TO:	Charles Hay, Tappé Architects	DATE:	September 3, 2019
FROM:	Elizabeth Peart Michael White	HSH PROJECT NO.:	2018107.00
SUBJECT:	Sharon High School – Transportation Study		

Overview

Howard Stein Hudson (HSH) has prepared this technical memorandum presenting existing and future transportation and parking conditions associated with Sharon High School (SHS), located at 181 Pond Street, Sharon, Massachusetts. The Town of Sharon is planning to demolish the existing SHS and construct a new school building with redesigned campus circulation, including changes to access and egress driveways. The Project is currently in the schematic design phase, led by the architectural firm Tappe Architects. HSH is the transportation consultant on the Project, working closely with Tappé Architects, other team members, the Massachusetts School Building Authority (MSBA), and the Town of Sharon.

Sharon High School

The 28.5-acre SHS campus is centrally located in the Town, north of Lake Massapoag, and includes the school building, several parking areas, and athletic fields. Primary vehicle access/egress is via two driveways on Pond Street, with secondary access/egress to the rear of the building via Ames Court. Staff members park in on-site spaces. Students are permitted to drive and park off-site. Loading docks are located at the rear of the building and loading/delivery vehicles use Ames Court to enter/exit the site. Note that vehicles cannot circulate entirely around the existing school building.

The SHS building is over 60 years old and not compliant with the Americans with Disabilities Act (ADA). With a current enrollment of 1,150 students in grades 9 through 12, the school is overcrowded based on state guidelines indicating that the existing building is appropriately sized for about 900 students. Based on enrollment projections from the MSBA, SHS enrollment by 2025 could increase to 1,350 students. [Note that to "right-size" a new MSBA school building, the Town adopts a design enrollment level which is developed and certified by the MSBA and used by the design team. For SHS, the design enrollment is 1,250 students. For the transportation impact analysis, a maximum enrollment level of 1,350 was used to ensure conservative (higher impact) results.]

SHS currently has about 140 staff members. If the future staffing level increases proportionally to the enrollment growth, staff will increase to about 160 members by 2025.

For SHS students, the school day begins at 8:05 a.m. and ends at 2:40 p.m. On occasional early-release days, dismissal is at 11:40 a.m. Some student clubs meet before school at 7:30 a.m. and many students participate in after school activities, such as clubs, organizations, and sports. After school activities typically begin between 2:45 p.m. and 3:30 p.m. and end at various times.

Study Area

For the transportation assessment of SHS, the study area encompasses the school site and five key intersections, listed below and shown in **Figure 1.**

- Ames Street/Ames Court;
- Pond Street/Ames Street;
- Pond Street/SHS Northern Driveway/Parking Lot (DPW) Northern Driveway;
- Pond Street/SHS Southern Driveway/Parking Lot (DPW) Southern Driveway; and
- Pond Street/Beach Street.

Transportation Impact Summary

Key transportation characteristics and analysis results of the Project include:

- The curb-cut for the school's northern driveway on Pond Street will be relocated approximately 80 feet north of the existing curb-cut. The northern driveway will accommodate two-way travel. All vehicle trips entering the SHS campus (except deliveries) will use the northern driveway. The southern driveway curb-cut on Pond Street will remain at the existing location but the southern driveway will only be used by buses/vans exiting the site. All other exiting vehicles (drop-off/pick-up, staff, and visitors) will use the northern driveway.

- Bus/van drop-off/pick-up will occur along a designated driveway immediately adjacent to the main SHS entrance. Establishing a dedicated bus/van driveway will reduce conflicts between buses/vans, general traffic (such as parent vehicles), and pedestrians and will improve safety.

- Based on the results of future condition traffic analysis, the study team recommends that left turns from the SHS's northern driveway onto Pond Street be prohibited during the morning drop-off period to minimize queuing along the driveway. This is the same prohibition that currently exists on the main driveway. During the afternoon pick-up period and other non-peak times, left turns from the northern driveway would be permitted. (Signage will clarify these time restrictions.)

Figure 1. *Sharon High Scool Study Area and Data Collection Locations*

- In total, 190 parking spaces will be provided on campus. The existing four staff/visitor parking lots will be replaced with one main staff/visitor lot (175 spaces), which will have access/egress from Pond Street. A small 15-space lot will be located near the football field and will have access/egress from Ames Court. During school days, these 15 spaces will be designated for staff use and will be available as general parking during other times. Given that the projected future staffing level is approximately 160, the planned parking supply of 190 spaces will adequately serve staff and visitor parking demands.

- Loading/service vehicle access will be relocated from the Ames Court driveway to a new service driveway on Beach Street.

- While emergency vehicles will be able to access the SHS campus via the northern and southern driveways on Pond Street, the service driveway on Beach Street, and Ames Court, an additional gated access point for emergency vehicles will be provided on Beach Street, immediately west of Pond Street. No other vehicles will be permitted to use this gated driveway.

- By 2025, SHS will generate up to 142 new vehicle trips in the morning peak hour and 79 new vehicle trips during the afternoon peak hour. Vehicle trips include new drop-off/pick-up trips, bus/van trips, staff trips, and student trips to the permitted student parking lots.

- While some study intersection approaches will exhibit increased delays under the Build Condition, these delays are expected to occur, as today, only for a short time. It is commonplace to experience delays and queues near most schools during the periods when students are arriving in the morning and departing in the afternoon.

- Overall, the Project will have minimal impacts on transportation operations in the vicinity of the SHS site. Furthermore, the redesigned circulation on the SHS campus will support better vehicle flow and improve safety by reducing conflicts between buses/vans, general traffic, and pedestrians.

Existing Condition

This section presents information related to existing traffic volumes, school activity, parking, and pedestrian/bicycle environment.

Traffic Data Collection

TURNING MOVEMENT COUNTS

Turning Movement Counts (TMCs) were recorded during the morning peak period (7:00 – 9:00 a.m.) and the afternoon peak period (2:00 – 4:00 p.m.) on Thursday, October 18, 2018, at the study intersections and include counts of vehicles, pedestrians, and bicycles. The peak one hour (the hour with the highest traffic volumes) was identified during each period and the associated TMCs are shown in **Figure 2** and **Figure 3,** respectively, for the morning and afternoon.

AUTOMATIC TRAFFIC RECORDER COUNTS

An automatic traffic recorder (ATR) is a device that continuously records the number and class of vehicles on a roadway for a given period of time. ATR counts, as located in **Figure 1**, were conducted at two locations on Pond Street for a 48-hour period on October 18-19, 2018.

Figure 4 and **Figure 5** present graphs of the hourly traffic volumes at the two Pond Street ATR locations. Travel volumes and patterns on Pond Street are, as expected, similar on the two days. The morning peak hour generally occurs between 7:00 a.m. and 8:00 a.m. reflecting the typical peak of commuter travel and the SHS start time at 8:05 a.m. The evening peak hour of traffic along Pond Street occurs between 5:00 – 6:00 p.m., reflecting commuter travel activity. Between 3:00 – 4:00 p.m., the volumes reflect a lesser peak, coinciding with SHS dismissal at 2:40 p.m. when students and staff start leaving the campus.

Two-way volumes along Pond Street are approximately 6,000 to 6,100 vehicle trips per day. Hourly volumes are highest, between approximately 600 and 700 vehicles per hour, during the morning and evening commuter peak hours. The directionality of vehicle travel (northbound vs. southbound) show the activity generated at the school and the background commuter patterns, which is predominantly northbound in the morning and southbound in the evening. During the midday, between about 9:00 a.m. and 1:00 p.m., hourly volumes are less than 300 vehicles per hour. After the evening peak, volumes decline from about 250 vehicles per hour at 7:00 p.m. to less than 50 vehicles per hour at midnight.

