part of the project, the District plans to reconfigure the site access, parking, and circulation to better accommodate student arrival and dismissal queues that regularly spill onto Wildwood Park Drive. A new fully-separated school-bus load/unload area and a new staff parking lot (with 28 spaces) would be created on the east side of the building west of the existing athletic field with all access and egress at the easternmost driveway.

A new entry-only access driveway would be constructed 150 feet west of the existing eastern access. This new entry would serve as the automobile entry for an expanded on-site queuing and load/unload area as well as the expanded western parking lot (increased by 2 spaces to 87 spaces). In total, the site would have 115 striped parking spaces available for typical school day conditions (an increase of 28 compared to the existing site). The school-bus load/unload areas and portions of the automobile load/unload zones may also be available for parking during non-school hours (such as for evening or weekend events) providing capacity for another 70 or more vehicles, for a total event capacity of over 185. The westernmost driveway would be relocated about 35 feet to the west and reconfigured to serve outbound traffic only. Figure 2 shows the proposed site plan.

⁶ B. Devereux, Puyallup School District, estimated based on staffing levels at other District junior high schools and likely increases for added student enrollment, July 2020.





Source: NAC Architecture, Landscape Plan Rendering, June 16, 2020.

Ferrucci Junior High Classroom Addition

Figure 2
Proposed Site Plan



2. EXISTING CONDITIONS

This section describes the existing roadway network, traffic volumes, traffic operations, transit facilities, non-motorized facilities, and parking.

2.1. Roadway Network

The City designates streets as major arterials, minor arterials, major collectors, minor collectors, and local streets depending upon the street's function in the roadway network.⁷ The following describes the near-site roadway network.

Wildwood Park Drive is a two-way northwest-to-southeast Major Collector that connects 23rd Avenue SE on the north to 39th Avenue SE on the south. Adjacent to the school site, it has two lanes (one in each direction) with curb and sidewalk along the northeast side; there is paved shoulder on the southwest side. The curb and sidewalk along the school frontage was constructed by the City in 2019. The roadway has a posted speed limit of 25 miles per hour (mph).

31st Avenue SE and **17th Street Place SE** are local residential streets located to the north and west of the site, respectively. 31st Avenue SE provide access from Wildwood Park Drive to the residential areas north of the school site; 17th Street Place SE is a dead-end street that extends south of 31st Avenue SE and provides access to 21 single-family residences. Both roadways have curbs and sidewalks on both sides. There is a raised crosswalk on 31st Avenue SE at Thornhill Road (west leg) that connects to the pedestrian pathway to Ferrucci Junior High School. There are also pedestrian pathways that connect between the school and 17th Street Place SE. One is located at the site's northwest corner; the other, which has been gated by the local homeowner's association, extends from the cul-de-sac at the south end of the street to the southwest corner of the school site. The speed limits are 25 mph with advisory 15-mph speed limits where speed humps exist.

2.2. Traffic Volumes

The City of Puyallup requested analysis of the school's access driveways on Wildwood Park Drive. Existing traffic volume data were collected at the access driveways to determine travel patterns including site-generated traffic, arrival and departure directions, and peaking conditions.

2.2.1. Existing Traffic

Traffic data at Ferrucci Junior High School were collected in February 2020 prior to the state-wide school closures and stay-home orders issued by Governor Inslee due to the Covid-19 pandemic. At the time of data collection, classes at the existing Ferrucci Junio High School started at 7:30 A.M. and were dismissed at 2:00 P.M. To evaluate the potential traffic conditions in the study area during times when the school generates its highest traffic volumes (the morning arrival and afternoon dismissal peak hours), video vehicle turning movement counts were performed at both site access driveways on Thursday, February 6, 2020. The morning counts were performed from 6:30 to 8:30 A.M.; the afternoon counts were performed from 1:00 to 6:00 P.M.

The traffic count data were compiled to document the 2020 existing morning arrival and afternoon dismissal peak hour traffic volumes for the school. Based on the counts, the school's morning peak hour occurs from 6:45 to 7:45 A.M.; the afternoon peak hour occurs from 1:45 to 2:45 P.M. The PM peak hour of the adjacent street occurred from 4:45 to 5:45 P.M.; however, the highest volume generated by the school during the PM peak period (highest volume between 4:00 and 6:00 P.M.) occurred from 4:00 to

⁷ City of Puyallup, *Puyallup Comprehensive Plan – Transportation Element*, 2015.



Ferrucci Junior High School Classroom Addition Transportation Technical Report

5:00 P.M. Figure 3 shows the existing 2020 morning arrival, afternoon dismissal, and PM peak hour traffic volumes. The count data sheets are provided in Appendix A. As stated previously, enrollment at the time of the counts was 727 students, which is about 70% of the school's existing capacity.

2.2.2. Existing School Trip Generation

Trip generation for the existing school was derived using the traffic counts performed in February 2020 plus in-person observations that were performed during afternoon dismissal at off-site locations along 31st Avenue SE, 17th Street Place SE, and Manorwood Drive to capture school-related trips that do not enter or exit the site. Table 1 summarizes the results of the trip generation study for Ferrucci Junior High. It lists the number of trips generated for the AM peak hour, afternoon peak hour of the school (highest one-hour volume at the end of the school day), and the PM peak hour of the adjacent street (highest one-hour volume between 4:00 and 6:00 P.M.). The time when each peak hour occurred is also listed. The morning peak hour trip values were increased to account for some observed off-site load/unload activity and decreased to remove 5th- and 6th-grade band student trips that would no longer occur at this site.⁸ The afternoon peak hour trip values were increased to account for some observed off-site load/unload activity.

Trip generation for the proposed school will be derived using rates published by the Institute of Transportation Engineers [ITE] in its *Trip Generation Manual*.⁹ The derived and published rates reflect all trips generated by the school including student pick-up/drop-offs, school bus trips, parent trips, teacher/staff trips, visitors, and after-hours use of fields or facilities. The City requires that peak hour trip generation for the school be developed using rates based on school building floor area. For comparison, peak hour trip generation rates for the existing school were derived based on the total school area (including the portables), which is 98,536 sf. These derived rates are presented in Table 1 along with the published rates for Middle/Junior High Schools (Land Use Code 522) from ITE's *Trip Generation Manual*.

Table 1. Trip Generation Summary: Ferrucci Junior High School – Existing

Reporting Period	School Size ¹ & Time Period	Observed Number of Trips			Observed Trip Rate (trips/1,000 sf)			ITE Rates ² (trips/1,000 sf)
		In	Out	Total	In	Out	Total	
	98,536 sf							
AM Peak Hour ³	6:45 – 7:45 A.M.	276	235	511	54%	46%	5.19	6.73
Afternoon Peak Hour ⁴	1:45 – 2:45 P.M.	89	133	222	40%	60%	2.25	3.33
PM Peak Hour	4:00 – 5:00 P.M.	28	46	74	38%	62%	0.75	1.19

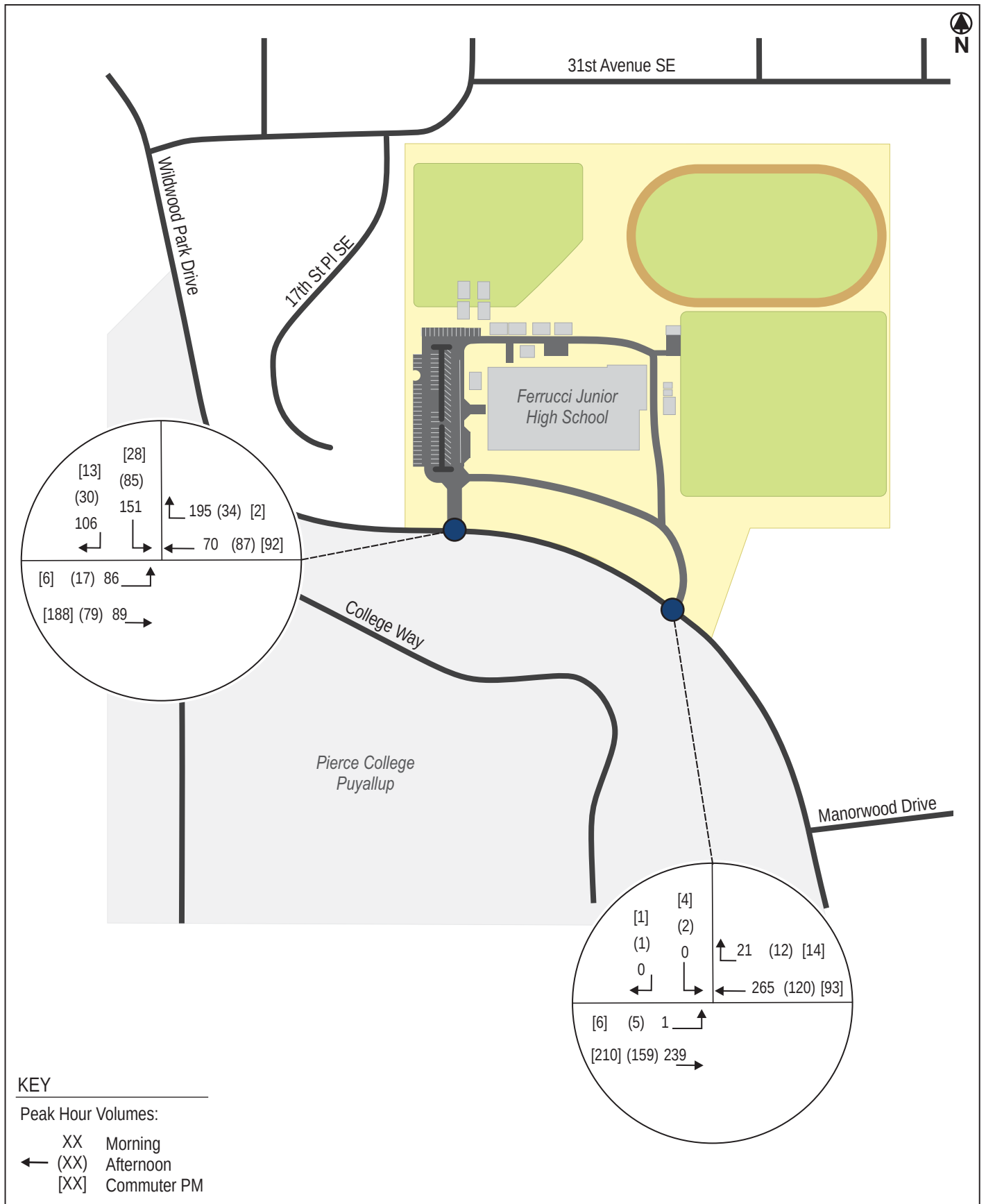
Source: Number of trips is based on turning movement counts (TMCs) performed at school's driveways on Thursday, February 06, 2020.

- Existing building area from Puyallup School District's 2019-2024 Capital Facilities Plan, October 7, 2019.
- Rates for Middle School/Junior High School (Land Use 522) from ITE's *Trip Generation Manual*, 10th Edition, 2017.
- AM peak hour trip values increased by 16 trips (8 in, 8 out) to account for some observed off-site load/unload activity and to remove 5th- and 6th-grade band student trips (35 in, 30 out) that would no longer occur at this site.
- Afternoon peak hour trip values increased by 30 trips (15 in, 15 out) to account for some observed off-site load/unload activity.

⁸ At the time of the counts, in addition to students enrolled in grades 7 through 9, the District offered band and orchestra instruction to interested 5th- and 6th-grade students within local junior high schools. This instruction took place during the junior high's first period. The District estimates that participation throughout the week ranged from 45 to 120 students (average of about 80 per day) and that more than half were driven by parents or guardians with under half riding the District's buses to the schools in the morning. After class, the 5th- and 6th-grade students were returned to their elementary schools by shuttle bus. In 2020, the Puyallup School Board determined that 5th and 6th-grade band student practice would be returned to elementary schools.

⁹ ITE, 10th Edition, September 2017.





Ferrucci Junior High Classroom Addition

Figure 3
Existing (2020) Traffic Volumes
Morning, Afternoon, and PM Peak Hour



As shown, all of the observed rates are lower than the published ITE rates. This is expected since the school was enrolled at about 70% of its total capacity at the time of the counts (with enrollment of 727 students). The derived rates range from 63% to 77% of the published ITE rates and combined are about 69% of the ITE rates. Based on this analysis, it appears reasonable to apply the ITE building-floor-area rates for analysis of the proposed project, as requested by the City, which would reflect conditions with the school at its capacity.

2.3. Traffic Operations

Traffic operations analyses were performed for the two site access driveway intersections on Wildwood Park Drive. Traffic operations are evaluated using levels of service (LOS) with six letter designations, “A” through “F.” LOS A is the best and represents the best traffic operation with little or no delay to motorists. LOS F is the worst and indicates poor traffic operations with long delays. The level of service definitions and thresholds are provided in Appendix B. The City’s adopted minimum operational standard for all intersections in the City is LOS D.¹⁰

Levels of service were determined using procedures in the *Highway Capacity Manual, Sixth Edition*.¹¹ Delay calculations rely on complex equations that consider a number of variables. For example, 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* traffic operations analysis software. The software models reflect current intersection geometries and levels of service were reported using the *HCM 6* module for unsignalized intersections.

Table 2 summarizes levels of service for existing (2020) morning arrival, afternoon dismissal, and PM peak hours at the site access intersections. As shown, the western (main) access driveway currently operates at LOS E overall in the morning with outbound turns operating at LOS F. During the afternoon and PM peak hours, both access intersections currently operate at LOS A overall with all movements operating at LOS C or better. The level-of-service calculation sheets are provided in Appendix C.

Table 2. Level of Service – Existing (2020) Conditions

Unsignalized Intersection	Morning Peak Hour (6:45 to 7:45 A.M.)		Afternoon Peak Hour (1:45 to 2:45 P.M.)		PM Peak Hour (4:00 to 5:00 P.M.)	
	LOS ¹	Delay ²	LOS	Delay	LOS	Delay
Wildwood Park Dr / Ferrucci West Dwy (overall)	E	47.6	A	7.7	A	2.5
Eastbound Left Turns	A	8.7	A	7.6	A	7.5
Southbound Turns	F	122.5	C	15.3	B	10.8
Wildwood Park Dr / Ferrucci East Dwy (overall)	A	0.0	A	0.4	A	0.4
Eastbound Left Turns	A	9.9	A	8.7	A	7.5
Southbound Turns	A	0.0	B	11.3	B	10.3

Source: Heffron Transportation, June 2020

1. LOS = Level of service.

2. Delay = Average seconds of delay per vehicle.

¹⁰ Ibid.

¹¹ Transportation Research Board [TRB], 2016.



2.4. Parking

The existing school's main parking lot is located west of the school building with a total of 85 striped spaces. There are two disabled-permit parking spaces located at the southeast corner of the building and there is a gravel area east of the building that is used for some staff parking.

