

SCHEMATIC DESIGN TRAFFIC IMPACT AND ACCESS STUDY

CUTLER ELEMENTARY SCHOOL
ASBURY STREET
HAMILTON, MASSACHUSETTS



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November 2024

(GPI Project No.: NEX-2400246.00)

***Cutler Elementary School – Hamilton, MA
Schematic Design Report
Traffic Impact and Access Study
November 26, 2024***

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TECHNICAL MEMORANDUM

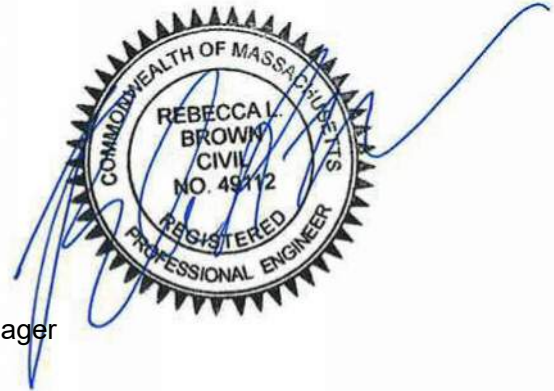
REF: NEX-2400246

DATE: November 26, 2024

TO: JCJ Architecture
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FROM: Ms. Rebecca L. Brown, P.E., Senior Project Manager
Ms. Cecilia Donaldson, E.I.T, Designer

RE: Schematic Design - Traffic Impact and Access Study
Cutler Elementary School
237 Asbury Street
Hamilton, Massachusetts 01982



INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed consolidated elementary school to be located at the site of the existing Cutler Elementary School at 237 Asbury Street in Hamilton, Massachusetts. The site currently contains the Cutler Elementary School with an approximate enrollment of 255 students in Grades K – 5. Access is currently provided via two entrance-only driveways on Asbury Street at the far east and far west ends of the property, and an egress-only driveway in the center of the property. The easterly driveway is primarily used for bus loading/unloading during morning arrival and afternoon dismissal, while the westerly driveway is used for both staff and parent entrances to the site. A single egress for all traffic is provided near the center of the site. The project consists of razing the existing elementary school and constructing a new consolidated elementary school for up to 740 students in Grades 1 – 5, comprised of students from the existing Cutler Elementary School, Winthrop Elementary School, and Buker Elementary School in the Hamilton-Wenham school district. The easterly driveway will be reconstructed and shifted approximately 20 feet west providing access and egress for a large parking lot with ± 186 parking spaces for staff during school hours, and for the athletic fields during off-hours. The middle driveway will remain in approximately the same location and will provide access-only for parent and bus drop off. The westerly driveway will also remain in approximately the same location and will provide egress only for parents and buses. The middle driveway will provide access to the ± 56 -space parking lot along the front of the building, as well as to the bus and parent loading/unloading areas. The bus loop will circulate around the front / southerly side of the building, while the parent drop-off/pick-up loop will circulate counter-clockwise around the rear / north side of the building to maximize queue storage distance between the loading/unloading area and Asbury Street. A loading/unloading area with space for up to six vehicles will be provided for parent pick-up/drop-off at the rear of the building. The site location in relation to the surrounding roadway network is shown on Figure 1.

The design of the proposed school is being completed through the Massachusetts School Building Authority (MSBA) process. The Module 3 – Feasibility Study phase was recently completed and the Project was authorized to advance to the Module 4 – Preferred Schematic Design phase. As part of this phase, it will be necessary to perform an assessment of the potential traffic impacts associated with the proposed school and identify measures to mitigate those impacts. This TIAS evaluates the existing conditions of the

roadways immediately surrounding the proposed elementary school, identifies existing deficiencies, estimates the traffic and parking demand to be generated by the proposed school, evaluates the impacts the additional traffic may have on the surrounding area traffic operations, and identifies measures recommended to mitigate project-specific impacts or address existing safety deficiencies.

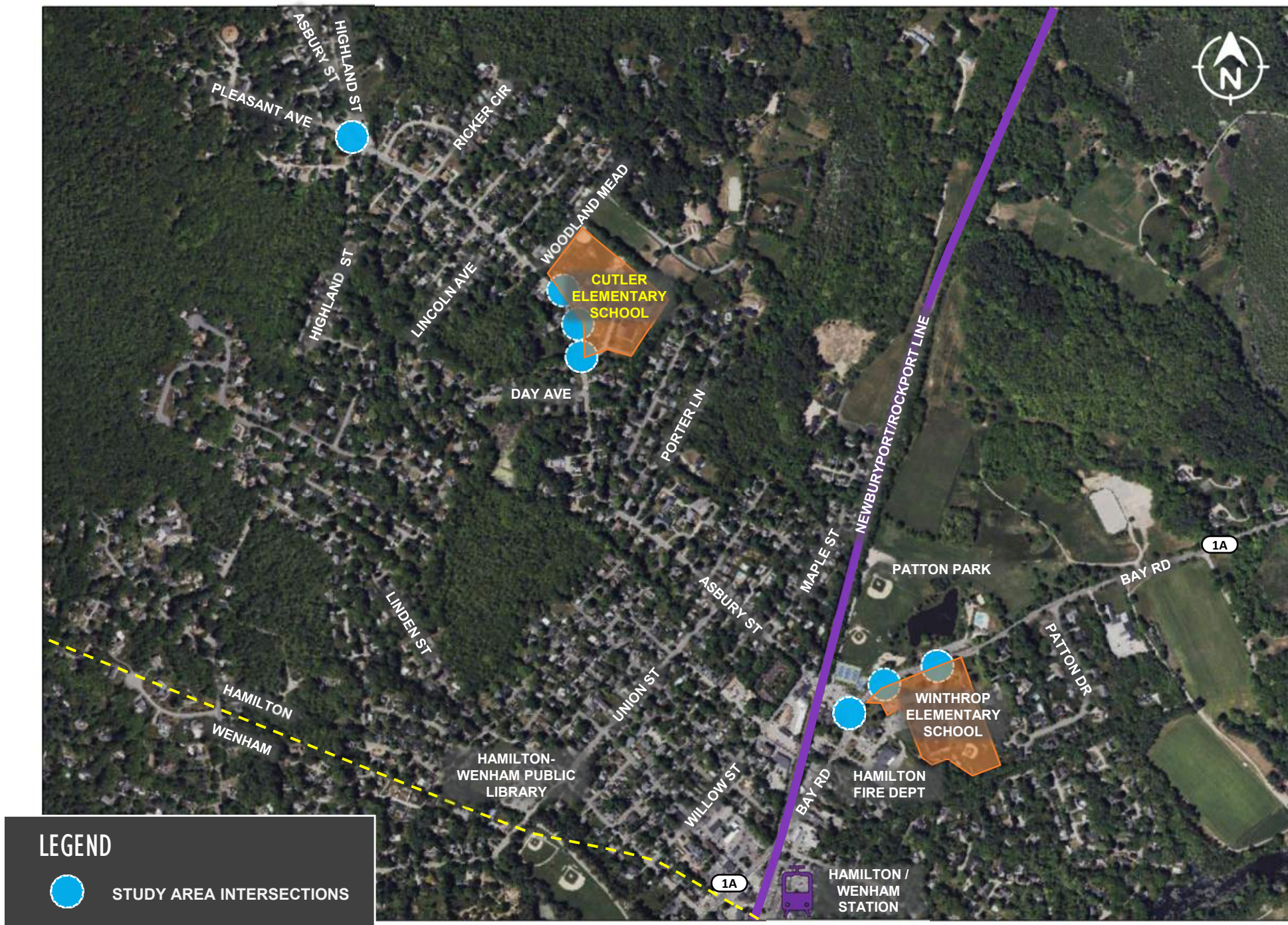


FIGURE I
SITE LOCATION MAP

EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and project traffic volumes on the adjacent streets, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent streets and nearby intersections. The traffic impacts associated with the proposed school have been evaluated at the following intersections:

- Highland Street at Asbury Street and Pleasant Avenue
- Asbury Street at Cutler Elementary School West Driveway
- Asbury Street at Cutler Elementary School Center Driveway
- Asbury Street at Cutler Elementary School East Driveway
- Bay Road at Asbury Street
- Bay Road at Winthrop Elementary School West Driveway
- Bay Road at Winthrop Elementary School East Driveway

Roadway Geometry

Asbury Street

Asbury Street is under the jurisdiction of Town of Hamilton and is classified as an urban collector. Asbury Street runs in the northwest/southeast direction and provides a single 11-foot travel-lane in each direction with directional travel separated by a double yellow centerline. Four-to-five-foot shoulders are provided on each side of the roadway and a sidewalk is provided along the northeast side of the roadway. No bicycle accommodations are provided. The speed limit is posted at 30 miles per hour (MPH). Although school zone signage is provided on Asbury Street, the signs are not compliant with Manual on Uniform Traffic Control Devices (MUTCD) guidelines and are obscured by overgrown vegetation along the roadway. Pedestrian signs are present in the vicinity of Cutler Elementary School. A crosswalk is provided across Asbury Street 190 feet south of the southern Cutler Elementary School Driveway and 430 feet north of the northern Cutler Elementary School Driveway. Both crosswalks area equipped with school zone crossing signs. Land uses along Asbury Street consist of residential and educational uses.

Bay Road (Route 1A)

Bay Road (Route 1A) is under the jurisdiction of MassDOT and is classified as an urban principle arterial. Bay Road runs in the general northeast/southwest direction and provides a single 12-foot lane in each direction with directional travel separated by a double yellow centerline. The northwestern side of the roadway provides a 3- to 9-foot variable width shoulder, while the shoulder on the southeastern side varies from 3- to 5.5-feet. Sidewalks are provided along both sides of the roadway to the south of the Winthrop School entrance driveway and are provided on only the northwest side of the roadway north of the Winthrop School driveway. No bicycle accommodations are provided. The speed limit is posted at 30 MPH. No designated School Zone signs are present along Bay Road, a signalized crosswalk is provided 70 feet south of the southern Winthrop Elementary School Driveway. Land use along Bay Road (Route 1A) consist of a mix of residential and commercial uses.

Intersection Geometry

Highland Street at Asbury Street and Pleasant Avenue

Asbury Street and Pleasant Street intersect Highland Street from the east and west, respectively, to form a four way unsignalized intersection. Both Asbury Street and Pleasant Avenue approaches operate under STOP control and the Highland Street approaches are free-flowing. The Asbury westbound approach provides a single 12-foot general purpose travel-lane. The Pleasant Street eastbound approach is not striped, but is 26-feet wide, providing adequate width for a single travel lane in each direction. The Highland Street northbound and southbound approaches provide a single 13-foot lane. A crosswalk is provided across the Asbury Street westbound approach and across the Highland Street northbound approach, offset from the intersection approximately 35 feet to the south. No bicycle accommodations are provided at the intersection.

Bay Road at Asbury Street

Asbury Street intersects Bay Road from the northwest to form a three-way unsignalized intersection, with the Asbury Street approach operating under STOP control and the Bay Road approaches operating free-flowing. The Asbury eastbound approach provides separate 11-foot left-turn and right-turn lanes. The Bay Street northbound and southbound approaches provide a single 13-foot lane. An unsignalized crosswalk is provided across the Asbury Street eastbound approach. A signalized crosswalk is provided across the Bay Road northerly leg of the intersection. The signal controls only traffic on Bay Road and no signal indications are provided on the Asbury Street approach. The signal remains in green operation on Bay Road until actuated by a pedestrian pressing the push-button on either side of the roadway. Upon actuation, the signal cycles from green to yellow to red while the pedestrian WALK and FLASHING DON'T WALK phases are in operation. No STOP lines are provided on Bay Road to indicate where traffic should stop when the pedestrian signal is actuated. This pedestrian crossing is not in compliance with MUTCD guidelines and there is poor visibility to the signal heads due to the curvature of Bay Road and vegetation along the edges of the roadway. There are no bicycle accommodations provided at the intersection.

Public Transportation

The Massachusetts Bay Transit Authority (MBTA) provides public transportation services within the greater Boston area and parts of Rhode Island. The commuter rail provides services into and out of Boston within this area. The Newburyport/Rockport line provides service from Boston North Station to both Newburyport and Rockport and runs from 4:49 AM to 1:08 AM every hour on the weekdays and 5:00 AM to 1:06 AM every two hours on the weekends. This line has three stops within a 10 minute drive to the site:

- Hamilton/Wenham stop located 0.9 miles (4 minute drive and 22 minute walk) to the southeast of Cutler Elementary School.
- North Beverly stop located 3.2 miles (8 minute drive) to the south of Cutler Elementary School
- Ipswich stop located 5.2 miles (10 minute drive) to the north of Cutler Elementary School.

The MBTA also provides a bus line that is located within a 10-minute drive of the site. Bus line 451 provides service from Salem Depot to North Beverly Station with stops at Enon St at Super Stop and Shop, Dodge St at Enon St, Tozer Road, Dodge St & Cabot St, and Cummings Center. Service during the weekdays runs from 5:55AM to 7:54PM every hour and a half during the AM and PM peak periods, with not service provided on the weekends.

The fare for the MBTA commuter rail and MBTA bus lines provides regular fares, reduced fares, and free rides for certain riders. People 65 years old and older, students, and people with disabilities may be eligible for a reduced fare, military personnel and children under 11 ride for free. The fares for the commuter rail and bus lines are below:

- MBTA commuter rail – Fares range from \$2.40-\$13.25 for a one way fare based on the beginning stop and ending stop. Reduced fares range from \$1.10-\$6.50 for a one way fare.
- MBTA bus line – Fares are \$1.70 and \$0.85 with the reduced fare.

All public transportation information is provided in the Appendix.

Traffic Volumes

Automatic traffic recorders (ATR) were used to obtain daily traffic volumes and speeds on Asbury Street along the site frontage. ATR counts were collected over a 72-hour period from Tuesday, September 17 to Thursday, September 19, 2024 to obtain weekday daily traffic volumes. All traffic-count data is provided in detail in the Appendix.

Base traffic conditions within the study area were developed by conducting manual turning movement counts (TMCs) and vehicle classification counts at the study area locations. The TMCs and vehicle classification counts were performed during the weekday morning (7:00 AM to 9:00 AM), the weekday afternoon dismissal (2:00 PM – 4:00 PM), and weekday evening (4:00 PM – 6:00 PM) peak periods on Thursday, September 19, 2024 at the following intersections:

- Highland Street at Asbury Street/Pleasant Avenue
- Asbury Street at Cutler Elementary School West Driveway
- Asbury Street at Cutler Elementary School Center Driveway
- Asbury Street at Cutler Elementary School East Driveway
- Asbury Street at Bay Road
- Bay Road at Winthrop Elementary School West Driveway
- Bay Road at Winthrop Elementary School East Driveway

Seasonal Adjustment

Traffic on a given roadway typically fluctuates throughout the year depending on the area and the type of roadway. To determine if the September traffic-volume data needed to be adjusted to account for this fluctuation, the 2017-2019 MassDOT weekday seasonal factors¹ for Factor Group U3 (other principle arterials) and Factor Group U6 (urban minor collector) were reviewed, which represent Bay Road (Route 1A) and Asbury Street, respectively. Based on a review of this data, it was determined that traffic volumes for the month of September are approximately 7.0 percent higher than average month conditions for both Factor Group U3 and Factor Group U6. Therefore, traffic volumes were unadjusted for seasonal variation to provide a conservative (worse case) scenario. The MassDOT seasonal adjustment data is provided in the Appendix.

¹ MassDOT Weekday Seasonal and Axle Correction Factors 2017-2019

Existing Traffic Volumes

Table 1 summarizes the resulting existing daily and peak-hour traffic volumes on Asbury Street. The 2024 Existing traffic-flow networks for the weekday AM, Weekday School Dismissal, and Weekday PM peak hours are shown graphically on Figures 2 – 4, respectively.

TABLE 1
Existing Traffic Volume Summary

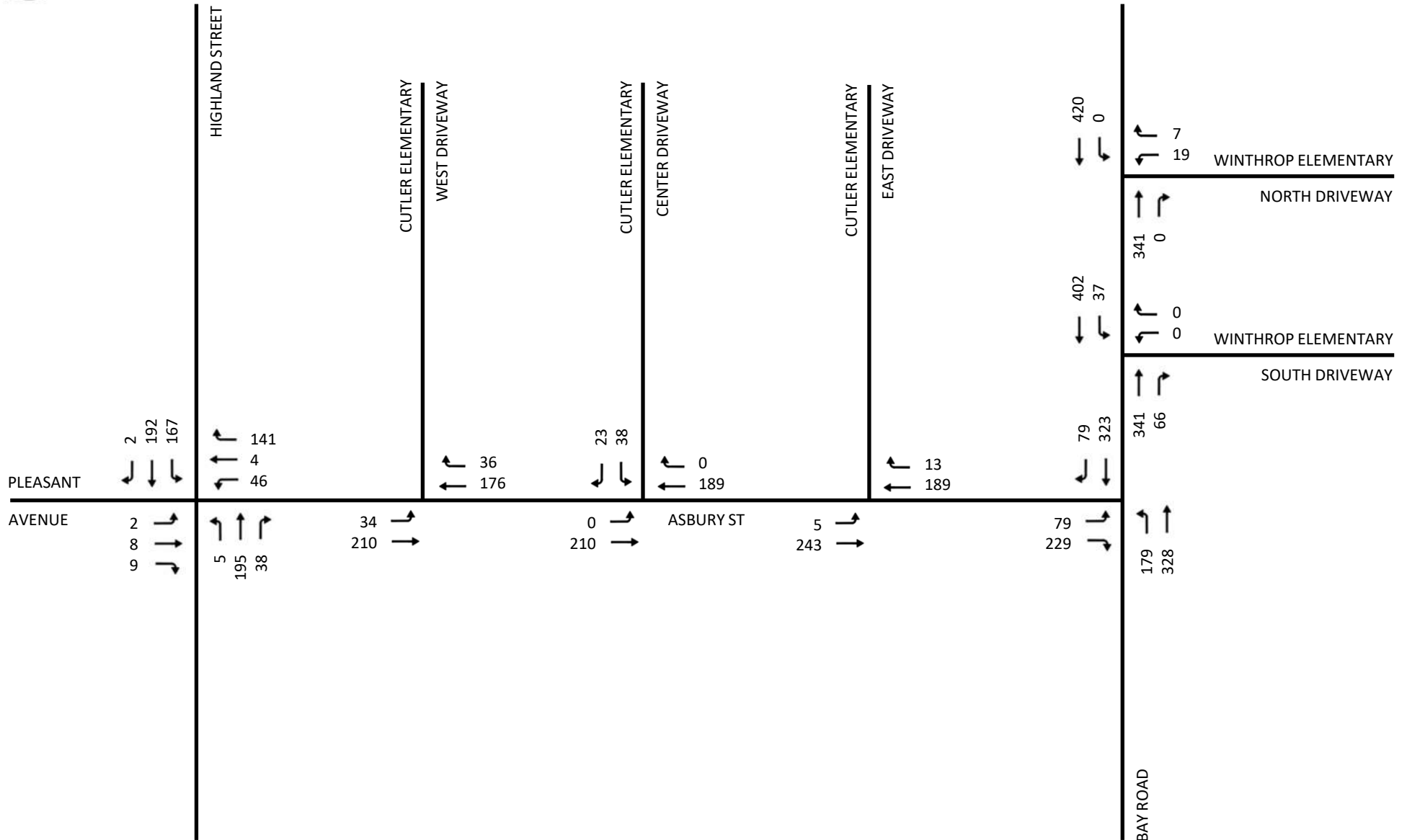
Location/Time Period	Daily Volume (vpd) ^a	Peak Hour Volume (vph) ^b	K Factor (%) ^c	Directional Distribution ^d
Asbury Street, adjacent to site:				
Weekday Daily	4,310			
Weekday AM Peak Hour		422	9.8	50% WB
School Dismissal Peak Hour		394	9.1	59% WB
Weekday PM Peak Hour		455	10.6	58% WB

^a In vehicles per day.

^b In vehicles per hour. Volumes obtained from Figures 2 through 4.

^c Percentage of daily traffic occurring during the peak hour.

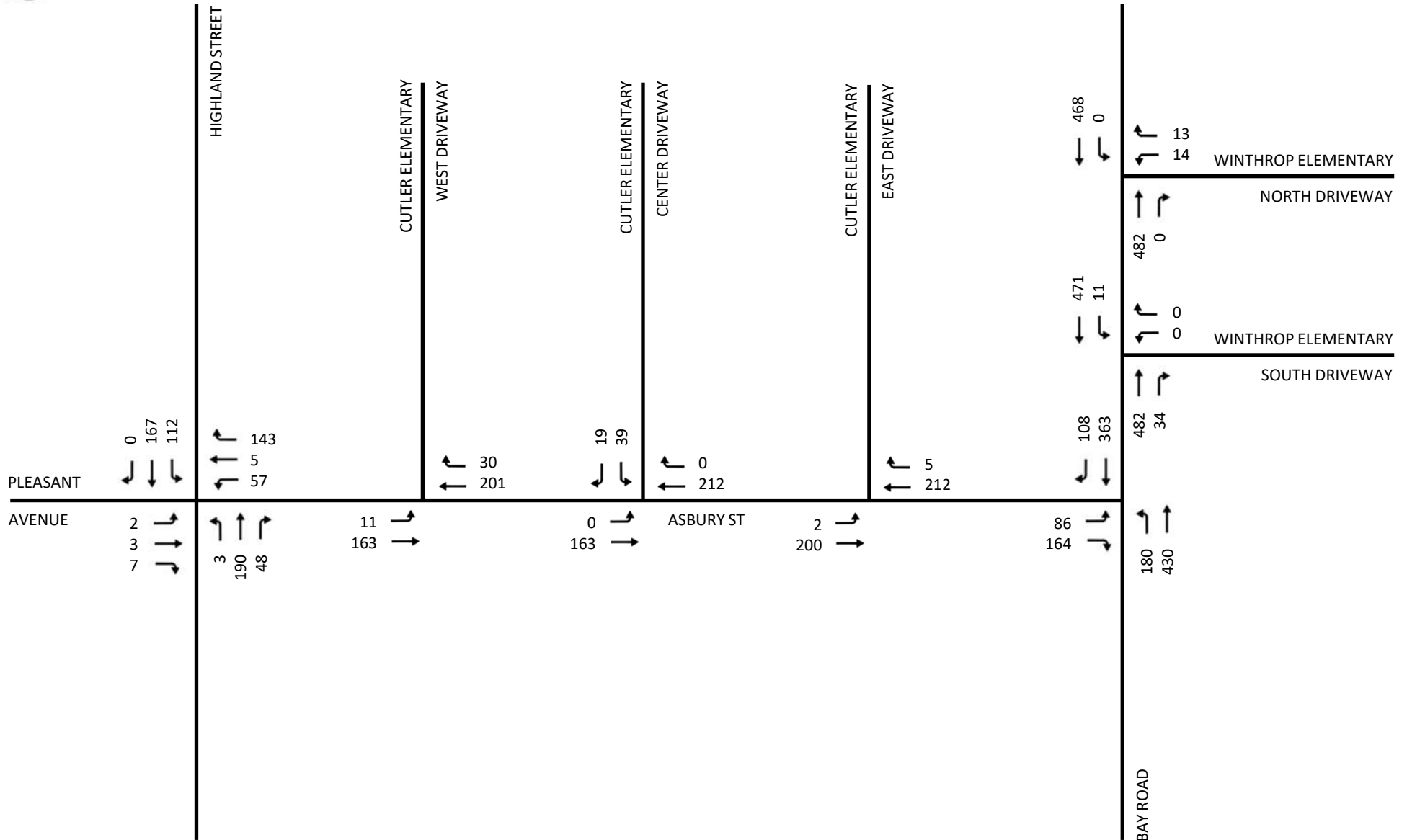
^d WB = westbound. Percentages from volumes on Figures 2 through 4.



* = ILLEGAL MOVEMENT



FIGURE 2
2024 EXISTING TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

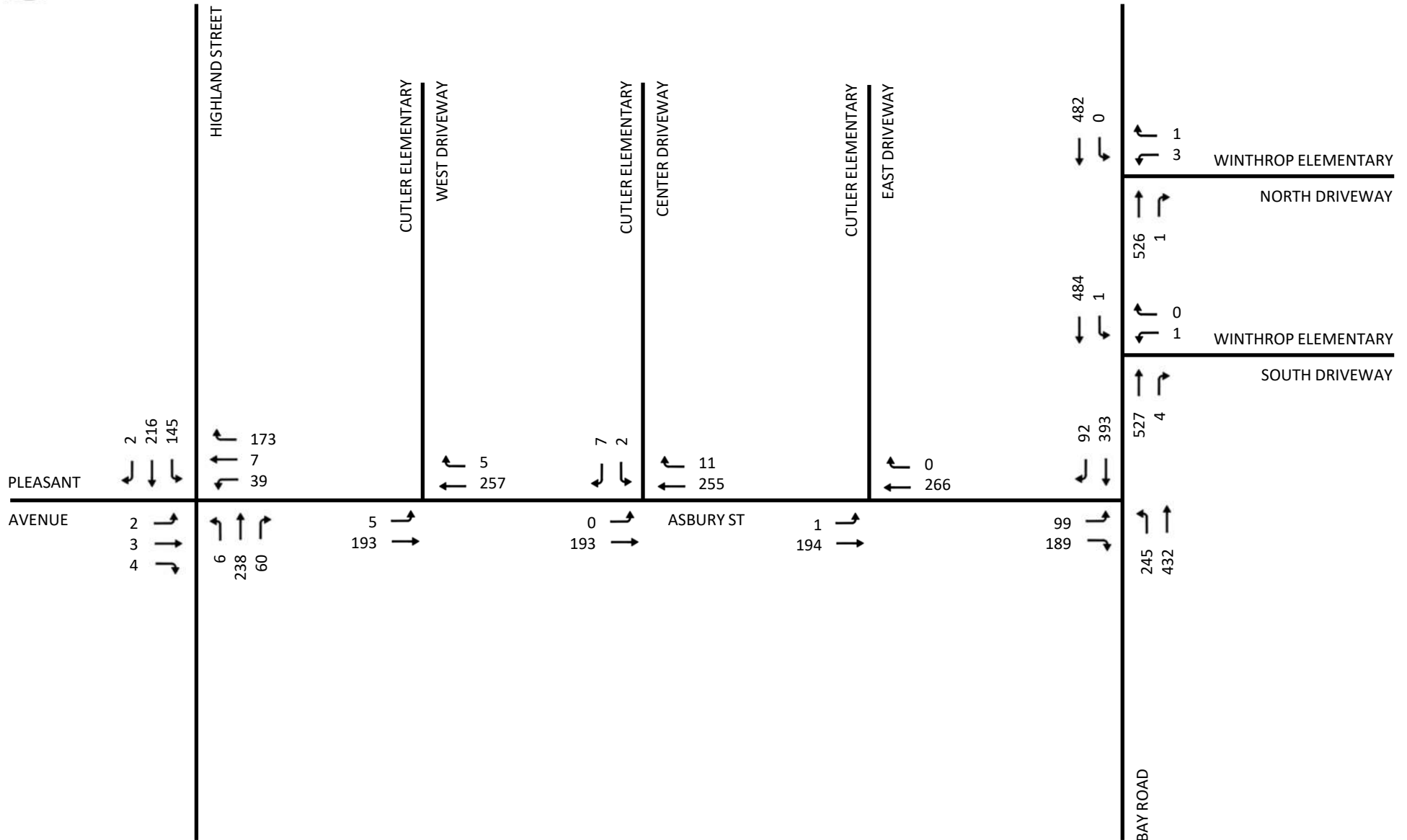


* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 3
2024 EXISTING TRAFFIC VOLUMES
WEEKDAY SCHOOL DISMISSAL PEAK HOUR



* = ILLEGAL MOVEMENT



FIGURE 4
2024 EXISTING TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR

Collisions

Collision data for the study area intersections were obtained from the Massachusetts Department of Transportation (MassDOT) for the latest complete five years available (2017-2021). A summary of the crashes at this intersection is provided in Table 2 and the detailed crash data is provided in the Appendix.

In addition to the collision summary, crash occurrence also should be compared to the volume of traffic through a particular intersection or on a particular classification of roadway to determine any significance. Accordingly, the crash rate was calculated for the study area intersections and segments and compared with the statewide and district-wide averages. An intersection crash rate is a measure of the frequency of collisions compared to the volume of traffic through an intersection and is presented in crashes per million entering vehicles (c/mev). For unsignalized intersections, the statewide and District 4 average is 0.57 c/mev. A roadway segment crash rate is a measure of the frequency of collisions compared to the volume of traffic through a roadway segment and is presented in crashes per million vehicle miles traveled (c/mvmt). The average statewide crash rate among urban segments is 2.10 c/mvmt, the average crash rate on Urban Collector Roadways (Asbury Street) is 2.85 c/mvmt, and on Other Principal Arterials (Bay Road) is 3.05 c/mvmt. A comparison of the calculated crash rate to these averages can be used to establish the significance of collision occurrence and whether or not potential safety problems exist. All crash rate worksheets are provided in the Appendix.

All of the study area intersections and roadway segments experienced an average of fewer than two (2) collisions per year and a crash rate significantly lower than the state and District-wide averages, indicating that no significant safety issue exists. None of the collisions involved pedestrians or bicyclists. Although the total occurrence of collisions at the Bay Road / Asbury Street intersection is low, approximately 44 percent of the collisions occurred during the commuter peak hours, indicating that traffic congestion and queuing may be contributing factors to collisions at that location.

TABLE 2
Collision Summary

Location	Number of Collisions			Severity ^a				Collision Type ^b							Percent During	
	Total	Average per Year	Crash Rate	PD	PI	F	U	CM	RE	HO	SV	SS	Bike/Ped	U	Commuter Peak ^c	Wet/Icy Conditions ^d
Highland Street at Asbury Street and Pleasant Avenue	5	1.0	0.28	5	--	--	--	2	3	--	--	--	--	--	20%	40%
Asbury Street along site frontage, from Woodland Mead to Day Ave	1	0.2	0.72	1	--	--	--	--	--	--	--	1	--	--	100%	0%
Bay Road at Asbury Street	9	1.8	0.36	6	2	--	1	3	3	1	1	1	--	--	44%	33%
Bay Road along site frontage, from Asbury Street to Patton Drive	2	0.4	0.40	2	--	--	--	--	1	--	--	1	--	--	0%	0%

Source: MassDOT (2017-2021).

^a PD = property damage only; PI = personal injury; NR = not reported.

^b CM = cross movement/angle; RE = rear end; HO = head-on; FO = fixed object; SS = sideswipe; Bike/Ped = bicycle / pedestrian; U = unknown.

^c Percent of vehicle incidents that occurred during the weekday AM (7:00 AM-9:00 AM) and weekday PM (4:00 PM -6:00 PM) commuter peak periods.

^d Represents the percentage of only "known" collisions occurring during inclement weather conditions.

Vehicle Speeds

Vehicle speed measurements were conducted along Asbury Street by use of radar. The primary use of this information is explained in the *Sight Distance* section where the speeds are correlated to sight distance measurements taken at the location of the site driveways to assure that adequate sight distances exist at the driveways to provide safe operation. The results of the speed measurements are summarized in Table 3.

Asbury Street along the site frontage is posted for 30 miles per hour (MPH). There is also a school zone speed limit sign posted on Asbury Street approximately 200 feet to the southeast and northwest of the school's property boundaries that notes "SCHOOL SPEED 20 MPH ON SCHOOL DAYS WHEN CHILDREN PRESENT".



Image 1 – School Zone Speed Limit sign on Asbury Street WB approaching school



Image 2 – School Zone Speed Limit sign on Asbury Street EB approaching school

TABLE 3
Observed Travel Speeds

Location/Time/Direction	Enforced Speed Limit ^a	Average Speed ^b	85 th Percentile Speed ^c
Asbury Street, adjacent to site:			
<i>Eastbound</i>	30 (20)	32 (31)	36 (35)
<i>Westbound</i>	30 (20)	31 (28)	34 (33)

^a In miles per hour (mph).

^b Average Speed of all observed vehicles travel.

^c Speed at, or below which 85 percent of all observed vehicles travel.

XX (XX) = Speed during non-school hours (Speed during school morning arrival and afternoon dismissal hours)

As shown in Table 3, the 85th percentile speeds were 34 – 37 MPH, which were moderately higher than the posted speed limit of 30 MPH on Asbury Street adjacent to the site. However, it should be noted during school hours, the enforced speed on Asbury Street along the site frontage is 20 MPH. During this time, the 85th percentile speeds decreased slightly to 33 – 35 MPH, but remained well above the posted school zone

speed of 20 MPH. This may, in part, be due to the location of the school zone signage that is blocked by vegetation and that the school zone signage notes that this speed is only applicable “WHEN CHILDREN ARE PRESENT”. These school zone signs are also static signs and are no longer compliant with *Manual on Uniform Traffic Control Devices* (MUTCD) guidelines for school zone signage.

To improve compliance with the school zone signage and reduce speeds on Asbury Street near the school, GPI recommends that the Town remove the existing non-compliant school zone signage and replace these signs with MUTCD-compliant school zone signage. At a minimum, a static school zone assembly (S4-3P, R2-1, S4-1P, and R2-6P) should be provided 200- to 500-feet in advance of the school's property boundaries with an advance warning sign (S4-5) of the reduced school zone speed provided 200 feet in advance of the start of the school zone as the school zone speed is 10 MPH less than the regularly enforced speed. Image 3 below provides a depiction of the school zone signage to be installed in advance of the school in both directions along Asbury Street. In addition, GPI recommends SCHOOL ZONE pavement markings be installed on Asbury Street at the start of the school zone in each direction. This consists of marking the word “SCHOOL” in white thermoplastic paint with a 10-foot height across the width of the approaching lane.

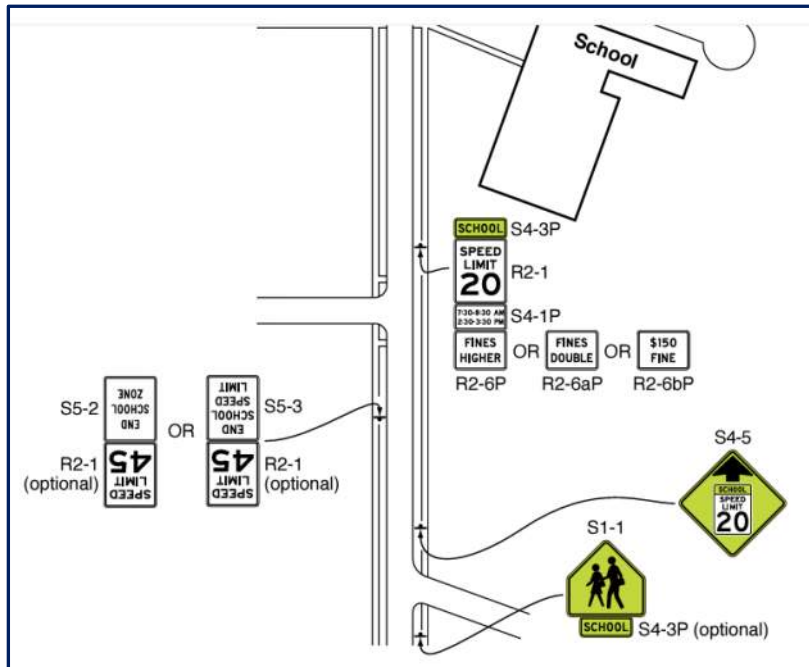


Image 3 – MUTCD-compliant school zone signage assemblies.

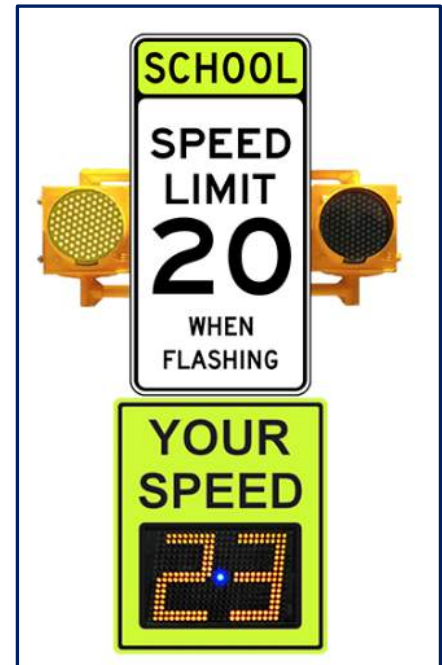


Image 4 – School zone flasher With radar speed feedback.

Alternatively, to provide a greater reduction in speed and compliance with the school zone speed limit, the Town may install school zone flashing beacons with radar speed feedback indications as shown in Image 4. These may be hard-wired or solar-powered assemblies, located at similar distances from the school boundaries as the static school zone assemblies.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway locations to determine if the available sight distances for vehicles exiting the site meet or exceed the minimum distances required for approaching vehicles to safely stop. The available sight distances were compared with minimum requirements, as established by the American

Association of State Highway and Transportation Officials (AASHTO)². AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Executive Office of Transportation (EOT) and the Executive Office of Energy and Environmental Affairs (EEA) require the use of AASHTO sight distance standards when preparing traffic impact assessments and studies, as stated in their guidelines for traffic impact assessments.

Sight distance is the length of roadway ahead that is visible to the driver. Stopping Sight Distance (SSD) is the minimum distance required for a vehicle traveling at a certain speed to safely stop before reaching a stationary object in its path. The values are based on a driver perception and reaction time of 2.5 seconds and a braking distance calculated for wet, level pavements. When the roadway is either on an upgrade or downgrade, grade correction factors are applied. Stopping sight distance is measured from an eye height of 3.5 feet to an object height of 2 feet above street level, equivalent to the taillight height of a passenger car. The SSD is measured along the centerline of the traveled way of the major road.

Intersection sight distance (ISD) is provided on minor street approaches to allow the drivers of stopped vehicles a sufficient view of the major roadway to decide when to enter the major roadway. By definition, ISD is the minimum distance required for a motorist exiting a minor street to turn onto the major street, without being overtaken by an approaching vehicle reducing its speed from the design speed to 70 percent of the design speed. ISD is measured from an eye height of 3.5 feet to an object height of 3.5 feet above street level. The use of an object height equal to the driver eye height makes intersection sight distances reciprocal (i.e., if one driver can see another vehicle, then the driver of that vehicle can also see the first vehicle). When the minor street is on an upgrade that exceeds 3 percent, grade correction factors are applied.

SSD is generally more important as it represents the minimum distance required for safe stopping while ISD is based only upon acceptable speed reductions to the approaching traffic stream. The ISD, however, must be equal to or greater than the minimum required SSD in order to provide safe operations at the intersection. In accordance with the AASHTO manual, *"If the available sight distance for an entering or crossing vehicle is at least equal to the appropriate stopping sight distance for the major road, then drivers have sufficient sight distance to anticipate and avoid collisions. However, in some cases, this may require a major-road vehicle to stop or slow to accommodate the maneuver by a minor-road vehicle. To enhance traffic operations, intersection sight distances that exceed stopping sight distances are desirable along the major road."* Accordingly, ISD should be at least equal to the distance required to allow a driver approaching the minor road to safely stop.

The available SSD and ISD at the proposed site driveway locations were measured and compared to minimum requirements as established by AASHTO. The SSD requirements were calculated based on a the 85th percentile speeds described in Table 3. The required minimum sight distances for the driveways are compared to the available distances, as shown in Table 4.

² A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2018.

TABLE 4
Sight Distance Summary

Location/Direction	Stopping Sight Distance (feet)		Intersection Sight Distance (feet)		
	Measured	Minimum Required ^a	Measured	Minimum Required ^b	Desirable ^c
Cutler Elementary School West Driveway: East of intersection (WB) West of intersection (EB)	392 500+	240 260	405 500+	240 260	290 335
Cutler Elementary School Middle Driveway: East of intersection (WB) West of intersection (EB)	500+ 500+	240 260	500+ 500+	240 260	290 335
Cutler Elementary School East Driveway: East of intersection (WB) West of intersection (EB)	500+ 280 (239)	240 260 (257)	245 293+	240 260	290 335

^a Values based on AASHTO requirements for minimum SSD based on 85th percentile speeds; 36 MPH for eastbound travel and 34 MPH for westbound travel on Asbury Street.

^b Values based on AASHTO requirements for minimum SSD.

^c Values based on AASHTO recommendations for desirable ISD for posted speed of 30 MPH.

XXX (XXX) = Available SSD to a vehicle exiting the site driveway (Available SSD to a vehicle waiting to turn left into site driveway).

As shown in Table 4, the available SSD and ISD at proposed west and center site driveways will exceed AASHTO's requirements for minimum SSD and ISD and AASHTO's recommendations for desirable ISD in all directions.

The available SSD and ISD at the proposed east site driveway will exceed AASHTO's requirements for minimum SSD and ISD for all movements with the exception of the stopping sight distance for a vehicle traveling eastbound on Asbury Street approaching a vehicle waiting to turn left into the east site driveway. This sight line is restricted by the horizontal curvature of Asbury Street to the west of the driveway. Based on the observed 85th percentile speed of 36 MPH on Asbury Street eastbound, a minimum stopping sight distance (SSD) of 257 feet would be required for a vehicle traveling on wet pavement to safely stop for a vehicle stopped in the roadway waiting to turn left into the east site driveway. The available SSD of 239 feet is adequate for vehicles traveling at 34 MPH or less to safely stop on wet pavement for a vehicle stopped in the roadway waiting to turn left into the site. Therefore, the available SSD is more than adequate for vehicles traveling safely at the posted speed to stop for a vehicle waiting to turn left into the east site driveway. As shown in Table 3, the 85th percentile speed on Asbury Street eastbound during school hours when traffic would be entering the east site driveway is 35 MPH. In addition, GPI has recommended installation of MUTCD-compliant school zone signage assemblies and/or school zone flashing beacons with radar speed feedback indications to reduce speeds along Asbury Street during school hours. In addition, the Town should consider installation of "DRIVEWAY ON CURVE" (W1-10d) advance warning signage with advisory speed placards (W13-1p) for a 25 MPH advisory speed on Asbury Street eastbound approaching the curve near the center driveway, as shown in Image 5.



Image 5 – DRIVEWAY ON CURVE and ADVISORY SPEED signage

It is recommended that any proposed plantings, vegetation, landscaping, and signing along the site frontage be kept low to the ground (no more than 3.0 feet above street level) or set back sufficiently from Asbury Street so as not to inhibit the available sight lines. All sight line plans can be found in the Appendix.

FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the year 2031, representing a seven-year design horizon in accordance with state requirements. The proposed school is expected to be completed and fully operational within this time. Traffic volumes on the roadway network at these times will include existing traffic, new traffic due to normal traffic growth, and traffic related to any significant development by others expected to be completed within the area by the 2031 design year. Consideration of these factors resulted in the development of 2031 No-Build traffic volumes, which assume that the proposed development is not built. The incremental impacts of the proposed project may then be determined by adding site-generated traffic volumes (Build conditions) and making comparisons to the No-Build conditions.

Traffic Growth

To develop the 2031 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined. Based on MassDOT historical count data from count stations³ in the surrounding area, traffic volumes were generally decreasing at a rate of 0.10 percent between 2010 and 2019, and after the COVID-19 pandemic traffic volumes have been generally increasing at a rate of 0.53 percent. To provide a conservative (worse case) analysis condition, a 1.0 percent per year annual growth rate was assumed, which is consistent with other recent studies completed from projects in the area. The MassDOT historical traffic-volume data are provided in the Appendix.

Second, any planned or approved specific developments in the area that would generate a significant volume of traffic on study area roadways within the next 10 years were considered. Based on discussions with the Town of Hamilton Planning Department, the only expected development in the area is a 12-unit Chapter 40-B residential development to be located to the northwest of the site. No traffic study was completed for this development, and based on the size of the development, it is not anticipated to have a measurable impact on traffic volumes in the study area. Therefore, the traffic to be generated by the residential development was assumed to be included in the conservative (worse than expected) annual growth rate of 1.0 percent per year.

³ MassDOT Transportation Data Management System.

Planned Roadway Improvements

Based on discussions with the Town of Hamilton, no project specific improvements were identified that would have a direct impact with the project study area. While the Town has expressed interest in pursuing an intersection improvement project at the Highland Street / Asbury Street intersection, no funding has been identified for a project at this location and design plans have not been prepared.

Based on the MassDOT projects website, there was previously a highway reconstruction project (project #601182) proposed in 2000 along Asbury Street and Bay Road. However, based on discussions with MassDOT, this project never moved forward and there are no current plans to advance this project.

No-Build Conditions

The 2031 No-Build peak-hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic-growth rate (7.2 percent compounded over seven years) to the 2024 Existing traffic volumes. The 2031 No-Build Weekday AM, Weekday Afternoon Dismissal, and Weekday PM peak-hour traffic volumes are shown graphically on Figure 5, 6, and 7, respectively.

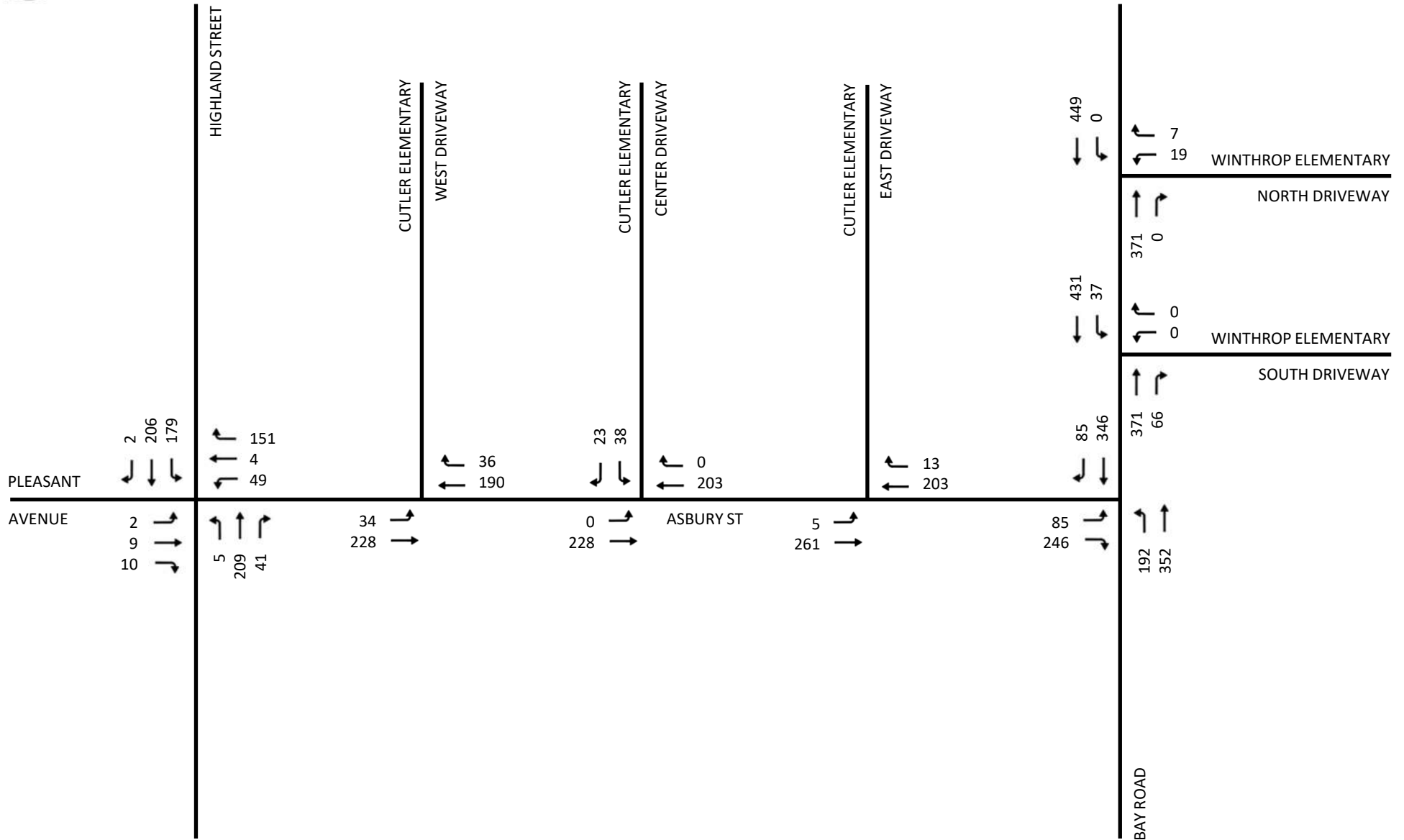


FIGURE 5
2031 NO-BUILD TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

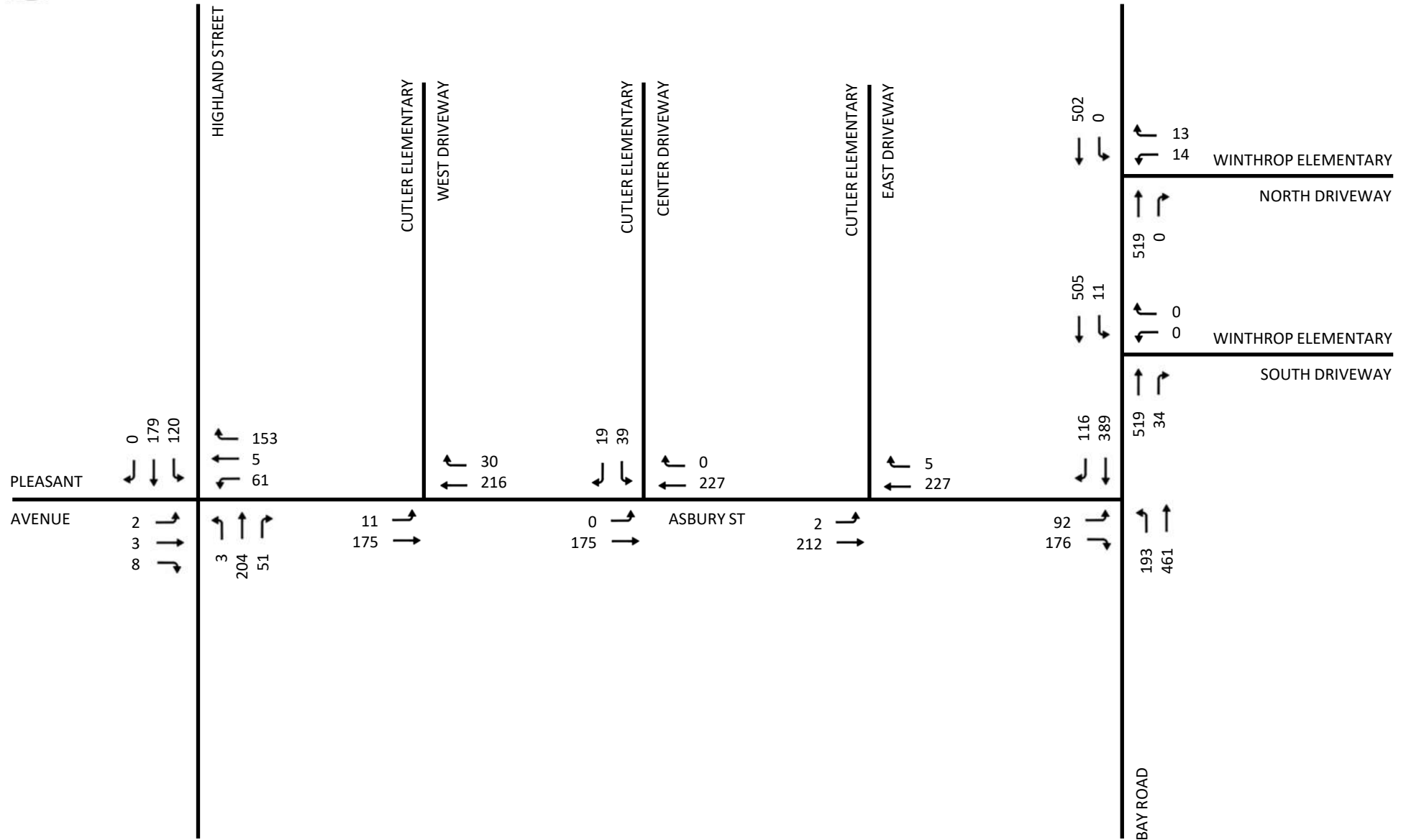


FIGURE 6
2031 NO-BUILD TRAFFIC VOLUMES
WEEKDAY SCHOOL DISMISSAL PEAK HOUR

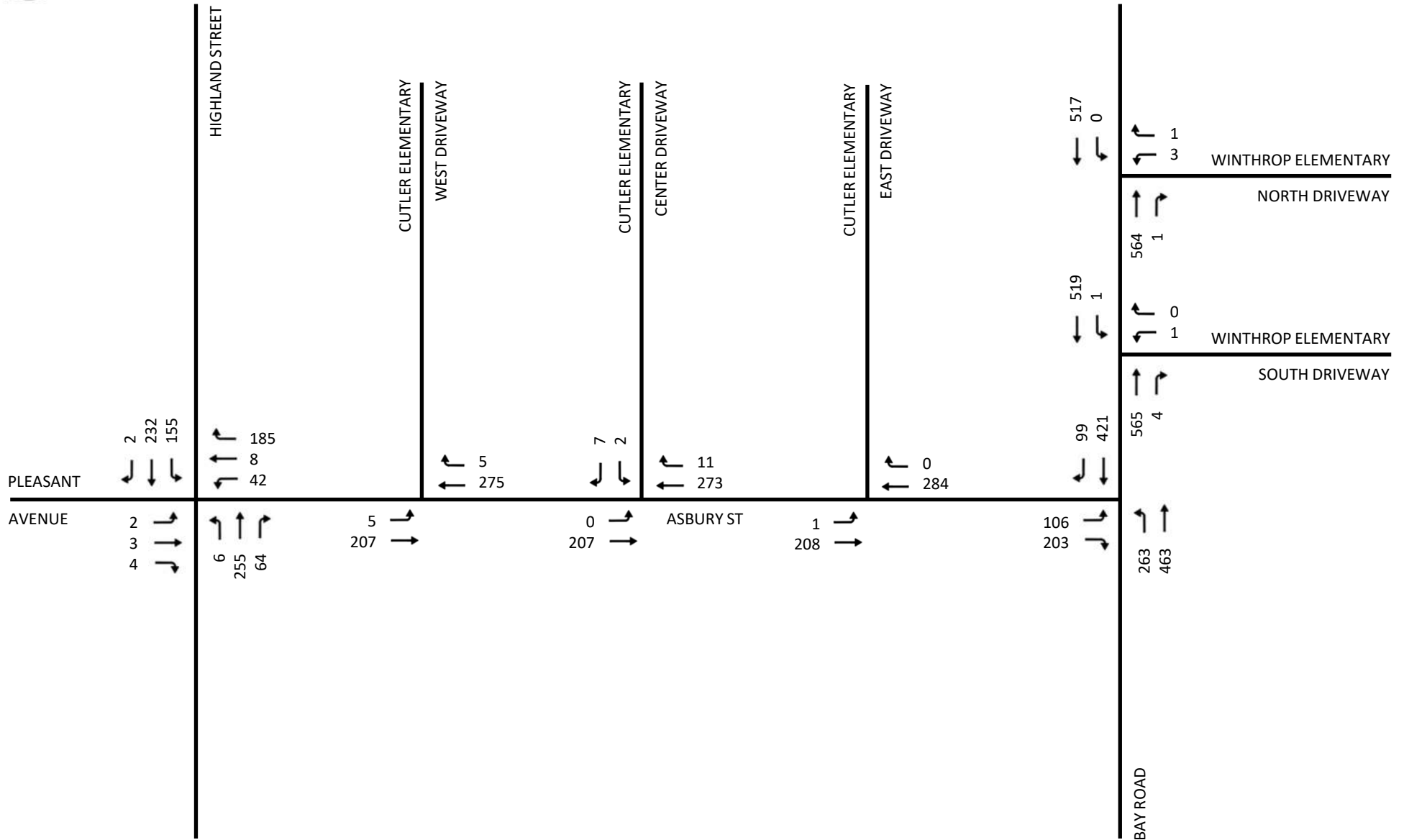


FIGURE 7
2031 NO-BUILD TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR

Trip Generation

The site is currently occupied by the Cutler Elementary School, which has a current enrollment of 253 students and capacity for up to 285 students in Grades K-5. The project consists of razing the existing school and constructing a new consolidated elementary school for up to 740 students in grades 1 – 5.

To estimate the volume of traffic to be generated by the proposed elementary school, two different methods were utilized and compared. Trip generation rates published by the Institute of Transportation Engineers (ITE) *Trip Generation Manual*⁴ for Land Use Code (LUC) 520 – Elementary School were utilized to estimate the trips generated by the proposed elementary school. In addition, existing travel patterns at the existing Cutler Elementary School were utilized to project traffic volumes to an enrollment of 740 students based on a ratio of existing-to-proposed students, staff, and buses for the weekday morning and weekday afternoon dismissal periods. The following describes the methodology used to estimate trips generated by the proposed 740-student school.

Existing Site Observations

GPI conducted observations of school arrival and dismissal patterns on Tuesday, October 1, 2024, at which time, GPI recorded the number of parent vehicles dropping off/picking up students, the number of students being dropped-off/picked-up by parents, the number of buses and students dropped-off/picked-up by bus, and the number of students walking and biking to/from school.

During the Weekday AM, the existing 253-student Cutler Elementary School had approximately 80 students dropped off by parents in 69 separate vehicles, 217 students were dropped off in six buses, and 29 students walked or biked to school. Based on a total of 246 students being recorded arriving during the morning arrival period, approximately 3 percent of students arrived late or were absent on the day of the observations, which is consistent with typical absentee rates for the school district.

During the Weekday Afternoon Dismissal period, approximately 50 students were picked up by parents in 39 separate vehicles, 141 students rode the bus, and 36 students walked or biked home from school. Based on 227 students being recorded departing the school during the afternoon dismissal period, approximately 10 percent of students were either absent, dismissed early, or stayed after school with parents to utilize the playground equipment.

Proposed School Estimated Trips

Weekday Morning Arrival

As the new school is proposed to increase the enrollment from 253 students to up to 740 students comprised of students from the existing Cutler Elementary School, Winthrop Elementary School, and Buker Elementary School, GPI utilized the existing travel patterns at the existing school to estimate the trips to be generated by the proposed school. All students who currently attend Cutler Elementary School were assumed to continue attending the new school once constructed. Therefore, the proposed school construction would result in a total of 487 additional students attending school at the Cutler Elementary School site under build conditions. As the majority of the students who live within a walkable range of the site already attend school at Cutler Elementary School, only a nominal increase in walking students of 10 new walkers/bikers was assumed, which would likely come from the Winthrop Elementary School district. The remaining 477 students were assumed to ride the bus or be driven to school. Based on travel patterns at the existing Cutler Elementary School, approximately 37-percent of non-walking students arrive via parent vehicle and 63-percent arrive by bus. Assuming the additional 477 students will follow a similar pattern, approximately

⁴ *Trip Generation Manual*; 10th Edition; Institute of Transportation Engineers; Washington, DC; September 2017.

176 new students will be dropped off by parents and 301 students will arrive in six additional buses. Some of the students dropped off by parents will arrive with siblings in a single vehicle. At the existing Cutler Elementary School, 80 students arrived in 69 vehicles, resulting in a 14-percent sibling-pair reduction in parent vehicle trips. Therefore, the 176 new parent-drop-off students are anticipated to arrive in 152 new parent vehicles.

The existing Cutler Elementary School has 53 staff members and the proposed elementary school will have up to 189 staff members. Not all of the staff members are anticipated to arrive during the weekday morning peak hour as many of the staff were observed arriving well before the start of the school day and many staff work limited hours, arriving in the middle of the day. GPI utilized the turning movement count (TMC) data collected at the site driveways in September 2024 to estimate the number of staff vehicle trips that would be generated during the weekday morning peak hour. The TMC counts showed that during the Weekday AM peak hour, 88 vehicles entered the site and 61 vehicles exited the site. Assuming that all parent vehicles and buses that entered the site during the Weekday AM peak hour also exited the site during that same time period, the discrepancy between the entering and exiting trips can be assumed to be attributed to staff arriving during the weekday AM peak hour. Therefore, a total of 27 staff (51-percent) were assumed to arrive during the weekday AM peak hour at the existing Cutler Elementary School. The new school will result in an increase of 136 new staff members. Assuming a similar ratio arriving during the weekday AM peak hour, the additional staff will result in a total of 69 new staff vehicles entering the site during the weekday AM peak hour.

Based on the calculations above, the proposed school is anticipated to result in an additional 227 vehicles entering and 158 vehicles exiting the school during the weekday AM peak hour.

Weekday Afternoon Dismissal

As previously noted, the proposed school construction would result in a total of 487 additional students attending school at the Cutler Elementary School site under build conditions. As the majority of the students who live within a walkable range of the site already attend school at Cutler Elementary School, only a nominal increase in walking students of 10 new walkers/bikers was assumed, which would likely come from the Winthrop Elementary School district. The remaining 477 students were assumed to ride the bus or be drive home from school. Based on travel patterns at the existing Cutler Elementary School, approximately 26-percent of non-walking students departed by parent vehicle and 74-percent departed by bus. Assuming the additional 477 students will follow a similar pattern, approximately 125 new students will be picked-up by parents and 352 students will depart in six additional buses. Some of the students picked up by parents will depart with siblings in a single vehicle. At the existing Cutler Elementary School, 50 students departed in 39 vehicles, resulting in a 22-percent sibling-pair reduction in parent vehicle trips. Therefore, the 125 new parent-pick-up students are anticipated to depart in 98 new parent vehicles.

The existing Cutler Elementary School has 53 staff members and the proposed elementary school will have up to 189 staff members. Not all of the staff members are anticipated to depart during the weekday afternoon dismissal peak hour as most of the staff were observed departing well after all students had departed the school, and many staff work limited hours, departing in the middle of the day. GPI utilized the turning movement count (TMC) data collected at the site driveways in September 2024 to estimate the number of staff vehicle trips that would be generated during the weekday afternoon dismissal peak hour. The TMC counts showed that during the Weekday Afternoon Dismissal peak hour, 48 vehicles entered the site and 58 vehicles exited the site. Assuming that all parent vehicles and buses that entered the site during the dismissal period also exited the site during that same time period, the discrepancy between the entering and exiting trips can be assumed to be attributed to staff arriving during the weekday afternoon dismissal peak hour. Therefore, a total of 10 staff (19-percent) were assumed to depart during the weekday afternoon dismissal period at the existing Cutler Elementary School. The new school will result in an increase of 136 new staff members. Assuming a similar ratio departing during the weekday dismissal peak hour, the additional staff will result in a total of 26 new staff vehicles departing the site during the weekday dismissal peak hour.

