

TABLE 1 – BHOD SUB-DISTRICTS

Sub-Districts	Descriptions	Development and Permitting Requirements
LC Lower Campus	The Lower Campus consists of two separate ANR lots of 6+/- acres each. There are currently six three-story Student Apartment Buildings (Total: 209 Housing Units) split between the two lots (Units A, B, and C, D on one lot and Units E and F on the other).	<i>Reuse for Existing Student Housing:</i> Reuse / renovation, or reconstruction of existing structures (Total 194,391-GSF) with no additions: Permitted By-Right <i>Expansion of Existing Student Housing:</i> Construction of additional floor area up to 10% of the existing GSF: Permitted by Special Permit
MC Middle Campus	The Middle Campus occupies the geographical center of the overall property on 19+/- acres. Having the least topographic challenges, this District is amenable for potential development. There is one existing legacy building – Pilgrim Hall (formerly the estate stables). There is an existing wastewater treatment facility along Woodbury St. that currently serves the entire campus that may be subject to expansion given additional site development.	<i>Rehabilitation of Existing Legacy Buildings:</i> 1) Pilgrim Hall & Garage: 15,351-GSF Renovation / reuse with no additions: Permitted By-Right <i>Expansion of Existing Legacy Building:</i> Construction of additional area up to 10% of the existing GSF: Permitted by Special Permit <i>New Residential / Professional Building:</i> Refer to Table 2 – Use Regulations and Table 4 - Dimensional Standards: Permitted by Special Permit
UC Upper Campus	The Upper Campus is 27+ acres including 4+ acres of undevelopable steep slopes. There is also a 1+ acres town-owned, underground, water reservoir with a right-of-way to a pumping station along Bridge Street within the UC boundary. The site currently contains office / institutional buildings including Kerr Hall, Goddard Library, the Academic Building & Chapel with extensive surface parking. The Gate House is used as a residential building located adjacent to the Bridge Street exit.	<i>Reuse or Conversion of Existing Office / Institutional Buildings:</i> Reuse or renovation of existing structures (Total 166,838 GSF): Permitted By-Right <i>Expansion or reconstruction of Existing Office / Institutional:</i> Permitted by Special Permit <i>New Residential / Professional Buildings:</i> Refer to Table 2 – Use Regulations and Table 4 – Dimensional Regulations: Permitted by Special Permit
HL Heritage Landscape	The Heritage Landscape is open space of 14+/- acres defined by sloping lawns and mature trees as defining features surrounding a three-story, legacy building - the Retreat House (formerly the Mandell House) - adjacent parking and a summit walking trail. This area is celebrated for its scenic and historic resources.	<i>Rehabilitation of Existing Legacy Building:</i> 1) Retreat House: 14,723-GSF Renovation / reuse with no additions: Permitted By-Right <i>Expansion of Existing Legacy Building:</i> Construction of additional area up to 10% of the existing GSF: Permitted by Special Permit
NZ Natural Zone	The 27+/- acres of Natural Zone in two separate areas consisting of protected conservation lands unsuitable for new development and protected in perpetuity.	N / A

Lower to 2.5%

Lower to 2.5%

No new commercial per G.C.T.S.

Re-Use as residential only.

Lower to 2.5%

TABLE 2 – USE REGULATIONS

Allowable Uses	Districts				
	LC	MC	UC	HL	NZ
RESIDENTIAL: MULTI-HOUSING & TOWNHOUSES					
Attached Housing: 2 - 4 Dwelling Units / Building	-	SP	SP	P	-
Multi-Housing: > 4 Dwelling Units	P	SP	SP	-	-
Townhouses: 3 - 6 Dwelling Units / Building	-	SP	SP	-	-
55+ Age-Qualified Housing	-	SP	SP	-	-
Reuse: Existing Detached Housing (Gate House)	-	-	P	-	-
COMMERCIAL: BUSINESS, INSTITUTIONAL & PROFESSIONAL					
Reuse: Existing Business / Assembly / Infrastructure / Residential ¹	-	P/SP	P/SP	P	-
Expansion or Reconstruction: Existing Business / Assembly / Infrastructure / Residential ²	-	SP	SP	SP	-
Professional Services: Clinic or Doctor Office	-	SP	SP	-	-
Institutional: Senior Serviced Housing	-	SP	SP	-	-
Commercial: Business / Professional Services	-	SP	SP	-	-
CIVIC: RECREATIONAL & PUBLIC ASSEMBLY					
Public Assembly: Library, Museum, Art Gallery	-	SP	SP	-	-
Recreational: Art, Dance, Music Studios	-	SP	SP	-	-
Trail	P	P	P	P	P
ACCESSORY USES³					
Day Care Center: Child or Adult	SP	SP	SP	-	-
Fitness / Health Facility	SP	SP	SP	-	-
Conference Center	SP	SP	SP	-	-
Home Occupation	-	SP	-	-	-
Park, Playground	SP	SP	SP	SP	SP
Small Retail, Café / Restaurant, or similar uses to serve occupants, employees or guests	SP	SP	SP	-	-
Structured Parking ⁴	-	SP	SP	-	-
INFRASTRUCTURE: UTILITIES & SERVICES					
Roads, sidewalks, major or minor infrastructure (sanitary, plumbing, electrical utilities, lighting, and a small security station at off-site road entrances.	SP	SP	SP	SP	SP

KEY TO SYMBOLS:

Permitting: P = By-Right	Districts: LC = Lower Campus	HL = Heritage Landscape
SP = Special Permit	MC = Middle Campus	NZ = Natural Zone
- = Not Allowed	UC = Upper Campus	

NOTES:

- Reuse of existing facilities (Kerr Hall, Library, Academic Center & Chapel, Retreat House, Pilgrim Hall, Gate House, Wastewater Treatment facility and Student Housing) by GCTS: **By-Right (P)**.
Otherwise, reuse of same buildings under new ownership: **Special Permit (SP)**
- Expansion or Reconstruction of existing facilities listed in Note 1 above: **Special Permit (SP)**
- Accessory Uses in general are not assumed to be free-standing facilities but secondary areas within the primary residential, business or institutional establishment providing services as noted.
- Structured parking buildings are exceptions to Note 3.

TABLE 3 – BUILDING TYPES

Building Type / Use	Description
Attached Housing: 2, 3 or 4 Dwelling Units	Attached Housing with the outward appearance of detached houses but accommodating two, three or four separate dwelling units within one building. They are appropriate for a wide variety of lot sizes.
Multi-Housing: 5 or More Dwelling Units	Housing with five or more dwellings in a vertical arrangement per structure. Common entrances and interior corridors serve multiple units. These buildings are a minimum of two stories with parking typically located behind the buildings.
Townhouses: 3, 4, 5 or 6 Dwelling Units / Building	Townhouses are residential buildings with three to six dwellings each that share a common wall. Each unit has its own entrance and is a minimum of two stories. Units are typically aligned close to the public sidewalk with small variations in setback to provide streetscape diversity. Provide 20 feet between buildings.
55+ Age-Qualified Housing: 2 Dwelling Units / Building	Age-qualified communities have specific requirements as to who is allowed to live in the community: Residents are typically 55 or better, although some communities may allow married individuals under the age of 55 to live in the community provided that their spouse meets the age guideline.
Senior Residential Care Facility	A housing arrangement chosen voluntarily by the residents, or their guardians; where 75 percent of the residents are at least 62 years of age, or, if younger, have needs compatible with other residents; and where varying levels of care and supervision are provided, as agreed to at the time of admission or appraisal.
Educational / Assembly	Existing Educational / Assembly buildings include Kerr Hall, Retreat House, Pilgrim Hall, the Chapel, Library, and Academic Center. The reuse or partial repurposing of those buildings into a similar type of use fit within the existing site.
Office / Professional Services	Office / Professional serves the public but does not offer a product or merchandise for sale. Typical services may include outpatient clinics, physicians, attorneys, dentists, architects, engineers or laboratory suites for testing and research. General or personal service establishments, however, are not to be included in the definition of business office.
Infrastructure	Wastewater treatment for all site structures occurs at either a small facility on the Central Campus along Woodbury Street, or on a limited septic field adjacent to Student Housing C & D.
Accessory Uses or Structures	Accessory use is part of and subordinate to a principal use or structure served in area, extent, or purpose. For the purposes of this Bylaw retail shops, dining facilities, and similar accessory uses primarily to serve occupants, employees or guests within the principal building are accessory uses. A structured parking accessory facility is an exception as a separate building.
Recreational	Parks and playgrounds are a typical component to public spaces used for recreation that customarily use benches for seating and playscapes.
Existing Legacy Buildings	Retreat House: May be reused By-Right or repurposed by Special Permit.
	Pilgrim Hall: May be reused By-Right or repurposed by Special Permit.
	Gate House: May be reused By-Right or repurposed by Special Permit.

NOTE:

1. Table 3 – Building Types lists general building types for uses specific to the BHOD site. Building Types not listed in Table 3 are prohibited.

TABLE 4 – DIMENSIONAL REGULATIONS

Building Type / Use	Permitted in Districts	Building Footprint (Max. GSF)	Building Floor Area (Max. GSF)	Open Space per Total Acreage (%)	Floor Area Ratio (Max.)	Height (Max. Stories/FT)
Attached Housing: 2 - 4 Dwelling Units / Building	MC ¹	4,000	8,000	40	TBD	2 / 35
	UC ¹	4,000	8,000	40	TBD	2 / 35
Multi-Housing: >4 Dwelling Units	LC-1	10,000	54,000	40	TBD	3 / 35
	LC-2	18,000	54,000	40	TBD	3 / 35
Townhouses: 3 - 6 Dwelling Units / Building	MC ¹	9,000	18,000	40	TBD	2 / 35
	UC ¹	9,000	18,000	40	TBD	2 / 35
55+ Age-Qualified Housing: 2 Dwelling Units / Building	MC	5,000	10,000	40	TBD	2 / 35
	UC	5,000	10,000	40	TBD	2 / 35
Senior Residential Care Facility	MC	25,000	50,000	40	TBD	2 / 35
	UC	25,000	50,000	40	TBD	2 / 35
Educational / Assembly	UC	40,000	75,000	40	TBD	2 / 35
Office / Professional Services	UC	40,000	80,000	40	TBD	2 / 35
Major / Minor Infrastructure	LC MC UC	By Permit	By Permit	By Permit	By Permit	1 / 25
Accessory Use or Structure	MC UC	By Permit	By Permit	By Permit	By Permit	1 / 25
Recreational	LC MC UC	By Permit	By Permit	By Permit	By Permit	-
Existing Legacy Buildings	MC UC HL	-	-	-	-	-

KEY TO SYMBOLS

Districts: LC = Lower Campus HL = Heritage Landscape
MC = Middle Campus NZ = Natural Zone
UC = Upper Campus

NOTE:

- Districts noted are eligible for 55+ Age-Qualified Housing Building Types.

March 15, 2019

VIA ELECTRONIC MAIL

Shawn M. Farrell, Chair
Hamilton Board of Selectmen
577 Bay Road
Hamilton, Massachusetts 01936

Patrick Reffett
Hamilton Director of Planning and Inspections
577 Bay Road
Hamilton, Massachusetts 01936

Re: Proposed Residential Development at the Gordon-Conwell Theological Seminary

Dear Messrs. Farrell and Reffett:

Our firm represents Jay and Katherine Horgen, the owners of 57 and 51 Miles River Road. The Horgens have concerns about the detrimental impacts from the proposed large-scale residential development project at the Gordon-Conwell Theological Seminary land at the intersection of Miles River Road and Bridge Street ("Gordon-Conwell").

The properties on Miles River Road would suffer a significant detrimental impact from this development, and the Horgens are submitting formal comments to the Board of Selectmen and Planning Board to raise awareness of these concerns about the Gordon-Conwell project. In particular, the Horgens are concerned that the density of development on this steep-sloped site will present significant impacts on public health, safety, and the environment, including, but not limited to traffic impacts on Bridge Road and Miles River Road, stormwater management issues, and impacts to groundwater within a Zone II for drinking water.

A. Any Large Scale Residential Development at Gordon-Conwell Will Have a Detrimental Impact on Miles River Road

Miles River Road is a designated scenic road. It is a narrow meandering road bound by wetlands connected to the Miles River system. The posted speed limit is only 30 mph in recognition of the need for caution. There is a posted Hidden Drive on the northbound side. There are several significant bends in Miles River Road that limit distance visibility. There are several posted warnings alerting drivers of the numerous consecutive turns. While these characteristics enhance the quaint character of this country road, these same attributes make it a

terrible selection for the conduit to a large-scale residential development. If a major residential development project is allowed at the Gordon-Conwell site, Miles River Road will become a major thoroughfare for the dramatic increase in car trips that will traverse Miles River Road to get to destinations in Hamilton and beyond.

Miles River Road was not engineered for this level of service. There are significant environmental resources on either side of the road that would make reconfiguration of the roadway challenging. The Horgens have a pond on their property at 57 Miles River Road. This pond provides significant habitat to many creatures, and is a potential habitat for several species of turtles. Any additional development of the roadway to accommodate an increased level of service associated with the additional residential development would have to include an assessment for the presence of endangered species, including but not limited to endangered native turtle species, under the requirements of the Massachusetts Endangered Species Act, M.G.L. c. 131A. The pond on the Horgens' property is hydrologically connected to the watercourse and extensive wetlands system that extends through the golf course on the opposite side of the road. In addition to the constraints this places on any further development of the roadway, it is likely that a large scale residential project near the intersection of Miles River Road and Bridge Street, will cause increased traffic and result in takings of turtles who would be vulnerable to the increased frequency of car trip ends as they travel back and forth from the golf course and the wetlands that surround the golf course over the roadway to the pond at 57 Miles River Road. The Horgens request that the developer perform an evaluation of the extent of wildlife habitat, including any endangered species habitat at the project site and along Miles River Road, which will undoubtedly experience impacts from the project.

Miles River Road is already well utilized by cars, bikes, horses, joggers, and walkers. Horses are frequently crossing the road as the riders access the Essex County Trail system. Although there is non-vehicular use of the road, the roadway layout does not include sidewalks and the curves of the road present a serious public safety issue that would only be exacerbated by the addition of large-scale residential development at the intersection of Miles River Road and Bridge Road. Miles River Road was not designed to support this type of extensive use, and this proposed development will have a significant detrimental impact on the residents and current users of Miles River Road.

Lastly, the increased car trips associated with a large-scale residential development at the Gordon-Conwell site will have an impact the intersection of Bridge Road and Miles River Road. In particular, there will likely be a back-up on Miles River Road due to increased wait times to enter the flow of traffic on Bridge Road. As more cars are forced to queue at the Bridge Street intersection, the extent of the backup may surprise some drivers given the curves along Miles River Road that limit forward visibility at some locations.

B. A Residential Development at the Gordon Conwell Site Could Damage Hamilton's Groundwater Resources

While the existing Bridge Street groundwater well is not currently in operation, Hamilton should not take actions that could further jeopardize this important resource. Given the recent experience with drought conditions in Hamilton, the Ipswich River Basin, and throughout the Commonwealth, communities are beginning to appreciate and safeguard their water supply resources. The Town should be mindful of Hamilton's public water supply needs as it assesses the proposal to place a large-scale residential development within a groundwater wellhead catchment area.

The Gordon-Conwell site is located across the street from the Bridge Street groundwater wellhead. Most of the seminary property, and the entire potential development site, is located within the catchment area for the groundwater wellhead. This area is designated as Zone II under the Massachusetts Department of Environmental Protection ("MassDEP") regulations, 310 CMR 22.02. Pursuant to the regulations, the Zone II is the "area of an aquifer which contributes water to a well under the most severe pumping and recharge conditions that can be realistically anticipated (180 days of pumping at the approved withdrawal rate, with no recharge from precipitation)." Just as the groundwater in the Zone II area will be drawn to the wellhead under pumping conditions, contaminants released into groundwater will migrate toward the wellhead and may eventually enter the public water supply system. Therefore, the activities that are permitted within a Zone II are highly regulated by MassDEP and the local community in order to preserve and protect this natural resource. This important environmental concern is similar to the finding in Reynolds v. Zoning Board of Appeals of Stow, 88 Mass. App. Ct. 339 (2015) rev. den. 473 Mass. 1106 (Dec. 22, 2015), where the Appeals Court held that maintaining clean groundwater servicing local private water wells is a reasonable local concern that outweighs the need for affordable housing. Hamilton should undertake a comprehensive review of the wellhead before approving any development on this land. It is possible that drilling a new deep well would provide Hamilton access to additional groundwater resources.

Hamilton added a Groundwater Protection Overlay District ("GPOD") to its Zoning Bylaw to address these important areas. The purpose of the GPOD is to:

- a. To promote the health, safety and general welfare of the Town by ensuring an adequate quality and quantity of drinking water for the residents, institutions, and business of Hamilton.
- b. To preserve and protect existing and potential sources of drinking water supplies and recharge areas;
- c. To conserve the natural resources of the Town; and
- d. To prevent temporary and permanent contamination of the environment.

To honor these goals, the GPOD imposes a minimum lot area requirement of 80,000 square feet for a building lot. The intent of this minimum lot area requirement that requires nearly 2 acres per building lot is to limit development and prevent density of structures. This is particularly important because Hamilton does not have extensive public sewers in the town. Therefore, lots

that are developed within GPOD, including lots within the Zone II, are going to contribute potential contaminants to the wellhead area through the septic systems.

Similarly, the GPOD Bylaw prohibits certain earth removal activity “consisting of the removal of soil, loam, sand, gravel or any other earth material... to within four (4) feet of the historical high ground water table as determined from monitoring wells and historical water table fluctuation data compiled by the United States Geological Survey. The Bylaw provision, 6.b, provides an except for excavations for building foundations, roads, or utility works, but the bylaw also assumes that any building foundation, road, or utility works are going to be supporting building lots that are just under two acres. The Town should assess the extent to which the layout for a development at Gordon-Conwell achieves the 80,000 square feet minimum lot area requirements for the GPOD.

In addition, Section 6.c.3 of the GPOD Bylaw states that “Any use that will render impervious more than 15% or 2,500 square feet of any lot, whichever is greater. A system for groundwater recharge must be provided which does not degrade groundwater quality.” In addition to this local requirement, any development at the Gordon-Conwell site will be subject to the Massachusetts Stormwater Standards. In particular, Stormwater Standard 6 [310 CMR 10.05(6)(k)(6)] mandates that locations within a Zone II that provide recharge for a public water supply must utilize certain stormwater management best management practices. Section 6.c.3 recommends that stormwater basins and wells “be preceded by oil, grease, and sediment traps to facilitate removal of contamination.” This is a good recommendation for the Gordon-Conwell site, because in addition to being in a Zone II to the Bridge Street Well, the site is proximate to significant wetland resources. Particularly for the road and infrastructure elements of any residential development at Gordon-Conwell, if the runoff from the roads and parking areas for the complex are not treated but rather are allowed to discharge to the wetlands, the regular contaminants that accumulate in roadways and parking areas will degrade the water quality in these important wetlands habitats. Lastly, Section 6.c.3 mandates that “[a]ny and all recharge areas shall be permanently maintained in full working order by the owner.” The Town should require any developer of the Gordon-Conwell site to retain maintenance obligations even after the project is built-out. At a minimum, Hamilton should not allow this construction project in a sensitive area without mandating that the developer accept the responsibility to ensure that its stormwater best management practices will indeed preserve and protect the wellhead catchment area and surrounding wetlands.

Even though the Bridge Street Well is not operating currently, Hamilton must insist on compliance with these regulatory standards for development within the GPOD and Zone II. As the Town assesses this project it should not be just with an eye towards meeting short term goals or interim planning objectives. The Town must approach this task with a very long view of the natural resources in Hamilton. As water scarcity increases, it may be the case that Hamilton will need to draw on the Bridge Street Well again to complement other public drinking water resources in the Town.

Hamilton should insist on detailed technical data to provide sufficient information to make an informed judgment about the viability of a large-scale residential development on this parcel. The Town should consider engaging a hydrogeologist to determine if the project area might function as an alternative location for the groundwater well. While the Bridge Street Well is not currently performing, it is possible that the aquifer that fed the Bridge Street Well could be accessed from another location in the vicinity – including potentially a location within the proposed development area. The Town should engage a hydrogeologist to assess the possibility of tapping into the aquifer from an alternate location before giving its support to a development project that will install a septic system to address additional residents within the recharge area for the aquifer. At a minimum, the Town should engage a consultant to assess the transport travel time from the potential development site (and from any specific location proposed as a septic leaching field for the extensive development).

C. The Steep Slope of the Gordon-Conwell Site Presents Significant Challenges

In addition to wellhead protection, the Gordon-Conwell site is challenging due to its topography. The steep slope of the lot presents significant engineering issues. The Town must assess the impact from any development on this pitched terrain on neighboring properties and the adjacent natural resources.

The steep slopes on the Gordon-Conwell property will also present challenges for stormwater management during construction. There is a strong likelihood that any erosion and sedimentation controls will be tested given the grade of the property and the frequency of rain events. Given the important water resources, including the Miles River and associated wetlands, that could be impacted by a breach of the erosion and sedimentation controls, the developer should be held to a high standard for developing and implementing an erosion and sedimentation control plan at this location.

In addition to compliance with Stormwater Management Standard 6 regarding recharge, it is going to be challenging to infiltrate all of the stormwater at this location. Infiltrating all stormwater run-off from this development, particularly given the steep slopes and the sensitive wetland areas around the based of the slopes, will be a considerable engineering challenge.

D. Conclusion

There are considerable obstacles to pursuing a large-scale residential development project at the Gordon-Conwell site. On behalf of the Horgens, I urge the Town to refrain from approving a development at this location. The Town should demand additional information from the developer, including, but not limited to:

- (a) technical plans for the feasibility of the Gordon-Conwell site;



- (b) a hydrological study showing the transport time from the proposed septic area for the Gordon-Conwell site to the Bridge Street wellhead;
- (c) a study to assess whether there is an alternate location at the Gordon-Conwell site that could provide access to the aquifer at Bridge Street; and
- (d) plans for stormwater management and road way infrastructure for any development at the Gordon-Conwell site.

Sincerely,

A handwritten signature in blue ink that reads 'Peter F. Durning'.