School-day parking demand at junior high schools is primarily influenced by staffing levels and family-volunteer activity. Due to the state-wide school closures and stay-home orders associated with the Covid-19 pandemic, field counts of on-site parking demand were not possible at the time of this analysis. However, historical Google Earth images were reviewed for weekday parking demand conditions. Two images—one from April 2015 and one from May 2017—appear to reflect midday conditions on weekdays. These images showed 65 and 63 vehicles parked on the site, respectively. Based on the enrollments reported for those years (706 and 718 students, respectively), these parking demand values are effectively identical to what would be estimated by applying the average student-based rate of 0.09 vehicles-per-student published for Middle School/Junior High School (Land Use 522) in the Institute of Transportation Engineers' *Parking Generation*.¹² Based on the current number of employees (68), these demand values reflect a parking demand rate of 0.93 to 0.96 vehicles-per-employee.

2.5. Transit Facilities and Service

School bus transportation is available to students who reside within the school attendance area and live outside the walk area or who meet other special qualifications. The existing on-site school-bus load/unload area is aligned along the south side of building parallel to Wildwood Park Drive and does not currently have adequate curb-side capacity to accommodate all school buses (some buses are stacked side-by-side for load/unload).

The site is not directly served with transit stops; however, Pierce Transit provides bus service within the larger Pierce County area. The closest transit stops, serving Route 402, are located about 1.25 miles to the west on 31st Avenue SE at 4th Street Place SE and on 5th Street SE south of 31st Avenue SE. Route 402 connects to Federal Way via South Hill Mall, Puyallup, and Edgewood; it operates seven days per week with weekday service from about 5:00 A.M. to 9:00 P.M. with headways (time between consecutive buses) of 30 to 60 minutes.

2.6. Non-Motorized Transportation Facilities

Wildwood Park Drive has curb and sidewalk (constructed in 2019) on the northeast side along the school frontage. The other surrounding local roadways, including 31st Avenue SE and 17th Street Place SE have curbs and sidewalks on both sides. There is a marked, signed, and raised crosswalk on 31st Avenue SE at Thornhill Road (west leg).

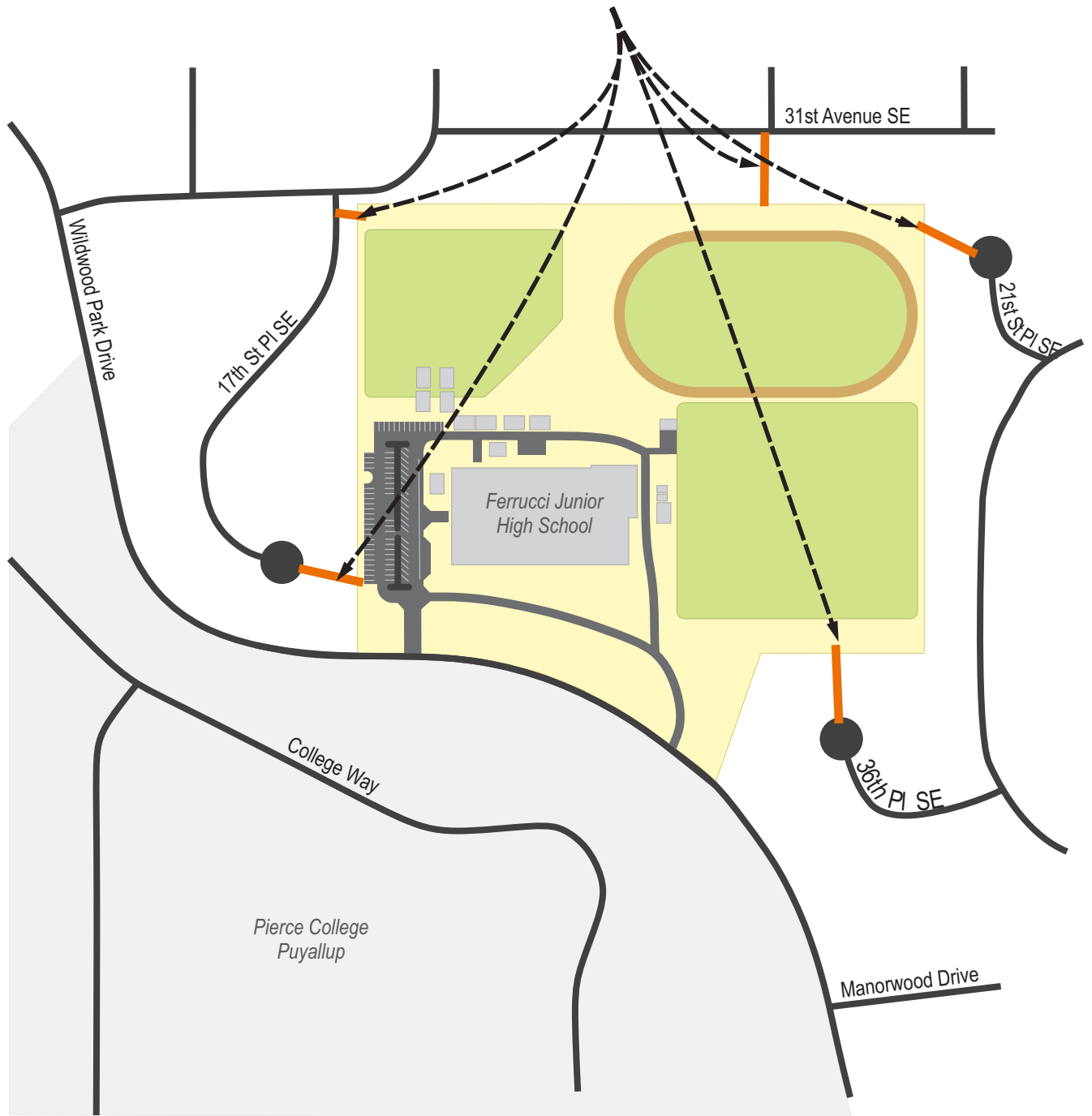
There are also five pedestrian connections between the school site and the surrounding residential streets to the west, north, and east as shown in Figure 4.

¹² ITE, 5th Edition, January 2019.





Pedestrian Access Paths



3. FUTURE WITHOUT PROJECT CONDITIONS

This section of the report presents the future conditions without the proposed project. Year 2023 was selected as the future horizon year for the analyses because the classroom addition and site reconfiguration project is expected to be complete and occupied for the 2022-23 school year. For comparison, and to provide an analysis of potential new traffic and parking impacts, year 2023 without-project conditions assume that Ferrucci Junior High School's attendance would grow to reach the level expected based on its total floor area. The following sections describe planned improvements, traffic volumes, and traffic operations (in terms of levels of service).

3.1. Planned Transportation Projects in Site Vicinity

The City of Puyallup's 2020-2026 *Six-Year Transportation Improvement (TIP)*¹³ summary sheet was reviewed to determine if any planned transportation projects could affect the analysis study area by 2023 when the project is planned to be complete and occupied. There are two projects identified along Wildwood Park Drive as described below.

Wildwood Park Drive: 23rd Ave SE to 39th Ave SE Bike Lanes – Project 2016-066 would install a shared-use path on the west side of the roadway from 23rd to 39th Avenues SE. It is identified for possible construction in 2023 with expenditures listed in 2024.

Safe Routes to School-Wildwood Sidewalk Links- Phase 3 - 26th to 31st – Project 2016-032 would extend the sidewalk on the east side of the roadway to complete the unimproved segment between 26th and 31st Avenues SE. It is identified for possible construction in 2022 with expenditures listed in 2022.

Neither of the above projects are expected to change the roadway capacity or channelization along the site frontage or at the analysis intersections. Therefore, the existing roadway network was assumed for 2023 baseline (without-project) analysis.

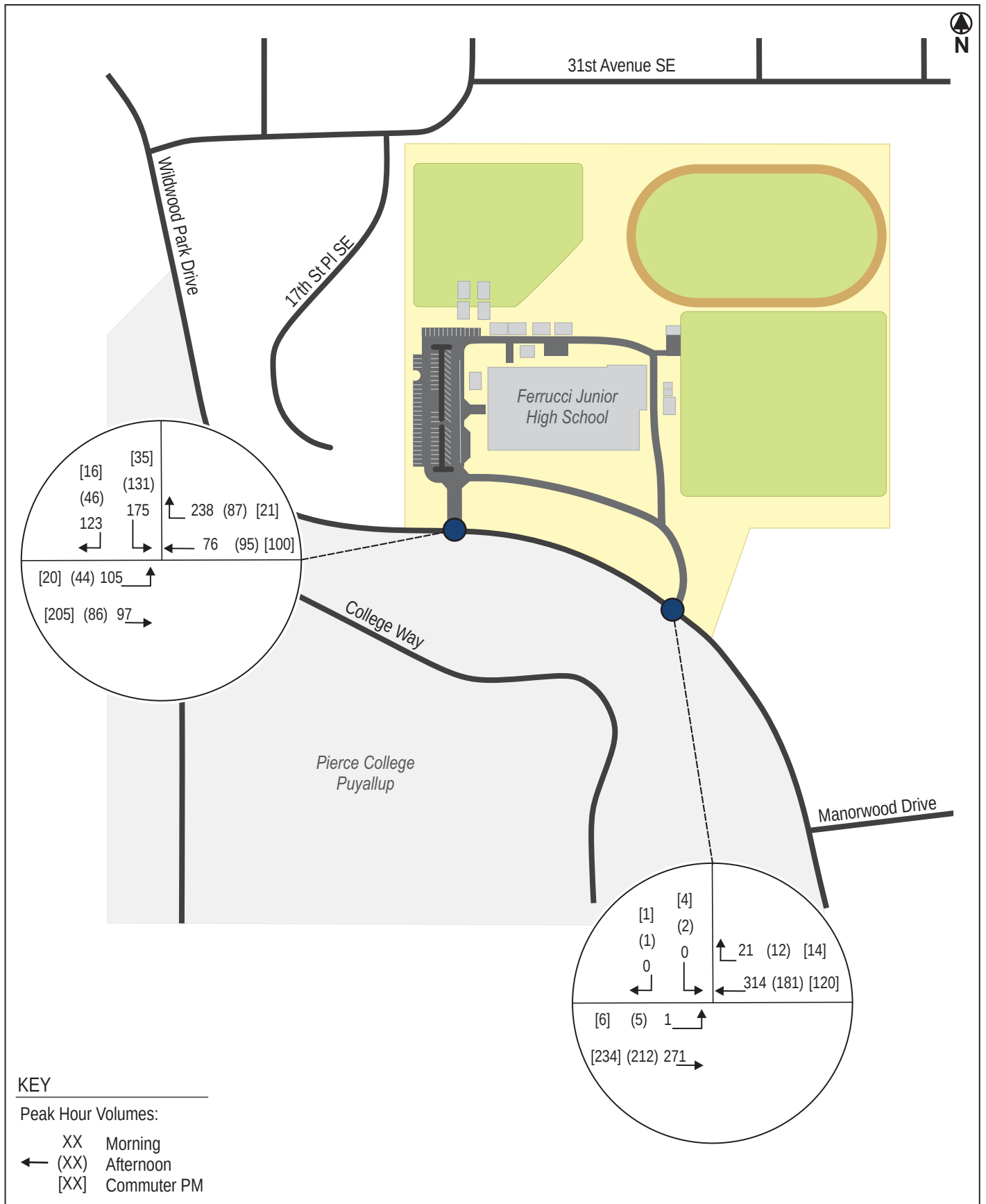
3.2. Forecast 2023 Background Traffic Volumes

Traffic forecasts were developed for future 2023 without-project conditions based on guidance provided by the City's Traffic Engineer. A 3% compound annual growth rate was applied to the existing 2020 non-school traffic volumes on Wildwood Park Drive to forecast 2023 without-project traffic volumes for each analysis period. School traffic generation at the site access intersections was also increased to reflect conditions with the existing school fully enrolled in order to provide a baseline for comparison of project impacts. As required by the City, trip estimates for the existing school without the project were developed using school building floor area rates published in the *Trip Generation Manual*. Those rates and a comparison to rates derived from traffic counts at Ferrucci Junior High were presented previously in section 2.2.2 *Existing School Trip Generation*. For this analysis, all school-generated traffic was assumed to occur at the site access driveways and no adjustments or reductions were made to account for the off-site vehicular load/unload activity observed around the site. The number of trips generated by the school at full capacity are summarized in Table 4 later in this report.

Figure 5 shows the resulting 2023 “without project” volumes during morning arrival, afternoon dismissal, and PM peak hours with the existing school fully enrolled.

¹³ City of Puyallup, Adopted 2019.





Ferrucci Junior High Classroom Addition

Figure 5
Forecast 2023 Without-Project Traffic Volumes
Morning, Afternoon, and PM Peak Hour

3.3. Traffic Operations

Levels of service for study area intersections were calculated for the 2023-without-project background conditions using the methodology described previously. Table 3 shows the results of the level of service analysis; results for the 2020 existing conditions are included for comparison.

As shown, the assumed increases in traffic by 2023 (3% annual growth in background traffic and increases in school traffic to reflect Ferrucci Junior High enrolled to its capacity) are forecast to increase delays during all three analysis periods. The increases in school traffic are forecast to cause sharp increases in delay for turns leaving the main site access in the morning peak hour. Turns leaving that access in the afternoon are also forecast to degrade to LOS E. Both intersections are projected to continue operating at LOS A overall with all movements at LOS B or better during the PM peak hour. The level of service calculation sheets are provided in Appendix C.

Table 3. Level of Service – Background (2023) Without-Project Conditions

Unsignalized Intersection	Morning Peak Hour (6:45 to 7:45 A.M.)		Afternoon Peak Hour (1:45 to 2:45 P.M.)		PM Peak Hour (4:00 to 5:00 P.M.)	
	LOS ¹	Delay ²	LOS	Delay	LOS	Delay
Wildwood Park Dr / Ferrucci West Dwy (overall)	F	124.1	C	24.6	A	3.0
Eastbound Left Turns	A	9.2	A	7.9	A	7.6
Southbound Turns	F	325.9	E	47.9	B	11.7
Wildwood Park Dr / Ferrucci East Dwy (overall)	A	0.0	A	0.3	A	0.3
Eastbound Left Turns	B	10.3	A	9.1	A	7.5
Southbound Turns	A	0.0	B	13.1	B	10.7

Source: Heffron Transportation, June 2020

1. LOS = Level of service.
2. Delay = Average seconds of delay per vehicle.

4. FUTURE WITH PROJECT CONDITIONS

This section describes the conditions that would exist with the proposed classroom addition and site reconfiguration at Ferrucci Junior High School. Potential impacts to study-area traffic operations, site access, queuing, transit, non-motorized facilities, and parking were evaluated. In addition, analysis of special event conditions and construction were examined.

4.1. Roadway Network

All vehicular access to the site would remain from Wildwood Park Drive; however, access would be reconfigured to expand on-site load/unload areas for buses and automobiles, and to increase parking. A new fully-separated school-bus load/unload area and a new staff parking lot would be created on the east side of the building with all access and egress at the existing easternmost driveway. A new entry-only access driveway would be constructed 150 feet west of the existing eastern access. This new entry would serve as the automobile entry for an expanded on-site queuing and load/unload area as well as the expanded western parking lot. The westernmost driveway would be relocated about 55 feet to the west and reconfigured to serve outbound traffic only. No other changes to the roadway system are proposed.