Based on the calculations above, the proposed school is anticipated to result in an additional 104 vehicles entering and 130 vehicles exiting the school during the weekday afternoon dismissal peak hour.

The detailed trip generation calculations are included in the Appendix and the resulting trip generation estimate based on both ITE and empirical data is summarized in Table 5.

TABLE 5
Trip Generation Summary

Time Period / Direction	Existing Cutler Elementary School ^a	Proposed 740-student School		Net Increase in Trips ^d
		ITE LUC 520 ^b	Empirical Data at Existing School ^c	
Weekday Daily	574	1,680	--	1,106
Weekday AM Peak Hour:				
<i>Enter</i>	88	296	315	227
<i>Exit</i>	<u>61</u>	<u>252</u>	<u>219</u>	<u>158</u>
<i>Total</i>	149	548	546	385
Weekday Dis Peak Hour				
<i>Enter</i>	48	153	152	104
<i>Exit</i>	<u>58</u>	<u>180</u>	<u>188</u>	<u>130</u>
<i>Total</i>	106	333	340	234
Weekday PM Peak Hour:				
<i>Enter</i>	22	54	64	32
<i>Exit</i>	<u>9</u>	<u>64</u>	<u>26</u>	<u>55</u>
<i>Total</i>	31	118	90	87

^a Based on TMCs collected at existing site driveways in September 2024.

^b Based on ITE trips rates for LUC 520 (Elementary School) for 740 students.

^c Based on empirical data collected at the existing 253-student school and increased for 740 students.

^d Proposed Elementary School Trips minus Existing School Trips.

As shown in Table 5, the ITE trip rates and empirical data obtained from the existing Cutler Elementary School resulted in similar trip generation estimates for the proposed elementary school during the Weekday AM and Afternoon Dismissal peak hours. For consistency with existing travel patterns within the Hamilton-Wenham School District, the empirical data was used to estimate the site-generated trips during the Weekday AM and Afternoon Dismissal peak hours. The ITE trip rates resulted in a higher estimate of site-generated trips during the Weekday PM peak hour. As the proposed school will provide additional athletic fields and facilities that are not provided at the existing school and may provide after-school programs, GPI utilized the ITE trip rates to estimate the trips generated by the proposed school during the Weekday PM peak hour to provide a conservative (worse case) analysis condition.

Not all of the trips generated by the proposed school will be new to the roadway network as the site is currently occupied by the 253-student Cutler Elementary School, which is currently generating traffic. Therefore, the new vehicle trips were estimated by comparing the vehicle turning movement counts collected in September 2024 at the existing driveways to the trips estimated to be generated by the proposed elementary school.

As shown in Table 5, the proposed Hamilton-Wenham Regional Elementary School is anticipated to generate an increase of 385 vehicle trips (227 entering and 158 exiting) during the weekday AM peak hour, 234 vehicle trips (104 entering and 130 exiting) during the weekday dismissal peak hour and 87 vehicle trips (32 entering, 55 exiting) during the weekday PM peak hour.

Trip Distribution

Having estimated project-generated vehicle trips, the next step is to determine the distribution of project traffic and assign these trips to the local roadway network. Three methods for the trip distribution were utilized to distribute the generated traffic through the study area intersections. The distribution of parent pick-up/drop-off vehicles was based on population density within the Hamilton-Wenham school district. The directional distribution of the staff traffic is based on United States Census Bureau Journey-to-Work information on place of residency for employees working in Hamilton. The distribution of the bus traffic is assigned to the roadway based on the expected bus routes for the new school provided by the school district. All trip distribution data is provided in the Appendix and Table 6 provides a summary of the anticipated trip distribution percentages by type of vehicle.

TABLE 6
Trip Distribution Percentages

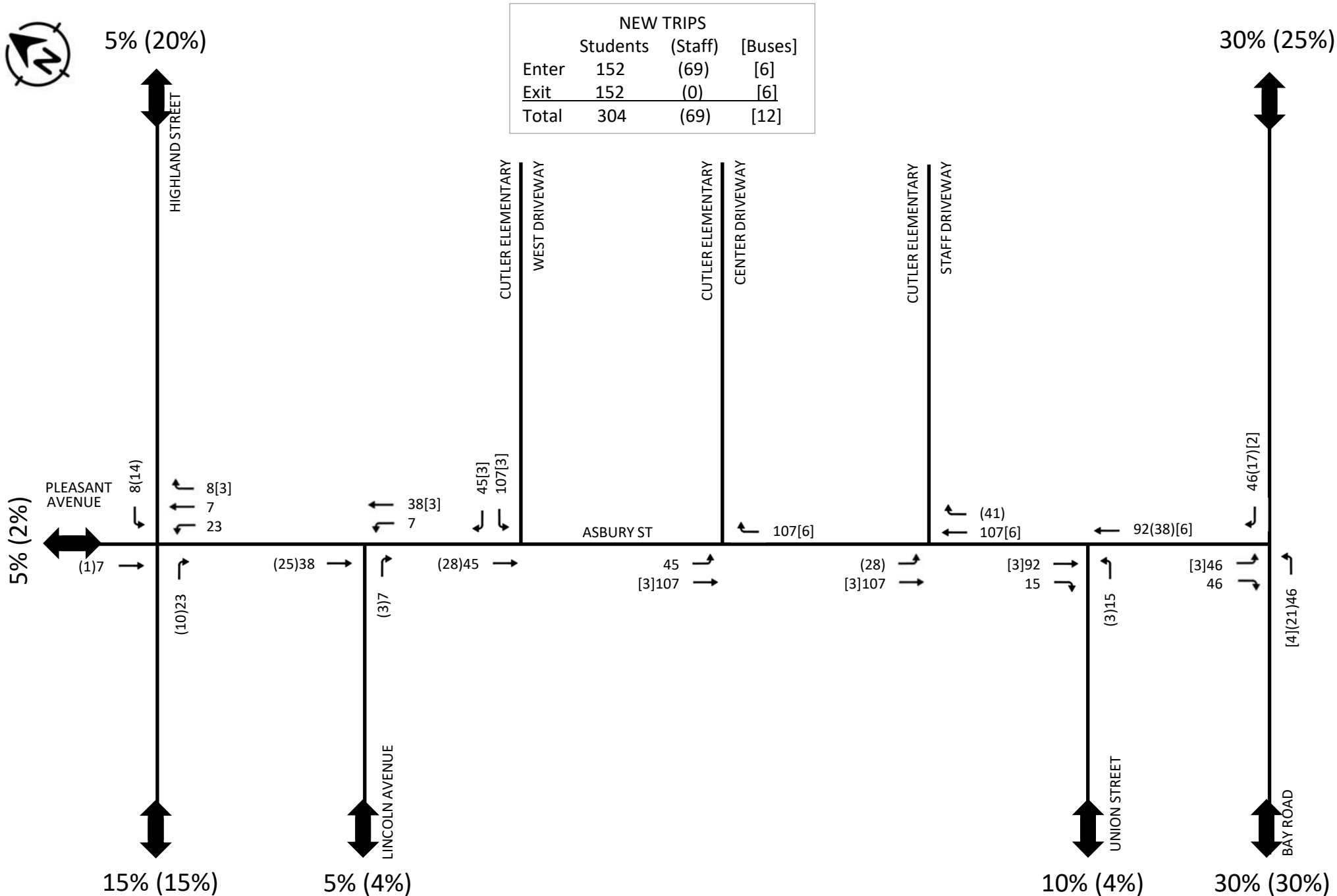
Roadway / Direction	Percent Trips to/from		
	Parent Pick-up / Drop-off Vehicles	Staff Vehicles	Buses
Highland Street – North	5%	20%	--
Highland Street – South	15%	15%	--
Pleasant Street – West	5%	2%	--
Bay Road – North	30%	25%	33%
Bay Road – South	30%	30%	67%
Lincoln Ave & Neighborhood Streets West	5%	4%	--
Union Street & Neighborhood Streets East	10%	4%	--
Total	100%	100%	100%

Bus traffic was distributed based on the bus routes provided by the existing elementary schools. During the Weekday AM peak hour, four of the buses are expected to enter into the school from the south on Bay Road and two buses are expected to enter from the north on Bay Road. After the children are dropped off at the school, the buses leave the school and go back to the bus depot, so the existing traffic volumes were utilized to determine the directional travel away from the school. Similarly, during the afternoon dismissal period, the buses arrive to the school from a bus depot, so the existing traffic volumes were utilized to determine the directional travel to the school. Once the children are picked up at the school, four buses are expected to exit to the south on Bay Road and two buses are expected to exit to the north on Bay Road. Detailed calculations for all the trip distributions are provided in the Appendix.

Build Traffic Volumes

Based on the traffic generation and distribution estimates for this project, the traffic volumes associated with the proposed Hamilton-Wenham Regional Elementary School were assigned to the roadway network. The site-generated traffic networks are shown on Figures 8, 9 and 10 for the Weekday AM, Weekday Afternoon Dismissal, and Weekday PM peak hours, respectively. The existing trips at Cutler Elementary School were

then re-distributed based on the new driveway geometry as shown on Figures 11, 12, and 13 for the Weekday AM, Weekday Afternoon Dismissal, and Weekday PM peak hours, respectively. The 2031 Build peak-hour traffic volume networks were then developed by applying the redistributed trips to the 2031 No-Build traffic volumes and adding the site generated traffic volumes. The 2031 Build Weekday AM, Afternoon Dismissal, and PM peak hour traffic volumes are illustrated in Figures 14, 15 and 16, respectively.

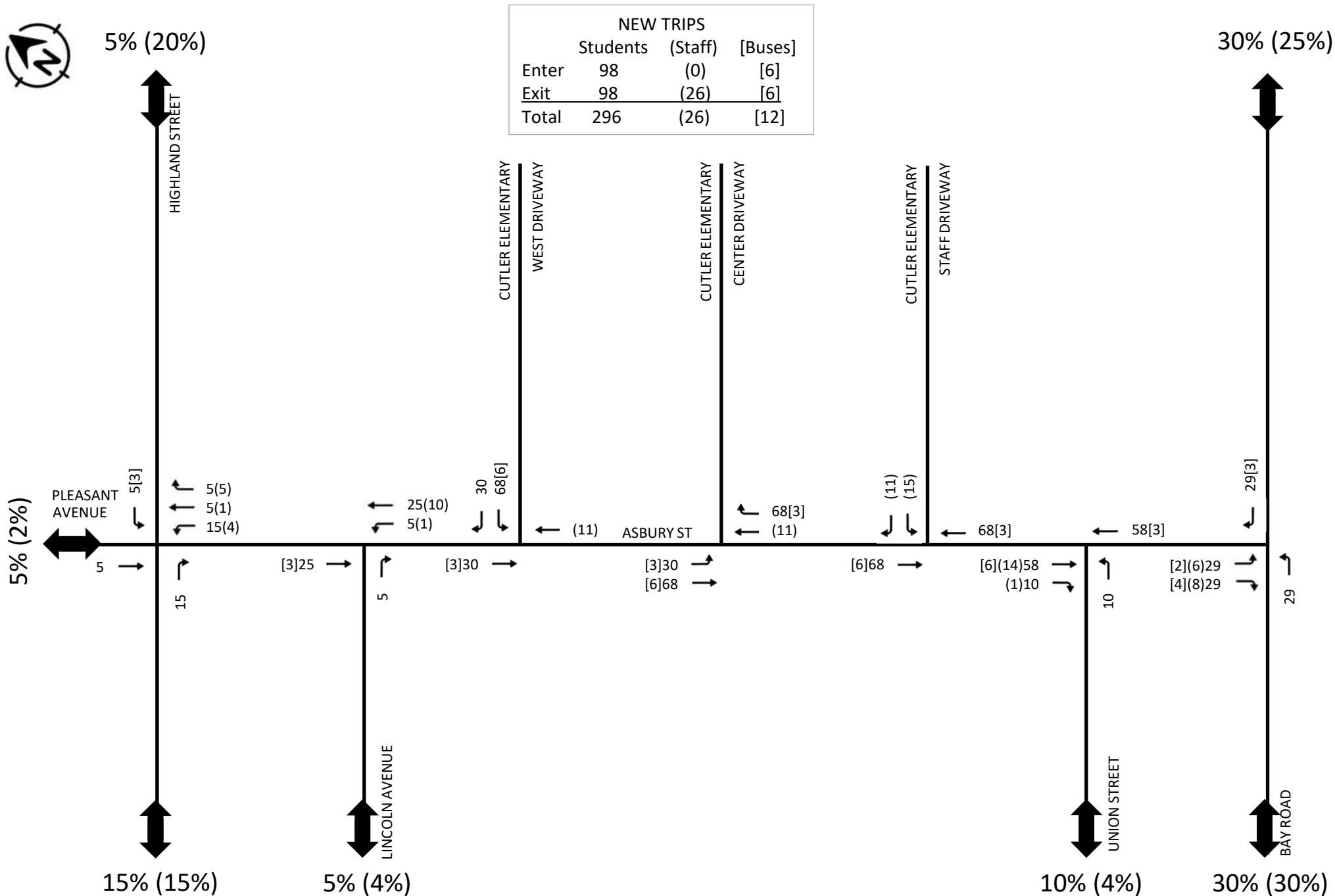


* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 8
SITE GENERATED TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR



* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 9
SITE GENERATED TRAFFIC VOLUMES
WEEKDAY SCHOOL DISMISSAL PEAK HOUR

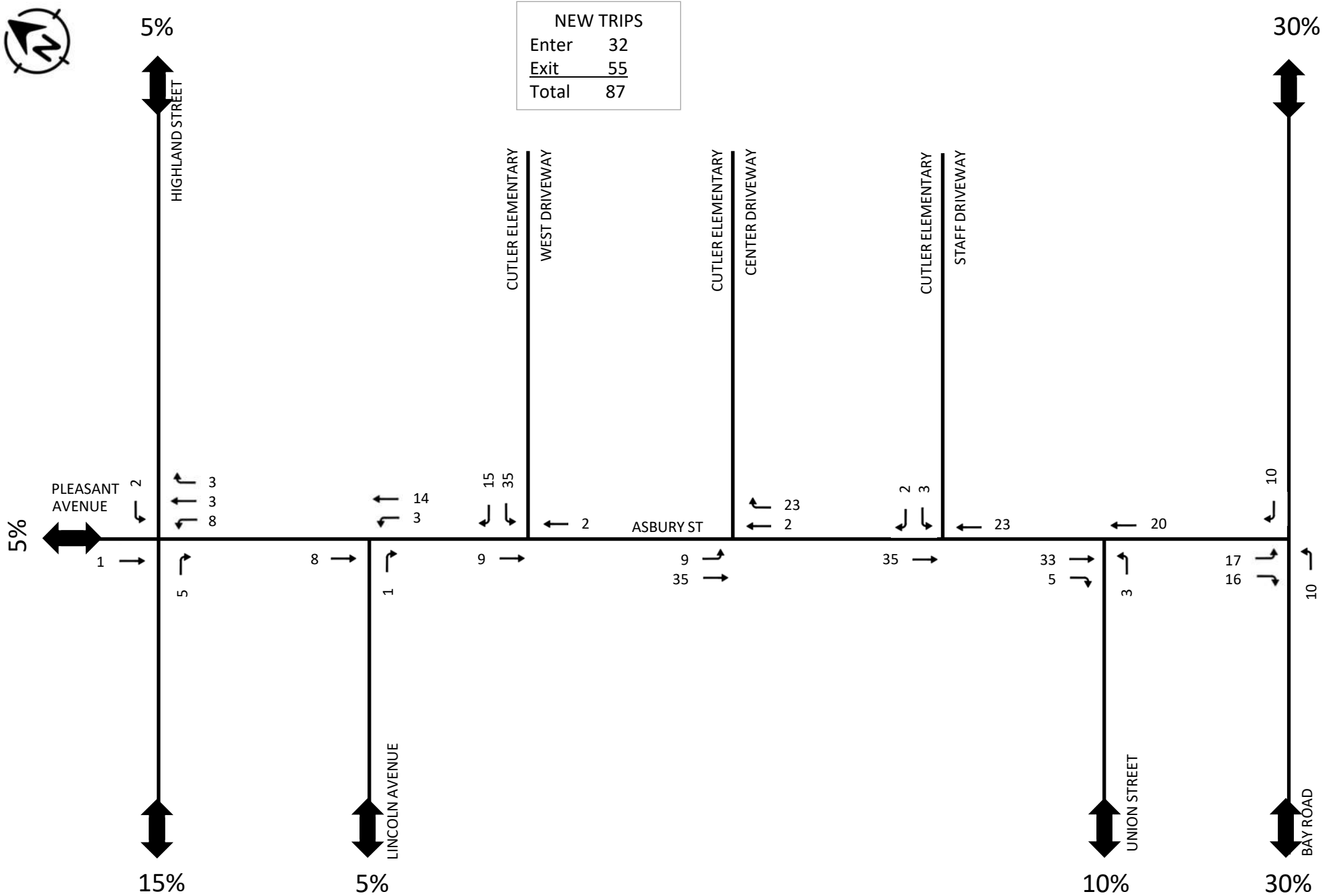
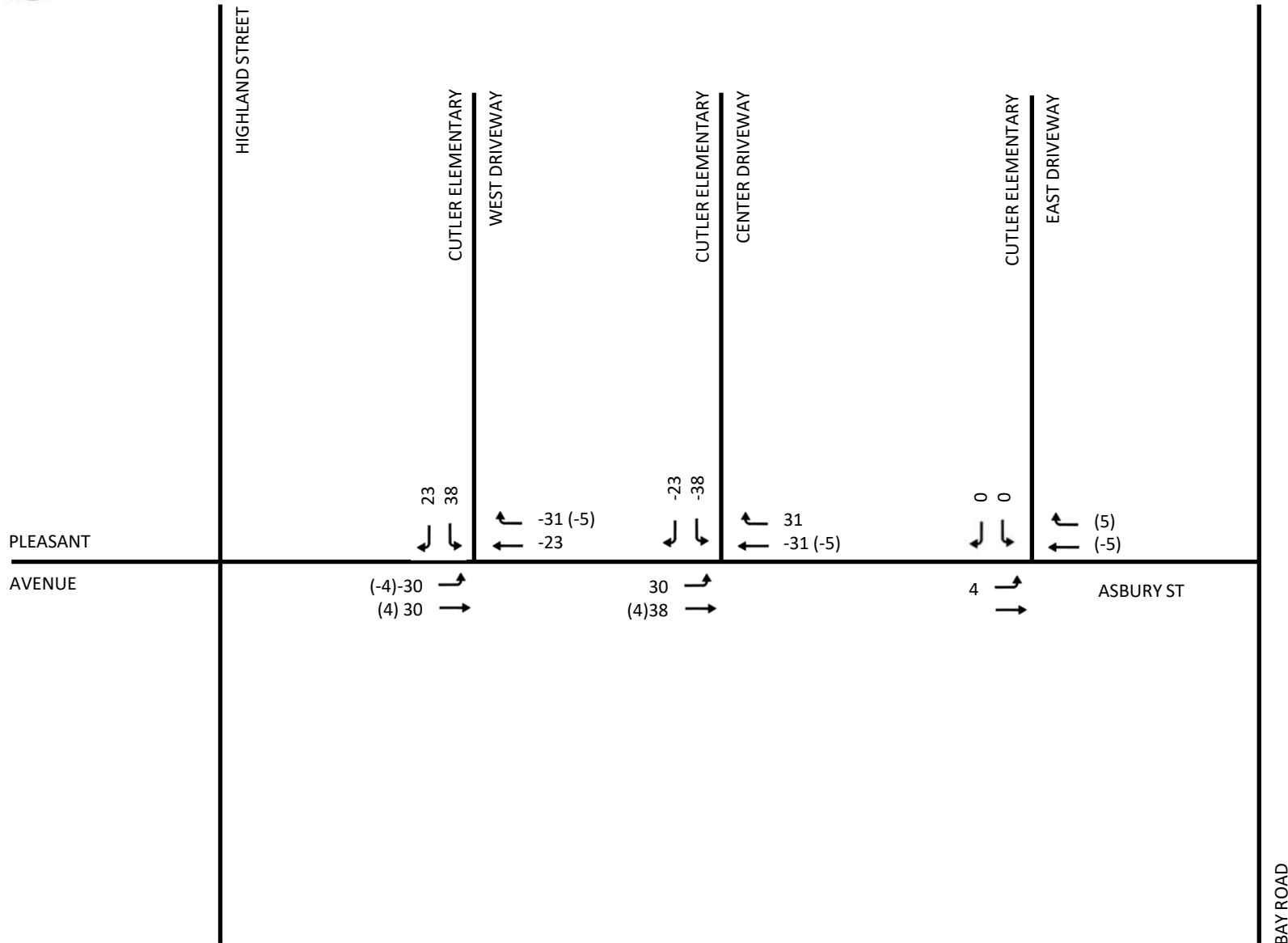


FIGURE 10

**SITE GENERATED TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR**

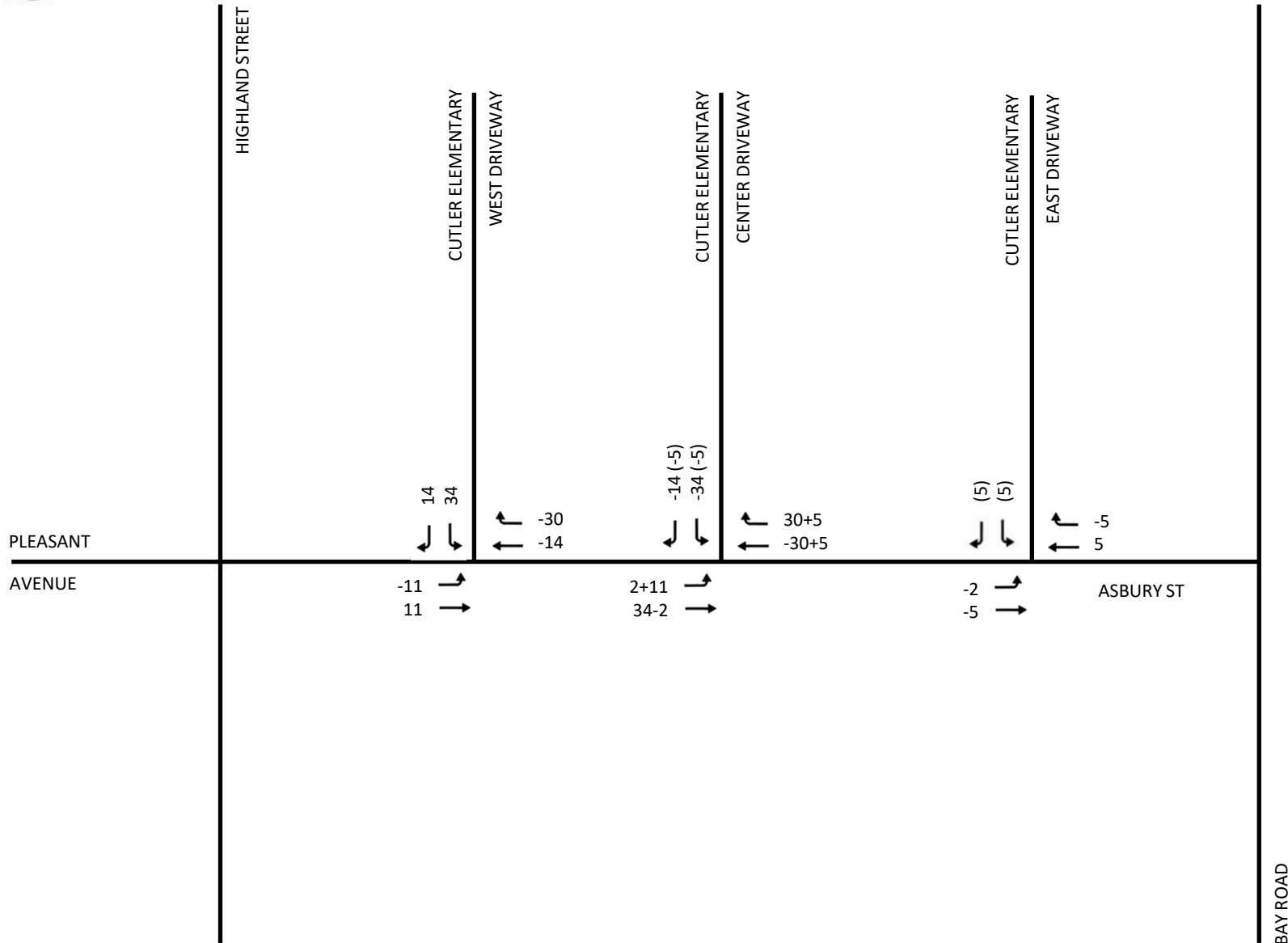


* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 11
REDISTRIBUTED TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR

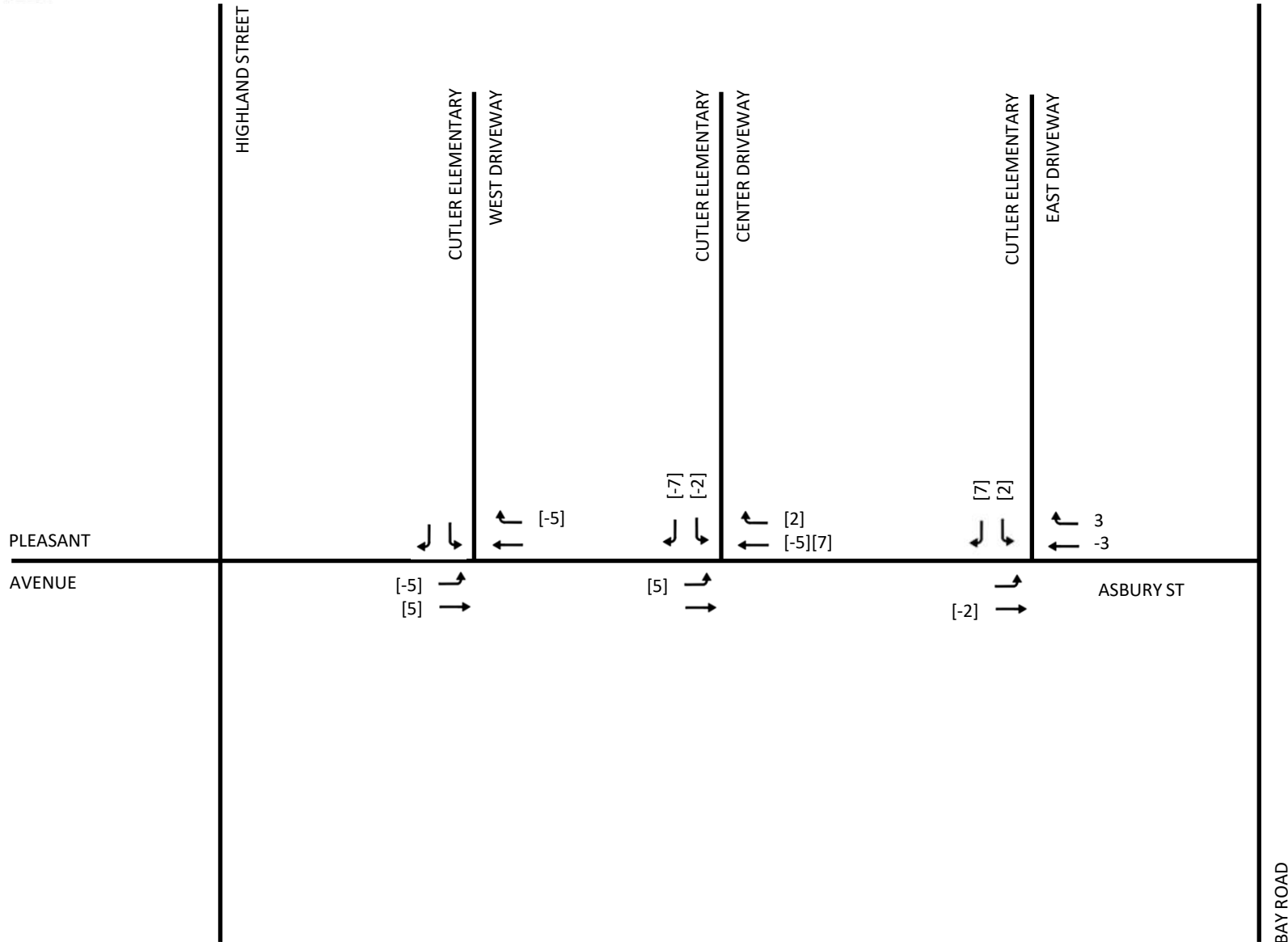


* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 12
REDISTRIBUTED TRAFFIC VOLUMES
WEEKDAY SCHOOL DISMISSAL PEAK HOUR



* = ILLEGAL MOVEMENT

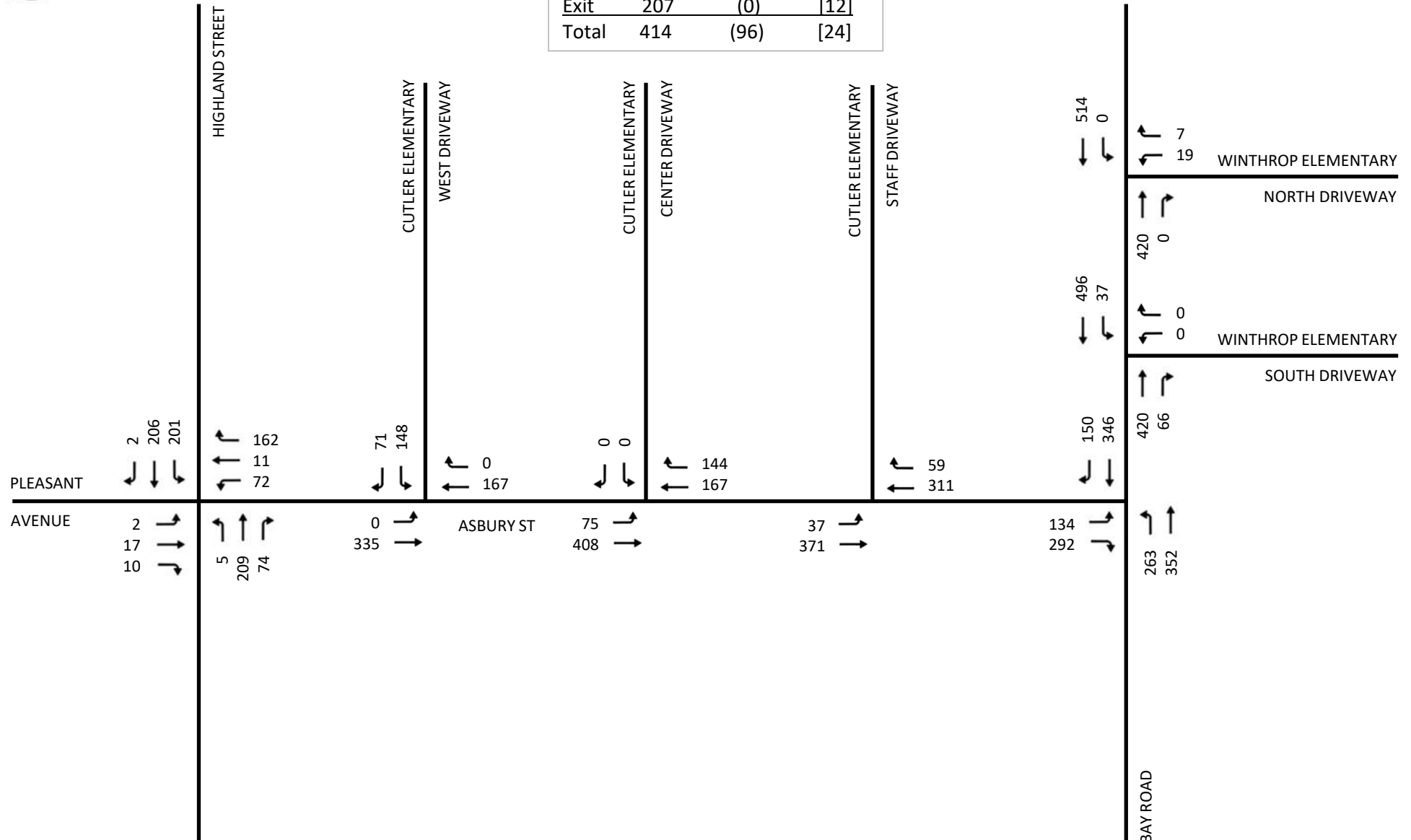


Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 13
REDISTRIBUTED TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR



	TOTAL TRIPS		
	Students	(Staff)	[Buses]
Enter	207	(96)	[12]
Exit	207	(0)	[12]
Total	414	(96)	[24]



* = ILLEGAL MOVEMENT

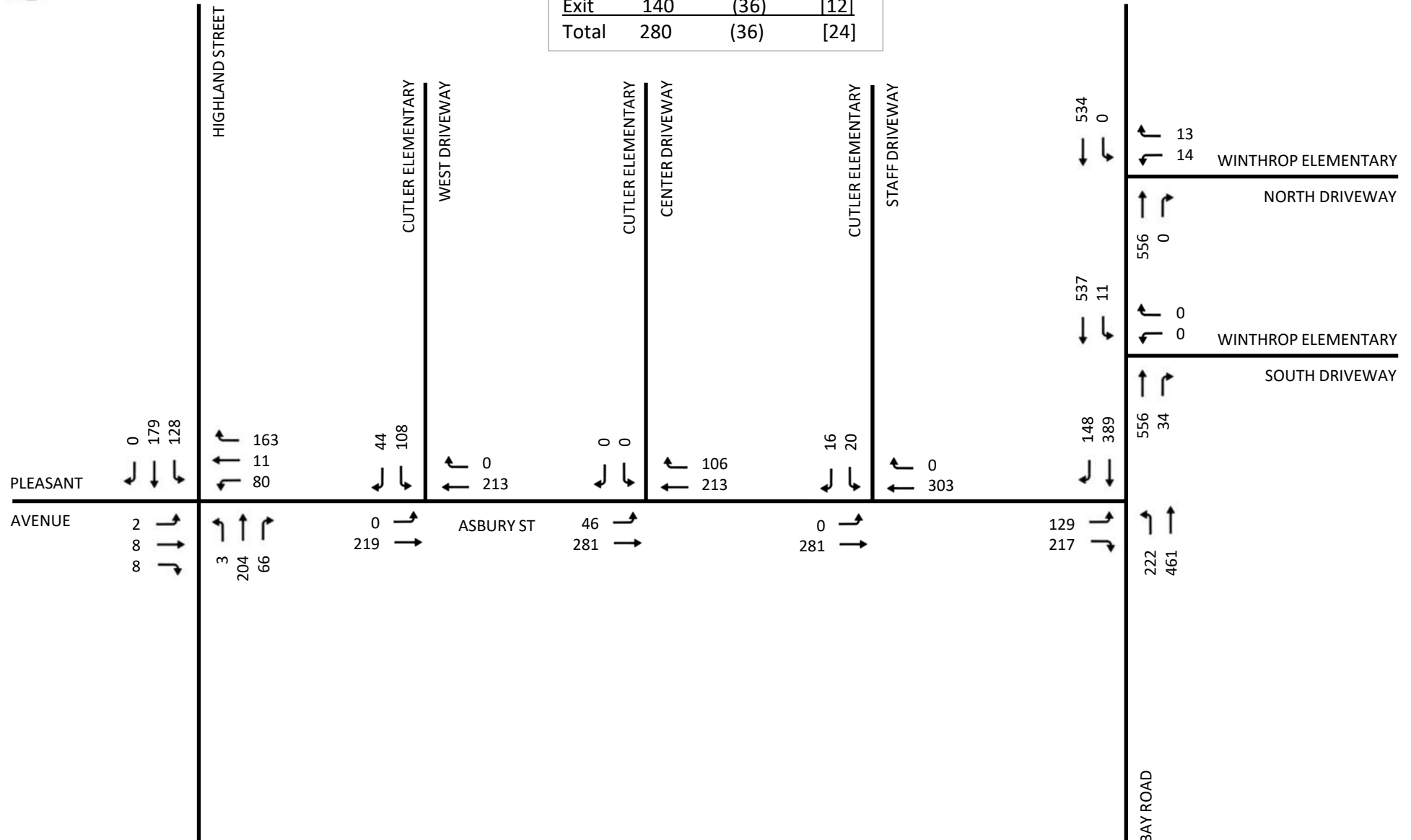


Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 14
2031 BUILD TRAFFIC VOLUMES
WEEKDAY AM PEAK HOUR



	TOTAL TRIPS		
	Students	(Staff)	[Buses]
Enter	140	(0)	[12]
Exit	140	(36)	[12]
Total	280	(36)	[24]



* = ILLEGAL MOVEMENT

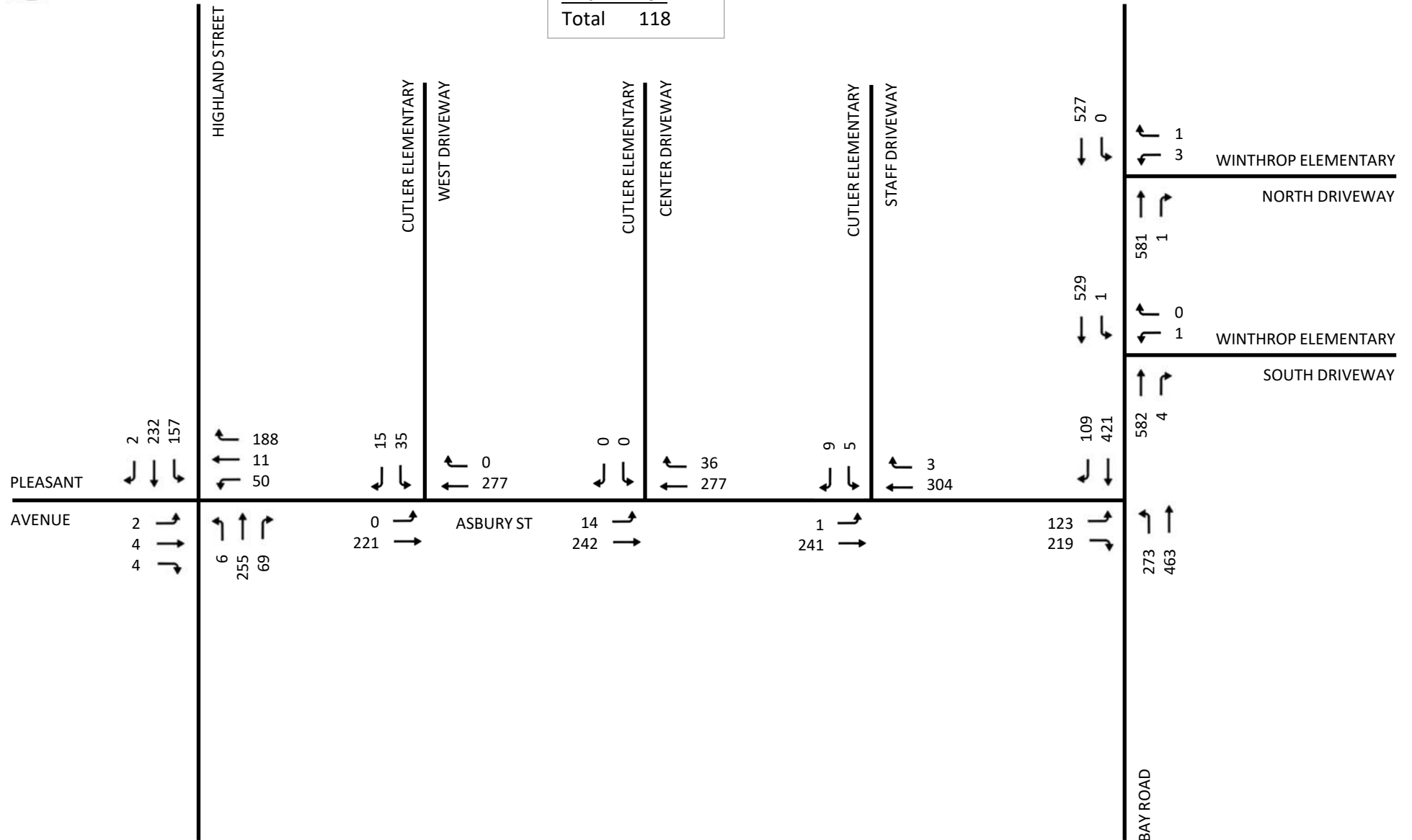


Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 15
2031 BUILD TRAFFIC VOLUMES
WEEKDAY SCHOOL PEAK HOUR



TOTAL TRIPS	
Enter	54
Exit	64
Total	118



* = ILLEGAL MOVEMENT



Greenman-Pedersen, Inc.
ELEMENTARY SCHOOL REDEVELOPMENT – HAMILTON/WENHAM, MASSACHUSETTS

FIGURE 16
2031 BUILD TRAFFIC VOLUMES
WEEKDAY PM PEAK HOUR

PARKING DEMAND

ITE Parking Demand Rates

GPI utilized parking demand generation rates contained in the ITE publication *Parking Generation, 6th Edition*⁵ to estimate the potential parking demand generated by the proposed Hamilton-Wenham Regional Elementary School based on LUC 520 (Elementary School). Parking demand was estimated based on both number of students and number of staff members. Based on 740 students, the proposed Hamilton-Wenham Regional Elementary School is anticipated to generate a peak parking demand on a typical school day of 104 parking spaces. Based on 189 employees, the proposed school is anticipated to generate a peak parking demand of 223 parking spaces.

The site plan indicates that ±186 parking spaces are proposed to be provided in a staff parking lot at the easterly end of the site and an additional ±56 parking spaces will be provided in a separate lot on the inside of the bus loop, providing a total of ±242 parking spaces on the site. Therefore, the proposed parking supply will be more than adequate to accommodate the anticipated peak parking demand. Further, additional parking can be accommodated along the perimeter loop during special events.

SITE CIRCULATION AND ACCESS

Figure 17 provides a graphical depiction of the proposed site access, egress, and circulation patterns for the proposed elementary school. As shown in the figure, a total of three driveways are proposed along Asbury Street, with the westerly driveway providing egress-only, the middle driveway providing entrance-only, and the easterly driveway providing full-access/egress. All bus and parent traffic is expected to enter the site via the middle driveway. Bus traffic will then turn left to enter the bus loading/unloading loop at the front of the building and egress via the westerly site driveway. Parent vehicles will continue straight beyond the bus loop and circulate around the back of the building to a parent loading/unloading area with space for up to six vehicles to load/unload at once. Upon dropping off or picking up students, parents will continue circulating around the perimeter loop and exit the site via the westerly driveway with the bus traffic. The majority of staff will park in the ±186-space stand-alone lot at the easterly end of the site near the athletic fields to reduce conflicts with parent and bus traffic. The staff vehicles will enter and exit via the easterly site driveway.

Sidewalks will be constructed along the perimeter loop and bus loop with connections to the existing sidewalks on Asbury Street, as well as the two parking lots and playground / athletic fields. High-visibility crosswalks will be installed at each pedestrian crossing of the perimeter road and bus loop.

⁵ *Parking Generation Manual, 6th Edition*; Institute of Transportation Engineers; October 2023.

FIGURE 17
Proposed Site Circulation and Access



DROP-OFF AND PICK-UP QUEUING

Proposed Queue Storage

Dedicated drop-off and pick-up areas will be provided on-site. The active unloading / loading area is proposed to be approximately 132 feet in length and is adequate to accommodate 6 vehicles unloading / loading in a single lane. An additional 645 feet of vehicle queue storage will be available between the unloading / loading zone and the bus loop, which will be adequate to accommodate 26 to 29 vehicles (at 22 to 25-ft headways) without impacting access to the bus loop. An additional 115 feet of storage is available between the bus loop and Asbury Street for storage for an additional five (5) vehicles, if needed. During the weekday morning arrival and afternoon dismissal periods, all vehicles will be stacked in a single line to allow for an emergency bypass lane.

The parking lane along the front of the school will be dedicated to bus traffic only. There is a queue storage length of approximately 245 feet, which is adequate to accommodate 7 buses in a single line or up to 14 buses double-stacked without impacting access to the perimeter loop.

Projected Queue Analysis

Utilizing the existing and predicted volumes as further described below combined with basic queuing theory models, a queue analysis was performed to estimate the potential queues in the loading/unloading areas during morning arrival and afternoon dismissal. The detailed queue calculations are provided in the Appendix and the results of this analysis are described below.

- **Parent Drop-off Queues** – As previously described in the trip generation section, the existing 253-student Cutler Elementary School experienced approximately 69 parent drop-off vehicles, and the additional enrollment is anticipated to increase the parent drop-off vehicles to 221 vehicles.

Based on arrival patterns at the existing Cutler Elementary School, all parent drop-off vehicles were assumed to arrive within a 15-minute window prior to the start of school. Each vehicle requires less than 20 seconds to unload once stopped in the unloading area, and the unloading area can accommodate up to six vehicles unloading at one time. Based on basic queuing theory models using an arrival rate of 14.7 vehicles/minute (221 vehicles / 15 minutes = 14.7 vehicles/minute), a service time of three vehicles per minute, and six servers, the average queues is expected to be three vehicles while the 95th percentile back of queue is anticipated to be 18 vehicles. As the available queue storage area can accommodate 26 to 29 vehicles without impacting access to the bus loop, the available queue storage area will be more than adequate to accommodate the anticipated maximum queues during the morning arrival.

- **Parent Pick-up Queues** – The existing 253-student Cutler Elementary School experienced approximately 39 parent pick-up vehicles, and the additional enrollment is anticipated to increase the parent pick-up to 137 vehicles.

Based on arrival patterns at the existing Cutler Elementary School, parents generally begin arriving and lining up for pick-up approximately 25 minutes prior to school being dismissed, with approximately 38 percent (52 vehicles) arriving before school is released. With single-stacking of vehicles, this queue would extend onto Asbury Street. Therefore, in an effort to reduce extensive queues forming prior to the release of school, GPI recommends the school consider restricting access to the perimeter loop for parent pick-up until ten (10) minutes before the release of students from school. Otherwise, vehicles would be required to be double-stacked around the perimeter loop to fit all 52 vehicles on-site without impacting access to the bus loop.

Assuming that parents begin arriving 10 minutes before the release of school and continue arriving over a 10-minute period following the end of the school day, a queue of 29 vehicles single-stacked is anticipated to occur just before school is released. Once school is released, the queue will begin dissipating at a rate of two (2) vehicles per minute (12 vehicles per minute loading – 10 vehicles per minute arriving), requiring approximately 15 minutes to fully clear the queue following the start of the dismissal.

Currently, all students are released from the building at one time, which provides benefit to parents arriving prior to the start of dismissal in order to immediately collect students and exit the school. With the proposed school layout, students will be held inside the building and will be released in groups of 12 to waiting parents. As parents will need to queue and wait in line to retrieve students, there will be less benefit to arriving well before the start of dismissal, as this will increase the wait time for parents. As a result, the arrival patterns of parents are likely to shift within the first couple of weeks of school as parents adjust to the new pick-up patterns. While parents currently arrive as much as 25 minutes before school is released until 10 minutes after school is released, with the new arrival pattern, the majority of parents are anticipated to arrive within 10 minutes of school dismissal. As a result, the 95th percentile back of queue is anticipated to be 15 vehicles beyond the 6-vehicle loading area once parents become familiar with the patterns and traffic normalizes.

Therefore, it is anticipated that the school will be able to stack parents in a single-file line after traffic normalizes without traffic queuing onto Asbury Street. To encourage this type of arrival pattern, the school should consider restricting access to the parent pick-up loop until 10- to 15-minutes before the start of school dismissal.

- **Alternative Parent Pick-up Queues** – The proposed site plan provides opportunities for adjusting the parent pick-up patterns in the event that queues extend beyond the bus loop or onto Asbury Street. A bumped-out area will be provided for parent loading/unloading, which effectively widens the perimeter loop in this area. As a result, parent vehicles could be double-stacked within the designated loading area to allow up to 12 vehicles to load at one time and still provide an emergency vehicle bypass area. With this option, however, parent vehicles would need to be loaded and released in platoons to avoid students attempting to walk between moving vehicles. Platoon loading takes more time than single-vehicle loading, but allows more vehicles to be loaded at once. With double-stacking in the loading area, the 95th percentile back of queue is anticipated to be 18 vehicles beyond the 12-vehicle loading area.

CAPACITY AND QUEUE ANALYSIS

Capacity and queue analyses were conducted at all study area locations under 2024 Existing, 2031 No-Build and 2031 Build conditions. The impact of site-generated traffic can be measured by comparing 2031 No-Build conditions to 2031 Build conditions.

Methodology

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)⁶ and is described in the Appendix. The *HCM 6th Edition* methodology does not allow for the analysis of entrance-only driveways or signalized intersections with exclusive pedestrian signal phases. MassDOT is aware of this deficiency and allows the HCM 2000 methodology to be utilized in these instances. For consistency, the HCM 2000 methodology was utilized for the analysis of all study area intersections. All capacity analyses were performed using the Synchro⁷ analysis software. For unsignalized intersections, the 95th percentile queue represents the length of queue of the critical minor-street movement that is not expected to be exceeded 95 percent of the time during the analysis period (typically one hour). In this case, the queue length is a function of the capacity of the movement and the movement's degree of saturation.

Analysis Results

The following describes the results of the capacity and queue analyses performed as part of the TIAS. The capacity and queue analysis worksheets for all conditions are provided in the Appendix and the results are summarized in Table 7.

Highland Street / Asbury Street / Pleasant Avenue

As shown in Table 7, all movements through the Highland Street / Asbury Street / Pleasant Avenue intersection are anticipated to operate at level-of-service (LOS) C or better during all analysis conditions with the exception of the Asbury Street westbound approach during the Weekday AM peak period. Although

⁶ *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

⁷ *Synchro plus SimTraffic 11*; Trafficware LLC.; Sugar Land, TX; 2019.

the Asbury Street westbound approach is anticipated to degrade from LOS C to LOS E during the Weekday AM peak hour as a result of the additional traffic generated by the consolidated school, the volume-to-capacity (V/C) ratio will be well below 1.00, indicating that more than adequate capacity exists to accommodate the anticipated traffic volumes. In addition, queues are not expected to exceed six vehicles.

Asbury Street / Cutler Elementary School West Driveway

Traffic exiting the Elementary School West Driveway is anticipated to operate at LOS D during the Weekday AM and Afternoon Dismissal peak periods with queues not exceeding eight vehicles and a V/C ratio below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. All other movements through the intersection are anticipated to operate at LOS B or better under all analysis conditions.

Asbury Street / Cutler Elementary School Middle Driveway

All movements at the Asbury Street / Cutler Elementary School Middle Driveway are anticipated to operate at LOS B or better under all analysis conditions with queues not exceeding one vehicle.

Asbury Street at Cutler Elementary School East Driveway

All movements at the Asbury Street / Cutler Elementary School East Driveway are anticipated to operate at LOS B or better under all analysis conditions with queues not exceeding one vehicle.

Bay Road / Asbury Street

As shown in Table 8, the left-turn exiting Asbury Street onto Bay Road currently operates near capacity at LOS F with long queues during the Weekday AM and Afternoon Dismissal periods. During the Weekday PM peak hour, the Asbury Street approach is currently operating over capacity. The additional traffic generated by the proposed school is anticipated to exacerbate queues and delays on Asbury Street, causing the Asbury Street approach to operate over capacity during all analysis time periods with queues extending over the MBTA Commuter Rail tracks. The intersection of Bay Road / Asbury Street is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). Therefore, GPI recommends that MassDOT consider implementation of an intersection improvement project at this location, independent of the proposed school project, to address existing intersection deficiencies and improve the capacity and operations of the intersection. A review of the potential solutions for this intersection is described in the *Off-Site Roadway Improvements* section of this report.

All movements at all other study area intersections are anticipated to operate at LOS C or better under all analysis conditions. The additional traffic generated by the proposed school is not anticipated to increase delay on any movement at any other intersection by more than two seconds per vehicle and will have negligible impacts to queues.

TABLE 7
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2024 Existing				2031 No-Build				2031 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Highland Street at Pleasant Avenue & Asbury Street												
<i>Weekday AM:</i>												
Pleasant Avenue EB approach	0.07	17.2	C	--/<25	0.07	16.8	C	--/<25	0.12	20.7	C	--/<25
Asbury Street WB approach	0.50	20.8	C	--/70	0.47	19.5	C	--/63	0.71	35.5	E	--/134
Highland Street NB approach	0.00	0.2	A	--/<25	0.00	0.2	A	--/<25	0.00	0.2	A	--/<25
Highland Street SB approach	0.16	4.7	A	--/<25	0.16	4.7	A	--/<25	0.18	5.1	A	--/<25
<i>Weekday Dismissal:</i>												
Pleasant Avenue EB approach	0.04	14.3	B	--/<25	0.03	13.2	B	--/<25	0.05	15.2	C	--/<25
Asbury Street WB approach	0.46	17.9	C	--/60	0.46	17.6	C	--/59	0.59	23.1	C	--/93
Highland Street NB approach	0.00	0.1	A	--/<25	0.00	0.1	A	--/<25	0.00	0.1	A	--/<25
Highland Street SB approach	0.10	3.9	A	--/<25	0.10	3.8	A	--/<25	0.11	4.0	A	--/<25
<i>Weekday PM:</i>												
Pleasant Avenue EB approach	0.05	21.7	C	--/<25	0.04	21.7	C	--/<25	0.05	22.3	C	--/<25
Asbury Street WB approach	0.50	18.7	C	--/69	0.52	20.1	C	--/75	0.58	23.1	C	--/91
Highland Street NB approach	0.01	0.2	A	--/<25	0.01	0.2	A	--/<25	0.01	0.2	A	--/<25
Highland Street SB approach	0.13	4.1	A	--/<25	0.14	4.2	A	--/<25	0.14	4.2	A	--/<25
Asbury Street / Cutler Elementary School West Driveway												
<i>Weekday AM:</i>												
Asbury Street EB left-turn	0.04	1.4	A	--/<25	0.03	1.2	A	--/<25	--	--	--	--/--
Asbury Street WB right-turn	0.18	0.0	A	--/<25	0.14	0.0	A	--/<25	--	--	--	--/--
Site Driveway SB approach	--	--	--	--/--	--	--	--	--/--	0.79	31.3	D	--/185
<i>Weekday Dismissal:</i>												
Asbury Street EB left-turn	0.01	0.6	A	--/<25	0.01	0.5	A	--/<25	--	--	--	--/--
Asbury Street WB right-turn	0.16	0.0	A	--/<25	0.16	0.0	A	--/<25	--	--	--	--/--
Site Driveway SB approach	--	--	--	--/--	--	--	--	--/--	0.74	26.6	D	--/160
<i>Weekday PM:</i>												
Asbury Street EB left-turn	0.00	0.2	A	--/<25	0.00	0.2	A	--/<25	--	--	--	--/--
Asbury Street WB right-turn	0.16	0.0	A	--/<25	0.18	0.0	A	--/<25	--	--	--	--/--
Site Driveway SB approach	--	--	--	--/--	--	--	--	--/--	0.10	12.4	B	--/<25

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 7 (continued)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2024 Existing				2031 No-Build				2031 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Asbury Street / Cutler Elementary School Middle Driveway												
<i>Weekday AM:</i>												
Asbury Street EB left-turn	--	--	--	--/--	--	--	--	--/--	0.07	1.9	A	--/<25
Site Driveway SB left turn	0.25	14.9	B	--/25	0.08	12.3	B	--/<25	--	--	--	--/--
Site Driveway SB right-turn	0.10	10.3	B	--/<25	0.03	9.8	A	--/<25	--	--	--	--/--
<i>Weekday Dismissal:</i>												
Asbury Street EB left-turn	--	--	--	--/--	--	--	--	--/--	0.04	1.5	A	--/<25
Site Driveway SB left turn	0.21	13.4	B	--/<25	0.08	12.1	B	--/<25	--	--	--	--/--
Site Driveway SB right-turn	0.07	10.1	B	--/<25	0.03	9.9	A	--/<25	--	--	--	--/--
<i>Weekday PM:</i>												
Asbury Street EB left-turn	--	--	--	--/--	--	--	--	--/--	0.01	0.5	A	--/<25
Site Driveway SB left turn	0.01	11.8	B	--/<25	0.00	12.2	B	--/<25	--	--	--	--/--
Site Driveway SB right-turn	0.02	9.9	A	--/<25	0.01	10.0	B	--/<25	--	--	--	--/--
Asbury Street / Cutler Elementary School East Driveway												
<i>Weekday AM:</i>												
Site Driveway WB approach	--	--	--	--/--	--	--	--	--/--	0.03	0.0	A	--/<25
Asbury Street NB right-turn	0.15	0.0	A	--/<25	0.14	0.0	A	--/<25	--	--	--	--/--
Asbury Street SB left-turn	0.01	0.2	A	--/<25	0.00	0.2	A	--/<25	0.04	1.3	A	--/<25
<i>Weekday Dismissal:</i>												
Site Driveway WB approach	--	--	--	--/--	--	--	--	--/--	0.14	13.4	B	--/<25
Asbury Street NB right-turn	0.16	0.0	A	--/<25	0.15	0.0	A	--/<25	--	--	--	--/--
Asbury Street SB left-turn	0.00	0.1	A	--/<25	0.00	0.1	A	--/<25	0.00	0.0	A	--/<25
<i>Weekday PM:</i>												
Site Driveway WB approach	--	--	--	--/--	--	--	--	--/--	0.03	11.2	B	--/<25
Asbury Street NB right-turn	0.16	0.0	A	--/<25	0.18	0.0	A	--/<25	--	--	--	--/--
Asbury Street SB left-turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 7 (continued)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2024 Existing				2031 No-Build				2031 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Bay Road at Asbury Street												
<i>Weekday AM:</i>												
Asbury Street EB left-turn	0.68	81.0	F	--/92	0.65	68.7	F	--/89	1.52	355.8	F	--/278
Asbury Street EB right-turn	0.37	13.5	B	--/42	0.42	14.8	B	--/52	0.52	17.3	C	--/76
Bay Road NB approach	0.21	4.9	A	--/<25	0.19	4.7	A	--/<25	0.28	6.3	A	--/29
Bay Road SB approach	0.25	0.0	A	--/<25	0.28	0.0	A	--/<25	0.32	0.0	A	--/<25
<i>Weekday Dismissal:</i>												
Asbury Street EB left-turn	0.93	130.7	F	--/149	0.94	145.4	F	--/143	1.55	375.0	F	--/274
Asbury Street EB right-turn	0.35	14.1	B	--/39	0.33	14.2	B	--/36	0.42	15.9	C	--/51
Bay Road NB approach	0.19	4.5	A	--/<25	0.21	4.8	A	--/<25	0.25	5.6	A	--/<25
Bay Road SB approach	0.30	0.0	A	--/<25	0.32	0.0	A	--/<25	0.34	0.0	A	--/<25
<i>Weekday PM:</i>												
Asbury Street EB left-turn	1.44	335.9	F	--/241	1.39	321.5	F	--/222	1.71	458.0	F	--/284
Asbury Street EB right-turn	0.41	15.2	C	--/49	0.39	15.5	C	--/47	0.43	16.2	C	--/53
Bay Road NB approach	0.28	6.0	A	--/28	0.28	6.2	A	--/29	0.30	6.5	A	--/31
Bay Road SB approach	0.31	0.0	A	--/<25	0.33	0.0	A	--/<25	0.34	0.0	A	--/<25
Bay Road / Winthrop Elementary School Enter (South) Driveway												
<i>Weekday AM:</i>												
Bay Road EB right-turn	0.32	0.0	A	--/<25	0.28	0.0	A	--/<25	0.31	0.0	A	--/<25
Bay Road WB left-turn	0.04	1.2	A	--/<25	0.04	1.1	A	--/<25	0.04	1.1	A	--/<25
<i>Weekday Dismissal:</i>												
Bay Road EB right-turn	0.37	0.0	A	--/<25	0.35	0.0	A	--/<25	0.38	0.0	A	--/<25
Bay Road WB left-turn	0.01	0.4	A	--/<25	0.01	0.4	A	--/<25	0.01	0.4	A	--/<25
<i>Weekday PM:</i>												
Bay Road EB right-turn	0.39	0.0	A	--/<25	0.36	0.0	A	--/<25	0.37	0.0	A	--/<25
Bay Road WB left-turn	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25	0.00	0.0	A	--/<25

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 7 (continued)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2024 Existing				2031 No-Build				2031 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Bay Road / Winthrop Elementary School Exit (North) Driveway												
<i>Weekday AM:</i> Site Driveway NB approach	0.16	18.2	C	--/<25	0.09	17.3	C	--/<25	0.11	19.7	C	--/<25
<i>Weekday Dismissal:</i> Site Driveway NB approach	0.13	20.0	C	--/<25	0.10	19.3	C	--/<25	0.11	20.8	C	--/<25
<i>Weekday PM:</i> Site Driveway NB approach	0.03	20.3	C	--/<25	0.02	19.8	C	--/<25	0.02	20.4	C	--/<25

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

TABLE 8
Intersection Capacity Analysis Summary – Improvements Comparison

Intersection/Peak Hour/Lane Group	2031 No-Build				2031 Build				2031 Build with Turning Lanes				2031 Build with Signal			
	V/C ^a	Del. ^b	LOS ^c	V/C	V/C	V/C	V/C	Queue	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Bay Road at Asbury Street																
Weekday AM:																
Asbury Street EB left-turn	0.65	68.7	F	--/89	1.52	355.8	F	--/278	1.52	355.8	F	--/278	0.63	40.3	D	85/148
Asbury Street EB right-turn	0.42	14.8	B	--/52	0.52	17.3	C	--/76	0.52	17.3	C	--/76	0.20	33.2	C	<25/75
Bay Road NB left-turn	--	--	--	--/--	--	--	--	--/--	0.28	9.9	A	--/29	0.74	20.5	C	142/326
Bay Road NB through	0.19	4.7	A	--/<25	0.28	6.3	A	--/29	0.23	0.0	A	--/<25	0.37	9.9	A	138/227
Bay Road SB approach	0.28	0.0	A	--/<25	0.32	0.0	A	--/<25	0.32	0.0	A	--/<25	0.52	11.4	B	207/340
Overall Intersection	--	--	--	--	--	--	--	--	--	--	--	--	0.62	19.3	B	--/--
Weekday Dismissal:																
Asbury Street EB left-turn	0.94	145.4	F	--/143	1.55	375.0	F	--/274	1.55	375.0	F	--/274	0.56	34.8	C	53/136
Asbury Street EB right-turn	0.33	14.2	B	--/36	0.42	15.9	C	--/51	0.42	15.9	C	--/51	0.15	30.2	C	<25/64
Bay Road NB left-turn	--	--	--	--/--	--	--	--	--/--	0.25	9.9	A	--/<25	0.66	11.8	B	49/330
Bay Road NB through	0.21	4.8	A	--/<25	0.25	5.6	A	--/<25	0.29	0.0	A	--/<25	0.42	6.9	A	66/312
Bay Road SB approach	0.32	0.0	A	--/<25	0.34	0.0	A	--/<25	0.34	0.0	A	--/<25	0.49	7.4	A	77/371
Overall Intersection	--	--	--	--	--	--	--	--	--	--	--	--	0.61	13.2	B	--/--
Weekday PM:																
Asbury Street EB left-turn	1.39	321.5	F	--/222	1.71	458.0	F	--/284	1.71	458.0	F	--/284	0.62	40.4	D	81/143
Asbury Street EB right-turn	0.39	15.5	C	--/47	0.43	16.2	C	--/53	0.43	16.2	C	--/53	0.15	33.4	C	<25/64
Bay Road NB left-turn	--	--	--	--/--	--	--	--	--/--	0.30	10.1	B	--/31	0.68	17.8	B	112/275
Bay Road NB through	0.28	6.2	A	--/29	0.30	6.5	A	--/31	0.30	0.0	A	--/<25	0.48	10.8	B	195/317
Bay Road SB approach	0.33	0.0	A	--/<25	0.34	0.0	A	--/<25	0.34	0.0	A	--/<25	0.57	12.0	B	234/387
Overall Intersection	--	--	--	--	--	--	--	--	--	--	--	--	0.58	17.8	B	--/--

^a Volume-to-capacity ratio.