Figure 2. ***Existing (2018) Condition Traffic Volumes, Morning Peak Hour***

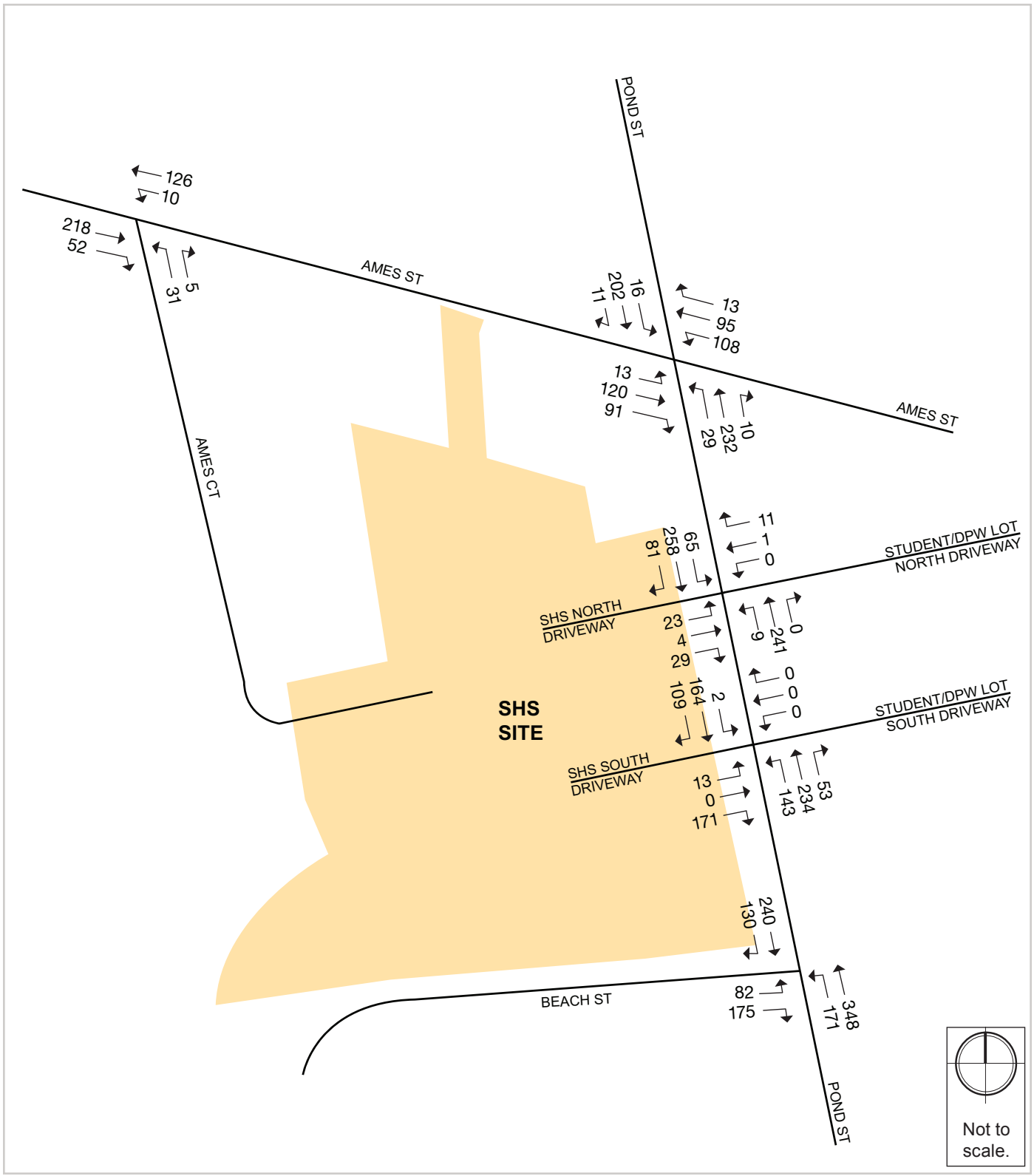


Figure 3. ***Existing (2018) Condition Traffic Volumes, Afternoon Peak Hour***

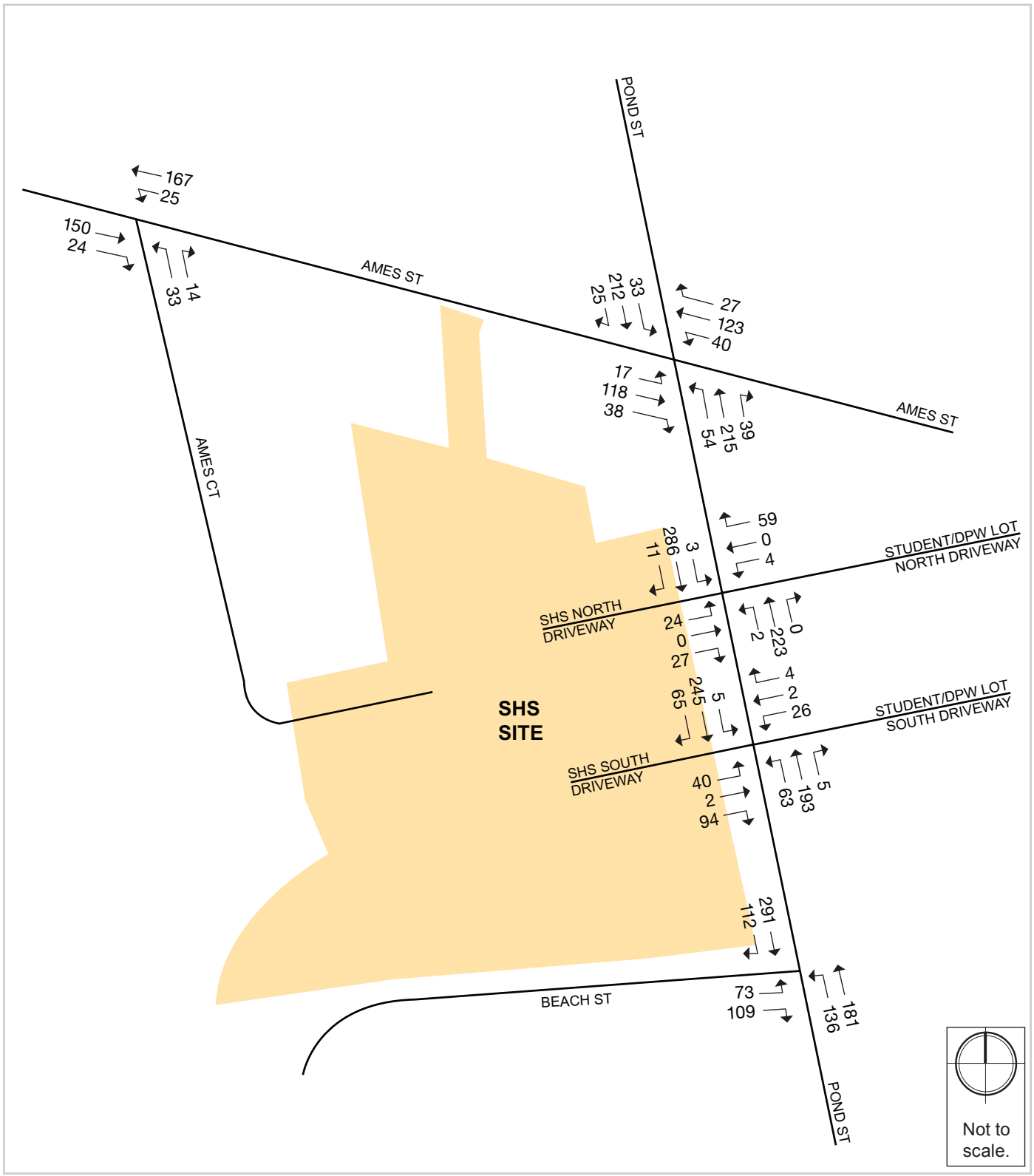


Figure 4. ***Pond Street Volumes, North of Sharon High School Entrance***

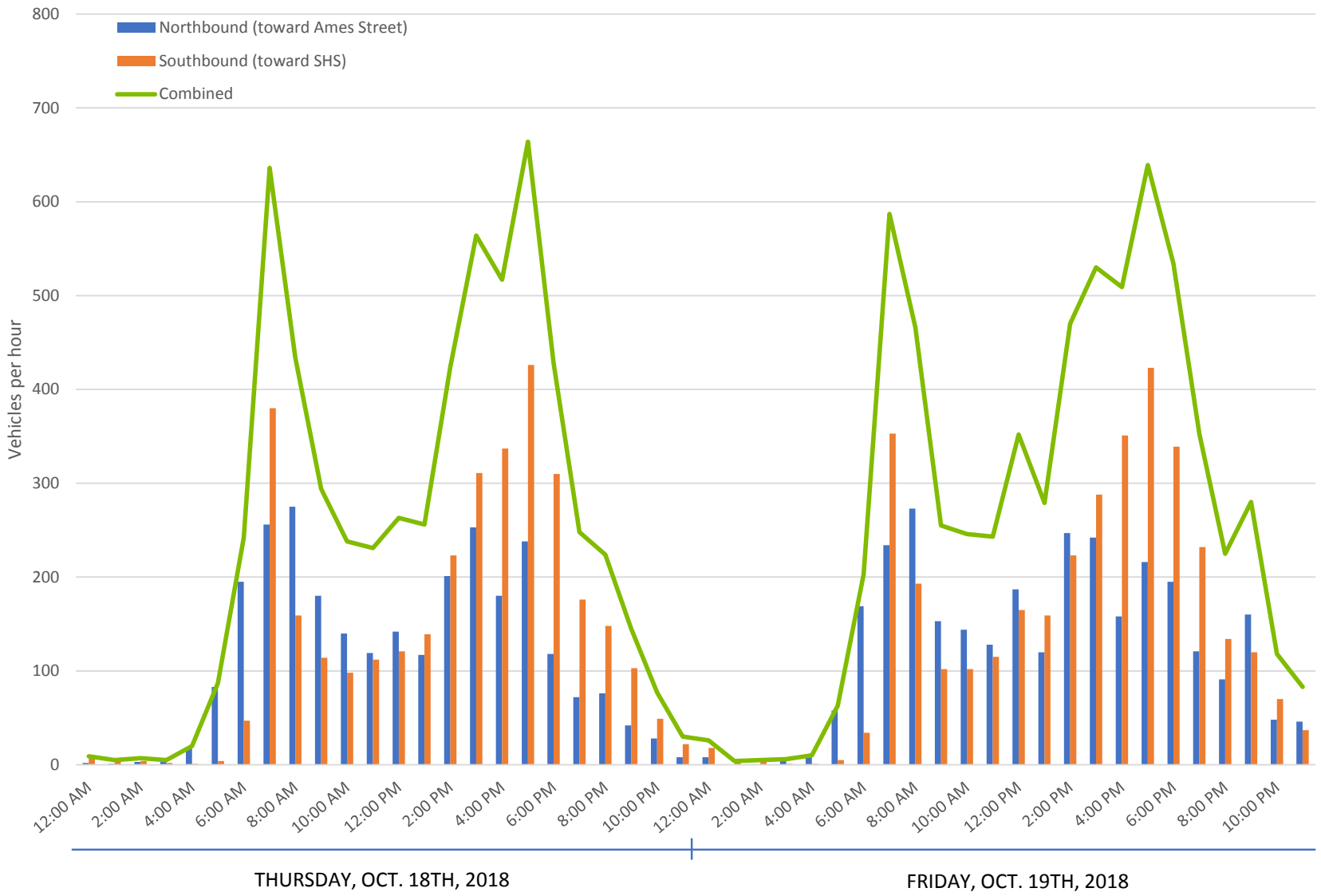
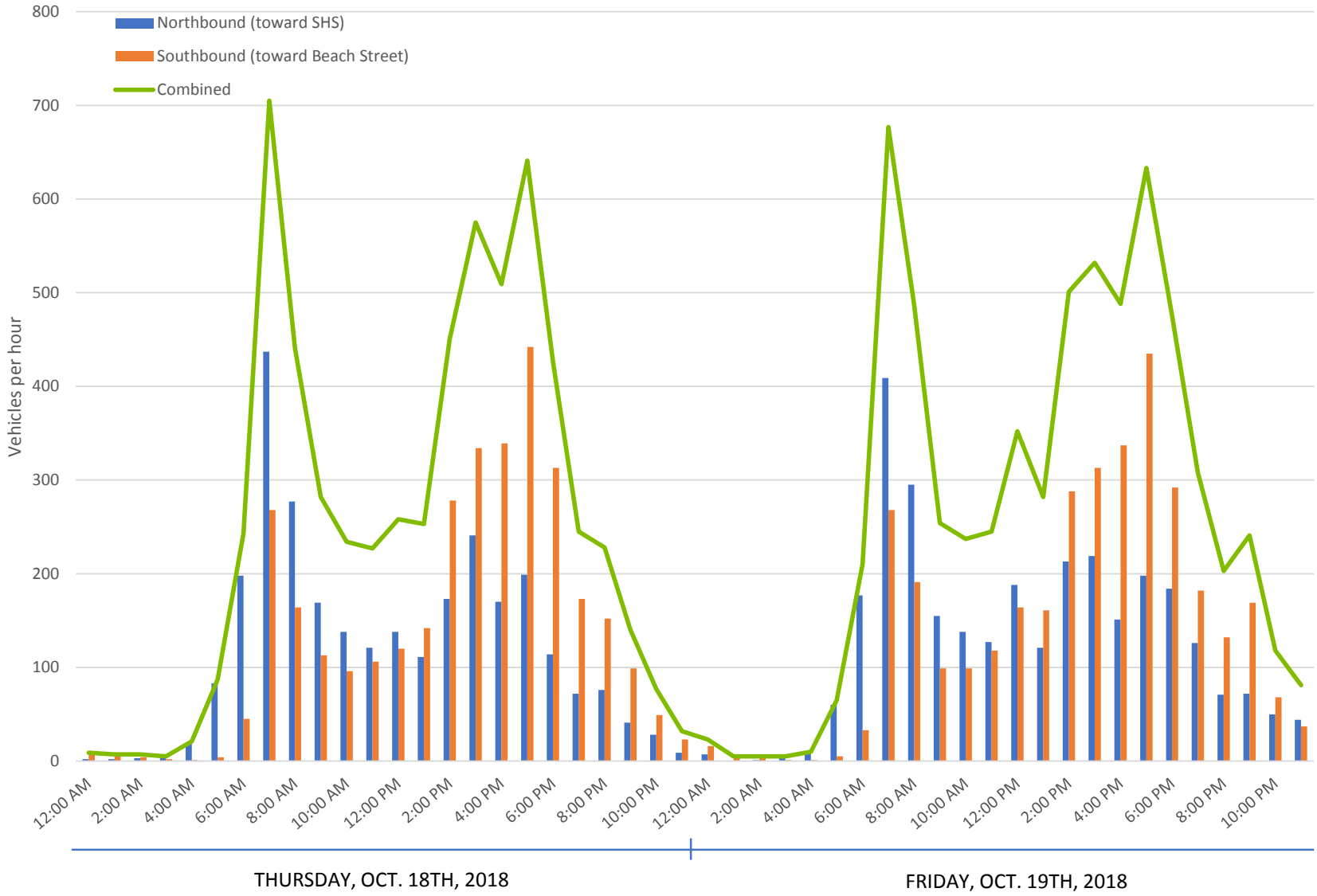


Figure 5. ***Pond Street Volumes, South of Sharon High School Entrance***



Existing School Activity Observations

The study team conducted detailed field observations at the SHS campus during the morning drop-off and afternoon pick-up periods on Thursday, October 25, 2018. The weather was clear. (Informal observations of the morning drop-off period were also observed on Friday, October 12, 2018, during rain showers.)

Students and staff enter and exit the school building at three primary points. The main entrance on the Pond Street side of the building is located near the middle of the south side of the building. An auxiliary entrance, also on Pond Street, is located near the circle on the northern side of the school. The rear entrance is located on the west side of the building at the end of Ames Court. Parents are permitted to drop-off and pick-up their students at any of these entrances, while school buses use only the main entrance and school vans serving special needs students use the auxiliary entrance.

The SHS school day officially starts at 8:05 a.m., although the library opens at 7:15 a.m. and the cafeteria is available for breakfast at 7:30 a.m. SHS is dismissed at 2:40 p.m. As is typical at high schools, vehicle activity associated with the afternoon dismissal period is less than during the morning arrival period because some students stay after school for clubs and athletics and more student carpooling occurs.

Unless otherwise noted, the observations presented below for the morning and afternoon periods are from October 25, 2018.

MORNING ARRIVAL PERIOD

Many staff members arrive and park on-site prior to 7:30 a.m. Noticeable parent drop-off activity starts about 7:30 a.m. with a few vehicles at a time. The pace increases at about 7:45 a.m. and continues up until a few minutes after 8:00 a.m. The 13 school buses serving the school typically arrive between 7:45 a.m. and 7:58 a.m. During this peak time, parent vehicles and buses queue back from the main entrance. The queue can build back from the main entrance to the Pond Street/SHS South Driveway intersection. As this happens, some students will exit their parent's vehicle while waiting in the queue. To discourage those parents from then passing on the left to exit the lot, school buses may unload students from the travel lane of the parking lot rather than the curb lane. The queue, which can extend from the main entrance back to Pond Street and then along Pond Street, begins to alleviate a bit past 8:00 a.m. and is somewhat clear by about 8:05 a.m. Some sporadic late drop-offs occur after 8:05 a.m. Overall, the circulation and mixing of parent drop-off vehicles with bus activity in the same area causes some driver confusion and creates an unsafe environment for students.

On October 12, 2018, with rainy weather, during the peak of the morning drop-off, buses and parent vehicles queued back from the main entrance, and out onto Pond Street in both directions. In the northbound direction, the Pond Street queue extended back to Beach Street. In the southbound direction, the Pond Street queue extended back close to Ames Street. During this period, a firetruck responding to a

report of the pedestrian accident had to travel northbound on Pond Street, pass the school, and through the congestion. The queues observed on October 25, 2018, during clear weather, were much shorter.

At the auxiliary front entrance (with the circle), SHS faculty began to arrive and park at approximately 7:30 a.m. Approximately 50 parent vehicles dropped-off students off at the circle adjacent to the auxiliary front entrance. Seven school vans, carrying special needs students, began to arrive at approximately 7:45 a.m. Occasionally, parents would pass vans while students were unloading. At no time between 7:00 a.m. and 8:00 a.m. did the queue extend back more than three-quarters around the circle. The overlap of parent drop-off activity with school van activity in the same area creates an unsafe environment for students.

During the morning drop-off period, activity in the rear SHS area (accessed via Ames Court) was primarily related to SHS staff, who arrive and park, and 28 parent vehicles dropping-off students. The area was also used as staging for one full-sized school bus and two school vans. Most students who park at the Memorial Park Beach parking lot (Recreation Dept.) walk into the building at this rear entrance.