Peter F. Durning

cc: Bill Olson, Selectman
Allison M. Jenkins, Selectwoman
Scott F. Maddern, Selectman
Jeffery M. Hubbard, Selectman
Joseph J. Domelowicz, Jr., Town Manager
James Hankin, Conservation Commission Coordinator
Dorr S. Fox, Hamilton Community Preservation Committee Coordinator
Jay C. Horgen and Katherine Battle Horgen

TECHNICAL MEMORANDUM

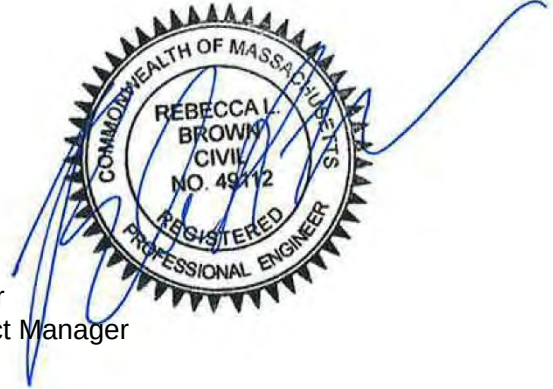
REF: NEX-2021355.00

DATE: June 27, 2022

TO: Ms. Kristin Carlson
Harborlight Community Partners
283 Elliot Street
Beverly, Massachusetts 01915

FROM: Ms. Rebecca Brown, P.E., Senior Project Manager
Mr. Robert E. Bollinger, P.E., PTOE, Senior Project Manager
Mr. Benjamin Lippman, EIT, Assistant Designer

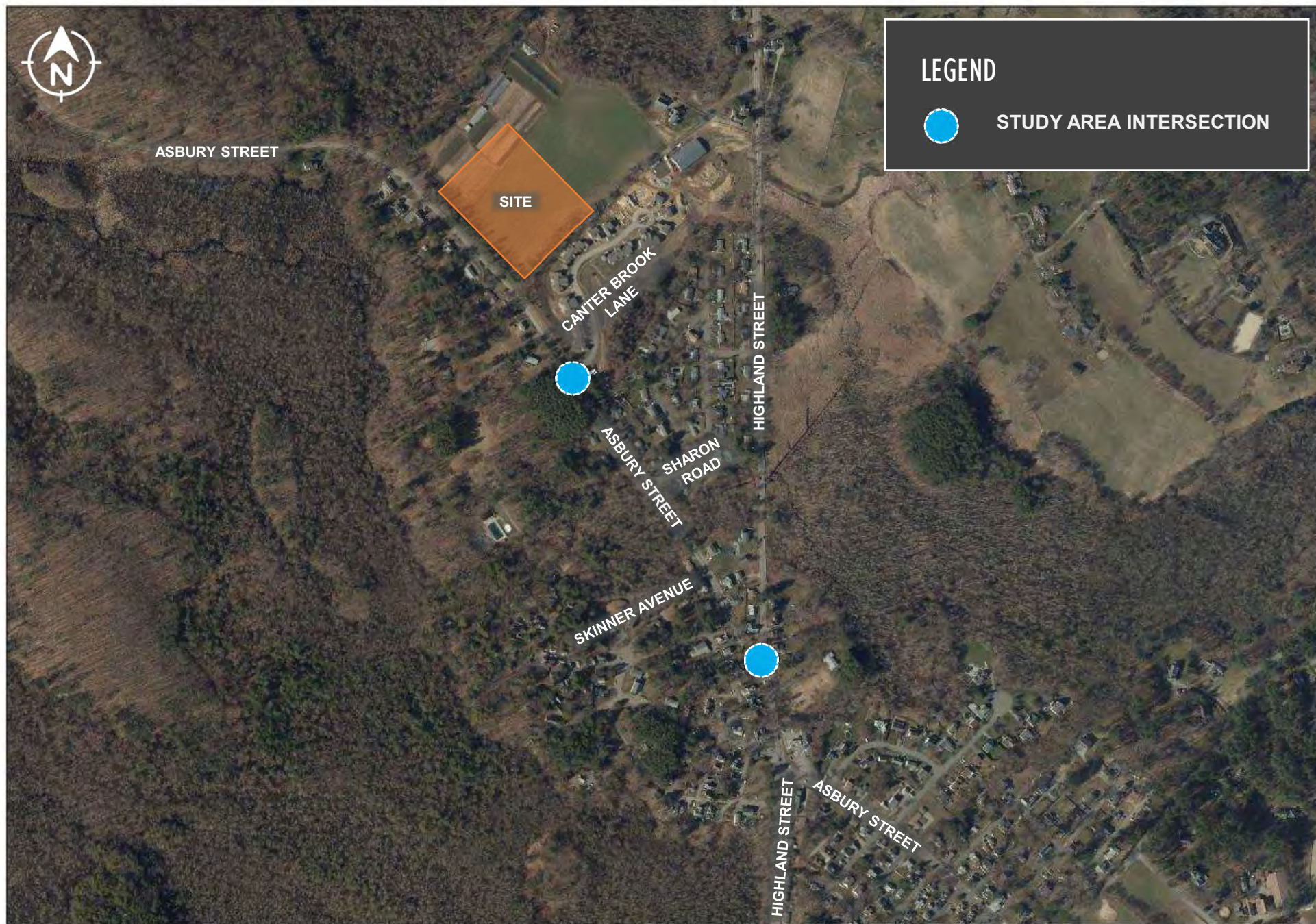
RE: Traffic Impact and Access Study
Proposed Residential Development
421 Asbury Street – Hamilton, Massachusetts



INTRODUCTION

Greenman-Pedersen, Inc. (GPI) has prepared this *Traffic Impact and Access Study* (TIAS) for a proposed residential development to be located at 421 Asbury Street in Hamilton, Massachusetts that will be permitted pursuant to M.G.L. Ch. 40B. The site is currently comprised of farmland. The project consists of constructing a 45-unit family housing building, with on-site parking for 68 vehicles. Access and egress to and from the site are proposed via one new full-access driveway on the north/east side of Asbury Street, approximately 1,000-ft west of Canter Brook Lane.

The site location in relation to the surrounding roadways is shown on the map on Figure 1. This TIAS evaluates the traffic impacts and access/egress requirements for the proposed development.



EXISTING CONDITIONS

Study Area

Evaluation of the traffic impacts associated with the proposed project requires an evaluation of existing and projected traffic volumes on the adjacent street, the volume of traffic expected to be generated by the project, and the impact that this traffic will have on the adjacent street. In preparing the TIAS for the proposed site, the following unsignalized intersections have been analyzed and evaluated:

- Highland Street at Asbury Street
- Asbury Street at Canter Brook Lane
- Asbury Street at Proposed Site Driveway

Asbury Street

Asbury Street is under the jurisdiction of the Town of Hamilton and is classified as an urban collector within the Boston Urbanized Area. Asbury Street runs in a general northwest-to-southeast direction in the study area and has a posted speed limit of 35 miles per hour (mph). Asbury Street provides one general purpose travel lane in each direction, separated by a double-yellow center-line. Asbury Street does not provide sidewalks or bicycle accommodations within the study area. Land uses along Asbury Street within the study consist of primarily of residential uses, farmland (the subject site), and areas of wooded space.

Asbury Street at Canter Brook Lane

Canter Brook Lane (a private road) intersects Asbury Street from the east to form this three-legged “T” type intersection, with the minor approach (Canter Brook Lane) operating under STOP-sign control. Although not formally delineated by pavement markings, Canter Brook Lane provides a single approach lane for both left- and right-turning vehicles. The northbound Asbury Street approach consists of a single 11-foot wide all-purpose travel lane, and provides a 0.5(±)-foot wide marked shoulder. The southbound Asbury Street approach consists of a single 10-foot wide all-purpose travel lane, and provides a 1-foot wide marked shoulder. Directional travel along Asbury Street is separated by a double-yellow centerline. Sidewalk is present on the northeast corner of the intersection, and extends back down Canter Brook Lane. The sidewalk terminates abruptly just north of the Canter Brook Lane approach to Asbury Street.

Asbury Street at Highland Street

Asbury Street intersects Highland Street from the west to form this three-legged intersection, with the minor approach (Asbury Street) operating under STOP-sign control. It should be noted that Asbury Street intersects Highland Street at an oblique angle, and forms a “Y” type intersection with Highland Street. The Asbury Street eastbound approach consists of a single 10-foot wide all purpose travel lane; however the approach widens to 21 feet at the intersection with Highland Street. Field observations revealed that the flared approach allows for queuing of up to two left-turning vehicles on Asbury Street, while allowing right-turning vehicles to bypass and turn onto to Highland Street. Directional travel on Asbury Street is separated by an unusually sized raised splitter island, with a “Keep Right” sign facing motorists on Highland Street and facing eastbound motorists on Asbury Street. Just west of the raised island, directional travel on Asbury Street is separated by a double-yellow center-line. The STOP-sign on Asbury Street is supplemented by a short section of white STOP line. However, the STOP Line does not fully cross the entire Asbury Street approach.

The Highland Street northbound approach consists of a single 12-foot wide all-purpose travel lane, and provides a 2-foot wide paved shoulder. The Highland Street southbound approach consists of a 9.5-foot

wide all-purpose travel lane, and provides a 1-foot wide marked shoulder. Directional travel along Highland Street is separated by a double-yellow center-line. No sidewalks or crosswalks are provided at this location.

Public Transportation

The Massachusetts Bay Transportation Authority (MBTA) Commuter Rail Newburyport/Rockport Line provides service between Newburyport Branch and North Station in Boston. A station for the Newburyport/Rockport Line is located in Hamilton (Hamilton/Wenham), approximately 2 miles south of the proposed site. Service is provided at the Hamilton/Wenham Station on weekdays from 5:06 AM to 11:52 PM, and weekends from 5:27 AM to 10:42 PM. The full schedule for the Newburyport/Rockport Line is provided in the Appendix.

Traffic Volumes

Base traffic conditions within the study area were developed by conducting manual-turning movement counts (TMCs), vehicle classification counts, and automatic traffic recorder (ATR) counts on Wednesday, January 19 to Thursday, January 20, 2022. The TMCs and vehicle classification counts were performed during the weekday AM peak period (7:00 to 9:00 AM) and weekday PM peak period (4:00 to 6:00 PM). The ATRs were used to obtain weekday daily traffic volumes and speed data along Asbury Street adjacent to the site. All traffic-count data are provided in the Appendix.

COVID-19 Adjustment

Due to the COVID-19 pandemic, current traffic volumes may vary from typical conditions. To verify whether any adjustment to traffic volumes was necessary to account for any drop in traffic volumes due to COVID-19, GPI reviewed traffic volume counts collected at a nearby MassDOT continuous count station¹ both pre- and post-pandemic. Traffic volume counts collected at these permanent count stations on the same dates as the January 2022 TMCs were compared to counts collected at the same count stations pre-pandemic on approximately the same days in January 2020. Based on the traffic comparison, the January 2022 weekday daily traffic volumes are 9.8 percent lower than pre-pandemic volumes, weekday morning peak hour volumes are 8.5 percent lower than pre-pandemic volumes, and weekday evening peak hour volumes are 3.9 percent lower than pre-pandemic volumes. Accordingly, the January 2022 traffic counts were upwardly adjusted to reflect pre-pandemic traffic-volume conditions. The MassDOT historical traffic-volume data is provided in the Appendix.

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 January traffic-volume data needed to be adjusted to account for this fluctuation, historical traffic-volume data were reviewed from the MassDOT records.² This information revealed that January traffic volumes are approximately 5.0 percent below average-month conditions. Accordingly, the January traffic volumes were seasonally adjusted upwards by 5.0 percent to represent average-month conditions. The MassDOT seasonal adjustment data is provided in the Appendix.

Table 1 summarizes the existing daily and peak-hour traffic volumes on Asbury Street adjacent to the site. The 2022 Existing traffic-flow networks for the weekday AM and weekday PM peak hours are shown graphically on Figure 2.

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 the site:				
Weekday Daily	2,850			
Weekday AM Peak Hour		332	11.6	69% EB
Weekday PM Peak Hour		290	10.2	58% WB

^a In vehicles per day. January traffic counts adjusted upward by 14.3 percent to reflect pre-COVID-19 pandemic conditions, and adjusted upwards by an additional 5.0 percent to reflect average-month conditions.

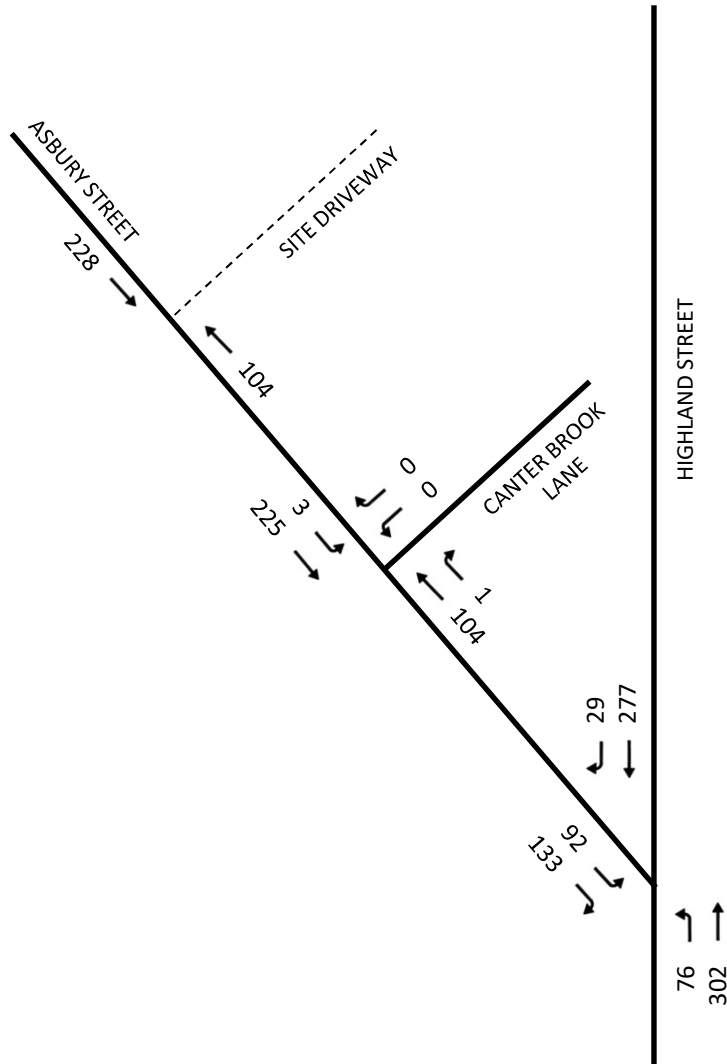
^b In vehicles per hour. Volumes obtained from Figure 2.

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

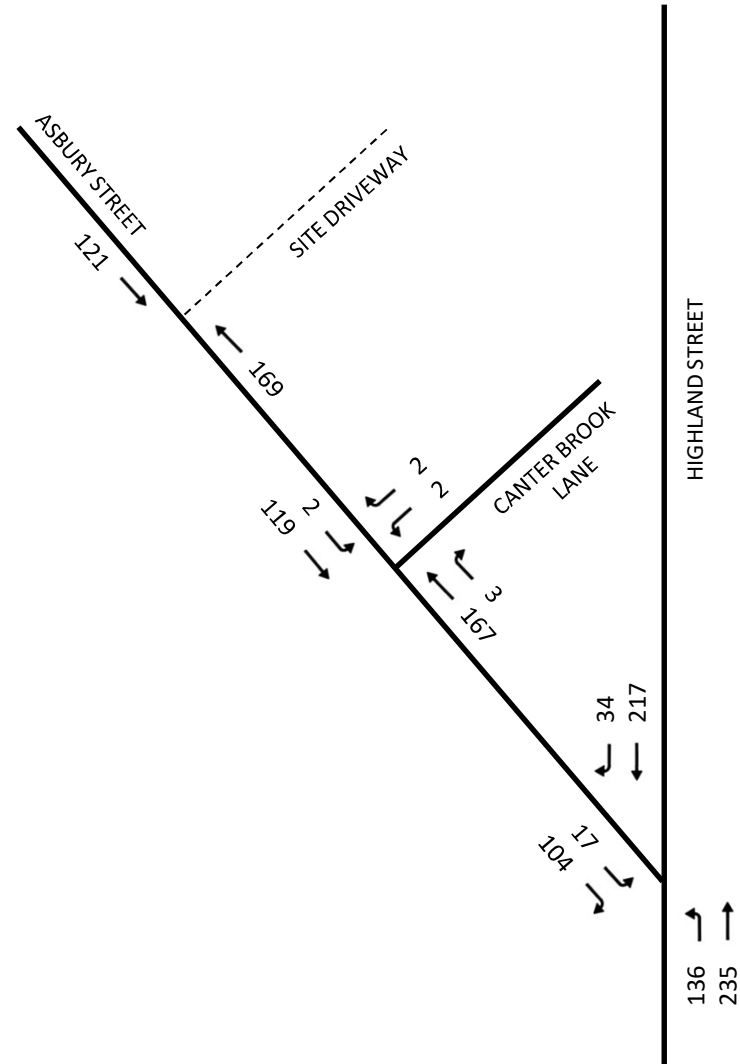
^d EB = eastbound, WB = westbound. Percentages from volumes on Figure 2.

¹ MassDOT Transportation Data Management System; Station 35 – Yankee Division Highway, north of Brimbal Ave. (Beverly).

² MassDOT Weekday Seasonal and Axle Correction Factors, Average of 2014-2019 data.



Weekday AM



Weekday PM

FIGURE 2

2022 EXISTING
PEAK HOUR TRAFFIC VOLUMES

Collisions

Collision data for the study area intersections were obtained from MassDOT for the latest five years available. Table 2 summarizes the data. In addition to the collision summary, crash occurrence also should be compared to the volume of traffic through a particular intersection to determine any significance. Accordingly, the crash rates were calculated for each study area segment and intersection 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, both 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 2.26 c/mvmt and the average crash rate on urban collectors is 3.33 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.

Based on the most recent MassDOT collision data (2017-2021), the unsignalized intersection of Highland Street at Asbury Street experienced an average of approximately 1.2 collisions per year, with a crash rate of 0.45 c/mev, which is less than the statewide and District 4 average (0.57 c/mev) for unsignalized intersections. All crashes resulted in property damage only with no injuries. Two of the crashes were single vehicle collisions, two were sideswipes, one was a rear-end and one was a cross movement/angle collision. The low occurrence of collisions at this location do not indicate a safety issue; however, during a field visit, GPI noted that there is an awkwardly-shaped and small median island that is intended to separate directional travel on Asbury Street. However, the STOP line on Asbury Street only extends half-way across the approach lane, which gives drivers the impression that they can turn left from Highland Street northbound onto Asbury Street to the left of the island. At a minimum, the Town should extend the STOP line striping across the entire width of the Asbury Street approach. In addition, to further enhance the safety of the intersection, the Town should consider elimination of the median island and realigning Asbury Street to meet Highland Street at a more 90-degree angle.

Based on the most recent MassDOT collision data (2020-2021), the unsignalized intersection of Asbury Street at Canter Brook Lane experienced an average of approximately 0.50 collisions per year, with a crash rate of 0.47 c/mev, which is less than the statewide and District 4 average (0.57 c/mev) for unsignalized intersections. Based on historical imagery, the development on Canter Brook Lane did not begin to become occupied until late 2019/early 2020; prior to occupation, there was minimal vehicular interaction at this location, other than construction vehicles and trips associated with sales. The one crash resulted in a non-fatal injury, was a single vehicle collision, and was due to driver illness. Due to the low crash rate, however, there is no safety concern that requires further investigation.

Based on the most recent MassDOT collision data (2017-2021), the segment on Asbury Street between Canter Brook Lane and Highland Street experienced an average of approximately 0.20 collisions per year, with a crash rate of 0.64 c/mvmt which is less than the average (3.33 c/mvmt) for urban collectors. The one crash resulted in property damage only with no injuries and was a rear to side collision. Due to the low crash rate, however, there is no safety concern that requires further investigation.

TABLE 2
Collision Summary

Location	Number of Collisions			Severity ^a				Collision Type ^b					Percent During	
	Total	Average per Year	Crash Rate ^c	PD	PI	F	NR	SS	RE	CM	SV	U	Commuter Peak ^d	Wet/Icy Conditions ^e
MassDOT Collision Data (2017-2021)														
Asbury Street at Canter Brook Lane	1	0.50 ^f	0.46	--	1	--	--	--	--	--	1	--	0%	0%
Asbury Street, between Canter Brook Lane and Highland Street	1	0.20	0.62	1	--	--	--	--	--	1	--	--	0%	0%
Highland Street at Asbury Street	6	1.20	0.43	6	--	--	--	2	1	1	2	--	17%	50%

Source: MassDOT (2017-2021).

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

^b SS = sideswipe; RE = rear end; CM = cross movement/angle; SV = single vehicle; U = unknown.

^c Measured in crashes per million entering vehicles for intersections and in crashes per million vehicle miles traveled for roadway segments.

^d 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.

^e Represents the percentage of only “known” collisions occurring during inclement weather conditions.

^f Crash data at this location is from 2020 to 2021. Based on historical imagery, the development on Canter Brook Lane did not begin to become occupied until late 2019/early 2020; prior to occupation, there was minimal vehicular interaction at this location, other than construction vehicles and trips associated with sales.

Vehicle Speeds

Vehicle speed measurements were conducted along Asbury Street as part of the ATR counts in January 2022. 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 driveway to assure that adequate sight distances exist at the driveway to provide safe operation. The results of the speed measurements are summarized in Table 3.

TABLE 3
Observed Travel Speeds

Location/Direction	Posted Speed Limit ^a	Average Speed ^b	85 th Percentile Speed ^c
Asbury Street, adjacent to the site:			
<i>Eastbound</i>	35	38	42
<i>Westbound</i>	35	39	43

^a In miles per hour (mph).

^b Average speed of all observed vehicles.

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

As shown in Table 3, the average speeds along Asbury Street were found to be 38 to 39 mph, with 85th percentile speeds between 42 mph and 43 mph. The observed speeds were found to be higher than the posted speed limit of 35 mph adjacent to the site.

Sight Distance

To identify potential safety concerns associated with site access and egress, sight distances have been evaluated at the proposed site driveway 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)³. AASHTO is the national standard by which vehicle sight distance is calculated, measured, and reported. The Massachusetts Department of Transportation (MassDOT) 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.

³ A Policy on Geometric Design of Highways and Streets; American Association of State Highway and Transportation Officials (AASHTO); 2018.

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 were measured and compared to minimum requirements as established by AASHTO. Based on the enforced and observed speeds, the SSD and ISD requirements at the intersections were calculated. The required minimum sight distances for the driveways are compared to the available distances, as shown in Table 4. The sight distance calculations are provided in the Appendix.

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
Asbury Street at Site Driveway:					
West of intersection (EB)	489	325	489	325	390
East of intersection (WB)	500	340	270[340+] ^d	340	335

^a Values based on AASHTO requirements for minimum SSD based on 85th percentile speed of 42 mph (EB) and 43 mph (WB) on Asbury Street.

^b Values based on AASHTO requirements for SSD.

^c Values based on AASHTO requirements for ISD for posted speed of 35 mph on Asbury Street.

^d XXX[XXX] = Existing sight line with current tree obstruction. [Future sight line with removal of tree obstruction].

As indicated in Table 4 above, available sight distances at the proposed site driveway on Asbury Street exceed the minimum SSD requirements for safe operation. Field observations indicate that ISD requirements to/from the west are satisfied. However, ISD requirements to/from the east are limited by the presence of several large trees on the site side of Asbury Road between the existing stone wall and the edge of pavement. In order to achieve the requirements for safe operation in all directions, the

aforementioned trees should be removed. Additionally, in order to maintain the sight distances at the driveways after development of the site, 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.

FUTURE CONDITIONS

To estimate the impact of site-generated traffic within the study area, existing traffic volumes were projected to the year 2029, representing a seven-year design horizon in accordance with state requirements. The proposed development is expected to be completed and fully operational well within this time frame. Traffic volumes on the roadway network at that time will include existing traffic and new traffic due to normal traffic growth. Consideration of these factors resulted in the development of 2029 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 2029 No-Build forecast volumes, two components of traffic growth were considered. First, an annual growth percentage was determined. Based on historic traffic-volume data provided by MassDOT, traffic volumes in the area have been increasing, on average, at a rate of approximately 0.8 percent per year.⁴ Therefore, to provide a conservative (worse than expected) analysis scenario, a 1.0 percent compounded annual growth was assumed for the project area, consistent with other traffic studies in the area. The MassDOT adjustment 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 seven years were considered. Based on discussions with the Planning Department, the following development was identified.

- *The Village at Canter Brook Farm, Canter Brook Lane, Hamilton, MA* – The project entails the construction of a 23-unit age-restricted (55+) residential development. Field observations indicated that all units are constructed. Further, marketing materials for the development indicate that all units have been sold at this point. However, at the time of publication of this report, the number of occupied units could not be verified. In order to account for the full build out of this development, site-generated traffic volumes from traffic analysis⁵ for the project were included in the 2029 No-Build traffic volumes, as full occupancy was assumed to occur by that time.

Planned Roadway Improvements

Based on correspondence with the Hamilton Department of Public Works, no roadway improvement projects are planned in the vicinity of the project area. Additionally, no infrastructure projects were identified on the MassDOT Projects website.

⁴ MassDOT Transportation Data Management System (2015-2019).

⁵ Traffic Impact Assessment, Proposed Canter Brook Estates Residential Community; Vanasse & Associates, Inc.; 2011, and Supplemental Letter, Canter Brook Estates Residential Community; Vanasse & Associates, Inc.; 2014.

No-Build Conditions

The 2029 No-Build peak-hour traffic volumes were accordingly developed by applying a 1.0 percent compounded annual traffic growth rate (7.2 percent over seven years) to the 2022 Existing traffic volumes, and an appropriate accounting of previously noted development by others. The 2029 No-Build traffic volumes are shown graphically on Figure 3 for the peak hours.

Trip Generation

The site is currently comprised of farmland. The project consists of constructing a 45-unit family housing building, with on-site parking for 68 vehicles. Traffic to be generated by the proposed development was forecast using trip rates contained in the ITE *Trip Generation, 11th Edition*⁶ for Land Use Code (LUC) 221 (Multifamily Housing [Mid-Rise]). All trip-generation data are provided in the Appendix. Table 5 summarizes the results of the trip-generation estimates.