4.2. Traffic Volumes

The classroom addition project is intended to replace existing portable classrooms on the site. When complete, the school would have the same number of classrooms and capacity. Therefore, the project is not expected to result in increased traffic generation. However, the City has required that traffic generation estimates for the project be evaluated using rates published by ITE in its *Trip Generation Manual* based on the change in overall building floor area. The classroom addition would add about 21,450 sf of permanent building space while eight of twelve existing portable classrooms would be removed (four portable classrooms may be left at the site for storage though not expected to be used as classrooms). The project would result in an overall net increase of about 14,495 sf (accounting for removal of eight portables with about 870 sf each). Application of the published ITE floor-area rates suggests the proposed project could generate new trips on the surrounding transportation network. The following sections describe the potential net increases in traffic from the proposed project.

4.2.1. Trip Generation Estimates

Table 4 summarizes the forecast trip generation for the Ferrucci Junior High School without and with the proposed classroom addition project, using the ITE published floor-area rates described previously. As shown, the project is forecast to result in net increases of 260 trips per day, 88 morning peak hour trips, 44 afternoon peak hour trips, and 16 PM peak hour trips.

Table 4. Ferrucci Junior High School Classroom Addition – Trip Generation Summary

Site Condition	Total Size (st)	Daily Trips	Morning Peak Hour (6:45 to 7:45 A.M.)			Afternoon Peak Hour (1:45 to 2:45 P.M.)			PM Peak Hour (4:00 to 5:00 P.M.)		
			In	Out	Total	In	Out	Total	In	Out	Total
With Addition ¹	113,030	2,280	419	342	761	169	207	376	70	65	135
Existing School ²	98,536	1,990	365	298	663	148	180	328	61	56	117
Net Change	14,494	290	54	44	98	21	27	48	9	9	18

Source: Heffron Transportation, Inc., June 2020 using rates for Middle School/Junior High School (Land Use 522) from ITE's Trip Generation Manual, 10th Edition, 2017.

1. Proposed size of Ferrucci Junior High School, with addition (21,449 sf) and removal of eight portable classrooms (6,955 sf).
2. Existing size of Ferrucci Junior High School, including portable classrooms.



4.2.1. Forecast With-Project Traffic Volumes

School driveway trips were increased to reflect the with-project trip generation estimates described above and reassigned to account for the reconfigured site access, new school-bus load/unload area, and changes in on-site parking allocations. Figure 6 shows the estimated net changes in school-generated for the morning, afternoon, and PM peak hours. The net changes in school trips were combined with the 2023 non-school traffic forecasts described and presented previously. Figure 7 shows the forecast 2023 with-project volumes for morning, afternoon, and PM peak hours.

4.3. Traffic Operations

4.3.1. Levels of Service

Intersection levels of service for with-project conditions were determined using the same methodology described previously. Table 5 summarizes forecast 2019-with-project levels of service; without-project results are shown for comparison. As shown, the proposed site access reconfiguration is expected to substantially improve operations at the westernmost access driveway, which is planned to be shifted west and converted to exit only with two lanes. Even with potential increased school traffic, morning peak hour operations at this egress are forecast to improve from LOS F overall with severe delays for exiting traffic to LOS B overall with both left- and right-turns operating at LOS D or better. Afternoon peak hour operations are also forecast to improve from LOS C overall with poor delays for exiting traffic to LOS A overall with both left- and right-turns operating at LOS C or better. The proposed new entry driveway and the eastern school-bus/staff driveway are both forecast to operate at LOS A overall with all movements operating at LOS D or better. The level of service calculation sheets are provided in Appendix C.

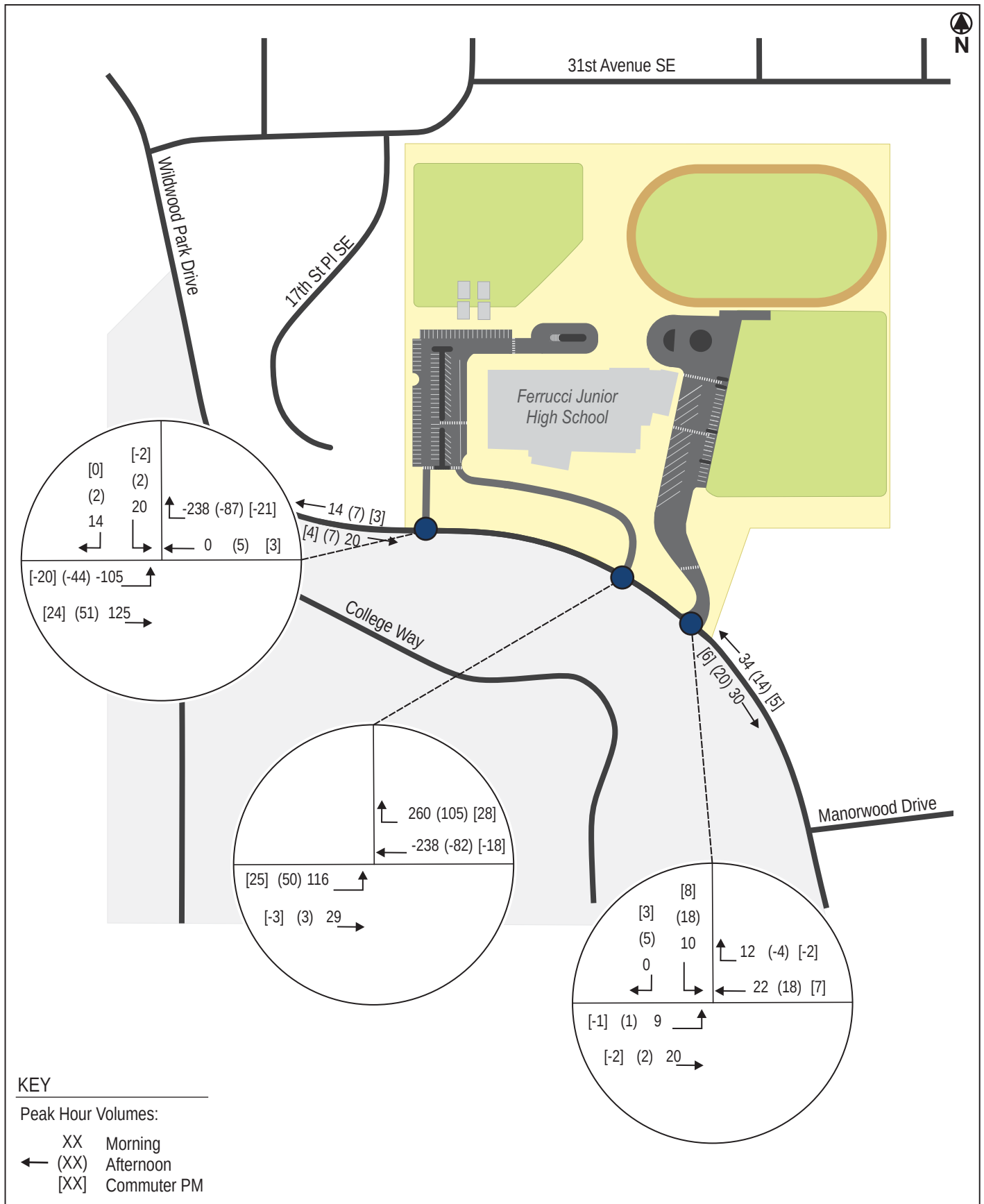
Table 5. Level of Service – Forecast 2023 With-Project Conditions

Unsignalized Intersection	Morning Peak Hour (6:45 to 7:45 A.M.)		Afternoon Peak Hour (2:00 to 3:00 P.M.)		PM Peak Hour (4:00 to 5:00 P.M.)	
	Without- Project	With-Project	Without- Project	With- Project	Without- Project	With- Project
	LOS ¹ Delay ²	LOS Delay	LOS Delay	LOS Delay	LOS Delay	LOS Delay
Wildwood Park Dr / Ferrucci West Dwy (overall)	F 124.1	B 10.4	C 24.6	A 9.1	A 3.0	A 2.5
Eastbound Left Turns	A 9.2	n/a ³	A 7.9	n/a ³	A 7.6	n/a ³
Southbound Turns ⁴ Lefts	F 325.9	D 26.1	E 47.9	C 17.6	B 11.7	B 11.7
Right		B 10.1		A 9.5		A 9.1
Wildwood Park Dr / Ferrucci New Center Dwy (overall)	n/a ⁵	A 1.5	n/a ⁵	A 0.9	n/a ⁵	A 0.4
Eastbound Left Turns		A 9.4		A 8.1		A 7.6
Wildwood Park Dr / Ferrucci East Dwy (overall)	A 0.0	A 0.7	A 0.3	A 1.6	A 3.0	A 0.7
Eastbound Left Turns	B 10.3	A 8.9	A 9.1	A 8.9	A 7.6	A 7.6
Southbound Turns	A 0.0	D 31.2	B 13.1	C 18.7	B 11.7	B 10.8

Source: Heffron Transportation, June 2020.

1. LOS = Level of service.
2. Delay = Average seconds of delay per vehicle.
3. n/a = Not Applicable. Access would be converted to exit only with project.
4. For existing and without-project conditions, all southbound turns occur from one shared lane. With proposed project, left and right turns have separate lanes.
5. n/a = Not Applicable. New driveway proposed with project; does not currently exist

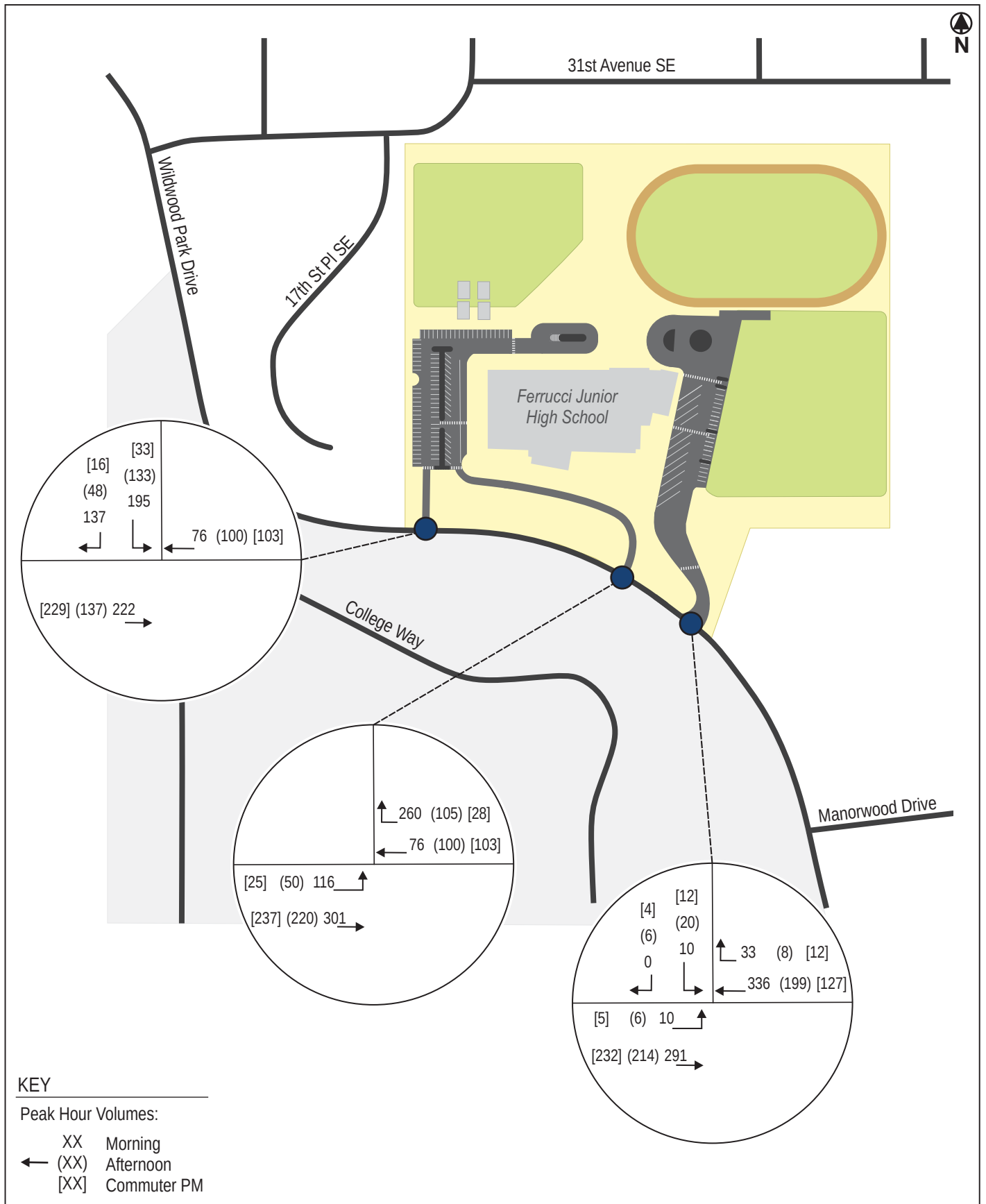




Ferrucci Junior High Classroom Addition

Figure 6
Net Change in School Traffic Volumes
Morning, Afternoon, and PM Peak Hour





Ferrucci Junior High Classroom Addition

Figure 7
Forecast 2023 With-Project Traffic Volumes
Morning, Afternoon, and PM Peak Hour

4.3.2. On-Site Operations & Queuing

Access Channelization Review

The City requested review of left-turn channelization requirements using guidance published in the latest version of Washington State Department of Transportation's (WSDOT) *Design Manual*.¹⁴ The potential need for left-turn storage was evaluated using the forecast 2023 peak hour traffic volumes described in the previous section and guidance in section 1310.03(2)(a) of WSDOT's *Design Manual*. The manual suggests considering the following to determine whether or not to provide left-turn lanes.

- *A traffic analysis indicates congestion reduction with a left-turn lane.*
- *On two-lane highways, use Exhibit 1310-7a, based on total traffic volume (DHV) for both directions and percent left turn traffic, to determine whether further investigation is needed.*
- *A study indicates crash reduction with a left-turn lane.*
- *Restrictive geometrics require left-turning vehicles to slow greatly below the speed of the through traffic.*
- *There is less than decision sight distance for traffic approaching a vehicle stopped at the intersection to make a left turn.*

A traffic analysis based on the Highway Capacity Manual (HCM) may also be used to determine whether left-turn lanes are needed to maintain the desired level of service.

Exhibit 1310-7a from the WSDOT *Design Manual* was used together with the forecast 2023 morning, afternoon, and PM peak hour traffic volumes at both proposed entry locations on Wildwood Park Drive—the new main entry and the bus/staff access. The WSDOT review exhibit provides guidance for roadways with posted speed limits of 40, 50, and 60 mph. Since the posted speed limit on Wildwood Park Drive is 25 mph, the 40 mph curves were considered. Figure 8 shows the WSDOT review exhibit with the volumes and left-turn percentages for each driveway location and analysis hour. As shown, the volume and left-turn percentage for the main entry during the morning peak hour are above the 40-mph curve and indicate 'further analysis recommended,' while storage is not needed for afternoon or PM peak hours. Storage is also not needed for any period at the bus/staff access.