AFTERNOON DISMISSAL PERIOD

During the afternoon pick-off period, all 13 school buses began to queue in the travel lane of the parking lot near the main entrance at approximately 2:30 p.m. The first arriving bus pulled all the way around and parked within the travel lane approximately 50 feet from the exit and the last bus parked in the travel lane approximately 150 feet from the main entrance. Parents did not queue within the line of buses. The parked buses did not allow enough space for faculty members parked in the main lot to exit their parking space. All buses were out of the parking lot by 3:00 p.m. A few parent vehicles arrived and parked in available spaces. While parents began to arrive at the main entrance soon after the school buses departed, very little parent vehicle queueing occurred. Many students were already waiting outside the school for their parents and got into vehicles quickly. Most parents did not wait longer than five minutes for their student to enter the vehicle. A total of 23 personal vehicles picked-up students at the main entrance.

During the afternoon pick-up period at the auxiliary front entrance, school vans began to arrive and park around the circle at 2:05 p.m. By 2:35 p.m., 5 vans were parked at the circle. All vans departed by 2:45 p.m. Some parent vehicles that arrived at this entrance parked in available spaces by the circle and waited for their students. Once the vans departed, some parents would idle in the circle while waiting for students. In total, approximately 13 parent vehicles picked-up students at the auxiliary entrance. There were ten faculty members that used the auxiliary front entrance to access their vehicles between 2:30 and 3:30 p.m.

During the afternoon pick-up period, activity at the rear entrance was minimal. Prior to dismissal, the lot was occupied by 40 vehicles, seemingly all belonging to SHS staff. A total of 29 SHS staff members used the rear entrance to access their vehicles in the rear lot. An empty school bus entered the lot at 2:28 p.m. and departed at 3:00 p.m. Approximately 29 parent vehicles picked students at the rear entrance. Some

parents parked and waited for their student, but most remained in the travel lane to wait. Many students exiting the rear entrance walked toward the Recreation Department lot on Beach Street or towards Ames Court. The SHS football team hosted a 3:45 p.m. game at the field near the rear entrance.

It was noted that although left turns onto Pond Street are always restricted from the northern SHS driveway and during school drop-off and pick-up times from the southern SHS driveway, many vehicles do make the left turn. (These volumes are shown in **Figure 2** and **Figure 3**.)

Existing Parking

SHS staff members park on-site near the school building, including the spaces near the main building entrance, spaces adjacent to the circle on the northern side of the building, and spaces in the rear of the school, accessed via Ames Court.

Many students also drive to school and may park at three off-site student parking lots. The primary student parking area is located on Pond Street, opposite from the school's main entrance. This lot is owned by the Town's Department of Public Works (DPW) and student purchase passes at the school to park here. Students can also park at the Memorial Beach parking lot on Beach Street, which is owned by the Town's Recreation Department. Students purchase parking passes from the Recreation Department. Also, the SHS and The Young Israel of Sharon Synagogue, at 100 Ames Street, have an arrangement that permits up to 25 students to park at the Synagogue as needed.

Table 1 shows a summary of parking supply and observed occupancies at these locations.

The on-site parking observations show that 80% of the overall spaces are occupied midday, indicating that sufficient staff and visitor parking is currently provided. Note that the 43 vehicles observed at the rear of the school included some visitors who were walking on the track. While the DPW lot for student parking is generally full, there are available spaces at the Recreation Dept. Lot. Note that a few student vehicles with tickets were observed in both the DPW lot and Recreation Department lot, indicating that the Town does enforce the parking regulations.

Table 1. SHS Existing Parking Supply and Occupancy

Parking Location	Capacity (spaces)	Mid-morning [1] Parking Occupancy	
		Spaces	Percent
Staff and Visitors			
On-site at SHS South (main entrance area) North (circle area) Front (adjacent to Pond St.) Rear Total	 73 28 46 42 189	 45 21 43 43 152	 62% 75% 93% 102% 80%
Students			
Student/DPW lot *Pond Street*	135	124 *4 cars without permit*	92%
Student/Recreation Dept. Lot *Beach Street*	70	59 *3 cars without permit*	84%
Young Israel of Sharon Synagogue *Ames Street*	25 *Available for SHS use*	20[2]	80%

1 – Combination of observations on Thursday October 25, 2018, and Wednesday, November 7, 2018.
2 – It was unclear whether these were student vehicles or vehicles associated with the Synagogue.

Existing Pedestrian and Bicycle Conditions

Pedestrian and bicycle counts were conducted concurrent with the TMCs. **Figure 6** shows pedestrian volumes during peak hours. The highest pedestrian crossing activity occurred on Pond Street between the Student/DPW parking lot and the SHS site.

Figure 6 also identifies the inventory of crosswalks. At the Ames Street/Ames Court intersection, no crosswalks are provided. At the Ames Street/Pond Street intersection, crosswalks are provided across the Ames Street eastbound approach and the Pond Street northbound approach. At the Pond Street/Beach Street intersection, only the eastbound Beach Street eastbound approach has a crosswalk. At each SHS driveway on Pond Street, one crosswalk is provided across the school driveways and one crosswalk across Pond Street. The Pond Street crosswalks are highly visible to drivers and signage to alert drivers is provided.

As shown in **Figure 7**, bicycle volumes at the study intersections are relatively low. No bicycle lanes are provided on roadways within the study area. About 20 parked bicycles were observed at the SHS bicycle racks during the midday.

Figure 6. ***Existing (2018) Condition Pedestrian Volumes, Morning and Afternoon Peak Hours***

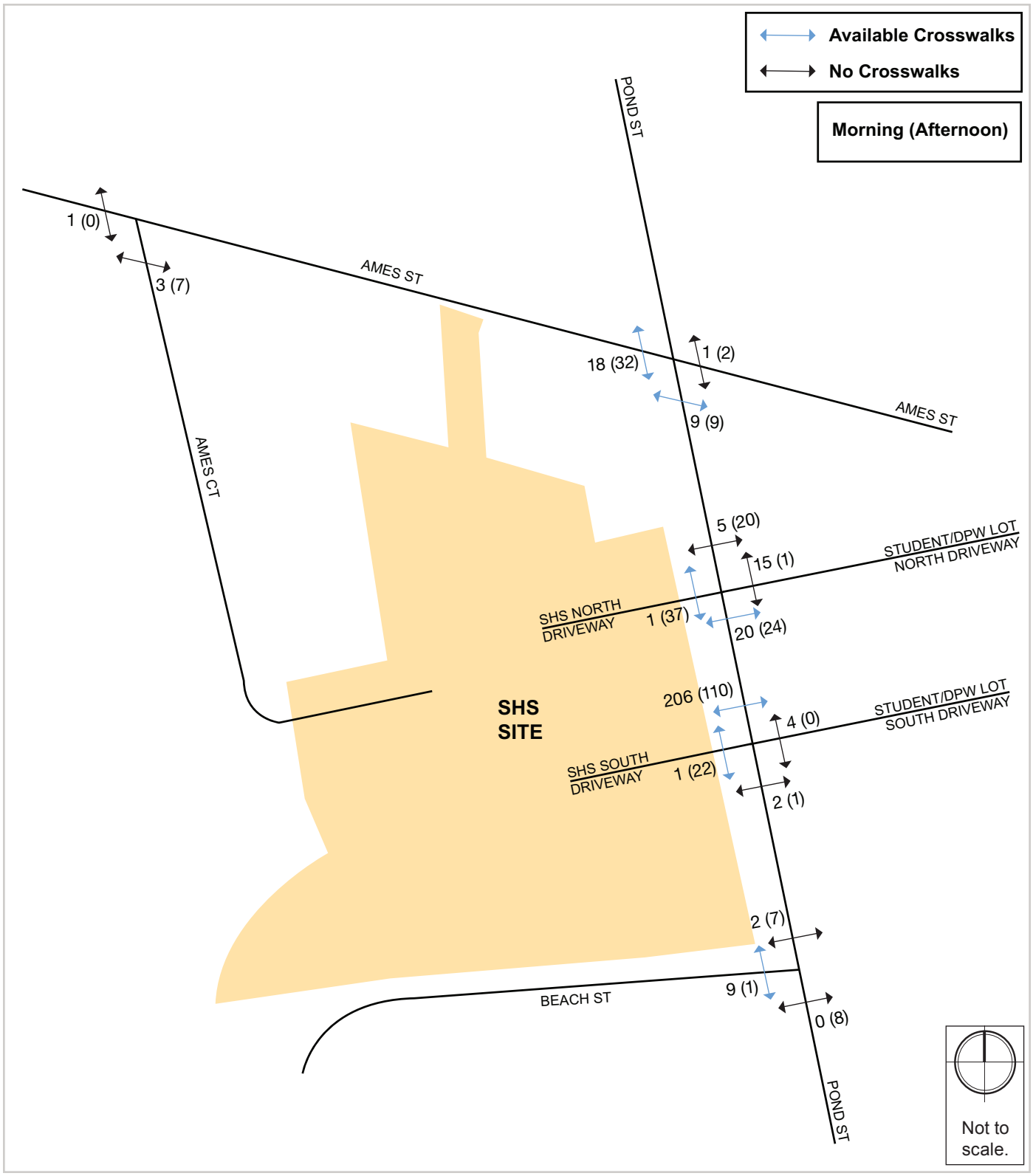
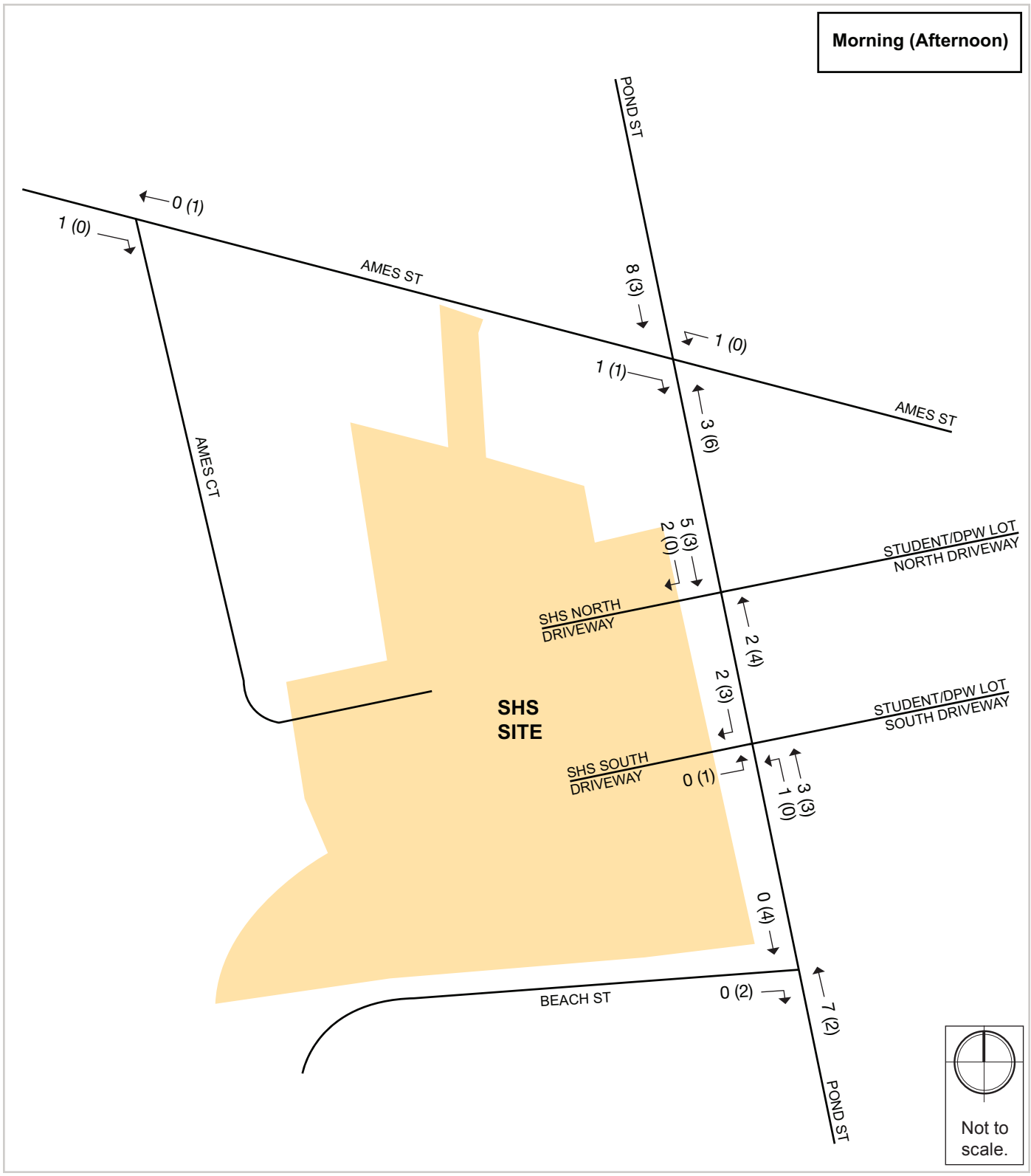


Figure 7. ***Existing (2018) Condition Bicycle Volumes, Morning and Afternoon Peak Hours***