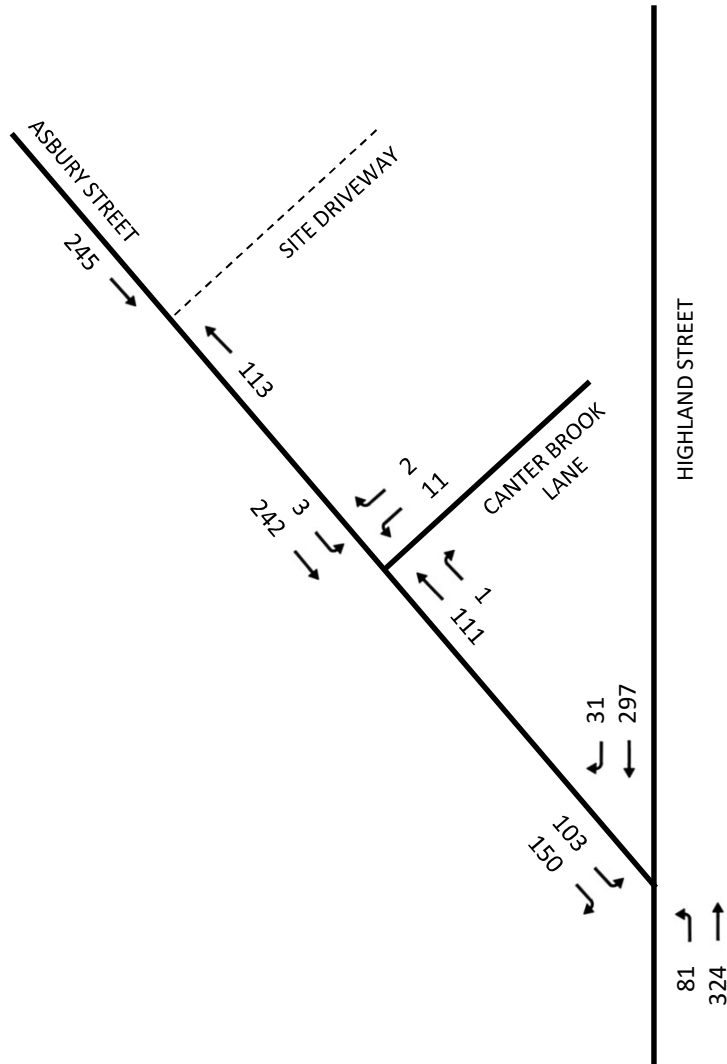
TABLE 5
Trip-Generation Summary

Peak Hour/Direction	Proposed Trips ^c
Weekday Daily:	168
Weekday AM Peak Hour:	
<i>Enter</i>	4
<i>Exit</i>	<u>13</u>
<i>Total</i>	17
Weekday PM Peak Hour:	
<i>Enter</i>	11
<i>Exit</i>	<u>7</u>
<i>Total</i>	18

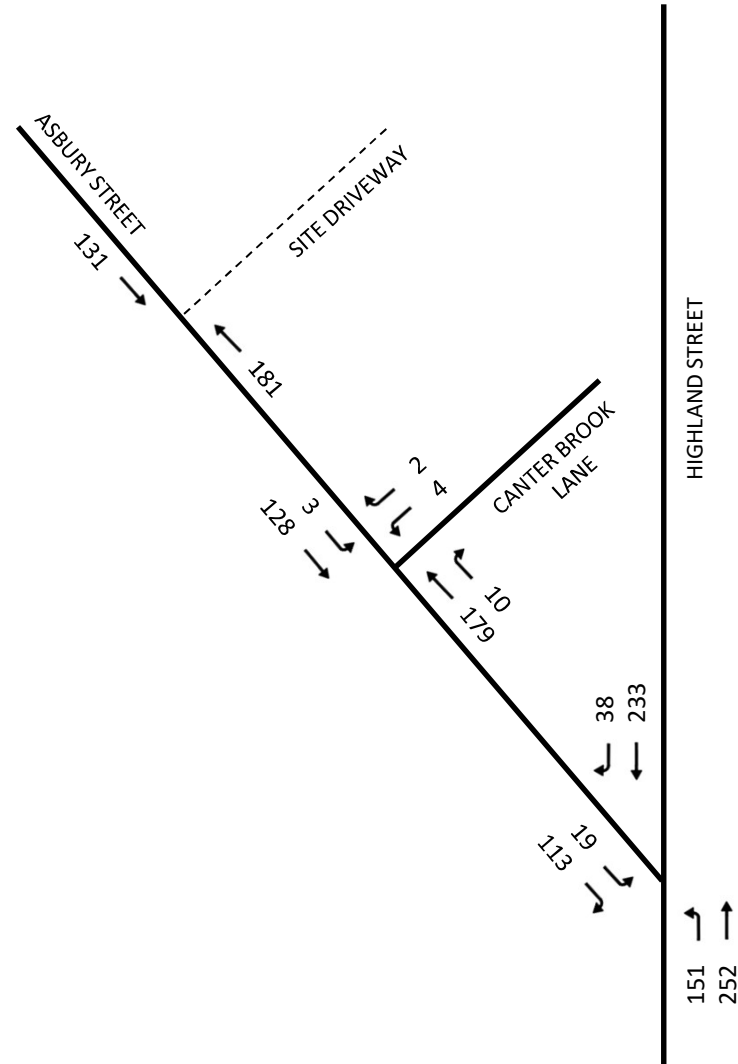
^a Based on ITE LUC 221 (Multifamily Housing [Mid-Rise]) for 45 dwelling units.

As shown in Table 5, the proposed development is expected to generate 17 vehicles trips (4 entering and 13 exiting) during the weekday AM peak hour and 18 vehicles trips (11 entering and 7 exiting) during the weekday PM peak hour.

⁶ *Trip Generation, 11th Edition*. Institute of Transportation Engineers; Washington, DC; 2021.



Weekday AM



Weekday PM

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. The distribution of proposed residential site traffic on the area roadways is based on existing travel patterns within the study area. Accordingly, approximately 20 percent of the site-generated traffic is expected to and from the west on Asbury Street, 35 percent to and from the north on Highland Street, and 45 percent to and from the south on Highland Street. Existing volume calculations 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 development were assigned to the roadway network. The site-generated traffic networks are shown on Figure 4 for the weekday AM and weekday PM peak hours. The site-generated traffic volumes were then combined with the 2029 No-Build traffic volumes to develop the 2029 Build peak-hour traffic-volume networks. The 2029 Build weekday AM and weekday PM peak hour traffic volumes are illustrated on Figure 5.

Traffic Increases

The proposed development will result in minor increases in traffic on the study area roadways. As shown on Figure 4, traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 3 to 8 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 8 minutes to every 20 minutes during the peak hours.

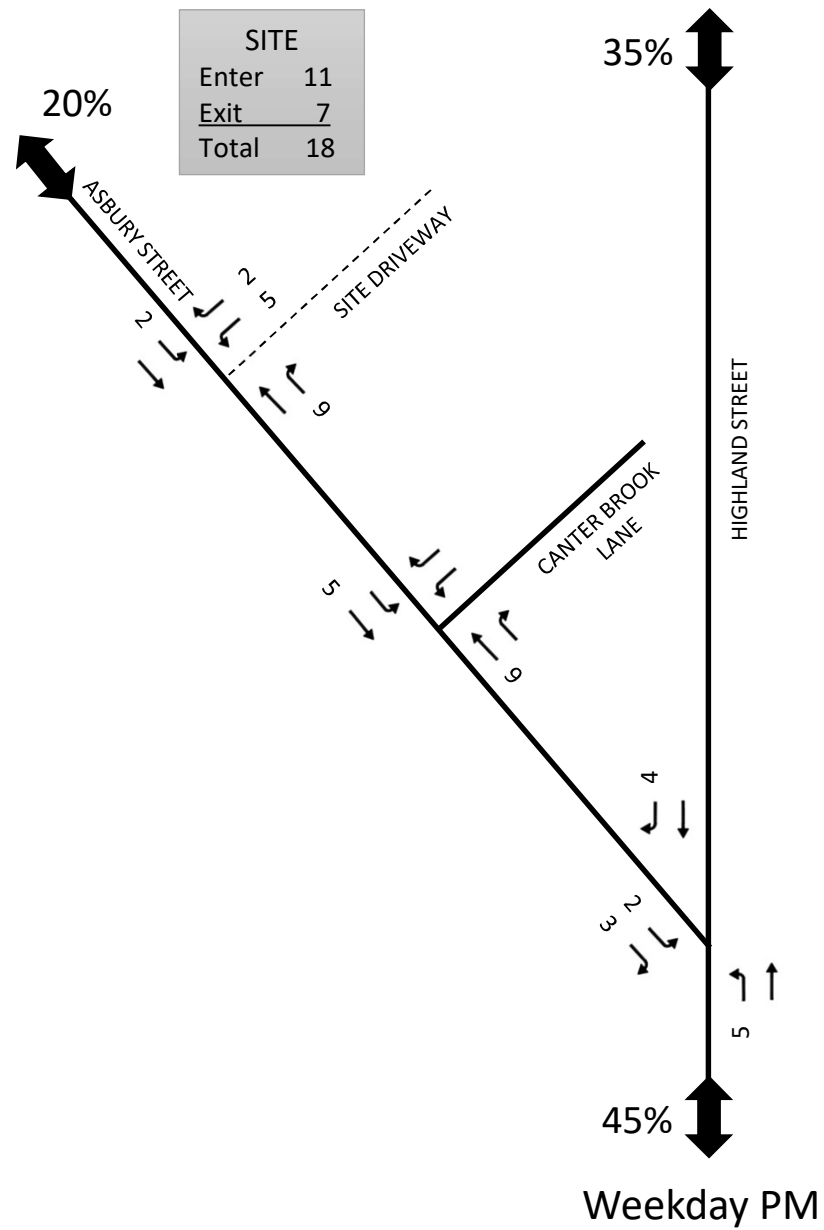
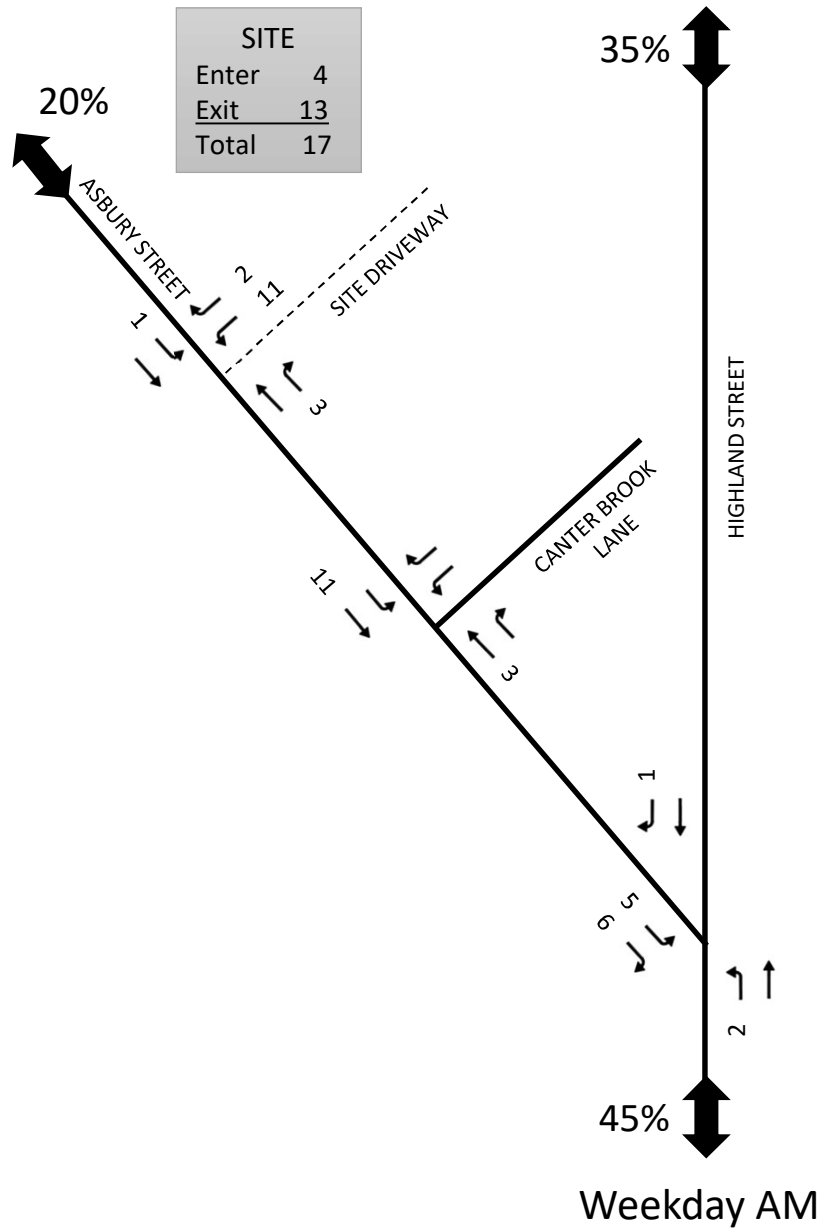


FIGURE 4
SITE-GENERATED
PEAK HOUR TRAFFIC VOLUMES

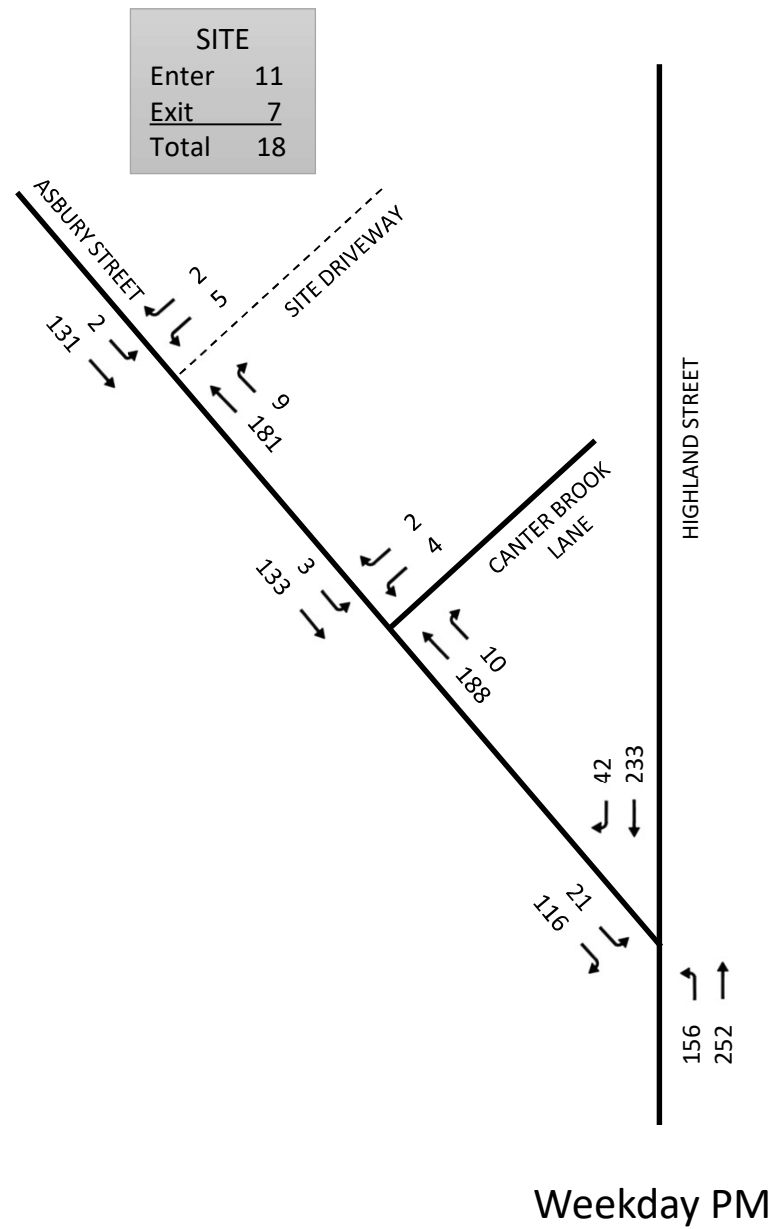
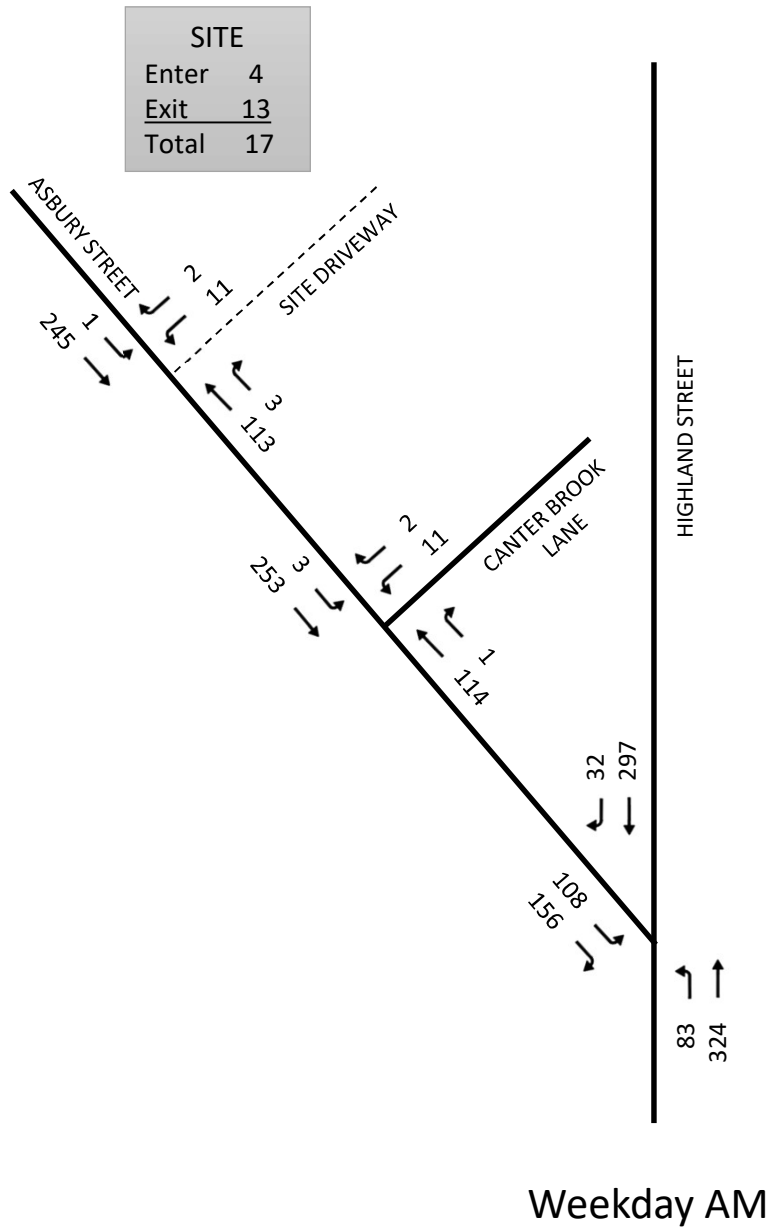


FIGURE 5

2029 BUILD
PEAK HOUR TRAFFIC VOLUMES

CAPACITY AND QUEUE ANALYSIS

Capacity and queue analyses were conducted at all study area locations under 2022 Existing, 2029 No-Build, and 2029 Build traffic-volume conditions. The impact of site-generated traffic can be measured by comparing 2029 No-Build conditions to 2029 Build conditions.

Methodology

The capacity analysis methodology is based on the concepts and procedures in the *Highway Capacity Manual* (HCM)⁷ and is described in the Appendix.

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 results of the level-of-service (LOS) and queue analyses are shown in Table 6 and are discussed below. Capacity and queue analyses were conducted at the study area intersections utilizing *Synchro* software.⁸ The capacity and queue analysis worksheets for all conditions are provided in the Appendix.

Highland Street at Asbury Street

The Asbury Street eastbound left-turn movement currently operates at level-of-service (LOS) F during the weekday AM peak hour and is anticipated to continue operate at LOS F under 2029 No-Build and Build conditions. However, the proposed residential development is anticipated to result in an increase of only five vehicle trips on this movement, which represents one additional vehicle every twelve minutes. In addition, the additional site-generated vehicle trips are not expected to increase queues on this movement by more than one vehicle. This movement will operate at LOS C during the weekday PM peak hour with queues of only a single vehicle. All other movements through this intersection are expected to operate at acceptable levels of service (LOS C or better) during all analysis time periods.

Asbury Street at Canter Brook Lane

All movements at the Canter Brook Lane intersection with Asbury Street are anticipated to operate at LOS B or better under all analysis time periods with queues not exceeding one vehicle.

Asbury Street at Site Driveway

All movements at the site driveway intersection with Asbury Street are anticipated to operate at LOS B or better under all analysis time periods with queues not exceeding one vehicle.

⁷ *Highway Capacity Manual* 6th Edition, Transportation Research Board; Washington, D.C.; 2016.

⁸ *Synchro plus SimTraffic 11*; Trafficware LLC.; Sugar Land, TX; 2019.

TABLE 6
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2022 Existing				2029 No-Build				2029 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Highland Street at Asbury Street												
<i>Weekday AM:</i>												
Asbury Street EB left-turn	0.79	72.8	F	--/133	1.01	129.7	F	--/195	1.08	151.4	F	--/218
Asbury Street EB right-turn	0.34	14.0	B	--/38	0.40	15.3	C	--/48	0.42	15.6	C	--/53
Highland Street NB left-turn	0.11	8.7	A	--/<25	0.12	8.9	A	--/<25	0.12	8.9	A	--/<25
<i>Weekday PM:</i>												
Asbury Street EB left-turn	0.06	17.3	C	--/<25	0.07	19.1	C	--/<25	0.08	19.7	C	--/<25
Asbury Street EB right-turn	0.14	10.3	B	--/<25	0.16	10.6	B	--/<25	0.16	10.6	B	--/<25
Highland Street NB left-turn	0.11	8.1	A	--/<25	0.13	8.2	A	--/<25	0.13	8.3	A	--/<25
Asbury Street at Canter Brook Lane												
<i>Weekday AM:</i>												
Canter Brook Lane WB approach	0.01	10.5	B	--/<25	0.04	12.0	B	--/<25	0.04	12.2	B	--/<25
Asbury Street SB left-turn	0.00	7.5	A	--/<25	0.00	7.6	A	--/<25	0.00	7.6	A	--/<25
<i>Weekday PM:</i>												
Canter Brook Lane WB approach	0.01	9.8	A	--/<25	0.01	10.2	B	--/<25	0.01	10.3	B	--/<25
Asbury Street SB left-turn	0.00	7.6	A	--/<25	0.00	7.6	A	--/<25	0.00	7.7	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 6 (continued)
Intersection Capacity Analysis Summary

Intersection/Peak Hour/Lane Group	2022 Existing				2029 No-Build				2029 Build			
	V/C ^a	Del. ^b	LOS ^c	Queue ^d	V/C	Del.	LOS	Queue	V/C	Del.	LOS	Queue
Asbury Street at Site Driveway												
<i>Weekday AM:</i>												
Site Driveway WB approach	--	--	--	--/--	--	--	--	--/--	0.02	10.7	B	--/<25
Asbury Street SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	7.5	A	--/<25
<i>Weekday PM:</i>												
Site Driveway WB approach	--	--	--	--/--	--	--	--	--/--	0.01	10.3	B	--/<25
Asbury Street SB left-turn	--	--	--	--/--	--	--	--	--/--	0.00	7.6	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).

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 residential development. Conclusions of this effort are presented below.