^b Average control delay in seconds per vehicle.

^c Level of service.

^d Average/95th percentile queue length in feet per lane (assuming 25 feet per vehicle).

OFF-SITE ROADWAY IMPROVEMENTS

Following identification of the projects impacts on the surrounding area roadway network, the next step is to identify measures to minimize or mitigate the project's impacts on the study area and address any existing safety or traffic operations deficiencies. The following sections describe the analyses performed to assess the appropriate mitigation measures and GPI's recommendations for improvements along the study area roadways to accommodate both existing and future school traffic.

Turning Lane Warrants

Asbury Street at Site Driveways

In order to determine the appropriate geometric configuration of Asbury Street on its approach to the middle enter-only site driveway and the staff driveway, auxiliary turn lane warrant analyses were conducted. These analyses assessed the need for separate left- and right-turn lanes on the mainline (Asbury Street) approaches. These warrants were analyzed under the Weekday AM, Weekday Dismissal, and Weekday PM peak hours under 2031 Build conditions. The detailed turn lane warrant analysis worksheets are included in the Appendix and the results of the analysis indicate that neither a left-turn lane nor a right-turn lane is warranted on Asbury Street at either of the site driveways. In addition, the results of the capacity and queue analyses indicate the intersections will operate at acceptable levels of service without the presence of dedicated turning lanes. Therefore, GPI does not recommend installation of turning lanes on Asbury Street at the site driveways at this time.

Bay Road at Asbury Street

Due to the poor levels of service on Asbury Street approaching Bay Road under all analysis conditions, GPI investigated the need for dedicated left- and right-turn lanes on Bay Road at the approaches to Asbury Street. The analyses were performed based on Weekday AM, Weekday Afternoon Dismissal, and Weekday PM peak hour traffic-volumes under 2024 Existing, 2031 No-Build, and 2031 Build conditions. The analyses indicated that the warranting conditions for a right-turn lane on Bay Road southbound may be marginally exceeded in the 2031 Build conditions during the Weekday Afternoon Dismissal period, but will not be exceeded during any other time periods or analysis conditions. The results also indicated that the existing traffic volumes marginally exceed the warranting condition for a dedicated left-turn lane during the Weekday AM peak hour and the existing volumes heavily exceed the warranting condition for a left-turn lane during the Weekday Afternoon Dismissal and PM peak hours. Therefore, at a minimum GPI recommends that MassDOT consider installation of a left-turn lane on Bay Road northbound approaching Asbury Street to alleviate queuing and delay through the intersection.

GPI conducted an analysis of the traffic operations at the Bay Road / Asbury Street intersection with the installation of a dedicated left-turn lane on Bay Road to determine whether the additional turning lane would improve the operations of the intersection to bring the Asbury Road approach below capacity. The detailed analysis worksheets are included in the Appendix and the results are summarized in Table 8. As shown in the analysis, the installation of the left-turn lane on Bay Road will not provide improvement to the operations of the Asbury Street approach to the intersection. Therefore, GPI investigated additional measures to improve the operations of this intersection.

TABLE 9
Bay Road at Asbury Street Warrant Analysis Summary

	2024 Existing			2031 No-Build			2031 Build		
	AM	Dismissal	PM	AM	Dismissal	PM	AM	Dismissal	PM
Left-Turn Warranted?	No	Yes	Yes	Yes	Yes*	Yes*	Yes*	Yes*	Yes*
Right-Turn Warranted?	No	No	No	No	No	No	No	Yes	No

Warrant Analysis Calculations can be found in the Appendix.

* Because these warrants were met under previous conditions, no calculations were completed since more traffic was simply added.

Signal Warrants

As previously noted, the intersection of Bay Road / Asbury Street currently experiences operational deficiencies that will be exacerbated as traffic volumes continue to grow through the area. Therefore, GPI conducted a signal warrant analysis to determine whether the existing and/or future traffic volumes through the intersection warrant installation of a traffic-control signal to improve traffic operations. The signal warrant analysis was conducted based on turning movement counts (TMCs) collected at the intersection between 7:00 AM and 6:00 PM on Thursday, September 19, 2024. The 2024 Existing traffic volumes were compared with the requirements established in the *Manual on Uniform Traffic Control Devices (MUTCD)*⁸ for the following volume-related warrants:

- Warrant 1 – Eight Hour Vehicular Volume
 - Condition A – Minimum Vehicular Volume
 - Condition B – Interruption of Continuous Traffic
 - Combination of Conditions A and B
- Warrant 2 – Four-Hour Vehicular Volume; and
- Warrant 3 – One-Hour Vehicular Volume.

In accordance with the MUTCD, a traffic control signal may only be installed if at least one of the signal warrants is met. A number of factors are involved in determining if signal control should be installed, however, including intersection operations, safety, and engineering judgment. It is only in very rare circumstances that a traffic control signal is installed on the basis of the peak hour warrant alone. Normally, at least one of the eight-hour warrants (Warrant 1, Condition A or B) should be met before signal control is considered. The peak-hour volume warrant is applied only in unusual cases such as driveways serving large office/industrial complexes, manufacturing plants, or high-occupancy vehicle facilities that attract or discharge large numbers of vehicles over a short period of time. In addition, the combination of Conditions A and B under Warrant 1 should only be applied after an adequate trial of other alternatives that could cause less delay and inconvenience to traffic has failed to solve the traffic problems.

The Asbury Street approach provides separate turning lanes for left- and right-turning vehicles. Right-turning vehicles experience significantly less conflict than left-turning vehicles. Therefore, a right-turn reduction factor is often applied when evaluating a traffic signal warrant to account for this reduced conflict. GPI conducted the signal warrant analysis under two separate scenarios:

- Without Right-Turn Reduction – This scenario included all of the traffic exiting the Asbury Street approach and evaluated Asbury Street as a two-lane approach.

⁸ *Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD)*; Washington, D.C.: U.S. Department of Transportation, Federal Highway Administration, 2010.

- With Right-Turn Reduction – This scenario included only the left-turn volume and only the left-turn lane exiting Asbury Street

Table 10 summarizes the results of this signal warrant analysis. The signal warrant analysis worksheets are provided in the Appendix.

TABLE 10
Traffic Signal Warrant Analysis Summary

Intersection	Warrant #1			Warrant #2	Warrant #3
	A	B	Combo		
Bay Road at Asbury Street	Yes (No)	Yes (Yes)	Yes (No)	Yes (Yes)	Yes (Yes)

XXX (XXX) = Without Right-Turn Reduction (With Right-Turn Reduction)

As shown in Table 10, without the application of a right-turn reduction, the existing traffic volumes through the Bay Road / Asbury Street intersection exceed all volume-related warranting conditions for installation of a traffic signal. Even when a right-turn reduction is applied, the existing traffic volumes exceed the warranting conditions for Warrants 1B, Warrant 2, and Warrant 3. Therefore, independent of the proposed school development, GPI recommends MassDOT install a fully-actuated traffic control signal at the intersection of Bay Road / Asbury Street to address existing operational deficiencies. This would involve removing the existing signal equipment at the pedestrian crossing on Bay Road just north of Asbury Street, which does not meet current MUTCD standards, and installing new mast arm poles and foundations, signal lenses, signal control cabinet, traffic detection equipment, Opticom equipment for emergency vehicle detection, and pedestrian crossing signals and push-buttons. In addition, GPI recommends the installation of advance queue detection on Asbury Street to ensure that queues do not extend over the MBTA Commuter Rail tracks. The estimated cost to complete these improvements will be in the range of \$500,000 - \$650,000, depending on whether dedicated turning lanes are constructed on Bay Road at the intersection.

GPI has conducted capacity and queue analysis to determine the impact of installation of a fully-actuated traffic control signal at the Bay Road / Asbury Street intersection as summarized in Table 8. With installation of a traffic signal at this intersection, all movements are anticipated to operate at LOS D or better with queues on Asbury Street not exceeding six vehicles during any of the analysis time periods.

School Zone Safety Enhancements

Asbury Street at Site Driveways

To improve the safety of Asbury Street in the vicinity of the school, GPI recommends the Town remove the existing non-complaint school zone signage and install new school zone flasher assemblies with radar speed feedback indications. The signs should be located between 200 and 500 feet from the school's property boundaries or site driveways. When a crosswalk is located close to the school that may be used by students walking to the school, it is preferable for the school zone flashers to be installed at least 50 feet in advance of the crosswalks. As there are crosswalks on Asbury Street within 300 feet of the school's property boundaries on either side of the school, GPI recommends the school zone flashers be installed approximately 50 feet in advance of the crosswalks. As such, the school zone flasher assemblies should be installed approximately 270 feet to the east and 360 feet to the west of the school's outer boundaries facing westbound and eastbound traffic, respectively. A SCHOOL ZONE SPEED AHEAD (S4-5) advance warning sign should be installed approximately 200 feet in advance of the start of the school zone to alert

drivers to the need to slow down approaching the school zone. END SCHOOL ZONE (S5-2) with appropriate 30 MPH SPEED LIMIT signs should be installed on Asbury Street in either direction opposite the school zone flasher assemblies. As the crosswalks closest to the school will be located within the school zone, these crosswalks should be equipped with school zone crossing (S1-1) signs with supplementary school zone (S4-3p) placards. The layout of the proposed school zone signage and flasher assemblies is graphically depicted in Figure 18.

In addition, there is a tight curve on Asbury Street along the site frontage, which will restrict sight lines for vehicles traveling eastbound on Asbury Street approaching the east site driveway. To alert drivers to the tightness of the curve and the driveway immediately following the curve, GPI recommends the Town install an INTERSECTION ON CURVE (W1-10d) sign on Asbury Street eastbound approximately 100 feet to the west of the start of the curve. The approximate location of the proposed signage is graphically depicted in Figure 18.

The proposed school zone flasher assemblies and school zone signage improvements along Asbury Street near the school are anticipated to result in a cost of approximately \$50,000 for construction.

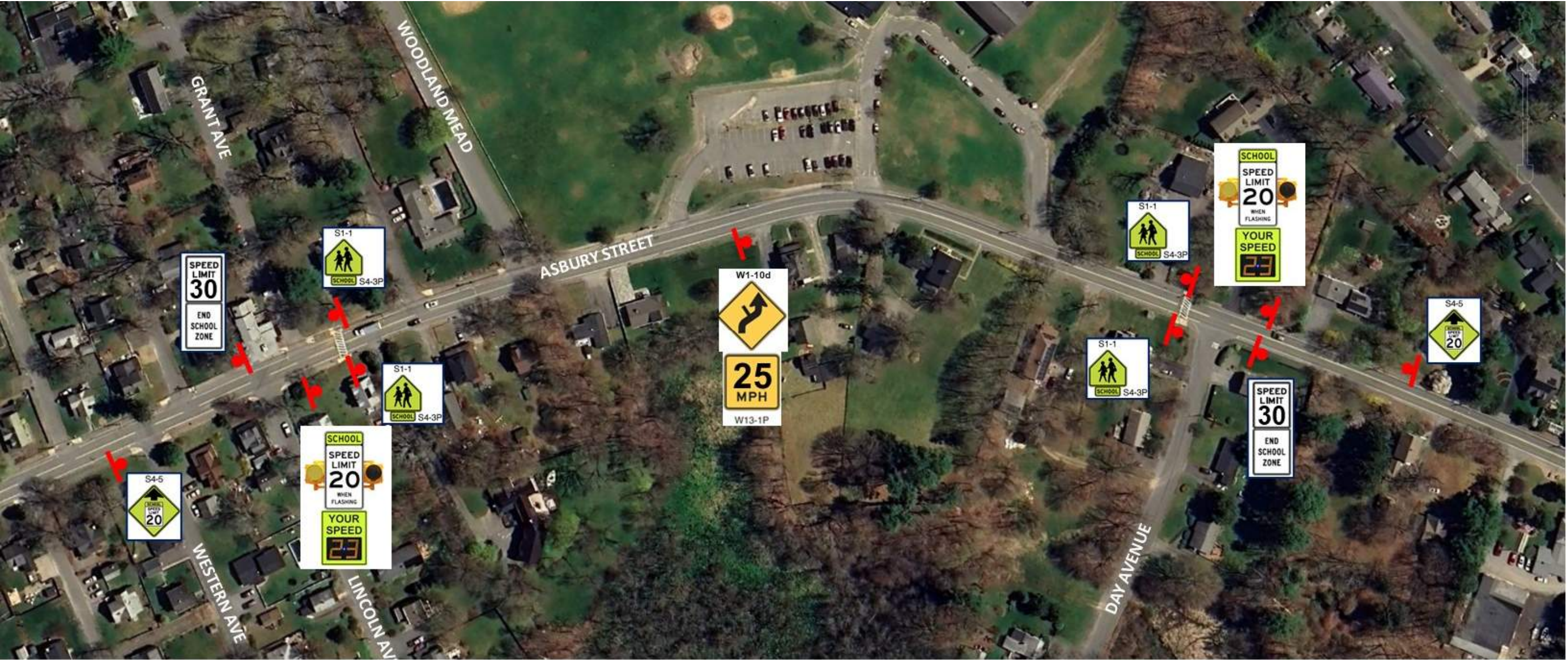


FIGURE 18
Conceptual Improvement Plan

CONCLUSIONS

Existing and future conditions in the study area have been described, analyzed, and evaluated with respect to traffic operations and the impact of the proposed school. Conclusions of this effort are presented below.

- The subject site is currently occupied by the existing 253-student Cutler Elementary School. The project consists of razing the existing elementary school and constructing a new consolidated elementary school for up to 740 students in Grades 1 – 5, comprised of students from the existing Cutler Elementary School, Winthrop Elementary School, and Buker Elementary School in the Hamilton-Wenham school district.
- Access is currently proposed via three driveways on Asbury Street. The easterly driveway will provide full-access / egress for a ± 186 -space staff parking lot. The middle driveway will provide entrance-only for buses and parent drop-off/pick-up traffic. The westerly driveway will provide egress-only for buses and parent drop-off/pick-up traffic. Buses will circulate around the front of school to a dedicated bus loading/unloading loop, while parent traffic will circulate counterclockwise around the back of the school to a dedicated parent drop-off/pick-up area with six marked parking spaces.
- The school is proposed to provide two parking lots, one containing ± 56 parking spaces located inside the bus loop and a second containing ± 186 parking spaces near the athletic fields. Based on Institute of Transportation Engineers (ITE) parking demand generation rates for Land Use Code (LUC) 520 (Elementary School), the proposed school is anticipated to generate a peak parking demand of 223 spaces. Therefore, the ± 242 parking spaces provided on the site will be sufficient to accommodate the peak parking demand generated on a typical school day. During special events, additional parking can be accommodated on the school property along the perimeter roadway.
- Based on the MassDOT collision data (2017-2021), all of the study area intersections and segments experienced crash rates below the state and district-wide averages, indicating no significant safety issue exists.
- The available SSD and ISD at the proposed east site driveway will exceed AASHTO's requirements for minimum SSD and ISD for all movements with the exception of the stopping sight distance for a vehicle traveling eastbound on Asbury Street approaching a vehicle waiting to turn left into the east site driveway. This sight line is restricted by the horizontal curvature of Asbury Street to the west of the driveway. Based on the observed 85th percentile speed of 36 MPH on Asbury Street eastbound, a minimum stopping sight distance (SSD) of 257 feet would be required for a vehicle traveling on wet pavement to safely stop for a vehicle stopped in the roadway waiting to turn left into the east site driveway. The available SSD of 239 feet is adequate for vehicles traveling at 34 MPH or less to safely stop on wet pavement for a vehicle stopped in the roadway waiting to turn left into the site. Therefore, the available SSD is more than adequate for vehicles traveling safely at the posted speed to stop for a vehicle waiting to turn left into the east site driveway. GPI recommends installation of MUTCD-compliant school zone flashing beacons with radar speed feedback indications to reduce speeds along Asbury Street during school hours, as well as installation of "DRIVEWAY ON CURVE" (W1-10d) advance warning signage with advisory speed placards (W13-1p) for a 25 MPH advisory speed on Asbury Street eastbound approaching the curve near the center driveway to further reduce speeds during non-school hours. All available SSD and ISD exceed AASHTO recommendations for safe operations at all other site driveways.
- The proposed Hamilton-Wenham Regional Elementary School is anticipated to generate an increase of 385 vehicle trips (227 entering and 158 exiting) during the weekday AM peak hour,

234 vehicle trips (104 entering and 130 exiting) during the weekday dismissal peak hour and 87 vehicle trips (32 entering, 55 exiting) during the weekday PM peak hour.

- During the weekday morning, approximately 221 parent drop-off vehicles are anticipated to utilize the perimeter road to drop off students. Based on current travel patterns at the existing school, the majority of parents arrive within 15 minutes of the start of the school day. The parent drop-off area provides unloading for up to six vehicles at one time with queuing for an additional 26 to 29 vehicles without impacting access to the bus loop. Based on the results of a queuing theory model, the 95th percentile queue in the drop-off area is anticipated to be 18 vehicles. Therefore, the proposed perimeter road will provide more than adequate storage for parent vehicles in the morning arrival.
- During the afternoon dismissal, approximately 137 parent pick-up vehicles are anticipated to utilize the perimeter road to pick-up students. GPI recommends restricting access to the perimeter loop for parent pick-up until 10- to 15-minutes prior to the release of school to avoid long queues of waiting vehicles forming before school is released. Assuming that six vehicles can load at one time, vehicles will stack in a single lane, and vehicles will generally arrive within 10 minutes of school dismissal, the queue is anticipated to reach 29 vehicles beyond the loading area just before school is released and dissipate at a rate of 2 vehicles per minute, clearing the entire queue within 15 minutes of the release of school.
- A turn lane warrant analysis indicated that neither a left-turn lane nor a right-turn lane is warranted on Asbury Street at any of the proposed site driveways. Therefore, GPI does not recommend installation of turning lanes on Asbury Street at the site driveways at this time.
- Although the Asbury Street westbound approach is anticipated to operate at LOS E during the Weekday AM peak hour under 2031 Build conditions, the volume-to-capacity (V/C) ratio will be well below 1.00, indicating that more than adequate capacity exists to accommodate the anticipated traffic volumes, and queues are not expected to exceed six vehicles. All other movements through the Highland Street / Asbury Street / Pleasant Avenue intersection are anticipated to operate at level-of-service (LOS) C or better during all analysis conditions.
- Traffic exiting the Elementary School West Driveway is anticipated to operate at LOS D during the Weekday AM and Afternoon Dismissal peak periods with queues not exceeding eight vehicles and a V/C ratio below 1.00, indicating there will be adequate capacity to accommodate the anticipated traffic volumes. All other movements at all site driveways are anticipated to operate at LOS B or better with queues not exceeding one vehicle.
- The left-turn exiting Asbury Street onto Bay Road currently operates near capacity at LOS F with long queues during the Weekday AM and Afternoon Dismissal periods. During the Weekday PM peak hour, the Asbury Street approach is currently operating over capacity. The additional traffic generated by the proposed school is anticipated to exacerbate queues and delays on Asbury Street, causing the Asbury Street approach to operate over capacity during all analysis time periods with queues extending over the MBTA Commuter Rail tracks. The intersection of Bay Road / Asbury Street is under the jurisdiction of the Massachusetts Department of Transportation (MassDOT). Therefore, GPI recommends that MassDOT consider implementation of an intersection improvement project at this location, independent of the proposed school project, to address existing intersection deficiencies and improve the capacity and operations of the intersection. GPI performed a review of the impacts of installation of additional turning lanes on Bay Road to increase the capacity of the intersection, as well as installation of a traffic signal at the intersection. The results of the analysis indicated that although a left-turn lane is warranted on Bay Road northbound under existing conditions, the installation of this lane alone will not provide sufficient capacity to improve the Asbury Street approach. The analysis indicated that all three volume-related warrants for installation of a traffic signal are currently exceeded based on existing traffic volumes traveling

through this intersection, and with installation of a traffic signal, all movements through the intersection will be improved to LOS D or better under all analysis conditions. Therefore, GPI recommends MassDOT pursue installation of a fully-actuated traffic-control signal at the Bay Road / Asbury Street intersection to address existing traffic operational deficiencies and provide additional capacity for future growth in the area.

- All movements at all other study area intersections are anticipated to operate at LOS C or better under all analysis conditions. The additional traffic generated by the proposed school is not anticipated to increase delay on any movement at any other intersection by more than two seconds per vehicle and will have negligible impacts to queues.

With the combination of efficient on-site circulation and the proposed off-site roadway improvements described above, the additional traffic generated by the proposed Hamilton-Wenham Elementary School can be safely and efficiently accommodated along the existing roadway network.

- APPENDIX

- ***Public Transportation Schedule***
 - ***Traffic Count Data***
 - ***MassDOT Adjustment Data***
 - ***MassDOT Crash Data***
 - ***Sight Distance Calculations***
 - ***Sight Distance Plans***
 - ***Trip-Generation Calculations***
 - ***Trip Distribution Calculations***
 - ***Bus Routes***
 - ***ITE Parking Data***
- ***Auxiliary Turning Lane Warrants***
 - ***Queue Analysis Calculations***
 - ***Signal Warrant Calculations***
 - ***Capacity Analysis Methodology***
- ***Capacity and Queue Analysis Worksheets***
- ***Mitigation Capacity and Queue Analysis Worksheets***

PUBLIC TRANSPORTATION SCHEDULE

SPRING/SUMMER SCHEDULE

Effective August 5, 2024

Monday to Friday

Inbound to Boston			AM																PM															
ZONE	STATION	TRAIN #	140	100	142	102	144	104	146	106	148	108	150	192	110	152	112	154	114	156	198	116	158	118	160	120	162	122	124	164	126			
	Bikes Allowed																																	
8	Rockport	♂	-	5:06	-	6:13	-	7:13	-	8:13	-	9:13	-	-	10:43	-	12:13	-	1:43	-	-	3:13	-	4:37	-	5:48	-	7:48	8:45	-	10:25			
7	Gloucester	♂	-	5:13	-	6:20	-	7:20	-	8:20	-	9:20	-	-	10:50	-	12:20	-	1:50	-	-	3:20	-	4:44	-	5:55	-	7:55	8:52	-	10:32			
7	West Gloucester	♂	-	5:19	-	6:26	-	7:26	-	8:26	-	9:26	-	-	10:56	-	f 12:26	-	f 1:56	-	f 3:26	-	4:50	-	6:01	-	8:01	8:58	-	10:38				
6	Manchester	♂	-	5:26	-	6:33	-	7:33	-	8:33	-	9:33	-	-	11:03	-	f 12:33	-	2:03	-	-	3:33	-	4:57	-	6:08	-	8:08	9:05	-	10:45			
5	Beverly Farms	♂	-	5:32	-	6:39	-	7:39	-	8:39	-	9:39	-	-	11:09	-	f 12:39	-	f 2:09	-	f 3:39	-	5:03	-	6:14	-	8:14	9:11	-	10:51				
4	Montserrat	♂	-	5:38	-	6:45	-	7:45	-	8:45	-	9:45	-	-	11:15	-	f 12:45	-	f 2:15	-	-	f 3:45	-	5:09	-	6:20	-	8:20	9:17	-	10:57			
8	Newburyport	♂	4:49	-	5:54	-	6:54	-	7:54	-	8:54	-	9:54	-	-	11:24	-	12:54	-	2:24	-	-	3:54	-	5:02	-	6:59	-	-	9:29	-			
7	Rowley	♂	4:54	-	5:59	-	6:59	-	7:59	-	8:59	-	9:59	-	-	11:29	-	12:59	-	2:29	-	-	3:59	-	5:07	-	7:04	-	-	9:34	-			
6	Ipswich	♂	5:00	-	6:05	-	7:05	-	8:05	-	9:05	-	10:05	-	-	11:35	-	-	1:05	-	2:35	-	-	4:05	-	5:13	-	7:10	-	-	9:40	-		
5	Hamilton/Wenham	♂	5:06	-	6:11	-	7:11	-	8:11	-	9:11	-	10:11	-	-	11:41	-	-	1:11	-	2:41	-	-	4:11	-	5:25	-	7:16	-	-	9:46	-		
5	North Beverly	♂	5:10	-	6:15	-	7:15	-	8:15	-	9:15	-	10:15	-	-	11:45	-	-	1:15	-	2:45	-	-	4:15	-	5:29	-	7:20	-	-	9:50	-		
4	Beverly	♂	5:15	5:43	6:20	6:50	7:20	7:50	8:20	8:50	9:20	9:50	10:20	10:50	11:20	11:50	12:50	1:20	2:20	2:50	3:20	3:50	4:20	5:14	5:34	6:25	7:25	8:25	9:22	9:55	11:02			
3	Salem	♂	5:19	5:47	6:24	6:54	7:24	7:54	8:24	8:54	9:24	9:54	10:24	10:54	11:24	11:54	12:54	1:24	2:24	2:54	3:24	3:54	4:24	5:18	5:42	6:29	7:29	8:29	9:31	9:56	11:06			
3	Swampscott	♂	5:26	5:54	6:31	7:01	7:31	8:01	8:31	9:01	9:31	10:01	10:31	11:01	11:31	12:01	1:01	1:31	2:31	3:01	3:31	4:01	4:31	5:25	5:49	6:36	7:36	8:36	9:38	10:06	11:13			
2	Lynn Interim	♂	5:29	5:57	6:34	7:04	7:34	8:04	8:34	9:04	9:34	10:04	10:34	11:04	11:34	12:04	1:04	1:34	2:34	3:04	3:34	4:04	4:34	5:28	5:52	6:39	7:39	8:39	9:41	10:09	11:16			
2	River Works	♂	f 5:32	f 6:00	f 6:37	f 7:07	-	f 8:07	f 8:37	-	-	-	-	-	-	-	-	-	f 2:37	f 3:07	f 3:37	f 4:07	f 4:37	f 5:31	f 5:55	f 6:42	f 7:42	-	-	f 10:12	f 11:19			
1A	Chelsea	♂	5:39	6:07	6:44	7:14	7:44	8:14	8:44	9:14	9:44	10:13	10:43	11:13	11:43	12:13	1:13	1:43	2:44	3:14	3:44	4:14	4:44	5:38	6:02	6:49	7:49	8:47	9:49	10:17	11:24			
1A	North Station	♂	5:56	6:25	7:05	7:36	8:04	8:36	9:05	9:34	10:01	10:31	11:00	11:29	12:01	12:30	1:31	2:00	3:02	3:31	4:00	4:32	5:01	5:56	6:20	7:07	8:05	9:04	10:08	10:35	11:44			

Monday to Friday

Outbound from Boston			AM																	PM																	AM
ZONE STATION	TRAIN #		141	101	143	103	145	105	191	147	107	149	109	151	111	197	153	113	155	115	157	117	159	119	161	121	163	123	165	125	127	167					
		Bikes Allowed	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲					
1A	North Station	🚲	5:35	6:35	7:07	7:38	8:35	9:05	9:35	10:05	10:35	11:35	12:05	1:05	1:35	2:05	2:35	3:05	3:35	4:05	4:30	5:05	5:35	6:05	6:40	7:15	8:05	8:55	9:50	10:50	11:50	Board Rockport Train 127 and change trains at Salem for a Newburyport connection					
1A	Chelsea	🚲	5:46	6:46	7:18	7:49	8:46	9:16	9:46	10:16	10:46	11:46	12:16	1:16	1:46	2:16	2:46	3:16	3:46	4:16	4:41	5:16	5:46	6:16	6:51	7:26	8:16	9:06	10:01	11:01	12:01						
2	River Works	🚲	f 5:53	f 6:53	f 7:25	f 7:56	-	-	-	-	-	-	-	-	f 1:53	-	f 2:53	f 3:23	f 3:53	f 4:23	-	f 5:23	f 5:53	-	f 6:58	f 7:33	-	-	f 11:08	f 12:08							
2	Lynn Interim	🚲	5:56	6:56	7:28	7:59	8:55	9:25	9:55	10:25	10:55	11:55	12:25	1:25	1:56	2:25	2:56	3:26	3:56	4:26	4:50	5:26	5:56	6:25	7:01	7:36	8:25	9:15	10:10	11:11	12:11						
3	Swampscott	🚲	5:59	6:59	7:31	8:02	8:58	9:28	9:58	10:28	10:58	11:58	12:28	1:28	1:59	2:28	2:59	3:29	3:59	4:29	4:53	5:29	5:59	6:28	7:04	7:39	8:28	9:18	10:13	11:14	12:14						
3	Salem	🚲	6:06	7:06	7:38	8:09	9:05	9:35	10:05	10:35	11:05	12:05	12:35	1:35	2:06	2:35	3:06	3:36	4:06	4:36	5:00	5:36	6:06	6:35	7:11	7:46	8:35	9:25	10:20	11:21	12:21						
4	Beverly	🚲	6:10	7:10	7:42	8:13	9:09	9:39	10:12	10:39	11:09	12:09	12:39	1:39	2:10	2:42	3:10	3:40	4:10	4:40	5:04	5:41	6:10	6:39	7:15	7:50	8:39	9:29	10:24	11:25	12:25						
5	North Beverly	🚲	f 6:14	-	f 7:46	-	f 9:13	-	-	f 10:43	-	f 12:13	-	1:43	-	3:14	-	4:14	-	5:08	-	6:14	-	7:19	-	8:43	-	10:28	-	-	-		12:38				
5	Hamilton/Wenham	🚲	f 6:18	-	f 7:50	-	f 9:17	-	-	f 10:47	-	f 12:17	-	1:47	-	3:18	-	4:19	-	5:13	-	6:19	-	7:24	-	8:47	-	10:32	-	-	-		12:42				
6	Ipswich	🚲	6:24	-	8:09	-	9:23	-	-	10:53	-	12:23	-	1:53	-	3:24	-	4:25	-	5:20	-	6:26	-	7:30	-	8:53	-	10:38	-	-	-		12:48				
7	Rowley	🚲	f 6:30	-	f 8:15	-	f 9:29	-	-	f 10:59	-	f 12:29	-	1:59	-	3:30	-	4:31	-	5:26	-	6:32	-	7:36	-	8:59	-	10:44	-	-	-	12:54					
8	Newburyport	🚲	6:41	-	8:27	-	9:41	-	-	11:11	-	12:41	-	2:11	-	3:41	-	4:43	-	5:38	-	6:44	-	7:48	-	9:11	-	10:56	-	-	-	1:06					
4	Montserrat	🚲	-	f 7:14	-	f 8:17	-	f 9:43	-	-	f 11:13	-	f 12:43	-	2:14	-	3:44	-	4:44	-	5:45	-	6:43	-	7:54	-	9:33	-	11:29	-	12:29	-					
5	Beverly Farms	🚲	-	f 7:20	-	f 8:23	-	f 9:49	-	-	f 11:19	-	f 12:49	-	2:20	-	3:50	-	4:51	-	5:52	-	6:50	-	8:00	-	9:39	-	11:35	-	12:35	-					
6	Manchester	🚲	-	7:26	-	8:29	-	9:55	-	-	11:25	-	12:55	-	2:26	-	3:56	-	4:57	-	5:58	-	6:56	-	8:06	-	9:45	-	11:41	-	12:41	-					
7	West Gloucester	🚲	-	f 7:32	-	f 8:35	-	f 10:01	-	-	f 11:31	-	f 1:01	-	2:32	-	4:02	-	5:03	-	6:04	-	7:02	-	8:12	-	9:51	-	11:47	-	12:47	-					
7	Gloucester	🚲	-	7:38	-	8:41	-	10:08	-	-	11:38	-	1:08	-	2:39	-	4:09	-	5:11	-	6:12	-	7:10	-	8:19	-	9:58	-	11:54	-	12:54	-					
8	Rockport	🚲	-	7:50	-	8:53	-	10:21	-	-	11:51	-	1:21	-	2:52	-	4:22	-	5:26	-	6:27	-	7:25	-	8:32	-	10:12	-	12:08	-	1:08	-					

Weekend

Inbound to Boston			AM												PM											
SATURDAY TRAIN #			1150	1100	1152	1102	1154	1104	1156	1106	1158	1108	1160	1110	1162	1112	1164	1114	1166	1116						
ZONE	STATION	SUNDAY TRAIN #	2150	2100	2152	2102	2154	2104	2156	2106	2158	2108	2160	2110	2162	2112	2164	2114	2166	2116						
Bikes Allowed																										
8	Rockport	↳	-	6:00	-	8:00	-	10:00	-	12:00	-	2:00	-	4:00	-	6:00	-	8:00	-	10:30						
7	Gloucester	↳	-	6:07	-	8:07	-	10:07	-	12:07	-	2:07	-	4:07	-	6:07	-	8:07	-	10:37						
7	West Gloucester	↳	-	6:13	-	8:13	-	10:13	-	12:13	-	2:13	-	4:13	-	6:13	-	8:13	-	10:43						
6	Manchester	↳	-	6:20	-	8:20	-	10:20	-	12:20	-	2:20	-	4:20	-	6:20	-	8:20	-	10:50						
5	Beverly Farms	↳	-	6:26	-	8:26	-	10:26	-	12:26	-	2:26	-	4:26	-	6:26	-	8:26	-	10:56						
4	Montserrat	↳	-	6:32	-	8:32	-	10:32	-	12:32	-	2:32	-	4:32	-	6:32	-	8:32	-	11:02						
3	Newburyport	↳	5:00	-	7:10	-	9:10	-	11:10	-	1:10	-	3:10	-	5:10	-	7:10	-	9:10	-						
7	Rowley	↳	5:05	-	7:15	-	9:15	-	11:15	-	1:15	-	3:15	-	5:15	-	7:15	-	9:15	-						
6	Ipswich	↳	5:11	-	7:21	-	9:21	-	11:21	-	1:21	-	3:21	-	5:21	-	7:21	-	9:21	-						
5	Hamilton/Wenham	↳	5:17	-	7:27	-	9:27	-	11:27	-	1:27	-	3:27	-	5:27	-	7:27	-	9:27	-						
5	North Beverly	↳	5:21	-	7:31	-	9:31	-	11:31	-	1:31	-	3:31	-	5:31	-	7:31	-	9:31	-						
4	Beverly	↳	5:27	6:37	7:37	8:37	9:37	10:37	11:37	12:37	1:37	2:37	3:37	4:37	5:37	6:37	7:37	8:37	9:37	11:07						
3	Salem	↳	5:31	6:41	7:41	8:41	9:41	10:41	11:41	12:41	1:41	2:41	3:41	4:41	5:41	6:41	7:41	8:41	9:41	11:11						
3	Swampscott	↳	5:38	6:48	7:48	8:48	9:48	10:48	11:48	12:48	1:48	2:48	3:48	4:48	5:48	6:48	7:48	8:48	9:48	11:18						
2	Lynn Interim	↳	5:41	6:51	7:51	8:51	9:51	10:51	11:51	12:51	1:51	2:51	3:51	4:51	5:51	6:51	7:51	8:51	9:51	11:21						
1A	Chelsea	↳	5:48	6:58	7:58	8:58	9:58	10:58	11:58	12:58	1:58	2:58	3:58	4:58	5:58	6:58	7:58	8:58	9:58	11:28						
1A	North Station	↳	6:07	7:18	8:17	9:18	10:17	11:18	12:17	1:18	2:17	3:18	4:17	5:18	6:17	7:18	8:17	9:18	10:17	11:28						

Weekend

Outbound from Boston																		
		SATURDAY TRAIN #																
ZONE	STATION	SUNDAY TRAIN #																
		AM								PM								
		1101	1153	1103	1155	1105	1157	1107	1159	1109	1161	1111	1163	1113	1165	1115	1167	1117
		2101	2153	2103	2155	2105	2157	2107	2159	2109	2161	2111	2163	2113	2165	2115	2167	2117
	Bikes Allowed	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲	🚲
1A	North Station	6:30	7:30	8:30	9:30	10:30	11:30	12:30	1:30	2:30	3:30	4:30	5:30	6:30	7:30	8:50	10:20	11:50
1A	Chelsea	6:41	7:41	8:41	9:41	10:41	11:41	12:41	1:41	2:41	3:41	4:41	5:41	6:41	7:41	9:01	10:31	12:01
2	Lynn Interim	6:50	7:50	8:50	9:50	10:50	11:50	12:50	1:50	2:50	3:50	4:50	5:50	6:50	7:50	9:10	10:40	12:10
3	Swampscott	6:53	7:53	8:53	9:53	10:53	11:53	12:53	1:53	2:53	3:53	4:53	5:53	6:53	7:53	9:13	10:43	12:13
3	Salem	7:00	8:00	9:00	10:00	11:00	12:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:20	10:50	12:20
4	Beverly	7:04	8:04	9:04	10:04	11:04	12:04	1:04	2:04	3:04	4:04	5:04	6:04	7:04	8:04	9:24	10:54	12:24
5	North Beverly	-	8:08	-	10:08	-	12:08	-	2:08	-	4:08	-	6:08	-	8:08	-	10:58	-
5	Hamilton/Wenham	6	8:12	-	10:12	-	12:12	-	2:12	-	4:12	-	6:12	-	8:12	-	11:02	-
6	Ipswich	6	8:18	-	10:18	-	12:18	-	2:18	-	4:18	-	6:18	-	8:18	-	11:08	-
7	Rowley	6	8:24	-	10:24	-	12:24	-	2:24	-	4:24	-	6:24	-	8:24	-	11:14	-
8	Newburyport	6	8:37	-	10:37	-	12:37	-	2:37	-	4:37	-	6:37	-	8:37	-	11:27	-
4	Mattressat	6	7:08	-	9:08	-	11:08	-	1:08	-	3:08	-	5:08	-	7:08	-	9:28	-
5	Beverly Farms	6	7:14	-	9:14	-	11:14	-	1:14	-	3:14	-	5:14	-	7:14	-	9:34	-
6	Manchester	6	7:20	-	9:20	-	11:20	-	1:20	-	3:20	-	5:20	-	7:20	-	9:40	-
7	West Gloucester	6	7:26	-	9:26	-	11:26	-	1:26	-	3:26	-	5:26	-	7:26	-	9:46	-
7	Gloucester	6	7:33	-	9:33	-	11:33	-	1:33	-	3:33	-	5:33	-	7:33	-	9:53	-
8	Rockport	6	7:46	-	9:46	-	11:46	-	1:46	-	3:46	-	5:46	-	7:46	-	10:06	-



Times in purple with “f” indicate a flag stop: Passengers must tell the conductor that they wish to leave. Passengers waiting to board must be visible on the platform for the train to stop.



High level platform and bridge plate available.
Visit mbta.com/accessibility for more information.



Connect to a different train for continued service outbound.



Bikes: Bicycles are allowed on trains with the bicycle symbol shown below the train number.

Keep in Mind:

This schedule will be effective from August 5, 2024 and will replace the schedule of May 20, 2024.

HOLIDAY SERVICE:

On Monday, September 2nd (Labor Day), all lines will operate on a weekend schedule.
On Monday, October 14th (Columbus Day), all lines will operate on a regular weekday schedule.

For all holiday schedules, please check MBTA.com/holidays or call 617-222-3200.

Effective **August 25, 2024**

Replaces June 2024

451

**North Beverly –
Salem Depot**

Connections

NEWBURYPORT/ROCKPORT LINE

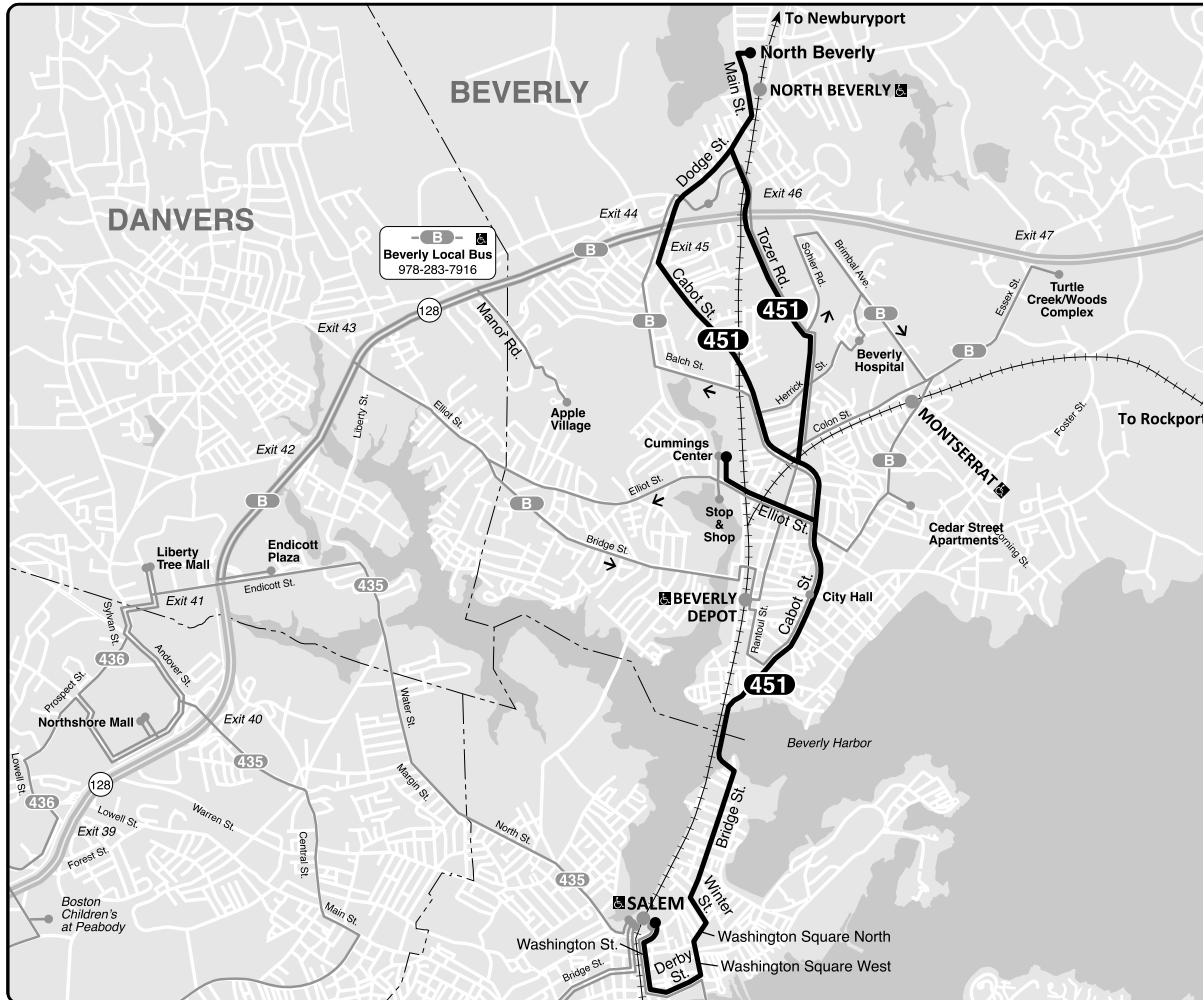


Information **617-222-3200**
Lost and Found **617-222-5263**
TTY **617-222-5146**

Realtime arrival information, maps, and more

mbta.com

A129-3-22.1



- Transfer to bus/subway available on CharlieCard and contactless—good for 2 hours, pay fare difference.
- Children 11 & under ride free.

All MBTA buses are accessible to people with disabilities.

	CharlieCard & Contactless	Cash on board	Reduced fare
Bus	\$1.70	\$1.70	\$0.85
Bus + Subway	\$2.40	\$4.10	\$1.10

Complete fare/pass rules and free/reduced fare eligibility:

mbta.com/fares or call **617-222-3200**

Weekday 451

Inbound

North Beverly	Tozer Road	Dodge St & Cabot St	Cummings Center	Salem Depot
6:42	-	6:44	6:51	7:11
8:04	-	8:08	8:16	8:39
9:30	-	9:33	9:41	10:02
4:37	4:40	-	4:47	5:11
6:08	6:11	-	6:18	6:36
7:25	7:28	-	7:33	7:54

Outbound

Salem Depot	Cummings Center	Dodge St & Cabot St	Tozer Road	North Beverly
5:55	6:15	-	6:26	6:35
7:17	7:38	-	7:47	7:56
8:45	9:05	-	9:14	9:23
3:45	4:08	4:15	-	4:30
5:20	5:42	5:53	-	6:00
6:45	7:03	7:11	-	7:20

No Saturday service

No Sunday service

PM times are **bold**

Information in this timetable is subject to change without notice. Traffic and weather may affect running times.

Always check bus destination signs before boarding. Some buses may only serve a part, or skip portions of this route.

Holidays

SUN New Year's Day	SUN Labor Day
SAT MLK Jr. Day	SAT Columbus/Indigenous Peoples Day
SAT Presidents Day	
SAT Patriots' Day	SUN Thanksgiving
SUN Memorial Day	SUN Christmas Day
SUN Independence Day	SUN New Year's Eve

TRAFFIC COUNT DATA

PDI File #: **240205 A**
Location: **N: Highland Street S: Highland Street**
Location: **E: Ashbury Street W: Pleasant Avenue**
City, State: **Hamilton, MA**
Client: **GPI/ R. Brown**
Site Code: **NEX-2400246.00**
Count Date: **Thursday, September 19, 2024**
Start Time: **7:00 AM**
End Time: **9:00 AM**
Class:



Cars and Heavy Vehicles (Combined)

	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
7:00 AM	0	36	15	0	51	18	0	9	0	27	7	27	0	0	34	1	0	0	0	1	113
7:15 AM	0	34	33	0	67	22	0	13	0	35	4	35	0	0	39	0	3	0	0	3	144
7:30 AM	0	65	46	0	111	26	2	10	0	38	6	38	0	0	44	0	1	3	0	4	197
7:45 AM	1	47	59	0	107	33	2	12	0	47	10	44	1	0	55	4	3	1	0	8	217
Total	1	182	153	0	336	99	4	44	0	147	27	144	1	0	172	5	7	4	0	16	671
8:00 AM	0	43	53	0	96	32	0	6	0	38	8	38	1	0	47	1	1	0	0	2	183
8:15 AM	0	56	29	0	85	34	1	14	0	49	15	49	1	0	65	2	2	0	0	4	203
8:30 AM	1	46	26	0	73	42	1	14	0	57	5	64	2	0	71	2	2	1	0	5	206
8:45 AM	1	64	30	0	95	50	3	12	0	65	5	85	3	0	93	2	1	0	0	3	256
Total	2	209	138	0	349	158	5	46	0	209	33	236	7	0	276	7	6	1	0	14	848
Grand Total	3	391	291	0	685	257	9	90	0	356	60	380	8	0	448	12	13	5	0	30	1519
Approach %	0.4	57.1	42.5	0.0		72.2	2.5	25.3	0.0		13.4	84.8	1.8	0.0		40.0	43.3	16.7	0.0		
Total %	0.2	25.7	19.2	0.0	45.1	16.9	0.6	5.9	0.0	23.4	3.9	25.0	0.5	0.0	29.5	0.8	0.9	0.3	0.0	2.0	
Exiting Leg Total	642					364					493					20					1519
Cars	3	383	267	0	653	242	9	87	0	338	56	366	7	0	429	12	13	5	0	30	1450
% Cars	100.0	98.0	91.8	0.0	95.3	94.2	100.0	96.7	0.0	94.9	93.3	96.3	87.5	0.0	95.8	100.0	100.0	100.0	0.0	100.0	95.5
Exiting Leg Total	613					336					482					19					1450
Heavy Vehicles	0	8	24	0	32	15	0	3	0	18	4	14	1	0	19	0	0	0	0	0	69
% Heavy Vehicles	0.0	2.0	8.2	0.0	4.7	5.8	0.0	3.3	0.0	5.1	6.7	3.7	12.5	0.0	4.2	0.0	0.0	0.0	0.0	0.0	4.5
Exiting Leg Total	29					28					11					1					69

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
7:45 AM	1	47	59	0	107	33	2	12	0	47	10	44	1	0	55	4	3	1	0	8	217
8:00 AM	0	43	53	0	96	32	0	6	0	38	8	38	1	0	47	1	1	0	0	2	183
8:15 AM	0	56	29	0	85	34	1	14	0	49	15	49	1	0	65	2	2	0	0	4	203
8:30 AM	1	46	26	0	73	42	1	14	0	57	5	64	2	0	71	2	2	1	0	5	206
Total Volume	2	192	167	0	361	141	4	46	0	191	38	195	5	0	238	9	8	2	0	19	809
% Approach Total	0.6	53.2	46.3	0.0		73.8	2.1	24.1	0.0		16.0	81.9	2.1	0.0		47.4	42.1	10.5	0.0		
PHF	0.500	0.857	0.708	0.000	0.843	0.839	0.500	0.821	0.000	0.838	0.633	0.762	0.625	0.000	0.838	0.563	0.667	0.500	0.000	0.594	0.932
Cars	2	186	156	0	344	133	4	45	0	182	34	185	4	0	223	9	8	2	0	19	768
Cars %	100.0	96.9	93.4	0.0	95.3	94.3	100.0	97.8	0.0	95.3	89.5	94.9	80.0	0.0	93.7	100.0	100.0	100.0	0.0	100.0	94.9
Heavy Vehicles	0	6	11	0	17	8	0	1	0	9	4	10	1	0	15	0	0	0	0	0	41
Heavy Vehicles %	0.0	3.1	6.6	0.0	4.7	5.7	0.0	2.2	0.0	4.7	10.5	5.1	20.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	5.1
Cars Enter Leg	2	186	156	0	344	133	4	45	0	182	34	185	4	0	223	9	8	2	0	19	768
Heavy Enter Leg	0	6	11	0	17	8	0	1	0	9	4	10	1	0	15	0	0	0	0	0	41
Total Entering Leg	2	192	167	0	361	141	4	46	0	191	38	195	5	0	238	9	8	2	0	19	809
Cars Exiting Leg					320					198					240					10	768
Heavy Exiting Leg					18					15					7					1	41
Total Exiting Leg					338					213					247					11	809

PDI File #: 240205 A
Location: N: Highland Street S: Highland Street
Location: E: Ashbury Street W: Pleasant Avenue
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 7:00 AM
End Time: 9:00 AM
Class:



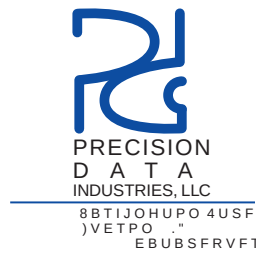
Bicycles (on Roadway and Crosswalks)

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0							1							0							0							1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0							0							0							0							0
Total	0							0							0							0							0

PDI File #: 240205 A
 Location: N: Highland Street S: Highland Street
 Location: E: Ashbury Street W: Pleasant Avenue
 City, State: Hamilton, MA
 Client: GPI/ R. Brown
 Site Code: NEX-2400246.00
 Count Date: Thursday, September 19, 2024
 Start Time: 7:00 AM
 End Time: 9:00 AM
 Class:



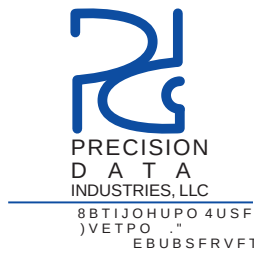
Pedestrians

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	3
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	1	1	0	0	0	0	6	0	6	8
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	2	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
Total	0	0	0	0	1	0	1	0	0	0	0	1	0	1	0	0	0	0	3	3	6	0	0	0	0	6	0	6	14
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	0	1	1	0	0	0	0	0	0	0	6
Grand Total	0	0	0	0	1	0	1	0	0	0	0	4	2	6	0	0	0	0	3	4	7	0	0	0	0	6	0	6	20
Approach %	0	0	0	0	100	0		0	0	0	0	66.7	33.3		0	0	0	0	42.9	57.1		0	0	0	0	100	0		
Total %	0	0	0	0	5	0	5	0	0	0	0	20	10	30	0	0	0	0	15	20	35	0	0	0	0	30	0	30	
Exiting Leg Total	1							6							7							6							20

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2	
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0	0	0	0	0	1	1	0	0	0	0	0	0	4	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	0	2	2	0	0	0	0	0	0	7	
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	60.0	40.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.417	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.438	
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	3	2	5	0	0	0	0	0	2	2	0	0	0	0	0	0	7	
Exiting Leg	0							5							2							0							7
Total	0							10							4							0							14

PDI File #: **240205 A**
 Location: **N: Highland Street S: Highland Street**
 Location: **E: Ashbury Street W: Pleasant Avenue**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	2	26	19	0	47	19	3	6	0	28	13	29	1	0	43	0	2	1	0	3	121
2:15 PM	0	28	21	0	49	25	1	9	0	35	10	29	0	0	39	0	1	1	0	2	125
2:30 PM	0	37	23	0	60	32	2	17	0	51	9	39	2	0	50	1	0	1	0	2	163
2:45 PM	0	49	24	0	73	34	0	9	0	43	14	46	1	0	61	2	1	0	0	3	180
Total	2	140	87	0	229	110	6	41	0	157	46	143	4	0	193	3	4	3	0	10	589
3:00 PM	0	38	28	0	66	33	1	18	0	52	15	58	0	0	73	2	1	0	0	3	194
3:15 PM	0	43	37	0	80	44	2	13	0	59	10	47	0	0	57	2	1	1	0	4	200
3:30 PM	0	39	34	0	73	44	3	17	0	64	13	63	1	0	77	1	0	0	0	1	215
3:45 PM	0	42	31	0	73	41	1	10	0	52	13	48	0	0	61	0	3	0	0	3	189
Total	0	162	130	0	292	162	7	58	0	227	51	216	1	0	268	5	5	1	0	11	798
4:00 PM	3	34	24	0	61	43	2	12	0	57	16	39	1	0	56	0	3	0	0	3	177
4:15 PM	2	50	34	0	86	34	2	11	0	47	11	40	1	0	52	0	1	0	0	1	186
4:30 PM	0	56	36	0	92	43	1	13	0	57	17	53	2	0	72	1	1	0	0	2	223
4:45 PM	0	43	29	0	72	54	2	9	0	65	11	57	1	0	69	2	0	0	0	2	208
Total	5	183	123	0	311	174	7	45	0	226	55	189	5	0	249	3	5	0	0	8	794
5:00 PM	1	56	41	0	98	42	1	9	0	52	17	63	0	0	80	0	0	2	0	2	232
5:15 PM	1	61	39	0	101	34	3	8	0	45	15	65	3	0	83	1	2	0	0	3	232
5:30 PM	0	36	25	0	61	50	3	12	0	65	15	94	2	0	111	0	0	1	0	1	238
5:45 PM	0	30	27	0	57	66	2	14	0	82	19	103	2	0	124	0	2	0	0	2	265
Total	2	183	132	0	317	192	9	43	0	244	66	325	7	0	398	1	4	3	0	8	967
Grand Total	9	668	472	0	1149	638	29	187	0	854	218	873	17	0	1108	12	18	7	0	37	3148
Approach %	0.8	58.1	41.1	0.0		74.7	3.4	21.9	0.0		19.7	78.8	1.5	0.0		32.4	48.6	18.9	0.0		
Total %	0.3	21.2	15.0	0.0	36.5	20.3	0.9	5.9	0.0	27.1	6.9	27.7	0.5	0.0	35.2	0.4	0.6	0.2	0.0	1.2	
Exiting Leg Total	1518					708					867					55					3148
Cars	8	660	459	0	1127	614	29	183	0	826	210	865	17	0	1092	12	18	5	0	35	3080
% Cars	88.9	98.8	97.2	0.0	98.1	96.2	100.0	97.9	0.0	96.7	96.3	99.1	100.0	0.0	98.6	100.0	100.0	71.4	0.0	94.6	97.8
Exiting Leg Total	1484					687					855					54					3080
Heavy Vehicles	1	8	13	0	22	24	0	4	0	28	8	8	0	0	16	0	0	2	0	2	68
% Heavy Vehicles	11.1	1.2	2.8	0.0	1.9	3.8	0.0	2.1	0.0	3.3	3.7	0.9	0.0	0.0	1.4	0.0	0.0	28.6	0.0	5.4	2.2
Exiting Leg Total	34					21					12					1					68

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:30 PM	0	37	23	0	60	32	2	17	0	51	9	39	2	0	50	1	0	1	0	2	163
2:45 PM	0	49	24	0	73	34	0	9	0	43	14	46	1	0	61	2	1	0	0	3	180
3:00 PM	0	38	28	0	66	33	1	18	0	52	15	58	0	0	73	2	1	0	0	3	194
3:15 PM	0	43	37	0	80	44	2	13	0	59	10	47	0	0	57	2	1	1	0	4	200
Total Volume	0	167	112	0	279	143	5	57	0	205	48	190	3	0	241	7	3	2	0	12	737
% Approach Total	0.0	59.9	40.1	0.0		69.8	2.4	27.8	0.0		19.9	78.8	1.2	0.0		58.3	25.0	16.7	0.0		
PHF	0.000	0.852	0.757	0.000	0.872	0.813	0.625	0.792	0.000	0.869	0.800	0.819	0.375	0.000	0.825	0.875	0.750	0.500	0.000	0.750	0.921
Cars	0	163	108	0	271	128	5	54	0	187	44	188	3	0	235	7	3	2	0	12	705
Cars %	0.0	97.6	96.4	0.0	97.1	89.5	100.0	94.7	0.0	91.2	91.7	98.9	100.0	0.0	97.5	100.0	100.0	100.0	0.0	100.0	95.7
Heavy Vehicles	0	4	4	0	8	15	0	3	0	18	4	2	0	0	6	0	0	0	0	0	32
Heavy Vehicles %	0.0	2.4	3.6	0.0	2.9	10.5	0.0	5.3	0.0	8.8	8.3	1.1	0.0	0.0	2.5	0.0	0.0	0.0	0.0	0.0	4.3
Cars Enter Leg	0	163	108	0	271	128	5	54	0	187	44	188	3	0	235	7	3	2	0	12	705
Heavy Enter Leg	0	4	4	0	8	15	0	3	0	18	4	2	0	0	6	0	0	0	0	0	32
Total Entering Leg	0	167	112	0	279	143	5	57	0	205	48	190	3	0	241	7	3	2	0	12	737
Cars Exiting Leg	318					155					224					8					705
Heavy Exiting Leg	17					8					7					0					32
Total Exiting Leg	335					163					231					8					737

PDI File #: 240205 A
Location: N: Highland Street S: Highland Street
Location: E: Ashbury Street W: Pleasant Avenue
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 2:00 PM
End Time: 6:00 PM
Class:



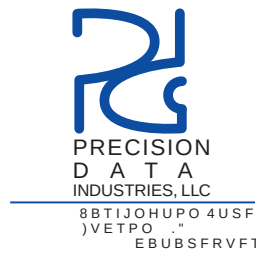
Bicycles (on Roadway and Crosswalks)

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	1	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
Approach %	0.0	50.0	50.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	25.0	25.0	0.0	0.0	0.0	50.0	25.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0		
Exiting Leg Total	1							1							2							0							4

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	
Entering Leg	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg	0							0							1							0							1
Total	1							0							1							0							2

PDI File #: 240205 A
Location: N: Highland Street S: Highland Street
Location: E: Ashbury Street W: Pleasant Avenue
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 2:00 PM
End Time: 6:00 PM
Class:



Pedestrians

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total	
	from North							from East							from South							from West								
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1	
2:30 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	1	1	7	
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	4	
Total	0	0	0	0	0	0	1	1	0	0	0	0	0	2	2	0	0	0	0	5	3	8	0	0	0	0	0	1	1	12
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	4	
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	2	0	2	0	0	0	0	0	0	4	
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0	0	0	2	2	4	0	0	0	0	1	0	1	9
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	
5:15 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:45 PM	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Total	0	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3	
Grand Total	0	0	0	0	0	1	3	4	0	0	0	0	2	4	6	0	0	0	0	8	5	13	0	0	0	0	3	1	4	27
Approach %	0	0	0	0	0	25	75		0	0	0	0	33.3	66.7		0	0	0	0	61.5	38.5		0	0	0	0	75	25		
Total %	0	0	0	0	0	3.7	11.1	14.8	0	0	0	0	7.41	14.8	22.2	0	0	0	0	29.6	18.5	48.1	0	0	0	0	11.1	3.7	14.8	
Exiting Leg Total	4							6							13							4							27	

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total	
	from North							from East							from South							from West								
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:30 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	1	1	7
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	0	0	1	1	0	0	0	0	0	4	4	0	0	0	0	5	4	9	0	0	0	0	1	1	2	16	
% Approach Total	0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	55.6	44.4		0.0	0.0	0.0	0.0	50.0	50.0			
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.500	0.500	0.000	0.000	0.000	0.000	0.250	0.500	0.450	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.571	
Entering Leg	0	0	0	0	0	1	1	0	0	0	0	0	4	4	0	0	0	0	5	4	9	0	0	0	0	1	1	2	16	
Exiting Leg	1							4							9							2							16	
Total	2							8							18							4							32	

PDI File #: **240205 A**
Location: **N: Highland Street S: Highland Street**
Location: **E: Ashbury Street W: Pleasant Avenue**
City, State: **Hamilton, MA**
Client: **GPI/ R. Brown**
Site Code: **NEX-2400246.00**
Count Date: **Thursday, September 19, 2024**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:



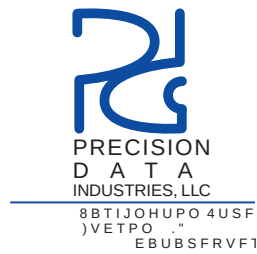
Cars and Heavy Vehicles (Combined)

