Exhibit 6

MILONE & MACBROOM

June 25, 2019

Mr. Joe Costa, Principal
Perkins Eastman
422 Summer Street
Stamford, CT 06901

RE: West Side Elementary School
Groton, Connecticut
MMI #1777-38-04

Dear Mr. Costa:

As requested, we have prepared this letter to quantify anticipated parking demands for the proposed West Side Elementary School. Our evaluation included review of data in our files, industry data from the Institute of Transportation Engineers (ITE), and our knowledge of current mode choice for students at West Side Middle School.

ITE provides parking generation rates for elementary schools based on both the number of students and the number of staff members. In Table 1, we summarize parking demand estimates from ITE for both average conditions and 85th percentile conditions.

TABLE 1

Variable	Anticipated Parking Demand
Students (603)	
Average	**79**
85th Percentile	**121**
Staff (85)	
Average	**81**
85th Percentile	**140**

As shown, ITE estimates that, on average, a school with the student/staff profile of West Side School would have a demand of around 80 parked vehicles. The more conservative 85th percentile data would suggest a demand of 120 to 140 parked vehicles. Note that the ITE data may not include parents that park and pick up in undesignated spaces.

Data in our files from other school projects we have worked on would suggest peak parking demand to occur just before dismissal and be a combination of staff demands and the demand of parents/guardians picking up students. For West Side Elementary School, this results in a demand of 167 spaces. Note however that the West Side Middle School had a particularly low parent/guardian parking rate for a middle school, and we would expect a similar lower rate for the elementary school. Consequently, the 167-space demand is likely on the conservatively high side.

Currently, the plan calls for 147 spaces including pickup/drop-off spaces. Based on the industry standard data and our anticipation that this school will be on the low end of the parent pickup/drop-off spectrum, we believe the 147 spaces will be adequate.

If you have any questions, please do not hesitate to call.

Very truly yours,

MILONE & MACBROOM, INC.

David G. Sullivan, PE, Associate
Manager of Traffic and Transportation Planning

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Exhibit # 7

MILONE & MACBROOM

August 6, 2019

Mr. Joseph Costa, Principal
Perkins Eastman
422 Summer Street
Stamford, CT 06901

RE: Traffic Impact Study
Proposed West Side Elementary School
250 Brandegee Avenue
Groton, Connecticut
MMI #1777-39-04

Dear Mr. Costa:

At your request, Milone & MacBroom, Inc. (MMI) has prepared this study to evaluate the traffic-related implications associated with the redevelopment of the existing West Side Middle School site to be used as an elementary school. Figure 1 shows the proposed location of the West Side School at 250 Brandegee Avenue in Groton, Connecticut, as well as the surrounding area. Based on discussions with the Town of Groton, it is expected that 606 students will be enrolled at the new West Side Elementary School.

The work comprising the study consisted of several tasks including field reconnaissance efforts, data collection and review of current traffic volumes and roadway conditions, estimation of future traffic conditions associated with the expected enrollment, and assessment of traffic operations at the new school.

Existing Roadways and Site Environs

The proposed West Side Elementary School will be located on the same site as the existing West Side Middle School at 250 Brandegee Avenue in Groton, Connecticut. Brandegee Avenue, Hynes Avenue, and Morse Avenue in the vicinity of the site are all two-lane roads with one travel lane in each direction. The southerly West Side School driveway is entrance only and is directly across from Morse Avenue. The intersection of Brandegee Avenue, Morse Avenue, and the southerly West Side School driveway is controlled by a stop sign on Morse Avenue and the northbound approach on Brandegee Avenue. The northerly West Side School driveway is full access and is directly across from Hynes Avenue. The intersection of Brandegee Avenue, Hynes Avenue, and the northerly West Side School driveway is controlled by a stop sign on all four approaches. Land uses in the vicinity of the proposed school site are primarily residential.

Vehicular Crash History

Information on traffic accident statistics for Brandegee Avenue in the vicinity of West Side School was obtained from the University of Connecticut's (UConn) Connecticut Crash Data Repository for the 3-year period, December 3, 2015, to December 2, 2018. In this time period, three rear-end collisions occurred.

Traffic Impact Study

West Side Elementary School
Groton, Connecticut
August 6, 2019

Prepared for:
Mr. Joseph Costa, Principal
Perkins Eastman
422 Summer Street
Stamford, Connecticut 06901

MMI #1777-39-04

Prepared by:
MILONE & MACBROOM, INC.
99 Realty Drive
Cheshire, Connecticut 06410
(203) 271-1773
www.mminc.com

MILONE & MACBROOM
ENGINEERING | PLANNING | LANDSCAPE ARCHITECTURE | ENVIRONMENTAL SCIENCE

Two of them resulted in no apparent injuries, and one was recorded as a possible injury. No accident patterns or unusual trends appear to be present in the accident history at this location.

Existing Traffic Volumes

Manual observations at the study intersections were conducted on Wednesday, February 6, 2019, from 7:00 a.m. to 9:00 a.m. and from 2:00 p.m. to 4:00 p.m. to capture peak traffic associated with school activities. The following intersections were counted during these times:

- Brandegee Avenue at Hynes Avenue and the northerly West Side Middle School driveway
- Brandegee Avenue at Morse Avenue and the southerly West Side Middle School driveway

Based on the count data, the weekday morning peak hour occurred from 7:00 a.m. to 8:00 a.m., and the weekday afternoon peak hour occurred from 2:15 p.m. to 3:15 p.m. Figures 2 and 3 illustrate the existing traffic volumes for the weekday morning arrival and weekday afternoon dismissal peak hours, respectively.

Proposed Development and Access

The existing West Side Middle School building will be razed and replaced with a new school building to be known as West Side Elementary School. Access to the site will be available via three new driveways. The southernmost driveway will be full access, approximately 150 feet south of Morse Avenue, and it will be primarily used by buses, staff, and visitors as well as for access to the rear of the building. The middle driveway will be entrance only, directly across from Morse Avenue, and will be used for pickup/drop-off activity. The northerly site driveway will be full access approximately 300 feet north of Hynes Avenue. It will provide access to the service area and will also serve as the exit for the pickup/drop-off area. As part of this development, dedicated left-turn lanes will be striped along Brandegee Avenue for southbound left turns into the middle and southerly driveways.

Visibility was reviewed from the point of view of a motorist about to egress each driveway. Motorists exiting the driveways will have visibility in both directions that meets the Connecticut Department of Transportation (CTDOT) guidelines for speeds of 30 miles per hour on Brandegee Avenue. Based on field observations, the sight lines from each of the three proposed driveways are currently clear.

Anticipated School Traffic Volumes

Based on discussions with the Town of Groton, it is expected that 606 students will be enrolled at the new West Side Elementary School. Peak-hour vehicle trips that will be generated by the proposed elementary school were then estimated by applying the anticipated student enrollment to statistical data contained in the Institute of Transportation Engineers' (ITE) *Trip Generation* publication. Based on ITE data, it is estimated that the proposed elementary school will generate approximately 400 new total vehicle trips (215 enter and 185 exit) during the morning arrival peak hour and approximately 205 total vehicle trips (90 enter and 115 exit) during the afternoon dismissal peak hour. This is a mix of trips made by parents/guardians, staff, and buses. These estimates are summarized in Table 1. Based on our field observations of the existing West Side Middle School, it appears that most students take the bus or walk to school. We therefore feel that this trip generation estimate based on ITE data is conservative, particularly for pickup/drop-off traffic.

TABLE 1
Trip Generation Summary

Land Use	Size	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour of School		
		Enter	Exit	Total	Enter	Exit	Total
Elementary School	**606 Students**	**215**	**185**	**400**	**90**	**115**	**205**
Pickup/Drop-off trips		170	170	340	75	75	150
Bus trips*		15	15	30	15	15	30
Staff trips		30	0	30	0	25	25

*Based on discussions with the Town of Groton, there are expected to be 14 buses at West Side Elementary School. For simplicity, we have assumed 15 buses.