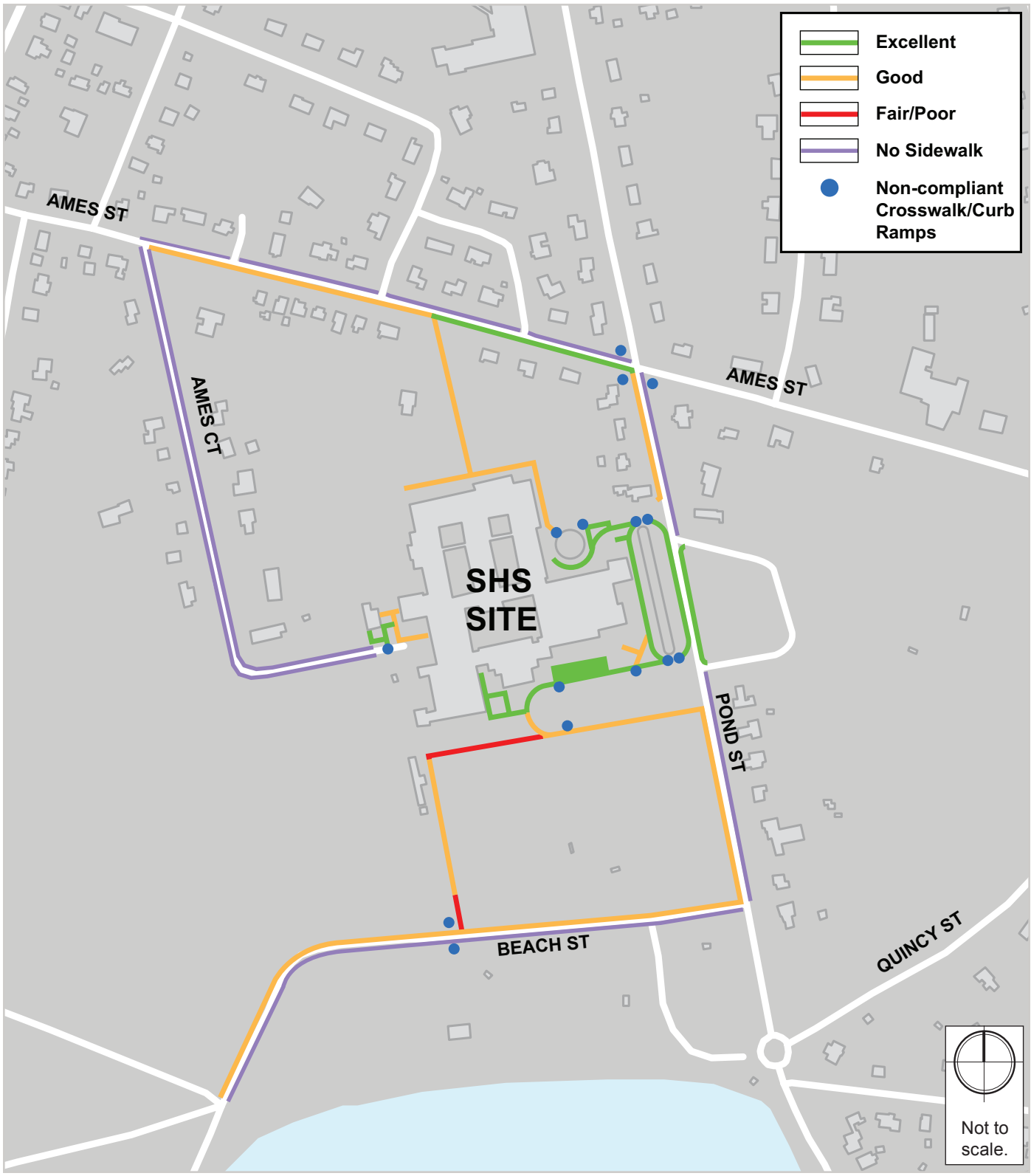
The study team conducted an inventory of sidewalk conditions along Ames Street, Pond Street, and Beach Street and on the SHS site. Sidewalk conditions were classified according to the following three categories:

- **Excellent.** No deterioration observed.
- **Good.** Minimal deterioration, such as cracking, heaving, sinking, and intrusion or encroachment of vegetation observed.
- **Fair/Poor.** Some deterioration observed, including more severe cracking, heaving, sinking, and intrusion or encroachment of vegetation, as well as presence of patching.

The sidewalk conditions are shown in **Figure 8**. Most street segments serving the school have a sidewalk on only one side of the street. Where sidewalks exist, they are sufficiently wide and generally the condition is good to excellent. While walking paths within the SHS site are generally in good condition, a segment of sidewalk between the main entrance and the athletic fields/ rear of school has broken asphalt.

Crosswalk curb ramps that are not in compliance with the Americans with Disabilities Act (ADA) are also noted in **Figure 8**. Any non-compliant ramps on the school property will ultimately be brought into compliance as part of the SHS project. Upgrades to the off-site non-compliant ramps should be discussed with the Town. The crosswalk across Beach Street near the Recreation Department parking lot used by students has no ramps and does not connect to a sidewalk on the southern side of Beach Street.

Figure 8. ***Pedestrian Conditions***



Build Condition

This section presents the proposed site plan, trip generation associated with growth at SHS, and intersection level of service evaluation.

The design year for the Project is designated as 2025, seven years into the future as is standard for traffic analysis. The baseline 2025 intersection volumes have been estimated by applying a 0.25 percent annual growth factor to existing volumes reflecting background growth unrelated to increases in enrollment and staff at SHS.

By 2025, the SHS enrollment is projected to increase by 200 students to 1,350 students. SHS currently has about 140 staff members. If the future staffing level increases proportionally to the enrollment growth, staff will increase to about 160 members by 2025. New vehicle trips for buses, parent drop-off/pick-up, staff, and students were incorporated into the estimated future traffic volumes.

Site Access and Circulation

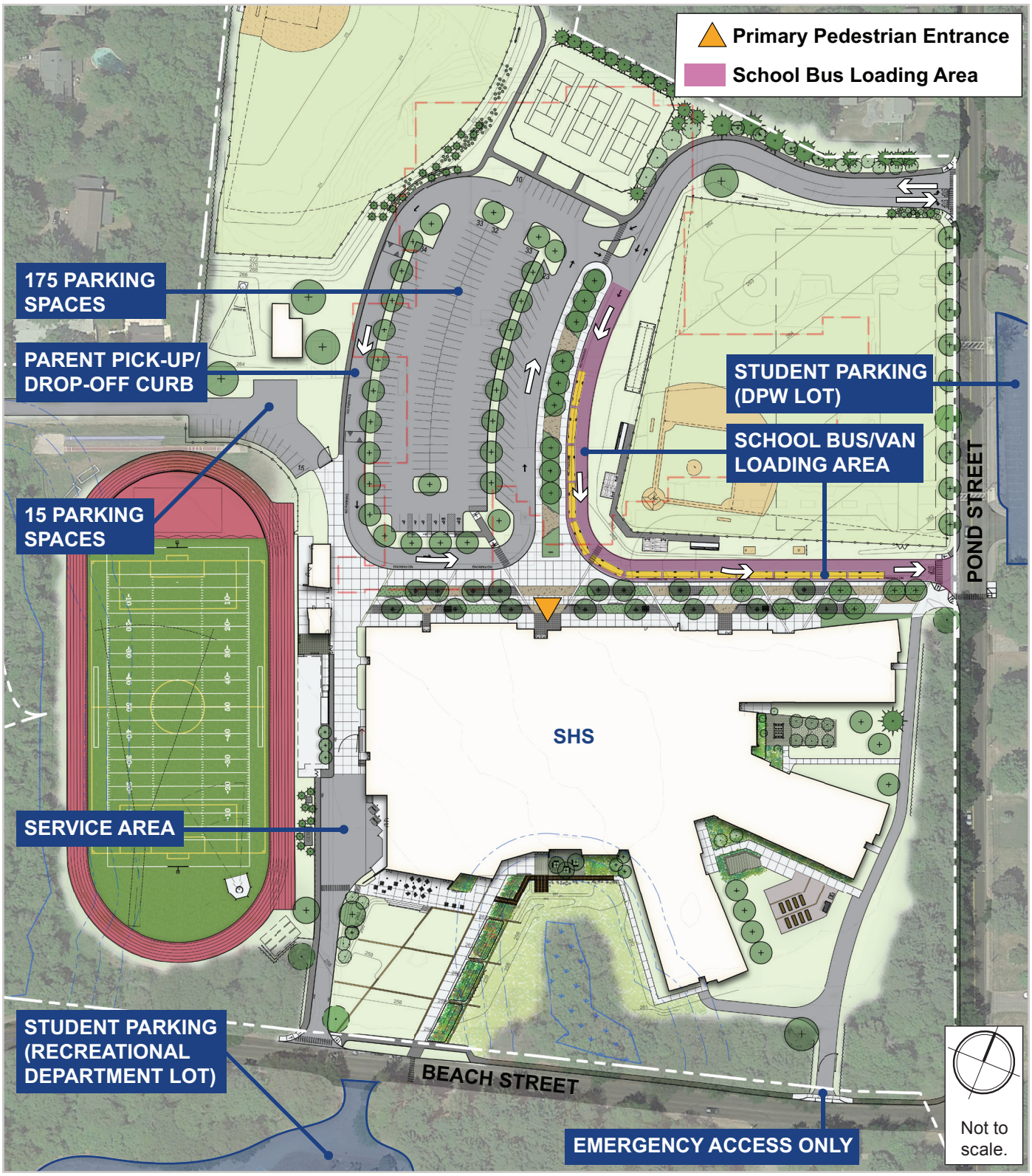
The proposed site plan is shown in **Figure 9**. The new school building will be constructed on the southern portion of the site, with relocation of parking and the baseball fields/tennis courts to the northern portion.

OVERVIEW

Primary access and egress driveways at the school will remain on Pond Street. The main parking lot will provide approximately 175 parking spaces for staff, visitor, and accessible/handicap use. Two site driveway curb-cuts will be located along Pond Street. The northern driveway will be two-way, providing access for all vehicles and egress for all vehicles except buses/vans. The southern driveway will provide egress for buses/vans only.

A rear, secondary driveway to the school will continue to be located on Ames Court and will provide access to approximately 15 parking spaces along the north side of the football field and track. During school days, this parking will be designated for staff use and will be available as general parking during other times. Because with the Project fewer parking spaces will be accessed via the rear driveway, vehicle trip activity on Ames Court will be reduced.

Figure 9. ***Site Plan***



PARENT DROP-OFF/PICK-UP

The largest component of on-site vehicle activity is generated by parent drop-off during the morning arrival period and parent pick-up during the afternoon dismissal period. Parent vehicles will enter at the northern site driveway and proceed to the student loading/unloading area adjacent to the tennis courts. After drop-off/pick-up, vehicles will circulate through the parking area to exit the northern driveway onto Pond Street. Along the driveway, the curbside length will be approximately 1,100 feet between Pond Street and the main entry area, providing queuing capacity for approximately 55 vehicles. A student loading and unloading zone will be provided on the curb segment adjacent to the tennis courts.

Based on the results of future condition traffic analysis (presented in a later section), the study team recommends that left turns from the SHS's northern driveway onto Pond Street be prohibited during the morning drop-off period to minimize queuing along the driveway. This is the same prohibition that currently exists on the main driveway. During the afternoon pick-up period and other non-peak times, left turns from the northern driveway would be permitted. (Signage will clarify these time restrictions.)

BUS/VAN CIRCULATION

A key feature of the circulation plan is that buses/vans will have a designated one-way driveway separated from the parking lot and the parent vehicle loading/unloading zone, thus eliminating the vehicle conflicts and resulting congestion that occur today in the main parking lot. Buses/vans will enter at the northern driveway and exit at the southern driveway with loading/unloading occurring adjacent to the main entrance of the building. The bus/van driveway will have a curbside length to accommodate approximately 15 full-sized school buses.

Outside of the morning arrival and afternoon dismissal periods, the bus/van driveway could, if deemed necessary by school officials, be used by other vehicles that are dropping-off or picking-up students. Signage will clarify these time restrictions. No parking will be permitted along the bus/van driveway.

SERVICE VEHICLES

Service, delivery, and trash vehicles will use the service driveway on Beach Street to access the loading area. Note that emergency vehicle access to the building will be available from Pond Street, Ames Court, the service driveway, and a gated access point on Beach Street, immediately west of Pond Street.

STUDENT PARKING

For this assessment, the study team assumed that the two off-site parking areas managed by others (DPW lot on Pond Street and Recreation Department lot on Beach Street) will continue to be available for student parking. No student parking will be provided on-site.

BICYCLES

Bicycle racks will be provided for student, staff and visitor use near the main building entrance.

PEDESTRIANS

Most street segments serving the SHS site have a sidewalk on only one side of the street. Where sidewalks exist, they are sufficiently wide and generally the condition is good to excellent.

In the future, the crosswalk across Pond Street between the off-site DPW student lot and campus will be relocated to the south of the southern driveway. A crosswalk beacon will be installed to increase the visibility of pedestrian crossings. The crosswalk across Beach Street between the off-site Recreation Department lot and the campus will generally remain in place and be located on the east side of the new intersection of Beach Street and the service driveway.

Crosswalks will be delineated with pavement markings across all site driveways. All new crosswalks and on-site sidewalks will be constructed in compliance with the Americans with Disabilities Act (ADA).