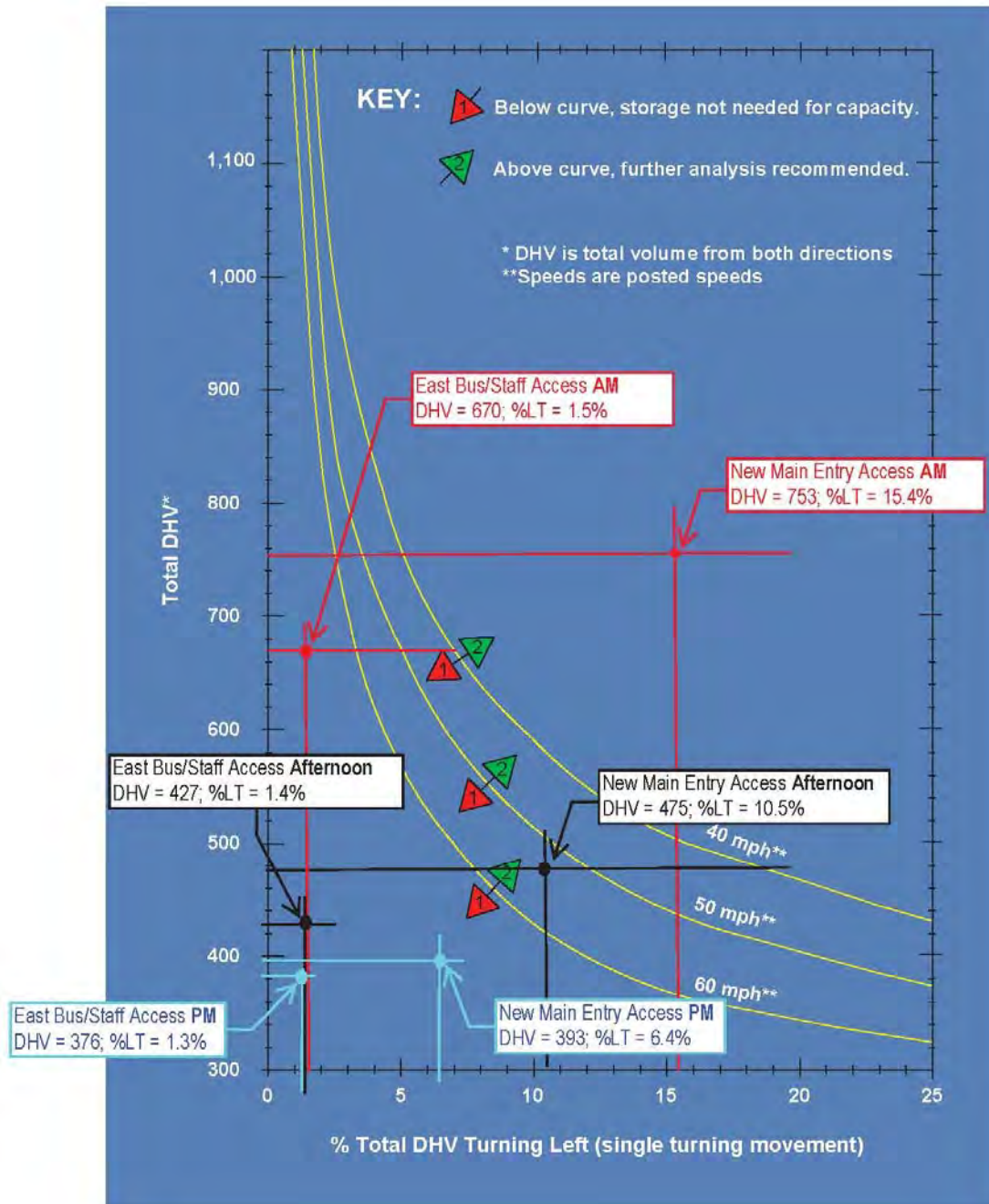
As suggested by the WSDOT exhibit, further analysis for the morning peak hour at the proposed new main entry access was performed. As noted in the intersection level of service analysis presented previously, the eastbound left-turn into the site at the proposed new main entry is forecast to operate at LOS A with average delay of 9.4 seconds per vehicle. The 95th-percentile queue is forecast at 0.8 seconds per vehicle. These are very good operating conditions and are expected because the background (non-school-generated) traffic on Wildwood Park Drive is forecast to remain relatively low—96 trips eastbound and 76 trips westbound—during the morning peak hour. Since the analysis reflects volumes for the entire peak hour, it is important to recognize that the volume of entering left-turn traffic would not occur at the same time as about 65% of the eastbound through volume. This is because the entering trips—families drivers dropping students off at school—would occur earlier in the peak hour, while those same family drivers leaving the site from the west exit driveway would be through trips later in the peak hour. The potential for queuing conditions along Wildwood Park Drive were also evaluated using the Synchro's companion SimTraffic 10.3 micro-simulation software. Five 60-minute simulation runs were performed for morning and afternoon peak hours. During the morning peak hour, the 95th-percentile queue for eastbound left-turns into the site was reported at 111 feet—or about 4 cars; during the afternoon peak hour, the 95th-percentile queue for eastbound left-turns into the site was reported at 45 feet—or about 2 cars. The simulation reports are provided in Appendix D.

¹⁴ WSDOT, December 2019.



Figure 8. WSDOT Left-Turn Channelization Review

Exhibit 1310-7a Left-Turn Storage Guidelines: Two-Lane, Unsignalized



Based on the level of service, queueing, and simulation analysis, the project would substantially improve site access driveway operations, and would significantly increase on-site vehicle queue storage and parking capacity. The addition of left-turn storage on Wildwood Park Drive would have limited benefit and is not needed to provide acceptable operations of the proposed new entry access. In addition, widening of Wildwood Park Drive to provide a center-left-turn storage pocket would necessitate demolition, removal, and replacement of the curb and sidewalk along the school frontage that was just constructed by the City in 2019. There could also be impacts to stormwater facilities, trees, and other sensitive environmental elements in the vicinity. Therefore, no left-turn channelization is recommended for the proposed classroom addition project.

On-Site Queuing Conditions

Peak on-site queuing demand may increase with the expanded school enrolled to its planned capacity. In the mornings, school drop-off activities tend to be spread out over the 20 to 30 minutes before school start time. During this period, family drivers generally arrive, drop off students, and then immediately leave the site. In the afternoons, many drivers arrive early and wait in the queue lane(s) or parking spaces for the students to be dismissed, and longer vehicle queues can develop.

The morning arrival queue can be modeled directly using Poisson arrival methodologies for a multi-channel service system (i.e., the number of drop-off spaces that can be used simultaneously). Assumptions from multi-day video data collection at Pacific Cascade Middle School in the Issaquah School District were applied for this analysis.¹⁵ These observations of 120 morning-unloading maneuvers over three consecutive days found an average of about 33 seconds for students to exit vehicles before the vehicle began egressing the site. This equates to a service rate for each drop-off space of 1.82 vehicles per minute (36.4 vehicles in 20 minutes or a rate of 109 vehicles per hour). For Ferrucci Junior High, the total estimated morning arrival peak hour volume is 419 vehicles (as presented in the *Trip Generation* section); however, 43 vehicles are forecast to enter at the eastern bus/staff access and 44 vehicles are expected to be staff that park in the main lot. The remaining 332 vehicles are forecast to use the load/unload area. To account for the compressed 20-minute arrival period, the arrival rate for the model is three times this level or 996 vehicles per hour.

Students could be dropped off anywhere along the load/unload zone shown on the site plan (see Figure 2), which allows for about 22 spaces to be used at one time. The project includes a building access revision that would focus morning student arrivals to the north side of the building. This would help encourage family drivers to use the entire load/unload zone and maximize queue storage. To provide an analysis of potential worst-case conditions, only the northernmost 12 to 15 spaces were evaluated to estimate both the average and 95th-percentile queues for the drop-off area. Table 6 presents the estimated queues for the assumed drop-off spaces during the morning arrival. As shown, the estimated morning arrival queue is expected to be accommodated on-site and not exceed the available load/unload zone capacity. The queue model calculation results are included in Appendix D.

Table 6. Estimated Morning Arrival Vehicle Queues

Vehicles Served Simultaneously	Average Queue	95 th Percentile Queue	Exceeds On-Site Vehicle Capacity?
12 vehicles	10 vehicles	17 vehicles	No
15 vehicles	9 vehicles	14 vehicles	No

Source: Heffron Transportation, Inc., July 2020, using service rate assumptions based on observations at Pacific Cascade Middle School, (Heffron Transportation, Inc., June 2019).

¹⁵ Heffron Transportation, Inc., Video observations at Pacific Cascade Middle School, June 11, 12, and 13, 2019.



Although the queue analysis and estimation model is reasonable for application to morning arrival queues, the afternoon queueing conditions are different. Family drivers arrive prior to school dismissal during a time when no vehicles are being loaded (or serviced). In addition, students arrive at their family vehicles at different rates, so the service times per vehicle are different than during morning arrival. Therefore, on-site vehicle queue estimates during afternoon dismissal were based on published planning research and guidance, which suggest providing on-site queue stacking of between 1.2 and 2.0 feet per student¹⁶ (for this site roughly 1,200 to 2,000 feet or 60 to 100 vehicles).

The existing school configuration provides about 290 linear feet (about 14 to 15 vehicles) of queue stacking area; however, it is interrupted by the conflicting school-bus egress path where buses are required to mingle with family vehicles to leave the site. The new on-site passenger-vehicle load/unload loop, at about 870 feet, would provide space for about 44 vehicles to queue and load or unload. The proposed new staff parking (28 spaces) on the east side of the building would free up parking within the main lot that could be used by family drivers that park and walk students to and from the building. During the afternoon dismissal period, the west lot is estimated to have 35 to 40 unused stalls that could be used by family drivers waiting to pick up students. Combined, the site would provide a total on-site queuing/stacking capacity for about 80 vehicles, which is within the recommended range and over 5.5 times more than the current site configuration. The separation of school buses from family-vehicle traffic and separated entry and exit driveways are also anticipated to substantially improve overall access and queuing conditions.

It is acknowledged that some fluctuation in volumes and queuing activities are common as they can be affected by weather, special events, and unfamiliarity with drop-off/pick-up procedures at the beginning of each school year.

4.4. Site Access Spacing and Sight Distance

4.4.1. Access Driveway Spacing

The proposed classroom addition project includes a site access and on-site circulation improvement that would construct a new entry-only driveway serving the main parking lot and family-vehicle load/unload area. That new entry driveway would be located 150 feet west of the existing easternmost access (measured between the closest edges of each driveway). In addition, the westernmost driveway would be relocated about 35 feet to the west and reconfigured to serve outbound traffic only. The proposed site access driveways would meet the minimum driveway spacing standards outlined in section 101.10.1 of the *City of Puyallup – City Standards*.¹⁷

4.4.2. Sight Distance Analysis

Entering and stopping sight distances at the access driveways were reviewed. The minimum Stopping Sight Distance (SSD) is distance a driver needs to enable the vehicle to stop before reaching a stationary object in its path. The distance accounts for reaction time and braking distance. As outlined in the *City Standards Table 100-2*, it is measured from a driver's eye height of 3.5 feet to an object height of 0.5 feet. Wildwood Park Drive is a Collector with a design speed of 35 mph and a posted speed limit of 25 mph. The roadway slopes downward to the southeast with limited vertical sightline obstruction; however, the roadway is curved with some horizontal sightline limitations. The required minimum SSD is 250 feet.

¹⁶ Keith B. Higgins, PE, TE – Hatch Mott MacDonald, *Retooling School Drop-off/Pick-up Zones to Meet Demand*, WesternITE Meeting Paper 9C, 2010.

¹⁷ City of Puyallup, Revised 11/2019.



Minimum Entering Sight Distance (ESD) is the distance required for a driver in a stopped position on the minor road (or driveway approach) to view an oncoming vehicle traveling at the speed limit on the major road and appearing after the movement has begun, and safely enter or cross the major road. Minimum values are based on an object (oncoming vehicle) height of 3.5 feet and a driver's eye height of 3.5 feet set back from the edge of the travel way by 14.5 feet. Based on these standards, driveways on Wildwood Park Drive require ESD of 300 feet.

Figure 9 shows that the minimum SSD of 250 feet is provided for all access driveway; Figure 10 shows sight triangles for ESD of 300 feet or greater can be provided within the right-of-way at the two access driveways that would serve site egress.

4.5. Transit Facilities and Service

School bus transportation would continue to be provided to those students who qualify. The site improvements would provide room for 11 full-size buses and 6 smaller SPED buses to load/unload simultaneously, which would improve school bus access and safety. Also, it is unlikely that transit trips would be generated by teachers or staff at the site since the nearest transit stops are over a mile from the site. The project is not expected to result in adverse impacts to transit.

4.6. Non-Motorized Transportation Facilities

The project would provide improved pedestrian connections from Wildwood Park Drive to the school building. New on-site crosswalks are also proposed between the building and the athletic fields to the east and north. The northern crosswalk would be raised to enhance pedestrian visibility and to serve as a speed hump near the planned main building entry for student arrivals and dismissals. The project is not expected to adversely impact non-motorized transportation facilities.

4.7. Parking

4.7.1. School Day Parking

School-day parking at junior high schools is primarily influenced by staffing levels and family-volunteer activity. The District estimates that Ferrucci Junior High School could have up to 83 employees with the school at capacity. Using the employee-based parking demand rates derived for Ferrucci Junior High and presented previously (0.96 vehicles-per-employee), the school is estimated to generate peak demand of about 80 vehicles on a typical school day. This peak demand level is likely to occur midday when teachers, administrative staff, kitchen staff, and volunteers. The proposed expanded on-site parking supply of 115 spaces is expected to accommodate typical midday peak parking demand.

4.7.2. Evening Event Parking

Ferrucci Junior High School would continue to host occasional evening events throughout the school year. The types of events typically held at the school include: 6th Family Night & 8th Grad Info Night, 7th Grade Parent Night, athletics (such as basketball games), PTSA meetings and events, music performances, school plays, and band, orchestra, and choir concerts. For many of these events, the attendance and parking demand would not change noticeably. With larger enrollment at the school, which could occur without or with the project, some event parking demand could be higher. For evening events, the on-site parking supply of 115 spaces would be available along with the school-bus and automobile load/unload zones offering another 70 or more vehicles for a total event capacity of over 185 spaces. The added event parking capacity proposed with the project would better allow the site to accommodate event-related parking demand compared to without-project conditions.



Figure 9
Stopping Sight Distance



4.8. Construction Traffic

The existing school will continue to operate on the site while the new school is being constructed. This will require careful coordination to make sure that construction activities do not affect school loading/unloading and parking operations when school is in session.

The District should require the selected contractor to develop a construction management plan (CMP) that addresses traffic and pedestrian control during school construction. It should define truck routes, lane closures, walkway closures, and parking disruptions, as necessary. The CMP 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. The CMP should identify parking locations for the construction staff; to the extent possible, construction employee parking should be contained on-site.



5. MITIGATION

5.1. Physical Improvements

Based on the analysis required by the City, no improvements would be required at off-site intersections to accommodate the proposed classroom addition project. Some modifications to the frontage along Wildwood Park Drive would be required as part of the access reconfiguration. With the relocation of the western driveway, curb and sidewalk would be constructed in place of the current access location.

5.2. Construction Management Plan

The District should require the selected contractor to develop a construction management plan (CMP) that addresses traffic and pedestrian control during school construction. It should define truck routes, lane closures, walkway closures, and parking disruptions, as necessary. The CMP 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. The CMP should identify parking locations for the construction staff; to the extent possible, construction employee parking should be contained on-site.