The distribution of the new vehicular site-generated traffic through the study area has been estimated based on existing travel patterns. In general, approximately 70 percent of traffic will be oriented to/from the north via Brandegee Avenue, 15 percent to/from the south via Brandegee Avenue, 10 percent to/from the west via Hynes Avenue, and 5 percent also to/from west via Morse Avenue. Figures 4 and 5 show the anticipated new site traffic volumes, broken down by pickup/drop-off, bus, and staff trips, applied to this distribution for the weekday morning and afternoon peak hours, respectively.

Future Roadway Traffic Volumes

In order to assess the impact of the new elementary school, roadway traffic within the study area was developed without and with the newly generated site traffic volumes. For the purposes of this study, a horizon year of 2021 was used to project future traffic volumes.

The background traffic scenario is reflective of future 2021 conditions before the new elementary school is completed and was estimated by removing the existing middle school traffic and then expanding the existing peak-hour roadway traffic volumes by 0.4 percent per year as recommended by CTDOT, which reflects slight growth in roadway traffic in the recent past and continuing into the near future. Our correspondence with CTDOT finds there are no new developments proposed in the area that are expected to generate a significant number of trips in the vicinity of the proposed West Side Elementary School. We were informed by the Town of Groton that there is a proposed expansion to the Electric Boat site, but we feel that this development would not generate significant traffic in the vicinity of the study area. The estimated background (no-build) peak-hour traffic volumes are shown in Figures 6 and 7. Figures 8 and 9 illustrate the future combined (build) peak-hour volumes, which are the combination of the background traffic and the future projected school trips.

Roadway Capacity Analysis

The future combined traffic scenario was evaluated by means of the *Synchro* software package, which uses the methodologies of the *Highway Capacity Manual*. Levels of service (LOS) were determined for the critical movements at each intersection, which are qualitative measures of efficiency of operations in terms of delay and inconvenience to motorists. The levels are expressed with letter designations of A through F. LOS A represents little or no vehicle delay. LOS F reflects an intersection or movement that is over capacity and where long delays can be expected. Table 2 summarizes the results of the capacity analysis.

TABLE 2
Capacity Analysis Summary – Future Combined Conditions

Intersection/Movement	Levels of Service	
	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Brandegee Avenue at West Side Elementary School North Driveway (SSSC)		
Westbound Approach	C	B
Southbound Left	A	A
Brandegee Avenue at Hynes Ave (AWSC)		
Eastbound Approach	B	A
Northbound Approach	B	B
Southbound Approach	F	B
Brandegee Avenue at West Side Elementary School Middle Driveway and Morse Avenue (SSSC)		
Westbound Approach	D	B
Northbound Left	A	A
Southbound Left	A	A
Brandegee Avenue at West Side Elementary School South Driveway (SSSC)		
Westbound Approach	B	B
Southbound Left	A	A

SSSC – Side Street Stop Control
AWSC – All-Way-Stop Control

As can be seen, motorists making the critical movements at the site driveways will experience LOS D or better under future combined conditions. At the intersection of Brandegee Avenue at Hynes Avenue, under all-way-stop control, the southbound approach is expected to operate at LOS F during the weekday morning peak hour. Therefore, we tested the scenario to remove the stop bars on Brandegee Avenue to analyze this intersection with side street stop signs only. As shown in Table 3, under side street stop control, motorists making the critical movements at this intersection are expected to experience LOS C or better.

TABLE 3
Capacity Analysis Summary –
Brandegee Avenue at Hynes Avenue
with Side Street Stop Control instead of All-Way-Stop Control

Intersection/Movement	Levels of Service	
	Weekday Morning Peak Hour	Weekday Afternoon Peak Hour
Brandegee Avenue at Hynes Avenue (SSSC)		
Eastbound Approach	C	B
Northbound Left	A	A

Summary and Recommendations

This study was conducted to assess the transportation implications of the proposed West Side Elementary School. To determine a profile of existing conditions, detailed field reconnaissance and data assembly efforts were undertaken. New traffic generated by the expected enrollment was estimated, and roadway capacity analyses were performed for future conditions at and near the proposed school. Analysis of the addition of new traffic associated with the new elementary school finds that motorists at the site driveways are expected to experience LOS D or better under future combined conditions. Southbound traffic at the intersection of Brandegee Avenue at Hynes Avenue would operate at LOS F under combined condition, and we therefore recommend that side street stop control be considered at this intersection to improve operations. We additionally recommend that dedicated left-turn lanes be striped along Brandegee Avenue for southbound left turns into the middle and southerly new school driveways.

We hope this report is useful to you and the Town of Groton. If you have any questions or need anything further, please do not hesitate to contact me.

Very truly yours,

MILONE & MACBROOM, INC.