- The proposed development is to be located at 421 Asbury Street in Hamilton, Massachusetts. The site is currently comprised of farmland. The project consists of constructing a 45-unit family housing building, with on-site parking for 68 vehicles. Access and egress to and from the site are proposed via one new full-access driveway on the north/east side of Asbury Street, approximately 1,000-ft west of Canter Brook Lane.
- Available sight distances at the proposed site driveway on Asbury Street exceed the minimum SSD requirements for safe operation. Field observations indicate that ISD requirements to/from the west are satisfied. However, ISD requirements to/from the east are limited by the presence of several large trees on the site side of Asbury Road between the existing stone wall and the edge of pavement. In order to achieve the requirements for safe operation in all directions, the aforementioned trees should be removed. Additionally, in order to maintain the sight distances at the driveways after development of the site, 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 of the study area intersections experienced crash rates below the state and District-wide averages for unsignalized intersections, indicating no significant safety issue exists. However, to improve the safety and operations of the Asbury Street / Highland Street intersection, the Town should extend the STOP line on Asbury Street across the entire approach lane to reduce driver confusion over whether to travel to the right or left of the median island. In addition, the Town should consider removing the existing awkwardly shaped median island and slightly realigning the Asbury Street approach to meet Highland Street at a more 90-degree angle.
- The proposed development is expected to generate 17 vehicles trips (4 entering and 13 exiting) during the weekday AM peak hour and 18 vehicles trips (11 entering and 7 exiting) during the weekday PM peak hour. Traffic-volume increases beyond the study area during the peak hours are expected to be in the range of 1 to 8 vehicles trips. These increases represent, on average, one additional vehicle trip approximately every 8 minutes to every 60 minutes during the peak hours.
- The Asbury Street eastbound left-turn movement currently operates at level-of-service (LOS) F during the weekday AM peak hour and is anticipated to continue operate at LOS F under 2029 No-Build and Build conditions. However, the proposed residential development is anticipated to result in an increase of only five vehicle trips on this movement, which represents one additional vehicle every twelve minutes. In addition, the additional site-generated vehicle trips are not expected to increase queues on this movement by more than one vehicle. This movement will operate at LOS C during the weekday PM peak hour with queues of only a single vehicle. All other movements through this intersection are expected to operate at acceptable levels of service (LOS C or better) during all analysis time periods.
- All movements at the Canter Brook Lane and site driveway intersections with Asbury Street are anticipated to operate at LOS B or better under all analysis time periods with queues not exceeding one vehicle.

Based on the results of the study, the additional traffic generated by the proposed residential development can be safely and efficiently accommodated by the existing roadway network. No additional project-specific mitigation is warranted based on the incremental impacts of the proposed development.

- APPENDIX

- *Public Transportation Information*
 - *Traffic Count Data*
- *Traffic-Volume Adjustment Data*
- *MassDOT Crash Rate Worksheets*
 - *Sight Distance Calculations*
 - *Other Development*
- *Trip Generation Calculations*
 - *Trip Distribution Data*
- *Capacity Analysis Methodology*
- *Capacity and Queue Analysis Worksheets*
 - *Auxiliary Lane Warrants Worksheets*

PUBLIC TRANSPORTATION INFORMATION

B: Due to construction activities for the Gloucester Drawbridge Replacement project, bus shuttles will replace train service between Rockport, Gloucester, West Gloucester (and Manchester on designated outbound trips) on the Rockport Line.
Bikes are not allowed on board buses.

Keep in Mind:

Holiday Service

Masks are federally required on board and in station.
Visit [MBTA.com/covid19](https://www.mbta.com/covid19) for the latest updates.

Schedules may change in the event of severe weather

During weather events, the symbols below will communicate service level and impact on passengers. Service level for the following day will be announced mid afternoon on the prior day.

	REGULAR SERVICE Trains will operate on a normal schedule.
	STORM SERVICE Trains will operate on a weekend schedule.
	NO SERVICE No passenger service on Commuter Rail.

Weekend & Storm Service ⚠

Outbound from Boston			SATURDAY TRAIN #																	
ZONE	STATION	SUNDAY TRAIN #	AM									PM								
			1151	1101	1153	1103	1155	1105	1157	1107	1159	1109	1161	1111	1163	1113	1165	1115	1167	1117
			2151	2101	2153	2103	2155	2105	2157	2107	2159	2109	2161	2111	2163	2113	2165	2115	2167	2117
	Stikes Allowed																			
1A	North Station	⚡	5:30	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	8:30	10:00	11:00
1A	Chelsea	⚡	5:41	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	10:11	11:11
2	Lynn	⚡	5:50	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	8:50	10:20	11:20
3	Swampscott	⚡	5:53	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	8:53	10:23	11:23
3	Salem	⚡	6:00	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	9:00	10:30	11:30
4	Beverly	⚡	6:04	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	9:04	10:34	11:34
5	North Beverly	⚡	6:08	-	7:08	-	10:08	-	12:08	-	2:08	-	4:08	-	6:08	-	8:08	-	10:38	-
5	Hamilton/Wenham	⚡	6:12	-	8:12	-	10:12	-	12:12	-	2:12	-	4:12	-	6:12	-	8:12	-	10:42	-
6	Ipswich	⚡	6:18	-	8:18	-	10:18	-	12:18	-	2:18	-	4:18	-	6:18	-	8:18	-	10:48	-
7	Rowley	⚡	6:24	-	8:24	-	10:24	-	12:24	-	2:24	-	4:24	-	6:24	-	8:24	-	10:54	-
8	Newburyport	⚡	6:35	-	8:35	-	10:35	-	12:35	-	2:35	-	4:35	-	6:35	-	8:35	-	10:55	-
4	Montserratt	⚡	-	7:08	-	9:08	-	11:08	-	1:08	-	3:08	-	5:08	-	7:08	-	9:08	-	11:38
5	Beverly Farms	⚡	-	7:14	-	9:14	-	11:14	-	1:14	-	3:14	-	5:14	-	7:14	-	9:14	-	11:44
6	Manchester	⚡	-	B 7:20	-	B 9:20	-	B 11:20	-	B 1:20	-	B 3:20	-	B 5:20	-	B 7:20	-	B 9:20	-	B 11:50
7	West Gloucester	⚡	-	B 7:40	-	B 9:40	-	B 11:40	-	B 1:40	-	B 3:40	-	B 5:40	-	B 7:40	-	B 9:40	-	B 12:10
7	Gloucester	⚡	-	B 7:48	-	B 9:48	-	B 11:48	-	B 1:48	-	B 3:48	-	B 5:48	-	B 7:48	-	B 9:48	-	B 12:18
8	Rockport	⚡	-	B 7:48	-	B 9:48	-	B 11:48	-	B 1:48	-	B 3:48	-	B 5:48	-	B 7:48	-	B 9:48	-	B 12:18

 **Connect to a different train for continued service outbound.**

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

TRAFFIC IMPACT AND ACCESS STUDY

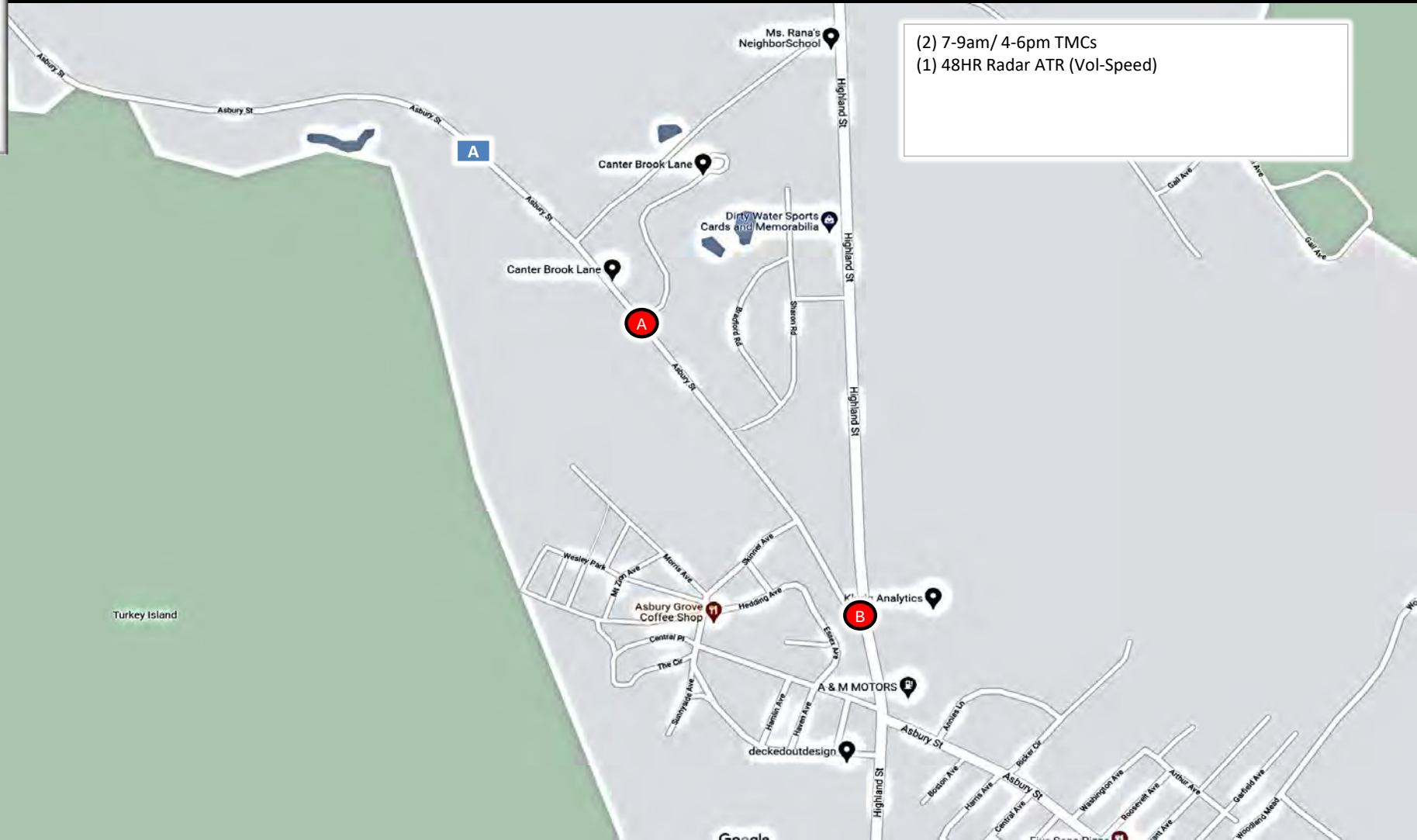
Proposed Residential Development – Hamilton, Massachusetts

TRAFFIC COUNT DATA



Location Map: 228368 Hamilton, MA

Precision Data Industries, LLC 157 Washington Street, Suite 2, Hudson, MA 01749 ph: 508-875-0100 email: datarequests@pdillc.com



Client:
GPI

Engineer:
R. Brown

Site Code:
NEX-2021355.00

Date:
Wed 1/19 thru Thurs 1/20/2022

PDI Job #
228368

City, State:
Hamilton, MA

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date:
Wednesday, January 19, 2022

Volume																	
WB					EB					Combined							
Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min			
12:00 AM	2		12:00 PM	22	12:00 AM	0		12:00 PM	14	12:00 AM	2		12:00 PM	36			
12:15 AM	0		12:15 PM	23	12:15 AM	2		12:15 PM	18	12:15 AM	2		12:15 PM	41			
12:30 AM	0		12:30 PM	18	12:30 AM	2		12:30 PM	16	12:30 AM	2		12:30 PM	34			
12:45 AM	0	2	12:45 PM	21	84	12:45 AM	1	5	12:45 PM	23	71	12:45 AM	1	7	12:45 PM	44	155
1:00 AM	0		1:00 PM	32		1:00 AM	0		1:00 PM	8		1:00 AM	0		1:00 PM	40	
1:15 AM	0		1:15 PM	24		1:15 AM	1		1:15 PM	15		1:15 AM	1		1:15 PM	39	
1:30 AM	0		1:30 PM	14		1:30 AM	0		1:30 PM	18		1:30 AM	0		1:30 PM	32	
1:45 AM	1	1	1:45 PM	25	95	1:45 AM	0	1	1:45 PM	22	63	1:45 AM	1	2	1:45 PM	47	158
2:00 AM	0		2:00 PM	25		2:00 AM	3		2:00 PM	26		2:00 AM	3		2:00 PM	51	
2:15 AM	0		2:15 PM	15		2:15 AM	0		2:15 PM	20		2:15 AM	0		2:15 PM	35	
2:30 AM	0		2:30 PM	24		2:30 AM	0		2:30 PM	26		2:30 AM	0		2:30 PM	50	
2:45 AM	0	0	2:45 PM	24	88	2:45 AM	0	3	2:45 PM	18	90	2:45 AM	0	3	2:45 PM	42	178
3:00 AM	0		3:00 PM	38		3:00 AM	0		3:00 PM	32		3:00 AM	0		3:00 PM	70	
3:15 AM	1		3:15 PM	42		3:15 AM	0		3:15 PM	28		3:15 AM	1		3:15 PM	70	
3:30 AM	0		3:30 PM	62		3:30 AM	0		3:30 PM	21		3:30 AM	0		3:30 PM	83	
3:45 AM	0	1	3:45 PM	33	175	3:45 AM	0	0	3:45 PM	30	111	3:45 AM	0	1	3:45 PM	63	286
4:00 AM	1		4:00 PM	39		4:00 AM	0		4:00 PM	36		4:00 AM	1		4:00 PM	75	
4:15 AM	0		4:15 PM	40		4:15 AM	0		4:15 PM	31		4:15 AM	0		4:15 PM	71	
4:30 AM	3		4:30 PM	39		4:30 AM	0		4:30 PM	17		4:30 AM	3		4:30 PM	56	
4:45 AM	0	4	4:45 PM	31	149	4:45 AM	0	0	4:45 PM	29	113	4:45 AM	0	4	4:45 PM	60	262
5:00 AM	0		5:00 PM	31		5:00 AM	0		5:00 PM	19		5:00 AM	0		5:00 PM	50	
5:15 AM	0		5:15 PM	36		5:15 AM	3		5:15 PM	19		5:15 AM	3		5:15 PM	55	
5:30 AM	5		5:30 PM	22		5:30 AM	2		5:30 PM	15		5:30 AM	7		5:30 PM	37	
5:45 AM	2	7	5:45 PM	24	113	5:45 AM	4	9	5:45 PM	19	72	5:45 AM	6	16	5:45 PM	43	185
6:00 AM	3		6:00 PM	24		6:00 AM	10		6:00 PM	16		6:00 AM	13		6:00 PM	40	
6:15 AM	8		6:15 PM	14		6:15 AM	10		6:15 PM	10		6:15 AM	18		6:15 PM	24	
6:30 AM	4		6:30 PM	9		6:30 AM	16		6:30 PM	16		6:30 AM	20		6:30 PM	25	
6:45 AM	19	34	6:45 PM	7	54	6:45 AM	16	52	6:45 PM	12	54	6:45 AM	35	86	6:45 PM	19	108
7:00 AM	16		7:00 PM	9		7:00 AM	16		7:00 PM	9		7:00 AM	32		7:00 PM	18	
7:15 AM	20		7:15 PM	9		7:15 AM	38		7:15 PM	9		7:15 AM	58		7:15 PM	18	
7:30 AM	20		7:30 PM	4		7:30 AM	57		7:30 PM	9		7:30 AM	77		7:30 PM	13	
7:45 AM	27	83	7:45 PM	3	25	7:45 AM	78	189	7:45 PM	2	29	7:45 AM	105	272	7:45 PM	5	54
8:00 AM	24		8:00 PM	6		8:00 AM	28		8:00 PM	7		8:00 AM	52		8:00 PM	13	
8:15 AM	21		8:15 PM	8		8:15 AM	22		8:15 PM	3		8:15 AM	43		8:15 PM	11	
8:30 AM	31		8:30 PM	2		8:30 AM	26		8:30 PM	7		8:30 AM	57		8:30 PM	9	
8:45 AM	14	90	8:45 PM	0	16	8:45 AM	19	95	8:45 PM	9	26	8:45 AM	33	185	8:45 PM	9	42
9:00 AM	18		9:00 PM	7		9:00 AM	16		9:00 PM	4		9:00 AM	34		9:00 PM	11	
9:15 AM	12		9:15 PM	18		9:15 AM	20		9:15 PM	11		9:15 AM	32		9:15 PM	29	
9:30 AM	19		9:30 PM	3		9:30 AM	20		9:30 PM	4		9:30 AM	39		9:30 PM	7	
9:45 AM	10	59	9:45 PM	1	29	9:45 AM	14	70	9:45 PM	4	23	9:45 AM	24	129	9:45 PM	5	52
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10:15 AM	17		10:15 PM	0		10:15 AM	18		10:15 PM	2		10:15 AM	35		10:15 PM	2	
10:30 AM	11		10:30 PM	0		10:30 AM	15		10:30 PM	2		10:30 AM	26		10:30 PM	2	
10:45 AM	14	56	10:45 PM	4	5	10:45 AM	9	58	10:45 PM	0	5	10:45 AM	23	114	10:45 PM	4	10
11:00 AM	23		11:00 PM	3		11:00 AM	15		11:00 PM	1		11:00 AM	38		11:00 PM	4	
11:15 AM	21		11:15 PM	0		11:15 AM	18		11:15 PM	1		11:15 AM	39		11:15 PM	1	
11:30 AM	10		11:30 PM	1		11:30 AM	16		11:30 PM	1		11:30 AM	26		11:30 PM	2	
11:45 AM	17	71	11:45 PM	0	4	11:45 AM	13	62	11:45 PM	0	3	11:45 AM	30	133	11:45 PM	0	7
Total	408		837			Total	544		660			Total	952		1497		
Percent	32.77%		67.23%			Percent	45.18%		54.82%			Percent	38.87%		61.13%		
Day Total			1245			Day Total			1204			Day Total			2449		
Peak Hour	7:45 AM		3:15 PM			Peak Hour	7:15 AM		3:30 PM			Peak Hour	7:15 AM		3:30 PM		
Volume	103		176			Volume	201		118			Volume	292		292		
P.H.F.	0.831		0.710			P.H.F.	0.644		0.819			P.H.F.	0.695		0.880		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date:
Thursday, January 20, 2022

Volume																	
WB					EB					Combined							
Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min	Start Time:	15 min	60 min	15 min	60 min			
12:00 AM	1		12:00 PM	14	12:00 AM	1		12:00 PM	16	12:00 AM	2		12:00 PM	30			
12:15 AM	2		12:15 PM	17	12:15 AM	2		12:15 PM	15	12:15 AM	4		12:15 PM	32			
12:30 AM	0		12:30 PM	15	12:30 AM	1		12:30 PM	19	12:30 AM	1		12:30 PM	34			
12:45 AM	0	3	12:45 PM	23	69	12:45 AM	0	4	12:45 PM	13	63	12:45 AM	0	7	12:45 PM	36	132
1:00 AM	0		1:00 PM	17		1:00 AM	0		1:00 PM	16		1:00 AM	0		1:00 PM	33	
1:15 AM	1		1:15 PM	19		1:15 AM	1		1:15 PM	13		1:15 AM	2		1:15 PM	32	
1:30 AM	0		1:30 PM	20		1:30 AM	0		1:30 PM	22		1:30 AM	0		1:30 PM	42	
1:45 AM	0	1	1:45 PM	25	81	1:45 AM	0	1	1:45 PM	13	64	1:45 AM	0	2	1:45 PM	38	145
2:00 AM	0		2:00 PM	24		2:00 AM	0		2:00 PM	16		2:00 AM	0		2:00 PM	40	
2:15 AM	0		2:15 PM	20		2:15 AM	0		2:15 PM	24		2:15 AM	0		2:15 PM	44	
2:30 AM	0		2:30 PM	25		2:30 AM	0		2:30 PM	28		2:30 AM	0		2:30 PM	53	
2:45 AM	0	0	2:45 PM	32	101	2:45 AM	0	0	2:45 PM	35	103	2:45 AM	0	0	2:45 PM	67	204
3:00 AM	1		3:00 PM	32		3:00 AM	0		3:00 PM	21		3:00 AM	1		3:00 PM	53	
3:15 AM	0		3:15 PM	34		3:15 AM	0		3:15 PM	18		3:15 AM	0		3:15 PM	52	
3:30 AM	0		3:30 PM	46		3:30 AM	0		3:30 PM	17		3:30 AM	0		3:30 PM	63	
3:45 AM	1	2	3:45 PM	33	145	3:45 AM	0	0	3:45 PM	42	98	3:45 AM	1	2	3:45 PM	75	243
4:00 AM	1		4:00 PM	39		4:00 AM	0		4:00 PM	25		4:00 AM	1		4:00 PM	64	
4:15 AM	0		4:15 PM	41		4:15 AM	0		4:15 PM	13		4:15 AM	0		4:15 PM	54	
4:30 AM	1		4:30 PM	40		4:30 AM	0		4:30 PM	39		4:30 AM	1		4:30 PM	79	
4:45 AM	2	4	4:45 PM	31	151	4:45 AM	0	0	4:45 PM	30	107	4:45 AM	2	4	4:45 PM	61	258
5:00 AM	0		5:00 PM	36		5:00 AM	0		5:00 PM	23		5:00 AM	0		5:00 PM	59	
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5:30 AM	2		5:30 PM	21		5:30 AM	3		5:30 PM	14		5:30 AM	5		5:30 PM	35	
5:45 AM	1	4	5:45 PM	20	117	5:45 AM	5	10	5:45 PM	20	72	5:45 AM	6	14	5:45 PM	40	189
6:00 AM	6		6:00 PM	15		6:00 AM	8		6:00 PM	15		6:00 AM	14		6:00 PM	30	
6:15 AM	9		6:15 PM	15		6:15 AM	4		6:15 PM	18		6:15 AM	13		6:15 PM	33	
6:30 AM	7		6:30 PM	9		6:30 AM	13		6:30 PM	8		6:30 AM	20		6:30 PM	17	
6:45 AM	10	32	6:45 PM	7	46	6:45 AM	13	38	6:45 PM	12	53	6:45 AM	23	70	6:45 PM	19	99
7:00 AM	11		7:00 PM	5		7:00 AM	17		7:00 PM	4		7:00 AM	28		7:00 PM	9	
7:15 AM	17		7:15 PM	11		7:15 AM	27		7:15 PM	8		7:15 AM	44		7:15 PM	19	
7:30 AM	16		7:30 PM	7		7:30 AM	39		7:30 PM	13		7:30 AM	55		7:30 PM	20	
7:45 AM	15	59	7:45 PM	3	26	7:45 AM	44	127	7:45 PM	5	30	7:45 AM	59	186	7:45 PM	8	56
8:00 AM	19		8:00 PM	3		8:00 AM	29		8:00 PM	11		8:00 AM	48		8:00 PM	14	
8:15 AM	17		8:15 PM	7		8:15 AM	21		8:15 PM	6		8:15 AM	38		8:15 PM	13	
8:30 AM	25		8:30 PM	5		8:30 AM	38		8:30 PM	3		8:30 AM	63		8:30 PM	8	
8:45 AM	32	93	8:45 PM	3	18	8:45 AM	68	156	8:45 PM	8	28	8:45 AM	100	249	8:45 PM	11	46
9:00 AM	27		9:00 PM	5		9:00 AM	27		9:00 PM	5		9:00 AM	54		9:00 PM	10	
9:15 AM	16		9:15 PM	7		9:15 AM	30		9:15 PM	1		9:15 AM	46		9:15 PM	8	
9:30 AM	19		9:30 PM	7		9:30 AM	17		9:30 PM	2		9:30 AM	36		9:30 PM	9	
9:45 AM	20	82	9:45 PM	8	27	9:45 AM	13	87	9:45 PM	2	10	9:45 AM	33	169	9:45 PM	10	37
10:00 AM	8		10:00 PM	2		10:00 AM	13		10:00 PM	1		10:00 AM	21		10:00 PM	3	
10:15 AM	15		10:15 PM	0		10:15 AM	9		10:15 PM	2		10:15 AM	24		10:15 PM	2	
10:30 AM	13		10:30 PM	1		10:30 AM	11		10:30 PM	5		10:30 AM	24		10:30 PM	6	
10:45 AM	9	45	10:45 PM	2	5	10:45 AM	14	47	10:45 PM	0	8	10:45 AM	23	92	10:45 PM	2	13
11:00 AM	12		11:00 PM	2		11:00 AM	14		11:00 PM	0		11:00 AM	26		11:00 PM	2	
11:15 AM	14		11:15 PM	2		11:15 AM	12		11:15 PM	0		11:15 AM	26		11:15 PM	2	
11:30 AM	14		11:30 PM	0		11:30 AM	13		11:30 PM	2		11:30 AM	27		11:30 PM	2	
11:45 AM	15	55	11:45 PM	1	5	11:45 AM	20	59	11:45 PM	0	2	11:45 AM	35	114	11:45 PM	1	7
Total	380		791			Total	529		638			Total	909		1429		
Percent	32.45%		67.55%			Percent	45.33%		54.67%			Percent	38.88%		61.12%		
Day Total			1171			Day Total			1167			Day Total			2338		
Peak Hour	8:15 AM		3:30 PM			Peak Hour	8:30 AM		3:45 PM			Peak Hour	8:30 AM		3:45 PM		
Volume	101		159			Volume	163		119			Volume	263		272		
P.H.F.	0.789		0.864			P.H.F.	0.599		0.708			P.H.F.	0.658		0.861		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Wednesday, January 19, 2022