5.3. Street Impact Fee

The City of Puyallup collects Street Impact Fees impact fees for new development. Based on rates published in the Puyallup Municipal Code Section 21.20.130,¹⁸ the impact fee rate is currently \$4,500 per new PM peak hour trip. Based on this rate and the estimated net increase of 18 PM peak hour trips (as shown in Table 4), the estimated impact fee would be \$81,000 (18 trips × \$4,500 per trips). It should be noted that traffic impact fees are typically due and payable as a condition of issuance of a building permit based on the fee rates in effect at that time.

¹⁸ Ord. 2893 § 1, 2007; Ord. 2837 § 1, 2005.

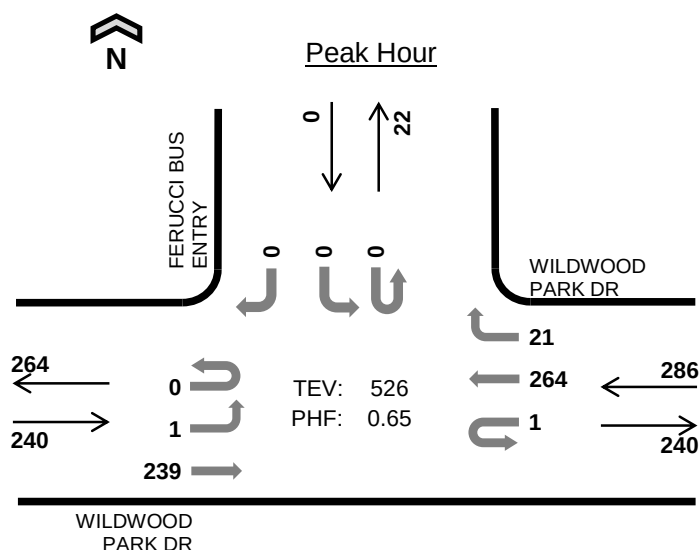


APPENDIX A

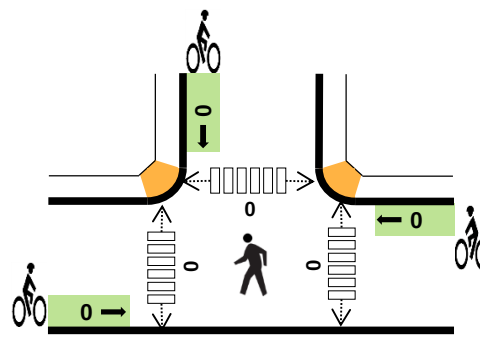
TRAFFIC COUNT DATA SHEETS



FERUCCI BUS ENTRY WILDWOOD PARK DR



Date: Thu, Feb 06, 2020
Count Period: 6:30 AM to 8:30 AM
Peak Hour: 6:45 AM to 7:45 AM



	HV %:	PHF
EB	5.0%	0.60
WB	4.9%	0.63
NB	-	-
SB	-	-
TOTAL	4.9%	0.65

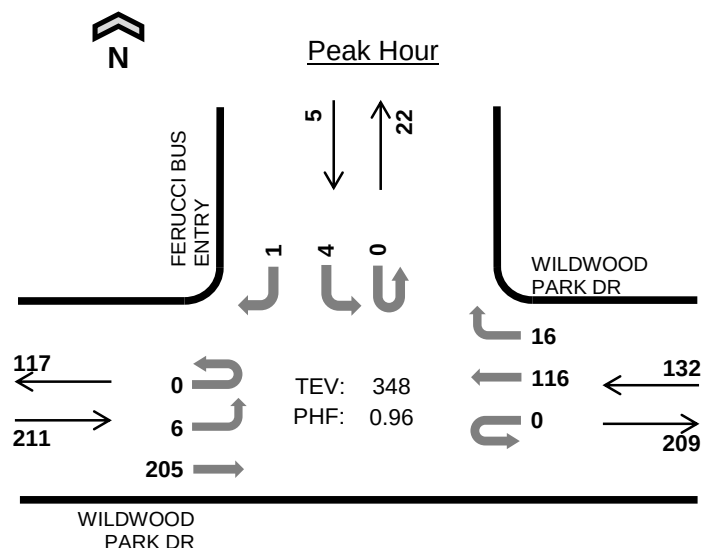
Two-Hour Count Summaries

Interval Start	WILDWOOD PARK DR Eastbound				WILDWOOD PARK DR Westbound				0 Northbound				FERUCCI BUS ENTRY Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
6:30 AM	0	0	16	0	0	0	25	1	0	0	0	0	0	0	0	0	42	0
6:45 AM	0	0	19	0	0	0	34	7	0	0	0	0	0	0	0	0	60	0
7:00 AM	0	0	65	0	0	0	105	9	0	0	0	0	0	0	0	0	179	0
7:15 AM	0	1	99	0	1	0	97	3	0	0	0	0	0	0	0	0	201	482
7:30 AM	0	0	56	0	0	0	28	2	0	0	0	0	0	0	0	0	86	526
7:45 AM	0	0	25	0	0	0	31	1	0	0	0	0	0	0	0	0	57	523
8:00 AM	0	1	22	0	0	0	24	3	0	0	0	0	0	0	0	0	50	394
8:15 AM	0	0	21	0	0	0	34	2	0	0	0	0	0	0	0	0	57	250
Count Total	0	2	323	0	1	0	378	28	0	0	0	0	0	0	0	0	732	0
Peak Hour	0	1	239	0	1	0	264	21	0	0	0	0	0	0	0	0	526	0

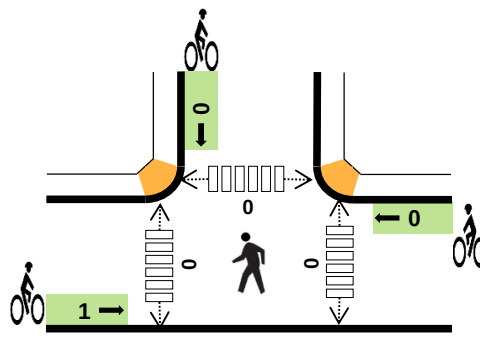
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
7:00 AM	5	9	0	0	14	0	0	0	0	0	0	0	0	0	0
7:15 AM	5	3	0	0	8	0	0	0	0	0	0	0	0	0	0
7:30 AM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
8:00 AM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0
Count Total	16	17	0	0	33	0	0	0	0	0	0	0	0	0	0
Peak Hr	12	14	0	0	26	0	0	0	0	0	0	0	0	0	0

FERUCCI BUS ENTRY WILDWOOD PARK DR



Date: Thu, Feb 06, 2020
Count Period: 1:00 PM to 6:00 PM
Peak Hour: 3:30 PM to 4:30 PM



	HV %:	PHF
EB	1.9%	0.91
WB	4.5%	0.85
NB	-	-
SB	0.0%	0.63
TOTAL	2.9%	0.96

Five-Hour Count Summaries

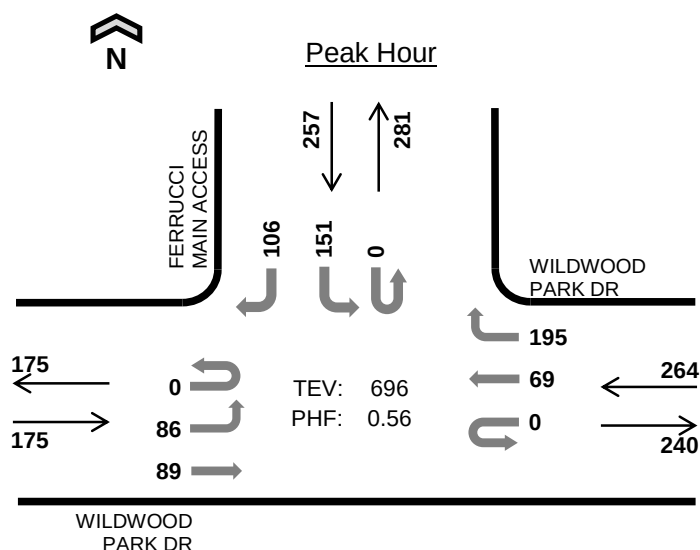
Interval Start	WILDWOOD PARK DR				WILDWOOD PARK DR				0				FERUCCI BUS ENTRY				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
3:30 PM	0	0	54	0	0	0	37	0	0	0	0	0	0	0	0	0	91	0
3:45 PM	0	0	48	0	0	0	35	4	0	0	0	0	0	1	0	0	88	0
4:00 PM	0	3	48	0	0	0	21	4	0	0	0	0	0	1	0	1	78	0
4:15 PM	0	3	55	0	0	0	23	8	0	0	0	0	0	2	0	0	91	348
Peak Hour	0	6	205	0	0	0	116	16	0	0	0	0	0	4	0	1	348	0

Note: For all three-hour count summary, see next page.

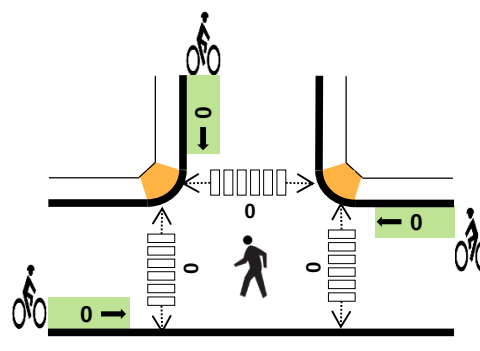
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
3:30 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0
3:45 PM	3	3	0	0	6	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
4:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
Peak Hour	4	6	0	0	10	1	0	0	0	1	0	0	0	0	0

Five-Hour Count Summaries																		
Interval Start	WILDWOOD PARK DR				WILDWOOD PARK DR				0				FERUCCI BUS ENTRY				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
1:00 PM	0	0	23	0	0	0	23	3	0	0	0	0	0	0	0	0	49	0
1:15 PM	0	2	15	0	0	0	20	0	0	0	0	0	0	0	0	0	37	0
1:30 PM	0	4	24	0	0	0	26	0	0	0	0	0	0	0	0	0	54	0
1:45 PM	1	0	19	0	0	0	35	9	0	0	0	0	0	0	0	0	64	204
2:00 PM	0	3	89	0	2	0	30	0	0	0	0	0	0	0	0	1	125	280
2:15 PM	0	0	25	0	0	0	25	2	0	0	0	0	0	0	0	0	52	295
2:30 PM	0	2	24	0	0	0	28	1	0	0	0	0	0	2	0	0	57	298
2:45 PM	0	0	30	0	0	0	41	0	0	0	0	0	0	0	0	2	73	307
3:00 PM	0	0	32	0	0	0	26	1	0	0	0	0	0	0	0	0	59	241
3:15 PM	0	0	38	0	0	0	21	1	0	0	0	0	0	0	0	0	60	249
3:30 PM	0	0	54	0	0	0	37	0	0	0	0	0	0	0	0	0	91	283
3:45 PM	0	0	48	0	0	0	35	4	0	0	0	0	0	1	0	0	88	298
4:00 PM	0	3	48	0	0	0	21	4	0	0	0	0	0	1	0	1	78	317
4:15 PM	0	3	55	0	0	0	23	8	0	0	0	0	0	2	0	0	91	348
4:30 PM	0	0	54	0	0	0	29	2	0	0	0	0	0	1	0	0	86	343
4:45 PM	0	0	53	0	0	0	20	0	0	0	0	0	0	0	0	0	73	328
5:00 PM	0	0	56	0	0	0	21	1	0	0	0	0	0	0	0	0	78	328
5:15 PM	0	0	47	0	0	0	23	1	0	0	0	0	0	0	0	0	71	308
5:30 PM	0	0	68	0	0	0	25	0	0	0	0	0	0	1	0	0	94	316
5:45 PM	0	0	48	0	0	0	22	1	0	0	0	0	0	0	0	0	71	314
Count Total	1	17	850	0	2	0	531	38	0	0	0	0	0	8	0	4	1,451	0
Peak Hour	0	6	205	0	0	0	116	16	0	0	0	0	0	4	0	1	348	0
Note: Five-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total			
1:00 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0		
1:15 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0		
1:30 PM	5	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0		
1:45 PM	5	8	0	0	13	0	0	0	0	0	0	0	0	0	0	0		
2:00 PM	10	1	0	0	11	0	0	0	0	0	0	0	0	0	0	0		
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
2:45 PM	1	5	0	0	6	0	0	0	0	0	0	0	0	0	0	0		
3:00 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0		
3:15 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0		
3:30 PM	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0		
3:45 PM	3	3	0	0	6	0	0	0	0	0	0	0	0	0	0	0		
4:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0		
4:15 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
4:30 PM	2	0	0	0	2	0	0	0	0	0	0	0	1	0	1	1		
4:45 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
5:00 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
5:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0		
5:30 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Count Total	39	27	0	0	66	1	0	0	0	1	0	0	1	0	1	1		
Peak Hr	4	6	0	0	10	1	0	0	0	1	0	0	0	0	0	0		

FERRUCCI MAIN ACCESS WILDWOOD PARK DR



Date: Thu, Feb 06, 2020
Count Period: 6:30 AM to 8:30 AM
Peak Hour: 6:45 AM to 7:45 AM



	HV %:	PHF
EB	1.1%	0.53
WB	0.4%	0.61
NB	-	-
SB	3.9%	0.55
TOTAL	1.9%	0.56

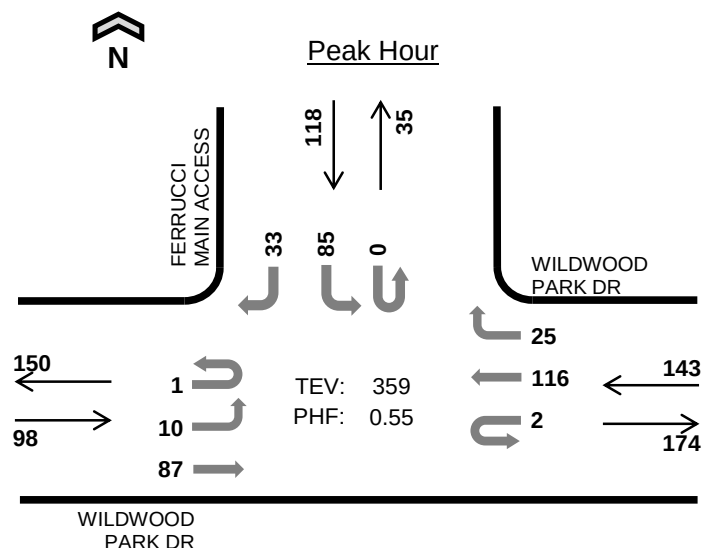
Two-Hour Count Summaries

Interval Start	WILDWOOD PARK DR Eastbound				WILDWOOD PARK DR Westbound				0 Northbound				FERRUCCI MAIN ACCESS Southbound				15-min Total	Rolling One Hour
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
6:30 AM	0	7	8	0	0	0	18	8	0	0	0	0	0	9	0	2	52	0
6:45 AM	0	10	14	0	0	0	12	22	0	0	0	0	0	5	0	8	71	0
7:00 AM	0	25	14	0	0	0	18	76	0	0	0	0	0	51	0	31	215	0
7:15 AM	0	47	35	0	0	0	25	84	0	0	0	0	0	64	0	53	308	646
7:30 AM	0	4	26	0	0	0	14	13	0	0	0	0	0	31	0	14	102	696
7:45 AM	0	1	22	0	0	0	27	5	0	0	0	0	0	3	0	3	61	686
8:00 AM	0	1	18	0	0	0	22	1	0	0	0	0	0	5	0	4	51	522
8:15 AM	0	1	19	0	0	0	32	2	0	0	0	0	0	2	0	1	57	271
Count Total	0	96	156	0	0	0	168	211	0	0	0	0	0	170	0	116	917	0
Peak Hour	0	86	89	0	0	0	69	195	0	0	0	0	0	151	0	106	696	0