David G. Sullivan, PE, Associate
Manager of Traffic and Transportation Planning

Enclosures

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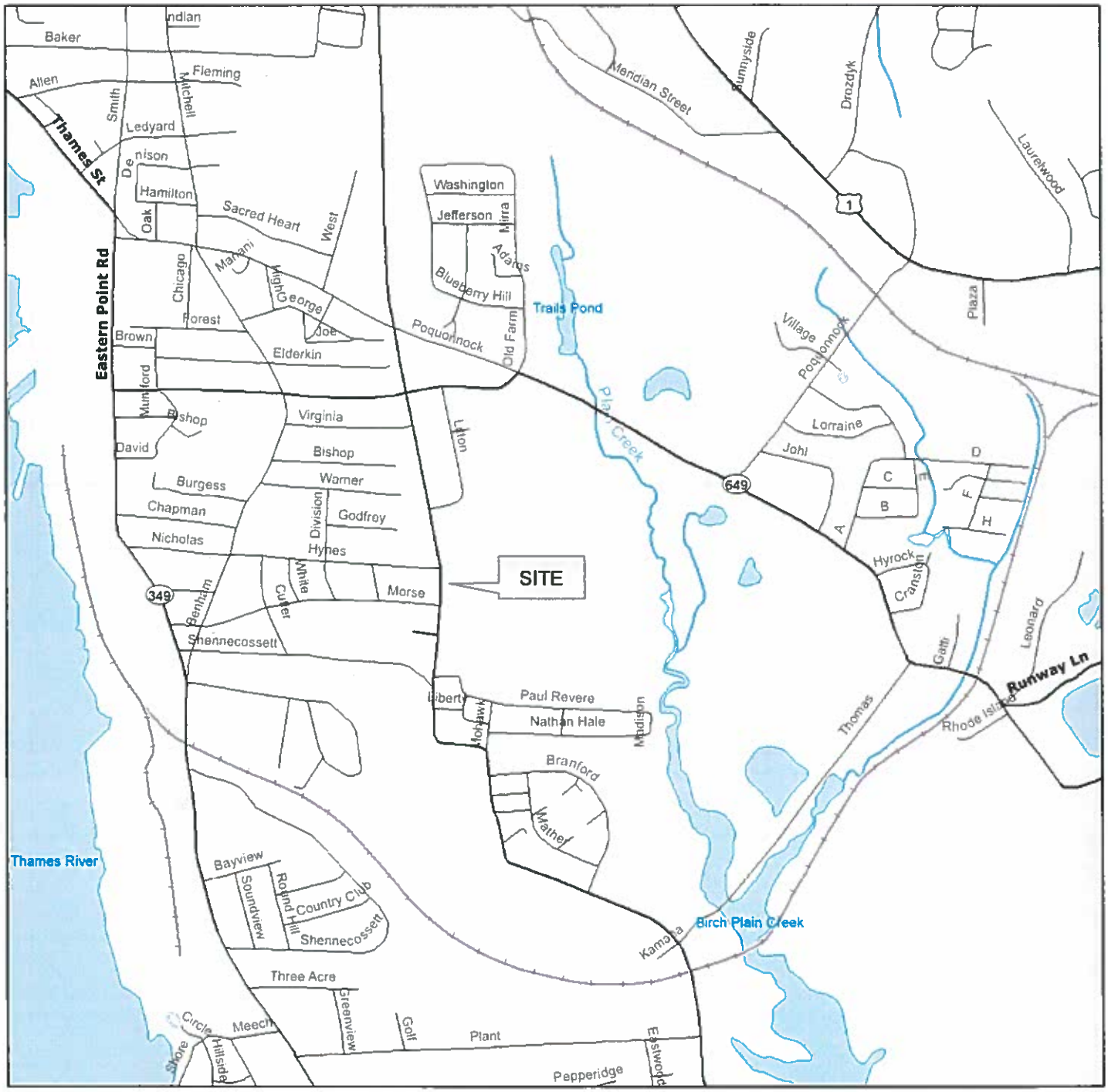
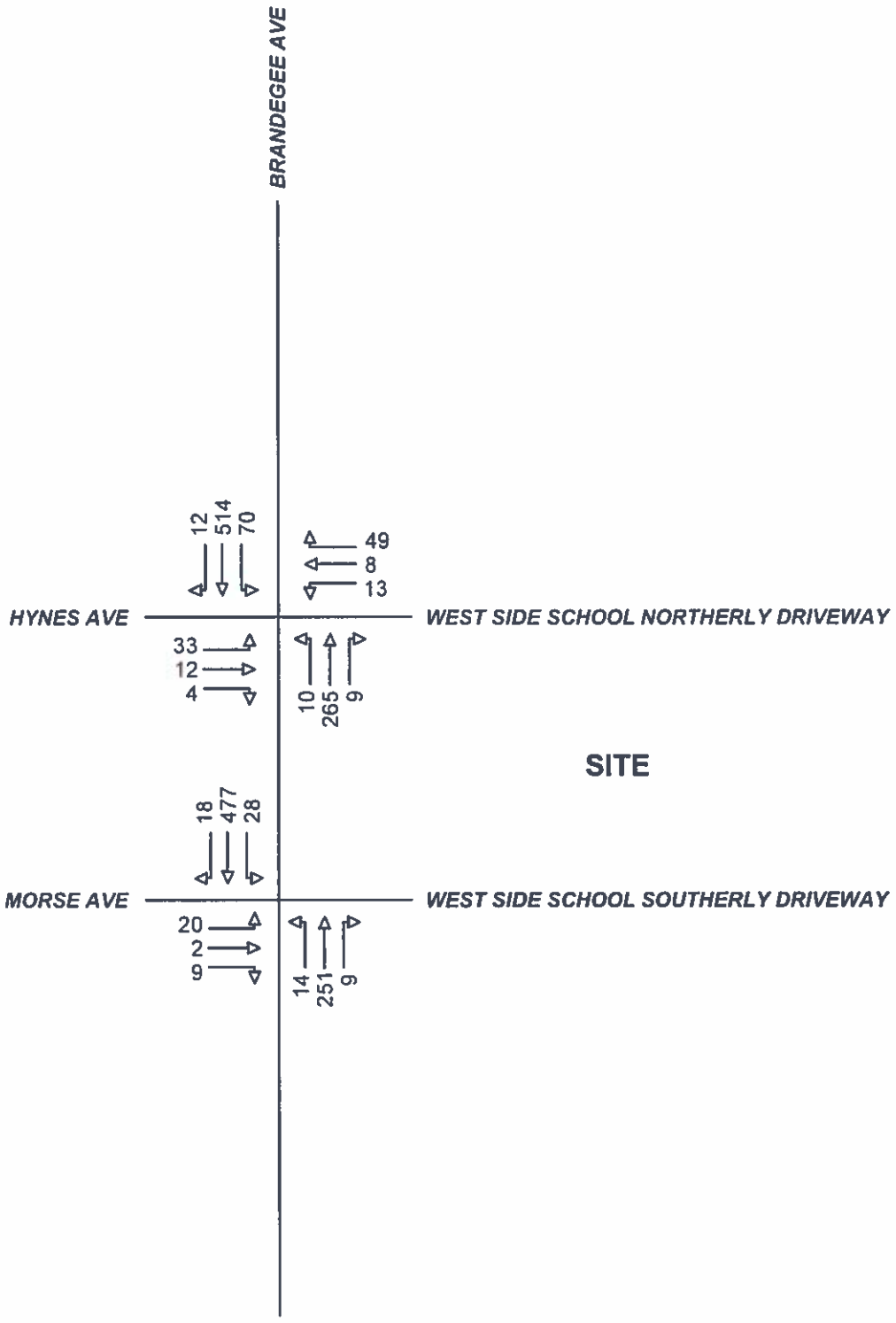


SITE LOCATION
Proposed West Side Elementary School
Groton, Connecticut

MILONE & MACBROOM

FIGURE 1



EXISTING 2019 TRAFFIC VOLUMES

WEEKDAY MORNING PEAK HOUR (7:00 A.M. - 8:00 A.M.)

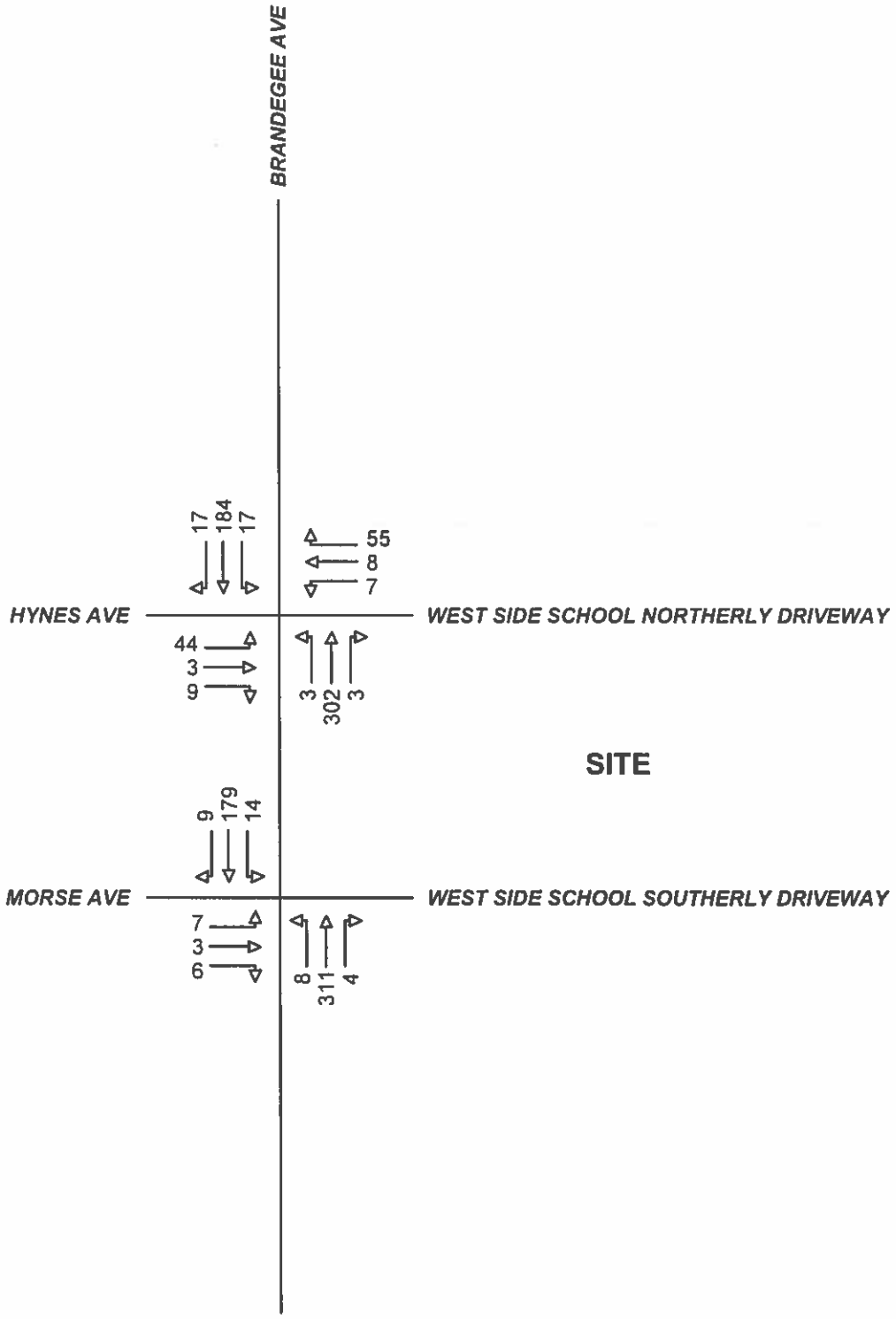
Proposed West Side Elementary School
Groton, Connecticut

N

SCHEMATIC

MILONE & MACBROOM, Inc.