Trip Generation

The increases in trip activity at SHS under the future condition are based on data provided by the school and field observations of travel characteristics. Peak traffic in the area coincides with the school start and dismissal times of 8:05 a.m. and 2:40 p.m. The morning peak hour occurs between 7:15 a.m. and 8:15 a.m. and the afternoon peak hour occurs between 2:45 p.m. and 3:45 p.m.

SHS enrollment is currently 1,150 students and by 2025 is expected to increase by approximately 200 new students for a total enrollment of 1,350 students. [Note that to "right-size" a new MSBA school building, the Town adopts a design enrollment level which is developed and certified by the MSBA and used by the design team. For SHS, the design enrollment is 1,250 students. For the transportation impact analysis, a maximum enrollment level of 1,350 was used to ensure conservative (higher impact) results.] Based on the future student enrollment, it is estimated that there will be corresponding increase of approximately 20 staff members, from 140 to approximately 160 staff.

TRAVEL MODE SHARES

Travel mode shares reflect the distribution of person trips among travel modes, including drop-off/pick-up by parents, student drivers, school buses/vans, and walking/bicycling. A travel mode share profile, as summarized in **Table 2**, has been developed from the existing condition based on available data and observations for students and staff. Note that on an average day about 4% of SHS students are absent from school. In the future, the travel mode shares are expected to be similar to the existing condition.

Table 2. Travel Mode Shares and Vehicle Occupancy

Characteristic	Students						Staff	
	Private Vehicle			School Bus/Van	Walk/ Bicycle	Absent	Private Vehicle	Average Vehicle Occupancy (AVO)
	Drop-off/ Pick-Up	Student Parking	Average Vehicle Occupancy (AVO)					
Mode Share/AVO	25.0%	20.0%	1.15	48.5%	2.5%	4.0%	100%	1.00

VEHICLE TRIP GENERATION

By applying the travel mode shares in **Table 2** to the new person trips associated with the growth in the SHS student enrollment and staff expected by 2025, the number of new vehicle trips was estimated and shown in **Table 3** for the various categories of vehicle trips.

Table 3. Vehicle Trips Associated with New SHS Students and Staff

Time Period/Direction		Drop-off/ Pick-Up	Student Parking	School Bus/Van	Staff	Total Vehicles
Morning Peak Hour	In	52	10	4	20	86
	Out	52	0	4	0	56
	Total	104	10	8	20	142
Afternoon Peak Hour	In	27	0	4	0	31
	Out	27	10	4	7	48
	Total	54	10	8	7	79

During the morning peak hour, parent drop-off activity is estimated to increase by 104 vehicle trips (52 in and 52 out). During the afternoon peak hour, parent pick-up activity is estimated to increase by 54 vehicle trips (27 in and 27 out).

The additional 10 student parking trips (10 in and 0 out) during the morning peak hour were assigned to the Recreation Department lot on Beach Street, as the DPW lot is generally at capacity under the existing condition. During the afternoon peak hour, 10 new vehicle trips (0 in and 10 out) will occur at the same lot.

To accommodate the growth in students, four additional buses/vans are expected to provide service SHS in the future. These will result in 8 new bus/van trips during each of the peak hours (4 in and 4 out).

Additional staff members are expected to generate approximately 20 new vehicle trips (20 in and 0 out) during the morning peak hour and 7 new staff vehicle trips (0 in and 7 out) during the afternoon peak hour. Most staff will park in the main parking lot accessed from Pond Street, but some will use parking at the rear of the school accessed from Ames Court.

VEHICLE TRIP DISTRIBUTION

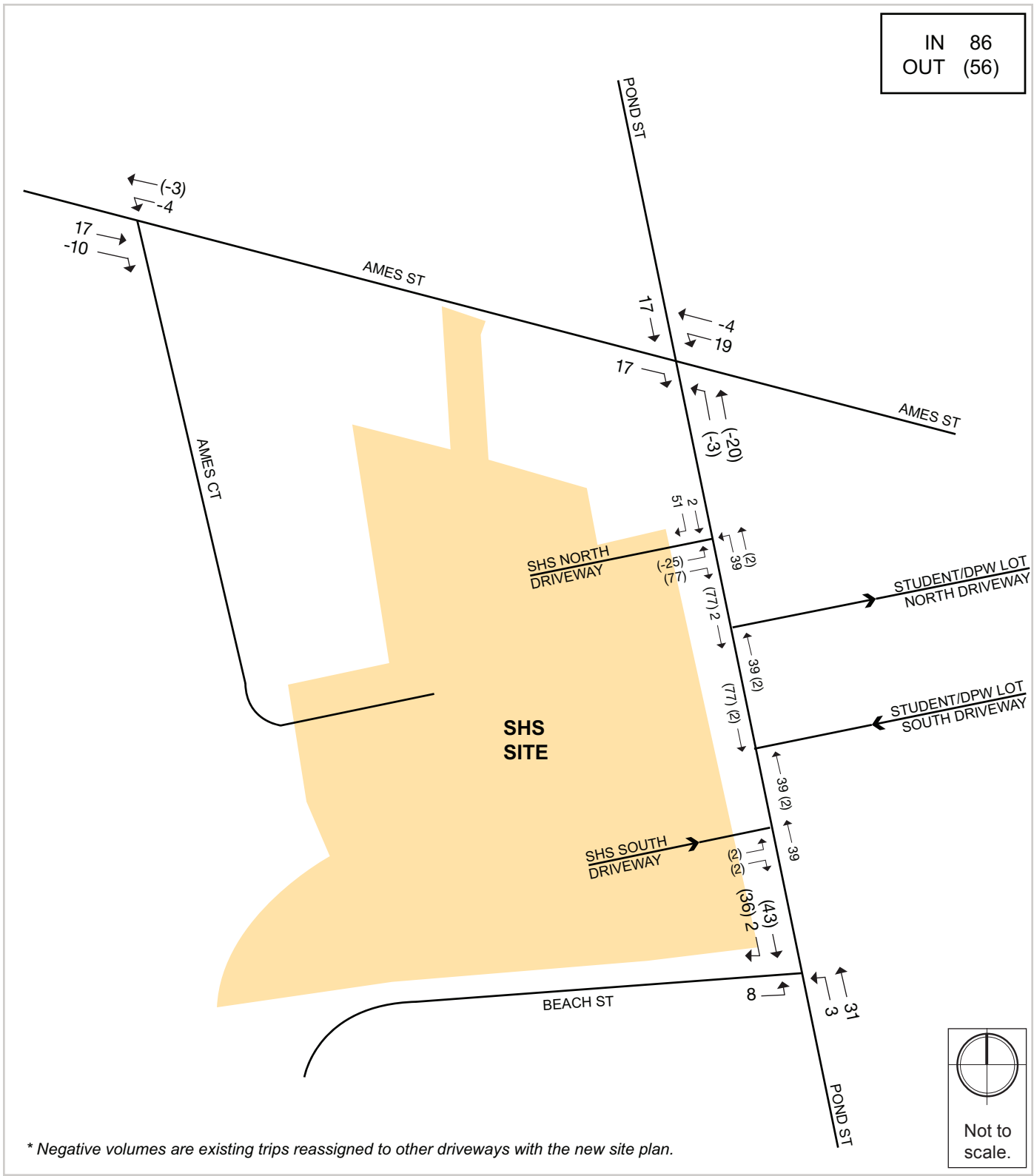
Vehicle trip distribution identifies the various travel paths for vehicles arriving at a destination and the corresponding departure travel paths. Vehicle distribution patterns were developed for each group of vehicles (parent drop-off/pick-up, student parking, buses/vans, and staff) based on field observations, traffic counts, travel patterns, parking location, and circulation routes.

TRAFFIC VOLUMES

Based on the forecasted increase in vehicle trips and the trip distribution patterns, the new SHS vehicle trips were assigned to the study area roadways and SHS site driveways. The new project-generated trips during the morning and afternoon peak hours are shown in **Figure 10** and **Figure 11**, respectively.

The Build Condition traffic volumes, which incorporate background growth and new SHS trips, are shown in **Figure 12** and **Figure 13.**