Speed (60-minute)

WB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	2	53.2	49.0
1:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	41.0	41.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	40.0	40.0
4:00 AM	0	0	0	0	1	0	2	0	1	0	0	0	0	4	49.1	43.0
5:00 AM	0	0	0	0	0	2	3	1	1	0	0	0	0	7	47.6	43.0
6:00 AM	0	0	0	1	4	14	13	2	0	0	0	0	0	34	43.0	38.9
7:00 AM	0	0	0	0	6	32	36	9	0	0	0	0	0	83	43.7	40.0
8:00 AM	0	0	0	0	10	36	37	6	1	0	0	0	0	90	43.0	39.4
9:00 AM	0	0	1	0	3	25	26	4	0	0	0	0	0	59	43.0	39.1
10:00 AM	0	0	0	2	5	25	21	3	0	0	0	0	0	56	42.0	38.4
11:00 AM	0	0	1	0	6	30	27	7	0	0	0	0	0	71	44.0	39.1
12:00 PM	0	0	0	0	16	31	32	3	1	1	0	0	0	84	43.0	38.8
1:00 PM	1	3	2	2	12	38	29	5	2	1	0	0	0	95	43.0	37.5
2:00 PM	0	0	0	1	3	35	36	12	1	0	0	0	0	88	44.0	40.4
3:00 PM	1	1	1	1	12	74	73	11	1	0	0	0	0	175	43.0	39.1
4:00 PM	0	0	0	3	14	71	48	11	2	0	0	0	0	149	43.0	39.0
5:00 PM	0	0	0	0	13	56	39	5	0	0	0	0	0	113	43.0	38.8
6:00 PM	0	0	0	0	6	24	18	5	1	0	0	0	0	54	43.0	39.5
7:00 PM	0	0	0	0	3	5	9	6	1	1	0	0	0	25	46.0	41.9
8:00 PM	0	0	0	0	0	8	5	2	0	1	0	0	0	16	46.0	41.0
9:00 PM	0	0	0	0	2	6	13	8	0	0	0	0	0	29	46.0	41.9
10:00 PM	0	0	0	0	1	2	0	2	0	0	0	0	0	5	46.8	40.2
11:00 PM	0	0	0	0	0	2	2	0	0	0	0	0	0	4	41.0	39.0
Total	2	4	5	10	117	516	472	102	12	5	0	0	0	1245	43.0	39.3
Percent	0.16%	0.32%	0.40%	0.80%	9.40%	41.45%	37.91%	8.19%	0.96%	0.40%	0.00%	0.00%	0.00%			

AM Peak			9:00 AM	10:00 AM	8:00 AM	8:00 AM	8:00 AM	7:00 AM	4:00 AM	12:00 AM				8:00 AM
Volume	0	0	1	2	10	36	37	9	1	1	0	0	0	90

PM Peak	1:00 PM	1:00 PM	1:00 PM	4:00 PM	12:00 PM	3:00 PM	3:00 PM	2:00 PM	1:00 PM	12:00 PM				3:00 PM
Volume	1	3	2	3	16	74	73	12	2	1	0	0	0	175

15th Percentile:	35.0 MPH	Average Speed:	39.3 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	1050
85th Percentile:	43.0 MPH	Number in Pace:	988	Percent of Vehicles > 35 MPH:	84.3%
95th Percentile:	46.0 MPH	Percent in Pace:	79.4%		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Wednesday, January 19, 2022

Speed (60-minute)

EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	2	0	2	1	0	0	0	0	0	5	44.4	38.6
1:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	1	35.0	35.0
2:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	3	37.5	34.7
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
5:00 AM	0	0	1	0	1	2	3	2	0	0	0	0	0	9	44.8	38.3
6:00 AM	0	0	1	0	9	27	11	3	1	0	0	0	0	52	41.4	38.0
7:00 AM	1	0	1	3	12	83	78	10	1	0	0	0	0	189	42.0	38.9
8:00 AM	0	2	1	2	3	43	38	6	0	0	0	0	0	95	42.0	38.5
9:00 AM	0	0	1	0	4	32	27	4	1	1	0	0	0	70	43.0	39.5
10:00 AM	0	2	2	0	9	27	11	7	0	0	0	0	0	58	43.0	37.3
11:00 AM	0	0	1	5	8	23	19	6	0	0	0	0	0	62	43.0	38.0
12:00 PM	0	1	0	0	9	23	29	7	2	0	0	0	0	71	44.0	39.6
1:00 PM	0	0	0	1	6	39	14	3	0	0	0	0	0	63	41.7	37.9
2:00 PM	0	0	0	2	8	47	30	3	0	0	0	0	0	90	42.0	38.5
3:00 PM	0	1	1	3	6	48	43	7	2	0	0	0	0	111	43.0	39.0
4:00 PM	2	1	1	1	9	56	39	4	0	0	0	0	0	113	42.0	37.8
5:00 PM	0	0	0	4	16	42	10	0	0	0	0	0	0	72	39.0	36.0
6:00 PM	0	0	0	0	5	32	16	1	0	0	0	0	0	54	41.1	38.2
7:00 PM	0	0	0	0	8	13	5	3	0	0	0	0	0	29	40.8	37.4
8:00 PM	0	0	0	0	3	12	10	1	0	0	0	0	0	26	41.0	38.4
9:00 PM	0	0	0	1	3	12	7	0	0	0	0	0	0	23	42.0	37.9
10:00 PM	0	0	0	0	0	2	2	0	1	0	0	0	0	5	45.2	41.0
11:00 PM	0	0	0	0	2	0	1	0	0	0	0	0	0	3	38.4	34.0
Total	3	7	10	22	125	565	395	68	8	1	0	0	0	1204	42.0	38.3
Percent	0.25%	0.58%	0.83%	1.83%	10.38%	46.93%	32.81%	5.65%	0.66%	0.08%	0.00%	0.00%	0.00%			

AM Peak	7:00 AM	8:00 AM	10:00 AM	11:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	6:00 AM	9:00 AM				7:00 AM
Volume	1	2	2	5	12	83	78	10	1	1	0	0	0	189

PM Peak	4:00 PM	12:00 PM	3:00 PM	5:00 PM	5:00 PM	4:00 PM	3:00 PM	12:00 PM	12:00 PM					4:00 PM
Volume	2	1	1	4	16	56	43	7	2	0	0	0	0	113

15th Percentile:	35.0 MPH	Average Speed:	38.3 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	38.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 35 MPH:	975
85th Percentile:	42.0 MPH	Number in Pace:	971	Percent of Vehicles > 35 MPH:	81.0%
95th Percentile:	45.0 MPH	Percent in Pace:	80.6%		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Wednesday, January 19, 2022

Speed (60-minute)

Combined WB and EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	2	0	3	1	0	1	0	0	0	7	46.0	41.6
1:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	2	40.1	38.0
2:00 AM	0	0	0	0	2	1	0	0	0	0	0	0	0	3	37.5	34.7
3:00 AM	0	0	0	0	0	0	1	0	0	0	0	0	0	1	40.0	40.0
4:00 AM	0	0	0	0	1	0	2	0	1	0	0	0	0	4	49.1	43.0
5:00 AM	0	0	1	0	1	4	6	3	1	0	0	0	0	16	45.8	40.4
6:00 AM	0	0	1	1	13	41	24	5	1	0	0	0	0	86	42.3	38.3
7:00 AM	1	0	1	3	18	115	114	19	1	0	0	0	0	272	43.0	39.2
8:00 AM	0	2	1	2	13	79	75	12	1	0	0	0	0	185	43.0	38.9
9:00 AM	0	0	2	0	7	57	53	8	1	1	0	0	0	129	43.0	39.3
10:00 AM	0	2	2	2	14	52	32	10	0	0	0	0	0	114	43.0	37.9
11:00 AM	0	0	2	5	14	53	46	13	0	0	0	0	0	133	44.0	38.6
12:00 PM	0	1	0	0	25	54	61	10	3	1	0	0	0	155	43.0	39.2
1:00 PM	1	3	2	3	18	77	43	8	2	1	0	0	0	158	42.0	37.7
2:00 PM	0	0	0	3	11	82	66	15	1	0	0	0	0	178	43.5	39.5
3:00 PM	1	2	2	4	18	122	116	18	3	0	0	0	0	286	43.0	39.1
4:00 PM	2	1	1	4	23	127	87	15	2	0	0	0	0	262	43.0	38.5
5:00 PM	0	0	0	4	29	98	49	5	0	0	0	0	0	185	42.0	37.7
6:00 PM	0	0	0	0	11	56	34	6	1	0	0	0	0	108	42.0	38.9
7:00 PM	0	0	0	0	11	18	14	9	1	1	0	0	0	54	45.0	39.5
8:00 PM	0	0	0	0	3	20	15	3	0	1	0	0	0	42	42.0	39.4
9:00 PM	0	0	0	1	5	18	20	8	0	0	0	0	0	52	44.4	40.1
10:00 PM	0	0	0	0	1	4	2	2	1	0	0	0	0	10	47.3	40.6
11:00 PM	0	0	0	0	2	2	3	0	0	0	0	0	0	7	41.1	36.9
Total	5	11	15	32	242	1081	867	170	20	6	0	0	0	2449	43.0	38.8
Percent	0.20%	0.45%	0.61%	1.31%	9.88%	44.14%	35.40%	6.94%	0.82%	0.24%	0.00%	0.00%	0.00%			

AM Peak	7:00 AM	8:00 AM	9:00 AM	11:00 AM	7:00 AM	7:00 AM	7:00 AM	7:00 AM	4:00 AM	12:00 AM				7:00 AM
Volume	1	2	2	5	18	115	114	19	1	1	0	0	0	272
PM Peak	4:00 PM	1:00 PM	1:00 PM	3:00 PM	5:00 PM	4:00 PM	3:00 PM	3:00 PM	12:00 PM	12:00 PM				3:00 PM
Volume	2	3	2	4	29	127	116	18	3	1	0	0	0	286

15th Percentile:	35.0 MPH	Average Speed:	38.8 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	2025
85th Percentile:	43.0 MPH	Number in Pace:	1948	Percent of Vehicles > 35 MPH:	82.7%
95th Percentile:	46.0 MPH	Percent in Pace:	79.5%		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Thursday, January 20, 2022

Speed (60-minute)

WB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	1	1	0	1	0	0	0	0	3	48.9	44.0
1:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33.0	33.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	2	41.1	39.0
4:00 AM	0	0	0	0	0	1	2	1	0	0	0	0	0	4	45.8	42.0
5:00 AM	0	0	0	0	0	1	2	1	0	0	0	0	0	4	44.1	41.5
6:00 AM	0	0	0	1	4	14	12	1	0	0	0	0	0	32	42.4	38.3
7:00 AM	0	0	0	1	2	25	24	7	0	0	0	0	0	59	43.3	39.8
8:00 AM	1	0	0	0	9	39	41	3	0	0	0	0	0	93	43.0	38.6
9:00 AM	1	0	0	1	11	35	28	5	1	0	0	0	0	82	42.0	38.4
10:00 AM	0	0	2	2	6	25	9	1	0	0	0	0	0	45	41.0	36.3
11:00 AM	1	0	1	1	8	28	14	2	0	0	0	0	0	55	41.9	37.2
12:00 PM	0	1	0	2	6	32	21	7	0	0	0	0	0	69	44.0	38.4
1:00 PM	0	1	0	0	7	39	30	3	1	0	0	0	0	81	42.0	38.7
2:00 PM	0	0	0	1	16	43	27	9	5	0	0	0	0	101	44.0	39.2
3:00 PM	1	0	0	0	15	80	38	10	1	0	0	0	0	145	42.0	38.4
4:00 PM	0	0	0	1	10	71	59	9	1	0	0	0	0	151	43.0	39.3
5:00 PM	0	0	0	0	6	59	47	4	1	0	0	0	0	117	42.0	39.2
6:00 PM	0	0	0	0	5	22	12	7	0	0	0	0	0	46	43.5	39.2
7:00 PM	0	0	0	1	0	13	10	2	0	0	0	0	0	26	43.0	39.4
8:00 PM	0	0	0	0	2	8	6	1	1	0	0	0	0	18	44.0	40.2
9:00 PM	0	0	0	1	2	13	9	2	0	0	0	0	0	27	44.0	39.0
10:00 PM	0	0	0	0	0	0	4	1	0	0	0	0	0	5	45.2	43.8
11:00 PM	0	0	0	0	0	1	2	1	1	0	0	0	0	5	47.6	43.6
Total	4	2	3	12	110	551	399	77	13	0	0	0	0	1171	43.0	38.8
Percent	0.34%	0.17%	0.26%	1.02%	9.39%	47.05%	34.07%	6.58%	1.11%	0.00%	0.00%	0.00%	0.00%			

AM Peak	8:00 AM		10:00 AM	10:00 AM	9:00 AM	8:00 AM	8:00 AM	7:00 AM	12:00 AM					8:00 AM
Volume	1	0	2	2	11	39	41	7	1	0	0	0	0	93

PM Peak	3:00 PM	12:00 PM		12:00 PM	2:00 PM	3:00 PM	4:00 PM	3:00 PM	2:00 PM					4:00 PM
Volume	1	1	0	2	16	80	59	10	5	0	0	0	0	151

15th Percentile:	35.0 MPH	Average Speed:	38.8 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	35 to 44 MPH	Number of Vehicles > 35 MPH:	958
85th Percentile:	43.0 MPH	Number in Pace:	950	Percent of Vehicles > 35 MPH:	81.8%
95th Percentile:	46.0 MPH	Percent in Pace:	81.1%		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Thursday, January 20, 2022

Speed (60-minute)

EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	1	2	1	0	0	0	0	0	4	44.6	41.0
1:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	1	31.0	31.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
5:00 AM	0	0	0	2	2	4	2	0	0	0	0	0	0	10	41.0	34.9
6:00 AM	0	0	0	1	9	18	10	0	0	0	0	0	0	38	41.0	36.8
7:00 AM	0	0	1	0	15	64	44	2	1	0	0	0	0	127	42.0	38.3
8:00 AM	0	1	1	1	15	67	67	4	0	0	0	0	0	156	42.0	38.8
9:00 AM	0	0	1	1	9	54	16	5	1	0	0	0	0	87	42.0	37.8
10:00 AM	0	0	4	2	4	24	11	1	1	0	0	0	0	47	41.0	36.3
11:00 AM	0	0	0	3	8	27	19	2	0	0	0	0	0	59	42.0	38.1
12:00 PM	0	1	0	0	13	29	16	4	0	0	0	0	0	63	42.0	37.6
1:00 PM	1	0	0	0	4	33	23	2	0	1	0	0	0	64	42.0	38.6
2:00 PM	0	4	5	3	7	39	39	6	0	0	0	0	0	103	43.0	37.2
3:00 PM	0	1	0	1	16	35	39	5	1	0	0	0	0	98	42.5	38.6
4:00 PM	0	0	0	1	10	60	33	3	0	0	0	0	0	107	42.0	38.3
5:00 PM	0	0	0	2	23	30	15	2	0	0	0	0	0	72	41.0	36.8
6:00 PM	0	0	0	0	9	24	15	4	0	1	0	0	0	53	43.2	38.6
7:00 PM	0	0	0	0	8	9	9	3	1	0	0	0	0	30	43.0	38.5
8:00 PM	0	1	0	5	7	11	4	0	0	0	0	0	0	28	39.0	34.0
9:00 PM	0	0	0	0	1	7	2	0	0	0	0	0	0	10	39.7	37.5
10:00 PM	0	0	1	1	3	1	0	1	1	0	0	0	0	8	47.5	35.3
11:00 PM	0	0	0	0	0	2	0	0	0	0	0	0	0	2	38.9	38.5
Total	1	8	13	23	164	539	366	45	6	2	0	0	0	1167	42.0	37.9
Percent	0.09%	0.69%	1.11%	1.97%	14.05%	46.19%	31.36%	3.86%	0.51%	0.17%	0.00%	0.00%	0.00%			

AM Peak 8:00 AM 10:00 AM 11:00 AM 7:00 AM 8:00 AM 8:00 AM 9:00 AM 7:00 AM 8:00 AM
Volume 0 1 4 3 15 67 67 5 1 0 0 0 0 156

PM Peak 1:00 PM 2:00 PM 2:00 PM 8:00 PM 5:00 PM 4:00 PM 2:00 PM 2:00 PM 3:00 PM 1:00 PM 4:00 PM
Volume 1 4 5 5 23 60 39 6 1 1 0 0 0 107

15th Percentile:	34.0 MPH	Average Speed:	37.9 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	38.0 MPH	10 MPH Pace:	33 to 42 MPH	Number of Vehicles > 35 MPH:	882
85th Percentile:	42.0 MPH	Number in Pace:	930	Percent of Vehicles > 35 MPH:	75.6%
95th Percentile:	44.0 MPH	Percent in Pace:	79.7%		

Ashbury Street
west of Canter Brook Lane
City, State: Hamilton, MA
Client: GPI/ R. Brown
Site Code: NEX-2021355.00



PDI File #: 228368 ATR-A

Count Date
Thursday, January 20, 2022

Speed (60-minute)

Combined WB and EB																
Start Time:	1 to 14	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 44	45 to 49	50 to 54	55 to 59	60 to 64	65 to 69	70+	Total	85th %ile	Ave Speed
12:00 AM	0	0	0	0	0	2	3	1	1	0	0	0	0	7	45.6	42.3
1:00 AM	0	0	0	0	2	0	0	0	0	0	0	0	0	2	32.7	32.0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0	0.0
3:00 AM	0	0	0	0	0	1	1	0	0	0	0	0	0	2	41.1	39.0
4:00 AM	0	0	0	0	0	1	2	1	0	0	0	0	0	4	45.8	42.0
5:00 AM	0	0	0	2	2	5	4	1	0	0	0	0	0	14	42.1	36.8
6:00 AM	0	0	0	2	13	32	22	1	0	0	0	0	0	70	41.0	37.5
7:00 AM	0	0	1	1	17	89	68	9	1	0	0	0	0	186	42.0	38.8
8:00 AM	1	1	1	1	24	106	108	7	0	0	0	0	0	249	42.0	38.7
9:00 AM	1	0	1	2	20	89	44	10	2	0	0	0	0	169	42.0	38.1
10:00 AM	0	0	6	4	10	49	20	2	1	0	0	0	0	92	41.0	36.3
11:00 AM	1	0	1	4	16	55	33	4	0	0	0	0	0	114	42.0	37.7
12:00 PM	0	2	0	2	19	61	37	11	0	0	0	0	0	132	43.0	38.0
1:00 PM	1	1	0	0	11	72	53	5	1	1	0	0	0	145	42.0	38.7
2:00 PM	0	4	5	4	23	82	66	15	5	0	0	0	0	204	43.0	38.2
3:00 PM	1	1	0	1	31	115	77	15	2	0	0	0	0	243	42.0	38.5
4:00 PM	0	0	0	2	20	131	92	12	1	0	0	0	0	258	42.0	38.9
5:00 PM	0	0	0	2	29	89	62	6	1	0	0	0	0	189	42.0	38.3
6:00 PM	0	0	0	0	14	46	27	11	0	1	0	0	0	99	43.3	38.9
7:00 PM	0	0	0	1	8	22	19	5	1	0	0	0	0	56	43.0	38.9
8:00 PM	0	1	0	5	9	19	10	1	1	0	0	0	0	46	41.0	36.4
9:00 PM	0	0	0	1	3	20	11	2	0	0	0	0	0	37	43.6	38.6
10:00 PM	0	0	1	1	3	1	4	2	1	0	0	0	0	13	47.2	38.5
11:00 PM	0	0	0	0	0	3	2	1	1	0	0	0	0	7	46.4	42.1
Total	5	10	16	35	274	1090	765	122	19	2	0	0	0	2338	42.0	38.3
Percent	0.21%	0.43%	0.68%	1.50%	11.72%	46.62%	32.72%	5.22%	0.81%	0.09%	0.00%	0.00%	0.00%			

AM Peak	8:00 AM	8:00 AM	10:00 AM	10:00 AM	8:00 AM	8:00 AM	8:00 AM	9:00 AM	9:00 AM					8:00 AM
Volume	1	1	6	4	24	106	108	10	2	0	0	0	0	249
PM Peak	1:00 PM	2:00 PM	2:00 PM	8:00 PM	3:00 PM	4:00 PM	4:00 PM	2:00 PM	2:00 PM	1:00 PM				4:00 PM
Volume	1	4	5	5	31	131	92	15	5	1	0	0	0	258

15th Percentile:	35.0 MPH	Average Speed:	38.3 MPH	Posted Speed Limit:	35 MPH
50th Percentile:	39.0 MPH	10 MPH Pace:	34 to 43 MPH	Number of Vehicles > 35 MPH:	1840
85th Percentile:	42.0 MPH	Number in Pace:	1870	Percent of Vehicles > 35 MPH:	78.7%
95th Percentile:	45.0 MPH	Percent in Pace:	80.0%		

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Canter Brook Lane				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	1	1	0	2	1	15	0	16	13	0	0	13	31
7:15 AM	0	0	0	0	0	20	0	20	35	1	0	36	56
7:30 AM	0	0	0	0	0	20	0	20	53	0	0	53	73
7:45 AM	0	0	0	0	1	27	0	28	85	0	0	85	113
Total	1	1	0	2	2	82	0	84	186	1	0	187	273
8:00 AM	0	0	0	0	0	24	0	24	24	2	0	26	50
8:15 AM	0	1	0	1	0	21	0	21	19	0	0	19	41
8:30 AM	2	1	0	3	1	27	0	28	25	0	0	25	56
8:45 AM	0	2	0	2	1	14	0	15	20	0	0	20	37
Total	2	4	0	6	2	86	0	88	88	2	0	90	184
Grand Total	3	5	0	8	4	168	0	172	274	3	0	277	457
Approach %	37.5	62.5	0.0		2.3	97.7	0.0		98.9	1.1	0.0		
Total %	0.7	1.1	0.0	1.8	0.9	36.8	0.0	37.6	60.0	0.7	0.0	60.6	
Exiting Leg Total	7				279				171				457
Cars	2	5	0	7	4	161	0	165	268	2	0	270	442
% Cars	66.7	100.0	0.0	87.5	100.0	95.8	0.0	95.9	97.8	66.7	0.0	97.5	96.7
Exiting Leg Total	6				273				163				442
Heavy Vehicles	1	0	0	1	0	7	0	7	6	1	0	7	15
% Heavy Vehicles	33.3	0.0	0.0	12.5	0.0	4.2	0.0	4.1	2.2	33.3	0.0	2.5	3.3
Exiting Leg Total	1				6				8				15

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

7:15 AM	Canter Brook Lane				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		
7:15 AM	0	0	0	0	0	20	0	20	35	1	0	36	56	
7:30 AM	0	0	0	0	0	20	0	20	53	0	0	53	73	
7:45 AM	0	0	0	0	1	27	0	28	85	0	0	85	113	
8:00 AM	0	0	0	0	0	24	0	24	24	2	0	26	50	
Total Volume	0	0	0	0	1	91	0	92	197	3	0	200	292	
% Approach Total	0.0	0.0	0.0		1.1	98.9	0.0		98.5	1.5	0.0			
PHF	0.000	0.000	0.000	0.000	0.250	0.843	0.000	0.821	0.579	0.375	0.000	0.588	0.646	
Cars	0	0	0	0	1	89	0	90	194	2	0	196	286	
Cars %	0.0	0.0	0.0	0.0	100.0	97.8	0.0	97.8	98.5	66.7	0.0	98.0	97.9	
Heavy Vehicles	0	0	0	0	0	2	0	2	3	1	0	4	6	
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	2.2	0.0	2.2	1.5	33.3	0.0	2.0	2.1	
Cars Enter Leg	0	0	0	0	1	89	0	90	194	2	0	196	286	
Heavy Enter Leg	0	0	0	0	0	2	0	2	3	1	0	4	6	
Total Entering Leg	0	0	0	0	1	91	0	92	197	3	0	200	292	
Cars Exiting Leg					3								89	286
Heavy Exiting Leg					1				3				2	6
Total Exiting Leg					4								91	292