FIGURE 2



EXISTING 2019 TRAFFIC VOLUMES

WEEKDAY AFTERNOON PEAK HOUR (2:15 P.M. - 3:15 P.M.)

Proposed West Side Elementary School
Groton, Connecticut

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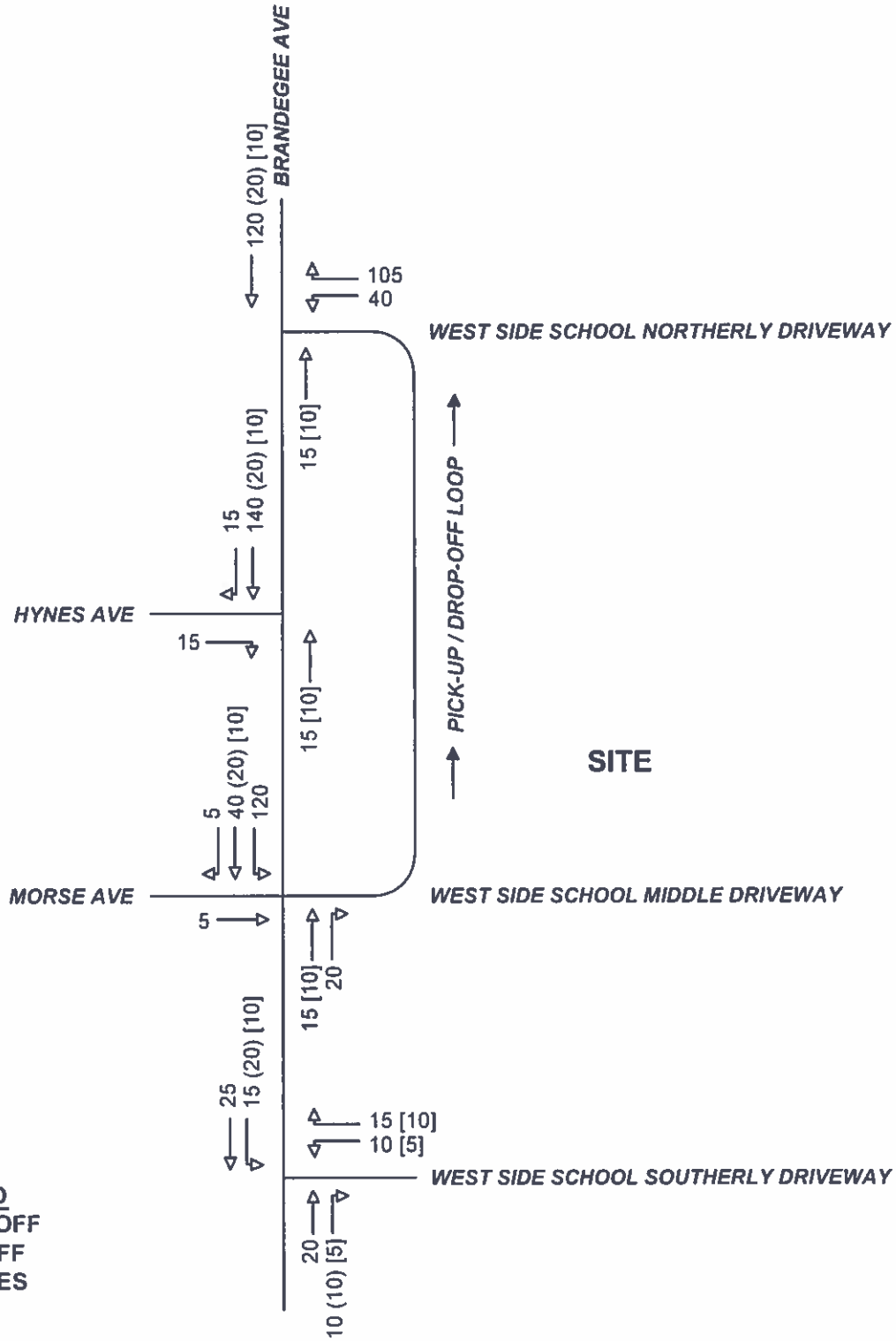
MILONE & MACBROOM, Inc.

FIGURE 3



ANTICIPATED SITE-GENERATED TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR

Proposed West Side Elementary School
Groton, Connecticut

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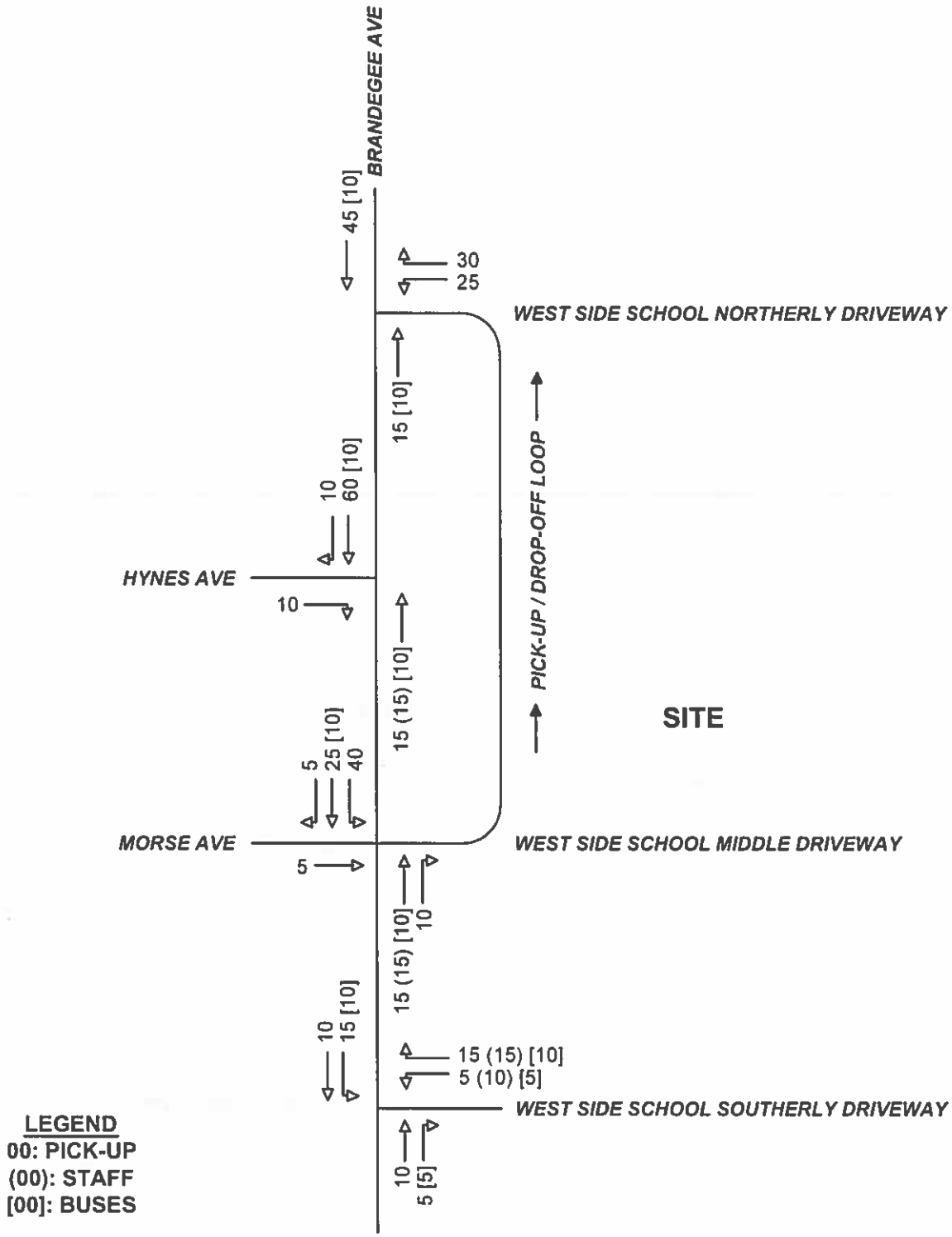
MILONE & MACBROOM, Inc.