	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
2:00 PM	2	26	19	0	47	19	3	6	0	28	13	29	1	0	43	0	2	1	0	3	121
2:15 PM	0	28	21	0	49	25	1	9	0	35	10	29	0	0	39	0	1	1	0	2	125
2:30 PM	0	37	23	0	60	32	2	17	0	51	9	39	2	0	50	1	0	1	0	2	163
2:45 PM	0	49	24	0	73	34	0	9	0	43	14	46	1	0	61	2	1	0	0	3	180
Total	2	140	87	0	229	110	6	41	0	157	46	143	4	0	193	3	4	3	0	10	589
3:00 PM	0	38	28	0	66	33	1	18	0	52	15	58	0	0	73	2	1	0	0	3	194
3:15 PM	0	43	37	0	80	44	2	13	0	59	10	47	0	0	57	2	1	1	0	4	200
3:30 PM	0	39	34	0	73	44	3	17	0	64	13	63	1	0	77	1	0	0	0	1	215
3:45 PM	0	42	31	0	73	41	1	10	0	52	13	48	0	0	61	0	3	0	0	3	189
Total	0	162	130	0	292	162	7	58	0	227	51	216	1	0	268	5	5	1	0	11	798
4:00 PM	3	34	24	0	61	43	2	12	0	57	16	39	1	0	56	0	3	0	0	3	177
4:15 PM	2	50	34	0	86	34	2	11	0	47	11	40	1	0	52	0	1	0	0	1	186
4:30 PM	0	56	36	0	92	43	1	13	0	57	17	53	2	0	72	1	1	0	0	2	223
4:45 PM	0	43	29	0	72	54	2	9	0	65	11	57	1	0	69	2	0	0	0	2	208
Total	5	183	123	0	311	174	7	45	0	226	55	189	5	0	249	3	5	0	0	8	794
5:00 PM	1	56	41	0	98	42	1	9	0	52	17	63	0	0	80	0	0	2	0	2	232
5:15 PM	1	61	39	0	101	34	3	8	0	45	15	65	3	0	83	1	2	0	0	3	232
5:30 PM	0	36	25	0	61	50	3	12	0	65	15	94	2	0	111	0	0	1	0	1	238
5:45 PM	0	30	27	0	57	66	2	14	0	82	19	103	2	0	124	0	2	0	0	2	265
Total	2	183	132	0	317	192	9	43	0	244	66	325	7	0	398	1	4	3	0	8	967
Grand Total	9	668	472	0	1149	638	29	187	0	854	218	873	17	0	1108	12	18	7	0	37	3148
Approach %	0.8	58.1	41.1	0.0		74.7	3.4	21.9	0.0		19.7	78.8	1.5	0.0		32.4	48.6	18.9	0.0		
Total %	0.3	21.2	15.0	0.0	36.5	20.3	0.9	5.9	0.0	27.1	6.9	27.7	0.5	0.0	35.2	0.4	0.6	0.2	0.0	1.2	
Exiting Leg Total	1518					708					867					55					3148
Cars	8	660	459	0	1127	614	29	183	0	826	210	865	17	0	1092	12	18	5	0	35	3080
% Cars	88.9	98.8	97.2	0.0	98.1	96.2	100.0	97.9	0.0	96.7	96.3	99.1	100.0	0.0	98.6	100.0	100.0	71.4	0.0	94.6	97.8
Exiting Leg Total	1484					687					855					54					3080
Heavy Vehicles	1	8	13	0	22	24	0	4	0	28	8	8	0	0	16	0	0	2	0	2	68
% Heavy Vehicles	11.1	1.2	2.8	0.0	1.9	3.8	0.0	2.1	0.0	3.3	3.7	0.9	0.0	0.0	1.4	0.0	0.0	28.6	0.0	5.4	2.2
Exiting Leg Total	34					21					12					1					68

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Highland Street					Ashbury Street					Highland Street					Pleasant Avenue					Total
	from North					from East					from South					from West					
	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	Right	Thru	Left	U-Turn	Total	
4:30 PM	0	56	36	0	92	43	1	13	0	57	17	53	2	0	72	1	1	0	0	2	223
4:45 PM	0	43	29	0	72	54	2	9	0	65	11	57	1	0	69	2	0	0	0	2	208
5:00 PM	1	56	41	0	98	42	1	9	0	52	17	63	0	0	80	0	0	2	0	2	232
5:15 PM	1	61	39	0	101	34	3	8	0	45	15	65	3	0	83	1	2	0	0	3	232
Total Volume	2	216	145	0	363	173	7	39	0	219	60	238	6	0	304	4	3	2	0	9	895
% Approach Total	0.6	59.5	39.9	0.0		79.0	3.2	17.8	0.0		19.7	78.3	2.0	0.0		44.4	33.3	22.2	0.0		
PHF	0.500	0.885	0.884	0.000	0.899	0.801	0.583	0.750	0.000	0.842	0.882	0.915	0.500	0.000	0.916	0.500	0.375	0.250	0.000	0.750	0.964
Cars	1	214	145	0	360	170	7	39	0	216	60	238	6	0	304	4	3	1	0	8	888
Cars %	50.0	99.1	100.0	0.0	99.2	98.3	100.0	100.0	0.0	98.6	100.0	100.0	100.0	0.0	100.0	100.0	100.0	50.0	0.0	88.9	99.2
Heavy Vehicles	1	2	0	0	3	3	0	0	0	3	0	0	0	0	0	0	0	1	0	1	7
Heavy Vehicles %	50.0	0.9	0.0	0.0	0.8	1.7	0.0	0.0	0.0	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	11.1	0.8
Cars Enter Leg	1	214	145	0	360	170	7	39	0	216	60	238	6	0	304	4	3	1	0	8	888
Heavy Enter Leg	1	2	0	0	3	3	0	0	0	3	0	0	0	0	0	0	0	1	0	1	7
Total Entering Leg	2	216	145	0	363	173	7	39	0	219	60	238	6	0	304	4	3	2	0	9	895
Cars Exiting Leg	409					208					257					14					888
Heavy Exiting Leg	4					0					2					1					7
Total Exiting Leg	413					208					259					15					895

PDI File #: 240205 A
Location: N: Highland Street S: Highland Street
Location: E: Ashbury Street W: Pleasant Avenue
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 2:00 PM
End Time: 6:00 PM
Class:



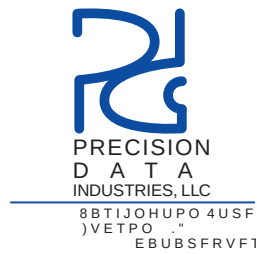
Bicycles (on Roadway and Crosswalks)

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	2
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	3
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	1	0	0	0	2	1	0	0	0	0	0	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	4
Approach %	0.0	50.0	50.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		
Total %	0.0	25.0	25.0	0.0	0.0	0.0	50.0	25.0	0.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	25.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0		
Exiting Leg Total	1							1							2							0							4

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:15 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Total Volume	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
% Approach Total	0.0	0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0			
PHF	0.000	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.250	
Entering Leg	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
Exiting Leg	0							1							0							0							1
Total	1							1							0							0							2

PDI File #: 240205 A
Location: N: Highland Street S: Highland Street
Location: E: Ashbury Street W: Pleasant Avenue
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 2:00 PM
End Time: 6:00 PM
Class:



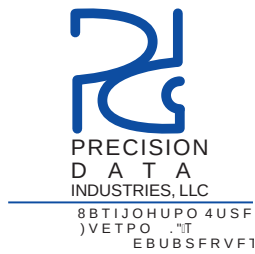
Pedestrians

	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	5	0	5	0	0	0	0	0	1	1	7
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
Total	0	0	0	0	0	1	1	0	0	0	0	0	2	2	0	0	0	0	5	3	8	0	0	0	0	0	1	1	12
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	2	2	0	0	0	0	0	0	0	4
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	2	0	0	0	0	2	0	2	0	0	0	0	0	0	0	4
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	2	2	4	0	0	0	0	2	2	4	0	0	0	0	1	0	1	9
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	3	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	3
Grand Total	0	0	0	0	1	3	4	0	0	0	0	2	4	6	0	0	0	0	8	5	13	0	0	0	0	3	1	4	27
Approach %	0	0	0	0	25	75		0	0	0	0	33.3	66.7		0	0	0	0	61.5	38.5		0	0	0	0	75	25		
Total %	0	0	0	0	3.7	11.1	14.8	0	0	0	0	7.41	14.8	22.2	0	0	0	0	29.6	18.5	48.1	0	0	0	0	11.1	3.7	14.8	
Exiting Leg Total	4							6							13							4							27

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Highland Street							Ashbury Street							Highland Street							Pleasant Avenue							Total
	from North							from East							from South							from West							
	Right	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	4
% Approach Total	0.0	0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	100.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.500
Entering Leg	0	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	1	0	1	4
Exiting Leg	2							0							1							1							4
Total	4							0							2							2							8

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Cutler Elementary School West Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:00 AM	0	0	0	0	0	19	0	19	28	0	0	28	47
7:15 AM	0	0	0	0	1	32	0	33	48	0	0	48	81
7:30 AM	0	0	0	0	2	30	0	32	57	3	0	60	92
7:45 AM	0	0	0	0	1	34	0	35	73	5	0	78	113
Total	0	0	0	0	4	115	0	119	206	8	0	214	333
8:00 AM	0	0	0	0	8	36	0	44	56	9	0	65	109
8:15 AM	0	0	0	0	26	50	0	76	37	20	0	57	133
8:30 AM	0	0	0	0	1	52	0	53	40	0	0	40	93
8:45 AM	0	0	0	0	1	59	0	60	36	0	0	36	96
Total	0	0	0	0	36	197	0	233	169	29	0	198	431
Grand Total	0	0	0	0	40	312	0	352	375	37	0	412	764
Approach %	0.0	0.0	0.0		11.4	88.6	0.0		91.0	9.0	0.0		
Total %	0.0	0.0	0.0	0.0	5.2	40.8	0.0	46.1	49.1	4.8	0.0	53.9	
Exiting Leg Total	77				375				312				764
Cars	0	0	0	0	40	290	0	330	343	37	0	380	710
% Cars	0.0	0.0	0.0	0.0	100.0	92.9	0.0	93.8	91.5	100.0	0.0	92.2	92.9
Exiting Leg Total	77				343				290				710
Heavy Vehicles	0	0	0	0	0	22	0	22	32	0	0	32	54
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	7.1	0.0	6.3	8.5	0.0	0.0	7.8	7.1
Exiting Leg Total	0				32				22				54

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School West Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:45 AM	0	0	0	0	1	34	0	35	73	5	0	78	113
8:00 AM	0	0	0	0	8	36	0	44	56	9	0	65	109
8:15 AM	0	0	0	0	26	50	0	76	37	20	0	57	133
8:30 AM	0	0	0	0	1	52	0	53	40	0	0	40	93
Total Volume	0	0	0	0	36	172	0	208	206	34	0	240	448
% Approach Total	0.0	0.0	0.0		17.3	82.7	0.0		85.8	14.2	0.0		
PHF	0.000	0.000	0.000	0.000	0.346	0.827	0.000	0.684	0.705	0.425	0.000	0.769	0.842
Cars	0	0	0	0	36	159	0	195	186	34	0	220	415
Cars %	0.0	0.0	0.0	0.0	100.0	92.4	0.0	93.8	90.3	100.0	0.0	91.7	92.6
Heavy Vehicles	0	0	0	0	0	13	0	13	20	0	0	20	33
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	7.6	0.0	6.3	9.7	0.0	0.0	8.3	7.4
Cars Enter Leg	0	0	0	0	36	159	0	195	186	34	0	220	415
Heavy Enter Leg	0	0	0	0	0	13	0	13	20	0	0	20	33
Total Entering Leg	0	0	0	0	36	172	0	208	206	34	0	240	448
Cars Exiting Leg	70				186				159				415
Heavy Exiting Leg	0				20				13				33
Total Exiting Leg	70				206				172				448

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



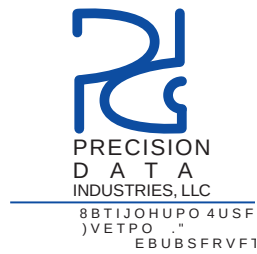
Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0	
Exiting Leg Total	1						1						0						2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg						1						0							1
Total						2						0							2

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



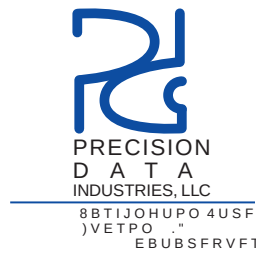
Pedestrians

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	3	1	4	0	0	0	0	0	0	0	0	0	0	0	0	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	4	3	7	0	0	0	0	0	0	0	0	0	0	0	0	7
8:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	2	4	5
8:30 AM	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
8:45 AM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	4	6	10	0	0	0	0	0	0	0	0	0	2	2	4	14
Grand Total	0	0	0	8	9	17	0	0	0	0	0	0	0	0	0	2	2	4	21
Approach %	0	0	0	47.059	52.941		0	0	0	0	0	0	0	0	0	50	50		
Total %	0	0	0	38.095	42.857	80.952	0	0	0	0	0	0	0	0	0	9.5238	9.5238	19.048	
Exiting Leg Total	17						0						4						21

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	2	2	4	5
8:30 AM	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	0	0	3	5	8	0	0	0	0	0	0	0	0	0	2	2	4	12
% Approach Total	0.0	0.0	0.0	37.5	62.5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0		
PHF	0.000	0.000	0.000	0.250	0.417	0.333	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.250	0.500
Entering Leg	0	0	0	3	5	8	0	0	0	0	0	0	0	0	0	2	2	4	12
Exiting Leg	8						0						4						12
Total	16						0						8						24

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



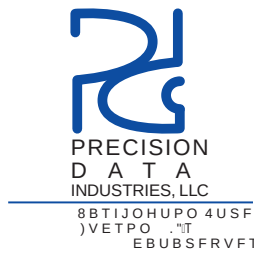
Cars and Heavy Vehicles (Combined)

	Cutler Elementary School West Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	20	0	20	29	0	0	29	49
2:15 PM	0	0	0	0	0	39	0	39	24	0	0	24	63
2:30 PM	0	0	0	0	7	44	0	51	25	3	0	28	79
2:45 PM	0	0	0	0	19	47	0	66	41	5	0	46	112
Total	0	0	0	0	26	150	0	176	119	8	0	127	303
3:00 PM	0	0	0	0	4	43	0	47	48	3	0	51	98
3:15 PM	0	0	0	0	0	64	0	64	49	0	0	49	113
3:30 PM	0	1	0	1	0	63	0	63	33	0	0	33	97
3:45 PM	1	0	0	1	0	56	0	56	37	1	0	38	95
Total	1	1	0	2	4	226	0	230	167	4	0	171	403
4:00 PM	0	0	0	0	0	53	0	53	37	1	0	38	91
4:15 PM	0	0	0	0	0	49	0	49	45	0	0	45	94
4:30 PM	0	0	0	0	0	68	0	68	46	0	0	46	114
4:45 PM	0	0	0	0	0	63	0	63	50	0	0	50	113
Total	0	0	0	0	0	233	0	233	178	1	0	179	412
5:00 PM	0	0	0	0	0	65	0	65	49	1	0	50	115
5:15 PM	0	0	0	0	5	56	0	61	47	4	0	51	112
5:30 PM	1	0	0	1	5	77	0	82	32	6	0	38	121
5:45 PM	0	0	0	0	0	63	0	63	37	0	0	37	100
Total	1	0	0	1	10	261	0	271	165	11	0	176	448
Grand Total	2	1	0	3	40	870	0	910	629	24	0	653	1566
Approach %	66.7	33.3	0.0		4.4	95.6	0.0		96.3	3.7	0.0		
Total %	0.1	0.1	0.0	0.2	2.6	55.6	0.0	58.1	40.2	1.5	0.0	41.7	
Exiting Leg Total	64				630				872				1566
Cars	2	1	0	3	40	845	0	885	610	24	0	634	1522
% Cars	100.0	100.0	0.0	100.0	100.0	97.1	0.0	97.3	97.0	100.0	0.0	97.1	97.2
Exiting Leg Total	64				611				847				1522
Heavy Vehicles	0	0	0	0	0	25	0	25	19	0	0	19	44
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	2.9	0.0	2.7	3.0	0.0	0.0	2.9	2.8
Exiting Leg Total	0				19				25				44

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School West Drive				Asbury Street				Asbury Street				Total	
	from North				from East				from West					
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total		
2:30 PM	0	0	0	0	7	44	0	51	25	3	0	28	79	
2:45 PM	0	0	0	0	19	47	0	66	41	5	0	46	112	
3:00 PM	0	0	0	0	4	43	0	47	48	3	0	51	98	
3:15 PM	0	0	0	0	0	64	0	64	49	0	0	49	113	
Total Volume	0	0	0	0	30	198	0	228	163	11	0	174	402	
% Approach Total	0.0	0.0	0.0		13.2	86.8	0.0		93.7	6.3	0.0			
PHF	0.000	0.000	0.000	0.000	0.395	0.773	0.000	0.864	0.832	0.550	0.000	0.853	0.889	
Cars	0	0	0	0	30	184	0	214	155	11	0	166	380	
Cars %	0.0	0.0	0.0	0.0	100.0	92.9	0.0	93.9	95.1	100.0	0.0	95.4	94.5	
Heavy Vehicles	0	0	0	0	0	14	0	14	8	0	0	8	22	
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	7.1	0.0	6.1	4.9	0.0	0.0	4.6	5.5	
Cars Enter Leg	0	0	0	0	30	184	0	214	155	11	0	166	380	
Heavy Enter Leg	0	0	0	0	0	14	0	14	8	0	0	8	22	
Total Entering Leg	0	0	0	0	30	198	0	228	163	11	0	174	402	
Cars Exiting Leg					41				155				184	380
Heavy Exiting Leg					0				8				14	22
Total Exiting Leg					41				163				198	402

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



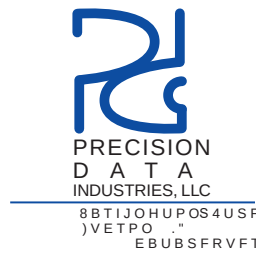
Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
Total	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	2	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	1	3
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	4	0	0	0	4	1	0	0	0	0	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
5:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	0	0	4	3	7	0	9	0	0	0	9	3	0	0	0	0	3	19
Approach %	0.0	0.0	0.0	57.1	42.9		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	21.1	15.8	36.8	0.0	47.4	0.0	0.0	0.0	47.4	15.8	0.0	0.0	0.0	0.0	15.8	
Exiting Leg Total	7						3						9						19

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
Exiting Leg						1						0						1	2
Total						2						1						1	4

PDI File #: 240205 B
Location: N: Cutler Elementary School West Drive
Location: E: Asbury Street W: Asbury Street
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2400246.00
Count Date: Thursday, September 19, 2024
Start Time: 2:00 PM
End Time: 6:00 PM
Class:



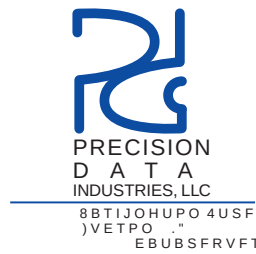
Pedestrians

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	7	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	1	1	2	4	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	3	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Total	0	0	0	6	12	18	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Grand Total	0	0	0	16	18	34	0	0	0	0	0	0	0	0	0	1	1	2	36	36
Approach %	0	0	0	47.059	52.941		0	0	0	0	0	0	0	0	0	50	50			
Total %	0	0	0	44.444	50	94.444	0	0	0	0	0	0	0	0	0	2.7778	2.7778	5.5556		
Exiting Leg Total	34						0						2						2	36

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total		
	from North						from East						from West								
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total			
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	
Total Volume	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	1	1	2		8	
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	50.0				
PHF	0.000	0.000	0.000	0.300	0.000	0.300	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.500		0.400	
Entering Leg	0	0	0	6	0	6	0	0	0	0	0	0	0	0	0	1	1	2		8	
Exiting Leg	6						0						2							2	8
Total	12						0						4							4	16

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



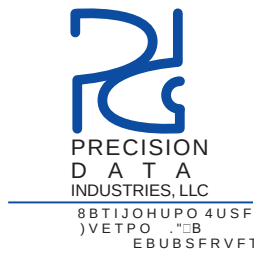
Cars and Heavy Vehicles (Combined)

	Cutler Elementary School West Drive				Asbury Street				Asbury Street				
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	20	0	20	29	0	0	29	49
2:15 PM	0	0	0	0	0	39	0	39	24	0	0	24	63
2:30 PM	0	0	0	0	7	44	0	51	25	3	0	28	79
2:45 PM	0	0	0	0	19	47	0	66	41	5	0	46	112
Total	0	0	0	0	26	150	0	176	119	8	0	127	303
3:00 PM	0	0	0	0	4	43	0	47	48	3	0	51	98
3:15 PM	0	0	0	0	0	64	0	64	49	0	0	49	113
3:30 PM	0	1	0	1	0	63	0	63	33	0	0	33	97
3:45 PM	1	0	0	1	0	56	0	56	37	1	0	38	95
Total	1	1	0	2	4	226	0	230	167	4	0	171	403
4:00 PM	0	0	0	0	0	53	0	53	37	1	0	38	91
4:15 PM	0	0	0	0	0	49	0	49	45	0	0	45	94
4:30 PM	0	0	0	0	0	68	0	68	46	0	0	46	114
4:45 PM	0	0	0	0	0	63	0	63	50	0	0	50	113
Total	0	0	0	0	0	233	0	233	178	1	0	179	412
5:00 PM	0	0	0	0	0	65	0	65	49	1	0	50	115
5:15 PM	0	0	0	0	5	56	0	61	47	4	0	51	112
5:30 PM	1	0	0	1	5	77	0	82	32	6	0	38	121
5:45 PM	0	0	0	0	0	63	0	63	37	0	0	37	100
Total	1	0	0	1	10	261	0	271	165	11	0	176	448
Grand Total	2	1	0	3	40	870	0	910	629	24	0	653	1566
Approach %	66.7	33.3	0.0		4.4	95.6	0.0		96.3	3.7	0.0		
Total %	0.1	0.1	0.0	0.2	2.6	55.6	0.0	58.1	40.2	1.5	0.0	41.7	
Exiting Leg Total	64				630				872				1566
Cars	2	1	0	3	40	845	0	885	610	24	0	634	1522
% Cars	100.0	100.0	0.0	100.0	100.0	97.1	0.0	97.3	97.0	100.0	0.0	97.1	97.2
Exiting Leg Total	64				611				847				1522
Heavy Vehicles	0	0	0	0	0	25	0	25	19	0	0	19	44
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	2.9	0.0	2.7	3.0	0.0	0.0	2.9	2.8
Exiting Leg Total	0				19				25				44

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School West Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
4:30 PM	0	0	0	0	0	68	0	68	46	0	0	46	114
4:45 PM	0	0	0	0	0	63	0	63	50	0	0	50	113
5:00 PM	0	0	0	0	0	65	0	65	49	1	0	50	115
5:15 PM	0	0	0	0	5	56	0	61	47	4	0	51	112
Total Volume	0	0	0	0	5	252	0	257	192	5	0	197	454
% Approach Total	0.0	0.0	0.0		1.9	98.1	0.0		97.5	2.5	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.926	0.000	0.945	0.960	0.313	0.000	0.966	0.987
Cars	0	0	0	0	5	248	0	253	191	5	0	196	449
Cars %	0.0	0.0	0.0	0.0	100.0	98.4	0.0	98.4	99.5	100.0	0.0	99.5	98.9
Heavy Vehicles	0	0	0	0	0	4	0	4	1	0	0	1	5
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	1.6	0.0	1.6	0.5	0.0	0.0	0.5	1.1
Cars Enter Leg	0	0	0	0	5	248	0	253	191	5	0	196	449
Heavy Enter Leg	0	0	0	0	0	4	0	4	1	0	0	1	5
Total Entering Leg	0	0	0	0	5	252	0	257	192	5	0	197	454
Cars Exiting Leg	10				191				248				449
Heavy Exiting Leg	0				1				4				5
Total Exiting Leg	10				192				252				454

PDI File #: **240205 B**
 Location: **N: Cutler Elementary School West Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



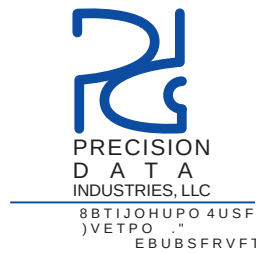
Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
Total	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	2	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	1	3
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	4	0	0	0	4	1	0	0	0	0	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
5:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	0	0	4	3	7	0	9	0	0	0	9	3	0	0	0	0	3	19
Approach %	0.0	0.0	0.0	57.1	42.9		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	21.1	15.8	36.8	0.0	47.4	0.0	0.0	0.0	47.4	15.8	0.0	0.0	0.0	0.0	15.8	
Exiting Leg Total	7						3						9						19

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	3
Total Volume	0	0	0	1	0	1	0	2	0	0	0	2	2	0	0	0	0	2	5
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.417
Entering Leg	0	0	0	1	0	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Exiting Leg	1						2						2						5
Total	2						4						4						10

PDI File #: **240205 B**
Location: **N: Cutler Elementary School West Drive**
Location: **E: Asbury Street W: Asbury Street**
City, State: **Hamilton, MA**
Client: **GPI/ R. Brown**
Site Code: **NEX-2400246.00**
Count Date: **Thursday, September 19, 2024**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:



Pedestrians

	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	7	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	1	1	2	4
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	3	5	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
Total	0	0	0	6	12	18	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Grand Total	0	0	0	16	18	34	0	0	0	0	0	0	0	0	0	0	1	1	2	36
Approach %	0	0	0	47.059	52.941		0	0	0	0	0	0	0	0	0	0	50	50		
Total %	0	0	0	44.444	50	94.444	0	0	0	0	0	0	0	0	0	0	2.7778	2.7778	5.5556	
Exiting Leg Total						34						0							2	36

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School West Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	4	8	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
% Approach Total	0.0	0.0	0.0	33.3	66.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.500	0.500	0.750	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000		0.750
Entering Leg	0	0	0	4	8	12	0	0	0	0	0	0	0	0	0	0	0	0	0	12
Exiting Leg						12						0						0	0	12
Total						24						0						0	0	24

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class:

Cars and Heavy Vehicles (Combined)

	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:00 AM	0	0	0	0	0	20	0	20	26	0	0	26	46
7:15 AM	0	0	0	0	0	31	0	31	51	0	0	51	82
7:30 AM	1	0	0	1	0	38	0	38	59	0	0	59	98
7:45 AM	0	1	0	1	0	33	0	33	68	0	0	68	102
Total	1	1	0	2	0	122	0	122	204	0	0	204	328
8:00 AM	1	2	0	3	0	44	0	44	59	0	0	59	106
8:15 AM	19	31	0	50	0	62	0	62	36	0	0	36	148
8:30 AM	3	4	0	7	0	50	0	50	37	0	0	37	94
8:45 AM	1	2	0	3	0	55	0	55	40	0	0	40	98
Total	24	39	0	63	0	211	0	211	172	0	0	172	446
Grand Total	25	40	0	65	0	333	0	333	376	0	0	376	774
Approach %	38.5	61.5	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
Total %	3.2	5.2	0.0	8.4	0.0	43.0	0.0	43.0	48.6	0.0	0.0	48.6	
Exiting Leg Total	0				416				358				774
Cars	21	37	0	58	0	312	0	312	345	0	0	345	715
% Cars	84.0	92.5	0.0	89.2	0.0	93.7	0.0	93.7	91.8	0.0	0.0	91.8	92.4
Exiting Leg Total	0				382				333				715
Heavy Vehicles	4	3	0	7	0	21	0	21	31	0	0	31	59
% Heavy Vehicles	16.0	7.5	0.0	10.8	0.0	6.3	0.0	6.3	8.2	0.0	0.0	8.2	7.6
Exiting Leg Total	0				34				25				59

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:45 AM	0	1	0	1	0	33	0	33	68	0	0	68	102
8:00 AM	1	2	0	3	0	44	0	44	59	0	0	59	106
8:15 AM	19	31	0	50	0	62	0	62	36	0	0	36	148
8:30 AM	3	4	0	7	0	50	0	50	37	0	0	37	94
Total Volume	23	38	0	61	0	189	0	189	200	0	0	200	450
% Approach Total	37.7	62.3	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.303	0.306	0.000	0.305	0.000	0.762	0.000	0.762	0.735	0.000	0.000	0.735	0.760
Cars	20	35	0	55	0	177	0	177	185	0	0	185	417
Cars %	87.0	92.1	0.0	90.2	0.0	93.7	0.0	93.7	92.5	0.0	0.0	92.5	92.7
Heavy Vehicles	3	3	0	6	0	12	0	12	15	0	0	15	33
Heavy Vehicles %	13.0	7.9	0.0	9.8	0.0	6.3	0.0	6.3	7.5	0.0	0.0	7.5	7.3
Cars Enter Leg	20	35	0	55	0	177	0	177	185	0	0	185	417
Heavy Enter Leg	3	3	0	6	0	12	0	12	15	0	0	15	33
Total Entering Leg	23	38	0	61	0	189	0	189	200	0	0	200	450
Cars Exiting Leg	0				220				197				417
Heavy Exiting Leg	0				18				15				33
Total Exiting Leg	0				238				212				450

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	50.0	50.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0	
Exiting Leg Total	1						1						0						2

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	1	0	0	0	0	0	0		0	0	0	0	0	1
Exiting Leg	1						0						0						1
Total	2						0						0						2

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Pedestrians

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:30 AM	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	4	4	8	0	0	0	0	0	0	0	0	0	0	0	0	8
8:00 AM	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
8:45 AM	0	0	0	2	1	3	0	0	0	1	0	1	0	0	0	0	0	0	4
Total	0	0	0	5	5	10	0	0	0	1	1	2	0	0	0	0	0	0	12
Grand Total	0	0	0	9	9	18	0	0	0	1	1	2	0	0	0	0	0	0	20
Approach %	0	0	0	50	50		0	0	0	50	50		0	0	0	0	0		
Total %	0	0	0	45	45	90	0	0	0	5	5	10	0	0	0	0	0	0	
Exiting Leg Total	18						2						0						20

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	2
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	6
Total Volume	0	0	0	3	5	8	0	0	0	0	1	1	0	0	0	0	0	0	9
% Approach Total	0.0	0.0	0.0	37.5	62.5		0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.417	0.333	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.375
Entering Leg	0	0	0	3	5	8	0	0	0	0	1	1	0	0	0	0	0	0	9
Exiting Leg	8						1						0						9
Total	16						2						0						18

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	25	0	25	30	0	0	30	55
2:15 PM	0	1	0	1	0	34	0	34	26	0	0	26	61
2:30 PM	0	0	0	0	0	54	0	54	24	0	0	24	78
2:45 PM	3	3	0	6	0	60	0	60	39	0	0	39	105
Total	3	4	0	7	0	173	0	173	119	0	0	119	299
3:00 PM	12	29	0	41	0	36	0	36	47	0	0	47	124
3:15 PM	4	7	0	11	0	62	0	62	50	0	0	50	123
3:30 PM	2	1	0	3	0	61	0	61	31	0	0	31	95
3:45 PM	3	2	0	5	0	56	0	56	39	0	0	39	100
Total	21	39	0	60	0	215	0	215	167	0	0	167	442
4:00 PM	4	2	0	6	1	50	0	51	36	0	0	36	93
4:15 PM	3	0	0	3	0	44	0	44	46	0	0	46	93
4:30 PM	2	0	0	2	0	66	0	66	48	0	0	48	116
4:45 PM	1	1	0	2	0	69	0	69	48	0	0	48	119
Total	10	3	0	13	1	229	0	230	178	0	0	178	421
5:00 PM	4	0	0	4	2	59	0	61	52	0	0	52	117
5:15 PM	0	1	0	1	9	61	0	70	45	0	0	45	116
5:30 PM	0	4	0	4	3	80	0	83	32	0	0	32	119
5:45 PM	1	3	0	4	0	58	0	58	35	0	0	35	97
Total	5	8	0	13	14	258	0	272	164	0	0	164	449
Grand Total	39	54	0	93	15	875	0	890	628	0	0	628	1611
Approach %	41.9	58.1	0.0		1.7	98.3	0.0		100.0	0.0	0.0		
Total %	2.4	3.4	0.0	5.8	0.9	54.3	0.0	55.2	39.0	0.0	0.0	39.0	
Exiting Leg Total	15				682				914				1611
Cars	37	49	0	86	15	848	0	863	607	0	0	607	1556
% Cars	94.9	90.7	0.0	92.5	100.0	96.9	0.0	97.0	96.7	0.0	0.0	96.7	96.6
Exiting Leg Total	15				656				885				1556
Heavy Vehicles	2	5	0	7	0	27	0	27	21	0	0	21	55
% Heavy Vehicles	5.1	9.3	0.0	7.5	0.0	3.1	0.0	3.0	3.3	0.0	0.0	3.3	3.4
Exiting Leg Total	0				26				29				55

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:30 PM	0	0	0	0	0	54	0	54	24	0	0	24	78
2:45 PM	3	3	0	6	0	60	0	60	39	0	0	39	105
3:00 PM	12	29	0	41	0	36	0	36	47	0	0	47	124
3:15 PM	4	7	0	11	0	62	0	62	50	0	0	50	123
Total Volume	19	39	0	58	0	212	0	212	160	0	0	160	430
% Approach Total	32.8	67.2	0.0		0.0	100.0	0.0		100.0	0.0	0.0		
PHF	0.396	0.336	0.000	0.354	0.000	0.855	0.000	0.855	0.800	0.000	0.000	0.800	0.867
Cars	17	35	0	52	0	199	0	199	152	0	0	152	403
Cars %	89.5	89.7	0.0	89.7	0.0	93.9	0.0	93.9	95.0	0.0	0.0	95.0	93.7
Heavy Vehicles	2	4	0	6	0	13	0	13	8	0	0	8	27
Heavy Vehicles %	10.5	10.3	0.0	10.3	0.0	6.1	0.0	6.1	5.0	0.0	0.0	5.0	6.3
Cars Enter Leg	17	35	0	52	0	199	0	199	152	0	0	152	403
Heavy Enter Leg	2	4	0	6	0	13	0	13	8	0	0	8	27
Total Entering Leg	19	39	0	58	0	212	0	212	160	0	0	160	430
Cars Exiting Leg				0				187				216	403
Heavy Exiting Leg				0				12				15	27
Total Exiting Leg				0				199				231	430

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**



Class: **Bicycles (on Roadway and Crosswalks)**

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
Total	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	2	2	0	2	0	0	0	2	0	0	0	0	0	0	4
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	2	0	2	0	0	0	2	0	0	0	0	0	0	4
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	1	0	1	0	2	0	1	0	3	1	0	0	0	0	1	5
4:30 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	2	0	4	0	1	0	5	1	0	0	0	0	1	8
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
5:30 PM	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	0	0	4	3	7	0	9	0	1	0	10	3	0	0	0	0	3	20
Approach %	0.0	0.0	0.0	57.1	42.9		0.0	90.0	0.0	10.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	20.0	15.0	35.0	0.0	45.0	0.0	5.0	0.0	50.0	15.0	0.0	0.0	0.0	0.0	15.0	
Exiting Leg Total	7						4						9						20

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
Exiting Leg												0						1	3
Total						4						1						1	6

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	7	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	3	6	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	0	6	13	19	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Grand Total	0	0	0	16	22	38	0	0	0	0	0	0	0	0	0	0	0	0	0	38
Approach %	0	0	0	42.105	57.895		0	0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	42.105	57.895	100	0	0	0	0	0	0	0	0	0	0	0	0		
Exiting Leg Total	38						0						0						38	

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10
% Approach Total	0.0	0.0	0.0	70.0	30.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.350	0.250	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0	0	0	0	10
Exiting Leg	10						0						0						10	
Total	20						0						0						20	

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	25	0	25	30	0	0	30	55
2:15 PM	0	1	0	1	0	34	0	34	26	0	0	26	61
2:30 PM	0	0	0	0	0	54	0	54	24	0	0	24	78
2:45 PM	3	3	0	6	0	60	0	60	39	0	0	39	105
Total	3	4	0	7	0	173	0	173	119	0	0	119	299
3:00 PM	12	29	0	41	0	36	0	36	47	0	0	47	124
3:15 PM	4	7	0	11	0	62	0	62	50	0	0	50	123
3:30 PM	2	1	0	3	0	61	0	61	31	0	0	31	95
3:45 PM	3	2	0	5	0	56	0	56	39	0	0	39	100
Total	21	39	0	60	0	215	0	215	167	0	0	167	442
4:00 PM	4	2	0	6	1	50	0	51	36	0	0	36	93
4:15 PM	3	0	0	3	0	44	0	44	46	0	0	46	93
4:30 PM	2	0	0	2	0	66	0	66	48	0	0	48	116
4:45 PM	1	1	0	2	0	69	0	69	48	0	0	48	119
Total	10	3	0	13	1	229	0	230	178	0	0	178	421
5:00 PM	4	0	0	4	2	59	0	61	52	0	0	52	117
5:15 PM	0	1	0	1	9	61	0	70	45	0	0	45	116
5:30 PM	0	4	0	4	3	80	0	83	32	0	0	32	119
5:45 PM	1	3	0	4	0	58	0	58	35	0	0	35	97
Total	5	8	0	13	14	258	0	272	164	0	0	164	449
Grand Total	39	54	0	93	15	875	0	890	628	0	0	628	1611
Approach %	41.9	58.1	0.0		1.7	98.3	0.0		100.0	0.0	0.0		
Total %	2.4	3.4	0.0	5.8	0.9	54.3	0.0	55.2	39.0	0.0	0.0	39.0	
Exiting Leg Total	15				682				914				1611
Cars	37	49	0	86	15	848	0	863	607	0	0	607	1556
% Cars	94.9	90.7	0.0	92.5	100.0	96.9	0.0	97.0	96.7	0.0	0.0	96.7	96.6
Exiting Leg Total	15				656				885				1556
Heavy Vehicles	2	5	0	7	0	27	0	27	21	0	0	21	55
% Heavy Vehicles	5.1	9.3	0.0	7.5	0.0	3.1	0.0	3.0	3.3	0.0	0.0	3.3	3.4
Exiting Leg Total	0				26				29				55

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School Middle Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
4:30 PM	2	0	0	2	0	66	0	66	48	0	0	48	116
4:45 PM	1	1	0	2	0	69	0	69	48	0	0	48	119
5:00 PM	4	0	0	4	2	59	0	61	52	0	0	52	117
5:15 PM	0	1	0	1	9	61	0	70	45	0	0	45	116
Total Volume	7	2	0	9	11	255	0	266	193	0	0	193	468
% Approach Total	77.8	22.2	0.0		4.1	95.9	0.0		100.0	0.0	0.0		
PHF	0.438	0.500	0.000	0.563	0.306	0.924	0.000	0.950	0.928	0.000	0.000	0.928	0.983
Cars	7	2	0	9	11	250	0	261	191	0	0	191	461
Cars %	100.0	100.0	0.0	100.0	100.0	98.0	0.0	98.1	99.0	0.0	0.0	99.0	98.5
Heavy Vehicles	0	0	0	0	0	5	0	5	2	0	0	2	7
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	2.0	0.0	1.9	1.0	0.0	0.0	1.0	1.5
Cars Enter Leg	7	2	0	9	11	250	0	261	191	0	0	191	461
Heavy Enter Leg	0	0	0	0	0	5	0	5	2	0	0	2	7
Total Entering Leg	7	2	0	9	11	255	0	266	193	0	0	193	468
Cars Exiting Leg				11				193				257	461
Heavy Exiting Leg				0				2				5	7
Total Exiting Leg				11				195				262	468

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**



Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
Total	0	0	0	2	0	2	0	1	0	0	0	1	0	0	0	0	0	0	3
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	2	2	0	2	0	0	0	2	0	0	0	0	0	0	4
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	2	2	0	2	0	0	0	2	0	0	0	0	0	0	4
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	1	0	1	0	2	0	1	0	3	1	0	0	0	0	1	5
4:30 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	0	2	0	4	0	1	0	5	1	0	0	0	0	1	8
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
5:30 PM	0	0	0	0	1	1	0	1	0	0	0	1	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	0	0	4	3	7	0	9	0	1	0	10	3	0	0	0	0	3	20
Approach %	0.0	0.0	0.0	57.1	42.9		0.0	90.0	0.0	10.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	20.0	15.0	35.0	0.0	45.0	0.0	5.0	0.0	50.0	15.0	0.0	0.0	0.0	0.0	15.0	
Exiting Leg Total	7						4						9						20

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	0	0	0	0	2
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	2	0	0	0	0	2	3
Total Volume	0	0	0	1	0	1	0	2	0	0	0	2	2	0	0	0	0	2	5
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250	0.417
Entering Leg	0	0	0	1	0	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Exiting Leg						1						2						2	5
Total						2						4						4	10

PDI File #: **240205 C**
 Location: **N: Cutler Elementary School Middle Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



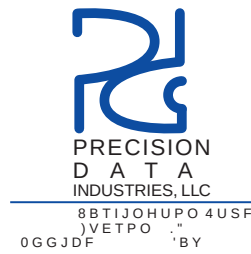
Pedestrians

	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
2:45 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	7	1	8	0	0	0	0	0	0	0	0	0	0	0	0	0	8
3:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	3
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	3	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	6
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	3	6	9	0	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	0	6	13	19	0	0	0	0	0	0	0	0	0	0	0	0	0	19
Grand Total	0	0	0	16	22	38	0	0	0	0	0	0	0	0	0	0	0	0	0	38
Approach %	0	0	0	42.105	57.895		0	0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	42.105	57.895	100	0	0	0	0	0	0	0	0	0	0	0	0		
Exiting Leg Total	38						0						0						0	38

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School Middle Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
5:15 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	0	0	0	3	8	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11
% Approach Total	0.0	0.0	0.0	27.3	72.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.375	0.500	0.688	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.688	
Entering Leg	0	0	0	3	8	11	0	0	0	0	0	0	0	0	0	0	0	0	0	11
Exiting Leg						11													0	11
Total						22													0	22

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



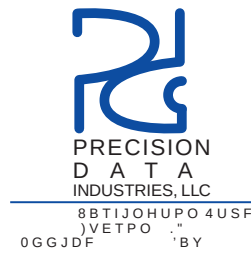
Cars and Heavy Vehicles (Combined)

	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:00 AM	0	0	0	0	1	18	0	19	23	2	0	25	44
7:15 AM	0	0	0	0	0	30	0	30	48	0	0	48	78
7:30 AM	0	0	0	0	2	33	0	35	55	0	0	55	90
7:45 AM	0	0	0	0	4	33	0	37	71	2	0	73	110
Total	0	0	0	0	7	114	0	121	197	4	0	201	322
8:00 AM	0	0	0	0	4	44	0	48	56	2	0	58	106
8:15 AM	0	0	0	0	2	64	0	66	69	1	0	70	136
8:30 AM	0	0	0	0	3	48	0	51	47	0	0	47	98
8:45 AM	0	0	0	0	2	60	0	62	32	0	0	32	94
Total	0	0	0	0	11	216	0	227	204	3	0	207	434
Grand Total	0	0	0	0	18	330	0	348	401	7	0	408	756
Approach %	0.0	0.0	0.0		5.2	94.8	0.0		98.3	1.7	0.0		
Total %	0.0	0.0	0.0	0.0	2.4	43.7	0.0	46.0	53.0	0.9	0.0	54.0	
Exiting Leg Total	25				401				330				756
Cars	0	0	0	0	13	311	0	324	373	5	0	378	702
% Cars	0.0	0.0	0.0	0.0	72.2	94.2	0.0	93.1	93.0	71.4	0.0	92.6	92.9
Exiting Leg Total	18				373				311				702
Heavy Vehicles	0	0	0	0	5	19	0	24	28	2	0	30	54
% Heavy Vehicles	0.0	0.0	0.0	0.0	27.8	5.8	0.0	6.9	7.0	28.6	0.0	7.4	7.1
Exiting Leg Total	7				28				19				54

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
7:45 AM	0	0	0	0	4	33	0	37	71	2	0	73	110
8:00 AM	0	0	0	0	4	44	0	48	56	2	0	58	106
8:15 AM	0	0	0	0	2	64	0	66	69	1	0	70	136
8:30 AM	0	0	0	0	3	48	0	51	47	0	0	47	98
Total Volume	0	0	0	0	13	189	0	202	243	5	0	248	450
% Approach Total	0.0	0.0	0.0		6.4	93.6	0.0		98.0	2.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.813	0.738	0.000	0.765	0.856	0.625	0.000	0.849	0.827
Cars	0	0	0	0	9	179	0	188	227	3	0	230	418
Cars %	0.0	0.0	0.0	0.0	69.2	94.7	0.0	93.1	93.4	60.0	0.0	92.7	92.9
Heavy Vehicles	0	0	0	0	4	10	0	14	16	2	0	18	32
Heavy Vehicles %	0.0	0.0	0.0	0.0	30.8	5.3	0.0	6.9	6.6	40.0	0.0	7.3	7.1
Cars Enter Leg	0	0	0	0	9	179	0	188	227	3	0	230	418
Heavy Enter Leg	0	0	0	0	4	10	0	14	16	2	0	18	32
Total Entering Leg	0	0	0	0	13	189	0	202	243	5	0	248	450
Cars Exiting Leg	12				227				179				418
Heavy Exiting Leg	6				16				10				32
Total Exiting Leg	18				243				189				450

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Bicycles (on Roadway and Crosswalks)**

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		
Total %	0.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	1						0						0						1

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	1	0	0	0	0	0	0		0	0	0	0	0	1
Exiting Leg						1						0		0	0	0	0	0	1
Total						2						0						0	2

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Pedestrians

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
7:45 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	4	3	7	0	0	0	0	0	0	0	0	0	0	0	0	7
8:00 AM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	0	0	5	8	13	0	0	0	0	0	0	0	0	0	0	0	0	13
8:30 AM	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
8:45 AM	0	0	0	5	2	7	0	0	0	0	0	0	0	0	0	0	0	0	7
Total	0	0	0	11	17	28	0	0	0	0	0	0	0	0	0	0	0	0	28
Grand Total	0	0	0	15	20	35	0	0	0	0	0	0	0	0	0	0	0	0	35
Approach %	0	0	0	42.857	57.143		0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	42.857	57.143	100	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total	35						0						0						35

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
7:45 AM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
8:15 AM	0	0	0	5	8	13	0	0	0	0	0	0	0	0	0	0	0	0	0	13
8:30 AM	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	7	15	22	0	0	0	0	0	0	0	0	0	0	0	0	0	22
% Approach Total	0.0	0.0	0.0	31.8	68.2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.350	0.469	0.423	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.423
Entering Leg	0	0	0	7	15	22	0	0	0	0	0	0	0	0	0	0	0	0	0	22
Exiting Leg	22						0						0						22	
Total	44						0						0						44	

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	20	0	20	27	0	0	27	47
2:15 PM	0	0	0	0	0	35	0	35	24	1	0	25	60
2:30 PM	0	0	0	0	0	48	0	48	25	0	0	25	73
2:45 PM	0	0	0	0	3	65	0	68	42	1	0	43	111
Total	0	0	0	0	3	168	0	171	118	2	0	120	291
3:00 PM	0	0	0	0	2	37	0	39	72	1	0	73	112
3:15 PM	0	0	0	0	0	60	0	60	60	0	0	60	120
3:30 PM	0	0	0	0	1	63	0	64	35	0	0	35	99
3:45 PM	0	0	0	0	0	50	0	50	35	0	0	35	85
Total	0	0	0	0	3	210	0	213	202	1	0	203	416
4:00 PM	0	0	0	0	1	55	0	56	43	0	0	43	99
4:15 PM	0	0	0	0	0	48	0	48	43	0	0	43	91
4:30 PM	0	0	0	0	0	61	0	61	46	0	0	46	107
4:45 PM	0	0	0	0	0	67	0	67	54	0	0	54	121
Total	0	0	0	0	1	231	0	232	186	0	0	186	418
5:00 PM	0	0	0	0	0	63	0	63	48	1	0	49	112
5:15 PM	0	0	0	0	0	67	0	67	45	0	0	45	112
5:30 PM	0	0	0	0	0	86	0	86	37	1	0	38	124
5:45 PM	0	0	0	0	1	63	0	64	39	1	0	40	104
Total	0	0	0	0	1	279	0	280	169	3	0	172	452
Grand Total	0	0	0	0	8	888	0	896	675	6	0	681	1577
Approach %	0.0	0.0	0.0		0.9	99.1	0.0		99.1	0.9	0.0		
Total %	0.0	0.0	0.0	0.0	0.5	56.3	0.0	56.8	42.8	0.4	0.0	43.2	
Exiting Leg Total	14				675				888				1577
Cars	0	0	0	0	3	866	0	869	648	4	0	652	1521
% Cars	0.0	0.0	0.0	0.0	37.5	97.5	0.0	97.0	96.0	66.7	0.0	95.7	96.4
Exiting Leg Total	7				648				866				1521
Heavy Vehicles	0	0	0	0	5	22	0	27	27	2	0	29	56
% Heavy Vehicles	0.0	0.0	0.0	0.0	62.5	2.5	0.0	3.0	4.0	33.3	0.0	4.3	3.6
Exiting Leg Total	7				27				22				56

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total	
	from North				from East				from West					
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total		
2:30 PM	0	0	0	0	0	48	0	48	25	0	0	25	73	
2:45 PM	0	0	0	0	3	65	0	68	42	1	0	43	111	
3:00 PM	0	0	0	0	2	37	0	39	72	1	0	73	112	
3:15 PM	0	0	0	0	0	60	0	60	60	0	0	60	120	
Total Volume	0	0	0	0	5	210	0	215	199	2	0	201	416	
% Approach Total	0.0	0.0	0.0		2.3	97.7	0.0		99.0	1.0	0.0			
PHF	0.000	0.000	0.000	0.000	0.417	0.808	0.000	0.790	0.691	0.500	0.000	0.688	0.867	
Cars	0	0	0	0	1	199	0	200	187	0	0	187	387	
Cars %	0.0	0.0	0.0	0.0	20.0	94.8	0.0	93.0	94.0	0.0	0.0	93.0	93.0	
Heavy Vehicles	0	0	0	0	4	11	0	15	12	2	0	14	29	
Heavy Vehicles %	0.0	0.0	0.0	0.0	80.0	5.2	0.0	7.0	6.0	100.0	0.0	7.0	7.0	
Cars Enter Leg	0	0	0	0	1	199	0	200	187	0	0	187	387	
Heavy Enter Leg	0	0	0	0	4	11	0	15	12	2	0	14	29	
Total Entering Leg	0	0	0	0	5	210	0	215	199	2	0	201	416	
Cars Exiting Leg					1								199	387
Heavy Exiting Leg					6								11	29
Total Exiting Leg					7								210	416

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	2	0	0	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	3	5	0	2	0	0	0	2	0	0	0	0	0	0	7
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	1	3
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	4	0	0	0	4	1	0	0	0	0	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
5:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	2	0	1	4	7	0	8	0	0	0	8	3	0	0	0	0	3	18
Approach %	0.0	28.6	0.0	14.3	57.1		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	11.1	0.0	5.6	22.2	38.9	0.0	44.4	0.0	0.0	0.0	44.4	16.7	0.0	0.0	0.0	0.0	16.7	
Exiting Leg Total	5						5						8						18

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
% Approach Total	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg	1						0						0						1
Total	2						0						0						2

PDI File #: **240205 D**
Location: **N: Cutler Elementary School East Drive**
Location: **E: Asbury Street W: Asbury Street**
City, State: **Hamilton, MA**
Client: **GPI/ R. Brown**
Site Code: **NEX-2400246.00**
Count Date: **Thursday, September 19, 2024**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:



Pedestrians

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0	0	0	10
3:00 PM	0	0	0	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
3:15 PM	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	17	3	20	0	0	0	0	0	0	0	0	0	0	0	0	20
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	4	10	14	0	0	0	0	0	0	0	0	0	0	0	0	14
Grand Total	0	0	0	28	21	49	0	0	0	0	0	0	0	0	0	0	0	0	49
Approach %	0	0	0	57.143	42.857		0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	57.143	42.857	100	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total	49						0						0						49

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	5
3:00 PM	0	0	0	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
3:15 PM	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total Volume	0	0	0	20	5	25	0	0	0	0	0	0	0	0	0	0	0	0	25
% Approach Total	0.0	0.0	0.0	80.0	20.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.357	0.417	0.446	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.446
Entering Leg	0	0	0	20	5	25	0	0	0	0	0	0	0	0	0	0	0	0	25
Exiting Leg	25						0						0						25
Total	50						0						0						50

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
2:00 PM	0	0	0	0	0	20	0	20	27	0	0	27	47
2:15 PM	0	0	0	0	0	35	0	35	24	1	0	25	60
2:30 PM	0	0	0	0	0	48	0	48	25	0	0	25	73
2:45 PM	0	0	0	0	3	65	0	68	42	1	0	43	111
Total	0	0	0	0	3	168	0	171	118	2	0	120	291
3:00 PM	0	0	0	0	2	37	0	39	72	1	0	73	112
3:15 PM	0	0	0	0	0	60	0	60	60	0	0	60	120
3:30 PM	0	0	0	0	1	63	0	64	35	0	0	35	99
3:45 PM	0	0	0	0	0	50	0	50	35	0	0	35	85
Total	0	0	0	0	3	210	0	213	202	1	0	203	416
4:00 PM	0	0	0	0	1	55	0	56	43	0	0	43	99
4:15 PM	0	0	0	0	0	48	0	48	43	0	0	43	91
4:30 PM	0	0	0	0	0	61	0	61	46	0	0	46	107
4:45 PM	0	0	0	0	0	67	0	67	54	0	0	54	121
Total	0	0	0	0	1	231	0	232	186	0	0	186	418
5:00 PM	0	0	0	0	0	63	0	63	48	1	0	49	112
5:15 PM	0	0	0	0	0	67	0	67	45	0	0	45	112
5:30 PM	0	0	0	0	0	86	0	86	37	1	0	38	124
5:45 PM	0	0	0	0	1	63	0	64	39	1	0	40	104
Total	0	0	0	0	1	279	0	280	169	3	0	172	452
Grand Total	0	0	0	0	8	888	0	896	675	6	0	681	1577
Approach %	0.0	0.0	0.0		0.9	99.1	0.0		99.1	0.9	0.0		
Total %	0.0	0.0	0.0	0.0	0.5	56.3	0.0	56.8	42.8	0.4	0.0	43.2	
Exiting Leg Total	14				675				888				1577
Cars	0	0	0	0	3	866	0	869	648	4	0	652	1521
% Cars	0.0	0.0	0.0	0.0	37.5	97.5	0.0	97.0	96.0	66.7	0.0	95.7	96.4
Exiting Leg Total	7				648				866				1521
Heavy Vehicles	0	0	0	0	5	22	0	27	27	2	0	29	56
% Heavy Vehicles	0.0	0.0	0.0	0.0	62.5	2.5	0.0	3.0	4.0	33.3	0.0	4.3	3.6
Exiting Leg Total	7				27				22				56

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School East Drive				Asbury Street				Asbury Street				Total
	from North				from East				from West				
	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	
4:30 PM	0	0	0	0	0	61	0	61	46	0	0	46	107
4:45 PM	0	0	0	0	0	67	0	67	54	0	0	54	121
5:00 PM	0	0	0	0	0	63	0	63	48	1	0	49	112
5:15 PM	0	0	0	0	0	67	0	67	45	0	0	45	112
Total Volume	0	0	0	0	0	258	0	258	193	1	0	194	452
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		99.5	0.5	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.963	0.000	0.963	0.894	0.250	0.000	0.898	0.934
Cars	0	0	0	0	0	256	0	256	190	1	0	191	447
Cars %	0.0	0.0	0.0	0.0	0.0	99.2	0.0	99.2	98.4	100.0	0.0	98.5	98.9
Heavy Vehicles	0	0	0	0	0	2	0	2	3	0	0	3	5
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.8	1.6	0.0	0.0	1.5	1.1
Cars Enter Leg	0	0	0	0	0	256	0	256	190	1	0	191	447
Heavy Enter Leg	0	0	0	0	0	2	0	2	3	0	0	3	5
Total Entering Leg	0	0	0	0	0	258	0	258	193	1	0	194	452
Cars Exiting Leg				1				190				256	447
Heavy Exiting Leg				0				3				2	5
Total Exiting Leg				1				193				258	452

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	2	0	0	2	4	0	2	0	0	0	2	0	0	0	0	0	0	6
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	3	5	0	2	0	0	0	2	0	0	0	0	0	0	7
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	2	0	0	0	2	1	0	0	0	0	1	3
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	1	0	1	0	4	0	0	0	4	1	0	0	0	0	1	6
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	1	2
5:30 PM	0	0	0	0	1	1	0	0	0	0	0	0	1	0	0	0	0	1	2
5:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
Total	0	0	0	0	1	1	0	2	0	0	0	2	2	0	0	0	0	2	5
Grand Total	0	2	0	1	4	7	0	8	0	0	0	8	3	0	0	0	0	3	18
Approach %	0.0	28.6	0.0	14.3	57.1		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	0.0	11.1	0.0	5.6	22.2	38.9	0.0	44.4	0.0	0.0	0.0	44.4	16.7	0.0	0.0	0.0	0.0	16.7	
Exiting Leg Total	5						5						8						18

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total	
	from North						from East						from West							
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total		
4:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	1	0	0	0	0	0	1	2
Total Volume	0	0	0	1	0	1	0	2	0	0	0	2	1	0	0	0	0	0	1	4
% Approach Total	0.0	0.0	0.0	100.0	0.0		0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.500	0.000	0.000	0.000	0.500	0.250	0.000	0.000	0.000	0.000	0.250		0.500
Entering Leg	0	0	0	1	0	1	0	2	0	0	0	2	1	0	0	0	0	0	1	4
Exiting Leg	1						1						2						4	
Total	2						3						3						8	

PDI File #: **240205 D**
 Location: **N: Cutler Elementary School East Drive**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:30 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:45 PM	0	0	0	3	2	5	0	0	0	0	0	0	0	0	0	0	0	0	5
Total	0	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0	0	0	10
3:00 PM	0	0	0	14	0	14	0	0	0	0	0	0	0	0	0	0	0	0	14
3:15 PM	0	0	0	1	3	4	0	0	0	0	0	0	0	0	0	0	0	0	4
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total	0	0	0	17	3	20	0	0	0	0	0	0	0	0	0	0	0	0	20
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
5:00 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
5:30 PM	0	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0	0	5
5:45 PM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	4	10	14	0	0	0	0	0	0	0	0	0	0	0	0	14
Grand Total	0	0	0	28	21	49	0	0	0	0	0	0	0	0	0	0	0	0	49
Approach %	0	0	0	57.143	42.857		0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	57.143	42.857	100	0	0	0	0	0	0	0	0	0	0	0	0	
Exiting Leg Total	49						0						0						49

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Cutler Elementary School East Drive						Asbury Street						Asbury Street						Total
	from North						from East						from West						
	Right	Left	U-Turn	CW-EB	CW-WB	Total	Right	Thru	U-Turn	CW-SB	CW-NB	Total	Thru	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	0	0	0	4
4:45 PM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:15 PM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	2	8	10	0	0	0	0	0	0	0	0	0	0	0	0	10
% Approach Total	0.0	0.0	0.0	20.0	80.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.250	0.500	0.625	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.625
Entering Leg	0	0	0	2	8	10	0	0	0	0	0	0	0	0	0	0	0	0	10
Exiting Leg						10												0	10
Total						20						0						0	20

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
7:00 AM	13	67	0	80	84	20	0	104	29	15	0	44	228
7:15 AM	22	94	0	116	167	20	0	187	37	36	0	73	376
7:30 AM	29	130	0	159	49	22	0	71	49	18	0	67	297
7:45 AM	11	86	0	97	72	45	0	117	64	19	0	83	297
Total	75	377	0	452	372	107	0	479	179	88	0	267	1198
8:00 AM	21	72	0	93	76	29	0	105	63	20	0	83	281
8:15 AM	26	68	0	94	109	59	0	168	48	21	0	69	331
8:30 AM	21	80	0	101	71	46	0	117	54	19	0	73	291
8:45 AM	30	74	0	104	85	56	0	141	35	14	0	49	294
Total	98	294	0	392	341	190	0	531	200	74	0	274	1197
Grand Total	173	671	0	844	713	297	0	1010	379	162	0	541	2395
Approach %	20.5	79.5	0.0		70.6	29.4	0.0		70.1	29.9	0.0		
Total %	7.2	28.0	0.0	35.2	29.8	12.4	0.0	42.2	15.8	6.8	0.0	22.6	
Exiting Leg Total	875				1050				470				2395
Cars	156	645	0	801	684	288	0	972	368	145	0	513	2286
% Cars	90.2	96.1	0.0	94.9	95.9	97.0	0.0	96.2	97.1	89.5	0.0	94.8	95.4
Exiting Leg Total	829				1013				444				2286
Heavy Vehicles	17	26	0	43	29	9	0	38	11	17	0	28	109
% Heavy Vehicles	9.8	3.9	0.0	5.1	4.1	3.0	0.0	3.8	2.9	10.5	0.0	5.2	4.6
Exiting Leg Total	46				37				26				109

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
7:45 AM	11	86	0	97	72	45	0	117	64	19	0	83	297
8:00 AM	21	72	0	93	76	29	0	105	63	20	0	83	281
8:15 AM	26	68	0	94	109	59	0	168	48	21	0	69	331
8:30 AM	21	80	0	101	71	46	0	117	54	19	0	73	291
Total Volume	79	306	0	385	328	179	0	507	229	79	0	308	1200
% Approach Total	20.5	79.5	0.0		64.7	35.3	0.0		74.4	25.6	0.0		
PHF	0.760	0.890	0.000	0.953	0.752	0.758	0.000	0.754	0.895	0.940	0.000	0.928	0.906
Cars	70	293	0	363	316	172	0	488	226	71	0	297	1148
Cars %	88.6	95.8	0.0	94.3	96.3	96.1	0.0	96.3	98.7	89.9	0.0	96.4	95.7
Heavy Vehicles	9	13	0	22	12	7	0	19	3	8	0	11	52
Heavy Vehicles %	11.4	4.2	0.0	5.7	3.7	3.9	0.0	3.7	1.3	10.1	0.0	3.6	4.3
Cars Enter Leg	70	293	0	363	316	172	0	488	226	71	0	297	1148
Heavy Enter Leg	9	13	0	22	12	7	0	19	3	8	0	11	52
Total Entering Leg	79	306	0	385	328	179	0	507	229	79	0	308	1200
Cars Exiting Leg				387				519				242	1148
Heavy Exiting Leg				20				16				16	52
Total Exiting Leg				407				535				258	1200

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Grand Total	0	1	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	1	3
Approach %	0.0	100.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	0.0	33.3	0.0	0.0	0.0	33.3	33.3	0.0	0.0	0.0	0.0	33.3	0.0	33.3	0.0	0.0	0.0	33.3	
Exiting Leg Total	2						1						0						3

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
Exiting Leg	1						0						0						1
Total	1						1						0						2