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Cars**

	Canter Brook Lane					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	1	1	0	2		1	13	0	14		13	0	0	13		29
7:15 AM	0	0	0	0		0	18	0	18		34	1	0	35		53
7:30 AM	0	0	0	0		0	20	0	20		53	0	0	53		73
7:45 AM	0	0	0	0		1	27	0	28		85	0	0	85		113
Total	1	1	0	2		2	78	0	80		185	1	0	186		268
8:00 AM	0	0	0	0		0	24	0	24		22	1	0	23		47
8:15 AM	0	1	0	1		0	20	0	20		18	0	0	18		39
8:30 AM	1	1	0	2		1	26	0	27		23	0	0	23		52
8:45 AM	0	2	0	2		1	13	0	14		20	0	0	20		36
Total	1	4	0	5		2	83	0	85		83	1	0	84		174
Grand Total	2	5	0	7		4	161	0	165		268	2	0	270		442
Approach %	28.6	71.4	0.0			2.4	97.6	0.0			99.3	0.7	0.0			
Total %	0.5	1.1	0.0	1.6		0.9	36.4	0.0	37.3		60.6	0.5	0.0	61.1		
Exiting Leg Total	6					273					163					442

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

7:15 AM	Canter Brook Lane				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	
7:15 AM	0	0	0	0	0	18	0	18	34	1	0	35	53
7:30 AM	0	0	0	0	0	20	0	20	53	0	0	53	73
7:45 AM	0	0	0	0	1	27	0	28	85	0	0	85	113
8:00 AM	0	0	0	0	0	24	0	24	22	1	0	23	47
Total Volume	0	0	0	0	1	89	0	90	194	2	0	196	286
% Approach Total	0.0	0.0	0.0		1.1	98.9	0.0		99.0	1.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.250	0.824	0.000	0.804	0.571	0.500	0.000	0.576	0.633
Entering Leg	0	0	0	0	1	89	0	90	194	2	0	196	286
Exiting Leg				3				194				89	286
Total				3				284				285	572

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Canter Brook Lane				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	2	0	2	0	0	0	0	2
7:15 AM	0	0	0	0	0	2	0	2	1	0	0	1	3
7:30 AM	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
Total	0	0	0	0	0	4	0	4	1	0	0	1	5
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
8:30 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	1	0	0	1	0	3	0	3	5	1	0	6	10
Grand Total	1	0	0	1	0	7	0	7	6	1	0	7	15
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		85.7	14.3	0.0		
Total %	6.7	0.0	0.0	6.7	0.0	46.7	0.0	46.7	40.0	6.7	0.0	46.7	
Exiting Leg Total				1				6				8	15
Buses	0	0	0	0	0	2	0	2	0	0	0	0	2
% Buses	0.0	0.0	0.0	0.0	0.0	28.6	0.0	28.6	0.0	0.0	0.0	0.0	13.3
Exiting Leg Total				0				0				2	2
Single-Unit Trucks	1	0	0	1	0	3	0	3	6	1	0	7	11
% Single-Unit	100.0	0.0	0.0	100.0	0.0	42.9	0.0	42.9	100.0	100.0	0.0	100.0	73.3
Exiting Leg Total				1				6				4	11
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
% Articulated	0.0	0.0	0.0	0.0	0.0	28.6	0.0	28.6	0.0	0.0	0.0	0.0	13.3
Exiting Leg Total				0				0				2	2

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

8:00 AM	Canter Brook Lane				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	
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
8:30 AM	1	0	0	1	0	1	0	1	2	0	0	2	4
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	1	0	0	1	0	3	0	3	5	1	0	6	10
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		83.3	16.7	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.750	0.000	0.750	0.625	0.250	0.000	0.500	0.625
Buses	0	0	0	0	0	2	0	2	0	0	0	0	2
Buses %	0.0	0.0	0.0	0.0	0.0	66.7	0.0	66.7	0.0	0.0	0.0	0.0	20.0
Single-Unit Trucks	1	0	0	1	0	1	0	1	5	1	0	6	8
Single-Unit %	100.0	0.0	0.0	100.0	0.0	33.3	0.0	33.3	100.0	100.0	0.0	100.0	80.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Buses	0	0	0	0	0	2	0	2	0	0	0	0	2
Single-Unit Trucks	1	0	0	1	0	1	0	1	5	1	0	6	8
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Entering Leg	1	0	0	1	0	3	0	3	5	1	0	6	10
Buses				0				0				2	2
Single-Unit Trucks				1				5				2	8
Articulated Trucks				0				0				0	0
Total Exiting Leg				1				5				4	10

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Buses

	Canter Brook Lane					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	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
7:30 AM	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
Total	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
8:15 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1
8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
Grand Total	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	2
Approach %	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		0.0	100.0	0.0	100.0		0.0	0.0	0.0	0.0		
Exiting Leg Total	0					0					2					2

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

7:45 AM	Canter Brook Lane					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	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
8:15 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	0	2	0	2	0	0	0	0	2
% Approach Total	0.0	0.0	0.0			0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000		0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0		0	2	0	2	0	0	0	0	2
Exiting Leg					0				0				2	2
Total					0				2				2	4

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Single-Unit Trucks

	Canter Brook Lane				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	1	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	1	1	0	0	1	2
7:30 AM	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
Total	0	0	0	0	0	2	0	2	1	0	0	1	3
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
8:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	1	0	0	1	0	1	0	1	5	1	0	6	8
Grand Total	1	0	0	1	0	3	0	3	6	1	0	7	11
Approach %	100.0	0.0	0.0		0.0	100.0	0.0		85.7	14.3	0.0		
Total %	9.1	0.0	0.0	9.1	0.0	27.3	0.0	27.3	54.5	9.1	0.0	63.6	
Exiting Leg Total	1				6				4				11

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

8:00 AM	Canter Brook Lane				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	
8:00 AM	0	0	0	0	0	0	0	0	2	1	0	3	3
8:15 AM	0	0	0	0	0	0	0	0	1	0	0	1	1
8:30 AM	1	0	0	1	0	0	0	0	2	0	0	2	3
8:45 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	1	0	0	1	0	1	0	1	5	1	0	6	8
% Approach Total	100.0	0.0	0.0		0.0	100.0	0.0		83.3	16.7	0.0		
PHF	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.625	0.250	0.000	0.500	0.667
Entering Leg	1	0	0	1	0	1	0	1	5	1	0	6	8
Exiting Leg				1				5				2	8
Total				2				6				8	16

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Articulated Trucks

	Canter Brook Lane				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	1	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:30 AM	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
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
8:00 AM	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
8:30 AM	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
Total	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Approach %	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	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0				0				2				2

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

7:00 AM	Canter Brook Lane				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	1	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:30 AM	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
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	2	0	2	0	0	0	0	2
Exiting Leg				0				0				2	2
Total				0				2				2	4

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



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

	Canter Brook Lane						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	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	1	0	0	0	0	1	1
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	1	0	0	0	0	1	1
Grand Total	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
Approach %	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		
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	100.0	0.0	0.0	0.0	0.0	100.0	
Exiting Leg Total	0						1						0						1

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

7:45 AM	Canter Brook Lane						Asbury Street						Asbury Street							
	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	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	1	0	0	0	0	1	1	
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	
% Approach Total	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			
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	0.250	0.000	0.000	0.000	0.000	0.250	0.250	
Entering Leg	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1	
Exiting Leg	0						0						0						0	1
Total	0						1						1						1	2

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Pedestrians**

	Canter Brook Lane						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	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:

7:00 AM	Canter Brook Lane						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 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		
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 #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Canter Brook Lane				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	
4:00 PM	1	2	0	3	0	40	0	40	29	2	0	31	74
4:15 PM	1	0	0	1	1	40	0	41	32	0	0	32	74
4:30 PM	0	0	0	0	0	36	0	36	17	0	0	17	53
4:45 PM	0	0	0	0	2	32	0	34	25	0	0	25	59
Total	2	2	0	4	3	148	0	151	103	2	0	105	260
5:00 PM	0	0	0	0	1	34	0	35	19	0	0	19	54
5:15 PM	0	0	0	0	1	36	0	37	21	0	0	21	58
5:30 PM	0	1	0	1	0	22	0	22	15	0	0	15	38
5:45 PM	0	0	0	0	0	22	0	22	19	0	0	19	41
Total	0	1	0	1	2	114	0	116	74	0	0	74	191
Grand Total	2	3	0	5	5	262	0	267	177	2	0	179	451
Approach %	40.0	60.0	0.0		1.9	98.1	0.0		98.9	1.1	0.0		
Total %	0.4	0.7	0.0	1.1	1.1	58.1	0.0	59.2	39.2	0.4	0.0	39.7	
Exiting Leg Total	7				180				264				451
Cars	2	3	0	5	5	258	0	263	177	2	0	179	447
% Cars	100.0	100.0	0.0	100.0	100.0	98.5	0.0	98.5	100.0	100.0	0.0	100.0	99.1
Exiting Leg Total	7				180				260				447
Heavy Vehicles	0	0	0	0	0	4	0	4	0	0	0	0	4
% Heavy Vehicles	0.0	0.0	0.0	0.0	0.0	1.5	0.0	1.5	0.0	0.0	0.0	0.0	0.9
Exiting Leg Total	0				0				4				4

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Canter Brook Lane				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	
4:00 PM	1	2	0	3	0	40	0	40	29	2	0	31	74
4:15 PM	1	0	0	1	1	40	0	41	32	0	0	32	74
4:30 PM	0	0	0	0	0	36	0	36	17	0	0	17	53
4:45 PM	0	0	0	0	2	32	0	34	25	0	0	25	59
Total Volume	2	2	0	4	3	148	0	151	103	2	0	105	260
% Approach Total	50.0	50.0	0.0		2.0	98.0	0.0		98.1	1.9	0.0		
PHF	0.500	0.250	0.000	0.333	0.375	0.925	0.000	0.921	0.805	0.250	0.000	0.820	0.878
Cars	2	2	0	4	3	147	0	150	103	2	0	105	259
Cars %	100.0	100.0	0.0	100.0	100.0	99.3	0.0	99.3	100.0	100.0	0.0	100.0	99.6
Heavy Vehicles	0	0	0	0	0	1	0	1	0	0	0	0	1
Heavy Vehicles %	0.0	0.0	0.0	0.0	0.0	0.7	0.0	0.7	0.0	0.0	0.0	0.0	0.4
Cars Enter Leg	2	2	0	4	3	147	0	150	103	2	0	105	259
Heavy Enter Leg	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Entering Leg	2	2	0	4	3	148	0	151	103	2	0	105	260
Cars Exiting Leg	5				105				149				259
Heavy Exiting Leg	0				0				1				1
Total Exiting Leg	5				105				150				260

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class: **Cars**

	Canter Brook Lane					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	
4:00 PM	1	2	0	3		0	39	0	39	29	2	0	31	73
4:15 PM	1	0	0	1		1	40	0	41	32	0	0	32	74
4:30 PM	0	0	0	0		0	36	0	36	17	0	0	17	53
4:45 PM	0	0	0	0		2	32	0	34	25	0	0	25	59
Total	2	2	0	4		3	147	0	150	103	2	0	105	259
5:00 PM	0	0	0	0		1	34	0	35	19	0	0	19	54
5:15 PM	0	0	0	0		1	36	0	37	21	0	0	21	58
5:30 PM	0	1	0	1		0	20	0	20	15	0	0	15	36
5:45 PM	0	0	0	0		0	21	0	21	19	0	0	19	40
Total	0	1	0	1		2	111	0	113	74	0	0	74	188
Grand Total	2	3	0	5		5	258	0	263	177	2	0	179	447
Approach %	40.0	60.0	0.0			1.9	98.1	0.0		98.9	1.1	0.0		
Total %	0.4	0.7	0.0	1.1		1.1	57.7	0.0	58.8	39.6	0.4	0.0	40.0	
Exiting Leg Total	7					180				260				447

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Canter Brook Lane				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	
4:00 PM	1	2	0	3	0	39	0	39	29	2	0	31	73
4:15 PM	1	0	0	1	1	40	0	41	32	0	0	32	74
4:30 PM	0	0	0	0	0	36	0	36	17	0	0	17	53
4:45 PM	0	0	0	0	2	32	0	34	25	0	0	25	59
Total Volume	2	2	0	4	3	147	0	150	103	2	0	105	259
% Approach Total	50.0	50.0	0.0		2.0	98.0	0.0		98.1	1.9	0.0		
PHF	0.500	0.250	0.000	0.333	0.375	0.919	0.000	0.915	0.805	0.250	0.000	0.820	0.875
Entering Leg	2	2	0	4	3	147	0	150	103	2	0	105	259
Exiting Leg				5				105				149	259
Total				9				255				254	518

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Canter Brook Lane				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	
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
4:15 PM	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
4:45 PM	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	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	3	0	3	0	0	0	0	3
Grand Total	0	0	0	0	0	4	0	4	0	0	0	0	4
Approach %	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	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0				0				4				4
Buses	0	0	0	0	0	1	0	1	0	0	0	0	1
% Buses	0.0	0.0	0.0	0.0	0.0	25.0	0.0	25.0	0.0	0.0	0.0	0.0	25.0
Exiting Leg Total	0				0				1				1
Single-Unit Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
% Single-Unit	0.0	0.0	0.0	0.0	0.0	25.0	0.0	25.0	0.0	0.0	0.0	0.0	25.0
Exiting Leg Total	0				0				1				1
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
% Articulated	0.0	0.0	0.0	0.0	0.0	50.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0
Exiting Leg Total	0				0				2				2

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Canter Brook Lane				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	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	3	0	3	0	0	0	0	3
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.375	0.000	0.375	0.000	0.000	0.000	0.000	0.375
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Buses %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Single-Unit Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
Single-Unit %	0.0	0.0	0.0	0.0	0.0	33.3	0.0	33.3	0.0	0.0	0.0	0.0	33.3
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
Articulated %	0.0	0.0	0.0	0.0	0.0	66.7	0.0	66.7	0.0	0.0	0.0	0.0	66.7
Buses	0	0	0	0	0	0	0	0	0	0	0	0	0
Single-Unit Trucks	0	0	0	0	0	1	0	1	0	0	0	0	1
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Entering Leg	0	0	0	0	0	3	0	3	0	0	0	0	3
Buses				0				0				0	0
Single-Unit Trucks				0				0				1	1
Articulated Trucks				0				0				2	2
Total Exiting Leg				0				0				3	3

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class:

Buses

	Canter Brook Lane					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	
4:00 PM	0	0	0	0	0	0	1	0	1	0	0	0	0	1
4:15 PM	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
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	1	0	1	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	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
5:45 PM	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
Grand Total	0	0	0	0	0	0	1	0	1	0	0	0	0	1
Approach %	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		0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0					0				1				1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Canter Brook Lane				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	
4:00 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
4:15 PM	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
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	1	0	1	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		
PHF	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
Entering Leg	0	0	0	0	0	1	0	1	0	0	0	0	1
Exiting Leg				0				0				1	1
Total				0				1				1	2

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class:

Single-Unit Trucks

	Canter Brook Lane				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	
4:00 PM	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
4:30 PM	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
Total	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
5:15 PM	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
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total	0	0	0	0	0	1	0	1	0	0	0	0	1
Grand Total	0	0	0	0	0	1	0	1	0	0	0	0	1
Approach %	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	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0				0				1				1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Canter Brook Lane				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	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	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
5:45 PM	0	0	0	0	0	1	0	1	0	0	0	0	1
Total Volume	0	0	0	0	0	1	0	1	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		
PHF	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
Entering Leg	0	0	0	0	0	1	0	1	0	0	0	0	1
Exiting Leg				0				0				1	1
Total				0				1				1	2

PDI File #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**
 Class:



Articulated Trucks

	Canter Brook Lane				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	
4:00 PM	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
4:30 PM	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
Total	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
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Grand Total	0	0	0	0	0	2	0	2	0	0	0	0	2
Approach %	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	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0				0				2				2

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Canter Brook Lane				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	
4:45 PM	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
5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	0	0	0	0	2	0	2	0	0	0	0	2
Exiting Leg				0				0				2	2
Total				0				2				2	4

PDI File #: 228368 A
Location: N: Canter Brook Lane
Location: E: Asbury Street W: Asbury Street
City, State: Hamilton, MA
Client: GPI/R. Brown
Site Code: NEX-2021355.00
Count Date: Wednesday, January 19, 2022
Start Time: 4:00 PM
End Time: 6:00 PM



Class: Bicycles (on Roadway and Crosswalks)

	Canter Brook Lane						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	
4:00 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	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
Total	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	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	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	0.0		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	0.0	0.0	0.0	0.0	
Exiting Leg Total	0						0						0						0

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Canter Brook Lane						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	
4:00 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	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
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		
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 #: **228368 A**
 Location: **N: Canter Brook Lane**
 Location: **E: Asbury Street W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class: **Pedestrians**

	Canter Brook Lane						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	
4:00 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	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
Total	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	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	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 04:00 PM to 06:00 PM begins at:

4:00 PM	Canter Brook Lane						Asbury Street						Asbury Street						
	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	Total
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	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
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 #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**
 Class:



Cars and Heavy Vehicles (Combined)

	Highland Street				Highland Street				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	1	32	0	33	25	13	0	38	14	2	0	16	87
7:15 AM	0	46	0	46	37	18	0	55	30	5	0	35	136
7:30 AM	3	54	0	57	64	16	0	80	30	21	0	51	188
7:45 AM	13	77	0	90	117	15	0	132	37	50	0	87	309
Total	17	209	0	226	243	62	0	305	111	78	0	189	720
8:00 AM	9	66	0	75	47	16	0	63	19	4	0	23	161
8:15 AM	1	45	0	46	36	19	0	55	20	3	0	23	124
8:30 AM	2	46	0	48	20	26	0	46	24	1	0	25	119
8:45 AM	2	31	0	33	23	13	0	36	23	1	0	24	93
Total	14	188	0	202	126	74	0	200	86	9	0	95	497
Grand Total	31	397	0	428	369	136	0	505	197	87	0	284	1217
Approach %	7.2	92.8	0.0		73.1	26.9	0.0		69.4	30.6	0.0		
Total %	2.5	32.6	0.0	35.2	30.3	11.2	0.0	41.5	16.2	7.1	0.0	23.3	
Exiting Leg Total				456				594				167	1217
Cars	31	385	0	416	357	129	0	486	191	87	0	278	1180
% Cars	100.0	97.0	0.0	97.2	96.7	94.9	0.0	96.2	97.0	100.0	0.0	97.9	97.0
Exiting Leg Total				444				576				160	1180
Heavy Vehicles	0	12	0	12	12	7	0	19	6	0	0	6	37
% Heavy Vehicles	0.0	3.0	0.0	2.8	3.3	5.1	0.0	3.8	3.0	0.0	0.0	2.1	3.0
Exiting Leg Total				12				18				7	37

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

7:15 AM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
7:15 AM	0	46	0	46	37	18	0	55	30	5	0	35	136
7:30 AM	3	54	0	57	64	16	0	80	30	21	0	51	188
7:45 AM	13	77	0	90	117	15	0	132	37	50	0	87	309
8:00 AM	9	66	0	75	47	16	0	63	19	4	0	23	161
Total Volume	25	243	0	268	265	65	0	330	116	80	0	196	794
% Approach Total	9.3	90.7	0.0		80.3	19.7	0.0		59.2	40.8	0.0		
PHF	0.481	0.789	0.000	0.744	0.566	0.903	0.000	0.625	0.784	0.400	0.000	0.563	0.642
Cars	25	235	0	260	259	64	0	323	114	80	0	194	777
Cars %	100.0	96.7	0.0	97.0	97.7	98.5	0.0	97.9	98.3	100.0	0.0	99.0	97.9
Heavy Vehicles	0	8	0	8	6	1	0	7	2	0	0	2	17
Heavy Vehicles %	0.0	3.3	0.0	3.0	2.3	1.5	0.0	2.1	1.7	0.0	0.0	1.0	2.1
Cars Enter Leg	25	235	0	260	259	64	0	323	114	80	0	194	777
Heavy Enter Leg	0	8	0	8	6	1	0	7	2	0	0	2	17
Total Entering Leg	25	243	0	268	265	65	0	330	116	80	0	196	794
Cars Exiting Leg				339				349				89	777
Heavy Exiting Leg				6				10				1	17
Total Exiting Leg				345				359				90	794

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class:

Cars

	Highland Street				Highland Street				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	1	30	0	31	24	10	0	34	14	2	0	16	81
7:15 AM	0	44	0	44	35	17	0	52	29	5	0	34	130
7:30 AM	3	53	0	56	62	16	0	78	30	21	0	51	185
7:45 AM	13	74	0	87	116	15	0	131	37	50	0	87	305
Total	17	201	0	218	237	58	0	295	110	78	0	188	701
8:00 AM	9	64	0	73	46	16	0	62	18	4	0	22	157
8:15 AM	1	45	0	46	33	18	0	51	18	3	0	21	118
8:30 AM	2	44	0	46	20	25	0	45	22	1	0	23	114
8:45 AM	2	31	0	33	21	12	0	33	23	1	0	24	90
Total	14	184	0	198	120	71	0	191	81	9	0	90	479
Grand Total	31	385	0	416	357	129	0	486	191	87	0	278	1180
Approach %	7.5	92.5	0.0		73.5	26.5	0.0		68.7	31.3	0.0		
Total %	2.6	32.6	0.0	35.3	30.3	10.9	0.0	41.2	16.2	7.4	0.0	23.6	
Exiting Leg Total				444				576				160	1180

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

7:15 AM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
7:15 AM	0	44	0	44	35	17	0	52	29	5	0	34	130
7:30 AM	3	53	0	56	62	16	0	78	30	21	0	51	185
7:45 AM	13	74	0	87	116	15	0	131	37	50	0	87	305
8:00 AM	9	64	0	73	46	16	0	62	18	4	0	22	157
Total Volume	25	235	0	260	259	64	0	323	114	80	0	194	777
% Approach Total	9.6	90.4	0.0		80.2	19.8	0.0		58.8	41.2	0.0		
PHF	0.481	0.794	0.000	0.747	0.558	0.941	0.000	0.616	0.770	0.400	0.000	0.557	0.637
Entering Leg	25	235	0	260	259	64	0	323	114	80	0	194	777
Exiting Leg				339				349				89	777
Total				599				672				283	1554

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**

	Highland Street				Highland Street				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	0	2	0	2	1	3	0	4	0	0	0	0	6
7:15 AM	0	2	0	2	2	1	0	3	1	0	0	1	6
7:30 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
7:45 AM	0	3	0	3	1	0	0	1	0	0	0	0	4
Total	0	8	0	8	6	4	0	10	1	0	0	1	19
8:00 AM	0	2	0	2	1	0	0	1	1	0	0	1	4
8:15 AM	0	0	0	0	3	1	0	4	2	0	0	2	6
8:30 AM	0	2	0	2	0	1	0	1	2	0	0	2	5
8:45 AM	0	0	0	0	2	1	0	3	0	0	0	0	3
Total	0	4	0	4	6	3	0	9	5	0	0	5	18
Grand Total	0	12	0	12	12	7	0	19	6	0	0	6	37
Approach %	0.0	100.0	0.0		63.2	36.8	0.0		100.0	0.0	0.0		
Total %	0.0	32.4	0.0	32.4	32.4	18.9	0.0	51.4	16.2	0.0	0.0	16.2	
Exiting Leg Total	12				18				7				37
Buses	0	5	0	5	7	2	0	9	0	0	0	0	14
% Buses	0.0	41.7	0.0	41.7	58.3	28.6	0.0	47.4	0.0	0.0	0.0	0.0	37.8
Exiting Leg Total	7				5				2				14
Single-Unit Trucks	0	7	0	7	5	3	0	8	6	0	0	6	21
% Single-Unit	0.0	58.3	0.0	58.3	41.7	42.9	0.0	42.1	100.0	0.0	0.0	100.0	56.8
Exiting Leg Total	5				13				3				21
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
% Articulated	0.0	0.0	0.0	0.0	0.0	28.6	0.0	10.5	0.0	0.0	0.0	0.0	5.4
Exiting Leg Total	0				0				2				2