FIGURE 4



ANTICIPATED SITE-GENERATED TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR

Proposed West Side Elementary School
Groton, Connecticut

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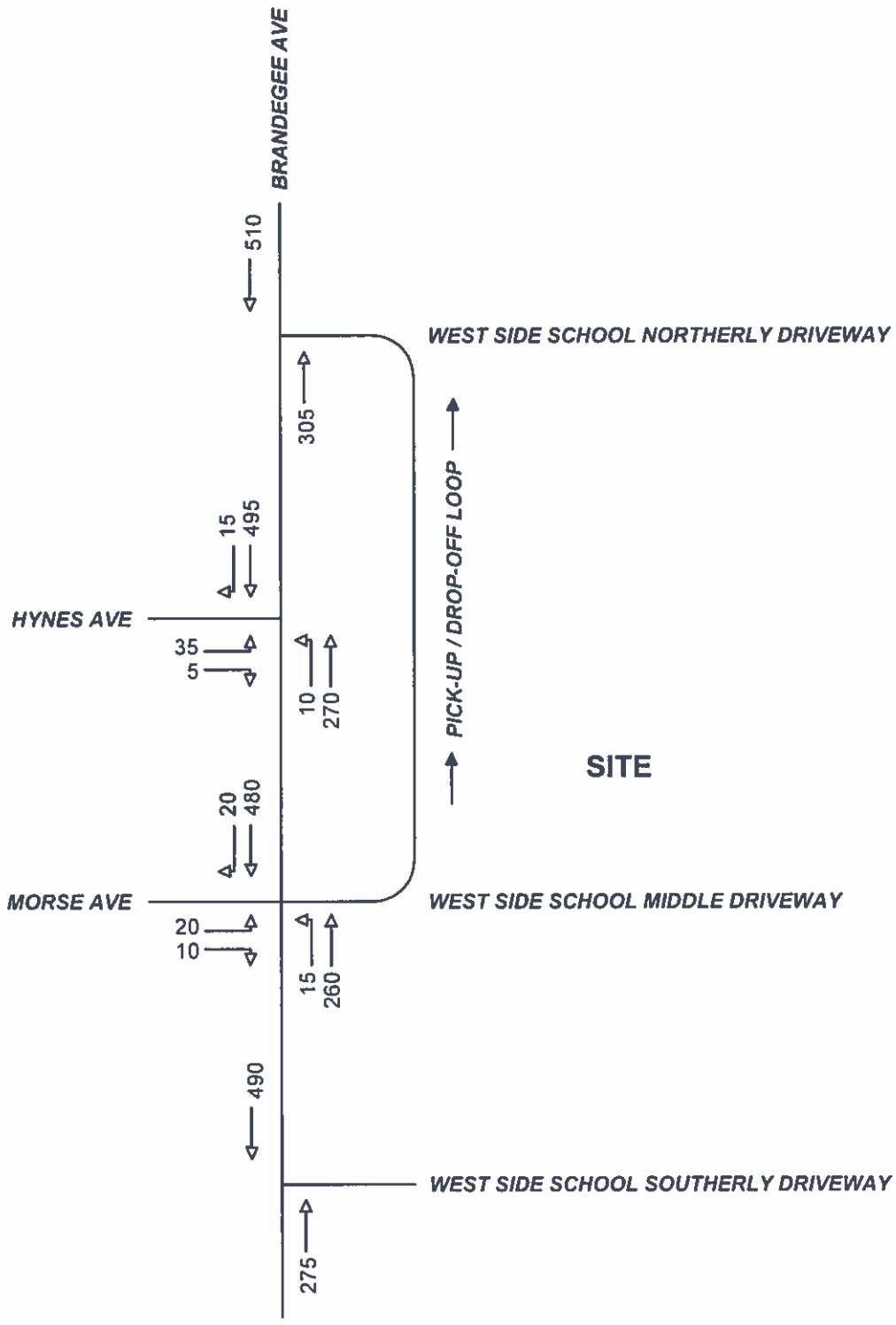
MILONE & MACBROOM, Inc.

FIGURE 5



2021 FUTURE BACKGROUND (NO BUILD) TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR

Proposed West Side Elementary School
Groton, Connecticut

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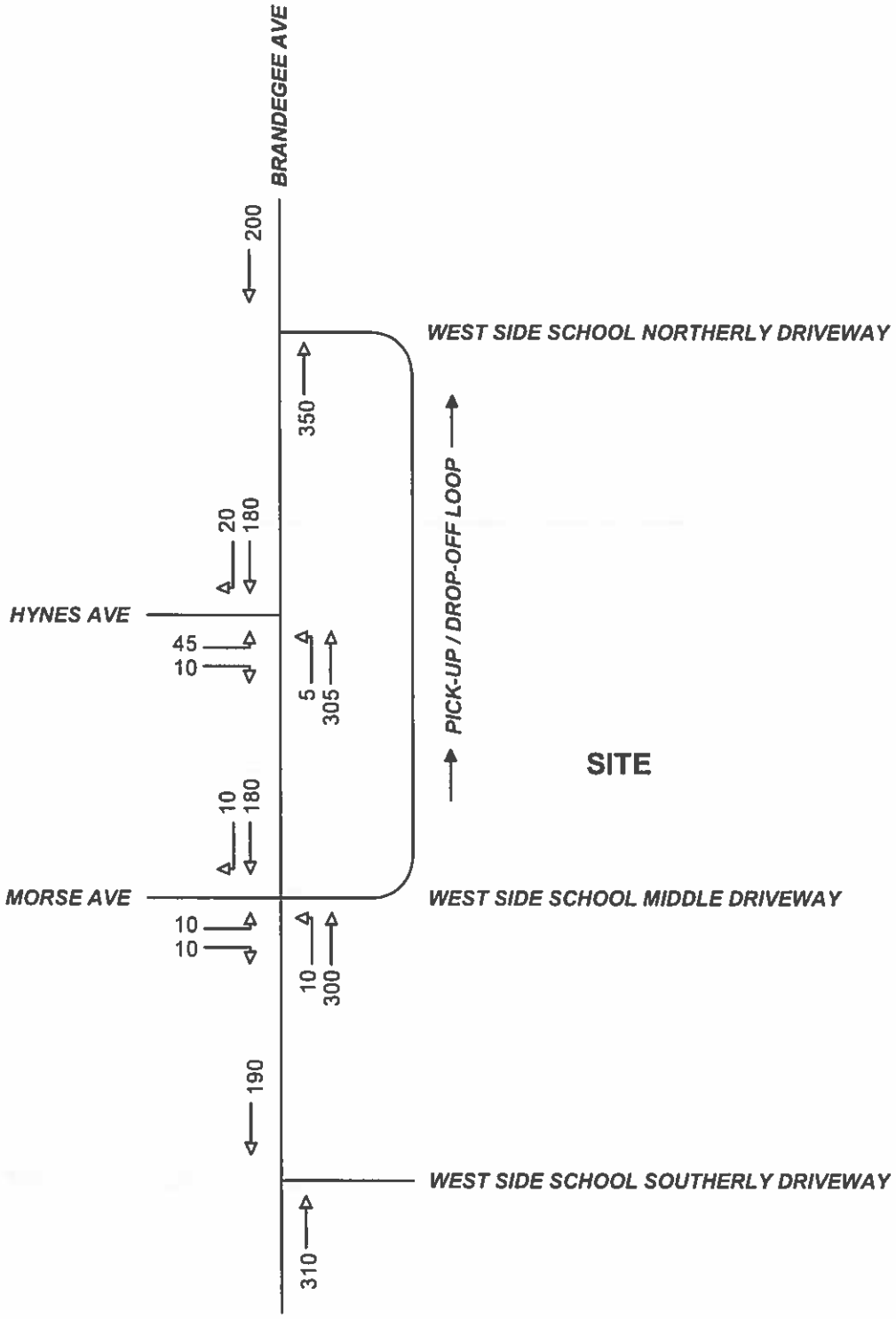
FIGURE 6