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	1	0	1	4
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	3	0	3	0	0	0	0	0	0	0	0	0	1	0	1	4
8:00 AM	0	0	0	18	1	19	0	0	0	0	0	0	0	0	0	0	0	0	19
8:15 AM	0	0	0	5	7	12	0	0	0	0	0	0	0	0	0	0	0	0	12
8:30 AM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
8:45 AM	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	0	0	0	25	10	35	0	0	0	0	0	0	0	0	0	0	0	0	35
Grand Total	0	0	0	28	10	38	0	0	0	0	0	0	0	0	0	1	0	1	39
Approach %	0	0	0	73.684	26.316		0	0	0	0	0	0	0	0	0	100	0		
Total %	0	0	0	71.795	25.641	97.436	0	0	0	0	0	0	0	0	0	2.5641	0	2.5641	
Exiting Leg Total	38						0						1						39

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	18	1	19	0	0	0	0	0	0	0	0	0	0	0	0	19
8:15 AM	0	0	0	5	7	12	0	0	0	0	0	0	0	0	0	0	0	0	12
8:30 AM	0	0	0	2	1	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Total Volume	0	0	0	25	9	34	0	0	0	0	0	0	0	0	0	0	0	0	34
% Approach Total	0.0	0.0	0.0	73.5	26.5		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.347	0.321	0.447	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.447
Entering Leg	0	0	0	25	9	34	0	0	0	0	0	0		0	0	0	0	0	34
Exiting Leg	34						0						0						34
Total	68						0						0						68

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
2:00 PM	10	84	0	94	85	24	0	109	29	12	0	41	244
2:15 PM	25	87	0	112	92	33	0	125	27	14	0	41	278
2:30 PM	29	97	0	126	88	33	0	121	24	16	0	40	287
2:45 PM	32	89	0	121	111	52	0	163	34	19	0	53	337
Total	96	357	0	453	376	142	0	518	114	61	0	175	1146
3:00 PM	22	79	0	101	128	42	0	170	49	32	0	81	352
3:15 PM	25	92	0	117	103	53	0	156	57	19	0	76	349
3:30 PM	21	108	0	129	91	53	0	144	51	14	0	65	338
3:45 PM	16	88	0	104	74	51	0	125	48	19	0	67	296
Total	84	367	0	451	396	199	0	595	205	84	0	289	1335
4:00 PM	17	86	0	103	81	46	0	127	44	14	0	58	288
4:15 PM	27	97	0	124	92	37	0	129	41	19	0	60	313
4:30 PM	19	102	0	121	133	59	0	192	48	27	0	75	388
4:45 PM	31	80	0	111	98	74	0	172	55	36	0	91	374
Total	94	365	0	459	404	216	0	620	188	96	0	284	1363
5:00 PM	19	100	0	119	95	54	0	149	51	18	0	69	337
5:15 PM	23	108	0	131	83	58	0	141	35	18	0	53	325
5:30 PM	26	80	0	106	86	61	0	147	45	21	0	66	319
5:45 PM	17	86	0	103	83	56	0	139	36	19	0	55	297
Total	85	374	0	459	347	229	0	576	167	76	0	243	1278
Grand Total	359	1463	0	1822	1523	786	0	2309	674	317	0	991	5122
Approach %	19.7	80.3	0.0		66.0	34.0	0.0		68.0	32.0	0.0		
Total %	7.0	28.6	0.0	35.6	29.7	15.3	0.0	45.1	13.2	6.2	0.0	19.3	
Exiting Leg Total				1840				2137				1145	5122
Cars	340	1413	0	1753	1501	767	0	2268	661	296	0	957	4978
% Cars	94.7	96.6	0.0	96.2	98.6	97.6	0.0	98.2	98.1	93.4	0.0	96.6	97.2
Exiting Leg Total				1797				2074				1107	4978
Heavy Vehicles	19	50	0	69	22	19	0	41	13	21	0	34	144
% Heavy Vehicles	5.3	3.4	0.0	3.8	1.4	2.4	0.0	1.8	1.9	6.6	0.0	3.4	2.8
Exiting Leg Total				43				63				38	144

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
2:30 PM	29	97	0	126	88	33	0	121	24	16	0	40	287
2:45 PM	32	89	0	121	111	52	0	163	34	19	0	53	337
3:00 PM	22	79	0	101	128	42	0	170	49	32	0	81	352
3:15 PM	25	92	0	117	103	53	0	156	57	19	0	76	349
Total Volume	108	357	0	465	430	180	0	610	164	86	0	250	1325
% Approach Total	23.2	76.8	0.0		70.5	29.5	0.0		65.6	34.4	0.0		
PHF	0.844	0.920	0.000	0.923	0.840	0.849	0.000	0.897	0.719	0.672	0.000	0.772	0.941
Cars	97	338	0	435	419	171	0	590	160	77	0	237	1262
Cars %	89.8	94.7	0.0	93.5	97.4	95.0	0.0	96.7	97.6	89.5	0.0	94.8	95.2
Heavy Vehicles	11	19	0	30	11	9	0	20	4	9	0	13	63
Heavy Vehicles %	10.2	5.3	0.0	6.5	2.6	5.0	0.0	3.3	2.4	10.5	0.0	5.2	4.8
Cars Enter Leg	97	338	0	435	419	171	0	590	160	77	0	237	1262
Heavy Enter Leg	11	19	0	30	11	9	0	20	4	9	0	13	63
Total Entering Leg	108	357	0	465	430	180	0	610	164	86	0	250	1325
Cars Exiting Leg				496				498				268	1262
Heavy Exiting Leg				20				23				20	63
Total Exiting Leg				516				521				288	1325

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	2	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	3
4:00 PM	2	1	0	0	1	4	2	0	0	0	0	2	0	0	0	0	0	0	6
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
4:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	2	0	0	1	5	4	1	0	0	0	5	0	0	0	0	0	0	10
5:00 PM	0	1	0	0	1	2	0	1	0	0	0	1	0	0	0	0	0	0	3
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	2	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	1	3	1	1	0	0	0	2	2	0	0	0	0	2	7
Grand Total	2	6	0	0	2	10	6	2	0	0	0	8	2	0	0	0	0	2	20
Approach %	20.0	60.0	0.0	0.0	20.0		75.0	25.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	10.0	30.0	0.0	0.0	10.0	50.0	30.0	10.0	0.0	0.0	0.0	40.0	10.0	0.0	0.0	0.0	0.0	10.0	
Exiting Leg Total	8						8						4						20

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						0

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



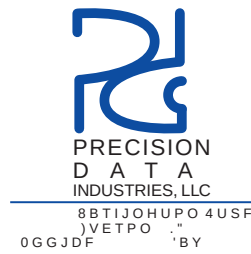
Pedestrians

	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	6	3	9	0	0	0	0	0	0	0	0	0	0	0	0	9
Total	0	0	0	7	3	10	0	0	0	0	0	0	0	0	0	0	1	1	11
3:00 PM	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	25
3:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
Total	0	0	0	1	25	26	0	0	0	0	0	0	0	0	0	1	0	1	27
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	2	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	4	4
4:30 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	1	2	4
4:45 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	3	4	6
Total	0	0	0	0	4	4	0	0	0	0	0	0	0	0	0	7	5	12	16
5:00 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
5:30 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	1	1	2	6
Grand Total	0	0	0	10	34	44	0	0	0	0	0	0	0	0	0	9	7	16	60
Approach %	0	0	0	22.727	77.273		0	0	0	0	0	0	0	0	0	56.25	43.75		
Total %	0	0	0	16.667	56.667	73.333	0	0	0	0	0	0	0	0	0	15	11.667	26.667	
Exiting Leg Total	44						0						16						60

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	6	3	9	0	0	0	0	0	0	0	0	0	0	0	0	9
3:00 PM	0	0	0	0	25	25	0	0	0	0	0	0	0	0	0	0	0	0	25
3:15 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	0	0	7	28	35	0	0	0	0	0	0	0	0	0	0	0	0	35
% Approach Total	0.0	0.0	0.0	20.0	80.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.292	0.280	0.350	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.350
Entering Leg	0	0	0	7	28	35	0	0	0	0	0	0	0	0	0	0	0	0	35
Exiting Leg	35						0						0						35
Total	70						0						0						70

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
2:00 PM	10	84	0	94	85	24	0	109	29	12	0	41	244
2:15 PM	25	87	0	112	92	33	0	125	27	14	0	41	278
2:30 PM	29	97	0	126	88	33	0	121	24	16	0	40	287
2:45 PM	32	89	0	121	111	52	0	163	34	19	0	53	337
Total	96	357	0	453	376	142	0	518	114	61	0	175	1146
3:00 PM	22	79	0	101	128	42	0	170	49	32	0	81	352
3:15 PM	25	92	0	117	103	53	0	156	57	19	0	76	349
3:30 PM	21	108	0	129	91	53	0	144	51	14	0	65	338
3:45 PM	16	88	0	104	74	51	0	125	48	19	0	67	296
Total	84	367	0	451	396	199	0	595	205	84	0	289	1335
4:00 PM	17	86	0	103	81	46	0	127	44	14	0	58	288
4:15 PM	27	97	0	124	92	37	0	129	41	19	0	60	313
4:30 PM	19	102	0	121	133	59	0	192	48	27	0	75	388
4:45 PM	31	80	0	111	98	74	0	172	55	36	0	91	374
Total	94	365	0	459	404	216	0	620	188	96	0	284	1363
5:00 PM	19	100	0	119	95	54	0	149	51	18	0	69	337
5:15 PM	23	108	0	131	83	58	0	141	35	18	0	53	325
5:30 PM	26	80	0	106	86	61	0	147	45	21	0	66	319
5:45 PM	17	86	0	103	83	56	0	139	36	19	0	55	297
Total	85	374	0	459	347	229	0	576	167	76	0	243	1278
Grand Total	359	1463	0	1822	1523	786	0	2309	674	317	0	991	5122
Approach %	19.7	80.3	0.0		66.0	34.0	0.0		68.0	32.0	0.0		
Total %	7.0	28.6	0.0	35.6	29.7	15.3	0.0	45.1	13.2	6.2	0.0	19.3	
Exiting Leg Total				1840				2137				1145	5122
Cars	340	1413	0	1753	1501	767	0	2268	661	296	0	957	4978
% Cars	94.7	96.6	0.0	96.2	98.6	97.6	0.0	98.2	98.1	93.4	0.0	96.6	97.2
Exiting Leg Total				1797				2074				1107	4978
Heavy Vehicles	19	50	0	69	22	19	0	41	13	21	0	34	144
% Heavy Vehicles	5.3	3.4	0.0	3.8	1.4	2.4	0.0	1.8	1.9	6.6	0.0	3.4	2.8
Exiting Leg Total				43				63				38	144

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)				Bay Road (Route 1A)				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:30 PM	19	102	0	121	133	59	0	192	48	27	0	75	388
4:45 PM	31	80	0	111	98	74	0	172	55	36	0	91	374
5:00 PM	19	100	0	119	95	54	0	149	51	18	0	69	337
5:15 PM	23	108	0	131	83	58	0	141	35	18	0	53	325
Total Volume	92	390	0	482	409	245	0	654	189	99	0	288	1424
% Approach Total	19.1	80.9	0.0		62.5	37.5	0.0		65.6	34.4	0.0		
PHF	0.742	0.903	0.000	0.920	0.769	0.828	0.000	0.852	0.859	0.688	0.000	0.791	0.918
Cars	92	379	0	471	408	240	0	648	186	95	0	281	1400
Cars %	100.0	97.2	0.0	97.7	99.8	98.0	0.0	99.1	98.4	96.0	0.0	97.6	98.3
Heavy Vehicles	0	11	0	11	1	5	0	6	3	4	0	7	24
Heavy Vehicles %	0.0	2.8	0.0	2.3	0.2	2.0	0.0	0.9	1.6	4.0	0.0	2.4	1.7
Cars Enter Leg	92	379	0	471	408	240	0	648	186	95	0	281	1400
Heavy Enter Leg	0	11	0	11	1	5	0	6	3	4	0	7	24
Total Entering Leg	92	390	0	482	409	245	0	654	189	99	0	288	1424
Cars Exiting Leg				503				565				332	1400
Heavy Exiting Leg				5				14				5	24
Total Exiting Leg				508				579				337	1424

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
3:45 PM	0	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	2
Total	0	2	0	0	0	2	1	0	0	0	0	1	0	0	0	0	0	0	3
4:00 PM	2	1	0	0	1	4	2	0	0	0	0	2	0	0	0	0	0	0	6
4:15 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0	0	0	2
4:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	2	2	0	0	1	5	4	1	0	0	0	5	0	0	0	0	0	0	10
5:00 PM	0	1	0	0	1	2	0	1	0	0	0	1	0	0	0	0	0	0	3
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	0	0	0	0	1	0	0	0	0	1	2	0	0	0	0	2	3
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	2	0	0	1	3	1	1	0	0	0	2	2	0	0	0	0	2	7
Grand Total	2	6	0	0	2	10	6	2	0	0	0	8	2	0	0	0	0	2	20
Approach %	20.0	60.0	0.0	0.0	20.0		75.0	25.0	0.0	0.0	0.0		100.0	0.0	0.0	0.0	0.0		
Total %	10.0	30.0	0.0	0.0	10.0	50.0	30.0	10.0	0.0	0.0	0.0	40.0	10.0	0.0	0.0	0.0	0.0	10.0	
Exiting Leg Total	8						8						4						20

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total	
	from North						from South						from West							
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total		
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	2	0	0	0	0	0	0	2
4:45 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	1	0	0	1	2	0	1	0	0	0	0	1	0	0	0	0	0	0	3
5:15 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	3	0	0	1	4	2	1	0	0	0	0	3	0	0	0	0	0	0	7
% Approach Total	0.0	75.0	0.0	0.0	25.0		66.7	33.3	0.0	0.0	0.0			0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.750	0.000	0.000	0.250	0.500	0.250	0.250	0.000	0.000	0.000	0.375		0.000	0.000	0.000	0.000	0.000	0.000	0.583
Entering Leg	0	3	0	0	1	4	2	1	0	0	0	3		0	0	0	0	0	0	7
Exiting Leg	3						3						1						7	
Total	7						6						1						14	

PDI File #: **240205 E**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Bay Road (Route 1A)							Bay Road (Route 1A)							Asbury Street							Total
	from North							from South							from West							
	Right	Thru	U-Turn	CW-EB	CW-WB	Total		Thru	Left	U-Turn	CW-WB	CW-EB	Total		Right	Left	U-Turn	CW-NB	CW-SB	Total		
2:00 PM	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
2:45 PM	0	0	0	6	3	9		0	0	0	0	0	0	0	0	0	0	0	0	0	9	
Total	0	0	0	7	3	10		0	0	0	0	0	0	0	0	0	0	0	1	1	11	
3:00 PM	0	0	0	0	25	25		0	0	0	0	0	0	0	0	0	0	0	0	0	25	
3:15 PM	0	0	0	1	0	1		0	0	0	0	0	0	0	0	0	0	0	0	0	1	
3:30 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3:45 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1	0	1	1	
Total	0	0	0	1	25	26		0	0	0	0	0	0	0	0	0	0	1	0	1	27	
4:00 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	2	0	2	2	
4:15 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	3	1	4	4	
4:30 PM	0	0	0	0	2	2		0	0	0	0	0	0	0	0	0	0	1	1	2	4	
4:45 PM	0	0	0	0	2	2		0	0	0	0	0	0	0	0	0	0	1	3	4	6	
Total	0	0	0	0	4	4		0	0	0	0	0	0	0	0	0	0	7	5	12	16	
5:00 PM	0	0	0	2	0	2		0	0	0	0	0	0	0	0	0	0	1	0	1	3	
5:15 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	1	1	
5:30 PM	0	0	0	0	2	2		0	0	0	0	0	0	0	0	0	0	0	0	0	2	
5:45 PM	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total	0	0	0	2	2	4		0	0	0	0	0	0	0	0	0	0	1	1	2	6	
Grand Total	0	0	0	10	34	44		0	0	0	0	0	0	0	0	0	0	9	7	16	60	
Approach %	0	0	0	22.727	77.273			0	0	0	0	0	0	0	0	0	0	56.25	43.75			
Total %	0	0	0	16.667	56.667	73.333		0	0	0	0	0	0	0	0	0	0	15	11.667	26.667		
Exiting Leg Total	44							0							16						60	

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Bay Road (Route 1A)						Asbury Street						Total
	from North						from South						from West						
	Right	Thru	U-Turn	CW-EB	CW-WB	Total	Thru	Left	U-Turn	CW-WB	CW-EB	Total	Right	Left	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	1	2	4
4:45 PM	0	0	0	0	2	2	0	0	0	0	0	0	0	0	0	1	3	4	6
5:00 PM	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	1	0	1	3
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
Total Volume	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	3	5	8	14
% Approach Total	0.0	0.0	0.0	33.3	66.7		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	37.5	62.5	
PHF	0.000	0.000	0.000	0.250	0.500	0.750	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.750	0.417	0.500
Entering Leg	0	0	0	2	4	6	0	0	0	0	0	0	0	0	0	0	3	5	8
Exiting Leg	6						0						8						14
Total	12						0						16						28

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
7:00 AM	80	1	0	81	0	0	0	0	2	89	0	91	172
7:15 AM	113	4	0	117	0	0	0	0	5	202	0	207	324
7:30 AM	150	0	0	150	0	0	0	0	3	70	0	73	223
7:45 AM	109	4	0	113	0	0	0	0	10	79	0	89	202
Total	452	9	0	461	0	0	0	0	20	440	0	460	921
8:00 AM	94	5	0	99	0	0	0	0	22	70	0	92	191
8:15 AM	96	22	0	118	0	0	0	0	25	108	0	133	251
8:30 AM	103	6	0	109	0	0	0	0	9	80	0	89	198
8:45 AM	102	3	0	105	0	0	0	0	6	99	0	105	210
Total	395	36	0	431	0	0	0	0	62	357	0	419	850
Grand Total	847	45	0	892	0	0	0	0	82	797	0	879	1771
Approach %	95.0	5.0	0.0		0.0	0.0	0.0		9.3	90.7	0.0		
Total %	47.8	2.5	0.0	50.4	0.0	0.0	0.0	0.0	4.6	45.0	0.0	49.6	
Exiting Leg Total	797				127				847				1771
Cars	804	39	0	843	0	0	0	0	78	754	0	832	1675
% Cars	94.9	86.7	0.0	94.5	0.0	0.0	0.0	0.0	95.1	94.6	0.0	94.7	94.6
Exiting Leg Total	754				117				804				1675
Heavy Vehicles	43	6	0	49	0	0	0	0	4	43	0	47	96
% Heavy Vehicles	5.1	13.3	0.0	5.5	0.0	0.0	0.0	0.0	4.9	5.4	0.0	5.3	5.4
Exiting Leg Total	43				10				43				96

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
7:45 AM	109	4	0	113	0	0	0	0	10	79	0	89	202
8:00 AM	94	5	0	99	0	0	0	0	22	70	0	92	191
8:15 AM	96	22	0	118	0	0	0	0	25	108	0	133	251
8:30 AM	103	6	0	109	0	0	0	0	9	80	0	89	198
Total Volume	402	37	0	439	0	0	0	0	66	337	0	403	842
% Approach Total	91.6	8.4	0.0		0.0	0.0	0.0		16.4	83.6	0.0		
PHF	0.922	0.420	0.000	0.930	0.000	0.000	0.000	0.000	0.660	0.780	0.000	0.758	0.839
Cars	379	31	0	410	0	0	0	0	63	321	0	384	794
Cars %	94.3	83.8	0.0	93.4	0.0	0.0	0.0	0.0	95.5	95.3	0.0	95.3	94.3
Heavy Vehicles	23	6	0	29	0	0	0	0	3	16	0	19	48
Heavy Vehicles %	5.7	16.2	0.0	6.6	0.0	0.0	0.0	0.0	4.5	4.7	0.0	4.7	5.7
Cars Enter Leg	379	31	0	410	0	0	0	0	63	321	0	384	794
Heavy Enter Leg	23	6	0	29	0	0	0	0	3	16	0	19	48
Total Entering Leg	402	37	0	439	0	0	0	0	66	337	0	403	842
Cars Exiting Leg	321				94				379				794
Heavy Exiting Leg	16				9				23				48
Total Exiting Leg	337				103				402				842

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	1	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Grand Total	1	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	4
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	25.0	0.0	0.0	0.0	0.0	25.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	75.0	0.0	0.0	0.0	75.0	
Exiting Leg Total	3						0						1						4

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Exiting Leg	2						0						0						2
Total	2						0						2						4

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Approach %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total %	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg Total	0						0						0						0

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						0

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:00 PM	87	0	0	87	1	0	0	1	1	94	0	95	183
2:15 PM	106	3	0	109	0	0	0	0	5	102	0	107	216
2:30 PM	131	4	0	135	0	0	0	0	6	93	0	99	234
2:45 PM	121	5	0	126	0	0	0	0	17	116	0	133	259
Total	445	12	0	457	1	0	0	1	29	405	0	434	892
3:00 PM	100	2	0	102	0	0	0	0	10	148	0	158	260
3:15 PM	119	0	0	119	0	0	0	0	1	124	0	125	244
3:30 PM	130	0	0	130	0	0	0	0	1	106	0	107	237
3:45 PM	103	0	0	103	0	0	0	0	1	99	0	100	203
Total	452	2	0	454	0	0	0	0	13	477	0	490	944
4:00 PM	102	0	0	102	0	0	0	0	1	91	0	92	194
4:15 PM	123	0	0	123	0	0	0	0	1	103	0	104	227
4:30 PM	128	0	0	128	0	0	0	0	0	165	0	165	293
4:45 PM	110	0	0	110	0	0	0	0	0	144	0	144	254
Total	463	0	0	463	0	0	0	0	2	503	0	505	968
5:00 PM	119	1	0	120	0	0	0	0	1	108	0	109	229
5:15 PM	127	0	0	127	0	1	0	1	3	106	0	109	237
5:30 PM	107	0	0	107	0	0	0	0	0	105	0	105	212
5:45 PM	105	0	0	105	0	0	0	0	0	100	0	100	205
Total	458	1	0	459	0	1	0	1	4	419	0	423	883
Grand Total	1818	15	0	1833	1	1	0	2	48	1804	0	1852	3687
Approach %	99.2	0.8	0.0		50.0	50.0	0.0		2.6	97.4	0.0		
Total %	49.3	0.4	0.0	49.7	0.0	0.0	0.0	0.1	1.3	48.9	0.0	50.2	
Exiting Leg Total				1805				63				1819	3687
Cars	1759	13	0	1772	1	1	0	2	41	1753	0	1794	3568
% Cars	96.8	86.7	0.0	96.7	100.0	100.0	0.0	100.0	85.4	97.2	0.0	96.9	96.8
Exiting Leg Total				1754				54				1760	3568
Heavy Vehicles	59	2	0	61	0	0	0	0	7	51	0	58	119
% Heavy Vehicles	3.2	13.3	0.0	3.3	0.0	0.0	0.0	0.0	14.6	2.8	0.0	3.1	3.2
Exiting Leg Total				51				9				59	119

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:30 PM	131	4	0	135	0	0	0	0	6	93	0	99	234
2:45 PM	121	5	0	126	0	0	0	0	17	116	0	133	259
3:00 PM	100	2	0	102	0	0	0	0	10	148	0	158	260
3:15 PM	119	0	0	119	0	0	0	0	1	124	0	125	244
Total Volume	471	11	0	482	0	0	0	0	34	481	0	515	997
% Approach Total	97.7	2.3	0.0		0.0	0.0	0.0		6.6	93.4	0.0		
PHF	0.899	0.550	0.000	0.893	0.000	0.000	0.000	0.000	0.500	0.813	0.000	0.815	0.959
Cars	442	9	0	451	0	0	0	0	28	467	0	495	946
Cars %	93.8	81.8	0.0	93.6	0.0	0.0	0.0	0.0	82.4	97.1	0.0	96.1	94.9
Heavy Vehicles	29	2	0	31	0	0	0	0	6	14	0	20	51
Heavy Vehicles %	6.2	18.2	0.0	6.4	0.0	0.0	0.0	0.0	17.6	2.9	0.0	3.9	5.1
Cars Enter Leg	442	9	0	451	0	0	0	0	28	467	0	495	946
Heavy Enter Leg	29	2	0	31	0	0	0	0	6	14	0	20	51
Total Entering Leg	471	11	0	482	0	0	0	0	34	481	0	515	997
Cars Exiting Leg				467				37				442	946
Heavy Exiting Leg				14				8				29	51
Total Exiting Leg				481				45				471	997

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
4:00 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	3	6
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	2	2	0	0	0	0	0	0	5
Grand Total	6	0	0	0	0	6	0	0	0	0	2	2	0	5	0	0	0	5	13
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0	0.0		
Total %	46.2	0.0	0.0	0.0	0.0	46.2	0.0	0.0	0.0	0.0	15.4	15.4	0.0	38.5	0.0	0.0	0.0	38.5	
Exiting Leg Total	5						2						6						13

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Bay Road (Route 1A)							Winthrop Elementary West Dr							Bay Road (Route 1A)							Total
	from North							from East							from South							
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total				
2:00 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2		
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	2		
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1		
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1		
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2	2		
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1		
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	1		
Grand Total	0	0	0	1	1	2	0	0	0	0	3	3	0	0	0	0	0	0	5	5		
Approach %	0	0	0	50	50		0	0	0	0	100		0	0	0	0	0					
Total %	0	0	0	20	20	40	0	0	0	0	60	60	0	0	0	0	0	0				
Exiting Leg Total	2						3						0									

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:00 PM	87	0	0	87	1	0	0	1	1	94	0	95	183
2:15 PM	106	3	0	109	0	0	0	0	5	102	0	107	216
2:30 PM	131	4	0	135	0	0	0	0	6	93	0	99	234
2:45 PM	121	5	0	126	0	0	0	0	17	116	0	133	259
Total	445	12	0	457	1	0	0	1	29	405	0	434	892
3:00 PM	100	2	0	102	0	0	0	0	10	148	0	158	260
3:15 PM	119	0	0	119	0	0	0	0	1	124	0	125	244
3:30 PM	130	0	0	130	0	0	0	0	1	106	0	107	237
3:45 PM	103	0	0	103	0	0	0	0	1	99	0	100	203
Total	452	2	0	454	0	0	0	0	13	477	0	490	944
4:00 PM	102	0	0	102	0	0	0	0	1	91	0	92	194
4:15 PM	123	0	0	123	0	0	0	0	1	103	0	104	227
4:30 PM	128	0	0	128	0	0	0	0	0	165	0	165	293
4:45 PM	110	0	0	110	0	0	0	0	0	144	0	144	254
Total	463	0	0	463	0	0	0	0	2	503	0	505	968
5:00 PM	119	1	0	120	0	0	0	0	1	108	0	109	229
5:15 PM	127	0	0	127	0	1	0	1	3	106	0	109	237
5:30 PM	107	0	0	107	0	0	0	0	0	105	0	105	212
5:45 PM	105	0	0	105	0	0	0	0	0	100	0	100	205
Total	458	1	0	459	0	1	0	1	4	419	0	423	883
Grand Total	1818	15	0	1833	1	1	0	2	48	1804	0	1852	3687
Approach %	99.2	0.8	0.0		50.0	50.0	0.0		2.6	97.4	0.0		
Total %	49.3	0.4	0.0	49.7	0.0	0.0	0.0	0.1	1.3	48.9	0.0	50.2	
Exiting Leg Total				1805				63				1819	3687
Cars	1759	13	0	1772	1	1	0	2	41	1753	0	1794	3568
% Cars	96.8	86.7	0.0	96.7	100.0	100.0	0.0	100.0	85.4	97.2	0.0	96.9	96.8
Exiting Leg Total				1754				54				1760	3568
Heavy Vehicles	59	2	0	61	0	0	0	0	7	51	0	58	119
% Heavy Vehicles	3.2	13.3	0.0	3.3	0.0	0.0	0.0	0.0	14.6	2.8	0.0	3.1	3.2
Exiting Leg Total				51				9				59	119

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)				Winthrop Elementary West Dr				Bay Road (Route 1A)				Total
	from North				from East				from South				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
4:30 PM	128	0	0	128	0	0	0	0	0	165	0	165	293
4:45 PM	110	0	0	110	0	0	0	0	0	144	0	144	254
5:00 PM	119	1	0	120	0	0	0	0	1	108	0	109	229
5:15 PM	127	0	0	127	0	1	0	1	3	106	0	109	237
Total Volume	484	1	0	485	0	1	0	1	4	523	0	527	1013
% Approach Total	99.8	0.2	0.0		0.0	100.0	0.0		0.8	99.2	0.0		
PHF	0.945	0.250	0.000	0.947	0.000	0.250	0.000	0.250	0.333	0.792	0.000	0.798	0.864
Cars	479	1	0	480	0	1	0	1	4	509	0	513	994
Cars %	99.0	100.0	0.0	99.0	0.0	100.0	0.0	100.0	100.0	97.3	0.0	97.3	98.1
Heavy Vehicles	5	0	0	5	0	0	0	0	0	14	0	14	19
Heavy Vehicles %	1.0	0.0	0.0	1.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	2.7	1.9
Cars Enter Leg	479	1	0	480	0	1	0	1	4	509	0	513	994
Heavy Enter Leg	5	0	0	5	0	0	0	0	0	14	0	14	19
Total Entering Leg	484	1	0	485	0	1	0	1	4	523	0	527	1013
Cars Exiting Leg				509				5				480	994
Heavy Exiting Leg				14				0				5	19
Total Exiting Leg				523				5				485	1013

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
4:00 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	3
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	3	6
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	2	2	0	0	0	0	0	0	5
Grand Total	6	0	0	0	0	6	0	0	0	0	2	2	0	5	0	0	0	5	13
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	100.0		0.0	100.0	0.0	0.0	0.0		
Total %	46.2	0.0	0.0	0.0	0.0	46.2	0.0	0.0	0.0	0.0	15.4	15.4	0.0	38.5	0.0	0.0	0.0	38.5	
Exiting Leg Total	5						2						6						13

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	3
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	4	0	0	0	0	4	0	0	0	0	0	0	0	3	0	0	0	3	7
% Approach Total	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	
PHF	0.500	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.250	0.000	0.000	0.000	0.583
Entering Leg	4	0	0	0	0	4	0	0	0	0	0	0		0	3	0	0	0	7
Exiting Leg						3						0						4	7
Total						7						0						7	14

PDI File #: **240205 F**
 Location: **N: Bay Road (Route 1A) S: Bay Road (Route 1A)**
 Location: **E: Winthrop Elementary West Dr**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total
	from North						from East						from South						
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total	
2:00 PM	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	2
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Grand Total	0	0	0	1	1	2	0	0	0	0	3	3	0	0	0	0	0	0	5
Approach %	0	0	0	50	50		0	0	0	0	100		0	0	0	0	0		
Total %	0	0	0	20	20	40	0	0	0	0	60	60	0	0	0	0	0	0	
Exiting Leg Total	2						3						0						5

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Winthrop Elementary West Dr						Bay Road (Route 1A)						Total	
	from North						from East						from South							
	Thru	Left	U-Turn	CW-EB	CW-WB	Total	Right	Left	U-Turn	CW-SB	CW-NB	Total	Right	Thru	U-Turn	CW-WB	CW-EB	Total		
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0		0.0	0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.500		0.000	0.000	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	2	2	0	0	0	0	0	0	2
Exiting Leg	0						2						0						2	
Total	0						4						0						4	

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
7:00 AM	81	0	0	81	0	1	0	1	0	89	0	89	171
7:15 AM	117	0	0	117	1	0	0	1	0	200	0	200	318
7:30 AM	156	0	0	156	1	1	0	2	0	71	0	71	229
7:45 AM	109	0	0	109	1	0	0	1	0	79	0	79	189
Total	463	0	0	463	3	2	0	5	0	439	0	439	907
8:00 AM	100	0	0	100	0	3	0	3	0	70	0	70	173
8:15 AM	104	0	0	104	5	8	0	13	0	108	0	108	225
8:30 AM	100	0	0	100	1	8	0	9	0	78	0	78	187
8:45 AM	96	0	0	96	5	10	0	15	0	101	0	101	212
Total	400	0	0	400	11	29	0	40	0	357	0	357	797
Grand Total	863	0	0	863	14	31	0	45	0	796	0	796	1704
Approach %	100.0	0.0	0.0		31.1	68.9	0.0		0.0	100.0	0.0		
Total %	50.6	0.0	0.0	50.6	0.8	1.8	0.0	2.6	0.0	46.7	0.0	46.7	
Exiting Leg Total	810				0				894				1704
Cars	821	0	0	821	10	25	0	35	0	756	0	756	1612
% Cars	95.1	0.0	0.0	95.1	71.4	80.6	0.0	77.8	0.0	95.0	0.0	95.0	94.6
Exiting Leg Total	766				0				846				1612
Heavy Vehicles	42	0	0	42	4	6	0	10	0	40	0	40	92
% Heavy Vehicles	4.9	0.0	0.0	4.9	28.6	19.4	0.0	22.2	0.0	5.0	0.0	5.0	5.4
Exiting Leg Total	44				0				48				92

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
7:45 AM	109	0	0	109	1	0	0	1	0	79	0	79	189
8:00 AM	100	0	0	100	0	3	0	3	0	70	0	70	173
8:15 AM	104	0	0	104	5	8	0	13	0	108	0	108	225
8:30 AM	100	0	0	100	1	8	0	9	0	78	0	78	187
Total Volume	413	0	0	413	7	19	0	26	0	335	0	335	774
% Approach Total	100.0	0.0	0.0		26.9	73.1	0.0		0.0	100.0	0.0		
PHF	0.947	0.000	0.000	0.947	0.350	0.594	0.000	0.500	0.000	0.775	0.000	0.775	0.860
Cars	392	0	0	392	4	13	0	17	0	320	0	320	729
Cars %	94.9	0.0	0.0	94.9	57.1	68.4	0.0	65.4	0.0	95.5	0.0	95.5	94.2
Heavy Vehicles	21	0	0	21	3	6	0	9	0	15	0	15	45
Heavy Vehicles %	5.1	0.0	0.0	5.1	42.9	31.6	0.0	34.6	0.0	4.5	0.0	4.5	5.8
Cars Enter Leg	392	0	0	392	4	13	0	17	0	320	0	320	729
Heavy Enter Leg	21	0	0	21	3	6	0	9	0	15	0	15	45
Total Entering Leg	413	0	0	413	7	19	0	26	0	335	0	335	774
Cars Exiting Leg				324				0				405	729
Heavy Exiting Leg				18				0				27	45
Total Exiting Leg				342				0				432	774

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Grand Total	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	3
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	33.3	0.0	0.0	0.0	0.0	33.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	66.7	0.0	0.0	0.0	66.7	
Exiting Leg Total	2						0						1						3

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
% Approach Total	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.500	0.500
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
Exiting Leg	2						0						0						2
Total	2						0						2						4

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
Total	0	0	0	4	4	8	0	0	0	0	0	0	0	0	0	0	0	0	8
Grand Total	0	0	0	4	4	8	0	0	0	0	0	0	0	0	0	0	0	0	8
Approach %	0	0	0	50	50		0	0	0	0	0	0	0	0	0	0	0		
Total %	0	0	0	50	50	100	0	0	0	0	0	0	0	0	0	0	0		
Exiting Leg Total	8						0						0						8

Peak Hour Analysis from 07:00 AM to 09:00 AM begins at:

7:45 AM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	2	2	4	0	0	0	0	0	0	0	0	0	0	0	0	4
% Approach Total	0.0	0.0	0.0	50.0	50.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
PHF	0.000	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	2	2	4	0	0	0	0	0	0		0	0	0	0	0	4
Exiting Leg	4						0						0						4
Total	8						0						0						8

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:00 PM	90	0	0	90	1	2	0	3	0	96	0	96	189
2:15 PM	109	0	0	109	1	0	0	1	0	102	0	102	212
2:30 PM	128	0	0	128	0	2	0	2	0	92	0	92	222
2:45 PM	123	0	0	123	3	4	0	7	0	116	0	116	246
Total	450	0	0	450	5	8	0	13	0	406	0	406	869
3:00 PM	102	0	0	102	6	3	0	9	0	148	0	148	259
3:15 PM	113	0	0	113	4	5	0	9	0	124	0	124	246
3:30 PM	125	0	0	125	0	5	0	5	0	107	0	107	237
3:45 PM	102	0	0	102	0	1	0	1	0	100	0	100	203
Total	442	0	0	442	10	14	0	24	0	479	0	479	945
4:00 PM	94	0	0	94	1	1	0	2	0	90	0	90	186
4:15 PM	131	0	0	131	0	1	0	1	0	104	0	104	236
4:30 PM	110	0	0	110	1	1	0	2	0	165	0	165	277
4:45 PM	107	0	0	107	0	0	0	0	0	144	0	144	251
Total	442	0	0	442	2	3	0	5	0	503	0	503	950
5:00 PM	118	0	0	118	0	2	0	2	1	109	0	110	230
5:15 PM	126	0	0	126	0	0	0	0	0	108	0	108	234
5:30 PM	104	0	0	104	0	1	0	1	1	112	0	113	218
5:45 PM	104	0	0	104	0	0	0	0	0	104	0	104	208
Total	452	0	0	452	0	3	0	3	2	433	0	435	890
Grand Total	1786	0	0	1786	17	28	0	45	2	1821	0	1823	3654
Approach %	100.0	0.0	0.0		37.8	62.2	0.0		0.1	99.9	0.0		
Total %	48.9	0.0	0.0	48.9	0.5	0.8	0.0	1.2	0.1	49.8	0.0	49.9	
Exiting Leg Total				1838				2				1814	3654
Cars	1726	0	0	1726	12	24	0	36	2	1774	0	1776	3538
% Cars	96.6	0.0	0.0	96.6	70.6	85.7	0.0	80.0	100.0	97.4	0.0	97.4	96.8
Exiting Leg Total				1786				2				1750	3538
Heavy Vehicles	60	0	0	60	5	4	0	9	0	47	0	47	116
% Heavy Vehicles	3.4	0.0	0.0	3.4	29.4	14.3	0.0	20.0	0.0	2.6	0.0	2.6	3.2
Exiting Leg Total				52				0				64	116

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:30 PM	128	0	0	128	0	2	0	2	0	92	0	92	222
2:45 PM	123	0	0	123	3	4	0	7	0	116	0	116	246
3:00 PM	102	0	0	102	6	3	0	9	0	148	0	148	259
3:15 PM	113	0	0	113	4	5	0	9	0	124	0	124	246
Total Volume	466	0	0	466	13	14	0	27	0	480	0	480	973
% Approach Total	100.0	0.0	0.0		48.1	51.9	0.0		0.0	100.0	0.0		
PHF	0.910	0.000	0.000	0.910	0.542	0.700	0.000	0.750	0.000	0.811	0.000	0.811	0.939
Cars	443	0	0	443	8	10	0	18	0	467	0	467	928
Cars %	95.1	0.0	0.0	95.1	61.5	71.4	0.0	66.7	0.0	97.3	0.0	97.3	95.4
Heavy Vehicles	23	0	0	23	5	4	0	9	0	13	0	13	45
Heavy Vehicles %	4.9	0.0	0.0	4.9	38.5	28.6	0.0	33.3	0.0	2.7	0.0	2.7	4.6
Cars Enter Leg	443	0	0	443	8	10	0	18	0	467	0	467	928
Heavy Enter Leg	23	0	0	23	5	4	0	9	0	13	0	13	45
Total Entering Leg	466	0	0	466	13	14	0	27	0	480	0	480	973
Cars Exiting Leg				475				0				453	928
Heavy Exiting Leg				18				0				27	45
Total Exiting Leg				493				0				480	973

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	4
4:00 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	5	0	0	0	5	8
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	2	5
Grand Total	7	0	0	0	0	7	0	0	0	0	0	0	0	10	0	0	0	10	17
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	41.2	0.0	0.0	0.0	0.0	41.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8	0.0	0.0	0.0	58.8	
Exiting Leg Total	10						0						7						17

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	2
Approach %	0	0	0	0	0		0	0	0	0	100		0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	50	50	0	0	0	50	0	50	
Exiting Leg Total	0						1						1						2

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

2:30 PM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exiting Leg	0						0						0						0
Total	0						0						0						

PDI File #: **240205 G**
Location: **S: Winthrop Elementary East Dr**
Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
City, State: **Hamilton, MA**
Client: **GPI/ R. Brown**
Site Code: **NEX-2400246.00**
Count Date: **Thursday, September 19, 2024**
Start Time: **2:00 PM**
End Time: **6:00 PM**
Class:



Cars and Heavy Vehicles (Combined)

	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
2:00 PM	90	0	0	90	1	2	0	3	0	96	0	96	189
2:15 PM	109	0	0	109	1	0	0	1	0	102	0	102	212
2:30 PM	128	0	0	128	0	2	0	2	0	92	0	92	222
2:45 PM	123	0	0	123	3	4	0	7	0	116	0	116	246
Total	450	0	0	450	5	8	0	13	0	406	0	406	869
3:00 PM	102	0	0	102	6	3	0	9	0	148	0	148	259
3:15 PM	113	0	0	113	4	5	0	9	0	124	0	124	246
3:30 PM	125	0	0	125	0	5	0	5	0	107	0	107	237
3:45 PM	102	0	0	102	0	1	0	1	0	100	0	100	203
Total	442	0	0	442	10	14	0	24	0	479	0	479	945
4:00 PM	94	0	0	94	1	1	0	2	0	90	0	90	186
4:15 PM	131	0	0	131	0	1	0	1	0	104	0	104	236
4:30 PM	110	0	0	110	1	1	0	2	0	165	0	165	277
4:45 PM	107	0	0	107	0	0	0	0	0	144	0	144	251
Total	442	0	0	442	2	3	0	5	0	503	0	503	950
5:00 PM	118	0	0	118	0	2	0	2	1	109	0	110	230
5:15 PM	126	0	0	126	0	0	0	0	0	108	0	108	234
5:30 PM	104	0	0	104	0	1	0	1	1	112	0	113	218
5:45 PM	104	0	0	104	0	0	0	0	0	104	0	104	208
Total	452	0	0	452	0	3	0	3	2	433	0	435	890
Grand Total	1786	0	0	1786	17	28	0	45	2	1821	0	1823	3654
Approach %	100.0	0.0	0.0		37.8	62.2	0.0		0.1	99.9	0.0		
Total %	48.9	0.0	0.0	48.9	0.5	0.8	0.0	1.2	0.1	49.8	0.0	49.9	
Exiting Leg Total				1838				2				1814	3654
Cars	1726	0	0	1726	12	24	0	36	2	1774	0	1776	3538
% Cars	96.6	0.0	0.0	96.6	70.6	85.7	0.0	80.0	100.0	97.4	0.0	97.4	96.8
Exiting Leg Total				1786				2				1750	3538
Heavy Vehicles	60	0	0	60	5	4	0	9	0	47	0	47	116
% Heavy Vehicles	3.4	0.0	0.0	3.4	29.4	14.3	0.0	20.0	0.0	2.6	0.0	2.6	3.2
Exiting Leg Total				52				0				64	116

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)				Winthrop Elementary East Dr				Bay Road (Route 1A)				Total
	from East				from South				from West				
	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	Right	Thru	U-Turn	Total	
4:30 PM	110	0	0	110	1	1	0	2	0	165	0	165	277
4:45 PM	107	0	0	107	0	0	0	0	0	144	0	144	251
5:00 PM	118	0	0	118	0	2	0	2	1	109	0	110	230
5:15 PM	126	0	0	126	0	0	0	0	0	108	0	108	234
Total Volume	461	0	0	461	1	3	0	4	1	526	0	527	992
% Approach Total	100.0	0.0	0.0		25.0	75.0	0.0		0.2	99.8	0.0		
PHF	0.915	0.000	0.000	0.915	0.250	0.375	0.000	0.500	0.250	0.797	0.000	0.798	0.895
Cars	451	0	0	451	1	3	0	4	1	512	0	513	968
Cars %	97.8	0.0	0.0	97.8	100.0	100.0	0.0	100.0	100.0	97.3	0.0	97.3	97.6
Heavy Vehicles	10	0	0	10	0	0	0	0	0	14	0	14	24
Heavy Vehicles %	2.2	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0	2.7	0.0	2.7	2.4
Cars Enter Leg	451	0	0	451	1	3	0	4	1	512	0	513	968
Heavy Enter Leg	10	0	0	10	0	0	0	0	0	14	0	14	24
Total Entering Leg	461	0	0	461	1	3	0	4	1	526	0	527	992
Cars Exiting Leg				513				1				454	968
Heavy Exiting Leg				14				0				10	24
Total Exiting Leg				527				1				464	992

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Bicycles (on Roadway and Crosswalks)

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	2	3
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	1	0	0	0	0	1	0	0	0	0	0	0	0	3	0	0	0	3	4
4:00 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0	0	0	1	3
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	4
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	5	0	0	0	5	8
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
Total	3	0	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	2	5
Grand Total	7	0	0	0	0	7	0	0	0	0	0	0	0	10	0	0	0	10	17
Approach %	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0		
Total %	41.2	0.0	0.0	0.0	0.0	41.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	58.8	0.0	0.0	0.0	58.8	
Exiting Leg Total	10						0						7						17

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	4
4:45 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
5:15 PM	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2
Total Volume	4	0	0	0	0	4	0	0	0	0	0	0	0	4	0	0	0	0	8
% Approach Total	100.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0		0.0	100.0	0.0	0.0	0.0	
PHF	0.500	0.000	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000		0.000	0.250	0.000	0.000	0.000	0.500
Entering Leg	4	0	0	0	0	4	0	0	0	0	0	0		0	4	0	0	0	8
Exiting Leg						4						0						4	8
Total						8						0						8	16

PDI File #: **240205 G**
 Location: **S: Winthrop Elementary East Dr**
 Location: **E: Bay Road (Route 1A) W: Bay Road (Route 1A)**
 City, State: **Hamilton, MA**
 Client: **GPI/ R. Brown**
 Site Code: **NEX-2400246.00**
 Count Date: **Thursday, September 19, 2024**
 Start Time: **2:00 PM**
 End Time: **6:00 PM**
 Class:



Pedestrians

	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
2:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1
Grand Total	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1	2
Approach %	0	0	0	0	0		0	0	0	0	100		0	0	0	100	0		
Total %	0	0	0	0	0	0	0	0	0	0	50	50	0	0	0	50	0	50	
Exiting Leg Total	0						1						1						2

Peak Hour Analysis from 02:00 PM to 06:00 PM begins at:

4:30 PM	Bay Road (Route 1A)						Winthrop Elementary East Dr						Bay Road (Route 1A)						Total
	from East						from South						from West						
	Thru	Left	U-Turn	CW-SB	CW-NB	Total	Right	Left	U-Turn	CW-WB	CW-EB	Total	Right	Thru	U-Turn	CW-NB	CW-SB	Total	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1
% Approach Total	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0	100.0	0.0	0.0	0.0	100.0	0.0	0.0
PHF	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.250	0.250	0.000	0.000	0.000	0.250	0.000	0.250
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	1
Exiting Leg												1	1					1	2
Total	0						2						2						4

MASSDOT ADJUSTMENT DATA

Massachusetts Highway Department
Statewide Traffic Data Collection
2019 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.22	1.14	1.12	1.06	1.00	0.96	0.87	0.85	0.96	0.99	1.04	1.12	0.85
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.97
R4-R7	1.09	1.09	1.11	1.02	0.96	0.92	0.89	0.89	0.99	0.98	1.09	1.13	0.98
U1-Boston	1.03	1.01	0.98	0.94	0.94	0.92	0.95	0.93	0.94	0.94	0.97	1.04	0.96
U1-Essex	1.09	1.06	1.03	0.99	0.94	0.90	0.88	0.86	0.93	0.94	0.99	1.06	0.93
U1-Southeast	1.06	1.05	1.01	0.97	0.95	0.93	0.93	0.90	0.94	0.94	0.98	1.04	0.98
U1-West	1.19	1.14	1.09	0.95	0.92	0.89	0.89	0.86	0.91	0.95	0.97	1.07	0.84
U1-Worcester	1.02	1.04	0.97	0.94	0.93	0.91	0.95	0.91	0.93	0.92	0.95	1.10	0.88
U2	1.01	1.00	0.94	0.93	0.91	0.89	0.93	0.90	0.90	0.91	0.94	1.02	0.99
U3	1.06	1.03	0.98	0.94	0.93	0.91	0.95	0.91	0.92	0.93	0.97	1.00	0.98
U4-U7	1.01	1.00	0.95	0.92	0.88	0.86	0.92	0.91	0.92	0.94	0.99	1.04	0.99
Rec - East	1.04	1.16	1.12	0.98	0.92	0.88	0.77	0.81	0.94	1.02	1.08	1.12	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.98

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

Massachusetts Highway Department
Statewide Traffic Data Collection
2018 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.37	1.26	1.30	1.08	0.97	0.93	0.87	0.83	0.96	0.98	1.05	1.13	0.78
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.15	1.06	1.07	1.00	0.89	0.88	0.89	0.89	0.95	0.92	1.02	1.01	0.98
R4-R7	1.10	1.07	1.03	1.00	0.90	0.92	0.94	0.94	0.96	0.94	1.03	1.02	0.93
U1-Boston	1.05	0.98	1.01	0.93	0.92	0.91	0.95	0.93	0.94	0.92	0.96	0.99	0.96
U1-Essex	1.05	1.01	1.04	0.93	0.92	0.89	0.90	0.90	0.94	0.93	0.98	1.01	0.91
U1-Southeast	1.11	1.05	1.07	0.99	0.93	0.89	0.88	0.87	0.93	0.95	1.01	1.05	0.98
U1-West	1.15	1.08	1.07	0.98	0.94	0.92	0.92	0.88	0.92	0.91	1.00	1.06	0.83
U1-Worcester	1.18	1.11	1.09	0.99	0.95	0.94	0.95	0.91	0.97	0.97	1.01	1.05	0.87
U2	1.04	0.99	0.99	0.94	0.92	0.90	0.93	0.91	0.94	0.92	0.96	0.98	0.99
U3	0.99	1.00	1.02	0.96	0.91	0.89	0.92	0.90	0.95	0.92	1.01	0.97	0.97
U4-U7	1.03	1.02	0.97	0.95	0.88	0.89	0.96	0.93	0.94	0.93	1.00	1.00	0.99
Rec - East	1.22	1.15	1.09	1.12	0.90	0.89	0.82	0.83	0.92	0.98	1.06	1.08	0.99
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.97

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

Massachusetts Highway Department
Statewide Traffic Data Collection
2017 Weekday Seasonal Factors

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.30	1.23	1.21	1.04	0.98	0.92	0.86	0.81	0.95	0.99	1.03	1.10	0.80
R2	0.95	0.96	0.98	0.97	0.97	0.93	0.97	0.94	0.96	0.90	0.92	0.93	0.96
R3	1.05	1.01	1.04	0.99	0.94	0.93	0.91	0.92	0.96	0.94	1.01	1.03	0.97
R4-R7	1.10	1.07	1.09	1.00	0.95	0.89	0.88	0.87	0.92	0.95	1.04	1.09	0.93
U1-Boston	1.01	1.04	0.99	0.94	0.93	0.92	0.96	0.93	0.94	0.93	0.95	0.98	0.95
U1-Essex	1.04	1.05	1.00	0.96	0.93	0.89	0.90	0.90	0.93	0.93	0.98	1.03	0.90
U1-Southeast	1.07	1.05	1.02	0.97	0.95	0.90	0.89	0.88	0.92	0.94	0.98	1.01	0.97
U1-West	1.00	0.96	0.94	0.92	0.93	0.92	0.95	0.93	0.92	0.92	0.97	0.97	0.89
U1-Worcester	1.10	1.10	1.04	0.97	0.95	0.94	0.93	0.91	0.95	0.96	0.98	1.04	0.89
U2	1.01	1.03	0.98	0.95	0.93	0.91	0.94	0.92	0.95	0.95	0.95	0.97	0.98
U3	1.03	1.05	1.01	0.95	0.92	0.90	0.94	0.93	0.93	0.92	0.96	0.99	0.96
U4-U7	1.06	1.05	1.02	0.96	0.92	0.89	0.95	0.95	0.92	0.92	0.98	1.03	0.98
Rec - East	1.18	1.17	1.08	1.03	0.95	0.87	0.83	0.83	0.97	0.98	1.19	1.19	0.98
Rec - West	1.30	1.23	1.32	1.18	0.95	0.82	0.70	0.69	0.97	0.96	1.16	1.15	0.95

Round off:

0-999 = 10

>1000 = 100

U = Urban

R = Rural

1 - Interstate

2 - Freeway and Expressway

3 - Other Principal Arterial

4 - Minor Arterial

5 - Major Collector

6 - Minor Collector

7 - Local Road and Street

Recreational - East Group - Cape Cod (all towns) including the town of Plymouth south of Route 3A (stations 7014,7079,7080,7090,7091,7092,7093,7094,7095,7096,7097,7108 and 7178), Martha's Vineyard and Nantucket.

Recreational - West Group - Continuous Stations 2 and 189 including stations 1066,1067,1083,1084,1085,1086,1087,1088,1089,1090,1091,1092,1093,1094,1095,1096,1097,1098,1099,1100,1101,1102,1103,1104,1105,1106,1107,1108,1113,1114,1116,2196,2197 and 2198.

Traffic Growth Rate^a

PRE-COVID

Location	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Annual Rate
STATION 5081 - WENHAM - MAIN STREET (ROUTE 1A) EAST OF ARBOR STREET	15,000			14,895			15,219			14,151	-0.64%
STATION 5128 - NEWBURY - ROUTE 1 (NEWBURYPORT TPK), SOUTH OF HANOVER ST	9,040	8,602	8,348	8,794	9,105	9,027	9,169	9,366	9,322	8,732	-0.32%
STATION 35 - BEVERLY - YANKEE DIVISION HIGHWAY, NORTH OF BRIMBAL AVE	47,108	44,768			47,763	47,788	47,451	51,386		49,749	0.67%

Average Annual Growth Rate = -0.10%

^a Source: Based upon historical data; MassDOT Transportation Data Management System.