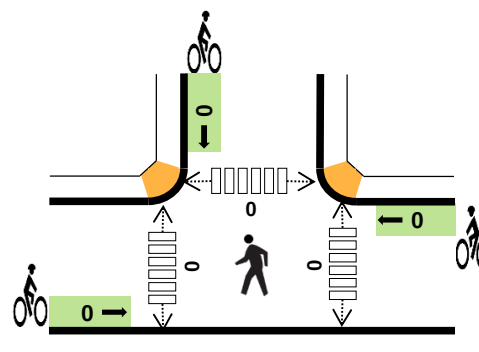
Note: Two-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
6:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	1	0	5	6	0	0	0	0	0	0	0	0	0	0
7:15 AM	2	0	0	3	5	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	0	2	3	0	0	0	0	0	0	0	0	0	0
8:15 AM	2	0	0	0	2	0	0	0	0	0	0	0	0	0	0
Count Total	4	3	0	14	21	0	0	0	0	0	0	0	0	0	0
Peak Hr	2	1	0	10	13	0	0	0	0	0	0	0	0	0	0

FERRUCCI MAIN ACCESS WILDWOOD PARK DR



Date: Thu, Feb 06, 2020
Count Period: 1:00 PM to 6:00 PM
Peak Hour: 2:00 PM to 3:00 PM



	HV %:	PHF
EB	4.1%	0.63
WB	4.2%	0.78
NB	-	-
SB	7.6%	0.37
TOTAL	5.3%	0.55

Five-Hour Count Summaries

Interval Start	WILDWOOD PARK DR				WILDWOOD PARK DR				0				FERRUCCI MAIN ACCESS				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
2:00 PM	1	6	32	0	2	0	23	21	0	0	0	0	0	59	0	20	164	0
2:15 PM	0	2	15	0	0	0	27	0	0	0	0	0	0	10	0	5	59	0
2:30 PM	0	0	16	0	0	0	24	2	0	0	0	0	0	10	0	4	56	0
2:45 PM	0	2	24	0	0	0	42	2	0	0	0	0	0	6	0	4	80	359
Peak Hour	1	10	87	0	2	0	116	25	0	0	0	0	0	85	0	33	359	0

Note: For all three-hour count summary, see next page.

Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)				
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South	Total
2:00 PM	2	0	0	9	11	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
2:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0
2:45 PM	1	5	0	0	6	0	0	0	0	0	0	0	0	0	0
Peak Hour	4	6	0	9	19	0	0	0	0	0	0	0	0	0	0

Five-Hour Count Summaries																		
Interval Start	WILDWOOD PARK DR				WILDWOOD PARK DR				0				FERRUCCI MAIN ACCESS				15-min Total	Rolling One Hour
	Eastbound				Westbound				Northbound				Southbound					
	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT	UT	LT	TH	RT		
1:00 PM	0	1	16	0	0	0	20	3	0	0	0	0	0	7	0	1	48	0
1:15 PM	0	1	14	0	0	0	16	4	0	0	0	0	0	2	0	0	37	0
1:30 PM	0	1	27	0	0	0	11	14	0	0	0	0	0	1	0	1	55	0
1:45 PM	0	9	15	0	0	0	10	11	0	0	0	0	0	6	0	1	52	192
2:00 PM	1	6	32	0	2	0	23	21	0	0	0	0	0	59	0	20	164	308
2:15 PM	0	2	15	0	0	0	27	0	0	0	0	0	0	10	0	5	59	330
2:30 PM	0	0	16	0	0	0	24	2	0	0	0	0	0	10	0	4	56	331
2:45 PM	0	2	24	0	0	0	42	2	0	0	0	0	0	6	0	4	80	359
3:00 PM	0	2	29	0	0	0	24	1	0	0	0	0	0	2	0	10	68	263
3:15 PM	0	0	38	0	0	0	22	1	0	0	0	0	0	1	0	2	64	268
3:30 PM	0	1	53	0	0	0	34	1	0	0	0	0	0	1	0	0	90	302
3:45 PM	0	3	47	0	0	0	36	1	0	0	0	0	0	1	0	3	91	313
4:00 PM	0	5	47	0	0	0	21	1	0	0	0	0	0	4	0	4	82	327
4:15 PM	0	1	41	0	0	0	20	1	0	0	0	0	0	17	0	7	87	350
4:30 PM	0	0	49	0	0	0	30	0	0	0	0	0	0	5	0	0	84	344
4:45 PM	0	0	51	0	0	0	21	0	0	0	0	0	0	2	0	2	76	329
5:00 PM	0	0	55	0	0	0	19	0	0	0	0	0	0	1	0	0	75	322
5:15 PM	0	0	47	0	0	0	24	0	0	0	0	0	0	0	0	1	72	307
5:30 PM	0	0	67	0	0	0	26	0	0	0	0	0	0	1	0	0	94	317
5:45 PM	0	0	46	0	0	0	21	0	0	0	0	0	0	1	0	0	68	309
Count Total	1	34	729	0	2	0	471	63	0	0	0	0	0	137	0	65	1,502	0
Peak Hour	1	10	87	0	2	0	116	25	0	0	0	0	0	85	0	33	359	0
Note: Five-hour count summary volumes include heavy vehicles but exclude bicycles in overall count.																		
Interval Start	Heavy Vehicle Totals					Bicycles					Pedestrians (Crossing Leg)					Total		
	EB	WB	NB	SB	Total	EB	WB	NB	SB	Total	East	West	North	South				
1:00 PM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	
1:15 PM	2	1	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	
1:30 PM	4	0	0	1	5	0	0	0	0	0	0	0	0	0	0	0	0	
1:45 PM	0	0	0	6	6	0	0	0	0	0	0	0	0	0	0	0	0	
2:00 PM	2	0	0	9	11	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
2:30 PM	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	1	5	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	
3:00 PM	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
3:15 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
3:30 PM	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM	3	2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	
4:00 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	
4:15 PM	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	1	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2	2	2	
5:00 PM	1	0	0	0	1	0	0	0	0	0	0	1	1	0	2	2	2	
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:30 PM	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Count Total	22	16	0	19	57	1	0	0	0	1	0	2	2	0	4	4	4	
Peak Hr	4	6	0	9	19	0	0	0	0	0	0	0	0	0	0	0	0	

APPENDIX B

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).

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 B-1 shows the level of service criteria for unsignalized intersections from the *Highway Capacity Manual, Sixth Edition*.

Table B-1. 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 C

LEVEL OF SERVICE CALCULATION SHEETS



Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

Existing (2020) - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
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Lane Configurations						
Traffic Vol, veh/h	1	239	265	21	0	0
Future Vol, veh/h	1	239	265	21	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	63	63	92	92
Heavy Vehicles, %	100	5	1	57	2	2
Mvmt Flow	2	398	421	33	0	0

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	454	0	0	840	438
Stage 1	-	-	-	438	-
Stage 2	-	-	-	402	-
Critical Hdwy	5.1	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	5.42	-
Follow-up Hdwy	3.1	-	-	3.518	3.318
Pot Cap-1 Maneuver	737	-	-	335	619
Stage 1	-	-	-	651	-
Stage 2	-	-	-	676	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	737	-	-	334	619
Mov Cap-2 Maneuver	-	-	-	334	-
Stage 1	-	-	-	649	-
Stage 2	-	-	-	676	-

Approach	EB	WB	SB
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HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
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Capacity (veh/h)	737	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	9.9	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

Existing (2020) - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 47.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	86	89	70	195	151	106
Future Vol, veh/h	86	89	70	195	151	106
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	61	61	55	55
Heavy Vehicles, %	0	2	1	0	7	0
Mvmt Flow	162	168	115	320	275	193

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	435	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1135	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1135	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	4.3	0	122.5
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1135	-	-	-	407
HCM Lane V/C Ratio	0.143	-	-	-	1.148
HCM Control Delay (s)	8.7	0	-	-	122.5
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.5	-	-	-	17.5

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

Existing (2020) - Afternoon peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.4

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	5	159	120	12	2	1
Future Vol, veh/h	5	159	120	12	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	44	75	75	38	38
Heavy Vehicles, %	100	10	0	75	0	0
Mvmt Flow	11	361	160	16	5	3

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	176	0	-	0	551	168
Stage 1	-	-	-	-	168	-
Stage 2	-	-	-	-	383	-
Critical Hdwy	5.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	3.1	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	975	-	-	-	499	881
Stage 1	-	-	-	-	867	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	975	-	-	-	492	881
Mov Cap-2 Maneuver	-	-	-	-	492	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	694	-

Approach EB WB SB

HCM Control Delay, s	0.3	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	975	-	-	-	577
HCM Lane V/C Ratio	0.012	-	-	-	0.014
HCM Control Delay (s)	8.7	0	-	-	11.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

Existing (2020) - Afternoon peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 7.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	17	79	87	34	85	30
Future Vol, veh/h	17	79	87	34	85	30
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	62	62	65	65	36	36
Heavy Vehicles, %	0	10	1	0	15	7
Mvmt Flow	27	127	134	52	236	83

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	186	0	-	0	341	160
Stage 1	-	-	-	-	160	-
Stage 2	-	-	-	-	181	-
Critical Hdwy	4.1	-	-	-	6.55	6.27
Critical Hdwy Stg 1	-	-	-	-	5.55	-
Critical Hdwy Stg 2	-	-	-	-	5.55	-
Follow-up Hdwy	2.2	-	-	-	3.635	3.363
Pot Cap-1 Maneuver	1401	-	-	-	629	872
Stage 1	-	-	-	-	838	-
Stage 2	-	-	-	-	820	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1401	-	-	-	616	872
Mov Cap-2 Maneuver	-	-	-	-	616	-
Stage 1	-	-	-	-	820	-
Stage 2	-	-	-	-	820	-

Approach EB WB SB

HCM Control Delay, s	1.3	0	15.3
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1401	-	-	-	667
HCM Lane V/C Ratio	0.02	-	-	-	0.479
HCM Control Delay (s)	7.6	0	-	-	15.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	-	-	-	2.6

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

Existing (2020) - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	210	93	14	4	1
Future Vol, veh/h	6	210	93	14	4	1
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	86	86	63	63
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	6	226	108	16	6	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	125	0	0 355 117
Stage 1	-	-	- 117 -
Stage 2	-	-	- 238 -
Critical Hdwy	4.12	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.218	-	- 3.5 3.3
Pot Cap-1 Maneuver	1462	-	- 647 941
Stage 1	-	-	- 913 -
Stage 2	-	-	- 806 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1461	-	- 642 940
Mov Cap-2 Maneuver	-	-	- 642 -
Stage 1	-	-	- 908 -
Stage 2	-	-	- 805 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1461	-	-	-	685
HCM Lane V/C Ratio	0.004	-	-	-	0.012
HCM Control Delay (s)	7.5	0	-	-	10.3
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

Existing (2020) - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	188	92	2	28	13
Future Vol, veh/h	6	188	92	2	28	13
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	78	78	43	43
Heavy Vehicles, %	1	1	0	0	5	5
Mvmt Flow	6	202	118	3	65	30

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	122	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.11	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.209	-	-
Pot Cap-1 Maneuver	1472	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1470	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1470	-	-	-	716
HCM Lane V/C Ratio	0.004	-	-	-	0.133
HCM Control Delay (s)	7.5	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.5

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

2023 WOP - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	1	271	314	21	0	0
Future Vol, veh/h	1	271	314	21	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	63	63	92	92
Heavy Vehicles, %	100	5	1	54	2	2
Mvmt Flow	2	452	498	33	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	531	0	-	0	971	515
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	5.1	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	3.1	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	682	-	-	-	280	560
Stage 1	-	-	-	-	600	-
Stage 2	-	-	-	-	638	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	682	-	-	-	279	560
Mov Cap-2 Maneuver	-	-	-	-	279	-
Stage 1	-	-	-	-	598	-
Stage 2	-	-	-	-	638	-

Approach EB WB SB

HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	682	-	-	-	-
HCM Lane V/C Ratio	0.002	-	-	-	-
HCM Control Delay (s)	10.3	0	-	-	0
HCM Lane LOS	B	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

2023 WOP - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 124.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	105	97	76	238	175	123
Future Vol, veh/h	105	97	76	238	175	123
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	61	61	55	55
Heavy Vehicles, %	0	2	1	0	7	0
Mvmt Flow	198	183	125	390	318	224

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	515	0	0 899 320
Stage 1	-	-	- 320 -
Stage 2	-	-	- 579 -
Critical Hdwy	4.1	-	- 6.47 6.2
Critical Hdwy Stg 1	-	-	- 5.47 -
Critical Hdwy Stg 2	-	-	- 5.47 -
Follow-up Hdwy	2.2	-	- 3.563 3.3
Pot Cap-1 Maneuver	1061	-	- ~ 303 725
Stage 1	-	-	- 725 -
Stage 2	-	-	- 551 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1061	-	- ~ 240 725
Mov Cap-2 Maneuver	-	-	- ~ 240 -
Stage 1	-	-	- 574 -
Stage 2	-	-	- 551 -

Approach	EB	WB	SB
HCM Control Delay, s	4.8	0	\$ 325.9
HCM LOS			F

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1061	-	-	-	332
HCM Lane V/C Ratio	0.187	-	-	-	1.632
HCM Control Delay (s)	9.2	0	-	-	\$ 325.9
HCM Lane LOS	A	A	-	-	F
HCM 95th %tile Q(veh)	0.7	-	-	-	32.5

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

2023 WOP - Afternoon peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.3

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	5	212	181	12	2	1
Future Vol, veh/h	5	212	181	12	2	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	44	75	75	38	38
Heavy Vehicles, %	100	10	0	64	0	0
Mvmt Flow	11	482	241	16	5	3

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	257	0	-	0	753	249
Stage 1	-	-	-	-	249	-
Stage 2	-	-	-	-	504	-
Critical Hdwy	5.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	3.1	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	899	-	-	-	380	795
Stage 1	-	-	-	-	797	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	899	-	-	-	374	795
Mov Cap-2 Maneuver	-	-	-	-	374	-
Stage 1	-	-	-	-	783	-
Stage 2	-	-	-	-	611	-

Approach EB WB SB

HCM Control Delay, s	0.2	0	13.1
HCM LOS			B

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	899	-	-	-	454
HCM Lane V/C Ratio	0.013	-	-	-	0.017
HCM Control Delay (s)	9.1	0	-	-	13.1
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

2023 WOP - Afternoon peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 24.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	44	86	95	87	131	46
Future Vol, veh/h	44	86	95	87	131	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	62	62	65	65	36	36
Heavy Vehicles, %	0	10	1	0	15	7
Mvmt Flow	71	139	146	134	364	128