2021 FUTURE BACKGROUND (NO BUILD) TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR

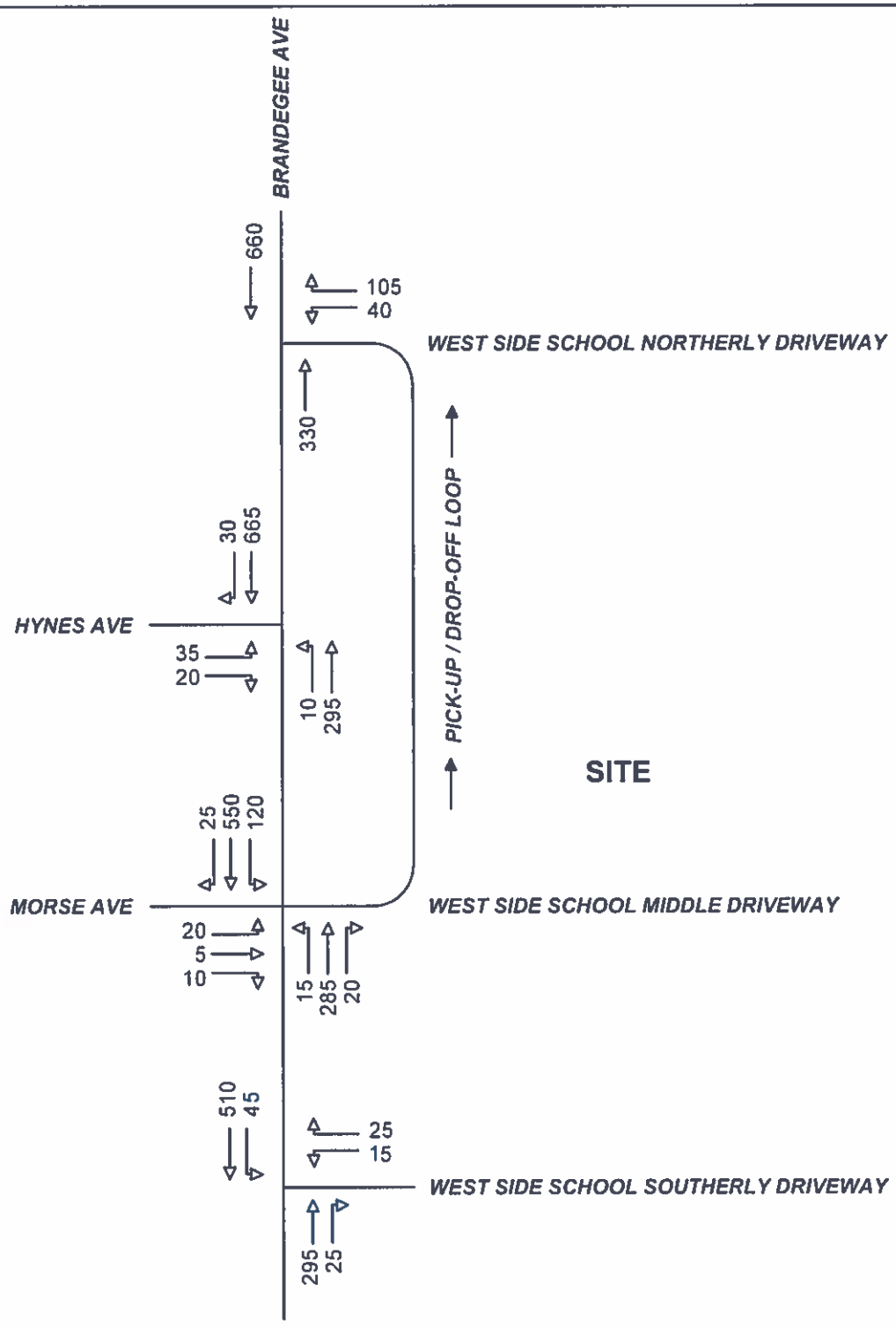
Proposed West Side Elementary School
Groton, Connecticut

N

SCHEMATIC

MILONE & MACBROOM, Inc.

FIGURE 7



2021 FUTURE COMBINED (BUILD) TRAFFIC VOLUMES
WEEKDAY MORNING PEAK HOUR

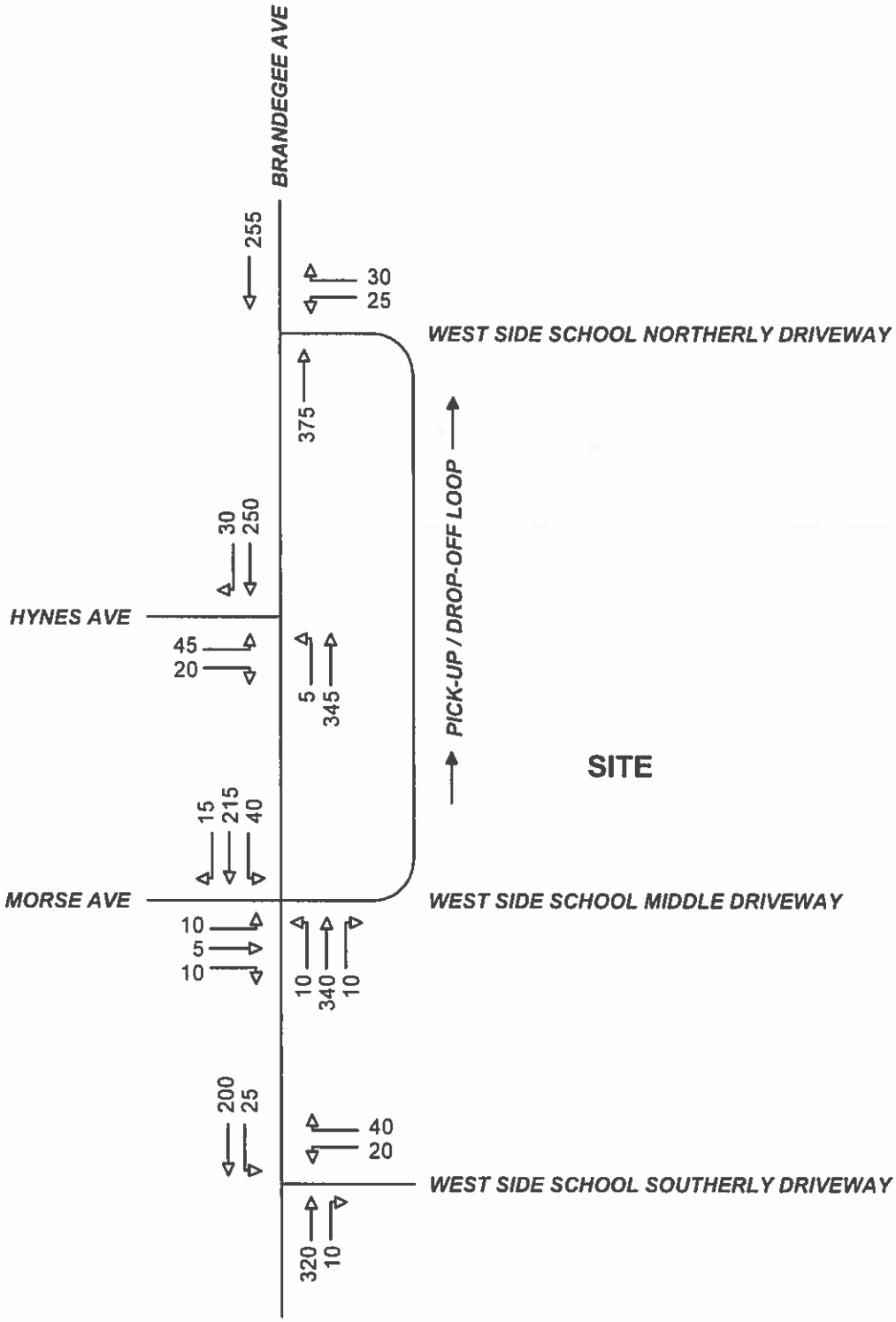
Proposed West Side Elementary School
Groton, Connecticut