USE 1.0%

POST-COVID

	2022	2023	Annual Rate
STATION 5081 - WENHAM - MAIN STREET (ROUTE 1A) EAST OF ARBOR STREET			
STATION 5128 - NEWBURY - ROUTE 1 (NEWBURYPORT TPK), SOUTH OF HANOVER ST	8,097	7,993	-1.28%
STATION 35 - BEVERLY - YANKEE DIVISION HIGHWAY, NORTH OF BRIMBAL AVE	46,898	47,993	2.33%
STATION 5069 - IPSWICH - COUNTY ROAD NORTH OF WARD STREET			

Average Annual Growth Rate = 0.53%

USE 1.0%

TRAFFIC IMPACT AND ACCESS STUDY

Cutler Elementary School - Hamilton, Massachusetts

MASSDOT CRASH DATA

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : Sep-24

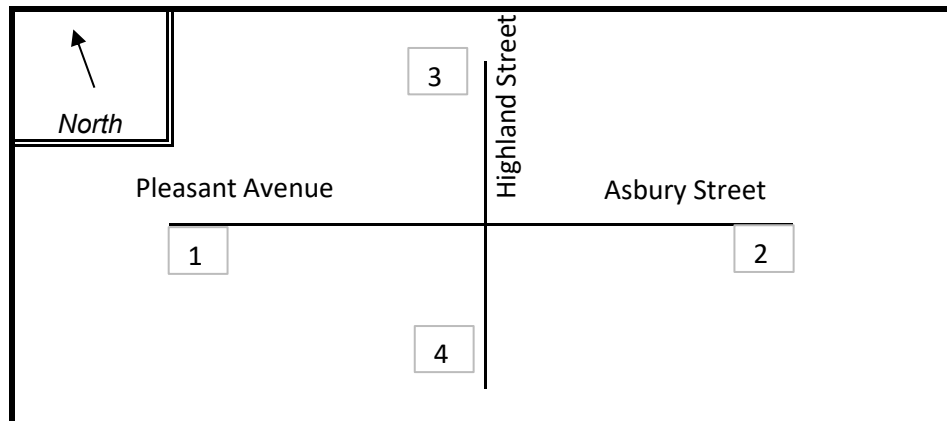
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Highland Street

MINOR STREET(S) : Pleasant Ave/Asbury Street

**INTERSECTION
DIAGRAM
(Label Approaches)**



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	WB	SB	NB		
PEAK HOURLY VOLUMES (AM/PM) :	9	219	363	304		895

" K " FACTOR :

0.106

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

8,443

TOTAL # OF CRASHES :

5

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

1.00

CRASH RATE CALCULATION :

0.32

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Thursday PM volumes used

Project Title & Date : NEX-2400246 - Hamilton/Wenham - Cutler Elementary School

SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : Sep-24

DISTRICT : 4

~ SEGMENT DATA ~

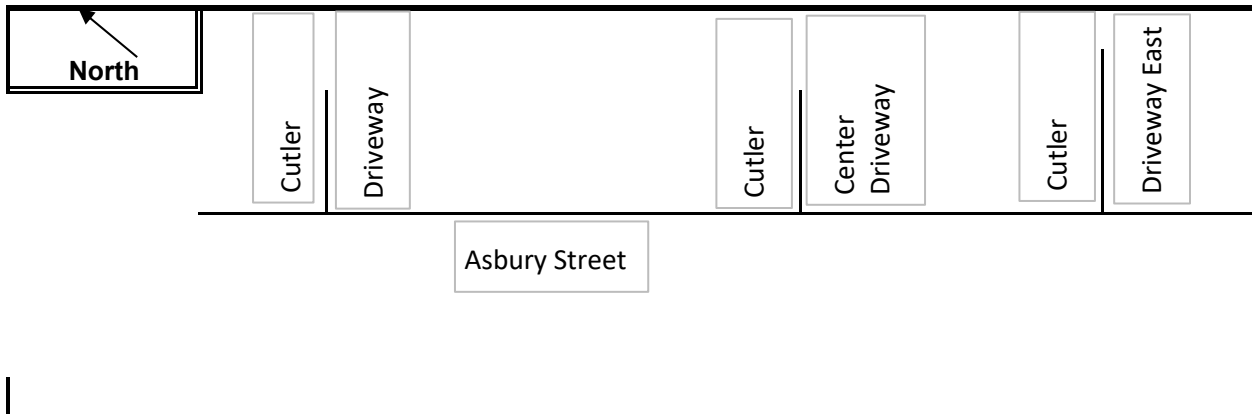
ROADWAY NAME: Asbury

START POINT: Woodland Mead

END POINT: Day Avenue

FUNCTIONAL CLASSIFICATION OF ROADWAY: Urban Collector

ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)



AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES (L): **0.176**

AVERAGE DAILY TRAFFIC VOLUME (V): **4,302**

TOTAL # OF CRASHES:

1

OF
YEARS :

5

AVERAGE # OF
CRASHES PER YEAR (A) :

0.20

CRASH RATE
CALCULATION :

0.72

RATE =

$$\frac{(A * 1,000,000)}{(L * V * 365)}$$

Comments : Thursday PM volumes used

Project Title & Date: NEX-2400246 - Hamilton/Wenham - Cutler Elementary School

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : Sep-24

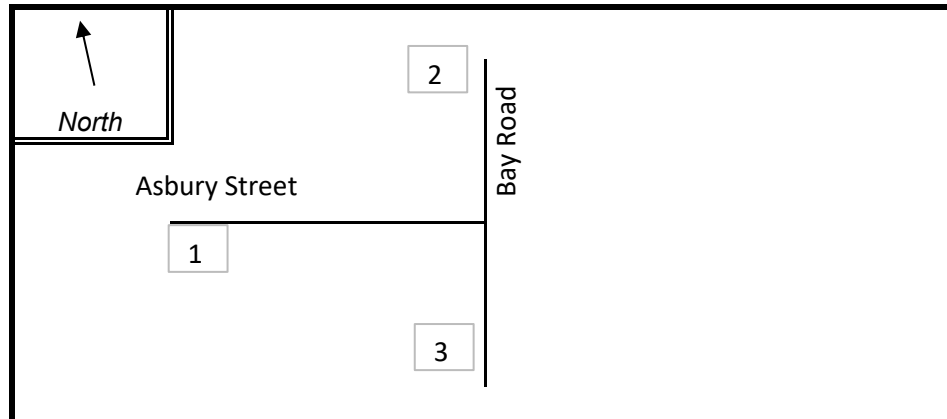
DISTRICT : 4 UNSIGNALIZED : ☒ SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Bay Road

MINOR STREET(S) : Asbury Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	EB	SB	NB			
PEAK HOURLY VOLUMES (AM/PM) :	288	485	677			1,450

" K " FACTOR :

0.106

INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME :

13,679

TOTAL # OF CRASHES :

9

OF YEARS :

5

AVERAGE # OF CRASHES PER YEAR (A) :

1.80

CRASH RATE CALCULATION :

0.36

RATE = $\frac{(A * 1,000,000)}{(V * 365)}$

Comments : Thursday PM volumes used

Project Title & Date: NEX-2400246 - Hamilton/Wenham - Cutler Elementary School

SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : Sep-24

DISTRICT : 4

~ SEGMENT DATA ~

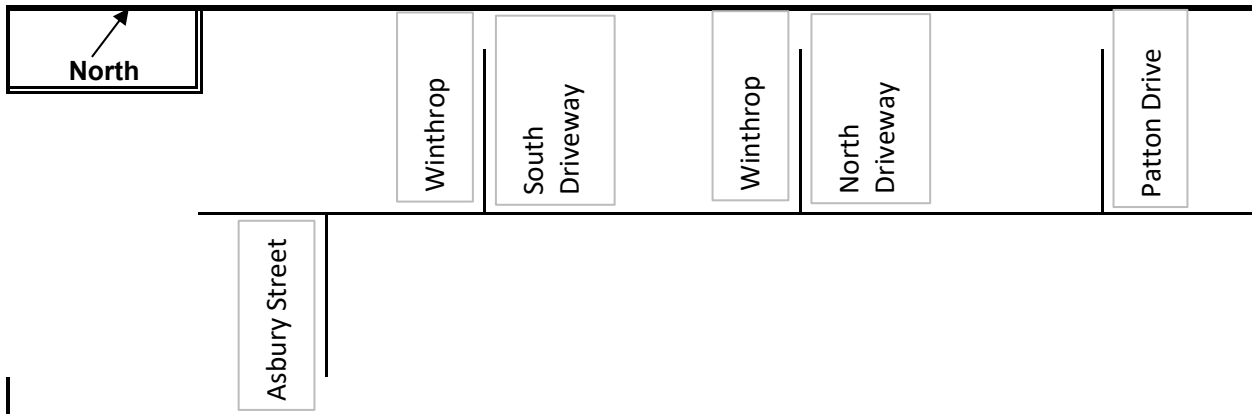
ROADWAY NAME: Bay Road

START POINT: Asbury Street

END POINT: Patton Drive

FUNCTIONAL CLASSIFICATION OF ROADWAY: Principal Arterial Other

ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)



AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES (L): **0.176**

AVERAGE DAILY TRAFFIC VOLUME (V): **15,455**

TOTAL # OF CRASHES: **2** # OF YEARS: **5** AVERAGE # OF CRASHES PER YEAR (A): **0.40**

CRASH RATE
CALCULATION :

0.40

RATE =
$$\frac{(A * 1,000,000)}{(L * V * 365)}$$

Comments : Thursday PM volumes used

Project Title & Date: NEX-2400246 - Hamilton/Wenham - Cutler Elementary School

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Police Agency Type	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Geocoding Method	Road Contributing Circumstance	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Street Number	Roadway	Near Intersection Roadway
4322672	HAMILTON	01/26/2017	Property damage only (none injured)	Closed	4:17 PM	2017	No injury	2	Local police	D1: (No improper driving) / D2: (Inattention)	D1: Not Distracted	Yes	Daylight	Rear-end	Dry	Y-intersection	Flashing traffic control signal	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: W	Cloudy	At Intersection	None	Yes, device 30 functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	ASBURY ST / HIGHLAND ST			
4523969	HAMILTON	03/28/2018	Property damage only (none injured)	Closed	9:19 PM	2018	No injury	2	Local police	D1: (Unknown) / D2: (Unknown)	D1: Not Distracted / D2: External distraction (outside the vehicle)	Yes	Dark - lighted roadway	Angle	Wet	T-intersection	No controls	V1: Slowing or stopped in traffic / V2: Overtaking/passing	V1:(Passenger car) / V2:(Passenger car) V1:(light truck/van, mini-van, pickup, sport utility) / V2:(Passenger car)	V1: N / V2: N	Cloudy/Rain	Off Intersection	None	30 Not reported	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	HIGHLAND ST	PLEASANT AVE		
4723157	HAMILTON	06/27/2019	Property damage only (none injured)	Closed	12:09 PM	2019	No Apparent Injury (O)	2	Local police	D1: (No improper driving) / D2: Followed too closely	D1: Not Distracted / D2: External distraction (outside the vehicle)	Yes	Daylight	Rear-end		T-intersection	No controls	V1: Turning right / V2: Turning right	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: W	Clear	At Intersection		Yes, device 30 functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	ASBURY ST / HIGHLAND ST			
4886845	HAMILTON	08/30/2020	Property damage only (none injured)	Closed	1:54 PM	2020	No Apparent Injury (O)	2	Local police	D1: (No improper driving) / D2: (Inattention)(Distracted)	D1: Not Distracted / D2: External distraction (outside the vehicle)	Yes	Daylight	Rear-end	Dry	T-intersection	Flashing traffic control signal	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: 5 / V2: 5	Clear	At Intersection	None	Yes, device 30 functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	HIGHLAND STREET / ASBURY STREET / PLEASANT AVENUE			
4972078	HAMILTON	04/21/2021	Property damage only (none injured)	Open	2:41 PM	2021	No Apparent Injury (O)	2	Local police	D1: (No improper driving) / D2: (Inattention)	D1: Not Distracted	Yes	Daylight	Rear to Side	Wet	T-intersection	Flashing traffic control signal	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: 5 / V2: 5	Cloudy/Rain	Off Intersection	None	Yes, device 30 functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	183	HIGHLAND ST	ASBURY ST	

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Police Agency	Driver Contributing Circumstances (All Drivers)	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Geocoding Method	Road Contributing Circumstance	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Landmark
4487896	HAMILTON	12/20/2017	Property damage only (none injured)	Closed	8:37 AM	2017	No injury	2	Local police	D1: (Unknown) / D2: (Unknown)	Yes	Daylight	Sideswipe, same direction	Dry	Not at junction	No controls	V1: Parked / V2: Turning left	V1:Light truck(van, mini-van, pickup, sport utility) / V2:Bus (seats for 16 or more, including driver)	V1: E / V2: W	Clear	At Address		Not reported	V1:(Collision with parked motor vehicle) V2:(Collision with parked motor vehicle)	42.62040516	-70.87889817	237	ASBURY STREET	CUTLER ROAD

Crash Number	City Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Police Agency Type	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Geocoding Method	Road Contributing Circumstance	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Roadway
4346920	HAMILTON	03/27/2017	Property damage only (none injured)	Closed	6:23 PM	2017	No injury	2	Local police	D1: (Inattention) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Yes	Daylight	Angle	Wet	T-intersection	Stop signs	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Clear	At Intersection	None	30	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY RD / ASBURY ST
4389419	HAMILTON	06/26/2017	Not Reported	Closed	3:16 PM	2017	Not Applicable	2	Local police	D1: (No improper driving) / D2: (Exceeded authorized speed limit)	D1: Not Distracted	Yes	Daylight	Rear-end	Dry	Four-way intersection	Stop signs	V1: Slowing or stopped in traffic / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: E	Clear	At Intersection	None	Not reported	V2:(Collision with motor vehicle in traffic) V1:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY ROAD / ASBURY STREET	
4409128	HAMILTON	07/22/2017	Property damage only (none injured)	Closed	3:20 PM	2017	No injury	3	Local police	D1: (No improper driving) / D2: (Failed to yield right of way) / D3: (Failed to yield right of way)	D1: Not Distracted / D2: Other activity (searching, eating, personal hygiene, etc.) / D3: Other activity (searching, eating, personal hygiene, etc.)	Yes	Daylight	Rear-end	Dry	T-intersection	Traffic control signal	V1: Slowing or stopped in traffic / V2: Slowing or stopped in traffic / V3: Travelling straight ahead	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility) / V3:(Light truck/van, mini-van, pickup, sport utility)	V1: N / V2: N / V3: Not Reported	Clear	At Intersection	None	30	Not reported	V2:(Collision with motor vehicle in traffic) V3:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY ROAD / ASBURY STREET
4495464	HAMILTON	01/04/2018	Non-fatal injury	Closed	9:21 AM	2018	Non-fatal injury - Possible	2	Local police	D1: (Wrong side or wrong way) / D2: (No improper driving) / D1: (Failure to keep in proper lane or running off road) / D2: (Swerving or avoiding due to wind, slippery surface, vehicle, object, vulnerable user in roadway) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Yes	Daylight	Head-on	Snow	T-intersection	Stop signs	V1: Turning left / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: W / V2: S	Snow/Blowing sand, snow	At Intersection	Road surface condition (wet, icy, snow, slush, etc.)	None	No, device not functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY RD / ASBURY ST
4499687	HAMILTON	01/19/2018	Property damage only (none injured)	Closed	5:06 PM	2018	No injury	2	Local police	D1: (Wrong side or wrong way) / D2: (No improper driving) / D1: (Failure to keep in proper lane or running off road) / D2: (Swerving or avoiding due to wind, slippery surface, vehicle, object, vulnerable user in roadway) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Yes	Dark - lighted roadway	Angle	Dry	T-intersection	Stop signs	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Light truck/van, mini-van, pickup, sport utility)	V1: S / V2: E	Cloudy	At Intersection	None	30	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY ROAD / ASBURY STREET
4523970	HAMILTON	03/30/2018	Property damage only (none injured)	Closed	5:20 PM	2018	No injury Suspected	2	Local police	D1: (Failed to yield right of way) / D2: (No improper driving)	D1: Not Distracted / D2: Not Distracted	Yes	Daylight	Angle	Wet	T-intersection	Stop signs	V1: Entering traffic lane / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: E / V2: S	Cloudy	At Intersection	None	30	Yes, device functioning	V1:(Collision with motor vehicle in traffic) V2:(Collision with motor vehicle in traffic)	42.61317	-70.8721	ASBURY ST / BAY RD
4886846	HAMILTON	08/28/2020	Non-fatal injury	Closed	5:04 PM	2020	Minor Injury (8)	1	Local police	D1: (No improper driving)	D1: Not Distracted	Yes	Daylight	Single vehicle crash	Dry	T-intersection	Stop signs	V1: Travelling straight ahead	V1:(Motorcycle)	V1: S	Clear	At Intersection	None	30	Yes, device functioning	V1:(Other non-collision) V1:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY RD / ASBURY ST / BAY RD
4985597	HAMILTON	05/07/2021	Property damage only (none injured)	Open	5:19 PM	2021	No Apparent Injury (0)	2	Local police	D1: (No improper driving) / D2: (Unknown)	D1: Not Distracted	Yes	Daylight	Rear-end	Dry	T-intersection	No controls	V1: Travelling straight ahead / V2: Travelling straight ahead	V1:(Passenger car) / V2:(Passenger car)	V1: S / V2: S	Clear	At Intersection	None	25	Yes, device functioning	V2:(Collision with motor vehicle in traffic) V1:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY RD / ASBURY ST
5063556	HAMILTON	12/22/2021	Property damage only (none injured)	Open	7:40 PM	2021	No Apparent Injury (0)	2	Local police	D1: (No improper driving) / D2: (Failed to yield right of way)	D1: Not Distracted / D2: Not Distracted	Yes	Dusk	Sideswipe, same direction	Dry	T-intersection	Stop signs	V1: Travelling straight ahead / V2: Turning left	V1:(Passenger car) / V2:(Passenger car)	V1: N / V2: N	Clear	At Intersection	None	30	Yes, device functioning	V2:(Collision with motor vehicle in traffic)	42.61317	-70.8721	BAY RD / ASBURY ST

Crash Number	City/Town Name	Crash Date	Crash Severity	Crash Status	Crash Time	Crash Year	Max Injury Severity Reported	Number of Vehicles	Police Agency Type	Driver Contributing Circumstances (All Drivers)	Driver Distracted By (All Vehicles)	Is Geocoded	Light Conditions	Manner of Collision	Road Surface Condition	Roadway Junction Type	Traffic Control Device Type	Vehicle Actions Prior to Crash (All Vehicles)	Vehicle Configuration (All Vehicles)	Vehicle Travel Directions (All Vehicles)	Weather Conditions	Geocoding Method	Road Contributing Circumstance	Speed Limit	Traffic Control Device Function	Vehicle Sequence of Events (All Vehicles)	Latitude	Longitude	Street Number	Roadway	Landmark
483384	HAMILTON	02/06/2020	Property damage only	Closed	2:54 PM	2020	No Apparent Injury (0)	2	Local police	D1: (Failed to yield right of way) / D2: (No improper driving)	D2: Not Distracted	Yes	Daylight	Sideways, same direction	Dry	Not at junction	No controls	V2: Travelling straight ahead / V1: Entering traffic lane	V2: (Passenger car) / V1: (Bus (seats for 9-25 people, including driver))	V2: S / V1: W	Clear	Operator Designated	None	30	Yes, device functioning	V1: [Collision with motor vehicle in traffic] (Other)	42.63411331	-76.8701122	BAY ROAD	Rte 56A W	WINTHROP SCHOOL DIST
			Property damage only							D1: (No improper driving) / D2: (Inattention)	D1: Not Distracted							V1: Stopping or stopped in traffic / V2: Travelling straight ahead	V1: (Light truck/box, mini-van, pickup, sport utility) / V2: (Passenger car)							V2: [Collision with motor vehicle in traffic]					
4917721	HAMILTON	10/06/2020	(none injured)	Closed	11:43 AM	2020	No Apparent Injury (0)	2	Local police		D1: Not Distracted	Yes	Daylight	Rear-end	Dry	Not at junction	No controls			V1: N / V2: N	Clear	At Address	None	30	Not reported		42.61373199	-76.87145247	325	BAY RD	

SIGHT DISTANCE CALCULATIONS

AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: Asbury St at East Site Driveway

Side Street Direction: SB
 Number of Lanes on Mainline = 2
 Median Width (Feet) = 0

STOPPING SIGHT DISTANCE

Mainline Direction: WB
 85th Percentile Speed (V) = 34 MPH
 Grade (G) = 0.9%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 236 \text{ FT}$
SSD = 240 FT

Mainline Direction: EB
 85th Percentile Speed (V) = 36 MPH
 Grade (G) = -0.9%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 257 \text{ FT}$
SSD = 260 FT

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: East of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 $ISD (\text{Right Turn from Stop}) = 1.47 * t_g * V = 287 \text{ FT}$
ISD (Right Turn from Stop) = 290 FT

LEFT TURN FROM STOP: West of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 $ISD (\text{Left Turn from Stop}) = 1.47 * t_g * V = 331 \text{ FT}$
ISD (Left Turn from Stop) = 335 FT

AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: Asbury St at Middle Site Driveway

Side Street Direction: SB
 Number of Lanes on Mainline = 2
 Median Width (Feet) = 0

STOPPING SIGHT DISTANCE

Mainline Direction: WB
 85th Percentile Speed (V) = 34 MPH
 Grade (G) = -1.9%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 236 FT

SSD =	240 FT
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Mainline Direction: EB
 85th Percentile Speed (V) = 36 MPH
 Grade (G) = 1.9%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 257 FT

SSD =	260 FT
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INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: East of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 ISD (Right Turn from Stop) = 1.47 * t_g * V = 287 FT

ISD (Right Turn from Stop) =	290 FT
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LEFT TURN FROM STOP: West of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 ISD (Left Turn from Stop) = 1.47 * t_g * V = 331 FT

ISD (Left Turn from Stop) =	335 FT
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AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: Asbury St at West Site Driveway

Side Street Direction: SB
 Number of Lanes on Mainline = 2
 Median Width (Feet) = 0

STOPPING SIGHT DISTANCE

Mainline Direction: WB
 85th Percentile Speed (V) = 34 MPH
 Grade (G) = -0.1%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 236 FT

SSD =	240 FT
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Mainline Direction: EB
 85th Percentile Speed (V) = 36 MPH
 Grade (G) = 0.1%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 SSD = 1.47 V * T + 1.075 V²/A = 257 FT

SSD =	260 FT
--------------	---------------

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: East of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 ISD (Right Turn from Stop) = 1.47 * t_g * V = 287 FT

ISD (Right Turn from Stop) =	290 FT
-------------------------------------	---------------

LEFT TURN FROM STOP: West of Driveway
 Posted Speed (V) = 30 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 ISD (Left Turn from Stop) = 1.47 * t_g * V = 331 FT

ISD (Left Turn from Stop) =	335 FT
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SIGHT DISTANCE PLANS

TRIP GENERATION CALCULATIONS

AM PEAK HOUR - Morning drop-off.

Existing - 253 kids

◦ parent drop-off - 80 kids (31%)
(69 cars)

◦ bus drop-off - 137 kids (63%)
(6 buses)

◦ walk - 29 kids.

proposed - 740 kids

◦ parent drop-off - $740 - 253(\text{existing}) - 10(\text{assumed new walk})$
 $= 477$ kids

$477(31\%) = 176$ new parent drop off.
 $176(69/80) = 152$ new cars.

◦ bus drop-off - 12 total buses
 $= 6$ new buses.

◦ walk - ~~no~~ 39 total walkers
 $= 10$ new walk

STAFF

Existing - 53 current staff.

from TMC's

88 vehicles in

61 vehicles out.

$= 27$ staff stayed.

$\frac{27}{53} = 51\%$ staff entered during AM peak.

proposed - 189 total staff.

189 total - 53 existing
 $= 136$ new.

51% of 136 = 69 new staff enter in AM peak 3 don't exit.

	<u>ENTER</u>
existing	88
future	152 parents
	69 staff
	6 buses.
	315

<u>EXIT</u>
61
152 parents
6 buses
219

546 total
315 in
219 out.

AFTERNOON PEAK HOUR - Afternoon pick-up.

Existing - 253 kids.

• parent pick-up - 50 kids (26%)
(39 cars)

• bus pick-up - 141 kids (74%)
(6 buses)

• walk - 36 kids

proposed - 740 kids.

• parent pick-up - $740 - 253(\text{existing}) - 10(\text{assumed new walk})$
 $= 477$ kids.

$477(26\%) = 125$ new parent pick-up
 $125(39/50) = 98$ new cars.

• bus pick-up - 12 total buses
6 new buses.

• walk - 46 total kids
 $= 10$ new walk.

STAFF

Existing - 53 current staff.

from TMC's

48 vehicles in
58 vehicles out.
 $= 10$ staff exited.

$\frac{10}{53} = 19\%$ staff left during
afternoon peak.

proposed - 189 total staff.

189 total - 53 existing
 $= 136$ new

19% of 136 = 26 staff exit in the
afternoon peak.

	<u>ENTER</u>
existing	48
future	98 parents 6 buses
-	
	152

	<u>EXIT</u>
	58
	98 parents
	26 staff
	6 buses
	188

340 total
152 in
188 out

Institute of Transportation Engineers (ITE)
Land Use Code (LUC) 520 - Elementary School
General Urban/Suburban

Average Vehicle Trips Ends vs: Students
Independent Variable (X): 740

AVERAGE WEEKDAY DAILY

$$T = 2.27 * (X)$$

$$T = 2.27 * 740$$

$$T = 1679.80$$

$$T = 1,680 \text{ vehicle trips} \\ \text{with 50\% (840 vpd) entering and 50\% (840 vpd) exiting.}$$

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.16 * (X)$$

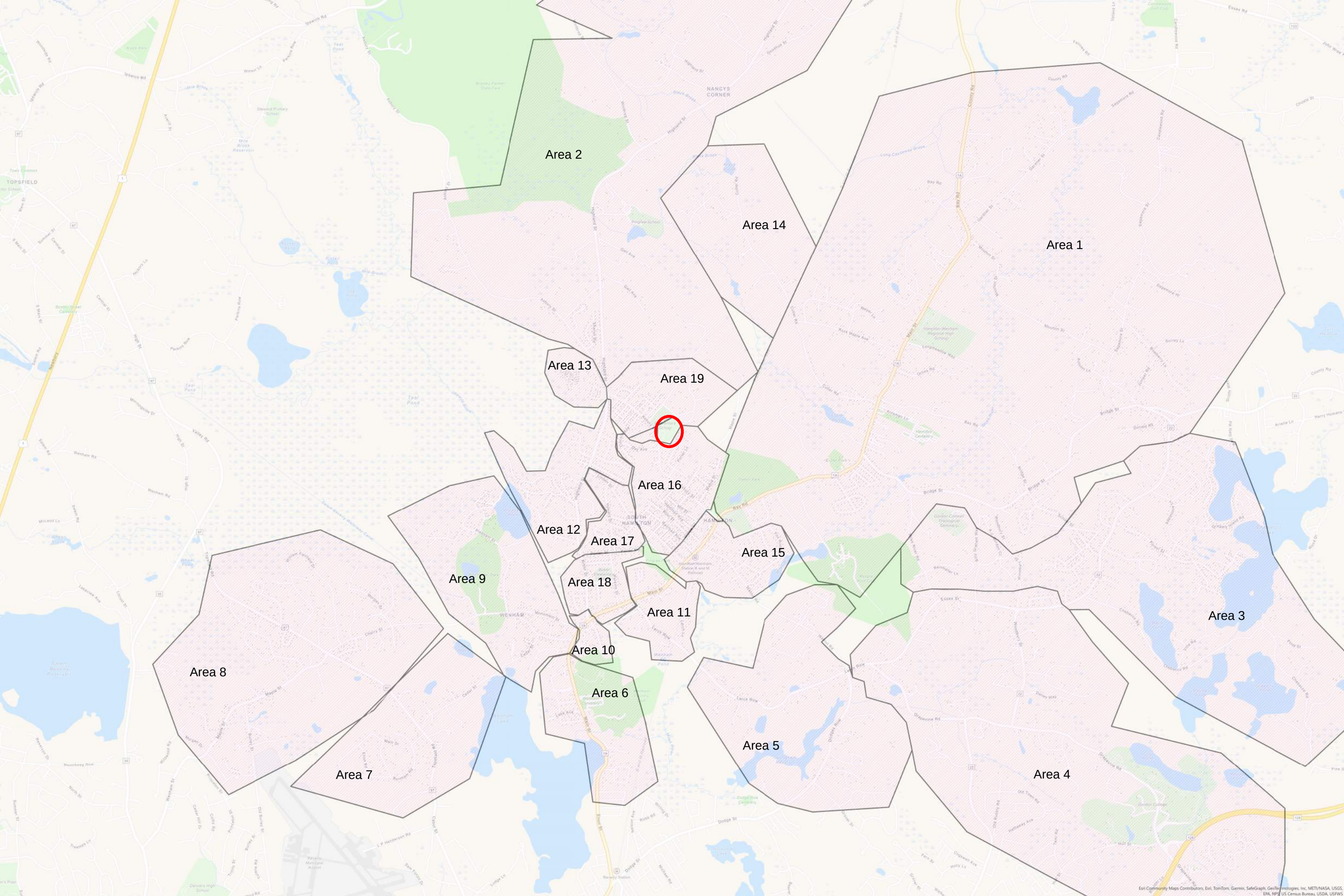
$$T = 0.16 * 740$$

$$T = 118.40$$

$$T = 118 \text{ vehicle trips} \\ \text{with 46\% (54 vph) entering and 54\% (64 vph) exiting.}$$

TRIP DISTRIBUTION CALCULATIONS

Distribution Category	Population	To/From South		To/From North		To/From West	To/From East	To/From West	To/From South		To/From North		To/From West	To/From East	To/From West
		Highland St	Bay Rd	Highland St	Bay Rd	Pleasant Avenue	Asbury St	Asbury St	Highland St	Bay Rd	Highland St	Bay Rd	Pleasant Avenue	Asbury St	Asbury St
Area 1	1095					100%			0	0	0	1095	0	0	0
Area 2	298			100%					0	0	298	0	0	0	0
Area 3	700		30%			70%			0	210	0	490	0	0	0
Area 4	405		70%			30%			0	284	0	122	0	0	0
Area 5	166		100%						0	166	0	0	0	0	0
Area 6	114		100%						0	114	0	0	0	0	0
Area 7	134	30%	70%						40	94	0	0	0	0	0
Area 8	476	50%	50%						238	238	0	0	0	0	0
Area 9	302	60%	40%						181	121	0	0	0	0	0
Area 10	45	50%	50%						23	23	0	0	0	0	0
Area 11	100		100%						0	100	0	0	0	0	0
Area 12	297	100%							297	0	0	0	0	0	0
Area 13	155								0	0	0	0	155	0	0
Area 14	43			50%		50%			0	0	22	22	0	0	0
Area 15	263		100%						0	263	0	0	0	0	0
Area 16	512						100%		0	0	0	0	0	512	0
Area 17	176						100%		0	0	0	0	0	176	0
Area 18	186	50%	50%						93	93	0	0	0	0	0
Area 19	192							100%	0	0	0	0	0	0	192
	5659								872	1705	320	1728	155	688	192
									15.41%	30.12%	5.65%	30.54%	2.74%	12.16%	3.39%
									USE	15%	30%	5%	30%	5%	10%



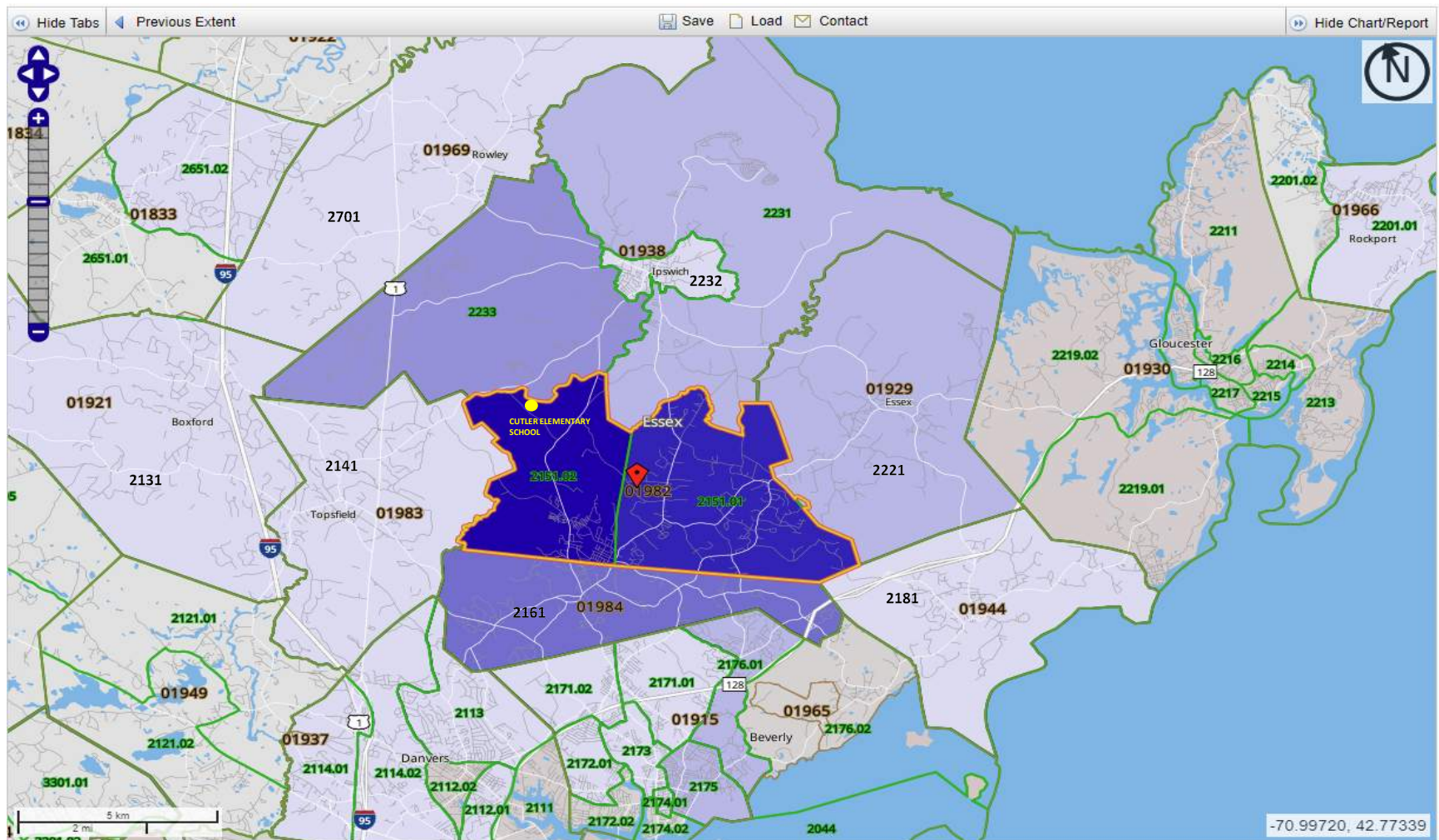
Destination Analysis

Workers: Employed in 01982

Showing: Residential locations grouped by Census Tracts

Job Counts by Census Tracts Where Workers Live - All Jobs

	2021 Count	To/From South		To/From North		To/From West		To/From East	To/From West	To/From South		To/From North		To/From West		To/From East	To/From West
		Highland St	Bay Rd	Highland St	Bay Rd	Pleasant Avenue	Asbury St	Asbury St	Highland St	Bay Rd	Highland St	Bay Rd	Pleasant Avenue	Asbury St	Asbury St		
2151.02 (Essex, MA)	101	20%		30%		0%	10%	20%	20%	20	0	30	0	10	20		20
2151.01 (Essex, MA)	85		20%		80%					0	17	0	68	0	0	0	0
2161 (Essex, MA)	58	50%	50%							29	29	0	0	0	0	0	0
2233 (Essex, MA)	40			100%						0	0	40	0	0	0	0	0
2221 (Essex, MA)	35				100%					0	0	0	35	0	0	0	0
2175 (Essex, MA)	26		100%							0	26	0	0	0	0	0	0
2176.01 (Essex, MA)	24		100%							0	24	0	0	0	0	0	0
2231 (Essex, MA)	24			50%	50%					0	0	12	12	0	0	0	0
2701 (Essex, MA)	21			70%	30%					0	0	15	6	0	0	0	0
2141 (Essex, MA)	19	30%		70%						6	0	13	0	0	0	0	0
2113 (Essex, MA)	17	50%	50%							9	9	0	0	0	0	0	0
2171.01 (Essex, MA)	16	30%	70%							5	11	0	0	0	0	0	0
2181 (Essex, MA)	16		90%		10%					0	14	0	2	0	0	0	0
2171.02 (Essex, MA)	15	10%	90%							2	14	0	0	0	0	0	0
2112.01 (Essex, MA)	13	10%	90%							1	12	0	0	0	0	0	0
2114.02 (Essex, MA)	13	50%	50%							7	7	0	0	0	0	0	0
2201.01 (Essex, MA)	13				100%					0	0	0	13	0	0	0	0
2232 (Essex, MA)	13			40%	60%					0	0	5	8	0	0	0	0
2114.01 (Essex, MA)	12	45%	45%	10%						5	5	1	0	0	0	0	0
	627									83	167	117	144	10	20		20
										14.78%	29.80%	20.80%	25.61%	1.80%	3.60%		3.60%
										15%	30%	20%	25%	2%	4%		4%



	AM	PM
Bus 1	F S on Bay then East on Asbury	T E on Asbury N on Bay rd
Bus 2		
Bus 3	F S on Highland and W on Asbury	T W on Asbury S on Highland
Bus 4	F N on Bay and E on Asbury	T E on Asbury and N on Bay
Bus 5	F S on Bay	T S on Bay
Bus 6	F S on Bay	T S on Bay
Bus 7	F S on Bay	T S on Bay
Bus 8		
Bus 9	F N on Bay	T S on Bay
Bus 10	F S on Highland	T E on Asbury
Bus 11	F N on Bay	T N on Bay
Bus 12	F N on Bay	T N on Bay
Bus 13	F S on Bay	T S on Bay
Bus 14	F N on Bay	T N on Bay

BUS ROUTES

HAM/WEN ELEM 01 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:46 AM	259 BRIDGE ST	Hamilton
2	7:48 AM	BRIDGE ST & HUNTER LN (E)	Hamilton
3	7:51 AM	489 BRIDGE ST	Hamilton
4	7:52 AM	499 BRIDGE ST	Hamilton
5	7:53 AM	SAGAMORE ST @ DONALD LN	Hamilton
6	7:54 AM	SAGAMORE ST & JUNCTION LN (W)	Hamilton
7	7:56 AM	ESSEX ST & SPINGLER WAY	Hamilton
8	7:57 AM	500 ESSEX ST	Hamilton
9	7:58 AM	WHIPPLE RD @ ESSEX	Hamilton
10	7:59 AM	440 ESSEX ST	Hamilton
11	8:00 AM	386 ESSEX ST	Hamilton
12	8:01 AM	KNOWLTON ST & APPLETON AVE	Hamilton
13	8:02 AM	27 KNOWLTON ST	Hamilton
14	8:03 AM	POSTGATE RD & TAFT WOODS ROW (NW)	Hamilton
15	8:04 AM	POSTGATE RD & ALAN RD (SW)	Hamilton
16	8:05 AM	33 ALAN RD	Hamilton
17	8:07 AM	ESSEX ST & MARTEL RD	Hamilton
18	8:09 AM	158 ESSEX ST	Hamilton
19	8:11 AM	96 LARCH ROW	Wenham
20	8:12 AM	55 LARCH ROW	Wenham
21	8:13 AM	35/42 LARCH ROW	Wenham
22	8:15 AM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton

HAM/WEN ELEM 01 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	2:55 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
2	3:05 PM	DEPART FROM SCHOOL (HW)	Hamilton
3	3:09 PM	259 BRIDGE ST	Hamilton
4	3:10 PM	BRIDGE ST & HUNTER LN (E)	Hamilton
5	3:12 PM	489 BRIDGE ST	Hamilton
6	3:13 PM	499 BRIDGE ST	Hamilton
7	3:14 PM	SAGAMORE ST @ DONALD LN	Hamilton
8	3:15 PM	SAGAMORE ST & JUNCTION LN (W)	Hamilton
9	3:16 PM	ESSEX ST & SPINGLER WAY	Hamilton
10	3:17 PM	500 ESSEX ST	Hamilton
11	3:18 PM	WHIPPLE RD @ ESSEX	Hamilton
12	3:19 PM	440 ESSEX ST	Hamilton
13	3:20 PM	386 ESSEX ST	Hamilton
14	3:21 PM	KNOWLTON ST & APPLETON AVE	Hamilton
15	3:22 PM	27 KNOWLTON ST	Hamilton
16	3:23 PM	POSTGATE RD & TAFT WOODS ROW (NW)	Hamilton
17	3:24 PM	POSTGATE RD & ALAN RD (SW)	Hamilton
18	3:25 PM	33 ALAN RD	Hamilton
19	3:26 PM	ESSEX ST & MARTEL RD	Hamilton
20	3:27 PM	158 ESSEX ST	Hamilton
21	3:30 PM	96 LARCH ROW	Wenham
22	3:32 PM	55 LARCH ROW	Wenham
23	3:34 PM	35/42 LARCH ROW	Wenham

HAM/WEN ELEM 03 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:49	221/227 HIGHLAND ST	Hamilton
2	7:50 AM	231 HIGHLAND ST	Hamilton
3	7:55 AM	595 HIGHLAND ST	Hamilton
4	7:56 AM	881 HIGHLAND ST	Hamilton
5	7:57 AM	947 HIGHLAND ST	Hamilton
6	7:59 AM	324 HIGHLAND ST	Hamilton
7	8:00 AM	302 HIGHLAND ST	Hamilton
8	8:01 AM	HIGHLAND ST & SHARON RD (SW)	Hamilton
9	8:02 AM	183 HIGHLAND ST	Hamilton
10	8:04 AM	3/7/9 MADONNA DR	Hamilton
11	8:05 AM	8/9/10 ANTHONY RD	Hamilton
12	8:07 AM	HIGHLAND ST & DURHAM AVE (SW)	Hamilton
13	8:08 AM	HOWARD ST & LINDEN ST (E)	Hamilton
14	8:09 AM	8 MOYNIHAN RD	Hamilton
15	8:10 AM	RED COACH RD & HONEYSUCKLE RD (NE)	Hamilton
16	8:15 AM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton
17	8:20:00 AM	WINTHROP ELEMENTARY SCHOOL	Wenham

HAM/WEN ELEM 03 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	WINTHROP SCHOOL	Hamilton
2	3:14 PM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton
3	3:15 PM	BUS DEPARTURE	Hamilton
4	3:17 PM	HIGHLAND ST & ASBURY AVE (NW)	Hamilton
5	3:18 PM	HIGHLAND ST & HONEYSUCKLE RD (SW)	Hamilton
6	3:19 PM	3/7/9 MADONNA DR	Hamilton
7	3:20 PM	8/9/10 ANTHONY RD	Hamilton
8	3:22 PM	HIGHLAND ST & DURHAM AVE	Hamilton
9	3:23 PM	LINDEN ST @ HOWARD ST	Hamilton
10	3:25 PM	8 MOYNIHAN RD	Hamilton
11	3:27 PM	221/227 HIGHLAND ST	Hamilton
12	3:28 PM	231 HIGHLAND ST	Hamilton
13	3:29 PM	595 HIGHLAND ST	Hamilton
14	3:30 PM	881 HIGHLAND ST	Hamilton
15	3:31 PM	947 HIGHLAND ST	Hamilton
16	3:34 PM	324 HIGHLAND ST	Hamilton
17	3:35 PM	302 HIGHLAND ST	Hamilton
18	3:36 PM	HIGHLAND ST & SHARON RD (NE)	Hamilton
19	3:37 PM	324 HIGHLAND ST	Hamilton
20	3:38 PM	595 HIGHLAND ST	Hamilton

HAM/WEN ELEM 04 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:43 AM	BAY RD @ KINSMAN LN	Hamilton
2	7:44 AM	BAY RD @ ORTINS RD	Hamilton
3	7:45 AM	BAY RD @ MANOR HILL RD	Hamilton
4	7:48	1073 BAY RD	Hamilton
5	7:49 AM	NORTHEdge RD (TURN AROUND)	Hamilton
6	7:50 AM	824 Bay Rd	Hamilton
7	7:53 AM	BAY RD & BOARDMAN LN	Hamilton
8	7:55 AM	690 BAY ROAD	Hamilton
9	7:59 AM	CUTLER & BLACK BROOK RD	Hamilton
10	8:02 AM	119 ROCK MAPLE AVENUE	Hamilton
11	8:04 AM	MEYER RD & ALEXANDER WAY	Hamilton
12	8:05 AM	18 MEYER RD	Hamilton
13	8:07 AM	78 ROCKMAPLE AVE	Hamilton
14	8:08 AM	66/45 ROCKMAPLE AVE	Hamilton
15	8:00 AM	BAY RD & KINSMAN LN (S)	Hamilton
16	8:13 AM	133 ASBURY ST	Hamilton
17	8:15 AM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton

HAM/WEN ELEM 04 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	BUKER DEPARTURE	Wenham
2	3:05 PM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton
3	3:15 PM	BUS DEPARTURE	Hamilton
4	3:17 PM	133 ASBURY ST	Hamilton
5	3:20 PM	BAY RD & KINSMAN LN (S)	Hamilton
6	3:21 PM	BAY RD @ ORTINS RD	Hamilton
7	3:22 PM	BAY RD @ MANOR HILL RD	Hamilton
8	3:23 PM	1073 BAY RD	Hamilton
9	3:26 PM	NORTHEdge RD	Hamilton
10	3:27 PM	824 BAY RD	Hamilton
11	3:28 PM	700 BAY RD	Hamilton
12	3:29 PM	BAY RD & BOARDMAN LN	Hamilton
13	3:30 PM	690 BAY ROAD	Hamilton
14	3:31 PM	CUTLER & BLACK BROOK RD	Hamilton
15	3:36 PM	119 ROCK MAPLE AVENUE	Hamilton
16	3:38 PM	MEYER RD & ALEXANDER WAY	Hamilton
17	3:40 PM	18 MEYER RD	Hamilton
18	3:41 PM	78 ROCKMAPLE AVE	Hamilton
19	3:42 PM	66/45 ROCKMAPLE AVE	Hamilton

HAM/WEN ELEM 05 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:40 AM	30 CHERRY ST	Wenham
2	7:41 AM	44 CHERRY ST	Wenham
3	7:42 AM	56 CHERRY ST	Wenham
4	7:43 AM	CHERRY ST & MORGAN	Wenham
5	7:45 AM	4 WILLIAM FAIRFIELD DRIVE	Wenham
6	7:46 AM	23 WILLIAM FAIRFIELD DR	Wenham
7	7:48 AM	29 WILLIAM FAIRFIELD DR	Wenham
8	7:49 AM	48 WILLIAM FAIRFIELD DR	Wenham
9	7:50 AM	51 WILLIAM FAIRFIELD DR	Wenham
10	7:52 AM	8 DANIELS ROAD	Wenham
11	7:53 AM	13 DANIELS RD	Wenham
12	7:55 AM	198 TOPSFIELD RD	Wenham
13	7:56 AM	9 CONRAD CIR	Wenham
14	7:57 AM	21 PURITAN RD	Wenham
15	7:58 AM	23 MAYFLOWER DR	Wenham
16	7:59 AM	33 MAYFLOWER DR	Wenham
17	8:00 AM	36/38 MAYFLOWER DR	Wenham
18	8:01 AM	PURITAN RD & MAYFLOWER DR (N)	Wenham
19	8:02 AM	195 TOPSFIELD RD	Wenham
20	8:03 AM	175 TOPSFIELD RD & MERIDIAN RD	Wenham
21	8:05 AM	181 CHERRY ST	Wenham
22	8:07 AM	CHERRY ST & EATON RD	Wenham
23	8:08 AM	45 CHERRY ST	Wenham
24	8:10	41 CHERRY ST	Wenham
25	8:12 AM	31 CHERRY ST	Wenham
26	8:15 AM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham

HAM/WEN ELEM 05 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham
2	3:15 PM	BUKER DEPARTURE	Wenham
3	3:17 PM	30 CHERRY ST	Wenham
4	3:18 PM	44 CHERRY ST	Wenham
5	3:19 PM	56 CHERRY ST	Wenham
6	3:20 PM	CHERRY ST & REGWILL AVE	Wenham
7	3:21 PM	CHERRY ST & EATON RD	Wenham
8	3:22 PM	4 WILLIAM FAIRFIELD DRIVE	Wenham
9	3:24 PM	23 WILLIAM FAIRFIELD DR	Wenham
10	3:25 PM	29 WILLIAM FAIRFIELD DR	Wenham
11	3:26 PM	48 WILLIAM FAIRFIELD DR	Wenham
12	3:28 PM	51 WILLIAM FAIRFIELD DR	Wenham
13	3:29 PM	TOPSFIELD RD & MERIDIAN RD	Wenham
14	3:30 PM	8 DANIELS ROAD	Wenham
15	3:32 PM	11/13 DANIELS RD	Wenham
16	3:34 PM	198/200/206 TOPSFIELD RD	Wenham
17	3:36 PM	9 CONRAD CIR	Wenham
18	3:38 PM	21 PURITAN RD	Wenham
19	3:39 PM	23 MAYFLOWER DR	Wenham
20	3:40 PM	28 MAYFLOWER DR	Wenham
21	3:41 PM	36/38 MAYFLOWER DR	Wenham
22	3:42 PM	PURITAN RD & MAYFLOWER DR (N)	Wenham
23	3:44 PM	195 TOPSFIELD RD	Wenham
24	3:47 PM	181 CHERRY ST	Wenham
25	3:49 PM	45 CHERRY ST	Wenham
26	3:50 PM	41 CHERRY ST	Wenham
27	3:51 AM	31 CHERRY ST	Wenham

HAM/WEN ELEM 06 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:48 AM	GUSSETT RD & CHARLES DAVIS DR (N)	Wenham
2	7:53 AM	358 GRAPEVINE RD	Wenham
3	7:56 AM	355/359 GRAPEVINE RD	Wenham
4	7:57 AM	41 PARSONS HILL RD	Wenham
5	7:58 AM	PARSONS HILL RD & LAFAYETTE LN (NE)	Wenham
6	7:59 AM	PARSONS HILL RD & PRINCEMERE LN (W)	Wenham
7	8:00AM	PARSONS HILL RD & STOCKWELL LN (W)	Wenham
8	8:01 AM	PARSONS HILL RD & DEXTER LN (S)	Wenham
9		17 HULL ST	Wenham
10	8:05 AM	OLD RUBBLY @ ACIENT RUBLY WAY	Wenham
11	8:08 AM	24 RUBBLY RD	Wenham
12	8:15 PM	CUTLER ELEMENTARY SCHOOL (CUTES)	
13	8:25 AM	BUKER ELEMENTARY SCHOOL (BUKES)	Hamilton

HAM/WEN ELEM 06 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:14 PM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton
2	3:15 PM	BUS DEPARTURE	Hamilton
3	3:24 PM	GUSSETT RD & CHARLES DAVIS DR (N)	Wenham
4	3:29 PM	358 GRAPEVINE RD	Wenham
5	3:33 PM	355/359 GRAPEVINE RD	Wenham
6	3:34 PM	41 PARSONS HILL RD	Wenham
7	3:35 PM	PARSONS HILL RD & LAFAYETTE LN (NE)	Wenham
8	3:36 PM	PARSONS HILL RD & PRINCEMERE LN (W)	Wenham
9	3:37 PM	PARSONS HILL RD & STOCKWELL LN (W)	Wenham
10	3:38 AM	PARSONS HILL RD & DEXTER LN (S)	Wenham
11	3:39 AM	17 HULL ST	Wenham
12	3:42 AM	OLD RUBLY RD @ ACIENT RUBLY WAY	Wenham
13	3:46 AM	24 OLD RUBBLY WAY	Wenham

HAM/WEN ELEM 07 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:45 AM	10 CEDAR ST	Wenham
2	7:46 AM	18 CEDAR ST	Wenham
3	7:47 AM	CEDAR ST & RAMONA WAY (NE)	Wenham
4	7:48 AM	84/86 CEDAR ST	Wenham
5	7:49 AM	100 CEDAR ST	Wenham
6	7:51AM	BURNHAM RD @ MAIN DR	Wenham
7	7:52 AM	24 BURNHAM RD	Wenham
8	7:53 AM	BURNHAM RD & HILLTOP DR (S)	Wenham
9	7:54 AM	13/15 BURNHAM RD	Wenham
10	7:55 AM	1 BURNHAM RD	Wenham
11	7:56 AM	35 TOPSFIELD RD	Wenham
12	7:57 AM	31 TOPSFIELD RD	Wenham
13	7:58 AM	36 TOPSFIELD RD	Wenham
14	8:00 AM	57 TOPSFIELD RD	Wenham
15	8:01 AM	38 MAPLE ST	Wenham
161	8:02 AM	78 MAPLE ST	Wenham
7	8:03 AM	96 MAPLE ST	Wenham
18	8:04 AM	103 MAPLE ST	Wenham
19	8:05 AM	104 MAPLE ST	Wenham
20	8:06 AM	MAPLE ST & BIRCH RD (N)	Wenham
21	8:07 AM	116 MAPLE ST	Wenham
22	8:08 AM	BURLEY ST @ NATHANIAL CIR	Wenham
23	8:09 AM	BURLEY ST @ ORCHARD LN	Wenham
24	8:10 AM	BURLEY ST & MIDDLEWOOD DR	Wenham
25	8:11 AM	26 BURLEY ST	Wenham
26	8:15 AM	BUKER ELEMENTARY SCHOOL (BUKES)	Hamilton
27	8:20 AM	WINTHROP ELEMENTARY SCHOOL (WINHA)	Wenham

HAM/WEN ELEM 07 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
2	3:08 PM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham
3	3:15 PM	BUS DEPARTURE	Hamilton
4	3:22 PM	10 CEDAR ST	Wenham
5	3:23 PM	18 CEDAR ST	Wenham
6	3:24 PM	CEDAR ST & RAMONA WAY (NE)	Wenham
7	3:26 PM	84/86 CEDAR ST	Wenham
8	3:27 PM	100 CEDAR ST	Wenham
9	3:30 PM	24 BURNHAM RD	Wenham
10	3:31 PM	BURNHAM ST @ MAIN DR	Wenham
11	3:32 PM	BURNHAM RD & HILLTOP DR (S)	Wenham
12	3:34 PM	15/13 BURNHAM RD	Wenham
13	3:35 PM	1 BURNHAM RD	Wenham
14	3:36 PM	35 TOPSFIELD RD	Wenham
15	3:38 PM	31 TOPSFIELD RD	Wenham
16	3:39 PM	36 TOPSFIELD RD	Wenham
17	3:42 PM	57 TOPSFIELD RD	Wenham
18	3:43 PM	38 MAPLE ST	Wenham
19	3:44 PM	78 MAPLE ST	Wenham
20	3:45 PM	96 MAPLE ST	Wenham
21	3:46 PM	103 MAPLE ST	Wenham
22	3:47 PM	104 MAPLE ST	Wenham
23	3:48 PM	MAPLE ST & BIRCH RD (N)	Wenham
24	3:50 PM	116 MAPLE ST	Wenham
25	3:51 PM	BURLEY ST @ NATHANIAL CIR	Hamilton
26	3:52 PM	BURLEY ST @ ORCHARD SLN	Hamilton
27	3:53 PM	BURLEY ST & MIDDLEWOOD DR	Wenham
28	3:54 PM	26 BURLEY ST	Wenham
29	3:55 PM	4 ORCHARD LN	Wenham

HAM/WEN ELEM 09 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:42 AM	27 WALNUT RD	Hamilton
2	7:43 AM	45 WALNUT RD	Hamilton
3	7:44 AM	49 WALNUT RD	Hamilton
4	7:45 AM	CHESTNUT ST & PINE ST	Hamilton
5	7:46 AM	CHESTNUT ST & ELM ST	Hamilton
6	7:47 AM	9 WALNUT ST	Hamilton
7	7:50 AM	72 DODGES ROW	Wenham
8	7:54 AM	DODGES ROW @ SPRING HILL FARM RD	Wenham
9	7:59 AM	185 WOODBURY ST	Hamilton
10	8:00 AM	J HOWARD PEW LN & A.J. GORDON CT (NE)	Hamilton
11	8:03 AM	233 ESSEX ST	Hamilton
12	8:05 AM	58 SCHOOL ST	Hamilton
13	8:06 AM	SCHOOL ST & KENNEDY RD / 93 SCHOOL ST	Hamilton
14	8:07 AM	107/125 SCHOOL ST	Hamilton
15	8:08 AM	SCHOOL ST & GREENBROOK RD (SE)	Hamilton
16	8:10 AM	93/100 BRIDGE ST	Hamilton
17	8:11 AM	13/25 BRIDGE ST	Hamilton
18	8:12 AM	10/14 BRIDGE ST	Hamilton
19	8:15 AM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton

HAM/WEN ELEM 09 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	BUKER DEPARTURE	Wenham
2	3:10 PM	ASBURY ST & BAY RD (W) COMMUNITY HOUSE	Hamilton
3	3:15 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
4	3:17 PM	BUS DEPARTURE	Hamilton
5	3:19 PM	27 WALNUT RD	Hamilton
6	3:20 PM	45 WALNUT RD	Hamilton
7	3:21 PM	49 WALNUT RD	Hamilton
8	3:22 PM	CHESTNUT ST & PINE ST	Hamilton
9	3:23 PM	CHESTNUT ST & ELM ST	Hamilton
10	3:24 PM	9 WALNUT ST	Wenham
11	3:27 PM	72 DODGES ROW	Wenham
12	3:31 PM	DODGES ROW @ SPRING HILL FARM RD	Wenham
13	3:36 PM	185 WOODBURY ST	Hamilton
14	3:38 PM	J HOWARD PEW LN & A.J. GORDON CT (NE)	Hamilton
15	3:40 PM	233 ESSEX ST	Hamilton
16	3:42 PM	58 SCHOOL ST	Hamilton
17	3:43 PM	SCHOOL ST & KENNEDY RD/93 SCHOOL ST	Hamilton
18	3:44 PM	107/125 SCHOOL ST	Hamilton
19	3:45 PM	SCHOOL ST & GREENBROOK RD (SE)	Hamilton
20	3:48 PM	100 Bridge Street	Hamilton
21	3:50 PM	13/25 BRIDGE ST	Hamilton
22	3:50 PM	10/14 BRIDGE ST	Hamilton

HAM/WEN ELEM 10 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:54 AM	92/87 UNION ST	Hamilton
2	7:55 AM	HAMILTON AVE & UNION ST	Hamilton
3	7:57 AM	HAMILTON & WILLOW ST	Hamilton
4	7:58 AM	WILLOW ST @ RAILRAOD AVE	Hamilton
5	7:59 AM	LINDEN ST & ELLIOTT ST (N)	Hamilton
6	8:00 AM	LINDEN ST & UNION ST (E)	Hamilton
7	8:01 AM	LINDEN ST & LOIS ST (E)	Hamilton
8	8:02 AM	200 LINDEN ST	Hamilton
9	8:03 AM	37 HOWARD ST	Hamilton
10	8:04: AM	5 HIGHLAND ST	Hamilton
11	8:07 AM	36 HIGHLAND ST	Hamilton
12	8:08 AM	LAKE DR & PERKINS AVE (SE)	Hamilton
13	8:09 AM	LAKE DR @ PINE TREE DR	Hamilton
14	8:10 AM	LAKE DR & KNOLL RD (E)	Hamilton
15	8:11 AM	LAKE DR & LEIGH RD (SE)	Hamilton
16	8:12 AM	ARBOR ST & SETTLERS LN (SW)	Wenham
17	8:13 AM	ARBOR ST & JUNIPER ST (SW)	Wenham
18	8:15 AM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham
19	8:20 AM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton

HAM/WEN ELEM 10 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	CUTLER ELEMENTARY SCHOOL (CUTES)	Hamilton
2	3:10 PM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham
3	3:15 PM	BUKER DEPARTURE	Wenham
4	3:18 PM	92/87 UNION ST	Hamilton
5	3:19 PM	HAMILTON AVE & UNION ST	Hamilton
6	3:20 PM	HAMILTON & WILLOW ST	Hamilton
7	3:21 PM	LINDEN ST & ELLIOTT ST (N)	Hamilton
8	3:22 PM	LINDEN ST & UNION ST (E)	Hamilton
9	3:23 PM	LINDEN ST & LOIS ST (E)	Hamilton
10	3:24 PM	200 LINDEN ST	Hamilton
11	3:25 PM	37 HOWARD ST	Hamilton
12	3:28 PM	5 HIGHLAND ST	Hamilton
13	3:29 PM	36 HIGHLAND ST	Hamilton
14	3:30 PM	LAKE DR & PERKINS AVE (SE)	Hamilton
15	3:31 PM	LAKE DR @ PINE TREE DR	Hamilton
16	3:32 PM	LAKE DR & KNOLL RD (E)	Hamilton
17	3:33 PM	LAKE DR & LEIGH RD (SE)	Hamilton
18	3:34 PM	ARBOR ST & SETTLERS LN (SW)	Wenham
19	3:35 PM	ARBOR ST & JUNIPER ST (SW)	Wenham

HAM/WEN ELEM 11 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:45 AM	231 SAGAMORE ST	Hamilton
2	7:46 AM	279 SAGAMORE ST	Hamilton
3	7:50 AM	21 BLUEBERRY LN	Hamilton
4	7:51 AM	57 BLUEBERRY LN	Hamilton
5	7:53 AM	109 BLUEBERRY LN	Hamilton
6	7:54 AM	BLUEBERRY LN @ JUNIPER	Hamilton
7	7:55 AM	23/24 JUNIPER RD	Hamilton
8	7:58 AM	255 MOULTON ST	Hamilton
9	7:59 AM	258 MOULTON ST	Hamilton
10	8:00 AM	18 MOULTON ST	Hamilton
11	8:01 AM	6 MOULTON ST	Hamilton
12	8:03 AM	GARDNER ST @ BANCROFT WAY	Hamilton
13	8:04 AM	GARDNER ST & FARRINGTON LN (N)	Hamilton
14	8:05 AM	170 GARDNER ST	Hamilton
15	8:06 AM	GARDNER ST & SMITHWOOD TER (W)	Hamilton
16	8:08 AM	18 GARDNER STREET	Hamilton
17	8:15 AM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton

HAM/WEN ELEM 11 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	CUTLER ELEMENTARY	Hamilton
2	3:06 PM	COMMUNITY HOUSE	Hamilton
3	3:10 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
4	3:15 PM	BUS DEPARTURE	Hamilton
5	3:20:00 PM	6 MOULTON ST	Hamilton
6	3:21 PM	18 MOULTON ST	Hamilton
7	3:23 PM	255 MOULTON ST	Hamilton
8	3:24 PM	258 MOULTON ST	Hamilton
9	3:25 PM	231 SAGAMORE ST	Hamilton
10	3:26 PM	279 SAGAMORE ST	Hamilton
11	3:31 PM	21 BLUEBERRY LN	Hamilton
12	3:32 PM	57 BLUEBERRY LN	Hamilton
13	3:34 PM	109 BLUEBERRY LN	Hamilton
14	3:35 PM	BLUEBERRY LN @ JUNIPER	Hamilton
15	3:36 PM	23/24 JUNIPER RD	Hamilton
16	3:42 PM	GARDNER ST @ BANCROFT WAY	Hamilton
17	3:43 PM	GARDNER ST & SMITHWOOD TER (W)	Hamilton
18	3:44 PM	GARDNER ST & FARRINGTON LN (N)	Hamilton
19		170 GARDNER ST	Hamilton
20	3:48 PM	18 GARDNER STREET	Hamilton

HAM/WEN ELEM 12 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:40 AM	35 MILES RIVER RD	Hamilton
2	7:41 AM	49 MILES RIVER RD	Hamilton
3	7:45 AM	CHEBACCO RD @ BOAT RAMP	Hamilton
4	7:46 AM	CHEBACCO RD & VILLA RD (E)	Hamilton
5	7:48 AM	74 CHEBACCO RD	Hamilton
6	7:50 AM	16 CHEBACCO RD	Hamilton
7	7:51 AM	ESSEX ST & BITTERSWEET LN (NE)	Hamilton
8	7:53 AM	75 OLD CART RD	Hamilton
9	7:56 AM	38 OLD CART RD	Hamilton
10	7:59 AM	4 FOREST ST	Hamilton
11	8:00 AM	81 FOREST ST	Hamilton
12	8:01 AM	GREGORY ISLAND RD & FOREST ST (NE)	Hamilton
13	8:02 AM	GREGORY ISLAND RD & APPALOOSA LN	Hamilton
14	8:03 AM	APPALOOSA LN @ ARABIAN WAY	Hamilton
15	8:04 AM	1 APPALOOSA LN	Hamilton
16	8:05 AM	505 ESSEX ST	Hamilton
17	8:15 AM	WINTHROP SCHOOL - HAMILTON (WINHA)	Wenham
18	8:20 AM	BUKER SCHOOL (BUKES)	Hamilton

HAM/WEN ELEM 12 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
2	3:15 PM	DEPART FROM SCHOOL (HW)	Hamilton
3	3:18 PM	35 MILES RIVER RD	Hamilton
4	3:20 PM	49 MILES RIVER RD	Hamilton
5	3:25 PM	CHEBACCO RD @ BOAT RAMP	Hamilton
6	3:28 PM	CHEBACCO RD & VILLA RD (E)	Hamilton
7	3:30 PM	74 CHEBACCO RD	Hamilton
8	3:31 PM	16 CHEBACCO RD	Hamilton
9	3:32 PM	ESSEX ST & BITTERSWEET LN (NE)	Hamilton
10	3:36 PM	75 OLD CART RD	Hamilton
11	3:45 PM	38 OLD CART RD	Hamilton
12	3:49 PM	4 FOREST ST	Hamilton
13	3:50 PM	81 FOREST ST	Hamilton
14	3:51 PM	GREGORY ISLAND RD & FOREST ST (NE)	Hamilton
15	3:52 PM	GREGORY ISLAND RD & APPALOOSA LN	Hamilton
16	3:53 PM	APPALOOSA LN @ ARABIAN WAY	Hamilton
17	3:54 PM	1 APPALOOSA LN	Hamilton
18	3:55 PM	505 ESSEX ST	Hamilton

HAM/WEN ELEM 13 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:47 AM	1 MONUMENT ST	Wenham
2	7:48 AM	29/30 MONUMENT ST	Wenham
3	7:49 AM	37 MONUMENT ST	Wenham
4	7:51 AM	30 CHERRY ST	Wenham
5	7:52 AM	44 CHERRY ST	Wenham
6	7:53 AM	32 PLEASANT ST	Wenham
7	7:54 AM	PLEASANT St @ BATHCHELDER PK	Wenham
8	7:55 AM	PLEASANT ST @ LONGFELLOW	Wenham
9	7:56 AM	PLEASANT ST @ WOODSIDE LN	Wenham
10	8:01 AM	17 CHERRY ST	Wenham
11	8:02 AM	4 FAIRVIEW AVE	Wenham
12	8:04 AM	FISKE RD & LAKE AVE (S)	Wenham
13	8:05 AM	17 FISKE RD	Wenham
14	8:06 AM	7 FISKE RD	Wenham
15	8:08 AM	4 MAIN ST	Wenham
16	8:09 AM	7 GREAT POND RD	Wenham
17	8:10 AM	195 MAINST	Wenham
18	8:12 AM	108 MAIN ST	Wenham
19	8:15 AM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham

HAM/WEN ELEM 13 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	BUKER ELEMENTARY SCHOOL (BUKES)	Wenham
2	3:15 PM	BUS DEPARTURE	Wenham
3	3:17 PM	4 FAIRVIEW AVE	Wenham
4	3:19 PM	LAKE AVE & FISKE RD (NE)	Wenham
5	3:20 PM	17 FISKE RD	Wenham
6	3:21 PM	7 FISKE RD	Wenham
7	3:22 PM	4 MAIN ST	Wenham
8	3:24 PM	7 GREAT POND RD	Wenham
9	3:26 PM	195 MAINST	Wenham
10	3:27 PM	108 MAIN ST	Wenham
11	3:28 PM	17 CHERRY ST	Wenham
12	3:29 PM	30 CHERRY ST	Wenham
13	3:30 PM	44 CHERRY ST	Wenham
14	3:33 PM	32 PLEASANT ST	Wenham
15	3:34 PM	PLEASANT ST @ LONGFELLOW	Wenham
16	3:37 PM	PLEASANT ST @ WOODSIDE LN	Wenham
17	3:38 PM	37 MONUMENT ST	Wenham
18	3:40 PM	29/30 MONUMENT ST	Wenham
19	3:42 PM	1 MONUMENT ST	Wenham

HAM/WEN ELEM 14 AM

	<u>TIME</u>	<u>LOCATION</u>	
1	7:44 AM	233 WOODBURY ST	Hamilton
2	7:45 AM	4/6 PARTRIDGEBERRY LN	Hamilton
3	7:47	BERRY CIR & BERRYWOOD LN	Hamilton
4	7:54 AM	567 ESSEX @ BERRY CIRCLE	Hamilton
5	7:55 AM	ESSEX ST. @ ECHO COVE RD.	Hamilton
6	7:57 AM	504 BRIDGE ST	Hamilton
7	8:02 AM	31 MARGARET ROAD	Hamilton
8	8:04 AM	43 MARGARET RD	Hamilton
9	8:05 AM	75 HOMESTEAD CIR	Hamilton
10	8:06 AM	94 HOMESTEAD CIR	Hamilton
11	8:07 AM	103 HOMESTEAD CIR	Hamilton
12	8:08 AM	10/17/18 HOMESTEAD CIR	Hamilton
13	8:09 AM	18 CRESCENT RD	Hamilton
14	8:10 AM	25 CRESCENT RD	Hamilton
15	8:11 AM	33 CRESCENT RD	Hamilton
16	8:12 AM	PILGRIM RD & NORMAN RD	Hamilton
17	8:13 AM	6 ORCHARD RD	Hamilton
18	8:14 AM	484 BAY RD	Hamilton
19	8:15 AM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
20	8:20 AM	CUTLER SCHOOL - HAMILTON	Hamilton

HAM/WEN ELEM 14 PM

	<u>TIME</u>	<u>LOCATION</u>	
1	3:00 PM	WINTHROP SCHOOL - HAMILTON (WINHA)	Hamilton
2	3:15 PM	BUS DEPARTURE	Hamilton
3	3:17 PM	484 BAY RD	Hamilton
4	3:20 PM	31 MARGARET ROAD	Hamilton
5	3:22 PM	43 MARGARET RD	Hamilton
6	3:23 PM	75 HOMESTEAD CIR	Hamilton
7	3:24 PM	94 HOMESTEAD CIR	Hamilton
8	3:25 PM	103 HOMESTEAD CIR	Hamilton
9	3:26 PM	10/17/18 HOMESTEAD CIR	Hamilton
10	3:27 PM	18 CRESCENT RD	Hamilton
11	3:28 PM	25 CRESCENT RD	Hamilton
12	3:29 PM	33 CRESCENT RD	Hamilton
13	3:30 PM	PILGRIM RD & NORMAN RD	Hamilton
14	3:31 PM	6 ORCHARD RD	Hamilton
15	3:37 PM	4/6 PARTRIDGEBERRY LN	Hamilton
16	3:40 PM	233 WOODBURY ST	Hamilton
17	3:45 PM	BERRY CIR & BERRYWOOD LN	Hamilton
18	3:46 PM	567 ESSEX @ BERRY CIRCLE	Hamilton
19	3:47 PM	ESSEX ST. @ ECHO COVE RD.	Hamilton
20	3:49 PM	504 BRIDGE ST	Hamilton

ITE PARKING DATA

Land Use: 520 Elementary School

Description

An elementary school is a public school that typically serves students attending kindergarten through the fifth or sixth grade. An elementary school is usually centrally located in a residential community to facilitate student access. Bus service is commonly provided to students living beyond a specified distance from the school.