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	280	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.1	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.2	-	-
Pot Cap-1 Maneuver	1294	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1294	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	2.7	0	47.9
HCM LOS			E

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1294	-	-	-	539
HCM Lane V/C Ratio	0.055	-	-	-	0.912
HCM Control Delay (s)	7.9	0	-	-	47.9
HCM Lane LOS	A	A	-	-	E
HCM 95th %tile Q(veh)	0.2	-	-	-	10.9

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus Entry

2023 WOP - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	234	120	14	4	1
Future Vol, veh/h	6	234	120	14	4	1
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	86	86	63	63
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	6	252	140	16	6	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	157	0	0 413 149
Stage 1	-	-	- 149 -
Stage 2	-	-	- 264 -
Critical Hdwy	4.12	-	- 6.4 6.2
Critical Hdwy Stg 1	-	-	- 5.4 -
Critical Hdwy Stg 2	-	-	- 5.4 -
Follow-up Hdwy	2.218	-	- 3.5 3.3
Pot Cap-1 Maneuver	1423	-	- 599 903
Stage 1	-	-	- 884 -
Stage 2	-	-	- 785 -
Platoon blocked, %		-	- -
Mov Cap-1 Maneuver	1422	-	- 595 902
Mov Cap-2 Maneuver	-	-	- 595 -
Stage 1	-	-	- 879 -
Stage 2	-	-	- 784 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1422	-	-	-	638
HCM Lane V/C Ratio	0.005	-	-	-	0.012
HCM Control Delay (s)	7.5	0	-	-	10.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Access

2023 WOP - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	20	205	100	21	35	16
Future Vol, veh/h	20	205	100	21	35	16
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	78	78	43	43
Heavy Vehicles, %	1	1	0	0	5	5
Mvmt Flow	22	220	128	27	81	37

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	156	0	0 407 144
Stage 1	-	-	- 143 -
Stage 2	-	-	- 264 -
Critical Hdwy	4.11	-	- 6.45 6.25
Critical Hdwy Stg 1	-	-	- 5.45 -
Critical Hdwy Stg 2	-	-	- 5.45 -
Follow-up Hdwy	2.209	-	- 3.545 3.345
Pot Cap-1 Maneuver	1430	-	- 594 895
Stage 1	-	-	- 877 -
Stage 2	-	-	- 773 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1429	-	- 582 893
Mov Cap-2 Maneuver	-	-	- 582 -
Stage 1	-	-	- 860 -
Stage 2	-	-	- 772 -

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	11.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1429	-	-	-	653
HCM Lane V/C Ratio	0.015	-	-	-	0.182
HCM Control Delay (s)	7.6	0	-	-	11.7
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.7

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus/Staff Dwy

2023 WP - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	10	291	336	33	10	0
Future Vol, veh/h	10	291	336	33	10	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	60	60	63	63	50	50
Heavy Vehicles, %	10	0	1	36	100	0
Mvmt Flow	17	485	533	52	20	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	585	0	-	0	1078	559
Stage 1	-	-	-	-	559	-
Stage 2	-	-	-	-	519	-
Critical Hdwy	4.2	-	-	-	7.4	6.2
Critical Hdwy Stg 1	-	-	-	-	6.4	-
Critical Hdwy Stg 2	-	-	-	-	6.4	-
Follow-up Hdwy	2.29	-	-	-	4.4	3.3
Pot Cap-1 Maneuver	951	-	-	-	161	532
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	439	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	951	-	-	-	157	532
Mov Cap-2 Maneuver	-	-	-	-	157	-
Stage 1	-	-	-	-	408	-
Stage 2	-	-	-	-	439	-

Approach EB WB SB

HCM Control Delay, s	0.3	0	31.2
HCM LOS			D

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	951	-	-	-	157
HCM Lane V/C Ratio	0.018	-	-	-	0.127
HCM Control Delay (s)	8.9	0	-	-	31.2
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0.1	-	-	-	0.4

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Exit

2023 WP - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 10.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	222	76	0	195	137
Future Vol, veh/h	0	222	76	0	195	137
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	53	53	69	69	55	55
Heavy Vehicles, %	0	1	1	0	0	0
Mvmt Flow	0	419	110	0	355	249

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	-
Pot Cap-1 Maneuver	0	-	0
Stage 1	0	-	0
Stage 2	0	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	19.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	514	949
HCM Lane V/C Ratio	-	-	0.69	0.262
HCM Control Delay (s)	-	-	26.1	10.1
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	5.3	1.1

Ferucci Junior High Addition
7: Wildwood Park Dr & New Entry

2023 WP - AM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 1.5

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	116	301	76	260	0	0
Future Vol, veh/h	116	301	76	260	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	57	57	61	61	92	92
Heavy Vehicles, %	0	2	1	0	0	0
Mvmt Flow	204	528	125	426	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	551	0	-	0	-	338
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	1029	-	-	-	0	709
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1029	-	-	-	-	709
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach EB WB SB

HCM Control Delay, s	2.6	0	0
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1029	-	-	-	-
HCM Lane V/C Ratio	0.198	-	-	-	-
HCM Control Delay (s)	9.4	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.7	-	-	-	-

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus/Staff Dwy

2023 WP - Aft peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 1.6

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	6	214	199	8	20	6
Future Vol, veh/h	6	214	199	8	20	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	44	44	75	75	38	38
Heavy Vehicles, %	83	2	0	100	60	33
Mvmt Flow	14	486	265	11	53	16

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	276	0	-	0	785	271
Stage 1	-	-	-	-	271	-
Stage 2	-	-	-	-	514	-
Critical Hdwy	4.93	-	-	-	7	6.53
Critical Hdwy Stg 1	-	-	-	-	6	-
Critical Hdwy Stg 2	-	-	-	-	6	-
Follow-up Hdwy	2.947	-	-	-	4.04	3.597
Pot Cap-1 Maneuver	935	-	-	-	291	699
Stage 1	-	-	-	-	658	-
Stage 2	-	-	-	-	498	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	935	-	-	-	285	699
Mov Cap-2 Maneuver	-	-	-	-	285	-
Stage 1	-	-	-	-	644	-
Stage 2	-	-	-	-	498	-

Approach EB WB SB

HCM Control Delay, s	0.2	0	18.7
HCM LOS			C

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	935	-	-	-	330
HCM Lane V/C Ratio	0.015	-	-	-	0.207
HCM Control Delay (s)	8.9	0	-	-	18.7
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.8

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Exit

2023 WP - Aft peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 9.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	137	100	0	133	48
Future Vol, veh/h	0	137	100	0	133	48
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	62	62	78	78	36	36
Heavy Vehicles, %	0	6	3	0	1	0
Mvmt Flow	0	221	128	0	369	133

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0 349 128
Stage 1	-	-	- 128 -
Stage 2	-	-	- 221 -
Critical Hdwy	-	-	- 6.41 6.2
Critical Hdwy Stg 1	-	-	- 5.41 -
Critical Hdwy Stg 2	-	-	- 5.41 -
Follow-up Hdwy	-	-	- 3.509 3.3
Pot Cap-1 Maneuver	0	-	0 650 927
Stage 1	0	-	0 900 -
Stage 2	0	-	0 818 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- 650 927
Mov Cap-2 Maneuver	-	-	- 650 -
Stage 1	-	-	- 900 -
Stage 2	-	-	- 818 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	15.5
HCM LOS			C

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	650	927
HCM Lane V/C Ratio	-	-	0.568	0.144
HCM Control Delay (s)	-	-	17.6	9.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	3.6	0.5

Ferucci Junior High Addition
7: Wildwood Park Dr & New Entry

2023 WP - Aft peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.9

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	50	220	100	105	0	0
Future Vol, veh/h	50	220	100	105	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	55	55	65	65	92	92
Heavy Vehicles, %	0	4	3	0	0	0
Mvmt Flow	91	400	154	162	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	316	0	-	0	-	235
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	4.1	-	-	-	-	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	2.2	-	-	-	-	3.3
Pot Cap-1 Maneuver	1256	-	-	-	0	809
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1256	-	-	-	-	809
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach EB WB SB

HCM Control Delay, s	1.5	0	0
HCM LOS			A

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1256	-	-	-	-
HCM Lane V/C Ratio	0.072	-	-	-	-
HCM Control Delay (s)	8.1	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.2	-	-	-	-

Ferucci Junior High Addition
1: Wildwood Park Dr & Bus/Staff Dwy

2023 WP - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.7

Movement EBL EBT WBT WBR SBL SBR

Lane Configurations						
Traffic Vol, veh/h	5	232	127	12	12	4
Future Vol, veh/h	5	232	127	12	12	4
Conflicting Peds, #/hr	1	0	0	1	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	86	86	63	63
Heavy Vehicles, %	2	2	0	0	0	0
Mvmt Flow	5	249	148	14	19	6

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	163	0	-	0	415	156
Stage 1	-	-	-	-	156	-
Stage 2	-	-	-	-	259	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1416	-	-	-	598	895
Stage 1	-	-	-	-	877	-
Stage 2	-	-	-	-	789	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1415	-	-	-	594	894
Mov Cap-2 Maneuver	-	-	-	-	594	-
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	788	-

Approach EB WB SB

HCM Control Delay, s	0.2	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt EBL EBT WBT WBR SBLn1

Capacity (veh/h)	1415	-	-	-	648
HCM Lane V/C Ratio	0.004	-	-	-	0.039
HCM Control Delay (s)	7.6	0	-	-	10.8
HCM Lane LOS	A	A	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Ferucci Junior High Addition
2: Wildwood Park Dr & Main Exit

2023 WP - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 2.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↓	↓
Traffic Vol, veh/h	0	229	103	0	33	16
Future Vol, veh/h	0	229	103	0	33	16
Conflicting Peds, #/hr	1	0	0	1	0	1
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	77	77	43	43
Heavy Vehicles, %	1	1	0	0	5	5
Mvmt Flow	0	246	134	0	77	37

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	0 380 135
Stage 1	-	-	- 134 -
Stage 2	-	-	- 246 -
Critical Hdwy	-	-	- 6.45 6.25
Critical Hdwy Stg 1	-	-	- 5.45 -
Critical Hdwy Stg 2	-	-	- 5.45 -
Follow-up Hdwy	-	-	- 3.545 3.345
Pot Cap-1 Maneuver	0	-	0 616 906
Stage 1	0	-	0 885 -
Stage 2	0	-	0 788 -
Platoon blocked, %	-	-	
Mov Cap-1 Maneuver	-	-	- 616 905
Mov Cap-2 Maneuver	-	-	- 616 -
Stage 1	-	-	- 885 -
Stage 2	-	-	- 788 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.9
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	616	905
HCM Lane V/C Ratio	-	-	0.125	0.041
HCM Control Delay (s)	-	-	11.7	9.1
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0.4	0.1

Ferucci Junior High Addition
7: Wildwood Park Dr & New Entry

2023 WP - PM peak
HCM 6th TWSC

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	237	103	28	0	0
Future Vol, veh/h	25	237	103	28	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	78	78	92	92
Heavy Vehicles, %	1	1	0	0	0	0
Mvmt Flow	27	255	132	36	0	0

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	168	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.11	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.209	-	-
Pot Cap-1 Maneuver	1416	-	0
Stage 1	-	-	0
Stage 2	-	-	0
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1416	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.7	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1416	-	-	-	-
HCM Lane V/C Ratio	0.019	-	-	-	-
HCM Control Delay (s)	7.6	0	-	-	0
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	-

APPENDIX D

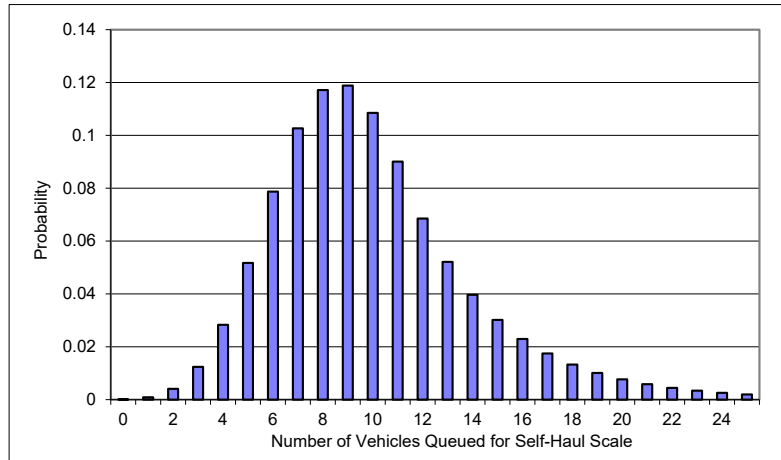
QUEUE MODEL RESULTS



M/M/s Queueing Model for Puyallup School District's Ferrucci JH Load/Unload Zone

Morning Peak Hour (Arrival)

Data		
$\lambda =$	996	(average arrival rate)
$\mu =$	109.1	(average service rate)
$s =$	12	(# servers)



where:

L = average number of vehicles queued at the load/unload zone at any one time

L_q = average number of vehicles in queue

W = average wait time at the load/unload zone (hours)

W_q = ave. wait time in queue (hours)

ρ = Load/Unload Zone utilization

P_0 = probability of 0 vehicles at the Load/Unload Zone

P_1 = probability of 1 vehicle at the Load/Unload Zone, etc.