Figure 10. ***Project Generated Vehicle Trips, Morning Peak Hour***



** Negative volumes are existing trips reassigned to other driveways with the new site plan.*

Figure 11. ***Project Generated Vehicle Trips, Afternoon Peak Hour***

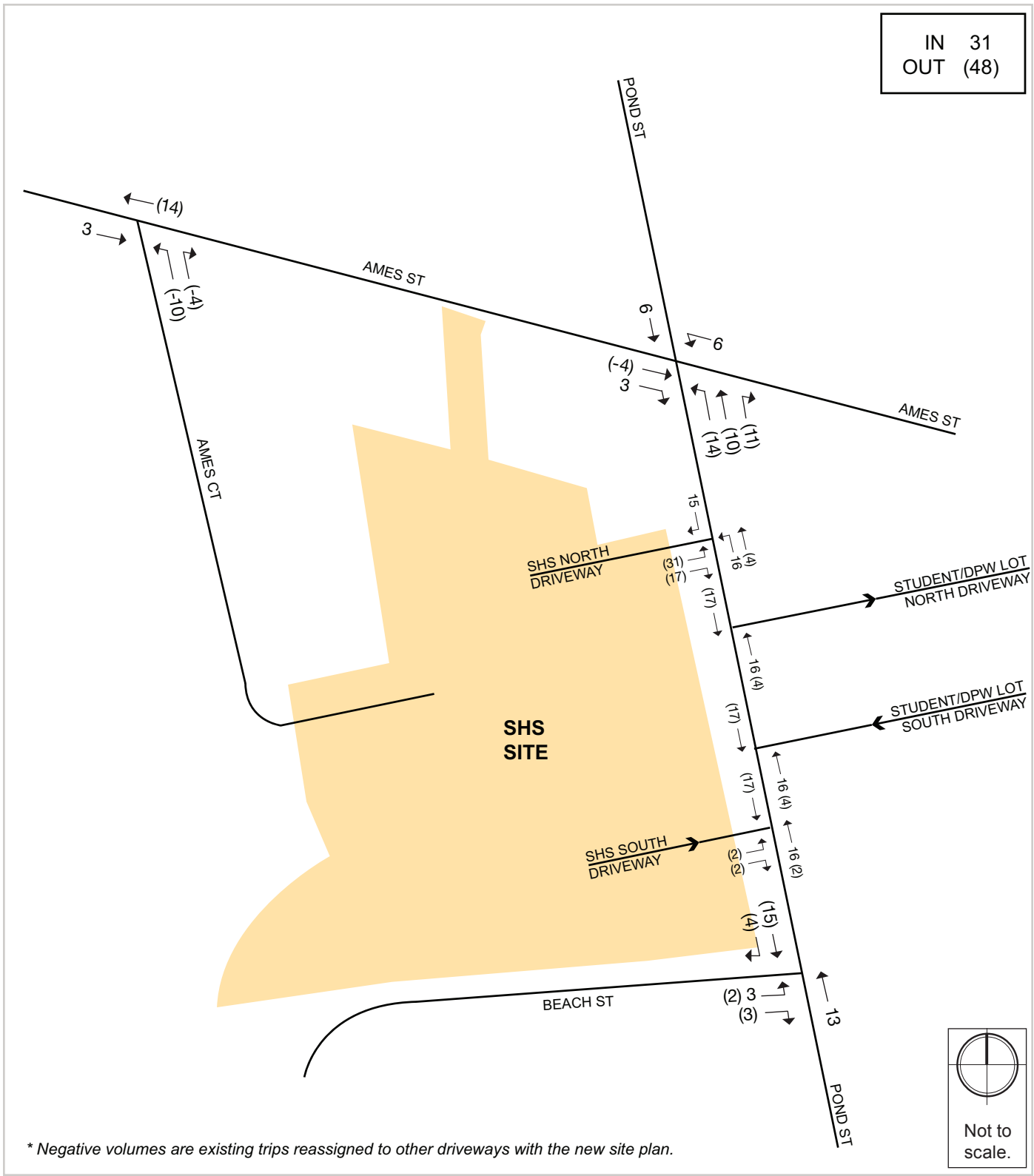


Figure 12. ***Build (2025) Condition Traffic Volumes, Morning Peak Hour***

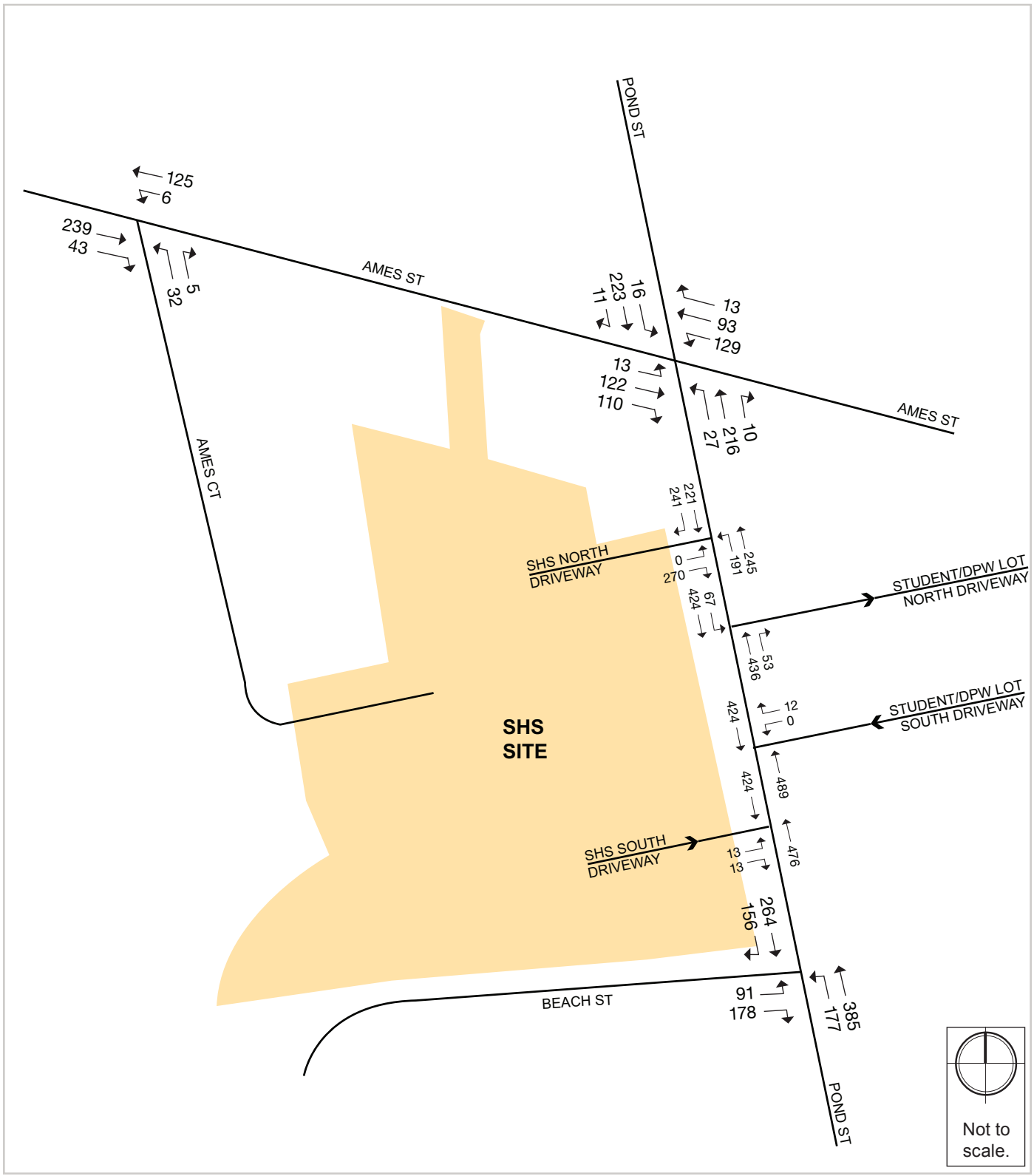
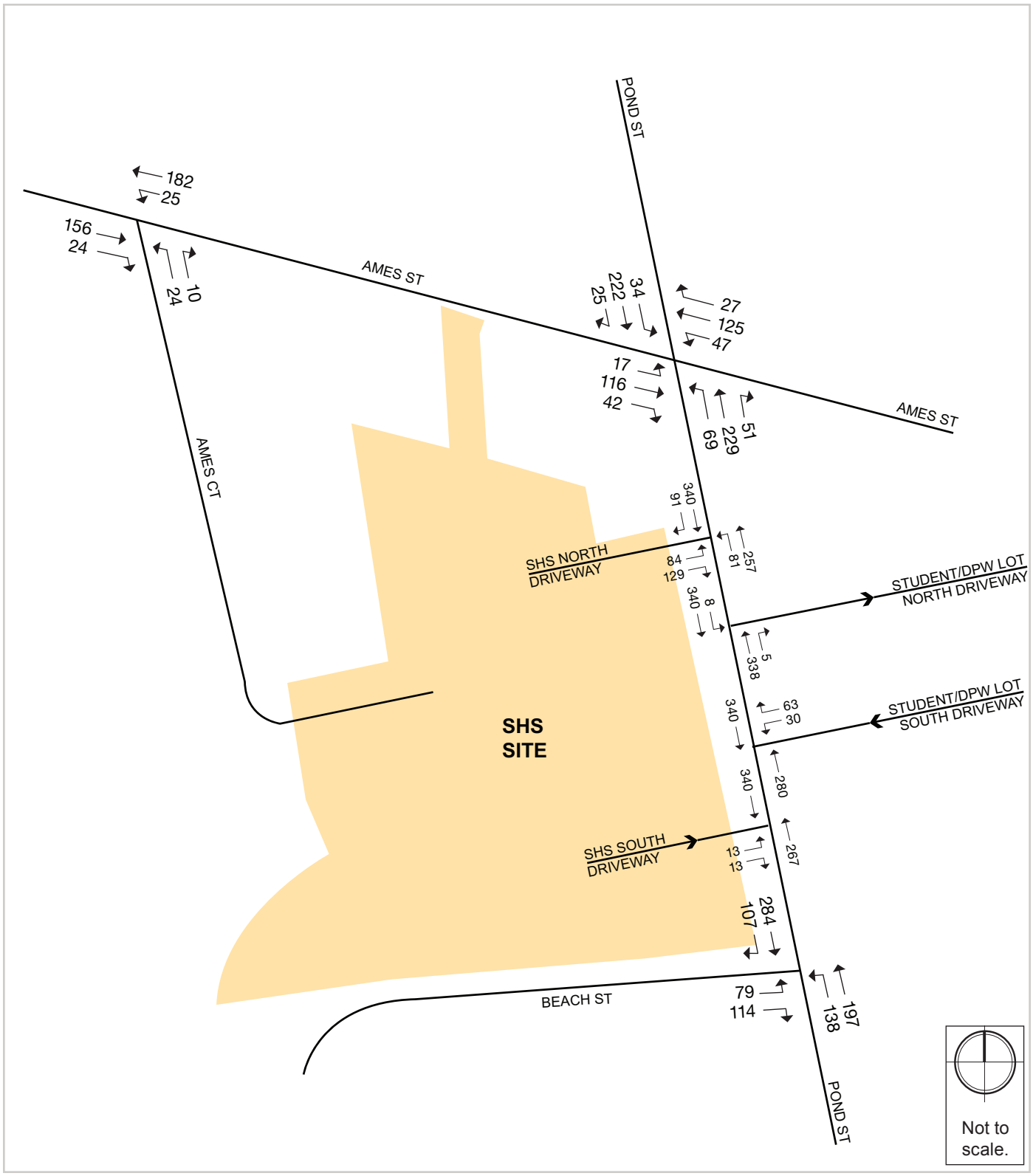


Figure 13. ***Build (2025) Condition Traffic Volumes, Afternoon Peak Hour***



Traffic Operation Analysis

The key intersections in the SHS area were evaluated to quantify the associated delays experienced by drivers. The criterion for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 9) software package was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's 2000 Highway Capacity Manual (HCM).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 4** displays the intersection LOS criteria for unsignalized intersections (there are no signalized intersections in the designated study area).

Table 4. Vehicle Level of Service Criteria, Unsignalized Intersections

Level of Service	Average Stopped Delay (sec.)
A	≤10
B	>10 and ≤15
C	>15 and ≤25
D	>25 and ≤35
E	>35 and ≤50
F	>50

Source: 2000 Highway Capacity Manual, Transportation Research Board

LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition, with significant traffic delay. LOS D or better is typically considered acceptable. However, LOS E or F is often typical for a stop controlled minor street that intersects a major roadway.

In addition to delay and LOS, the operational capacity and vehicular queues are calculated and used to further quantify traffic operations at intersections. The following describes these other calculated measures.

- The volume-to-capacity (v/c) ratio is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has adequate capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity.

- The 95th percentile queue length, measured in feet, represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during five percent of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only five percent of the time and would typically not occur during off-peak hours. Since volumes fluctuate throughout the hour, the 95th percentile queue represents what can be considered a "worst case" scenario. Queues at the intersection are generally below the 95th percentile queue throughout the course of the peak hour. It is also unlikely that the 95th percentile queues for each approach to the intersection will occur simultaneously.

Table 5 and **Table 6** summarize the Existing (2018) Condition and the Build (2025) Condition capacity analysis for the study area intersections during the weekday morning and afternoon peak hours, respectively. Complete Synchro reports are provided in the Appendix.

EXISTING (2018) CONDITION TRAFFIC CAPACITY ANALYSIS

As shown under the Existing (2018) Condition in **Table 5** and **Table 6**, all approaches at four of the five study area intersections operate at an acceptable level of service, LOS D or better during the morning peak hour. While the Beach Street approach at the Beach Street/Pond Street intersection operates at LOS F during the morning peak hour, this is not unusual for a stop controlled minor street that intersects a major street, such as Pond Street. During the afternoon peak hour, all approaches operate at LOS D or better.

BUILD (2025) CONDITION TRAFFIC CAPACITY ANALYSIS

As shown under the Build (2025) Condition in **Table 5** and **Table 6**, most intersection approaches continue to operate a similar level of service as under the Existing Condition and at LOS D or better, with the following exceptions:

- During the morning peak hour at the Pond Street/SHS northern driveway, operation of the eastbound driveway approach will operate at LOS E. The study team recommends that left turns from the SHS's northern driveway onto Pond Street be prohibited during the morning drop-off period to minimize queuing along the driveway. This is the same prohibition that currently exists on the main driveway. During the afternoon pick-up period and other non-peak times, left turns from the northern driveway would be permitted. (Signage will clarify these time restrictions.)

- During the afternoon peak hour, at the Pond Street/Ames Street intersection, the Pond Street northbound approach will deteriorate from LOS D to LOS F. This projected change in operation is due to 1) the additional trips associated with the increase in the number of staff/students and 2) the relocation of some staff parking from the rear side (Ames Court) of the existing school to the new main parking lot, which increases trips through the Pond Street/Ames Street intersection.

- The Beach Street approach at the Pond Street/Beach Street intersection will continue to operate at LOS F during the morning peak hour.

While some intersection approaches will exhibit increased delays under the Build Condition, these delays are expected to occur, as today, only for a short time. It is commonplace to experience delays and queues near most schools during the periods when students are arriving in the morning and departing in the afternoon. The redesigned circulation on the SHS campus will support better vehicle flow and improve safety by reducing conflicts between buses/vans, general traffic, and pedestrians.

Table 5. Capacity Analysis Summary, Morning Peak Hour

Intersection/Movement	Existing (2018) Conditions				Build (2025) Conditions			
	LOS	Delay (sec.)	V/C ratio	95th Queue (ft.)	LOS	Delay (sec.)	V/C ratio	95th Queue (ft.)
Ames Street/Ames Court								
EB Ames St. thru/right	A	0.0	0.26	0	A	0.0	0.27	0
WB Ames St. left/thru	A	0.7	0.01	1	A	0.5	0.01	1
NB Ames Ct. left/right	B	14.3	0.17	15	B	14.6	0.18	16
Pond Street/Ames Street								
EB Ames St. left/thru/right	C	20.7	0.61	4	D	26.8	0.70	5
WB Ames St. left/thru/right	C	21.8	0.62	4	D	28.7	0.72	6
NB Pond St. left/thru/right	C	22.9	0.66	5	D	25.3	0.67	5
SB Pond St. left/thru/right	C	24.2	0.68	5	D	34.0	0.78	7
Pond Street/SHS N. Driveway/ Parking Lot (DPW) Driveway								
WB DPW Dr. left/thru/right	C	22.8	0.34	37	-	-	-	-
EB SHS N. Dr. left/thru/right [1]	B	11.3	0.04	3	E	44.2	0.90	264
NB Pond St. left/thru/right	A	0.4	0.01	1	A	6.8	0.29	30
SB Pond St. left/thru/right	A	2.1	0.08	6	A	0.0	0.41	0
Pond Street/SHS S. Driveway/ Parking Lot (DPW) Driveway								
WB DPW Dr. left/thru/right	C	18.6	0.58	94	-	-	-	-
EB SHS S. Dr. left/thru/right [2]	A	0.0	0.00	0	C	19.2	0.16	15
NB Pond St. left/thru/right	A	3.9	0.15	13	A	0.0	0.33	0
SB Pond St. left/thru/right	A	0.1	0.00	0	A	0.0	0.35	0
Pond Street/Beach Street								
EB Beach St. left/right	F	147.3	1.18	374	F	277.3	1.49	525
NB Pond St. left/thru	A	4.9	0.21	20	A	5.3	0.23	22
SB Pond St. thru/right	A	0.0	0.32	0	A	0.0	0.37	0
Pond Street/DPW N. Driveway								
NB Pond St. left/thru	-	-	-	-	A	0.0	0.39	0
SB Pond St. thru/right	-	-	-	-	A	2.7	0.11	9
Pond Street/DPW S. Driveway								
WB DPW Dr. left/right	-	-	-	-	B	12.6	0.09	8
NB Pond St. left/thru	-	-	-	-	A	0.0	0.34	0
SB Pond St. thru/right	-	-	-	-	A	0.0	0.00	0

Grey shading indicates LOS E or F

1 Under the Existing Condition, left turns are always prohibited , although many vehicles do turn left. Under the Build Condition, left turns will not permitted during the morning drop-off period.

2 Under the Existing Condition, left turns are prohibited during morning drop-off period, although many vehicles do turn left. Under the Build Condition, left turns will be permitted at all times.