N

SCHEMATIC

MILONE & MACBROOM, Inc.

FIGURE 8



2021 FUTURE COMBINED (BUILD) TRAFFIC VOLUMES
WEEKDAY AFTERNOON PEAK HOUR

Proposed West Side Elementary School
Groton, Connecticut

N

SCHEMATIC

MILONE & MACBROOM, Inc.

FIGURE 9

APPENDIX

LEVEL OF SERVICE

FOR

UNSIGNALIZED INTERSECTIONS

ALL-WAY STOP-CONTROL (AWSC)

The criteria for AWSC intersections have different threshold values than do those for signalized intersections primarily because drivers expect different levels of performance from distinct types of transportation facilities. The expectation is that a signalized intersection is designed to carry higher traffic volumes than an AWSC intersection. Thus a higher level of control delay is acceptable at a signalized intersection for the same LOS. The level-of-service criteria are given below.

LEVEL-OF SERVICE CRITERIA FOR AWSC INTERSECTIONS	
LOS[1]	CONTROL DELAY (s/veh)
A	≤ 10
B	> 10 AND ≤ 15
C	> 15 AND ≤ 25
D	> 25 AND ≤ 35
E	> 35 AND ≤ 50
F	> 50

[1] For approaches and intersection-wide assessment, LOS is defined solely by control delay.

Note: LOS F is assigned to a movement if the volume-to-capacity ratio exceeds 1.0, regardless of the control delay.

Reference: Highway Capacity Manual Version 6.0, Transportation Research Board, 2016.

LEVEL OF SERVICE

FOR TWO-WAY

STOP SIGN CONTROLLED INTERSECTIONS

The level of service for a TWSC (two-way stop controlled) intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. LOS criteria are given in the Table. LOS criteria are given below:

LEVEL-OF SERVICE CRITERIA FOR AWSC INTERSECTIONS	
LOS[1]	CONTROL DELAY (s/veh)
A	≤ 10
B	> 10 AND ≤ 15
C	> 15 AND ≤ 25
D	> 25 AND ≤ 35
E	> 35 AND ≤ 50
F	> 50

Note: LOS criteria apply to each lane on a given approach and to each approach on the minor street.
LOS is not calculated for major-street approaches or for the intersection as a whole.
LOS F is assigned to a movement if the volume-to-capacity ratio exceeds 1.0, regardless of the control delay

Reference: Highway Capacity Manual Version 6.0. Transportation Research Board, 2016.

HCS7 Two-Way Stop-Control Report

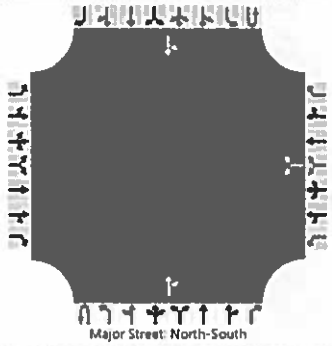
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined AM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at North Dwy
Jurisdiction	Groton
East/West Street	School North Driveway
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						40		105			330	0		0	660	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

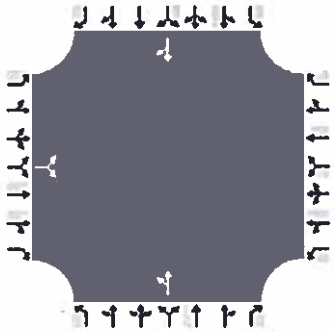
Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							161							0		
Capacity, c (veh/h)							446							1192		
v/c Ratio							0.36							0.00		
95% Queue Length, Q_{95} (veh)							1.7							0.0		
Control Delay (s/veh)							17.6							8.0		
Level of Service (LOS)							C							A		
Approach Delay (s/veh)						17.6							0.0			
Approach LOS						C										

HCS7 All-Way Stop Control Report

General Information		Site Information	
Analyst	WKF	Intersection	Brandegee at Hynes Ave
Agency/Co.	Milone & MacBroom, Inc.	Jurisdiction	Groton
Date Performed	07/25/2019	East/West Street	Hynes Ave
Analysis Year	2019	North/South Street	Brandegee Ave
Analysis Time Period (hrs)	1.00	Peak Hour Factor	0.90
Time Analyzed	Combined AM		
Project Description	West Side Elementary School		

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	35		20				10	295			665	30
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	61						339			772		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.054						0.301			0.686		
Final Departure Headway, hd (s)	6.30						4.98			4.52		
Final Degree of Utilization, x	0.107						0.469			0.969		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	4.30						2.98			2.52		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	61						339			772		
Capacity	572						722			797		
95% Queue Length, Q_{95} (veh)	0.4						2.6			28.4		
Control Delay (s/veh)	10.1						12.4			72.8		
Level of Service, LOS	B						B			F		
Approach Delay (s/veh)	10.1						12.4			72.8		
Approach LOS	B						B			F		
Intersection Delay, s/veh | LOS	52.1						F					

HCS7 Two-Way Stop-Control Report

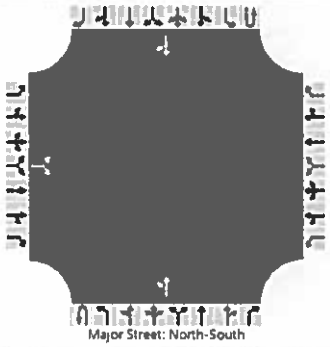
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined AM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at Hynes Ave
Jurisdiction	Groton
East/West Street	Hynes Ave
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		35		20						10	295				665	30
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			61							11						
Capacity, c (veh/h)			273							843						
v/c Ratio			0.22							0.01						
95% Queue Length, Q_{95} (veh)			0.9							0.0						
Control Delay (s/veh)			22.0							9.3						
Level of Service (LOS)			C							A						
Approach Delay (s/veh)		22.0								0.5						
Approach LOS		C														

HCS7 Two-Way Stop-Control Report

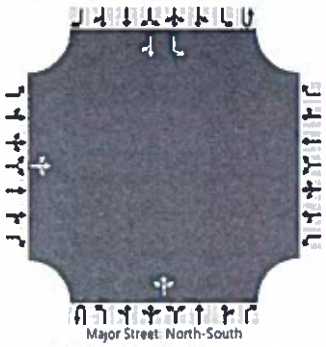
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined AM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at Middle Drive
Jurisdiction	Groton
East/West Street	Morse Ave / Middle Dwy
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	1	1	0
Configuration			LTR								LTR			L		TR
Volume (veh/h)		20	5	10						15	285	20		120	550	25
Percent Heavy Vehicles (%)		2	2	2						2				2		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22						4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32						2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			39							17				133		
Capacity, c (veh/h)			172							945				1220		
v/c Ratio			0.23							0.02				0.11		
95% Queue Length, Q_{95} (veh)			0.9							0.1				0.4		
Control Delay (s/veh)			32.0							8.9				8.3		
Level of Service (LOS)			D							A				A		
Approach Delay (s/veh)		32.0								0.6				1.4		
Approach LOS		D														