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

7:00 AM	Highland Street				Highland Street				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	0	2	0	2	1	3	0	4	0	0	0	0	6
7:15 AM	0	2	0	2	2	1	0	3	1	0	0	1	6
7:30 AM	0	1	0	1	2	0	0	2	0	0	0	0	3
7:45 AM	0	3	0	3	1	0	0	1	0	0	0	0	4
Total Volume	0	8	0	8	6	4	0	10	1	0	0	1	19
% Approach Total	0.0	100.0	0.0		60.0	40.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.667	0.000	0.667	0.750	0.333	0.000	0.625	0.250	0.000	0.000	0.250	0.792
Buses	0	4	0	4	4	0	0	4	0	0	0	0	8
Buses %	0.0	50.0	0.0	50.0	66.7	0.0	0.0	40.0	0.0	0.0	0.0	0.0	42.1
Single-Unit Trucks	0	4	0	4	2	2	0	4	1	0	0	1	9
Single-Unit %	0.0	50.0	0.0	50.0	33.3	50.0	0.0	40.0	100.0	0.0	0.0	100.0	47.4
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
Articulated %	0.0	0.0	0.0	0.0	0.0	50.0	0.0	20.0	0.0	0.0	0.0	0.0	10.5
Buses	0	4	0	4	4	0	0	4	0	0	0	0	8
Single-Unit Trucks	0	4	0	4	2	2	0	4	1	0	0	1	9
Articulated Trucks	0	0	0	0	0	2	0	2	0	0	0	0	2
Total Entering Leg	0	8	0	8	6	4	0	10	1	0	0	1	19
Buses				4				4				0	8
Single-Unit Trucks				2				5				2	9
Articulated Trucks				0				0				2	2
Total Exiting Leg				6				9				4	19

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class:

Buses

	Highland Street				Highland Street				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	0	1	0	1	1	0	0	1	0	0	0	0	2
7:15 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:45 AM	0	2	0	2	1	0	0	1	0	0	0	0	3
Total	0	4	0	4	4	0	0	4	0	0	0	0	8
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	2	1	0	3	0	0	0	0	3
8:30 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
8:45 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	0	1	0	1	3	2	0	5	0	0	0	0	6
Grand Total	0	5	0	5	7	2	0	9	0	0	0	0	14
Approach %	0.0	100.0	0.0		77.8	22.2	0.0		0.0	0.0	0.0		
Total %	0.0	35.7	0.0	35.7	50.0	14.3	0.0	64.3	0.0	0.0	0.0	0.0	
Exiting Leg Total	7				5				2				14

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

7:30 AM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
7:30 AM	0	1	0	1	1	0	0	1	0	0	0	0	2
7:45 AM	0	2	0	2	1	0	0	1	0	0	0	0	3
8:00 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	2	1	0	3	0	0	0	0	3
Total Volume	0	4	0	4	4	1	0	5	0	0	0	0	9
% Approach Total	0.0	100.0	0.0		80.0	20.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.500	0.000	0.500	0.500	0.250	0.000	0.417	0.000	0.000	0.000	0.000	0.750
Entering Leg	0	4	0	4	4	1	0	5	0	0	0	0	9
Exiting Leg				4				4				1	9
Total				8				9				1	18

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class:

Single-Unit Trucks

	Highland Street				Highland Street				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	0	1	0	1	0	2	0	2	0	0	0	0	3
7:15 AM	0	2	0	2	1	0	0	1	1	0	0	1	4
7:30 AM	0	0	0	0	1	0	0	1	0	0	0	0	1
7:45 AM	0	1	0	1	0	0	0	0	0	0	0	0	1
Total	0	4	0	4	2	2	0	4	1	0	0	1	9
8:00 AM	0	1	0	1	1	0	0	1	1	0	0	1	3
8:15 AM	0	0	0	0	1	0	0	1	2	0	0	2	3
8:30 AM	0	2	0	2	0	0	0	0	2	0	0	2	4
8:45 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
Total	0	3	0	3	3	1	0	4	5	0	0	5	12
Grand Total	0	7	0	7	5	3	0	8	6	0	0	6	21
Approach %	0.0	100.0	0.0		62.5	37.5	0.0		100.0	0.0	0.0		
Total %	0.0	33.3	0.0	33.3	23.8	14.3	0.0	38.1	28.6	0.0	0.0	28.6	
Exiting Leg Total	5				13				3				21

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

8:00 AM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
8:00 AM	0	1	0	1	1	0	0	1	1	0	0	1	3
8:15 AM	0	0	0	0	1	0	0	1	2	0	0	2	3
8:30 AM	0	2	0	2	0	0	0	0	2	0	0	2	4
8:45 AM	0	0	0	0	1	1	0	2	0	0	0	0	2
Total Volume	0	3	0	3	3	1	0	4	5	0	0	5	12
% Approach Total	0.0	100.0	0.0		75.0	25.0	0.0		100.0	0.0	0.0		
PHF	0.000	0.375	0.000	0.375	0.750	0.250	0.000	0.500	0.625	0.000	0.000	0.625	0.750
Entering Leg	0	3	0	3	3	1	0	4	5	0	0	5	12
Exiting Leg				3				8				1	12
Total				6				12				6	24

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class:

Articulated Trucks

	Highland Street				Highland Street				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	0	0	0	0	0	1	0	1	0	0	0	0	1	
7:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1	
7:30 AM	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	
Total	0	0	0	0	0	2	0	2	0	0	0	0	2	
8:00 AM	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	
8:30 AM	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	
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	
Grand Total	0	0	0	0	0	2	0	2	0	0	0	0	2	
Approach %	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	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0		
Exiting Leg Total	0				0				2				2	

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

7:00 AM	Highland Street				Highland Street				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	0	0	0	0	0	1	0	1	0	0	0	0	1
7:15 AM	0	0	0	0	0	1	0	1	0	0	0	0	1
7:30 AM	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
Total Volume	0	0	0	0	0	2	0	2	0	0	0	0	2
% Approach Total	0.0	0.0	0.0		0.0	100.0	0.0		0.0	0.0	0.0		
PHF	0.000	0.000	0.000	0.000	0.000	0.500	0.000	0.500	0.000	0.000	0.000	0.000	0.500
Entering Leg	0	0	0	0	0	2	0	2	0	0	0	0	2
Exiting Leg				0				0				2	2
Total				0				2				2	4

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



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

	Highland Street						Highland Street						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	0
7:15 AM	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
7:45 AM	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
8:00 AM	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
8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	1
8:45 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	1
Total	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	2
Grand Total	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	2
Approach %	0.0	0.0	0.0	0.0	0.0		100.0	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	0.0	0.0	50.0	0.0	0.0	0.0	0.0	50.0	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:

8:00 AM	Highland Street						Highland Street						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	
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	1	0	0	0	0	1	1
8:45 AM	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1
Total Volume	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	2
% 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	100.0	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	0.250	0.000	0.000	0.000	0.000	0.250	0.500
Entering Leg	0	0	0	0	0	0	1	0	0	0	0	1	1	0	0	0	0	1	2
Exiting Leg	1						1						0						2
Total	1						2						1						4

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **7:00 AM**
 End Time: **9:00 AM**



Class: **Pedestrians**

	Highland Street						Highland Street						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	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:

7:00 AM	Highland Street						Highland Street						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	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 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 #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**
 Class:



Cars and Heavy Vehicles (Combined)

	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	11	56	0	67	41	27	0	68	31	2	0	33	168
4:15 PM	7	44	0	51	62	36	0	98	31	3	0	34	183
4:30 PM	8	56	0	64	54	30	0	84	13	3	0	16	164
4:45 PM	5	43	0	48	58	32	0	90	20	8	0	28	166
Total	31	199	0	230	215	125	0	340	95	16	0	111	681
5:00 PM	12	62	0	74	41	27	0	68	18	1	0	19	161
5:15 PM	4	41	0	45	42	30	0	72	18	1	0	19	136
5:30 PM	5	44	0	49	36	16	0	52	18	1	0	19	120
5:45 PM	4	46	0	50	64	24	1	89	17	3	0	20	159
Total	25	193	0	218	183	97	1	281	71	6	0	77	576
Grand Total	56	392	0	448	398	222	1	621	166	22	0	188	1257
Approach %	12.5	87.5	0.0		64.1	35.7	0.2		88.3	11.7	0.0		
Total %	4.5	31.2	0.0	35.6	31.7	17.7	0.1	49.4	13.2	1.8	0.0	15.0	
Exiting Leg Total				420				559				278	1257
Cars	53	382	0	435	393	221	1	615	166	21	0	187	1237
% Cars	94.6	97.4	0.0	97.1	98.7	99.5	100.0	99.0	100.0	95.5	0.0	99.5	98.4
Exiting Leg Total				414				549				274	1237
Heavy Vehicles	3	10	0	13	5	1	0	6	0	1	0	1	20
% Heavy Vehicles	5.4	2.6	0.0	2.9	1.3	0.5	0.0	1.0	0.0	4.5	0.0	0.5	1.6
Exiting Leg Total				6				10				4	20

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	11	56	0	67	41	27	0	68	31	2	0	33	168
4:15 PM	7	44	0	51	62	36	0	98	31	3	0	34	183
4:30 PM	8	56	0	64	54	30	0	84	13	3	0	16	164
4:45 PM	5	43	0	48	58	32	0	90	20	8	0	28	166
Total Volume	31	199	0	230	215	125	0	340	95	16	0	111	681
% Approach Total	13.5	86.5	0.0		63.2	36.8	0.0		85.6	14.4	0.0		
PHF	0.705	0.888	0.000	0.858	0.867	0.868	0.000	0.867	0.766	0.500	0.000	0.816	0.930
Cars	30	195	0	225	213	125	0	338	95	15	0	110	673
Cars %	96.8	98.0	0.0	97.8	99.1	100.0	0.0	99.4	100.0	93.8	0.0	99.1	98.8
Heavy Vehicles	1	4	0	5	2	0	0	2	0	1	0	1	8
Heavy Vehicles %	3.2	2.0	0.0	2.2	0.9	0.0	0.0	0.6	0.0	6.3	0.0	0.9	1.2
Cars Enter Leg	30	195	0	225	213	125	0	338	95	15	0	110	673
Heavy Enter Leg	1	4	0	5	2	0	0	2	0	1	0	1	8
Total Entering Leg	31	199	0	230	215	125	0	340	95	16	0	111	681
Cars Exiting Leg				228				290				155	673
Heavy Exiting Leg				3				4				1	8
Total Exiting Leg				231				294				156	681

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class:

Cars

	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	10	55	0	65	40	27	0	67	31	2	0	33	165
4:15 PM	7	42	0	49	62	36	0	98	31	2	0	33	180
4:30 PM	8	55	0	63	54	30	0	84	13	3	0	16	163
4:45 PM	5	43	0	48	57	32	0	89	20	8	0	28	165
Total	30	195	0	225	213	125	0	338	95	15	0	110	673
5:00 PM	12	61	0	73	41	27	0	68	18	1	0	19	160
5:15 PM	4	40	0	44	39	30	0	69	18	1	0	19	132
5:30 PM	3	42	0	45	36	16	0	52	18	1	0	19	116
5:45 PM	4	44	0	48	64	23	1	88	17	3	0	20	156
Total	23	187	0	210	180	96	1	277	71	6	0	77	564
Grand Total	53	382	0	435	393	221	1	615	166	21	0	187	1237
Approach %	12.2	87.8	0.0		63.9	35.9	0.2		88.8	11.2	0.0		
Total %	4.3	30.9	0.0	35.2	31.8	17.9	0.1	49.7	13.4	1.7	0.0	15.1	
Exiting Leg Total				414				549				274	1237

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	10	55	0	65	40	27	0	67	31	2	0	33	165
4:15 PM	7	42	0	49	62	36	0	98	31	2	0	33	180
4:30 PM	8	55	0	63	54	30	0	84	13	3	0	16	163
4:45 PM	5	43	0	48	57	32	0	89	20	8	0	28	165
Total Volume	30	195	0	225	213	125	0	338	95	15	0	110	673
% Approach Total	13.3	86.7	0.0		63.0	37.0	0.0		86.4	13.6	0.0		
PHF	0.750	0.886	0.000	0.865	0.859	0.868	0.000	0.862	0.766	0.469	0.000	0.833	0.935
Entering Leg	30	195	0	225	213	125	0	338	95	15	0	110	673
Exiting Leg				228				290				155	673
Total				453				628				265	1346

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**
 Class: **Heavy Vehicles-Combined (Buses, Single-Unit Trucks, Articulated Trucks)**



	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	1	1	0	2	1	0	0	1	0	0	0	0	3
4:15 PM	0	2	0	2	0	0	0	0	0	1	0	1	3
4:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
Total	1	4	0	5	2	0	0	2	0	1	0	1	8
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	1	3	0	0	3	0	0	0	0	4
5:30 PM	2	2	0	4	0	0	0	0	0	0	0	0	4
5:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	3
Total	2	6	0	8	3	1	0	4	0	0	0	0	12
Grand Total	3	10	0	13	5	1	0	6	0	1	0	1	20
Approach %	23.1	76.9	0.0		83.3	16.7	0.0		0.0	100.0	0.0		
Total %	15.0	50.0	0.0	65.0	25.0	5.0	0.0	30.0	0.0	5.0	0.0	5.0	
Exiting Leg Total	6				10				4				20
Buses	3	4	0	7	4	0	0	4	0	0	0	0	11
% Buses	100.0	40.0	0.0	53.8	80.0	0.0	0.0	66.7	0.0	0.0	0.0	0.0	55.0
Exiting Leg Total	4				4				3				11
Single-Unit Trucks	0	5	0	5	1	1	0	2	0	1	0	1	8
% Single-Unit	0.0	50.0	0.0	38.5	20.0	100.0	0.0	33.3	0.0	100.0	0.0	100.0	40.0
Exiting Leg Total	2				5				1				8
Articulated Trucks	0	1	0	1	0	0	0	0	0	0	0	0	1
% Articulated	0.0	10.0	0.0	7.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0
Exiting Leg Total	0				1				0				1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

5:00 PM	Highland Street				Highland Street				Asbury Street				Total	
	from North				from South				from West					
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total		
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	1	3	0	0	3	0	0	0	0	0	4
5:30 PM	2	2	0	4	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	0	3
Total Volume	2	6	0	8	3	1	0	4	0	0	0	0	0	12
% Approach Total	25.0	75.0	0.0		75.0	25.0	0.0		0.0	0.0	0.0			
PHF	0.250	0.750	0.000	0.500	0.250	0.250	0.000	0.333	0.000	0.000	0.000	0.000		0.750
Buses	2	4	0	6	3	0	0	3	0	0	0	0		9
Buses %	100.0	66.7	0.0	75.0	100.0	0.0	0.0	75.0	0.0	0.0	0.0	0.0		75.0
Single-Unit Trucks	0	2	0	2	0	1	0	1	0	0	0	0		3
Single-Unit %	0.0	33.3	0.0	25.0	0.0	100.0	0.0	25.0	0.0	0.0	0.0	0.0		25.0
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0		0
Articulated %	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Buses	2	4	0	6	3	0	0	3	0	0	0	0		9
Single-Unit Trucks	0	2	0	2	0	1	0	1	0	0	0	0		3
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0		0
Total Entering Leg	2	6	0	8	3	1	0	4	0	0	0	0		12
Buses				3				4				2		9
Single-Unit Trucks				0				2				1		3
Articulated Trucks				0				0				0		0
Total Exiting Leg				3				6				3		12

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class:

Buses

	Highland Street				Highland Street				Asbury Street				Total	
	from North				from South				from West					
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total		
4:00 PM	1	0	0	1	0	0	0	0	0	0	0	0	0	1
4:15 PM	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
4:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	0	1
Total	1	0	0	1	1	0	0	1	0	0	0	0	0	2
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	1	3	0	0	3	0	0	0	0	0	4
5:30 PM	2	2	0	4	0	0	0	0	0	0	0	0	0	4
5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	2	4	0	6	3	0	0	3	0	0	0	0	0	9
Grand Total	3	4	0	7	4	0	0	4	0	0	0	0	0	11
Approach %	42.9	57.1	0.0		100.0	0.0	0.0		0.0	0.0	0.0			
Total %	27.3	36.4	0.0	63.6	36.4	0.0	0.0	36.4	0.0	0.0	0.0	0.0		
Exiting Leg Total	4				4				3				11	

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:45 PM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:45 PM	0	0	0	0	1	0	0	1	0	0	0	0	1
5:00 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
5:15 PM	0	1	0	1	3	0	0	3	0	0	0	0	4
5:30 PM	2	2	0	4	0	0	0	0	0	0	0	0	4
Total Volume	2	4	0	6	4	0	0	4	0	0	0	0	10
% Approach Total	33.3	66.7	0.0		100.0	0.0	0.0		0.0	0.0	0.0		
PHF	0.250	0.500	0.000	0.375	0.333	0.000	0.000	0.333	0.000	0.000	0.000	0.000	0.625
Entering Leg	2	4	0	6	4	0	0	4	0	0	0	0	10
Exiting Leg				4				4				2	10
Total				10				8				2	20

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**
 Class:



Single-Unit Trucks

	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
4:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
4:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	3	0	3	1	0	0	1	0	1	0	1	5
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	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
5:45 PM	0	2	0	2	0	1	0	1	0	0	0	0	3
Total	0	2	0	2	0	1	0	1	0	0	0	0	3
Grand Total	0	5	0	5	1	1	0	2	0	1	0	1	8
Approach %	0.0	100.0	0.0		50.0	50.0	0.0		0.0	100.0	0.0		
Total %	0.0	62.5	0.0	62.5	12.5	12.5	0.0	25.0	0.0	12.5	0.0	12.5	
Exiting Leg Total	2				5				1				8

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	0	1	0	1	1	0	0	1	0	0	0	0	2
4:15 PM	0	1	0	1	0	0	0	0	0	1	0	1	2
4:30 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	3	0	3	1	0	0	1	0	1	0	1	5
% Approach Total	0.0	100.0	0.0		100.0	0.0	0.0		0.0	100.0	0.0		
PHF	0.000	0.750	0.000	0.750	0.250	0.000	0.000	0.250	0.000	0.250	0.000	0.250	0.625
Entering Leg	0	3	0	3	1	0	0	1	0	1	0	1	5
Exiting Leg				2				3				0	5
Total				5				4				1	10

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class:

Articulated Trucks

	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	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
Total	0	1	0	1	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	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
5:45 PM	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
Grand Total	0	1	0	1	0	0	0	0	0	0	0	0	1
Approach %	0.0	100.0	0.0		0.0	0.0	0.0		0.0	0.0	0.0		
Total %	0.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Exiting Leg Total	0				1				0				1

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:00 PM	Highland Street				Highland Street				Asbury Street				Total
	from North				from South				from West				
	Right	Thru	U-Turn	Total	Thru	Left	U-Turn	Total	Right	Left	U-Turn	Total	
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	1	0	1	0	0	0	0	0	0	0	0	1
4:30 PM	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
Total Volume	0	1	0	1	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		
PHF	0.000	0.250	0.000	0.250	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250
Entering Leg	0	1	0	1	0	0	0	0	0	0	0	0	1
Exiting Leg				0				1				0	1
Total				1				1				0	2

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



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

	Highland Street						Highland Street						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		
4:00 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	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
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	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
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	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Grand Total	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Approach %	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			
Total %	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		
Exiting Leg Total	0						1						0						1	

Peak Hour Analysis from 04:00 PM to 06:00 PM begins at:

4:15 PM	Highland Street						Highland Street						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	
4:15 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	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
5:00 PM	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Total Volume	0	1	0	0	0	1	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		
PHF	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	0.250
Entering Leg	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Exiting Leg	0						1						0						1
Total	1						1						0						2

PDI File #: **228368 B**
 Location: **N: Highland Street S: Highland Street**
 Location: **W: Asbury Street**
 City, State: **Hamilton, MA**
 Client: **GPI/R. Brown**
 Site Code: **NEX-2021355.00**
 Count Date: **Wednesday, January 19, 2022**
 Start Time: **4:00 PM**
 End Time: **6:00 PM**



Class: **Pedestrians**

	Highland Street						Highland Street						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	
4:00 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	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
Total	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	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	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 04:00 PM to 06:00 PM begins at:

4:00 PM	Highland Street						Highland Street						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	
4:00 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	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
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

TRAFFIC-VOLUME ADJUSTMENT DATA

Traffic Volume Adjustments Summary

	<u>Used</u>	
COVID-19 Adjustment	8.5%	AM Peak Hour
	3.9%	PM Peak Hour
	9.8%	Weekday Daily
Seasonal Adjustment	5%	
Historical Growth	1%	

NOTES

Traffic counts were conducted on Wednesday, January 19, 2022

COVID-19 Adjustment

Station 35 - Yankee Division Highway, north of Brimbal Ave - Beverly

AM Peak Hour Volumes (vph)						
January 2020			January 2022			
Tues	1/21/2020	3,998	1/18/2022	3,729		
Wed	1/22/2020	4,048	1/19/2022	3,815		
Thurs	1/23/2020	4,135	1/20/2022	3,684		
		4,060	3,743		8.5%	Average

Station 35 - Yankee Division Highway, north of Brimbal Ave - Beverly

PM Peak Hour Volumes (vph)					
January 2020			January 2022		
Tues	1/21/2020	3,841	1/18/2022	3,738	
Wed	1/22/2020	4,061	1/19/2022	3,977	
Thurs	1/23/2020	4,046	1/20/2022	3,786	
		3,983			3,834
					3.9%
					Average

Station 35 - Yankee Division Highway, north of Brimbal Ave - Beverly

Daily Traffic Volumes (vpd)						
January 2020			January 2022			
Tues	1/21/2020	45,571	1/18/2022	42,066		
Wed	1/22/2020	47,009	1/19/2022	44,090		
Thurs	1/23/2020	48,176	1/20/2022	42,084		
		46,919			42,747	9.8% Average

Date of TMCs

Average - 2014-2019 (Note Rec East & Rec West only available since 2016)

Factor Group	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	Axle Factor
R1	1.26	1.22	1.18	1.05	0.97	0.94	0.88	0.85	0.98	0.99	1.04	1.10	0.85
R2	1.01	1.00	1.01	0.98	0.96	0.92	0.94	0.92	0.95	0.91	0.95	0.95	0.96
R3	1.12	1.08	1.06	0.99	0.92	0.90	0.90	0.90	0.95	0.94	0.99	1.02	0.97
R4-R7	1.11	1.12	1.10	1.03	0.95	0.91	0.89	0.89	0.95	0.96	1.05	1.07	0.94
U1-Boston	1.03	1.05	0.99	0.95	0.93	0.91	0.94	0.91	0.94	0.93	0.97	0.99	0.95
U1-Essex	1.08	1.08	1.03	0.98	0.94	0.90	0.89	0.88	0.93	0.94	0.99	1.03	0.92
U1-Southeast	1.11	1.11	1.05	0.99	0.94	0.90	0.88	0.87	0.93	0.94	0.99	1.02	0.96
U1-West	1.07	1.04	1.00	0.95	0.93	0.91	0.93	0.91	0.92	0.92	0.97	1.00	0.90
U1-Worcester	1.09	1.14	1.03	0.97	0.94	0.92	0.93	0.90	0.94	0.94	0.98	1.04	0.90
U2	1.04	1.04	0.98	0.95	0.92	0.90	0.92	0.90	0.93	0.92	0.96	0.99	0.97
U3	1.03	1.04	1.00	0.95	0.92	0.90	0.93	0.91	0.93	0.92	0.97	0.97	0.96
U4-U7	1.05	1.05	0.98	0.95	0.90	0.88	0.93	0.92	0.92	0.93	0.98	1.00	0.96
Rec - East	1.16	1.16	1.11	1.05	0.93	0.87	0.80	0.82	0.94	0.99	1.11	1.13	0.99
Rec - West	1.28	1.23	1.31	1.18	0.97	0.83	0.70	0.72	0.96	0.96	1.15	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.