Time-of-Day Distribution for Parking Demand

The following table presents a time-of-day distribution of parking demand on a weekday at eight study sites in a general urban/suburban setting.

Hour Beginning	Percent of Weekday Peak Parking Demand
12:00–4:00 a.m.	—
5:00 a.m.	—
6:00 a.m.	—
7:00 a.m.	57
8:00 a.m.	100
9:00 a.m.	96
10:00 a.m.	95
11:00 a.m.	97
12:00 p.m.	94
1:00 p.m.	96
2:00 p.m.	96
3:00 p.m.	75
4:00 p.m.	53
5:00 p.m.	28
6:00 p.m.	—
7:00 p.m.	—
8:00 p.m.	—
9:00 p.m.	—
10:00 p.m.	—
11:00 p.m.	—

Additional Data

The parking demand data only include vehicles that are parked in designated spaces, not queued vehicles that are associated with student pick up or drop off.

The average parking supply ratio for the 17 study sites in a general urban/suburban setting and with parking supply information is 16 spaces per 100 students. The average peak parking occupancy at these 17 sites is 83 percent.

The sites were surveyed in the 1990s, the 2000s, the 2010s and the 2020s in Alabama, Arizona, California, Hawaii, Maine, Minnesota, New York, Oklahoma, Ontario (CAN), Oregon, and Virginia.

Additional parking demand observations should include evening hours and when special events occur at the site (for example, special programs or sports field usage). If available, the type of event or number of sports fields in use should be documented.

Source Numbers

118, 315, 409, 507, 517, 520, 555, 622, 632

Elementary School (520)

Peak Period Parking Demand vs: Students

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban

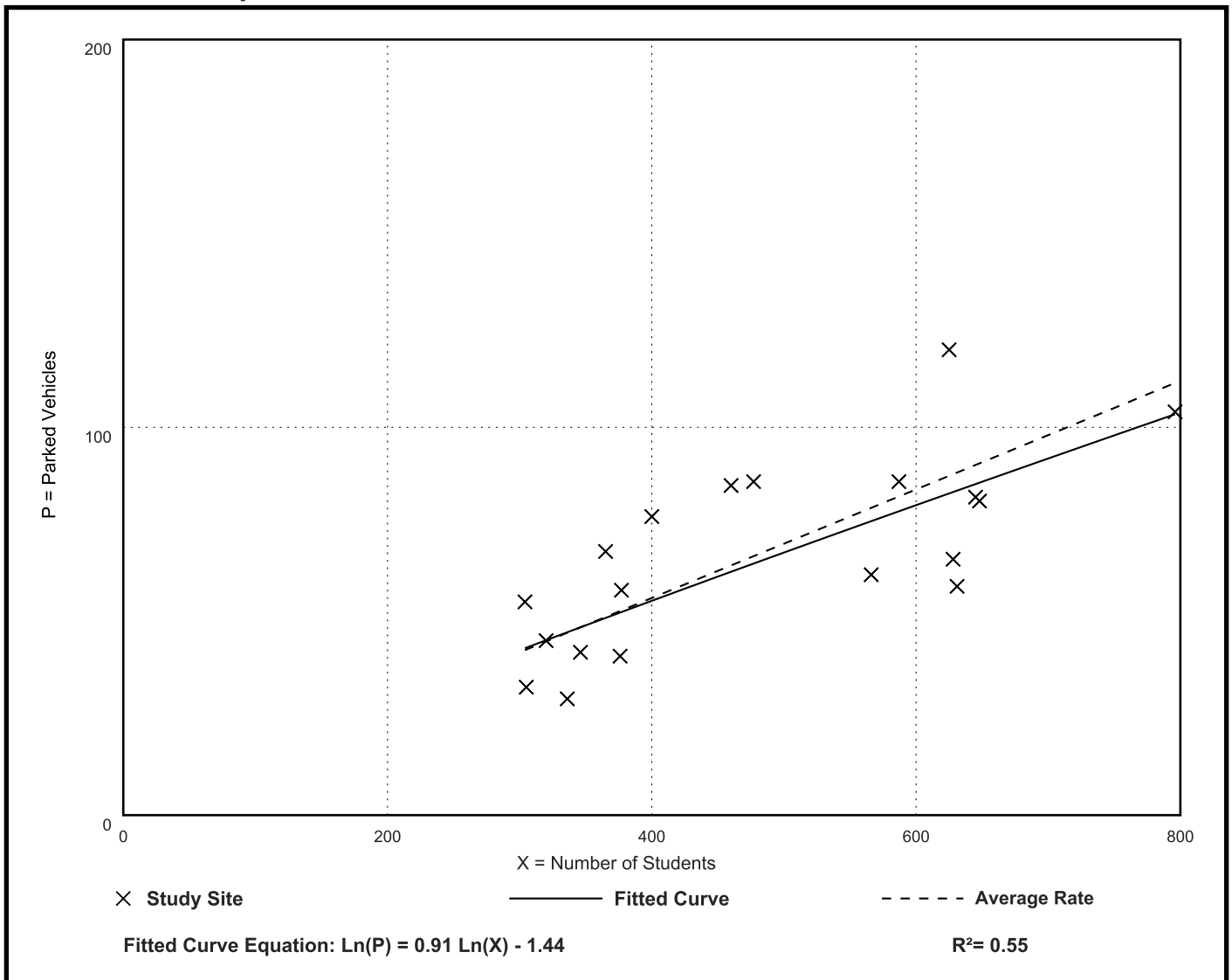
Number of Studies: 19

Avg. Num. of Students: 484

Peak Period Parking Demand per Student

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
0.14	0.09 - 0.19	0.12 / 0.19	***	0.03 (21%)

Data Plot and Equation



Elementary School (520)

Peak Period Parking Demand vs: Employees

On a: Weekday (Monday - Friday)

Setting/Location: General Urban/Suburban

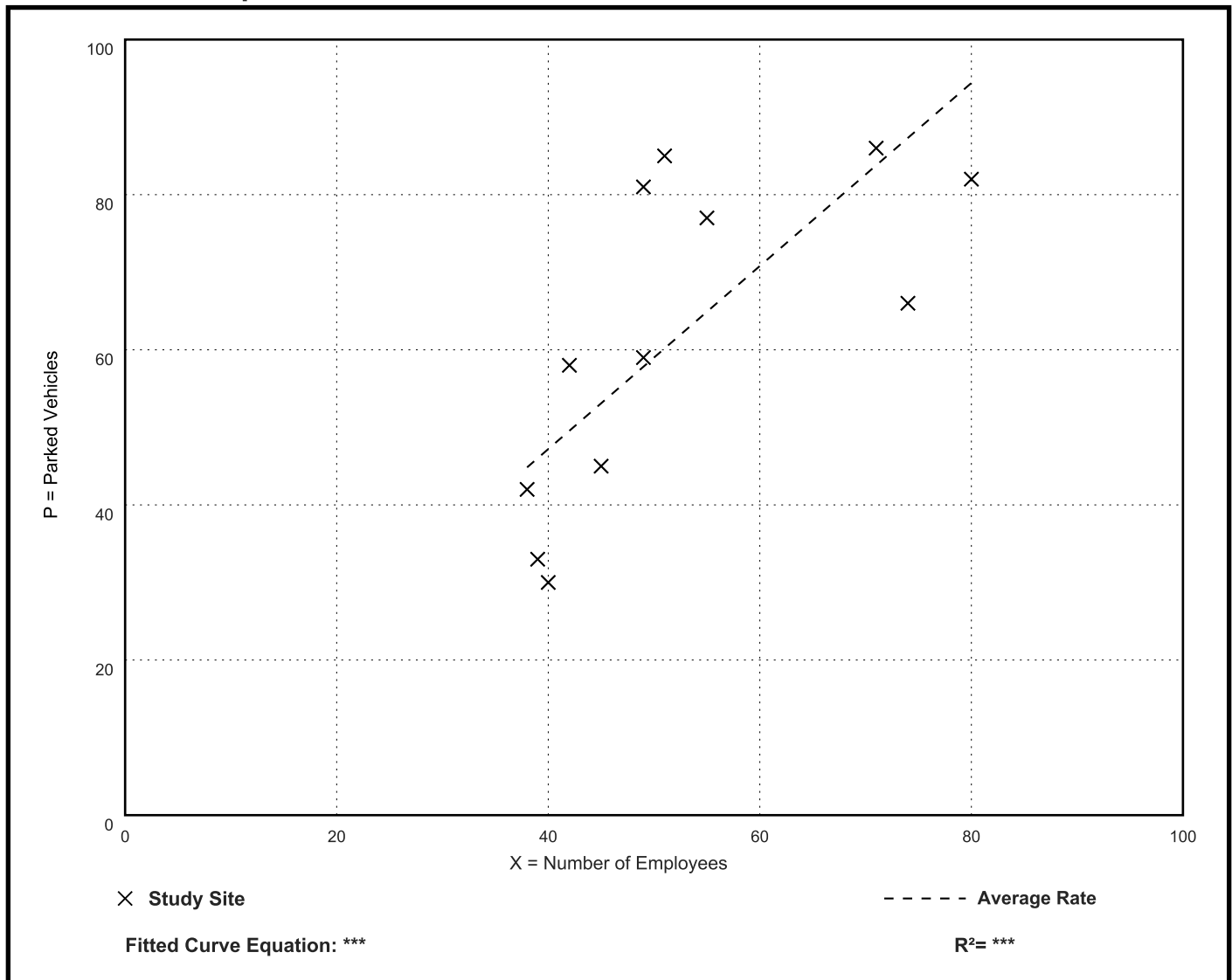
Number of Studies: 12

Avg. Num. of Employees: 53

Peak Period Parking Demand per Employee

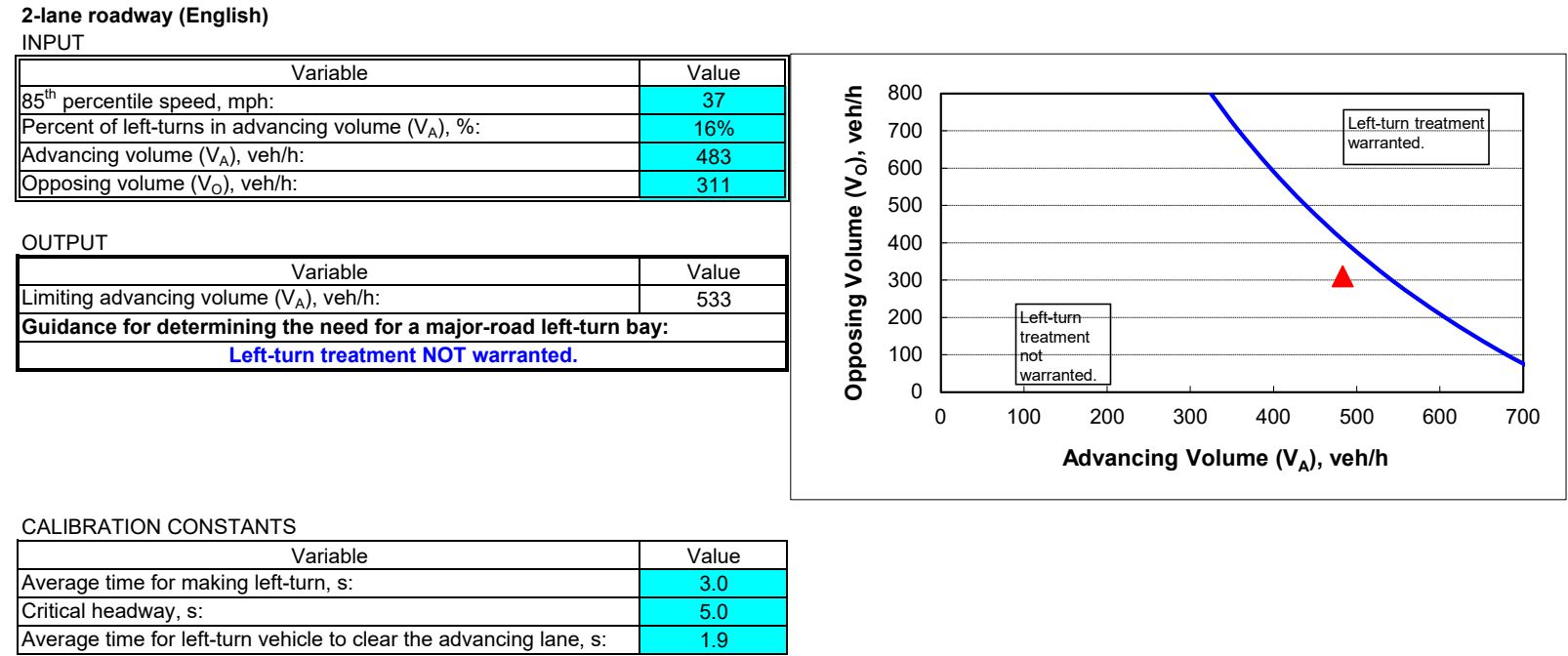
Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.18	0.75 - 1.67	1.01 / 1.65	***	0.29 (25%)

Data Plot and Equation



AUXILIARY TURNING LANE WARRANTS

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.



CALIBRATION CONSTANTS

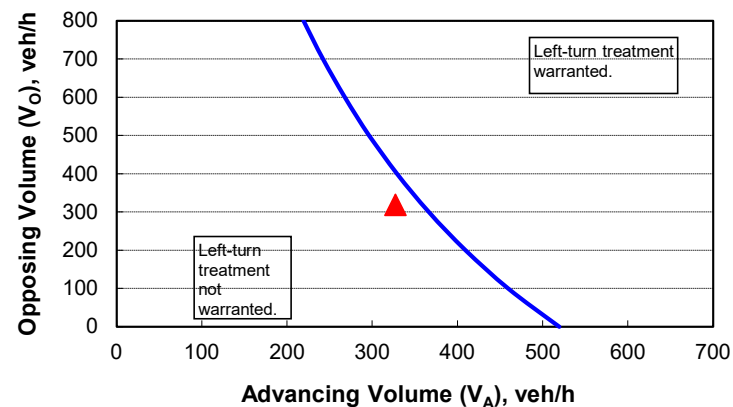
Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**2-lane roadway (English)****INPUT**

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V_A), %:	14%
Advancing volume (V_A), veh/h:	327
Opposing volume (V_O), veh/h:	319

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	359
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	

**CALIBRATION CONSTANTS**

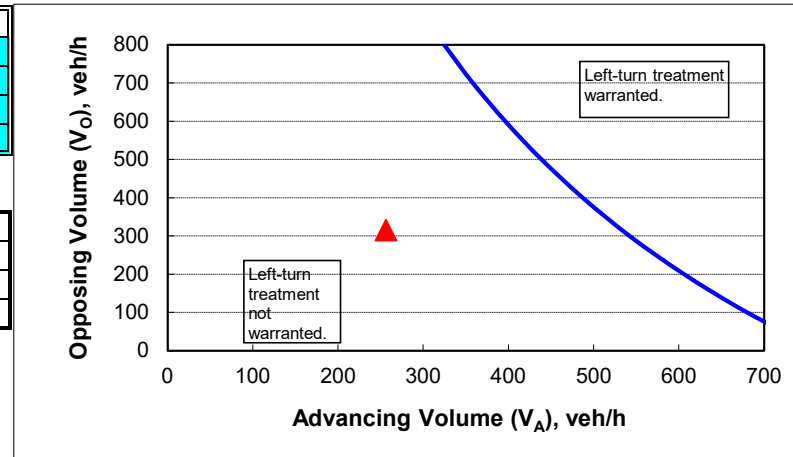
Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**2-lane roadway (English)****INPUT**

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V_A), %:	6%
Advancing volume (V_A), veh/h:	256
Opposing volume (V_O), veh/h:	316

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	533
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	

**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	311
Right-turn volume, veh/h:	144

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1509
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

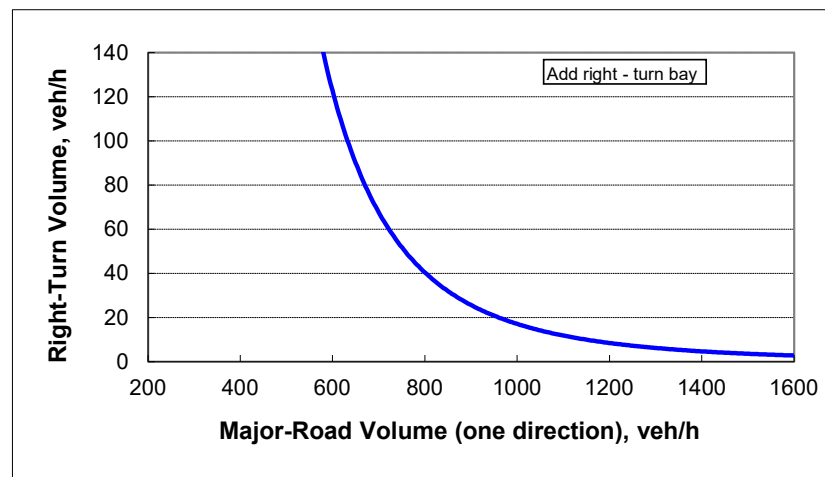


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	319
Right-turn volume, veh/h:	106

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1402
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

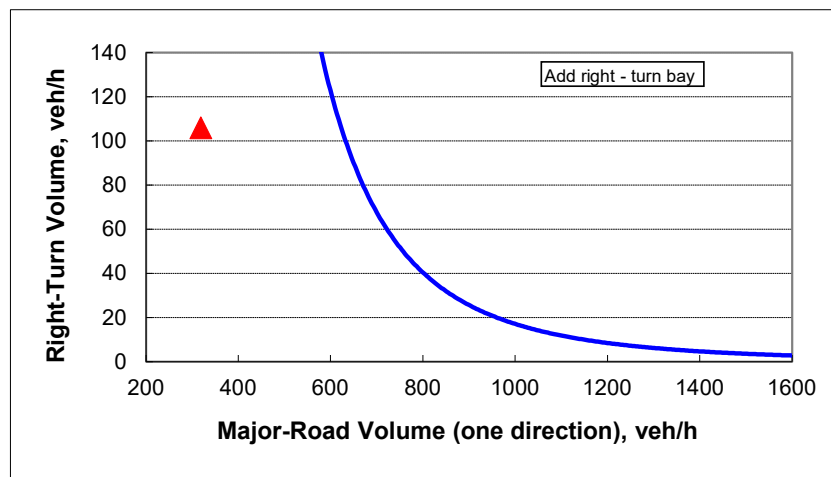


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	313
Right-turn volume, veh/h:	36

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1509
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

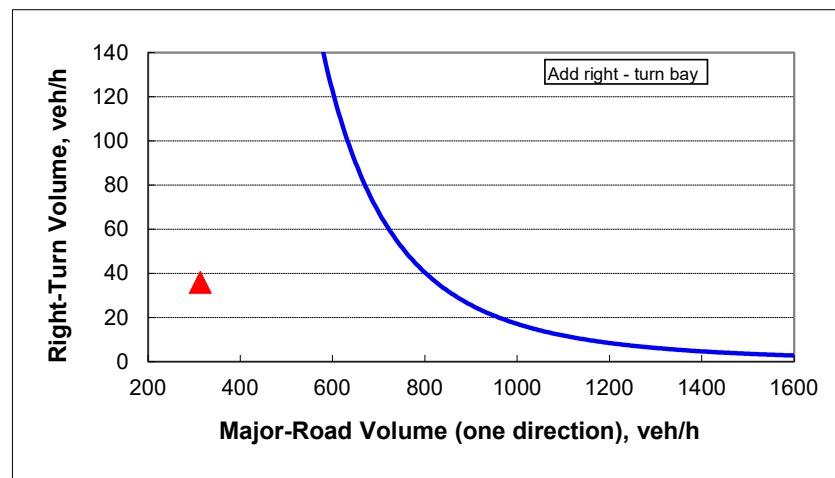
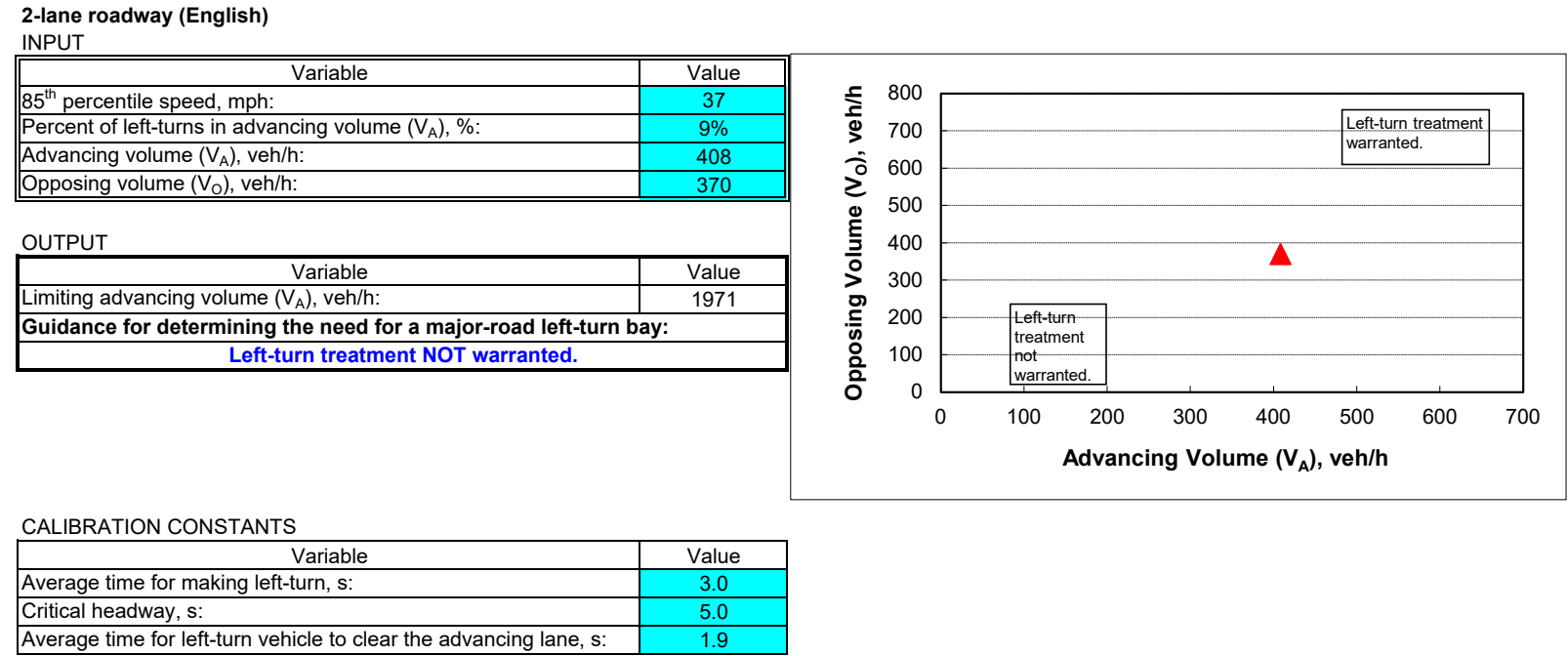


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.

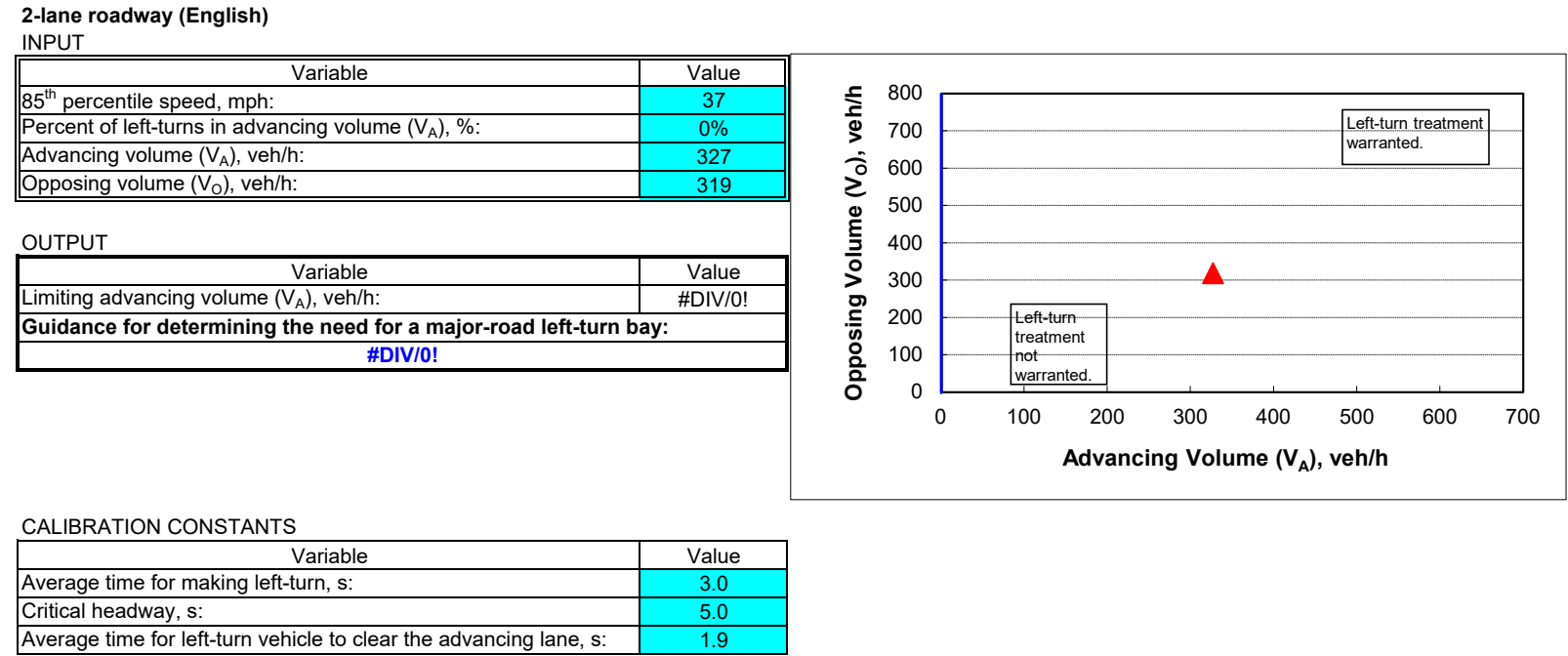
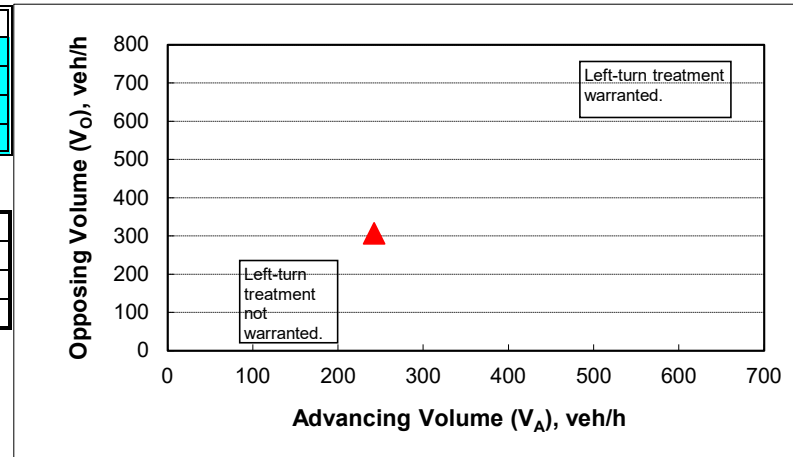


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection.**2-lane roadway (English)****INPUT**

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	242
Opposing volume (V_O), veh/h:	307

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1971
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	

**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	370
Right-turn volume, veh/h:	59

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1626
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

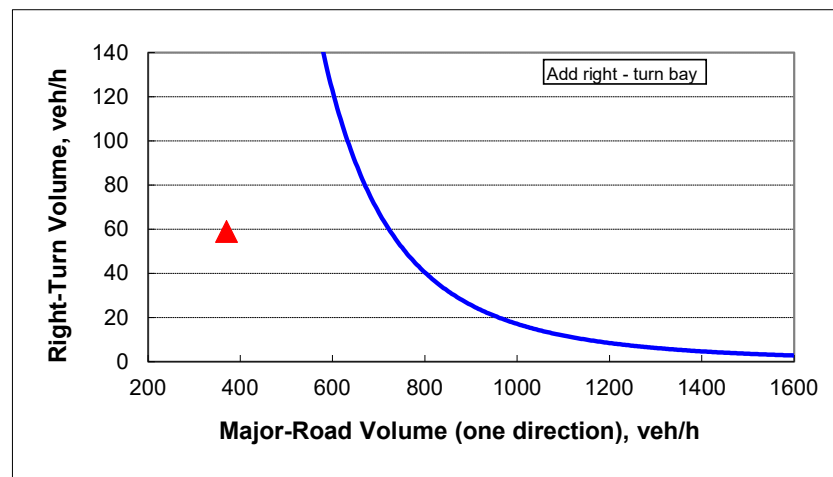


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	303
Right-turn volume, veh/h:	0

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1710
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

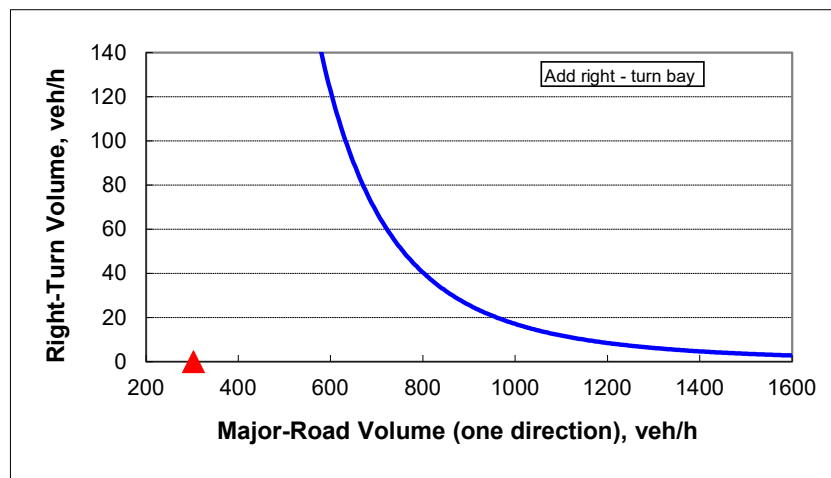


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	34
Major-road volume (one direction), veh/h:	307
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1626
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

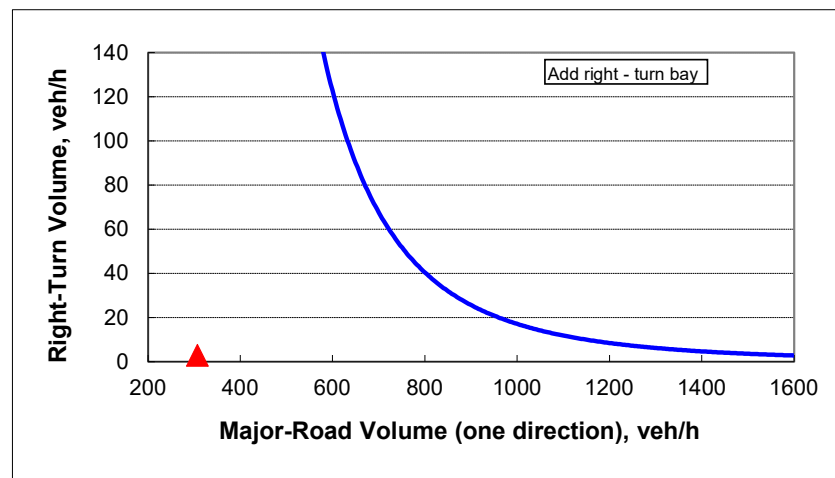


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection

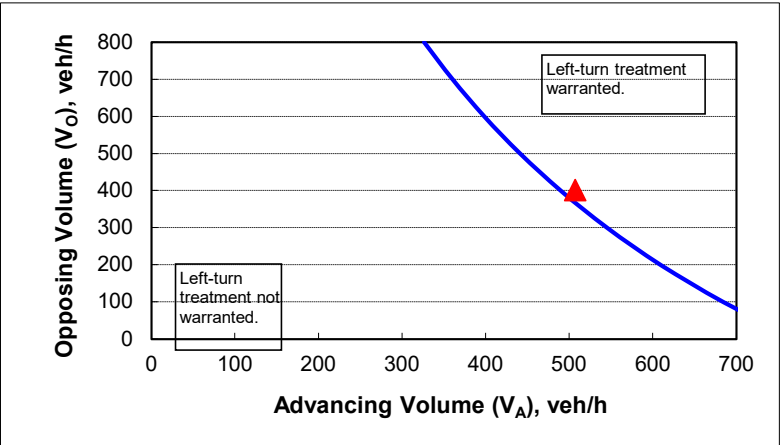
2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V _A), %:	35%
Advancing volume (V _A), veh/h:	507
Opposing volume (V _O), veh/h:	402

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	537
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	



CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection

2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V _A), %:	30%
Advancing volume (V _A), veh/h:	610
Opposing volume (V _O), veh/h:	471

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	233
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

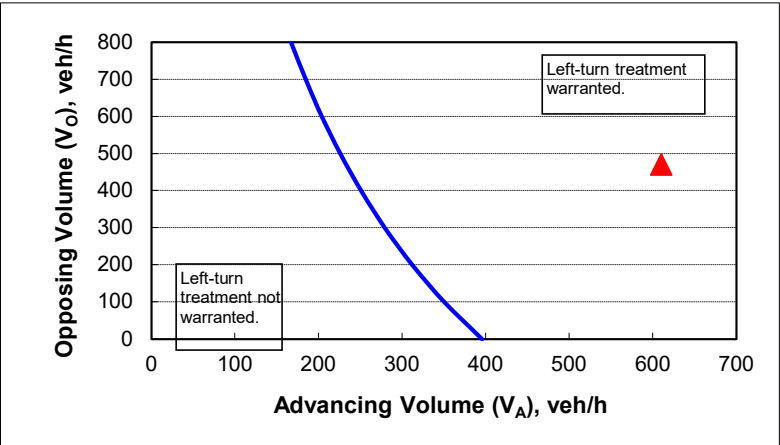


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection

2-lane roadway (English)

INPUT

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V _A), %:	36%
Advancing volume (V _A), veh/h:	677
Opposing volume (V _O), veh/h:	485

OUTPUT

Variable	Value
Limiting advancing volume (V _A), veh/h:	537
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

CALIBRATION CONSTANTS

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

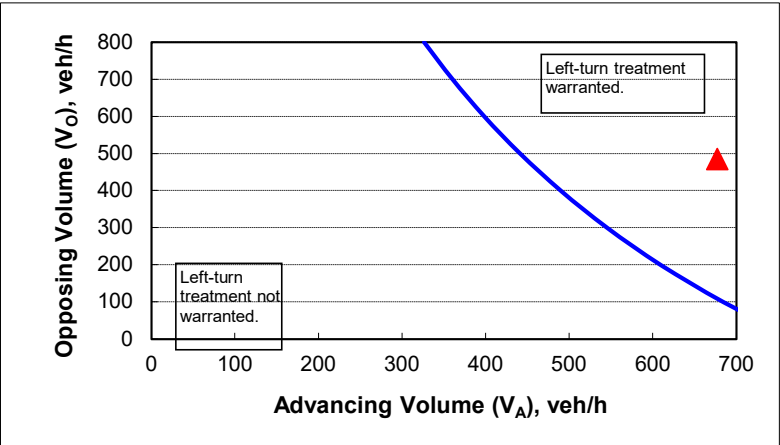
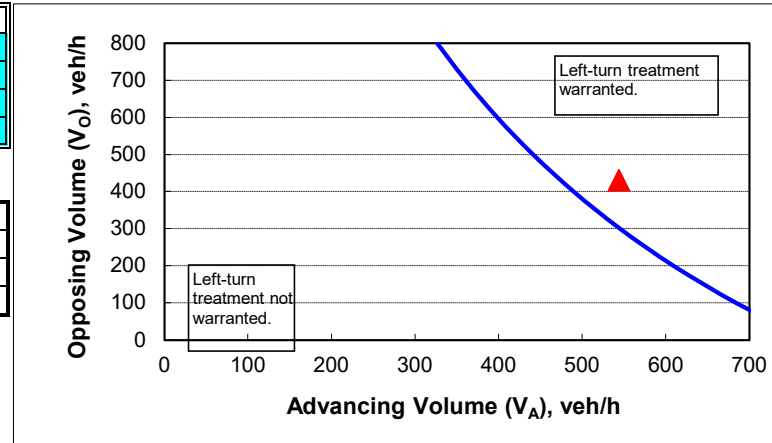


Figure 2 - 5. Guideline for determining the need for a major-road left-turn bay at a two-way stop-controlled intersection**2-lane roadway (English)****INPUT**

Variable	Value
85 th percentile speed, mph:	37
Percent of left-turns in advancing volume (V_A), %:	35%
Advancing volume (V_A), veh/h:	544
Opposing volume (V_O), veh/h:	431

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	537
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment warranted.	

**CALIBRATION CONSTANTS**

Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	402
Right-turn volume, veh/h:	79

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

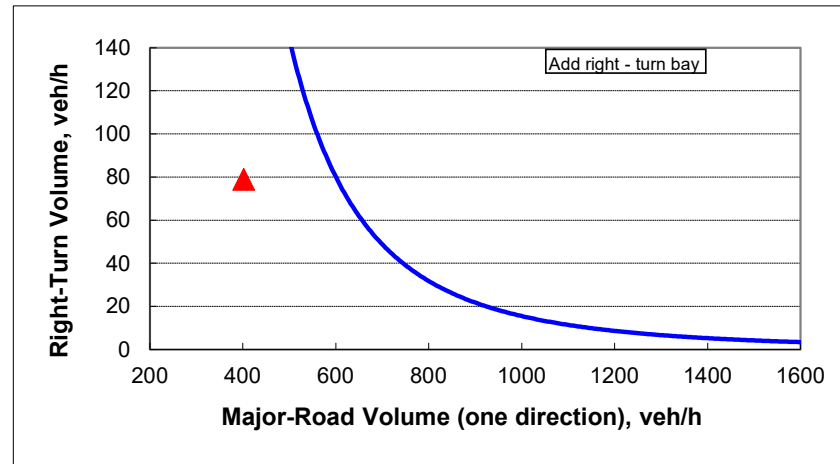


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	471
Right-turn volume, veh/h:	108

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	174
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

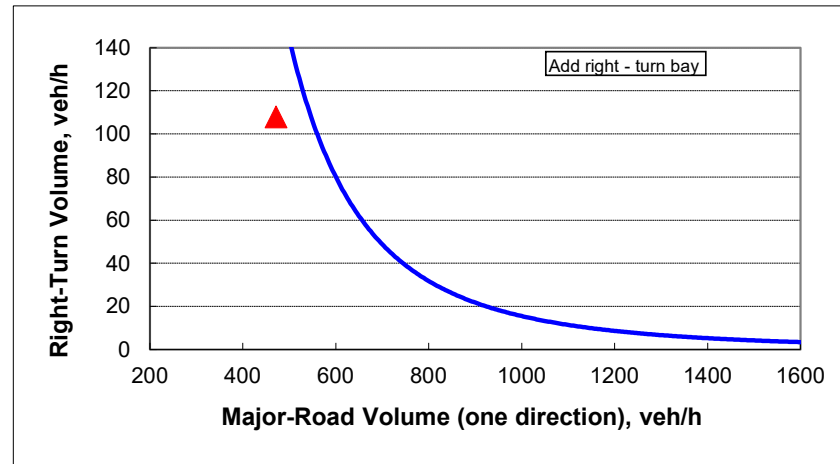


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	485
Right-turn volume, veh/h:	92

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

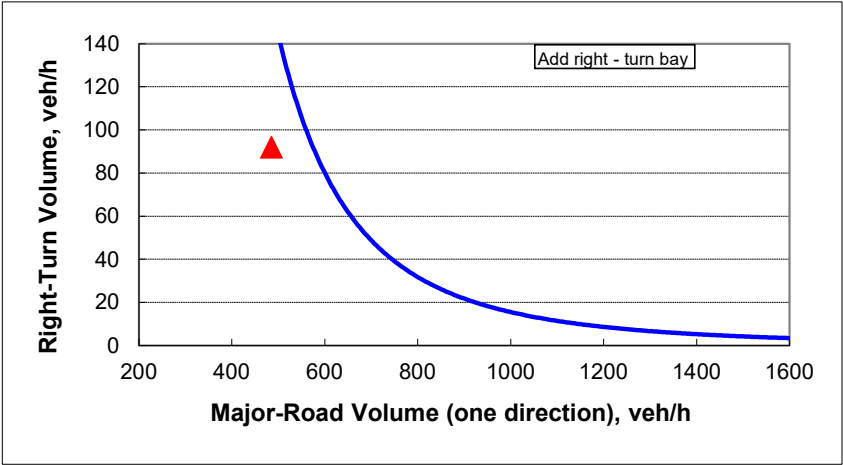


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	431
Right-turn volume, veh/h:	85

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

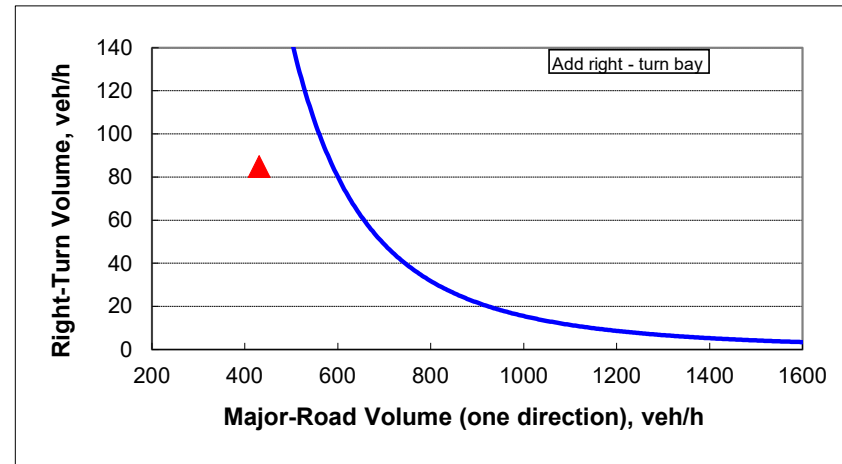


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	505
Right-turn volume, veh/h:	116

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	139
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

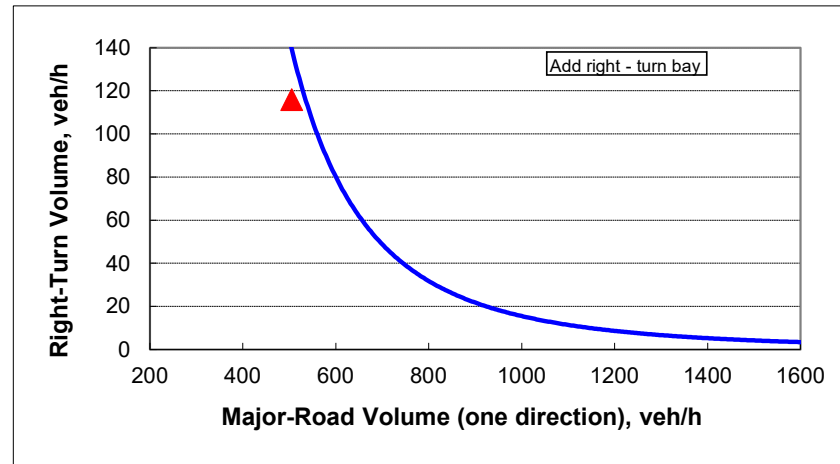


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	520
Right-turn volume, veh/h:	99

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

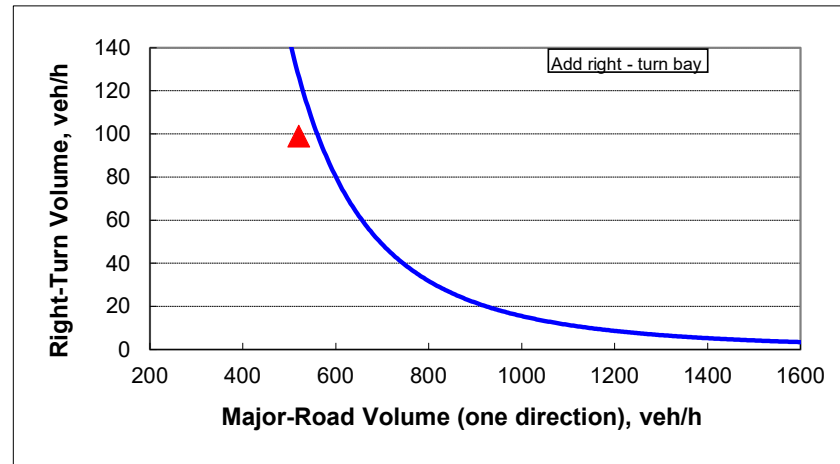


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	496
Right-turn volume, veh/h:	150

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

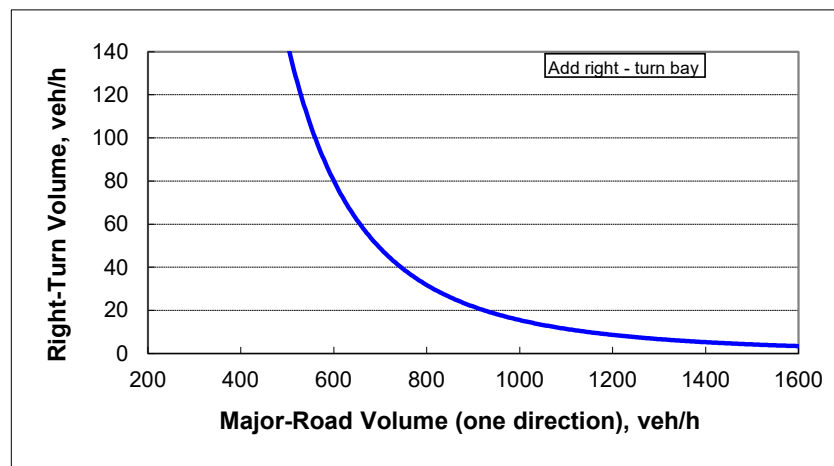


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	537
Right-turn volume, veh/h:	148

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	114
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Add right-turn bay.	

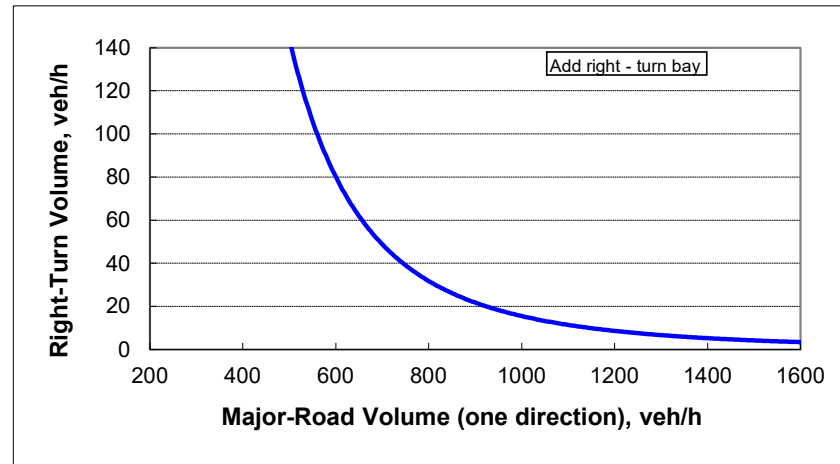


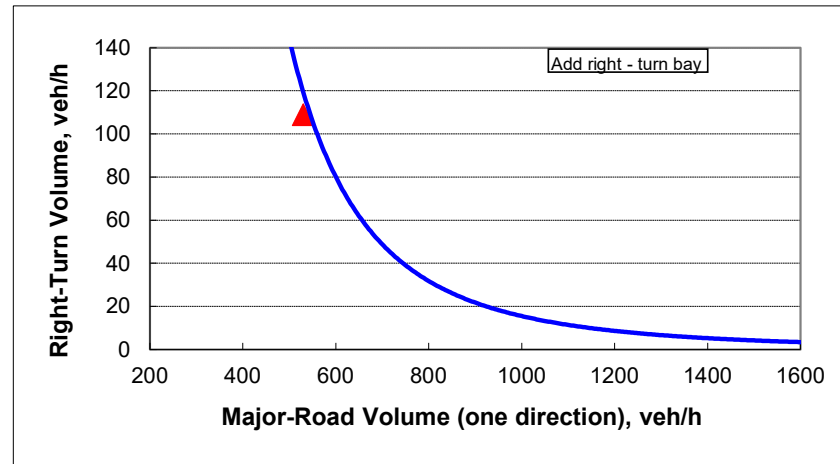
Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	37
Major-road volume (one direction), veh/h:	530
Right-turn volume, veh/h:	109

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	159
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	



QUEUE ANALYSIS CALCULATIONS

Number of Parent Drop-Off Vehicles =	221 vehicles
Arrival Period (in minutes) =	15 minutes
[A] Arival Rate (vehicles / min)	14.73333 veh/min
[S] Number of Unloading Spaces (Servers)	6 servers
Service Time per server per vehicle	20 seconds
[U] Service Rate (vehicles per minute)	3.0 veh / min

Traffic Intensity ($\rho = A / U$) = 4.911111

Probability of No Customers in Queue = 0.518%

Average Number of Customers in Queue = 2.507528 vehicles
 $L_q = ((\rho^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 7.418639 vehicles
 $L_s = L_q + \rho$

Average Time spent in queue = 0.170194 minutes
 $W_q = L_q / A$
 10.21165 seconds

Probability on N customers in system:

$P_n = (\rho^n / N!) * P_0$ for $n < S$

$P_n = (\rho^n / (S! * S^{(n-S)})) * P_0$ for $n = S$ or $n > S$

Probability of XX customers in System:	Vehicles	Probability	Cumulative Probability
P1 =	1	2.54%	2.54%
	2	6.24%	8.79%
	3	10.22%	19.01%
	4	12.55%	31.56%
	5	12.33%	43.89%
	6	10.09%	53.98%
	7	8.26%	62.23%
	8	6.76%	68.99%
	9	5.53%	74.53%
	10	4.53%	79.06%
	11	3.71%	82.76%
	12	3.03%	85.80%
	13	2.48%	88.28%
	14	2.03%	90.31%
	15	1.66%	91.98%
	16	1.36%	93.34%
	17	1.11%	94.45%
	18	0.91%	95.37%
	19	0.75%	96.11%
	20	0.61%	96.72%
	21	0.50%	97.23%
	22	0.41%	97.63%
	23	0.34%	97.97%
	24	0.27%	98.24%
	25	0.22%	98.47%
	26	0.18%	98.65%
	27	0.15%	98.80%
	28	0.12%	98.93%
	29	0.10%	99.03%
	30	0.08%	99.11%

Number of Parent Drop-Off Vehicles = 102 vehicles
 Arrival Period (in minutes) = 10 minutes
 [A] Arival Rate (vehicles / min) 10.2 veh/min
 [S] Number of Unloading Spaces (Servers) 6 servers
 Service Time per server per vehicle 30 seconds
 [U] Service Rate (vehicles per minute) 2.0 veh / min

Denotes field to be completed by user.

Traffic Intensity ($p = A / U$) = 5.1

Probability of No Customers in Queue = 0.383%

Average Number of Customers in Queue = 3.536284 vehicles
 $L_q = ((p^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 8.636284 vehicles
 $L_s = L_q + p$

Average Time spent in queue = 0.346695 minutes
 $W_q = L_q / A$
 20.80167 seconds

Probability on N customers in system:

$P_n = (p^n n! / N!) * P_0$ for $n < S$
 $P_n = (p^n n! / (S! * S^{n-S})) * P_0$ for $n = S$ or $n > S$

Arrived Before Dismissal = 35 vehicles
 Active Loading Storage = 6 vehicles
 Queued Before Dismissal = 29 vehicles
 Queue Clearance Rate = 12 veh / min

Probability of XX customers in System:	Vehicles	Probability	Cumulative Probability
P1 =	1	1.95%	1.95%
	2	4.98%	6.93%
	3	8.47%	15.40%
	4	10.80%	26.20%
	5	11.01%	37.21%
	6	9.36%	46.57%
	7	7.96%	54.53%
	8	6.76%	61.29%
	9	5.75%	67.04%
	10	4.89%	71.93%
	11	4.15%	76.08%
	12	3.53%	79.61%
	13	3.00%	82.61%
	14	2.55%	85.16%
	15	2.17%	87.33%
	16	1.84%	89.17%
	17	1.57%	90.74%
	18	1.33%	92.07%
	19	1.13%	93.20%
	20	0.96%	94.17%
	21	0.82%	94.98%
	22	0.70%	95.68%
	23	0.59%	96.27%
	24	0.50%	96.77%
	25	0.43%	97.20%
	26	0.36%	97.56%
	27	0.31%	97.87%
	28	0.26%	98.13%
	29	0.22%	98.35%
	30	0.19%	98.54%

T0 = 29 vehicles
 T1 = 27.2 vehicles
 T2 = 25.4 vehicles
 T3 = 23.6 vehicles
 T4 = 21.8 vehicles
 T5 = 20 vehicles
 T6 = 18.2 vehicles
 T7 = 16.4 vehicles
 T8 = 14.6 vehicles
 T9 = 12.8 vehicles
 T10 = 11 vehicles
 T11 = 9.2 vehicles
 T12 = 7.4 vehicles
 T13 = 5.6 vehicles
 T14 = 3.8 vehicles
 T15 = 2 vehicles
 T16 = 0.2 vehicles
 T17 = 0 vehicles
 T18 = 0 vehicles
 T19 = 0 vehicles
 T20 = 0 vehicles

Number of Parent Drop-Off Vehicles =	137 vehicles
Arrival Period (in minutes) =	15 minutes
[A] Arival Rate (vehicles / min)	9.133333 veh/min
[S] Number of Unloading Spaces (Servers)	6 servers
Service Time per server per vehicle	30 seconds
[U] Service Rate (vehicles per minute)	2.0 veh / min

Traffic Intensity ($p = A / U$) = 4.566667

Probability of No Customers in Queue = 0.838%

Average Number of Customers in Queue = 1.408609 vehicles
 $L_q = ((p^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 5.975275 vehicles
 $L_s = L_q + p$

Average Time spent in queue = 0.154227 minutes
 $W_q = L_q / A$
 9.253634 seconds

Probability on N customers in system:

$P_n = (p^n / N!) * P_0$ for $n < S$

$P_n = (p^n / (S! * S^{(n-S)})) * P_0$ for $n = S$ or $n > S$

Probability of XX customers in System:	Vehicles	Probability	Cumulative Probability
P1 =	1	3.83%	3.83%
	2	8.74%	12.57%
	3	13.31%	25.88%
	4	15.19%	41.07%
	5	13.88%	54.95%
	6	10.56%	65.51%
	7	8.04%	73.55%
	8	6.12%	79.67%
	9	4.66%	84.33%
	10	3.54%	87.87%
	11	2.70%	90.57%
	12	2.05%	92.62%
	13	1.56%	94.18%
	14	1.19%	95.37%
	15	0.91%	96.28%
	16	0.69%	96.97%
	17	0.52%	97.49%
	18	0.40%	97.89%
	19	0.30%	98.19%
	20	0.23%	98.42%
	21	0.18%	98.60%
	22	0.13%	98.73%
	23	0.10%	98.84%
	24	0.08%	98.91%
	25	0.06%	98.97%
	26	0.04%	99.02%
	27	0.03%	99.05%
	28	0.03%	99.08%
	29	0.02%	99.10%
	30	0.02%	99.11%

Number of Parent Drop-Off Vehicles =	137 vehicles
Arrival Period (in minutes) =	15 minutes
[A] Arival Rate (vehicles / min)	9.133333 veh/min
[S] Number of Unloading Spaces (Servers)	12 servers
Service Time per server per vehicle	60 seconds
[U] Service Rate (vehicles per minute)	1.0 veh / min

Traffic Intensity ($p = A / U$) = 9.133333

Probability of No Customers in Queue = 0.010%

Average Number of Customers in Queue = 0.914556 vehicles
 $L_q = ((p^S / (S-1)!) * AU / ((SU-A)^2)) * P_0$

Average Number of Customers in System = 10.04789 vehicles
 $L_s = L_q + p$

Average Time spent in queue = 0.100134 minutes
 $W_q = L_q / A$
6.00803 seconds

Probability on N customers in system:

$P_n = (p^n / N!) * P_0$ for $n < S$

$P_n = (p^n / (S! * S^{(n-S)})) * P_0$ for $n = S$ or $n > S$

Probability of XX customers in System: P1 =	Vehicles	Probability	Cumulative
			Probability
	1	0.09%	0.09%
	2	0.41%	0.50%
	3	1.24%	1.73%
	4	2.83%	4.56%
	5	5.16%	9.72%
	6	7.86%	17.58%
	7	10.25%	27.84%
	8	11.71%	39.54%
	9	11.88%	51.42%
	10	10.85%	62.28%
	11	9.01%	71.29%
	12	6.86%	78.14%
	13	5.22%	83.36%
	14	3.97%	87.33%
	15	3.02%	90.36%
	16	2.30%	92.66%
	17	1.75%	94.41%
	18	1.33%	95.74%
	19	1.01%	96.76%
	20	0.77%	97.53%
	21	0.59%	98.12%
	22	0.45%	98.57%
	23	0.34%	98.91%
	24	0.26%	99.16%
	25	0.20%	99.36%
	26	0.15%	99.51%
	27	0.11%	99.63%
	28	0.09%	99.71%
	29	0.07%	99.78%
	30	0.05%	99.83%

SIGNAL WARRANT CALCULATIONS

Traffic Control Signal Warrant Analyses

(Based on MUTCD-2009 Edition)

Intersection:	Bay Road at Asbury Street				
Pop. <10,000? (Y/N)	Y	Count Date:	9/19/2024	Analysis Date:	10/24/24
Speed (in mph):	30 mph	Analysis Year:	2024	Analyst:	CJD
Is Major?*	(Y/N)	#Lanes*	Adjustment Factor:	Raw counts	
	(Y/N)	(one way)			
EB	N	2	Major Lanes:	1	Enter the higher number of lanes for the major street approach
WB			Minor Lanes:	2	Enter the number of lanes for the minor street approach you want to analyze
NB	Y	1			
SB	Y	1			

*Note: If intersection is a "T" intersection, leave cells blank for the non-existent approach

Time	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
7:00	88	0	179	0	0	0	107	372	0	0	377	75
8:00	74	0	200	0	0	0	190	341	0	0	294	98
9:00	70	0	188	0	0	0	116	332	0	0	254	49
10:00	56	0	142	0	0	0	119	295	0	0	270	45
11:00	60	0	122	0	0	0	105	285	0	0	327	56
12:00	56	0	138	0	0	0	98	289	0	0	303	56
13:00	53	0	118	0	0	0	83	316	0	0	306	53
14:00	61	0	114	0	0	0	142	376	0	0	357	96
15:00	84	0	205	0	0	0	199	396	0	0	367	84
16:00	96	0	188	0	0	0	216	404	0	0	365	94
17:00	76	0	167	0	0	0	229	347	0	0	374	85
18:00	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0

Time	Σ EB	Σ WB	Σ NB	Σ SB	Σ Major	Σ Minor	Σ Max Minor	W1 A	W1 B	W1combo	W2	W3
7:00	267	0	479	452	931	267	267	Y	Y	Y	Y	Y
8:00	274	0	531	392	923	274	274	Y	Y	Y	Y	Y
9:00	258	0	448	303	751	258	258	Y	Y	Y	Y	Y
10:00	198	0	414	315	729	198	198	Y	Y	Y	Y	Y
11:00	182	0	390	383	773	182	182	Y	Y	Y	Y	Y
12:00	194	0	387	359	746	194	194	Y	Y	Y	Y	Y
13:00	171	0	399	359	758	171	171	Y	Y	Y	Y	Y
14:00	175	0	518	453	971	175	175	Y	Y	Y	Y	Y
15:00	289	0	595	451	1046	289	289	Y	Y	Y	Y	Y
16:00	284	0	620	459	1079	284	284	Y	Y	Y	Y	Y
17:00	243	0	576	459	1035	243	243	Y	Y	Y	Y	Y
18:00	0	0	0	0	0	0	0	N	N	N	N	N
19:00	0	0	0	0	0	0	0	N	N	N	N	N
								11 of 8	11 of 8	11 of 8	11 of 4	11 of 1

Warrant Analyses

Warrant 1: Condition A Minimum Vehicular Volume Warrant is Met
Warrant 1: Condition B Interruption of Continuous Traffic Warrant is Met
Warrant 1: Combination of Warrants 1A and 1B is Met
Warrant 2: Four-Hour Warrant is Met
Warrant 3: One-Hour Warrant is Met

Traffic Control Signal Warrant Analyses

(Based on MUTCD-2009 Edition)

Intersection:	Bay Road at Asbury Street				
Pop. <10,000? (Y/N)	Y	Count Date:	9/19/2024	Analysis Date:	10/24/24
Speed (in mph):	30 mph	Analysis Year:	2024	Analyst:	CJD
Is Major?*		Adjustment Factor:	1	Raw counts	
#Lanes* (one way)					
EB	N	1	Major Lanes:	1	Enter the higher number of lanes for the major street approach
WB			Minor Lanes:	1	Enter the number of lanes for the minor street approach you want to analyze
NB	Y	1			
SB	Y	1	*Note: If intersection is a "T" intersection, leave cells blank for the non-existent approach		

Time	EB LT	EB TH	EB RT	WB LT	WB TH	WB RT	NB LT	NB TH	NB RT	SB LT	SB TH	SB RT
7:00	88	0	0	0	0	0	107	372	0	0	377	75
8:00	74	0	0	0	0	0	190	341	0	0	294	98
9:00	70	0	0	0	0	0	116	332	0	0	254	49
10:00	56	0	0	0	0	0	119	295	0	0	270	45
11:00	60	0	0	0	0	0	105	285	0	0	327	56
12:00	56	0	0	0	0	0	98	289	0	0	303	56
13:00	53	0	0	0	0	0	83	316	0	0	306	53
14:00	61	0	0	0	0	0	142	376	0	0	357	96
15:00	84	0	0	0	0	0	199	396	0	0	367	84
16:00	96	0	0	0	0	0	216	404	0	0	365	94
17:00	76	0	0	0	0	0	229	347	0	0	374	85
18:00	0	0	0	0	0	0	0	0	0	0	0	0
19:00	0	0	0	0	0	0	0	0	0	0	0	0

Time	Σ EB	Σ WB	Σ NB	Σ SB	Σ Major	Σ Minor	Σ Max Minor	W1 A	W1 B	W1combo	W2	W3
7:00	88	0	479	452	931	88	88	N	Y	Y	Y	N
8:00	74	0	531	392	923	74	74	N	Y	N	Y	N
9:00	70	0	448	303	751	70	70	N	Y	N	Y	N
10:00	56	0	414	315	729	56	56	N	Y	N	N	N
11:00	60	0	390	383	773	60	60	N	Y	N	N	N
12:00	56	0	387	359	746	56	56	N	Y	N	N	N
13:00	53	0	399	359	758	53	53	N	Y	N	N	N
14:00	61	0	518	453	971	61	61	N	Y	N	Y	N
15:00	84	0	595	451	1046	84	84	N	Y	Y	Y	Y
16:00	96	0	620	459	1079	96	96	N	Y	Y	Y	Y
17:00	76	0	576	459	1035	76	76	N	Y	N	Y	Y
18:00	0	0	0	0	0	0	0	N	N	N	N	N
19:00	0	0	0	0	0	0	0	N	N	N	N	N
								0 of 8	11 of 8	3 of 8	7 of 4	3 of 1

Warrant Analyses
Warrant 1: Condition A Minimum Vehicular Volume Warrant is Not Met
Warrant 1: Condition B Interruption of Continuous Traffic Warrant is Met
Warrant 1: Combination of Warrants 1A and 1B is Not Met
Warrant 2: Four-Hour Warrant is Met
Warrant 3: One-Hour Warrant is Met

CAPACITY ANALYSIS METHODOLOGY

CAPACITY ANALYSIS METHODOLOGY

A primary result of capacity analysis is the assignment of levels of service to traffic facilities under various traffic flow conditions. The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM).⁹ The concept of level of service (LOS) is defined as a qualitative measure describing operational conditions within a traffic stream and their perception by motorists and/or passengers. A level-of-service definition provides an index to quality of traffic flow in terms of such factors as speed, travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety.