Table 6. Capacity Analysis Summary, Afternoon Peak Hour

Intersection/Movement	Existing (2018) Conditions				Build (2025) Conditions			
	LOS	Delay (sec.)	V/C ratio	95th Queue (ft.)	LOS	Delay (sec.)	V/C ratio	95th Queue (ft.)
Ames Street/Ames Court								
EB Ames St. thru/right	A	0.0	0.12	0	A	0.0	0.13	0
WB Ames St. left/thru	A	1.3	0.03	3	A	1.2	0.03	3
NB Ames Ct. left/right	B	13.0	0.12	10	B	13.1	0.09	8
Pond Street/Ames Street								
EB Ames St. left/thru/right	C	15.6	0.42	2	C	17.7	0.47	18
WB Ames St. left/thru/right	C	20.6	0.61	4	D	26.0	0.67	5.2
NB Pond St. left/thru/right	D	34.2	0.82	9	F	60.5	0.98	13
SB Pond St. left/thru/right	C	18.8	0.57	4	C	23.1	0.64	5
Pond Street/SHS N. Driveway/ Parking Lot (DPW) Driveway								
WB DPW Dr. left/thru/right	C	23.0	0.29	30	-	-	-	-
EB SHS N. Dr. left/thru/right [1]	B	13.9	0.35	39	-	-	-	-
EB SHS N. Dr. left [1] (future)	-	-	-	-	D	32.2	0.52	69
EB SHS N. Dr. right [1] (future)	-	-	-	-	B	14.3	0.35	40
NB Pond St. left/thru/right	A	0.0	0.00	0	A	2.8	0.09	7
SB Pond St. left/thru/right	A	0.1	0.00	0	A	0.0	0.31	0
Pond Street/SHS S. Driveway/ Parking Lot (DPW) Driveway								
WB DPW Dr. left/thru/right	B	14.8	0.31	33	-	-	-	-
EB SHS S. Dr. left/thru/right	C	23.2	0.29	29	B	12.3	0.05	4
NB Pond St. left/thru/right	A	2.4	0.06	5	A	0.0	0.17	0
SB Pond St. left/thru/right	A	0.1	0.00	0	A	0.0	0.22	0
Pond Street/Beach Street								
EB Beach St. left/right	D	30.1	0.63	101	D	33.2	0.67	117
NB Pond St. left/thru	A	4.8	0.15	13	A	4.7	0.15	13
SB Pond St. thru/right	A	0.0	0.34	0	A	0.0	0.33	0
Pond Street/DPW N. Driveway								
NB Pond St. left/thru	-	-	-	-	A	0.0	0.23	0
SB Pond St. thru/right	-	-	-	-	A	0.3	0.01	1
Pond Street/DPW S. Driveway								
WB DPW Dr. left/right	-	-	-	-	C	15.1	0.40	47
NB Pond St. left/thru	-	-	-	-	A	0.0	0.19	0
SB Pond St. thru/right	-	-	-	-	A	0.0	0.22	0

Grey shading indicates LOS E or F.

1 Under the Existing Condition, left turns from the northern driveway are always prohibited, although many drivers do turn left. Under the Build Condition, left turns from the northern driveway will be permitted during the afternoon pick-up period.

Appendix

- Existing Condition Intersection LOS/Synchro Reports
- Future Condition Intersection LOS/Synchro Reports

Existing Conditions Intersection LOS/Synchro Reports

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	218	52	10	126	31	5
Future Volume (Veh/h)	218	52	10	126	31	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.45	0.45
Hourly flow rate (vph)	357	85	14	183	69	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			442		610	400
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			442		610	400
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			99		85	98
cM capacity (veh/h)			1129		450	613

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	442	197	80
Volume Left	0	14	69
Volume Right	85	0	11
cSH	1700	1129	467
Volume to Capacity	0.26	0.01	0.17
Queue Length 95th (ft)	0	1	15
Control Delay (s)	0.0	0.7	14.3
Lane LOS		A	B
Approach Delay (s)	0.0	0.7	14.3
Approach LOS			B

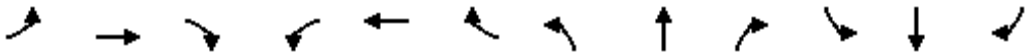
Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	24.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	22.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	120	91	108	95	13	29	232	10	16	202	11
Future Vol, veh/h	13	120	91	108	95	13	29	232	10	16	202	11
Peak Hour Factor	0.74	0.74	0.74	0.71	0.71	0.71	0.82	0.82	0.82	0.66	0.66	0.66
Heavy Vehicles, %	8	4	2	2	2	0	0	0	0	0	2	0
Mvmt Flow	18	162	123	152	134	18	35	283	12	24	306	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	20.7	21.8	22.9	24.2
HCM LOS	C	C	C	C

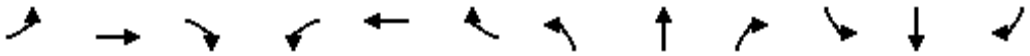
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	6%	50%	7%
Vol Thru, %	86%	54%	44%	88%
Vol Right, %	4%	41%	6%	5%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	271	224	216	229
LT Vol	29	13	108	16
Through Vol	232	120	95	202
RT Vol	10	91	13	11
Lane Flow Rate	330	303	304	347
Geometry Grp	1	1	1	1
Degree of Util (X)	0.656	0.604	0.621	0.683
Departure Headway (Hd)	7.141	7.182	7.349	7.082
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	502	499	490	507
Service Time	5.22	5.262	5.431	5.159
HCM Lane V/C Ratio	0.657	0.607	0.62	0.684
HCM Control Delay	22.9	20.7	21.8	24.2
HCM Lane LOS	C	C	C	C
HCM 95th-tile Q	4.7	3.9	4.2	5.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	4	29	0	1	11	9	241	0	65	258	81
Future Volume (Veh/h)	23	4	29	0	1	11	9	241	0	65	258	81
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.54	0.54	0.54	0.50	0.50	0.50	0.74	0.74	0.74	0.66	0.66	0.66
Hourly flow rate (vph)	43	7	54	0	2	22	12	326	0	98	391	123
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1022	998	452	1056	1060	326	514			326		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1022	998	452	1056	1060	326	514			326		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	78	97	91	100	99	97	99			92		
cM capacity (veh/h)	194	224	611	170	206	720	1062			1245		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	104	24	338	612
Volume Left	43	0	12	98
Volume Right	54	22	0	123
cSH	305	596	1062	1245
Volume to Capacity	0.34	0.04	0.01	0.08
Queue Length 95th (ft)	37	3	1	6
Control Delay (s)	22.8	11.3	0.4	2.1
Lane LOS	C	B	A	A
Approach Delay (s)	22.8	11.3	0.4	2.1
Approach LOS	C	B		

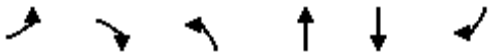
Intersection Summary				
Average Delay	3.8			
Intersection Capacity Utilization	55.2%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	0	171	0	0	0	143	234	53	2	164	109
Future Volume (Veh/h)	13	0	171	0	0	0	143	234	53	2	164	109
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.51	0.51	0.51	0.25	0.25	0.25	0.85	0.85	0.85	0.71	0.71	0.71
Hourly flow rate (vph)	25	0	335	0	0	0	168	275	62	3	231	154
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	956	987	308	1291	1033	306	385			337		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	956	987	308	1291	1033	306	385			337		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	100	53	100	100	100	85			100		
cM capacity (veh/h)	213	213	720	67	200	739	1157			1234		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	360	0	505	388
Volume Left	25	0	168	3
Volume Right	335	0	62	154
cSH	618	1700	1157	1234
Volume to Capacity	0.58	0.00	0.15	0.00
Queue Length 95th (ft)	94	0	13	0
Control Delay (s)	18.6	0.0	3.9	0.1
Lane LOS	C	A	A	A
Approach Delay (s)	18.6	0.0	3.9	0.1
Approach LOS	C	A		

Intersection Summary				
Average Delay	7.0			
Intersection Capacity Utilization	60.1%	ICU Level of Service	B	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	82	175	171	348	240	130
Future Volume (Veh/h)	82	175	171	348	240	130
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.81	0.81	0.67	0.67
Hourly flow rate (vph)	109	233	211	430	358	194
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1307	455	552			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1307	455	552			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	21	61	79			
cM capacity (veh/h)	138	603	1008			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	342	641	552
Volume Left	109	211	0
Volume Right	233	0	194
cSH	291	1008	1700
Volume to Capacity	1.18	0.21	0.32
Queue Length 95th (ft)	374	20	0
Control Delay (s)	147.3	4.9	0.0
Lane LOS	F	A	
Approach Delay (s)	147.3	4.9	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	34.9		
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	150	24	25	167	33	14
Future Volume (Veh/h)	150	24	25	167	33	14
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.53	0.53	0.76	0.76
Hourly flow rate (vph)	179	29	47	315	43	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			208		602	194
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			208		602	194
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			97		90	98
cM capacity (veh/h)			1375		440	853

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	208	362	61
Volume Left	0	47	43
Volume Right	29	0	18
cSH	1700	1375	514
Volume to Capacity	0.12	0.03	0.12
Queue Length 95th (ft)	0	3	10
Control Delay (s)	0.0	1.3	13.0
Lane LOS		A	B
Approach Delay (s)	0.0	1.3	13.0
Approach LOS			B

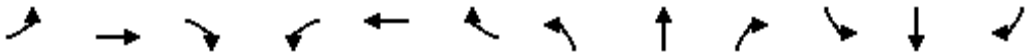
Intersection Summary			
Average Delay	2.0		
Intersection Capacity Utilization	32.9%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	24.2
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	118	38	40	123	27	54	215	39	33	212	25
Future Vol, veh/h	17	118	38	40	123	27	54	215	39	33	212	25
Peak Hour Factor	0.83	0.83	0.83	0.61	0.61	0.61	0.68	0.68	0.68	0.91	0.91	0.91
Heavy Vehicles, %	0	1	0	2	1	4	2	2	0	0	2	0
Mvmt Flow	20	142	46	66	202	44	79	316	57	36	233	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	15.6	20.6	34.2	18.8
HCM LOS	C	C	D	C

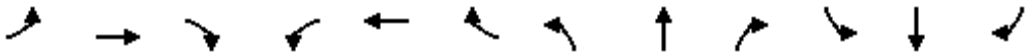
Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	18%	10%	21%	12%
Vol Thru, %	70%	68%	65%	79%
Vol Right, %	13%	22%	14%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	308	173	190	270
LT Vol	54	17	40	33
Through Vol	215	118	123	212
RT Vol	39	38	27	25
Lane Flow Rate	453	208	311	297
Geometry Grp	1	1	1	1
Degree of Util (X)	0.831	0.421	0.609	0.57
Departure Headway (Hd)	6.606	7.278	7.039	6.91
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	553	492	511	519
Service Time	4.606	5.359	5.108	4.979
HCM Lane V/C Ratio	0.819	0.423	0.609	0.572
HCM Control Delay	34.2	15.6	20.6	18.8
HCM Lane LOS	D	C	C	C
HCM 95th-tile Q	8.5	2.1	4	3.5



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	0	27	4	0	59	2	223	225	3	286	11
Future Volume (Veh/h)	24	0	27	4	0	59	2	223	225	3	286	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.61	0.61	0.61	0.29	0.29	0.29	0.88	0.88	0.88	0.83	0.83	0.83
Hourly flow rate (vph)	39	0	44	14	0	203	2	253	256	4	345	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	948	872	352	788	751	381	358			509		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	948	872	352	788	751	381	358			509		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	77	100	94	95	100	70	100			100		
cM capacity (veh/h)	169	289	697	290	340	671	1212			1066		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	83	217	511	362
Volume Left	39	14	2	4
Volume Right	44	203	256	13
cSH	282	618	1212	1066
Volume to Capacity	0.29	0.35	0.00	0.00
Queue Length 95th (ft)	30	39	0	0
Control Delay (s)	23.0	13.9	0.0	0.1
Lane LOS	C	B	A	A
Approach Delay (s)	23.0	13.9	0.0	0.1
Approach LOS	C	B		

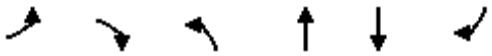
Intersection Summary				
Average Delay	4.3			
Intersection Capacity Utilization	43.1%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	2	94	26	2	4	63	193	5	5	245	65
Future Volume (Veh/h)	40	2	94	26	2	4	63	193	5	5	245	65
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.83	0.83	0.83	0.40	0.40	0.40	0.88	0.88	0.88	0.93	0.93	0.93
Hourly flow rate (vph)	48	2	113	65	5	10	72	219	6	5	263	70
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	686	677	298	788	709	222	333			225		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	686	677	298	788	709	222	333			225		
tC, single (s)	7.1	6.5	6.3	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.4	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	86	99	84	74	99	99	94			100		
cM capacity (veh/h)	332	353	714	248	339	823	1210			1356		

Direction, Lane #	EB 1	WB 1	NB 1	SB 1
Volume Total	163	80	297	338
Volume Left	48	65	72	5
Volume Right	113	10	6	70
cSH	529	277	1210	1356
Volume to Capacity	0.31	0.29	0.06	0.00
Queue Length 95th (ft)	33	29	5	0
Control Delay (s)	14.8	23.2	2.4	0.1
Lane LOS	B	C	A	A
Approach Delay (s)	14.8	23.2	2.4	0.1
Approach LOS	B	C		