10 =Average number of vehicles at the load/unload zone at any one time

17 =Peak (95th-percentile) number of vehicles in load/unload zone at any one time

94.4% <= Closest probability to 95%

Results	
$L =$	10.04144869
$L_q =$	0.911448689
$W =$	0.010
$W_q =$	0.001
$\rho =$	0.760833333
$P_0 =$	9.78434E-05
$P_1 =$	0.00089331
$P_2 =$	0.004077962
$P_3 =$	0.012410598
$P_4 =$	0.02832719
$P_5 =$	0.051725449
$P_6 =$	0.078708892
$P_7 =$	0.102658883
$P_8 =$	0.11715945
$P_9 =$	0.118851753
$P_{10} =$	0.108511651
$P_{11} =$	0.09006467
$P_{12} =$	0.068524203
$P_{13} =$	0.052135498
$P_{14} =$	0.039666425
$P_{15} =$	0.030179538
$P_{16} =$	0.022961599
$P_{17} =$	0.01746995
$P_{18} =$	0.01329172
$P_{19} =$	0.010112784
$P_{20} =$	0.007694143
$P_{21} =$	0.00585396
$P_{22} =$	0.004453888
$P_{23} =$	0.003388667
$P_{24} =$	0.00257821
$P_{25} =$	0.001961588
$P_{26} =$	0.001492442
$P_{27} =$	0.0011355
$P_{28} =$	0.000863926
$P_{29} =$	0.000657304
$P_{30} =$	0.000500099
$P_{31} =$	0.000380492
$P_{32} =$	0.000289491
$P_{33} =$	0.000220254
$P_{34} =$	0.000167577
$P_{35} =$	0.000127498
$P_{36} =$	9.70047E-05
$P_{37} =$	7.38044E-05
$P_{38} =$	5.61529E-05
$P_{39} =$	4.2723E-05
$P_{40} =$	3.25051E-05
$P_{41} =$	2.47309E-05

Minutes

0.6

0.1

Prob < x vehicles

0.0% 0

0.1% 1

0.5% 2

1.7% 3

4.6% 4

9.8% 5

17.6% 6

27.9% 7

39.6% 8

51.5% 9

62.3% 10

71.3% 11

78.2% 12

83.4% 13

87.4% 14

90.4% 15

92.7% 16

94.4% 17

95.8% 18

96.8% 19

97.6% 20

98.1% 21

98.6% 22

98.9% 23

99.2% 24

99.4% 25

99.5% 26

99.6% 27

99.7% 28

99.8% 29

99.8% 30

99.9% 31

99.9% 32

99.9% 33

99.9% 34

100.0% 35

100.0% 36

100.0% 37

100.0% 38

100.0% 39

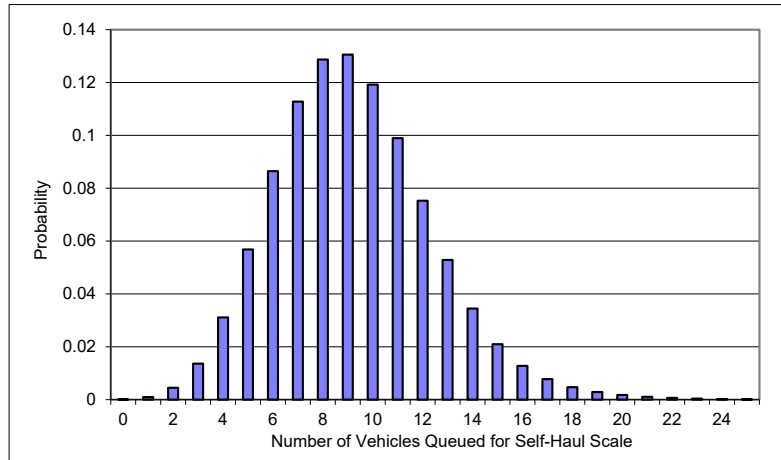
100.0% 40

100.0% 41

M/M/s Queueing Model for Puyallup School District's Ferrucci JH Load/Unload Zone

Morning Peak Hour (Arrival)

Data		
$\lambda =$	996	(average arrival rate)
$\mu =$	109.1	(average service rate)
$s =$	15	(# servers)



where:

L = average number of vehicles queued at the load/unload zone at any one time

L_q = average number of vehicles in queue

W = average wait time at the load/unload zone (hours)

W_q = ave. wait time in queue (hours)

ρ = Load/Unload Zone utilization

P_0 = probability of 0 vehicles at the Load/Unload Zone

P_1 = probability of 1 vehicle at the Load/Unload Zone, etc.

9 =Average number of vehicles at the load/unload zone at any one time

14 =Peak (95th-percentile) number of vehicles in load/unload zone at any one time

94.6% <= Closest probability to 95%

Results	
$L =$	9.21340229
$L_q =$	0.08340229
$W =$	0.009
$W_q =$	0.000
$\rho =$	0.608666667
$P_0 =$	0.000107481
$P_1 =$	0.000981298
$P_2 =$	0.004479625
$P_3 =$	0.013632992
$P_4 =$	0.031117304
$P_5 =$	0.056820196
$P_6 =$	0.086461399
$P_7 =$	0.112770367
$P_8 =$	0.128699181
$P_9 =$	0.13055817
$P_{10} =$	0.119199609
$P_{11} =$	0.098935675
$P_{12} =$	0.07527356
$P_{13} =$	0.0528652
$P_{14} =$	0.034475663
$P_{15} =$	0.020984187
$P_{16} =$	0.012772375
$P_{17} =$	0.007774119
$P_{18} =$	0.004731847
$P_{19} =$	0.002880118
$P_{20} =$	0.001753032
$P_{21} =$	0.001067012
$P_{22} =$	0.000649455
$P_{23} =$	0.000395301
$P_{24} =$	0.000240607
$P_{25} =$	0.000146449
$P_{26} =$	8.91388E-05
$P_{27} =$	5.42558E-05
$P_{28} =$	3.30237E-05
$P_{29} =$	2.01004E-05
$P_{30} =$	1.22345E-05
$P_{31} =$	7.44671E-06
$P_{32} =$	4.53256E-06
$P_{33} =$	2.75882E-06
$P_{34} =$	1.6792E-06
$P_{35} =$	1.02207E-06
$P_{36} =$	6.22103E-07
$P_{37} =$	3.78653E-07
$P_{38} =$	2.30474E-07
$P_{39} =$	1.40282E-07
$P_{40} =$	8.53847E-08
$P_{41} =$	5.19708E-08

Minutes

0.6

0.0

Prob < x vehicles

0.0% 0

0.1% 1

0.6% 2

1.9% 3

5.0% 4

10.7% 5

19.4% 6

30.6% 7

43.5% 8

56.6% 9

68.5% 10

78.4% 11

85.9% 12

91.2% 13

94.6% 14

96.7% 15

98.0% 16

98.8% 17

99.3% 18

99.6% 19

99.7% 20

99.8% 21

99.9% 22

99.9% 23

100.0% 24

100.0% 25

100.0% 26

100.0% 27

100.0% 28

100.0% 29

100.0% 30

100.0% 31

100.0% 32

100.0% 33

100.0% 34

100.0% 35

100.0% 36

100.0% 37

100.0% 38

100.0% 39

100.0% 40

100.0% 41

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	6:35	6:35	6:35	6:35	6:35	6:35
End Time	7:45	7:45	7:45	7:45	7:45	7:45
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	948	1022	949	942	974	967
Vehs Exited	954	1023	958	951	977	974
Starting Vehs	16	10	14	15	9	11
Ending Vehs	10	9	5	6	6	5
Travel Distance (mi)	261	282	261	264	265	267
Travel Time (hr)	11.8	13.0	11.8	12.0	12.2	12.2
Total Delay (hr)	1.3	1.6	1.2	1.4	1.6	1.4
Total Stops	410	440	403	422	394	414
Fuel Used (gal)	9.6	10.6	9.7	9.8	10.0	9.9

Interval #0 Information Seeding

Start Time 6:35
End Time 6:45
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information

Start Time 6:45
End Time 7:00
Total Time (min) 15
Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	176	227	195	155	163	185
Vehs Exited	185	224	196	166	166	187
Starting Vehs	16	10	14	15	9	11
Ending Vehs	7	13	13	4	6	7
Travel Distance (mi)	48	63	53	45	44	51
Travel Time (hr)	2.1	2.8	2.3	2.0	1.9	2.2
Total Delay (hr)	0.2	0.2	0.2	0.2	0.1	0.2
Total Stops	74	89	77	62	65	74
Fuel Used (gal)	1.8	2.3	1.9	1.7	1.6	1.9

Interval #2 Information

Start Time 7:00
 End Time 7:15
 Total Time (min) 15
 Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	409	427	396	404	456	418
Vehs Exited	397	417	393	390	436	407
Starting Vehs	7	13	13	4	6	7
Ending Vehs	19	23	16	18	26	18
Travel Distance (mi)	112	118	110	111	120	114
Travel Time (hr)	5.2	5.8	5.1	5.3	6.0	5.5
Total Delay (hr)	0.7	1.0	0.7	0.9	1.2	0.9
Total Stops	195	197	184	201	214	197
Fuel Used (gal)	4.1	4.6	4.2	4.3	4.7	4.4

Interval #3 Information

Start Time 7:15
 End Time 7:30
 Total Time (min) 15
 Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	196	172	177	189	160	179
Vehs Exited	204	186	182	199	176	189
Starting Vehs	19	23	16	18	26	18
Ending Vehs	11	9	11	8	10	9
Travel Distance (mi)	54	49	49	55	45	50
Travel Time (hr)	2.4	2.1	2.1	2.4	1.9	2.2
Total Delay (hr)	0.2	0.2	0.2	0.2	0.1	0.2
Total Stops	82	77	63	86	49	72
Fuel Used (gal)	2.0	1.8	1.8	2.0	1.7	1.8

Interval #4 Information Recording

Start Time 7:30
 End Time 7:45
 Total Time (min) 15
 Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	167	196	181	194	195	188
Vehs Exited	168	196	187	196	199	188
Starting Vehs	11	9	11	8	10	9
Ending Vehs	10	9	5	6	6	5
Travel Distance (mi)	47	53	49	54	55	51
Travel Time (hr)	2.0	2.3	2.2	2.3	2.4	2.2
Total Delay (hr)	0.1	0.2	0.2	0.2	0.2	0.2
Total Stops	59	77	79	73	66	71
Fuel Used (gal)	1.6	1.9	1.8	1.9	2.0	1.8

1: Wildwood Park Dr & Bus/Staff Dwy Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	All
Denied Del/Veh (s)	0.0	0.0	0.3	0.4	0.1	0.2
Total Del/Veh (s)	3.6	0.4	0.4	0.3	10.3	0.6

2: Wildwood Park Dr & Main Exit Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Denied Del/Veh (s)	0.3	0.0	0.3	0.2	0.2
Total Del/Veh (s)	0.9	0.4	8.1	3.6	3.6

7: Wildwood Park Dr & New Entry Performance by movement

Movement	EBL	EBT	WBT	WBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	5.4	2.5	1.0	0.5	2.1

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	4.9

Intersection: 1: Wildwood Park Dr & Bus/Staff Dwy

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	57	78
Average Queue (ft)	3	17
95th Queue (ft)	24	60
Link Distance (ft)	170	219
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Wildwood Park Dr & Main Exit

Movement	SB	SB
Directions Served	L	R
Maximum Queue (ft)	118	90
Average Queue (ft)	53	41
95th Queue (ft)	101	70
Link Distance (ft)	103	103
Upstream Blk Time (%)	2	0
Queuing Penalty (veh)	0	0
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Wildwood Park Dr & New Entry

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	168	27
Average Queue (ft)	39	2
95th Queue (ft)	111	15
Link Distance (ft)	335	170
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Summary of All Intervals

Run Number	1	2	3	4	5	Avg
Start Time	1:50	1:50	1:50	1:50	1:50	1:50
End Time	3:00	3:00	3:00	3:00	3:00	3:00
Total Time (min)	70	70	70	70	70	70
Time Recorded (min)	60	60	60	60	60	60
# of Intervals	5	5	5	5	5	5
# of Recorded Intervals	4	4	4	4	4	4
Vehs Entered	646	612	631	596	599	617
Vehs Exited	647	612	635	597	602	618
Starting Vehs	4	5	10	4	7	4
Ending Vehs	3	5	6	3	4	4
Travel Distance (mi)	181	168	172	166	166	170
Travel Time (hr)	7.9	7.4	7.3	7.2	7.3	7.4
Total Delay (hr)	0.7	0.7	0.5	0.6	0.7	0.6
Total Stops	203	223	211	193	210	207
Fuel Used (gal)	6.3	6.0	6.0	5.8	5.9	6.0

Interval #0 Information Seeding

Start Time 1:50
End Time 2:00
Total Time (min) 10
Volumes adjusted by Growth Factors.
No data recorded this interval.

Interval #1 Information

Start Time 2:00
End Time 2:15
Total Time (min) 15
Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	105	99	114	96	91	102
Vehs Exited	106	101	115	94	94	102
Starting Vehs	4	5	10	4	7	4
Ending Vehs	3	3	9	6	4	4
Travel Distance (mi)	30	29	32	28	28	29
Travel Time (hr)	1.2	1.2	1.3	1.1	1.1	1.2
Total Delay (hr)	0.1	0.1	0.1	0.0	0.0	0.1
Total Stops	25	26	33	20	15	23
Fuel Used (gal)	1.0	1.0	1.1	0.9	0.9	1.0

Interval #2 Information

Start Time 2:15
 End Time 2:30
 Total Time (min) 15
 Volumes adjusted by PHF, Growth Factors.

Run Number	1	2	3	4	5	Avg
Vehs Entered	333	296	272	281	328	303
Vehs Exited	323	284	269	273	311	292
Starting Vehs	3	3	9	6	4	4
Ending Vehs	13	15	12	14	21	15
Travel Distance (mi)	86	75	67	69	82	76
Travel Time (hr)	4.0	3.5	3.0	3.2	3.8	3.5
Total Delay (hr)	0.5	0.5	0.3	0.4	0.5	0.5
Total Stops	141	156	122	130	144	139
Fuel Used (gal)	3.2	2.9	2.5	2.6	3.1	2.9

Interval #3 Information

Start Time 2:30
 End Time 2:45
 Total Time (min) 15
 Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	113	102	113	104	86	103
Vehs Exited	121	113	119	111	99	114
Starting Vehs	13	15	12	14	21	15
Ending Vehs	5	4	6	7	8	4
Travel Distance (mi)	35	32	34	31	29	32
Travel Time (hr)	1.4	1.3	1.4	1.3	1.2	1.3
Total Delay (hr)	0.1	0.1	0.1	0.1	0.1	0.1
Total Stops	22	16	27	19	30	24
Fuel Used (gal)	1.2	1.1	1.1	1.0	1.0	1.1

Interval #4 Information Recording

Start Time 2:45
 End Time 3:00
 Total Time (min) 15
 Volumes adjusted by Growth Factors, Anti PHF.

Run Number	1	2	3	4	5	Avg
Vehs Entered	95	115	132	115	94	110
Vehs Exited	97	114	132	119	98	112
Starting Vehs	5	4	6	7	8	4
Ending Vehs	3	5	6	3	4	4
Travel Distance (mi)	30	31	39	37	26	33
Travel Time (hr)	1.2	1.3	1.6	1.6	1.1	1.4
Total Delay (hr)	0.0	0.1	0.1	0.1	0.0	0.1
Total Stops	15	25	29	24	21	22
Fuel Used (gal)	1.0	1.1	1.3	1.2	0.9	1.1

1: Wildwood Park Dr & Bus/Staff Dwy Performance by movement

Movement	EBL	EBT	WBT	WBR	SBL	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.2	0.2	0.1	0.2	0.1
Total Del/Veh (s)	2.6	0.3	0.2	0.1	9.5	5.9	0.8

2: Wildwood Park Dr & Main Exit Performance by movement

Movement	EBT	WBT	SBL	SBR	All
Denied Del/Veh (s)	0.2	0.0	0.4	0.2	0.2
Total Del/Veh (s)	0.5	0.2	7.2	3.5	2.8

7: Wildwood Park Dr & New Entry Performance by movement

Movement	EBL	EBT	WBT	WBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	3.0	0.8	0.5	0.2	0.8

Total Network Performance

Denied Del/Veh (s)	0.2
Total Del/Veh (s)	3.5

Intersection: 1: Wildwood Park Dr & Bus/Staff Dwy

Movement	EB	WB	SB
Directions Served	LT	TR	LR
Maximum Queue (ft)	48	4	106
Average Queue (ft)	2	0	27
95th Queue (ft)	21	3	78
Link Distance (ft)	170	390	219
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 2: Wildwood Park Dr & Main Exit

Movement	SB	SB
Directions Served	L	R
Maximum Queue (ft)	122	51
Average Queue (ft)	44	20
95th Queue (ft)	94	47
Link Distance (ft)	103	103
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	0	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Wildwood Park Dr & New Entry

Movement	EB	WB
Directions Served	LT	TR
Maximum Queue (ft)	70	15
Average Queue (ft)	12	1
95th Queue (ft)	45	8
Link Distance (ft)	335	170
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0