Six levels of service are defined for each type of facility. They are given letter designations from A to F, with LOS A representing the best operating conditions and LOS F the worst. Since the level of service of a traffic facility is a function of the traffic flows placed upon it, such a facility may operate at a wide range of levels of service, depending on the time of day, day of week, or period of year. A description of the operating condition under each level of service is provided below:

- LOS A describes conditions with little to no delay to motorists.
- LOS B represents a desirable level with relatively low delay to motorists.
- LOS C describes conditions with average delays to motorists.
- LOS D describes operations where the influence of congestion becomes more noticeable. Delays are still within an acceptable range.
- LOS E represents operating conditions with high delay values. This level is considered by many agencies to be the limit of acceptable delay.
- LOS F is considered to be unacceptable to most drivers with high delay values that often occur, when arrival flow rates exceed the capacity of the intersection.

Unsignalized Intersections

Levels of service for unsignalized intersections are calculated using the operational analysis methodology of the HCM. The procedure accounts for lane configuration on both the minor and major street approaches, conflicting traffic stream volumes, and the type of intersection control (STOP, YIELD, or all-way STOP control). The definition of level of service for unsignalized intersections is a function of average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The level-of-service criteria for unsignalized intersections are shown in Table A-1.

Signalized Intersections

Levels of service for signalized intersections are also calculated using the operational analysis methodology of the HCM. The methodology for signalized intersections assesses the effects of signal type, timing, phasing, and progression; vehicle mix; and geometrics on average *control* delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. Table A-1 summarizes the relationship between level of service and average control delay.

⁹ *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.

TABLE A-1
Level-of-Service Criteria for Intersections

Level of Service	Unsignalized Intersection Criteria Average Control Delay (Seconds per Vehicle)	Signalized Intersection Criteria Average Control Delay (Seconds per Vehicle)
A	≤10	≤10
B	>10 and ≤15	>10 and ≤20
C	>15 and ≤25	>20 and ≤35
D	>25 and ≤35	>35 and ≤55
E	>35 and ≤50	>55 and ≤80
F	>50	>80

Source *Highway Capacity Manual 2000*, Transportation Research Board; Washington, D.C.; 2000.
Pages 10-16, 20-6, and 17-2.

For signalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups, to individual intersection approaches, or to the entire intersection. For unsignalized intersections, this delay criterion may be applied in assigning level-of-service designations to individual lane groups or to individual intersection approaches.

CAPACITY ANALYSIS WORKSHEETS

1: Highland Street & Pleasant Avenue/Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	8	9	46	4	141	5	195	38	167	192	2
Future Volume (Veh/h)	2	8	9	46	4	141	5	195	38	167	192	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	2	10	11	55	5	168	6	232	45	199	229	2
Pedestrians					5			2				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1065	922	232	918	900	260	231			282		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1065	922	232	918	900	260	231			282		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.3		
p0 queue free %	99	96	99	74	98	78	100			84		
cM capacity (veh/h)	135	227	811	208	233	766	1238			1246		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	23	228	283	430								
Volume Left	2	55	6	199								
Volume Right	11	168	45	2								
cSH	317	452	1238	1246								
Volume to Capacity	0.07	0.50	0.00	0.16								
Queue Length 95th (ft)	6	70	0	14								
Control Delay (s)	17.2	20.8	0.2	4.7								
Lane LOS	C	C	A	A								
Approach Delay (s)	17.2	20.8	0.2	4.7								
Approach LOS	C	C										
Intersection Summary												
Average Delay			7.5									
Intersection Capacity Utilization			60.6%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	210	176	36	0	0
Future Volume (Veh/h)	34	210	176	36	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.77	0.77	0.68	0.68	0.25	0.25
Hourly flow rate (vph)	44	273	259	53	0	0
Pedestrians		4			8	
Lane Width (ft)		11.0			0.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	320				654	298
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				654	298
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	96				100	100
cM capacity (veh/h)	1251				419	744
Direction, Lane #	EB 1	WB 1				
Volume Total	317	312				
Volume Left	44	0				
Volume Right	0	53				
cSH	1251	1700				
Volume to Capacity	0.04	0.18				
Queue Length 95th (ft)	3	0				
Control Delay (s)	1.4	0.0				
Lane LOS	A					
Approach Delay (s)	1.4	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		39.5%		ICU Level of Service		A
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	210	189	0	38	23
Future Volume (Veh/h)	0	210	189	0	38	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.74	0.74	0.76	0.76	0.31	0.31
Hourly flow rate (vph)	0	284	249	0	123	74
Pedestrians			1		8	
Lane Width (ft)			11.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	257				542	257
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				542	257
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	100				75	90
cM capacity (veh/h)	1309				487	750
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	284	249	123	74		
Volume Left	0	0	123	0		
Volume Right	0	0	0	74		
cSH	1700	1700	487	750		
Volume to Capacity	0.17	0.15	0.25	0.10		
Queue Length 95th (ft)	0	0	25	8		
Control Delay (s)	0.0	0.0	14.9	10.3		
Lane LOS			B	B		
Approach Delay (s)	0.0	0.0	13.2			
Approach LOS			B			
Intersection Summary						
Average Delay			3.6			
Intersection Capacity Utilization			21.1%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	189	13	5	243
Future Volume (Veh/h)	0	0	189	13	5	243
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.77	0.77	0.85	0.85
Hourly flow rate (vph)	0	0	245	17	6	286
Pedestrians	22					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	574	276			284	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	574	276			284	
tC, single (s)	6.4	6.2			4.5	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.6	
p0 queue free %	100	100			99	
cM capacity (veh/h)	481	768			1089	
Direction, Lane #	NB 1	SB 1				
Volume Total	262	292				
Volume Left	0	6				
Volume Right	17	0				
cSH	1700	1089				
Volume to Capacity	0.15	0.01				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.2				
Lane LOS		A				
Approach Delay (s)	0.0	0.2				
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			20.1%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	79	229	179	328	323	79
Future Volume (Veh/h)	79	229	179	328	323	79
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.93	0.93	0.75	0.75	0.95	0.95
Hourly flow rate (vph)	85	246	239	437	340	83
Pedestrians					36	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1332	382	423			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1332	382	423			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	32	63	79			
cM capacity (veh/h)	124	668	1126			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	85	246	676	423		
Volume Left	85	0	239	0		
Volume Right	0	246	0	83		
cSH	124	668	1126	1700		
Volume to Capacity	0.68	0.37	0.21	0.25		
Queue Length 95th (ft)	92	42	20	0		
Control Delay (s)	81.0	13.5	4.9	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	30.8		4.9	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			9.4			
Intersection Capacity Utilization			63.3%		ICU Level of Service	B
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱		
Traffic Volume (veh/h)	341	66	37	402	0	0
Future Volume (Veh/h)	341	66	37	402	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.76	0.76	0.93	0.93	0.25	0.25
Hourly flow rate (vph)	449	87	40	432	0	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			536		1004	492
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			536		1004	492
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			965		259	580
Direction, Lane #	EB 1	WB 1				
Volume Total	536	472				
Volume Left	0	40				
Volume Right	87	0				
cSH	1700	965				
Volume to Capacity	0.32	0.04				
Queue Length 95th (ft)	0	3				
Control Delay (s)	0.0	1.2				
Lane LOS		A				
Approach Delay (s)	0.0	1.2				
Approach LOS						
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			51.8%	ICU Level of Service		A
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	341	0	0	420	19	7
Future Volume (Veh/h)	341	0	0	420	19	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.78	0.78	0.95	0.95	0.50	0.50
Hourly flow rate (vph)	437	0	0	442	38	14
Pedestrians				4		
Lane Width (ft)				11.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			437		879	441
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			437		879	441
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		87	97
cM capacity (veh/h)			1134		282	537
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	437	442	52			
Volume Left	0	0	38			
Volume Right	0	0	14			
cSH	1700	1700	324			
Volume to Capacity	0.26	0.26	0.16			
Queue Length 95th (ft)	0	0	14			
Control Delay (s)	0.0	0.0	18.2			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	18.2			
Approach LOS			C			
Intersection Summary						
Average Delay			1.0			
Intersection Capacity Utilization			33.4%	ICU Level of Service	A	
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	7	57	5	143	3	190	48	112	167	0
Future Volume (Veh/h)	2	3	7	57	5	143	3	190	48	112	167	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.87	0.87	0.87	0.83	0.83	0.83	0.87	0.87	0.87
Hourly flow rate (vph)	3	4	9	66	6	164	4	229	58	129	192	0
Pedestrians		2			2			9			1	
Lane Width (ft)		16.0			12.0			12.0			10.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	886	749	203	738	720	261	194			289		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	886	749	203	738	720	261	194			289		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	98	99	99	77	98	78	100			90		
cM capacity (veh/h)	188	306	833	293	317	754	1388			1259		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	16	236	291	321								
Volume Left	3	66	4	129								
Volume Right	9	164	58	0								
cSH	402	511	1388	1259								
Volume to Capacity	0.04	0.46	0.00	0.10								
Queue Length 95th (ft)	3	60	0	9								
Control Delay (s)	14.3	17.9	0.1	3.9								
Lane LOS	B	C	A	A								
Approach Delay (s)	14.3	17.9	0.1	3.9								
Approach LOS	B	C										
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			57.1%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	163	201	30	0	0
Future Volume (Veh/h)	11	163	201	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.85	0.85	0.86	0.86	0.25	0.25
Hourly flow rate (vph)	13	192	234	35	0	0
Pedestrians		2			6	
Lane Width (ft)		11.0			0.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	275				476	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	275				476	260
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1300				546	783
Direction, Lane #	EB 1	WB 1				
Volume Total	205	269				
Volume Left	13	0				
Volume Right	0	35				
cSH	1300	1700				
Volume to Capacity	0.01	0.16				
Queue Length 95th (ft)	1	0				
Control Delay (s)	0.6	0.0				
Lane LOS	A					
Approach Delay (s)	0.6	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		28.3%		ICU Level of Service		A
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	163	212	0	39	19
Future Volume (Veh/h)	0	163	212	0	39	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.80	0.80	0.86	0.86	0.35	0.35
Hourly flow rate (vph)	0	204	247	0	111	54
Pedestrians					10	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	257				461	257
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				461	257
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	100				79	93
cM capacity (veh/h)	1307				539	753
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	204	247	111	54		
Volume Left	0	0	111	0		
Volume Right	0	0	0	54		
cSH	1700	1700	539	753		
Volume to Capacity	0.12	0.15	0.21	0.07		
Queue Length 95th (ft)	0	0	19	6		
Control Delay (s)	0.0	0.0	13.4	10.1		
Lane LOS			B	B		
Approach Delay (s)	0.0	0.0	12.3			
Approach LOS			B			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			21.8%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	212	5	2	200
Future Volume (Veh/h)	0	0	212	5	2	200
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.79	0.79	0.69	0.69
Hourly flow rate (vph)	0	0	268	6	3	290
Pedestrians	25					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	592	296			299	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	592	296			299	
tC, single (s)	6.4	6.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			3.1	
p0 queue free %	100	100			100	
cM capacity (veh/h)	471	748			862	
Direction, Lane #	NB 1	SB 1				
Volume Total	274	293				
Volume Left	0	3				
Volume Right	6	0				
cSH	1700	862				
Volume to Capacity	0.16	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.1				
Lane LOS		A				
Approach Delay (s)	0.0	0.1				
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			15.9%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	86	164	180	430	363	108
Future Volume (Veh/h)	86	164	180	430	363	108
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.77	0.77	0.90	0.90	0.92	0.92
Hourly flow rate (vph)	112	213	200	478	395	117
Pedestrians					35	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1366	454	512			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1366	454	512			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	7	65	81			
cM capacity (veh/h)	121	606	1038			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	112	213	678	512		
Volume Left	112	0	200	0		
Volume Right	0	213	0	117		
cSH	121	606	1038	1700		
Volume to Capacity	0.93	0.35	0.19	0.30		
Queue Length 95th (ft)	149	39	18	0		
Control Delay (s)	130.7	14.1	4.5	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	54.3		4.5	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			13.7			
Intersection Capacity Utilization			73.0%		ICU Level of Service	D
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱		
Traffic Volume (veh/h)	482	34	11	471	0	0
Future Volume (Veh/h)	482	34	11	471	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.82	0.82	0.89	0.89	0.25	0.25
Hourly flow rate (vph)	588	41	12	529	0	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			629		1162	608
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			629		1162	608
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			881		215	499
Direction, Lane #	EB 1	WB 1				
Volume Total	629	541				
Volume Left	0	12				
Volume Right	41	0				
cSH	1700	881				
Volume to Capacity	0.37	0.01				
Queue Length 95th (ft)	0	1				
Control Delay (s)	0.0	0.4				
Lane LOS		A				
Approach Delay (s)	0.0	0.4				
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			37.0%	ICU Level of Service		A
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	482	0	0	468	14	13
Future Volume (Veh/h)	482	0	0	468	14	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.91	0.91	0.75	0.75
Hourly flow rate (vph)	595	0	0	514	19	17
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			595		1109	595
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			595		1109	595
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		91	96
cM capacity (veh/h)			991		206	442
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	595	514	36			
Volume Left	0	0	19			
Volume Right	0	0	17			
cSH	1700	1700	275			
Volume to Capacity	0.35	0.30	0.13			
Queue Length 95th (ft)	0	0	11			
Control Delay (s)	0.0	0.0	20.0			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	20.0			
Approach LOS			C			
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			35.4%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	4	39	7	173	6	238	60	145	216	2
Future Volume (Veh/h)	2	3	4	39	7	173	6	238	60	145	216	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.84	0.84	0.84	0.92	0.92	0.92	0.90	0.90	0.90
Hourly flow rate (vph)	3	4	5	46	8	206	7	259	65	161	240	2
Pedestrians		1						1			2	
Lane Width (ft)		16.0						12.0			10.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1082	902	243	876	870	294	243			324		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1082	902	243	876	870	294	243			324		
tC, single (s)	7.6	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.0	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	98	99	81	97	72	99			87		
cM capacity (veh/h)	100	242	799	239	252	745	1333			1247		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	12	260	331	403								
Volume Left	3	46	7	161								
Volume Right	5	206	65	2								
cSH	228	519	1333	1247								
Volume to Capacity	0.05	0.50	0.01	0.13								
Queue Length 95th (ft)	4	69	0	11								
Control Delay (s)	21.7	18.7	0.2	4.1								
Lane LOS	C	C	A	A								
Approach Delay (s)	21.7	18.7	0.2	4.1								
Approach LOS	C	C										
Intersection Summary												
Average Delay			6.8									
Intersection Capacity Utilization			62.7%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	193	257	5	0	0
Future Volume (Veh/h)	5	193	257	5	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.97	0.97	0.95	0.95	0.25	0.25
Hourly flow rate (vph)	5	199	271	5	0	0
Pedestrians					12	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	288				494	286
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	288				494	286
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1286				536	758
Direction, Lane #	EB 1	WB 1				
Volume Total	204	276				
Volume Left	5	0				
Volume Right	0	5				
cSH	1286	1700				
Volume to Capacity	0.00	0.16				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.2	0.0				
Lane LOS	A					
Approach Delay (s)	0.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		17.5%		ICU Level of Service	A	
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway

HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	193	255	11	2	7
Future Volume (Veh/h)	0	193	255	11	2	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.93	0.93	0.95	0.95	0.56	0.56
Hourly flow rate (vph)	0	208	268	12	4	12
Pedestrians					11	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	291				493	285
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	291				493	285
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	98
cM capacity (veh/h)	1269				533	751
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	208	280	4	12		
Volume Left	0	0	4	0		
Volume Right	0	12	0	12		
cSH	1700	1700	533	751		
Volume to Capacity	0.12	0.16	0.01	0.02		
Queue Length 95th (ft)	0	0	1	1		
Control Delay (s)	0.0	0.0	11.8	9.9		
Lane LOS			B	A		
Approach Delay (s)	0.0	0.0	10.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			24.1%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	266	0	1	194
Future Volume (Veh/h)	0	0	266	0	1	194
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.96	0.96	0.90	0.90
Hourly flow rate (vph)	0	0	277	0	1	216
Pedestrians	10					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	505	287			287	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	505	287			287	
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			100	
cM capacity (veh/h)	530	757			1287	
Direction, Lane #	NB 1	SB 1				
Volume Total	277	217				
Volume Left	0	1				
Volume Right	0	0				
cSH	1700	1287				
Volume to Capacity	0.16	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			17.3%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	99	189	245	432	393	92
Future Volume (Veh/h)	99	189	245	432	393	92
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.79	0.79	0.85	0.85	0.92	0.92
Hourly flow rate (vph)	125	239	288	508	427	100
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1567	477	527			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1567	477	527			
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	59	72			
cM capacity (veh/h)	87	588	1040			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	125	239	796	527		
Volume Left	125	0	288	0		
Volume Right	0	239	0	100		
cSH	87	588	1040	1700		
Volume to Capacity	1.44	0.41	0.28	0.31		
Queue Length 95th (ft)	241	49	28	0		
Control Delay (s)	335.9	15.2	6.0	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	125.4		6.0	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			29.9			
Intersection Capacity Utilization			78.0%		ICU Level of Service	D
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱		
Traffic Volume (veh/h)	527	4	1	484	1	0
Future Volume (Veh/h)	527	4	1	484	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.95	0.95	0.25	0.25
Hourly flow rate (vph)	659	5	1	509	4	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			666		1174	664
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			666		1174	664
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		98	100
cM capacity (veh/h)			933		214	464
Direction, Lane #	EB 1	WB 1				
Volume Total	664	510				
Volume Left	0	1				
Volume Right	5	0				
cSH	1700	933				
Volume to Capacity	0.39	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			Err%	ICU Level of Service	H	
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	526	1	0	482	3	1
Future Volume (Veh/h)	526	1	0	482	3	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.80	0.80	0.92	0.92	0.50	0.50
Hourly flow rate (vph)	658	1	0	524	6	2
Pedestrians	1				1	
Lane Width (ft)	12.0				16.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			660		1184	660
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			660		1184	660
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		97	100
cM capacity (veh/h)			937		210	466
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	659	524	8			
Volume Left	0	0	6			
Volume Right	1	0	2			
cSH	1700	1700	244			
Volume to Capacity	0.39	0.31	0.03			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	20.3			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	20.3			
Approach LOS			C			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			37.7%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	9	10	49	4	151	5	209	41	179	206	2
Future Volume (Veh/h)	2	9	10	49	4	151	5	209	41	179	206	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	10	11	53	4	164	5	227	45	195	224	2
Pedestrians					5			2				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1040	902	227	898	880	254	226			277		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1040	902	227	898	880	254	226			277		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.3		
p0 queue free %	99	96	99	75	98	79	100			84		
cM capacity (veh/h)	143	234	816	216	241	771	1243			1252		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	23	221	277	421								
Volume Left	2	53	5	195								
Volume Right	11	164	45	2								
cSH	328	466	1243	1252								
Volume to Capacity	0.07	0.47	0.00	0.16								
Queue Length 95th (ft)	6	63	0	14								
Control Delay (s)	16.8	19.5	0.2	4.7								
Lane LOS	C	C	A	A								
Approach Delay (s)	16.8	19.5	0.2	4.7								
Approach LOS	C	C										
Intersection Summary												
Average Delay			7.1									
Intersection Capacity Utilization			63.6%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	34	228	190	36	0	0
Future Volume (Veh/h)	34	228	190	36	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	248	207	39	0	0
Pedestrians		4			8	
Lane Width (ft)		11.0			0.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	254				556	238
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	254				556	238
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				100	100
cM capacity (veh/h)	1323				481	803
Direction, Lane #	EB 1	WB 1				
Volume Total	285	246				
Volume Left	37	0				
Volume Right	0	39				
cSH	1323	1700				
Volume to Capacity	0.03	0.14				
Queue Length 95th (ft)	2	0				
Control Delay (s)	1.2	0.0				
Lane LOS	A					
Approach Delay (s)	1.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.7				
Intersection Capacity Utilization		41.0%		ICU Level of Service		A
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	228	203	0	38	23
Future Volume (Veh/h)	0	228	203	0	38	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	248	221	0	41	25
Pedestrians			1		8	
Lane Width (ft)			11.0		12.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	229				478	229
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	229				478	229
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	100				92	97
cM capacity (veh/h)	1341				531	778
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	248	221	41	25		
Volume Left	0	0	41	0		
Volume Right	0	0	0	25		
cSH	1700	1700	531	778		
Volume to Capacity	0.15	0.13	0.08	0.03		
Queue Length 95th (ft)	0	0	6	2		
Control Delay (s)	0.0	0.0	12.3	9.8		
Lane LOS			B	A		
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			22.0%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	203	13	5	261
Future Volume (Veh/h)	0	0	203	13	5	261
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)	0	0	221	14	5	284
Pedestrians	22					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	544	250			257	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	544	250			257	
tC, single (s)	6.4	6.2			4.5	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.6	
p0 queue free %	100	100			100	
cM capacity (veh/h)	501	794			1116	
Direction, Lane #	NB 1	SB 1				
Volume Total	235	289				
Volume Left	0	5				
Volume Right	14	0				
cSH	1700	1116				
Volume to Capacity	0.14	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.2				
Lane LOS		A				
Approach Delay (s)	0.0	0.2				
Approach LOS						
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			21.1%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	85	246	192	352	346	85
Future Volume (Veh/h)	85	246	192	352	346	85
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)	92	267	209	383	376	92
Pedestrians					36	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1259	422	468			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1259	422	468			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	35	58	81			
cM capacity (veh/h)	141	634	1083			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	92	267	592	468		
Volume Left	92	0	209	0		
Volume Right	0	267	0	92		
cSH	141	634	1083	1700		
Volume to Capacity	0.65	0.42	0.19	0.28		
Queue Length 95th (ft)	89	52	18	0		
Control Delay (s)	68.7	14.8	4.7	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	28.6		4.7	0.0		
Approach LOS	D					
Intersection Summary						
Average Delay			9.2			
Intersection Capacity Utilization			67.2%		ICU Level of Service	C
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	371	66	37	431	0	0
Future Volume (Veh/h)	371	66	37	431	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	403	72	40	468	0	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			475		987	439
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			475		987	439
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.3		3.5	3.3
p0 queue free %			96		100	100
cM capacity (veh/h)			1018		266	622
Direction, Lane #	EB 1	WB 1				
Volume Total	475	508				
Volume Left	0	40				
Volume Right	72	0				
cSH	1700	1018				
Volume to Capacity	0.28	0.04				
Queue Length 95th (ft)	0	3				
Control Delay (s)	0.0	1.1				
Lane LOS		A				
Approach Delay (s)	0.0	1.1				
Approach LOS						
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			54.9%	ICU Level of Service		A
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	371	0	0	449	19	7
Future Volume (Veh/h)	371	0	0	449	19	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	403	0	0	488	21	8
Pedestrians				4		
Lane Width (ft)				11.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				0		
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			403		891	407
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			403		891	407
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		92	99
cM capacity (veh/h)			1167		278	562
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	403	488	29			
Volume Left	0	0	21			
Volume Right	0	0	8			
cSH	1700	1700	323			
Volume to Capacity	0.24	0.29	0.09			
Queue Length 95th (ft)	0	0	7			
Control Delay (s)	0.0	0.0	17.3			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	17.3			
Approach LOS			C			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			34.9%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	8	61	5	153	3	204	51	120	179	0
Future Volume (Veh/h)	2	3	8	61	5	153	3	204	51	120	179	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	9	66	5	166	3	222	55	130	195	0
Pedestrians		2			2			9			1	
Lane Width (ft)		16.0			12.0			12.0			10.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	882	742	206	732	714	252	197			279		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	882	742	206	732	714	252	197			279		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	99	99	99	78	98	78	100			90		
cM capacity (veh/h)	190	309	830	297	320	763	1384			1270		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	14	237	280	325								
Volume Left	2	66	3	130								
Volume Right	9	166	55	0								
cSH	450	520	1384	1270								
Volume to Capacity	0.03	0.46	0.00	0.10								
Queue Length 95th (ft)	2	59	0	9								
Control Delay (s)	13.2	17.6	0.1	3.8								
Lane LOS	B	C	A	A								
Approach Delay (s)	13.2	17.6	0.1	3.8								
Approach LOS	B	C										
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			59.9%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	11	175	216	30	0	0
Future Volume (Veh/h)	11	175	216	30	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	190	235	33	0	0
Pedestrians		2			6	
Lane Width (ft)		11.0			0.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	274				472	260
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	274				472	260
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1301				549	783
Direction, Lane #	EB 1	WB 1				
Volume Total	202	268				
Volume Left	12	0				
Volume Right	0	33				
cSH	1301	1700				
Volume to Capacity	0.01	0.16				
Queue Length 95th (ft)	1	0				
Control Delay (s)	0.5	0.0				
Lane LOS	A					
Approach Delay (s)	0.5	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		28.9%		ICU Level of Service		A
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	175	227	0	39	19
Future Volume (Veh/h)	0	175	227	0	39	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	190	247	0	42	21
Pedestrians					10	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	257				447	257
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	257				447	257
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	100				92	97
cM capacity (veh/h)	1307				549	753
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	190	247	42	21		
Volume Left	0	0	42	0		
Volume Right	0	0	0	21		
cSH	1700	1700	549	753		
Volume to Capacity	0.11	0.15	0.08	0.03		
Queue Length 95th (ft)	0	0	6	2		
Control Delay (s)	0.0	0.0	12.1	9.9		
Lane LOS			B	A		
Approach Delay (s)	0.0	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			22.3%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	227	5	2	212
Future Volume (Veh/h)	0	0	227	5	2	212
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)	0	0	247	5	2	230
Pedestrians	25					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	508	274			277	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	508	274			277	
tC, single (s)	6.4	6.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			3.1	
p0 queue free %	100	100			100	
cM capacity (veh/h)	527	769			882	
Direction, Lane #	NB 1	SB 1				
Volume Total	252	232				
Volume Left	0	2				
Volume Right	5	0				
cSH	1700	882				
Volume to Capacity	0.15	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.1				
Lane LOS		A				
Approach Delay (s)	0.0	0.1				
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			16.2%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	92	176	193	461	389	116
Future Volume (Veh/h)	92	176	193	461	389	116
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)	100	191	210	501	423	126
Pedestrians					35	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1442	486	549			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1442	486	549			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	6	67	79			
cM capacity (veh/h)	106	581	1006			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	100	191	711	549		
Volume Left	100	0	210	0		
Volume Right	0	191	0	126		
cSH	106	581	1006	1700		
Volume to Capacity	0.94	0.33	0.21	0.32		
Queue Length 95th (ft)	143	36	20	0		
Control Delay (s)	145.4	14.2	4.8	0.0		
Lane LOS	F	B	A			
Approach Delay (s)	59.3		4.8	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			13.3			
Intersection Capacity Utilization			77.6%		ICU Level of Service	D
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	519	34	11	505	0	0
Future Volume (Veh/h)	519	34	11	505	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	564	37	12	549	0	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			601		1156	582
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			601		1156	582
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			903		217	516
Direction, Lane #	EB 1	WB 1				
Volume Total	601	561				
Volume Left	0	12				
Volume Right	37	0				
cSH	1700	903				
Volume to Capacity	0.35	0.01				
Queue Length 95th (ft)	0	1				
Control Delay (s)	0.0	0.4				
Lane LOS		A				
Approach Delay (s)	0.0	0.4				
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			38.7%	ICU Level of Service	A	
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday School Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	519	0	0	502	14	13
Future Volume (Veh/h)	519	0	0	502	14	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	564	0	0	546	15	14
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			564		1110	564
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			564		1110	564
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		93	97
cM capacity (veh/h)			1018		206	461
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	564	546	29			
Volume Left	0	0	15			
Volume Right	0	0	14			
cSH	1700	1700	281			
Volume to Capacity	0.33	0.32	0.10			
Queue Length 95th (ft)	0	0	9			
Control Delay (s)	0.0	0.0	19.3			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	19.3			
Approach LOS			C			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	3	4	42	8	185	6	255	64	155	232	2
Future Volume (Veh/h)	2	3	4	42	8	185	6	255	64	155	232	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	4	46	9	201	7	277	70	168	252	2
Pedestrians		1						1			2	
Lane Width (ft)		16.0						12.0			10.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1124	951	255	922	917	314	255			347		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1124	951	255	922	917	314	255			347		
tC, single (s)	7.6	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.0	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	99	99	79	96	72	99			86		
cM capacity (veh/h)	92	224	787	222	235	725	1320			1223		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	9	256	354	422								
Volume Left	2	46	7	168								
Volume Right	4	201	70	2								
cSH	224	489	1320	1223								
Volume to Capacity	0.04	0.52	0.01	0.14								
Queue Length 95th (ft)	3	75	0	12								
Control Delay (s)	21.7	20.1	0.2	4.2								
Lane LOS	C	C	A	A								
Approach Delay (s)	21.7	20.1	0.2	4.2								
Approach LOS	C	C										
Intersection Summary												
Average Delay			6.9									
Intersection Capacity Utilization			66.5%		ICU Level of Service					C		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	207	275	5	0	0
Future Volume (Veh/h)	5	207	275	5	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	225	299	5	0	0
Pedestrians					12	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	316				548	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	316				548	314
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	100
cM capacity (veh/h)	1256				499	732
Direction, Lane #	EB 1	WB 1				
Volume Total	230	304				
Volume Left	5	0				
Volume Right	0	5				
cSH	1256	1700				
Volume to Capacity	0.00	0.18				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.2	0.0				
Lane LOS	A					
Approach Delay (s)	0.2	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.1				
Intersection Capacity Utilization		18.2%		ICU Level of Service		A
Analysis Period (min)		15				

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	207	273	11	2	7
Future Volume (Veh/h)	0	207	273	11	2	7
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	225	297	12	2	8
Pedestrians					11	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	320				539	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	320				539	314
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				100	99
cM capacity (veh/h)	1238				502	723
Direction, Lane #	EB 1	WB 1	SB 1	SB 2		
Volume Total	225	309	2	8		
Volume Left	0	0	2	0		
Volume Right	0	12	0	8		
cSH	1700	1700	502	723		
Volume to Capacity	0.13	0.18	0.00	0.01		
Queue Length 95th (ft)	0	0	0	1		
Control Delay (s)	0.0	0.0	12.2	10.0		
Lane LOS			B	B		
Approach Delay (s)	0.0	0.0	10.5			
Approach LOS			B			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			25.1%	ICU Level of Service		A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	284	0	1	208
Future Volume (Veh/h)	0	0	284	0	1	208
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)	0	0	309	0	1	226
Pedestrians	10					
Lane Width (ft)	0.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	0					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	547	319			319	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	547	319			319	
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			100	
cM capacity (veh/h)	501	726			1252	
Direction, Lane #	NB 1	SB 1				
Volume Total	309	227				
Volume Left	0	1				
Volume Right	0	0				
cSH	1700	1252				
Volume to Capacity	0.18	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			18.3%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	106	203	263	463	421	99
Future Volume (Veh/h)	106	203	263	463	421	99
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)	115	221	286	503	458	108
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1593	512	566			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1593	512	566			
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	61	72			
cM capacity (veh/h)	83	562	1006			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	115	221	789	566		
Volume Left	115	0	286	0		
Volume Right	0	221	0	108		
cSH	83	562	1006	1700		
Volume to Capacity	1.39	0.39	0.28	0.33		
Queue Length 95th (ft)	222	47	29	0		
Control Delay (s)	321.5	15.5	6.2	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	120.2		6.2	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			26.8			
Intersection Capacity Utilization			83.0%	ICU Level of Service	E	
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	565	4	1	519	1	0
Future Volume (Veh/h)	565	4	1	519	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	614	4	1	564	1	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			620		1184	618
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			620		1184	618
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			970		211	493
Direction, Lane #	EB 1	WB 1				
Volume Total	618	565				
Volume Left	0	1				
Volume Right	4	0				
cSH	1700	970				
Volume to Capacity	0.36	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			Err%	ICU Level of Service		H
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2024 Existing
Timing Plan: Weekday PM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	564	1	0	517	3	1
Future Volume (Veh/h)	564	1	0	517	3	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	613	1	0	562	3	1
Pedestrians	1				1	
Lane Width (ft)	12.0				16.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			615		1178	614
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			615		1178	614
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			973		212	495
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	614	562	4			
Volume Left	0	0	3			
Volume Right	1	0	1			
cSH	1700	1700	248			
Volume to Capacity	0.36	0.33	0.02			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.0	19.8			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	19.8			
Approach LOS			C			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			39.7%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	17	10	72	11	162	5	209	74	201	206	2
Future Volume (Veh/h)	2	17	10	72	11	162	5	209	74	201	206	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	18	11	78	12	176	5	227	80	218	224	2
Pedestrians					5			2				
Lane Width (ft)					12.0			12.0				
Walking Speed (ft/s)					3.5			3.5				
Percent Blockage					0			0				
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1120	983	227	965	944	272	226			312		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1120	983	227	965	944	272	226			312		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.3			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.4			2.3		
p0 queue free %	98	91	99	58	94	77	100			82		
cM capacity (veh/h)	117	204	816	184	215	751	1243			1215		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	31	266	312	444								
Volume Left	2	78	5	218								
Volume Right	11	176	80	2								
cSH	261	372	1243	1215								
Volume to Capacity	0.12	0.71	0.00	0.18								
Queue Length 95th (ft)	10	134	0	16								
Control Delay (s)	20.7	35.5	0.2	5.1								
Lane LOS	C	E	A	A								
Approach Delay (s)	20.7	35.5	0.2	5.1								
Approach LOS	C	E										
Intersection Summary												
Average Delay			11.8									
Intersection Capacity Utilization			69.2%		ICU Level of Service					C		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations					 	
Traffic Volume (veh/h)	0	335	167	0	148	71
Future Volume (Veh/h)	0	335	167	0	148	71
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	364	182	0	161	77
Pedestrians		5			11	
Lane Width (ft)		11.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	193				557	198
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	193				557	198
tC, single (s)	4.1				6.4	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.4
p0 queue free %	100				67	91
cM capacity (veh/h)	1378				483	816
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	364	182	238			
Volume Left	0	0	161			
Volume Right	0	0	77			
cSH	1700	1700	556			
Volume to Capacity	0.21	0.11	0.43			
Queue Length 95th (ft)	0	0	53			
Control Delay (s)	0.0	0.0	16.2			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	16.2			
Approach LOS			C			
Intersection Summary						
Average Delay			4.9			
Intersection Capacity Utilization			37.1%	ICU Level of Service	A	
Analysis Period (min)			15			

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	75	408	167	144	0	0
Future Volume (Veh/h)	75	408	167	144	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	82	443	182	157	0	0
Pedestrians			1		11	
Lane Width (ft)			11.0		0.0	
Walking Speed (ft/s)			3.5		3.5	
Percent Blockage			0		0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	350				880	272
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	350				880	272
tC, single (s)	4.1				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.4
p0 queue free %	93				100	100
cM capacity (veh/h)	1220				289	741
Direction, Lane #	EB 1	WB 1				
Volume Total	525	339				
Volume Left	82	0				
Volume Right	0	157				
cSH	1220	1700				
Volume to Capacity	0.07	0.20				
Queue Length 95th (ft)	5	0				
Control Delay (s)	1.9	0.0				
Lane LOS	A					
Approach Delay (s)	1.9	0.0				
Approach LOS						
Intersection Summary						
Average Delay			1.2			
Intersection Capacity Utilization			50.4%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	0	0	311	59	37	371
Future Volume (Veh/h)	0	0	311	59	37	371
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)	0	0	338	64	40	403
Pedestrians	29					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	882	399			431	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	882	399			431	
tC, single (s)	6.4	6.2			4.5	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.6	
p0 queue free %	100	100			96	
cM capacity (veh/h)	297	637			926	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	402	443			
Volume Left	0	0	40			
Volume Right	0	64	0			
cSH	1700	1700	926			
Volume to Capacity	0.03	0.24	0.04			
Queue Length 95th (ft)	0	0	3			
Control Delay (s)	0.0	0.0	1.3			
Lane LOS	A		A			
Approach Delay (s)	0.0	0.0	1.3			
Approach LOS	A					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			48.6%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	134	292	263	352	346	150
Future Volume (Veh/h)	134	292	263	352	346	150
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)	146	317	286	383	376	163
Pedestrians					36	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1448	458	539			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1448	458	539			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	48	72			
cM capacity (veh/h)	96	605	1019			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	146	317	669	539		
Volume Left	146	0	286	0		
Volume Right	0	317	0	163		
cSH	96	605	1019	1700		
Volume to Capacity	1.52	0.52	0.28	0.32		
Queue Length 95th (ft)	278	76	29	0		
Control Delay (s)	355.8	17.3	6.3	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	124.0		6.3	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			36.9			
Intersection Capacity Utilization			77.8%		ICU Level of Service	D
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	420	66	37	496	0	0
Future Volume (Veh/h)	420	66	37	496	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	457	72	40	539	0	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			529	1112		493
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			529	1112		493
tC, single (s)			4.3	6.4		6.2
tC, 2 stage (s)						
tF (s)			2.3	3.5		3.3
p0 queue free %			96	100		100
cM capacity (veh/h)			971	223		580
Direction, Lane #	EB 1	WB 1				
Volume Total	529	579				
Volume Left	0	40				
Volume Right	72	0				
cSH	1700	971				
Volume to Capacity	0.31	0.04				
Queue Length 95th (ft)	0	3				
Control Delay (s)	0.0	1.1				
Lane LOS		A				
Approach Delay (s)	0.0	1.1				
Approach LOS						
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			59.9%	ICU Level of Service	B	
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	420	0	0	514	19	7
Future Volume (Veh/h)	420	0	0	514	19	7
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	457	0	0	559	21	8
Pedestrians				4		
Lane Width (ft)				11.0		
Walking Speed (ft/s)				3.5		
Percent Blockage				0		
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			457		1016	461
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			457		1016	461
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		91	98
cM capacity (veh/h)			1114		232	522
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	457	559	29			
Volume Left	0	0	21			
Volume Right	0	0	8			
cSH	1700	1700	274			
Volume to Capacity	0.27	0.33	0.11			
Queue Length 95th (ft)	0	0	9			
Control Delay (s)	0.0	0.0	19.7			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	19.7			
Approach LOS			C			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			38.3%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	8	8	80	11	163	3	204	66	128	179	0
Future Volume (Veh/h)	2	8	8	80	11	163	3	204	66	128	179	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	9	9	87	12	177	3	222	72	139	195	0
Pedestrians		2			2			9			1	
Lane Width (ft)		16.0			12.0			12.0			10.0	
Walking Speed (ft/s)		3.5			3.5			3.5			3.5	
Percent Blockage		0			0			1			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	923	777	206	762	741	261	197			296		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	923	777	206	762	741	261	197			296		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.3	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.4	2.2			2.2		
p0 queue free %	99	97	99	69	96	77	100			89		
cM capacity (veh/h)	170	292	830	277	306	754	1384			1246		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	20	276	297	334								
Volume Left	2	87	3	139								
Volume Right	9	177	72	0								
cSH	374	469	1384	1246								
Volume to Capacity	0.05	0.59	0.00	0.11								
Queue Length 95th (ft)	4	93	0	9								
Control Delay (s)	15.2	23.1	0.1	4.0								
Lane LOS	C	C	A	A								
Approach Delay (s)	15.2	23.1	0.1	4.0								
Approach LOS	C	C										
Intersection Summary												
Average Delay			8.7									
Intersection Capacity Utilization			63.2%		ICU Level of Service					B		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations					 	
Traffic Volume (veh/h)	0	219	213	0	108	44
Future Volume (Veh/h)	0	219	213	0	108	44
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	238	232	0	117	48
Pedestrians		3			8	
Lane Width (ft)		11.0			12.0	
Walking Speed (ft/s)		3.5			3.5	
Percent Blockage		0			1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	240				478	243
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	240				478	243
tC, single (s)	4.1				6.5	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.6	3.3
p0 queue free %	100				78	94
cM capacity (veh/h)	1328				531	793
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	238	232	165			
Volume Left	0	0	117			
Volume Right	0	0	48			
cSH	1700	1700	588			
Volume to Capacity	0.14	0.14	0.28			
Queue Length 95th (ft)	0	0	29			
Control Delay (s)	0.0	0.0	13.5			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	13.5			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			27.6%	ICU Level of Service	A	
Analysis Period (min)			15			

3: Asbury Street & Cutler Middle Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	46	281	213	106	0	0
Future Volume (Veh/h)	46	281	213	106	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	305	232	115	0	0
Pedestrians					13	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	360				708	302
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	360				708	302
tC, single (s)	4.2				6.5	6.3
tC, 2 stage (s)						
tF (s)	2.3				3.6	3.4
p0 queue free %	96				100	100
cM capacity (veh/h)	1151				373	717
Direction, Lane #	EB 1	WB 1				
Volume Total	355	347				
Volume Left	50	0				
Volume Right	0	115				
cSH	1151	1700				
Volume to Capacity	0.04	0.20				
Queue Length 95th (ft)	3	0				
Control Delay (s)	1.5	0.0				
Lane LOS	A					
Approach Delay (s)	1.5	0.0				
Approach LOS						
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			42.1%		ICU Level of Service	A
Analysis Period (min)			15			

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	16	303	0	0	281
Future Volume (Veh/h)	20	16	303	0	0	281
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)	22	17	329	0	0	305
Pedestrians	32					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	3					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	666	361			361	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	666	361			361	
tC, single (s)	6.4	6.2			5.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			3.1	
p0 queue free %	95	97			100	
cM capacity (veh/h)	415	667			786	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	39	329	305			
Volume Left	22	0	0			
Volume Right	17	0	0			
cSH	497	1700	786			
Volume to Capacity	0.08	0.19	0.00			
Queue Length 95th (ft)	6	0	0			
Control Delay (s)	12.9	0.0	0.0			
Lane LOS	B					
Approach Delay (s)	12.9	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			25.9%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	129	217	222	461	389	148
Future Volume (Veh/h)	129	217	222	461	389	148
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)	140	236	241	501	423	161
Pedestrians					35	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1522	504	584			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1522	504	584			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	58	75			
cM capacity (veh/h)	90	564	976			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	140	236	742	584		
Volume Left	140	0	241	0		
Volume Right	0	236	0	161		
cSH	90	564	976	1700		
Volume to Capacity	1.55	0.42	0.25	0.34		
Queue Length 95th (ft)	274	51	24	0		
Control Delay (s)	375.0	15.9	5.6	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	149.6		5.6	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			35.5			
Intersection Capacity Utilization			83.2%	ICU Level of Service	E	
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	556	34	11	537	0	0
Future Volume (Veh/h)	556	34	11	537	0	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	604	37	12	584	0	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			641		1230	622
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			641		1230	622
tC, single (s)			4.3		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.4		3.5	3.3
p0 queue free %			99		100	100
cM capacity (veh/h)			871		195	490
Direction, Lane #	EB 1	WB 1				
Volume Total	641	596				
Volume Left	0	12				
Volume Right	37	0				
cSH	1700	871				
Volume to Capacity	0.38	0.01				
Queue Length 95th (ft)	0	1				
Control Delay (s)	0.0	0.4				
Lane LOS		A				
Approach Delay (s)	0.0	0.4				
Approach LOS						
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			40.4%		ICU Level of Service	A
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	556	0	0	534	14	13
Future Volume (Veh/h)	556	0	0	534	14	13
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	604	0	0	580	15	14
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			604		1184	604
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			604		1184	604
tC, single (s)			4.1		6.7	6.6
tC, 2 stage (s)						
tF (s)			2.2		3.8	3.7
p0 queue free %			100		92	97
cM capacity (veh/h)			984		185	436
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	604	580	29			
Volume Left	0	0	15			
Volume Right	0	0	14			
cSH	1700	1700	256			
Volume to Capacity	0.36	0.34	0.11			
Queue Length 95th (ft)	0	0	9			
Control Delay (s)	0.0	0.0	20.8			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	20.8			
Approach LOS			C			
Intersection Summary						
Average Delay			0.5			
Intersection Capacity Utilization			39.3%	ICU Level of Service		A
Analysis Period (min)			15			

1: Highland Street & Pleasant Avenue/Asbury Street

HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	4	4	50	11	188	6	255	69	157	232	2
Future Volume (Veh/h)	2	4	4	50	11	188	6	255	69	157	232	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	4	54	12	204	7	277	75	171	252	2
Pedestrians		1						1			2	
Lane Width (ft)		16.0						12.0			10.0	
Walking Speed (ft/s)		3.5						3.5			3.5	
Percent Blockage		0						0			0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1136	962	255	930	926	316	255			352		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1136	962	255	930	926	316	255			352		
tC, single (s)	7.6	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	4.0	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	98	99	75	95	72	99			86		
cM capacity (veh/h)	88	220	787	217	231	723	1320			1218		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	10	270	359	425								
Volume Left	2	54	7	171								
Volume Right	4	204	75	2								
cSH	218	463	1320	1218								
Volume to Capacity	0.05	0.58	0.01	0.14								
Queue Length 95th (ft)	4	91	0	12								
Control Delay (s)	22.3	23.1	0.2	4.2								
Lane LOS	C	C	A	A								
Approach Delay (s)	22.3	23.1	0.2	4.2								
Approach LOS	C	C										
Intersection Summary												
Average Delay			7.8									
Intersection Capacity Utilization			69.2%		ICU Level of Service					C		
Analysis Period (min)			15									

2: Asbury Street & Cutler West Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations					 	
Traffic Volume (veh/h)	0	221	277	0	35	15
Future Volume (Veh/h)	0	221	277	0	35	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	240	301	0	38	16
Pedestrians					12	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	313				553	313
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	313				553	313
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	98
cM capacity (veh/h)	1244				492	724
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	240	301	54			
Volume Left	0	0	38			
Volume Right	0	0	16			
cSH	1700	1700	543			
Volume to Capacity	0.14	0.18	0.10			
Queue Length 95th (ft)	0	0	8			
Control Delay (s)	0.0	0.0	12.4			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	12.4			
Approach LOS			B			
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			24.6%	ICU Level of Service		A
Analysis Period (min)			15			

3: Asbury Street & Cutler Middle Driveway

HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	14	242	277	36	0	0
Future Volume (Veh/h)	14	242	277	36	0	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	263	301	39	0	0
Pedestrians					11	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	351				624	332
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	351				624	332
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				100	100
cM capacity (veh/h)	1219				447	715
Direction, Lane #	EB 1	WB 1				
Volume Total	278	340				
Volume Left	15	0				
Volume Right	0	39				
cSH	1219	1700				
Volume to Capacity	0.01	0.20				
Queue Length 95th (ft)	1	0				
Control Delay (s)	0.5	0.0				
Lane LOS	A					
Approach Delay (s)	0.5	0.0				
Approach LOS						
Intersection Summary						
Average Delay		0.2				
Intersection Capacity Utilization		27.5%		ICU Level of Service		A
Analysis Period (min)		15				

4: Asbury Street & Cutler East Driveway HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	5	9	304	3	1	241
Future Volume (Veh/h)	5	9	304	3	1	241
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)	5	10	330	3	1	262
Pedestrians	10					
Lane Width (ft)	12.0					
Walking Speed (ft/s)	3.5					
Percent Blockage	1					
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	606	342			343	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	606	342			343	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	459	699			1216	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	15	333	263			
Volume Left	5	0	1			
Volume Right	10	3	0			
cSH	595	1700	1216			
Volume to Capacity	0.03	0.20	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	11.2	0.0	0.0			
Lane LOS	B		A			
Approach Delay (s)	11.2	0.0	0.0			
Approach LOS	B					
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			26.2%	ICU Level of Service		A
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	219	273	463	421	109
Future Volume (Veh/h)	123	219	273	463	421	109
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)	134	238	297	503	458	118
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1620	517	576			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1620	517	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 %	0	57	70			
cM capacity (veh/h)	78	558	997			
Direction, Lane #	EB 1	EB 2	NB 1	SB 1		
Volume Total	134	238	800	576		
Volume Left	134	0	297	0		
Volume Right	0	238	0	118		
cSH	78	558	997	1700		
Volume to Capacity	1.71	0.43	0.30	0.34		
Queue Length 95th (ft)	284	53	31	0		
Control Delay (s)	458.0	16.2	6.5	0.0		
Lane LOS	F	C	A			
Approach Delay (s)	175.3		6.5	0.0		
Approach LOS	F					
Intersection Summary						
Average Delay			40.3			
Intersection Capacity Utilization			85.1%		ICU Level of Service	E
Analysis Period (min)			15			

6: Winthrop West Driveway & Bay Road /Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱		
Traffic Volume (veh/h)	582	4	1	529	1	0
Future Volume (Veh/h)	582	4	1	529	1	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	633	4	1	575	1	0
Pedestrians					2	
Lane Width (ft)					0.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					0	
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			639		1214	637
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			639		1214	637
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		100	100
cM capacity (veh/h)			955		202	481
Direction, Lane #	EB 1	WB 1				
Volume Total	637	576				
Volume Left	0	1				
Volume Right	4	0				
cSH	1700	955				
Volume to Capacity	0.37	0.00				
Queue Length 95th (ft)	0	0				
Control Delay (s)	0.0	0.0				
Lane LOS		A				
Approach Delay (s)	0.0	0.0				
Approach LOS						
Intersection Summary						
Average Delay			Err			
Intersection Capacity Utilization			Err%	ICU Level of Service		H
Analysis Period (min)			15			

7: Winthrop East Driveway & Bay Road HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations					 	
Traffic Volume (veh/h)	581	1	0	527	3	1
Future Volume (Veh/h)	581	1	0	527	3	1
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	632	1	0	573	3	1
Pedestrians	1				1	
Lane Width (ft)	12.0				16.0	
Walking Speed (ft/s)	3.5				3.5	
Percent Blockage	0				0	
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume			634		1208	634
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			634		1208	634
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			100		99	100
cM capacity (veh/h)			958		204	482
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	633	573	4			
Volume Left	0	0	3			
Volume Right	1	0	1			
cSH	1700	1700	238			
Volume to Capacity	0.37	0.34	0.02			
Queue Length 95th (ft)	0	0	1			
Control Delay (s)	0.0	0.0	20.4			
Lane LOS			C			
Approach Delay (s)	0.0	0.0	20.4			
Approach LOS			C			
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			40.6%	ICU Level of Service	A	
Analysis Period (min)			15			

MITIGATION CAPACITY ANALYSIS WORKSHEETS

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	134	292	263	352	346	150
Future Volume (Veh/h)	134	292	263	352	346	150
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)	146	317	286	383	376	163
Pedestrians					36	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1448	458	539			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1448	458	539			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	48	72			
cM capacity (veh/h)	96	605	1019			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	146	317	286	383	539	
Volume Left	146	0	286	0	0	
Volume Right	0	317	0	0	163	
cSH	96	605	1019	1700	1700	
Volume to Capacity	1.52	0.52	0.28	0.23	0.32	
Queue Length 95th (ft)	278	76	29	0	0	
Control Delay (s)	355.8	17.3	9.9	0.0	0.0	
Lane LOS	F	C	A			
Approach Delay (s)	124.0		4.2		0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			36.1			
Intersection Capacity Utilization			59.3%	ICU Level of Service		B
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	129	217	222	461	389	148
Future Volume (Veh/h)	129	217	222	461	389	148
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)	140	236	241	501	423	161
Pedestrians					35	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					3	
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1522	504	584			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1522	504	584			
tC, single (s)	6.5	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.6	3.3	2.2			
p0 queue free %	0	58	75			
cM capacity (veh/h)	90	564	976			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	140	236	241	501	584	
Volume Left	140	0	241	0	0	
Volume Right	0	236	0	0	161	
cSH	90	564	976	1700	1700	
Volume to Capacity	1.55	0.42	0.25	0.29	0.34	
Queue Length 95th (ft)	274	51	24	0	0	
Control Delay (s)	375.0	15.9	9.9	0.0	0.0	
Lane LOS	F	C	A			
Approach Delay (s)	149.6		3.2		0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			34.5			
Intersection Capacity Utilization			58.9%	ICU Level of Service		B
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street HCM Unsignalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	123	219	273	463	421	109
Future Volume (Veh/h)	123	219	273	463	421	109
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)	134	238	297	503	458	118
Pedestrians					6	
Lane Width (ft)					12.0	
Walking Speed (ft/s)					3.5	
Percent Blockage					1	
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1620	517	576			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1620	517	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 %	0	57	70			
cM capacity (veh/h)	78	558	997			
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	SB 1	
Volume Total	134	238	297	503	576	
Volume Left	134	0	297	0	0	
Volume Right	0	238	0	0	118	
cSH	78	558	997	1700	1700	
Volume to Capacity	1.71	0.43	0.30	0.30	0.34	
Queue Length 95th (ft)	284	53	31	0	0	
Control Delay (s)	458.0	16.2	10.1	0.0	0.0	
Lane LOS	F	C	B			
Approach Delay (s)	175.3		3.8		0.0	
Approach LOS	F					
Intersection Summary						
Average Delay			39.0			
Intersection Capacity Utilization			60.7%	ICU Level of Service		B
Analysis Period (min)			15			

5: Bay Road/Bay Road & Asbury Street Queues

2031 Build
Timing Plan: Weekday AM

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	146	317	286	383	539
v/c Ratio	0.61	0.62	0.72	0.36	0.52
Control Delay	47.8	10.3	31.8	13.8	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	10.3	31.8	13.8	15.5
Queue Length 50th (ft)	85	0	142	138	207
Queue Length 95th (ft)	148	75	#326	227	340
Internal Link Dist (ft)	797			267	176
Turn Bay Length (ft)	115		150		
Base Capacity (vph)	346	596	395	1054	1037
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.42	0.53	0.72	0.36	0.52

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Bay Road/Bay Road & Asbury Street HCM Signalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday AM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	134	292	263	352	346	150
Future Volume (vph)	134	292	263	352	346	150
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1586	1599	1736	1766	1717	
Flt Permitted	0.95	1.00	0.36	1.00	1.00	
Satd. Flow (perm)	1586	1599	663	1766	1717	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	146	317	286	383	376	163
RTOR Reduction (vph)	0	270	0	0	13	0
Lane Group Flow (vph)	146	47	286	383	526	0
Heavy Vehicles (%)	10%	1%	4%	4%	4%	11%
Turn Type	Prot	Prot	Perm	NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases			2			
Actuated Green, G (s)	12.9	12.9	51.2	51.2	51.2	
Effective Green, g (s)	12.9	12.9	51.2	51.2	51.2	
Actuated g/C Ratio	0.15	0.15	0.58	0.58	0.58	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	233	235	387	1032	1003	
v/s Ratio Prot	c0.09	0.03		0.22	0.31	
v/s Ratio Perm			c0.43			
v/c Ratio	0.63	0.20	0.74	0.37	0.52	
Uniform Delay, d1	35.1	32.8	13.3	9.7	10.9	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.2	0.4	7.2	0.2	0.5	
Delay (s)	40.3	33.2	20.5	9.9	11.4	
Level of Service	D	C	C	A	B	
Approach Delay (s)	35.4			14.4	11.4	
Approach LOS	D			B	B	
Intersection Summary						
HCM 2000 Control Delay			19.3	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.62			
Actuated Cycle Length (s)			87.6	Sum of lost time (s)		13.5
Intersection Capacity Utilization			60.6%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

5: Bay Road/Bay Road & Asbury Street Queues

2031 Build
Timing Plan: Weekday School Peak

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	140	236	241	501	584
v/c Ratio	0.60	0.55	0.67	0.47	0.56
Control Delay	47.8	10.3	29.3	15.2	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.8	10.3	29.3	15.2	16.4
Queue Length 50th (ft)	81	0	112	195	234
Queue Length 95th (ft)	143	64	#275	317	387
Internal Link Dist (ft)	797			267	176
Turn Bay Length (ft)	115		150		
Base Capacity (vph)	338	519	362	1071	1044
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.41	0.45	0.67	0.47	0.56

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Bay Road/Bay Road & Asbury Street HCM Signalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday School Peak

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	129	217	222	461	389	148
Future Volume (vph)	129	217	222	461	389	148
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.96	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1572	1553	1719	1783	1720	
Flt Permitted	0.95	1.00	0.33	1.00	1.00	
Satd. Flow (perm)	1572	1553	603	1783	1720	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	140	236	241	501	423	161
RTOR Reduction (vph)	0	202	0	0	11	0
Lane Group Flow (vph)	140	34	241	501	573	0
Heavy Vehicles (%)	11%	4%	5%	3%	5%	10%
Turn Type	Prot	Prot	Perm	NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	12.8	12.8	52.0	52.0	52.0	
Effective Green, g (s)	12.8	12.8	52.0	52.0	52.0	
Actuated g/C Ratio	0.14	0.14	0.59	0.59	0.59	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	227	224	354	1048	1011	
v/s Ratio Prot	c0.09	0.02		0.28	0.33	
v/s Ratio Perm			c0.40			
v/c Ratio	0.62	0.15	0.68	0.48	0.57	
Uniform Delay, d1	35.5	33.1	12.5	10.4	11.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.9	0.3	5.3	0.3	0.7	
Delay (s)	40.4	33.4	17.8	10.8	12.0	
Level of Service	D	C	B	B	B	
Approach Delay (s)	36.0			13.1	12.0	
Approach LOS	D			B	B	
Intersection Summary						
HCM 2000 Control Delay			17.8	HCM 2000 Level of Service		B
HCM 2000 Volume to Capacity ratio			0.58			
Actuated Cycle Length (s)			88.4	Sum of lost time (s)		13.5
Intersection Capacity Utilization			60.2%	ICU Level of Service		B
Analysis Period (min)			15			
c Critical Lane Group						

5: Bay Road/Bay Road & Asbury Street Queues

2031 Build
Timing Plan: Weekday PM

					
Lane Group	EBL	EBR	NBL	NBT	SBT
Lane Group Flow (vph)	134	238	297	503	576
v/c Ratio	0.54	0.54	0.63	0.40	0.47
Control Delay	39.0	9.8	19.0	9.2	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	9.8	19.0	9.2	9.8
Queue Length 50th (ft)	53	0	49	66	77
Queue Length 95th (ft)	136	64	#330	312	371
Internal Link Dist (ft)	797			267	176
Turn Bay Length (ft)	115		150		
Base Capacity (vph)	407	564	475	1253	1231
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.42	0.63	0.40	0.47

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

5: Bay Road/Bay Road & Asbury Street HCM Signalized Intersection Capacity Analysis

2031 Build
Timing Plan: Weekday PM

						
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	123	219	273	463	421	109
Future Volume (vph)	123	219	273	463	421	109
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Lane Width	11	12	12	11	12	12
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	
Frpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.85	1.00	1.00	0.97	
Flt Protected	0.95	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1678	1583	1770	1837	1796	
Flt Permitted	0.95	1.00	0.37	1.00	1.00	
Satd. Flow (perm)	1678	1583	696	1837	1796	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	134	238	297	503	458	118
RTOR Reduction (vph)	0	204	0	0	6	0
Lane Group Flow (vph)	134	34	297	503	570	0
Confl. Bikes (#/hr)						3
Heavy Vehicles (%)	4%	2%	2%	0%	3%	0%
Turn Type	Prot	Prot	Perm	NA	NA	
Protected Phases	4	4		2	6	
Permitted Phases		4	2			
Actuated Green, G (s)	11.3	11.3	51.7	51.7	51.7	
Effective Green, g (s)	11.3	11.3	51.7	51.7	51.7	
Actuated g/C Ratio	0.14	0.14	0.65	0.65	0.65	
Clearance Time (s)	4.5	4.5	4.5	4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	238	225	453	1196	1169	
v/s Ratio Prot	c0.08	0.02		0.27	0.32	
v/s Ratio Perm			c0.43			
v/c Ratio	0.56	0.15	0.66	0.42	0.49	
Uniform Delay, d1	31.7	29.8	8.4	6.7	7.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.0	0.3	3.4	0.2	0.3	
Delay (s)	34.8	30.2	11.8	6.9	7.4	
Level of Service	C	C	B	A	A	
Approach Delay (s)	31.8			8.7	7.4	
Approach LOS	C			A	A	
Intersection Summary						
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			79.4		Sum of lost time (s)	13.5
Intersection Capacity Utilization			62.0%		ICU Level of Service	B
Analysis Period (min)			15			
c Critical Lane Group						