Intersection Summary				
Average Delay	5.7			
Intersection Capacity Utilization	48.8%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	73	109	136	181	291	112
Future Volume (Veh/h)	73	109	136	181	291	112
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	91	136	148	197	416	160
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	989	496	576			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	989	496	576			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	61	76	85			
cM capacity (veh/h)	234	576	997			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	227	345	576
Volume Left	91	148	0
Volume Right	136	0	160
cSH	363	997	1700
Volume to Capacity	0.63	0.15	0.34
Queue Length 95th (ft)	101	13	0
Control Delay (s)	30.1	4.8	0.0
Lane LOS	D	A	
Approach Delay (s)	30.1	4.8	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	7.4		
Intersection Capacity Utilization	59.9%	ICU Level of Service	B
Analysis Period (min)	15		

Future Conditions Intersection LOS/Synchro Reports

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	239	43	6	125	32	5
Future Volume (Veh/h)	239	43	6	125	32	5
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.69	0.69	0.45	0.45
Hourly flow rate (vph)	392	70	9	181	71	11
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			462		626	427
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			462		626	427
tC, single (s)			4.1		6.4	6.4
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.5
p0 queue free %			99		84	98
cM capacity (veh/h)			1110		443	591

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	462	190	82
Volume Left	0	9	71
Volume Right	70	0	11
cSH	1700	1110	458
Volume to Capacity	0.27	0.01	0.18
Queue Length 95th (ft)	0	1	16
Control Delay (s)	0.0	0.5	14.6
Lane LOS		A	B
Approach Delay (s)	0.0	0.5	14.6
Approach LOS			B

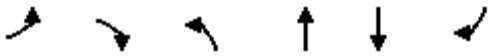
Intersection Summary			
Average Delay	1.7		
Intersection Capacity Utilization	25.2%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	28.9
Intersection LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	122	110	129	93	13	27	216	10	16	223	11
Future Vol, veh/h	13	122	110	129	93	13	27	216	10	16	223	11
Peak Hour Factor	0.74	0.74	0.74	0.71	0.71	0.71	0.82	0.82	0.82	0.66	0.66	0.66
Heavy Vehicles, %	8	4	2	2	2	0	0	0	0	0	2	0
Mvmt Flow	18	165	149	182	131	18	33	263	12	24	338	17
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	26.8	28.7	25.3	34
HCM LOS	D	D	D	D

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	11%	5%	55%	6%
Vol Thru, %	85%	50%	40%	89%
Vol Right, %	4%	45%	6%	4%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	253	245	235	250
LT Vol	27	13	129	16
Through Vol	216	122	93	223
RT Vol	10	110	13	11
Lane Flow Rate	309	331	331	379
Geometry Grp	1	1	1	1
Degree of Util (X)	0.668	0.701	0.72	0.794
Departure Headway (Hd)	7.797	7.623	7.827	7.546
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	463	473	460	477
Service Time	5.871	5.697	5.901	5.616
HCM Lane V/C Ratio	0.667	0.7	0.72	0.795
HCM Control Delay	25.3	26.8	28.7	34
HCM Lane LOS	D	D	D	D
HCM 95th-tile Q	4.8	5.4	5.7	7.2



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	270	191	245	221	241
Future Volume (Veh/h)	0	270	191	245	221	241
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.54	0.54	0.74	0.74	0.66	0.66
Hourly flow rate (vph)	0	500	258	331	335	365
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1364	518	700			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1364	518	700			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	10	71			
cM capacity (veh/h)	116	558	897			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	500	589	700
Volume Left	0	258	0
Volume Right	500	0	365
cSH	558	897	1700
Volume to Capacity	0.90	0.29	0.41
Queue Length 95th (ft)	264	30	0
Control Delay (s)	44.2	6.8	0.0
Lane LOS	E	A	
Approach Delay (s)	44.2	6.8	0.0
Approach LOS	E		

Intersection Summary			
Average Delay	14.6		
Intersection Capacity Utilization	76.6%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	436	53	67	424
Future Volume (Veh/h)	0	0	436	53	67	424
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.74	0.74	0.66	0.66
Hourly flow rate (vph)	0	0	589	72	102	642
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1471	625			661	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1471	625			661	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			89	
cM capacity (veh/h)	126	488			937	

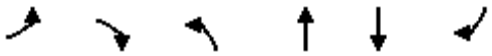
Direction, Lane #	NB 1	SB 1
Volume Total	661	744
Volume Left	0	102
Volume Right	72	0
cSH	1700	937
Volume to Capacity	0.39	0.11
Queue Length 95th (ft)	0	9
Control Delay (s)	0.0	2.7
Lane LOS		A
Approach Delay (s)	0.0	2.7
Approach LOS		

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	58.8%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	12	489	0	0	424
Future Volume (Veh/h)	0	12	489	0	0	424
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.85	0.85	0.71	0.71
Hourly flow rate (vph)	0	48	575	0	0	597
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1172	575			575	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1172	575			575	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	91			100	
cM capacity (veh/h)	215	521			1008	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	48	575	597
Volume Left	0	0	0
Volume Right	48	0	0
cSH	521	1700	1008
Volume to Capacity	0.09	0.34	0.00
Queue Length 95th (ft)	8	0	0
Control Delay (s)	12.6	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.6	0.0	0.0
Approach LOS	B		

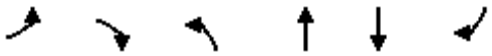
Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	13	0	476	424	0
Future Volume (Veh/h)	13	13	0	476	424	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.51	0.51	0.85	0.85	0.71	0.71
Hourly flow rate (vph)	25	25	0	560	597	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1157	597	597			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1157	597	597			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	88	95	100			
cM capacity (veh/h)	217	503	980			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	50	560	597
Volume Left	25	0	0
Volume Right	25	0	0
cSH	303	1700	1700
Volume to Capacity	0.16	0.33	0.35
Queue Length 95th (ft)	15	0	0
Control Delay (s)	19.2	0.0	0.0
Lane LOS	C		
Approach Delay (s)	19.2	0.0	0.0
Approach LOS	C		

Intersection Summary			
Average Delay	0.8		
Intersection Capacity Utilization	35.7%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	91	178	177	385	264	156
Future Volume (Veh/h)	91	178	177	385	264	156
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.75	0.75	0.81	0.81	0.67	0.67
Hourly flow rate (vph)	121	237	219	475	394	233
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1424	510	627			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1424	510	627			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	0	58	77			
cM capacity (veh/h)	114	561	945			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	358	694	627
Volume Left	121	219	0
Volume Right	237	0	233
cSH	241	945	1700
Volume to Capacity	1.49	0.23	0.37
Queue Length 95th (ft)	525	22	0
Control Delay (s)	277.3	5.3	0.0
Lane LOS	F	A	
Approach Delay (s)	277.3	5.3	0.0
Approach LOS	F		

Intersection Summary			
Average Delay	61.3		
Intersection Capacity Utilization	79.5%	ICU Level of Service	D
Analysis Period (min)	15		

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	156	24	25	182	24	10
Future Volume (Veh/h)	156	24	25	182	24	10
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.84	0.84	0.53	0.53	0.76	0.76
Hourly flow rate (vph)	186	29	47	343	32	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			215		638	200
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			215		638	200
tC, single (s)			4.1		6.5	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.6	3.3
p0 queue free %			97		92	98
cM capacity (veh/h)			1367		420	846

Direction, Lane #	EB 1	WB 1	NB 1
Volume Total	215	390	45
Volume Left	0	47	32
Volume Right	29	0	13
cSH	1700	1367	491
Volume to Capacity	0.13	0.03	0.09
Queue Length 95th (ft)	0	3	8
Control Delay (s)	0.0	1.2	13.1
Lane LOS		A	B
Approach Delay (s)	0.0	1.2	13.1
Approach LOS			B

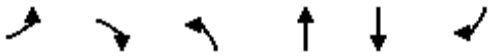
Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	34.0%	ICU Level of Service	A
Analysis Period (min)	15		

Intersection	
Intersection Delay, s/veh	37.1
Intersection LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	17	116	42	47	125	27	69	229	51	34	222	25
Future Vol, veh/h	17	116	42	47	125	27	69	229	51	34	222	25
Peak Hour Factor	0.83	0.83	0.83	0.61	0.61	0.61	0.68	0.68	0.68	0.91	0.91	0.91
Heavy Vehicles, %	0	1	0	2	1	4	2	2	0	0	2	0
Mvmt Flow	20	140	51	77	205	44	101	337	75	37	244	27
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	17.7	26	60.5	23.1
HCM LOS	C	D	F	C

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	20%	10%	24%	12%
Vol Thru, %	66%	66%	63%	79%
Vol Right, %	15%	24%	14%	9%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	349	175	199	281
LT Vol	69	17	47	34
Through Vol	229	116	125	222
RT Vol	51	42	27	25
Lane Flow Rate	513	211	326	309
Geometry Grp	1	1	1	1
Degree of Util (X)	0.977	0.465	0.69	0.643
Departure Headway (Hd)	6.985	7.948	7.618	7.496
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	523	453	476	485
Service Time	4.985	5.99	5.637	5.518
HCM Lane V/C Ratio	0.981	0.466	0.685	0.637
HCM Control Delay	60.5	17.7	26	23.1
HCM Lane LOS	F	C	D	C
HCM 95th-tile Q	13	2.4	5.2	4.5



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	84	129	81	257	340	91
Future Volume (Veh/h)	84	129	81	257	340	91
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	138	211	92	292	410	110
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	941	465	520			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	941	465	520			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	48	65	91			
cM capacity (veh/h)	267	597	1046			

Direction, Lane #	EB 1	EB 2	NB 1	SB 1
Volume Total	138	211	384	520
Volume Left	138	0	92	0
Volume Right	0	211	0	110
cSH	267	597	1046	1700
Volume to Capacity	0.52	0.35	0.09	0.31
Queue Length 95th (ft)	69	40	7	0
Control Delay (s)	32.2	14.3	2.8	0.0
Lane LOS	D	B	A	
Approach Delay (s)	21.3		2.8	0.0
Approach LOS	C			

Intersection Summary			
Average Delay	6.8		
Intersection Capacity Utilization	56.1%	ICU Level of Service	B
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	338	5	8	340
Future Volume (Veh/h)	0	0	338	5	8	340
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.29	0.29	0.88	0.88	0.83	0.83
Hourly flow rate (vph)	0	0	384	6	10	410
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	817	387			390	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	817	387			390	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	346	665			1180	

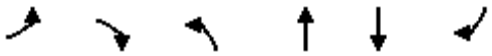
Direction, Lane #	NB 1	SB 1
Volume Total	390	420
Volume Left	0	10
Volume Right	6	0
cSH	1700	1180
Volume to Capacity	0.23	0.01
Queue Length 95th (ft)	0	1
Control Delay (s)	0.0	0.3
Lane LOS		A
Approach Delay (s)	0.0	0.3
Approach LOS		

Intersection Summary			
Average Delay	0.1		
Intersection Capacity Utilization	27.7%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	63	280	0	0	340
Future Volume (Veh/h)	30	63	280	0	0	340
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.40	0.40	0.88	0.88	0.93	0.93
Hourly flow rate (vph)	75	158	318	0	0	366
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	684	318			318	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	684	318			318	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	82	78			100	
cM capacity (veh/h)	417	727			1253	

Direction, Lane #	WB 1	NB 1	SB 1
Volume Total	233	318	366
Volume Left	75	0	0
Volume Right	158	0	0
cSH	587	1700	1700
Volume to Capacity	0.40	0.19	0.22
Queue Length 95th (ft)	47	0	0
Control Delay (s)	15.1	0.0	0.0
Lane LOS	C		
Approach Delay (s)	15.1	0.0	0.0
Approach LOS	C		

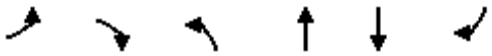
Intersection Summary			
Average Delay	3.8		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	13	13	0	267	340	0
Future Volume (Veh/h)	13	13	0	267	340	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	14	0	290	370	0
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	660	370	370			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	660	370	370			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	97	98	100			
cM capacity (veh/h)	428	676	1189			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	28	290	370
Volume Left	14	0	0
Volume Right	14	0	0
cSH	524	1700	1700
Volume to Capacity	0.05	0.17	0.22
Queue Length 95th (ft)	4	0	0
Control Delay (s)	12.3	0.0	0.0
Lane LOS	B		
Approach Delay (s)	12.3	0.0	0.0
Approach LOS	B		

Intersection Summary			
Average Delay	0.5		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	114	138	197	284	107
Future Volume (Veh/h)	79	114	138	197	284	107
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.92	0.92	0.70	0.70
Hourly flow rate (vph)	99	143	150	214	406	153
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	996	482	559			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	996	482	559			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	57	76	85			
cM capacity (veh/h)	232	586	1012			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	242	364	559
Volume Left	99	150	0
Volume Right	143	0	153
cSH	360	1012	1700
Volume to Capacity	0.67	0.15	0.33
Queue Length 95th (ft)	117	13	0
Control Delay (s)	33.2	4.7	0.0
Lane LOS	D	A	
Approach Delay (s)	33.2	4.7	0.0
Approach LOS	D		

Intersection Summary			
Average Delay	8.4		
Intersection Capacity Utilization	60.8%	ICU Level of Service	B
Analysis Period (min)	15		