HCS7 Two-Way Stop-Control Report

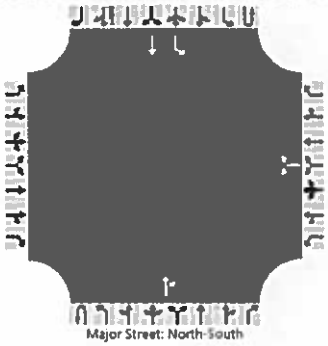
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined AM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at South Dwy
Jurisdiction	Groton
East/West Street	School South Driveway
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	1	1	0
Configuration							LR					TR		L	T	
Volume (veh/h)						15		25			295	25		45	510	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							44							50		
Capacity, c (veh/h)							424							1203		
v/c Ratio							0.10							0.04		
95% Queue Length, Q_{95} (veh)							0.4							0.1		
Control Delay (s/veh)							14.5							8.1		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)					14.5								0.7			
Approach LOS					B											

HCS7 Two-Way Stop-Control Report

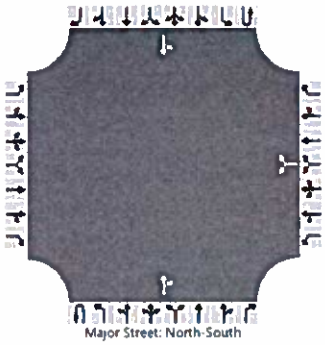
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined PM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at North Dwy
Jurisdiction	Groton
East/West Street	School North Driveway
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						30		25			375	0		0	255	
Percent Heavy Vehicles (%)						2		2						2		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type | Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.42		6.22						4.12		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.52		3.32						2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)							61							0		
Capacity, c (veh/h)							485							1142		
v/c Ratio							0.13							0.00		
95% Queue Length, Q_{95} (veh)							0.4							0.0		
Control Delay (s/veh)							13.5							8.2		
Level of Service (LOS)							B							A		
Approach Delay (s/veh)						13.5								0.0		
Approach LOS						B										

HCS7 All-Way Stop Control Report

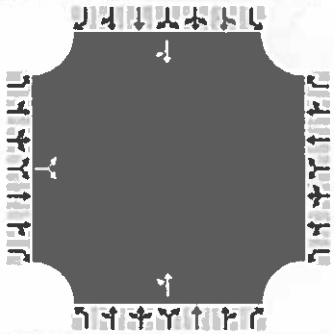
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	07/25/2019
Analysis Year	2019
Analysis Time Period (hrs)	1.00
Time Analyzed	Combined PM
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at Hynes Ave
Jurisdiction	Groton
East/West Street	Hynes Ave
North/South Street	Brandegee Ave
Peak Hour Factor	0.90

Lanes



Vehicle Volume and Adjustments

Approach	Eastbound			Westbound			Northbound			Southbound		
Movement	L	T	R	L	T	R	L	T	R	L	T	R
Volume	45		20				5	345			250	30
% Thrus in Shared Lane												
Lane	L1	L2	L3	L1	L2	L3	L1	L2	L3	L1	L2	L3
Configuration	LR						LT			TR		
Flow Rate, v (veh/h)	72						389			311		
Percent Heavy Vehicles	2						2			2		

Departure Headway and Service Time

Initial Departure Headway, hd (s)	3.20						3.20			3.20		
Initial Degree of Utilization, x	0.064						0.346			0.277		
Final Departure Headway, hd (s)	5.44						4.49			4.50		
Final Degree of Utilization, x	0.109						0.485			0.389		
Move-Up Time, m (s)	2.0						2.0			2.0		
Service Time, ts (s)	3.44						2.49			2.50		

Capacity, Delay and Level of Service

Flow Rate, v (veh/h)	72						389			311		
Capacity	662						802			800		
95% Queue Length, Q_{95} (veh)	0.4						2.8			1.9		
Control Delay (s/veh)	9.1						11.7			10.4		
Level of Service, LOS	A						B			B		
Approach Delay (s/veh)	9.1						11.7			10.4		
Approach LOS	A						B			B		
Intersection Delay, s/veh | LOS	10.9						B					

HCS7 Two-Way Stop-Control Report

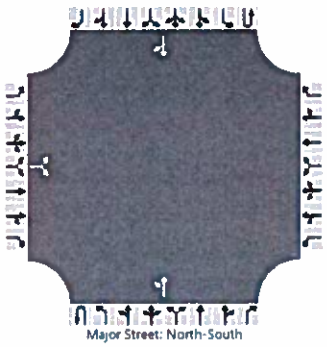
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined PM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at Hynes Ave
Jurisdiction	Groton
East/West Street	Hynes Ave
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	0	1	0
Configuration			LR							LT						TR
Volume (veh/h)		45		20						5	345				250	30
Percent Heavy Vehicles (%)		2		2						2						
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1		6.2						4.1						
Critical Headway (sec)		6.42		6.22						4.12						
Base Follow-Up Headway (sec)		3.5		3.3						2.2						
Follow-Up Headway (sec)		3.52		3.32						2.22						

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			72							6						
Capacity, c (veh/h)			475							1249						
v/c Ratio			0.15							0.00						
95% Queue Length, Q_{95} (veh)			0.5							0.0						
Control Delay (s/veh)			13.9							7.9						
Level of Service (LOS)			B							A						
Approach Delay (s/veh)		13.9								0.2						
Approach LOS		B														

HCS7 Two-Way Stop-Control Report

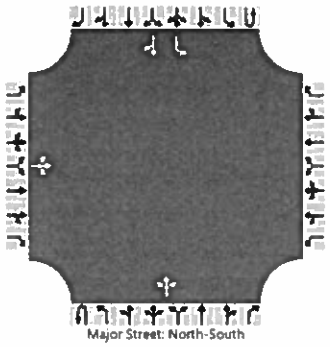
General Information

Analyst	WKF
Agency/Co.	Milone & MacBroom, Inc.
Date Performed	7/25/2019
Analysis Year	2019
Time Analyzed	Combined PM
Intersection Orientation	North-South
Project Description	West Side Elementary School

Site Information

Intersection	Brandegee at Middle Drive
Jurisdiction	Groton
East/West Street	Morse Ave / Middle Dwy
North/South Street	Brandegee Ave
Peak Hour Factor	0.90
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	1	0		0	0	0	0	0	1	0	0	1	1	0
Configuration			LTR								LTR			L		TR
Volume (veh/h)		10	5	10						10	340	10		40	215	15
Percent Heavy Vehicles (%)		2	2	2						2				2		
Proportion Time Blocked																
Percent Grade (%)		0														
Right Turn Channelized																
Median Type | Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)		7.1	6.5	6.2						4.1				4.1		
Critical Headway (sec)		7.12	6.52	6.22						4.12				4.12		
Base Follow-Up Headway (sec)		3.5	4.0	3.3						2.2				2.2		
Follow-Up Headway (sec)		3.52	4.02	3.32						2.22				2.22		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)			28							11				44		
Capacity, c (veh/h)			421							1309				1170		
v/c Ratio			0.07							0.01				0.04		
95% Queue Length, Q_{95} (veh)			0.2							0.0				0.1		
Control Delay (s/veh)			14.1							7.8				8.2		
Level of Service (LOS)			B							A				A		
Approach Delay (s/veh)		14.1								0.3				1.2		
Approach LOS		B														