*Use U4-U7; address w/in Boston Urbanized Area (<https://geo-massdot.opendata.arcgis.com/datasets/MassDOT::urban-boundaries-2010/explore?location=42.629896%2C-70.887649%2C15.80>)

MassDOT Functional Class either Urban collector or rural minor collector

Traffic Growth Rate^a

Location						Annual Rate
	2015	2016	2017	2018	2019	
STATION 5128 - NEWBURY - ROUTE 1 (NEWBURYPORT TPK), SOUTH OF HANOVER STREET	9,027	9,169	9,366	9,322	8,732	-0.8%
STATION 35 - BEVERLY - YANKEE DIVISION HIGHWAY, NORTH OF BRIMBAL AVE	47,788	47,451	51,386		49,749	1.5%
STATION 5086 - GLOUCESTER - YANKEE DIVISION HIGHWAY, EAST OF RAMP-RT 133 TO 128 SB	35,604	36,194	36,377	35,677	38,039	1.7%

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

Average Annual Growth Rate 0.8%

MASSDOT CRASH RATE WORKSHEETS

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : 1/19/2022

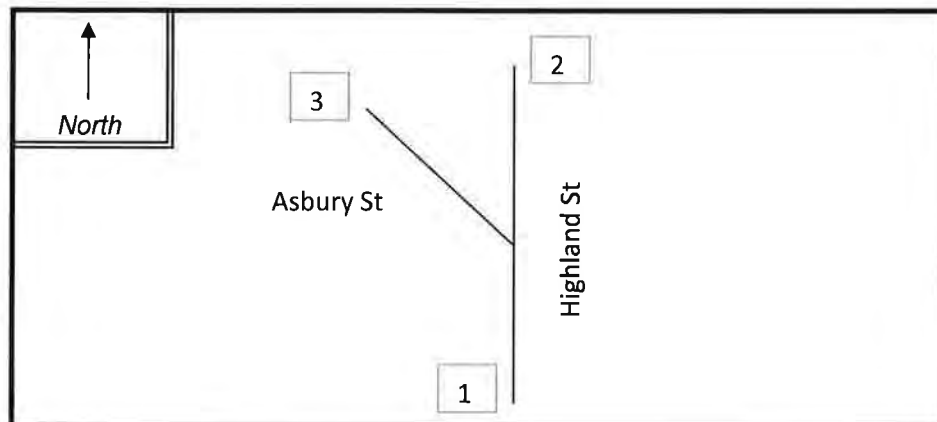
DISTRICT : 4 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Highland Street

MINOR STREET(S) : Asbury Street

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	EB			
PEAK HOURLY VOLUMES (AM/PM) :	371	251	121			743

" K " FACTOR : 0.102 INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : 7,284

TOTAL # OF CRASHES : 6 # OF YEARS : 5 AVERAGE # OF CRASHES PER YEAR (A) : 1.20

CRASH RATE CALCULATION :

0.45

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

Comments : 2022 Existing PM Peak Hour volumes used

Project Title & Date : NEX-2021355.00 - Hamilton, MA - 421 Asbury Street - Residential

INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : 1/19/2022

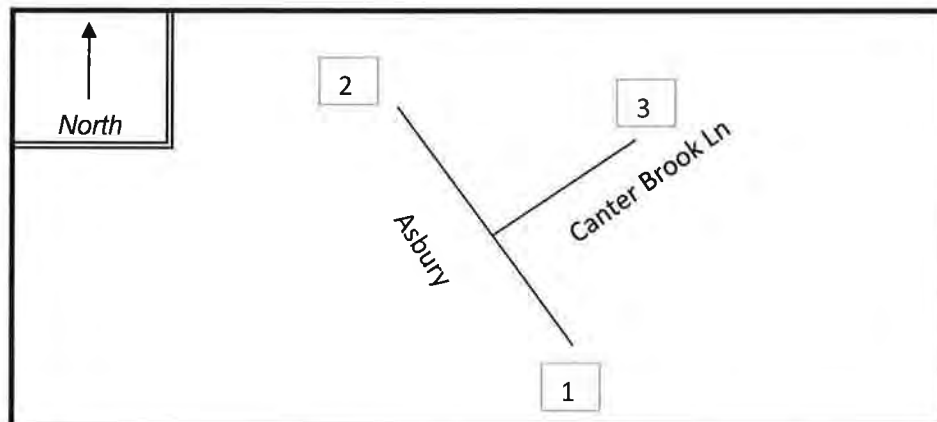
DISTRICT : 4 UNSIGNALIZED : ☒ X SIGNALIZED : ☐

~ INTERSECTION DATA ~

MAJOR STREET : Asbury Street

MINOR STREET(S) : Canter Brook Lane

**INTERSECTION
DIAGRAM**
(Label Approaches)



PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	SB	WB			
PEAK HOURLY VOLUMES (AM/PM) :	170	121	4			295

" K " FACTOR : 0.102 INTERSECTION ADT (V) = TOTAL DAILY APPROACH VOLUME : 2,892

TOTAL # OF CRASHES : 1 # OF YEARS : 2 AVERAGE # OF CRASHES PER YEAR (A) : 0.50

CRASH RATE CALCULATION :

0.47

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

Comments : 2022 Existing PM Pk. Hr. volumes used; Residential occupancy along Canter Brook Lane began sometime in 2020, meaning this only has only operated as an intersection in 2020 and 2021

Project Title & Date: NEX-2021355.00 - Hamilton, MA - 421 Asbury Street - Residential

SEGMENT CRASH RATE WORKSHEET

CITY/TOWN : Hamilton COUNT DATE : 1/19/2022

DISTRICT : 4

~ SEGMENT DATA ~

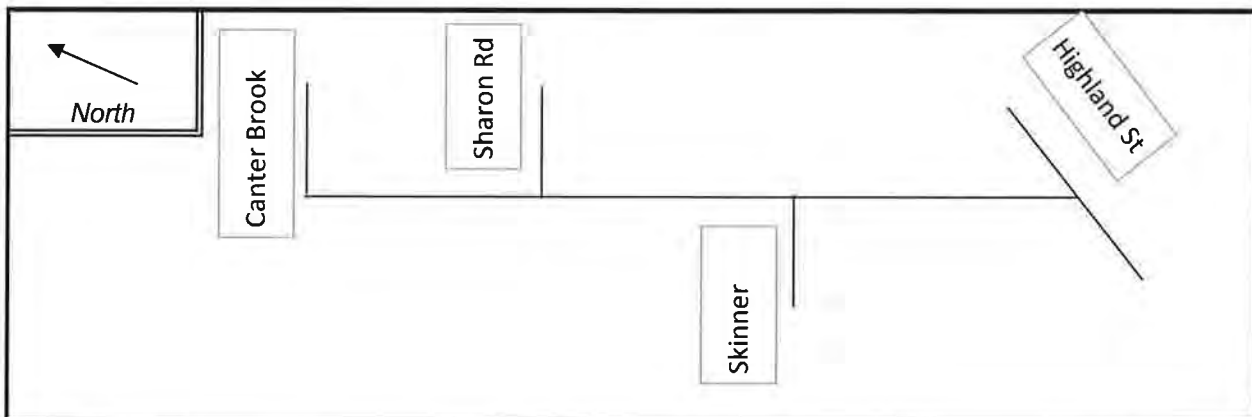
ROADWAY NAME: Asbury Street

START POINT: East of Canter Brook Lane

END POINT: West of Highland Street

FUNCTIONAL CLASSIFICATION OF ROADWAY: Urban Collector

ROADWAY DIAGRAM (LABEL ROADWAY AND CROSS STREETS)



AVERAGE DAILY TRAFFIC

SEGMENT LENGTH IN MILES (L): **0.3**

AVERAGE DAILY TRAFFIC VOLUME (V): **2,850**

TOTAL # OF CRASHES: **1** # OF YEARS: **5** AVERAGE # OF CRASHES PER YEAR (A): **0.20**

CRASH RATE
CALCULATION : **0.64**

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

Comments : _____

Project Title & Date: NEX-2021355.00 - Hamilton, MA - 421 Asbury Street - Residential

SIGHT DISTANCE CALCULATIONS

AASHTO Recommended Sight Distance Summary (Passenger Vehicles)

LOCATION: Asbury Street at 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) = 43 MPH
 Grade (G) = 0.0%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 336 \text{ FT}$

SSD =	340 FT
--------------	---------------

Mainline Direction: EB
 85th Percentile Speed (V) = 42 MPH
 Grade (G) = 0.0%
 Apply Grade Adjustment No
 Brake Reaction Time (T) = 2.5 seconds
 Deceleration Rate (A) = 11.2 ft/s²
 $SSD = 1.47 V * T + 1.075 V^2 / A = 324 \text{ FT}$

SSD =	325 FT
--------------	---------------

INTERSECTION SIGHT DISTANCE

RIGHT TURN FROM STOP: East of Driveway
 Posted Speed (V) = 35 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 6.5 seconds
 $ISD (\text{Right Turn from Stop}) = 1.47 * t_g * V = 335 \text{ FT}$

ISD (Right Turn from Stop) =	335 FT
-------------------------------------	---------------

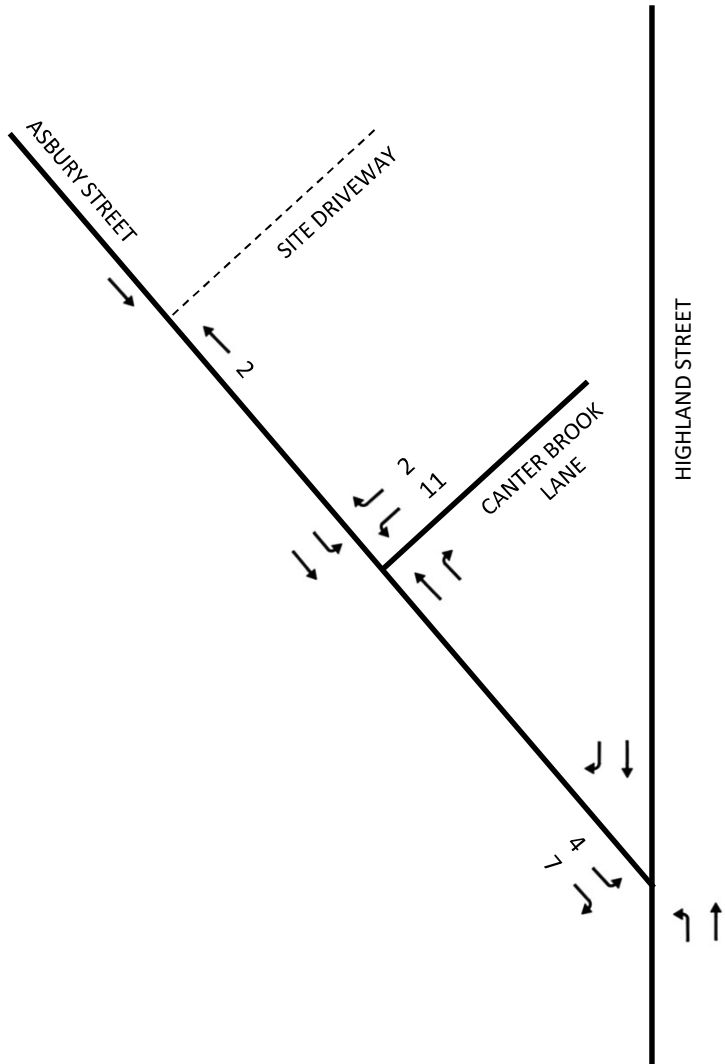
LEFT TURN FROM STOP: West of Driveway
 Posted Speed (V) = 35 MPH
 Minor Street Approach Grade (G) = 0.0%
 Apply Grade Adjustment No
 Time Gap (t_g) = 7.5 seconds
 $ISD (\text{Left Turn from Stop}) = 1.47 * t_g * V = 386 \text{ FT}$

ISD (Left Turn from Stop) =	390 FT
------------------------------------	---------------

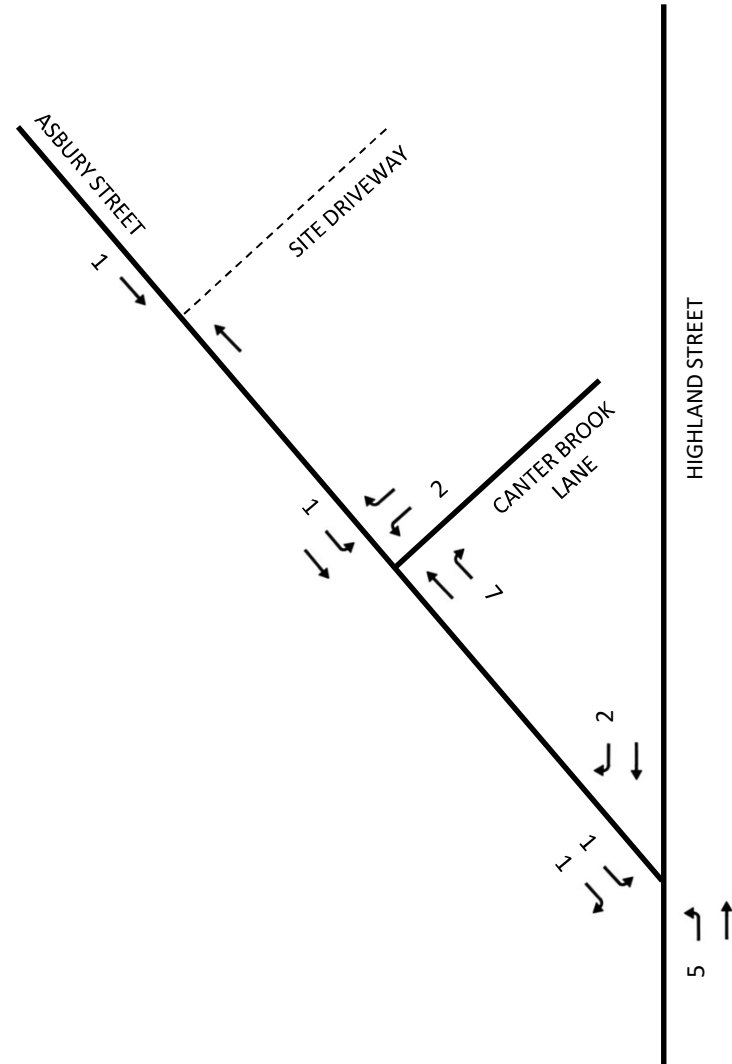
TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hamilton, Massachusetts

OTHER DEVELOPMENT



Weekday AM



Weekday PM

TRIP-GENERATION CALCULATIONS

Institute of Transportation Engineers (ITE)

Land Use Code (LUC) 221 - Multifamily Housing (Mid-Rise)

General Urban/Suburban

Average Vehicle Trips Ends vs: Dwelling Units
Independent Variable (X): 45

AVERAGE WEEKDAY DAILY

$$T = 4.77 * (X) - 46.46$$

$$T = 4.77 * 45 - 46.46$$

$$T = 168.19$$

T = 168 vehicle trips
with 50% (84 vpd) entering and 50% (84 vpd) exiting.

WEEKDAY MORNING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.37 * (X)$$

$$T = 0.37 * 45$$

$$T = 16.65$$

T = 17 vehicle trips
with 23% (4 vph) entering and 77% (13 vph) exiting.

WEEKDAY EVENING PEAK HOUR OF ADJACENT STREET TRAFFIC

$$T = 0.39 * (X) + 0.34$$

$$T = 0.39 * 45 + 0.34$$

$$T = 17.89$$

T = 18 vehicle trips
with 61% (11 vph) entering and 39% (7 vph) exiting.

SATURDAY DAILY

$$\ln T = 0.94 \ln (X) + 1.84$$

$$\ln T = 0.94 \ln (45) + 1.84$$

$$\ln T = 5.42$$

$$T = 225.49$$

T = 226 vehicle trips
with 50% (113 vpd) entering and 50% (113 vpd) exiting.

SATURDAY PEAK HOUR OF GENERATOR

$$\ln T = 1.00 \ln (X) - 0.91$$

$$\ln T = 1.00 \ln (45) - 0.91$$

$$\ln T = 2.90$$

$$T = 18.11$$

T = 18 vehicle trips
with 51% (9 vpd) entering and 49% (9 vpd) exiting.

TRAFFIC IMPACT AND ACCESS STUDY

Proposed Residential Development – Hamilton, Massachusetts

TRIP DISTRIBUTION DATA

4-HR TMC Summary (7:00-9:00 AM & 4:00-6:00 PM)

Wednesday, January 19, 2022

Network Volume Distribution

<u>Street</u>	<u>To/From</u>	<u>AM</u>	<u>PM</u>	<u>Total</u>	<u>%</u>
Asbury St.	West	448	443	891	18%
Highland St.	North	884	868	1752	36%
Highland St.	South	1099	1178	2277	46%
Total		2431	2489	4920	100%

Peak HR TMC Summary (7:15 AM -8:15 & 4:00 PM - 5:00 PM)

Wednesday, January 19, 2022

Network Volume Distribution

<u>Street</u>	<u>To/From</u>	<u>AM</u>	<u>PM</u>	<u>Total</u>	<u>%</u>
Asbury St.	West	291	255	546	19%
Highland St.	North	613	461	1074	36%
Highland St.	South	689	634	1323	45%
Total		1593	1350	2943	100%

Network Volume Distribution Summary

<u>Street</u>	<u>To/From</u>	<u>4-HR</u>	<u>Peak Hr</u>	<u>Use</u>
Asbury St.	West	18%	19%	20%
Highland St.	North	36%	36%	35%
Highland St.	South	46%	45%	45%
Total		100%	100%	100%

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.

⁹ *Highway Capacity Manual 6th Edition*, Transportation Research Board; Washington, D.C.; 2016.

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 or v/c > 1.0	>80 or v/c > 1.0

Source *Highway Capacity Manual 6th Edition*, Transportation Research Board; Washington, D.C.; 2016. Pages 19-16, 20-6, and 21-9.

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 AND QUEUE ANALYSIS WORKSHEETS

3: Highland St & Asbury St HCM 6th TWSC

2022 Existing AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 10.2

Movement NBL NBT SBT SBR SEL SER

Lane Configurations						
Traffic Vol, veh/h	76	302	277	29	92	133
Future Vol, veh/h	76	302	277	29	92	133
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	119	472	433	45	144	208

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	478	0	-	0	1166	456
Stage 1	-	-	-	-	456	-
Stage 2	-	-	-	-	710	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1084	-	-	-	215	606
Stage 1	-	-	-	-	640	-
Stage 2	-	-	-	-	489	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1084	-	-	-	183	606
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	489	-

Approach NB SB SE

HCM Control Delay, s	1.8	0	38
HCM LOS			E

Minor Lane/Major Mvmt NBL NBT SELn1 SELn2 SBT SBR

Capacity (veh/h)	1084	-	183	606	-	-
HCM Lane V/C Ratio	0.11	-	0.786	0.343	-	-
HCM Control Delay (s)	8.7	0	72.8	14	-	-
HCM Lane LOS	A	A	F	B	-	-
HCM 95th %tile Q(veh)	0.4	-	5.3	1.5	-	-

5: Asbury St & Canter Brook Ln
HCM 6th TWSC

2022 Existing AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 0.1

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	3	225	104	1	1	1
Future Vol, veh/h	3	225	104	1	1	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	346	160	2	2	2

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	162	0	-	0	517	161
Stage 1	-	-	-	-	161	-
Stage 2	-	-	-	-	356	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1417	-	-	-	522	889
Stage 1	-	-	-	-	873	-
Stage 2	-	-	-	-	713	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1417	-	-	-	520	889
Mov Cap-2 Maneuver	-	-	-	-	520	-
Stage 1	-	-	-	-	870	-
Stage 2	-	-	-	-	713	-

Approach SE NW SW

HCM Control Delay, s	0.1	0	10.5
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1417	-	656
HCM Lane V/C Ratio	-	-	0.003	-	0.005
HCM Control Delay (s)	-	-	7.5	0	10.5
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0

6: Site Driveway
HCM 6th TWSC

2022 Existing AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 0

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	0	0	-	0	1	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	1022	-
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-

Approach SE NW SW

HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

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

3: Highland St & Asbury St HCM 6th TWSC

2022 Existing PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 3.3

Movement	NBL	NBT	SBT	SBR	SEL	SER
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Lane Configurations						
Traffic Vol, veh/h	136	235	217	34	17	104
Future Vol, veh/h	136	235	217	34	17	104
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	146	253	233	37	18	112

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	270	0	-	0	797	252
Stage 1	-	-	-	-	252	-
Stage 2	-	-	-	-	545	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1299	-	-	-	357	789
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	583	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1299	-	-	-	310	789
Mov Cap-2 Maneuver	-	-	-	-	310	-
Stage 1	-	-	-	-	688	-
Stage 2	-	-	-	-	583	-

Approach	NB	SB	SE
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HCM Control Delay, s	3	0	11.3
HCM LOS			B

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
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Capacity (veh/h)	1299	-	310	789	-	-
HCM Lane V/C Ratio	0.113	-	0.059	0.142	-	-
HCM Control Delay (s)	8.1	0	17.3	10.3	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.5	-	-

Intersection

Int Delay, s/veh 0.2

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	2	119	167	3	2	2
Future Vol, veh/h	2	119	167	3	2	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	2	135	190	3	2	2

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	193	0	-	0	331	192
Stage 1	-	-	-	-	192	-
Stage 2	-	-	-	-	139	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1392	-	-	-	668	855
Stage 1	-	-	-	-	845	-
Stage 2	-	-	-	-	893	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1392	-	-	-	667	855
Mov Cap-2 Maneuver	-	-	-	-	667	-
Stage 1	-	-	-	-	843	-
Stage 2	-	-	-	-	893	-

Approach SE NW SW

HCM Control Delay, s	0.1	0	9.8
HCM LOS			A

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1392	-	749
HCM Lane V/C Ratio	-	-	0.002	-	0.006
HCM Control Delay (s)	-	-	7.6	0	9.8
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	-	0

6: Site Driveway
HCM 6th TWSC

2022 Existing PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 0

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	0	0	-	0	1	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	1022	-
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-

Approach SE NW SW

HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

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

3: Highland St & Asbury St HCM 6th TWSC

2029 No-Build AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 16.6

Movement	NBL	NBT	SBT	SBR	SEL	SER
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Lane Configurations		↰	↱		↰	↱
Traffic Vol, veh/h	81	324	297	31	103	150
Future Vol, veh/h	81	324	297	31	103	150
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	127	506	464	48	161	234

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	512	0	-	0	1248	488
Stage 1	-	-	-	-	488	-
Stage 2	-	-	-	-	760	-
Critical Hdwy	4.12	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.218	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1053	-	-	-	192	582
Stage 1	-	-	-	-	619	-
Stage 2	-	-	-	-	464	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1053	-	-	-	~ 160	582
Mov Cap-2 Maneuver	-	-	-	-	~ 160	-
Stage 1	-	-	-	-	515	-
Stage 2	-	-	-	-	464	-

Approach	NB	SB	SE
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HCM Control Delay, s	1.8	0	61.9
HCM LOS			F

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
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Capacity (veh/h)	1053	-	160	582	-	-
HCM Lane V/C Ratio	0.12	-	1.006	0.403	-	-
HCM Control Delay (s)	8.9	0	129.7	15.3	-	-
HCM Lane LOS	A	A	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	7.8	1.9	-	-

Notes

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

Intersection

Int Delay, s/veh 0.5

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	3	242	111	1	11	2
Future Vol, veh/h	3	242	111	1	11	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	372	171	2	17	3

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	173	0	-	0	554	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	382	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1404	-	-	-	497	877
Stage 1	-	-	-	-	863	-
Stage 2	-	-	-	-	694	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1404	-	-	-	495	877
Mov Cap-2 Maneuver	-	-	-	-	495	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	694	-

Approach SE NW SW

HCM Control Delay, s	0.1	0	12
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1404	-	531
HCM Lane V/C Ratio	-	-	0.003	-	0.038
HCM Control Delay (s)	-	-	7.6	0	12
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

6: Site Driveway
HCM 6th TWSC

2029 No-Build AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 0

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	0	0	-	0	1	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	1022	-
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-

Approach SE NW SW

HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

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

3: Highland St & Asbury St
HCM 6th TWSC

2029 No-Build PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 3.5

Movement NBL NBT SBT SBR SEL SER

Lane Configurations						
Traffic Vol, veh/h	151	252	233	38	19	113
Future Vol, veh/h	151	252	233	38	19	113
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	162	271	251	41	20	122

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	292	0	-	0	867	272
Stage 1	-	-	-	-	272	-
Stage 2	-	-	-	-	595	-
Critical Hdwy	4.11	-	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	-	3.509	3.309
Pot Cap-1 Maneuver	1275	-	-	-	325	769
Stage 1	-	-	-	-	776	-
Stage 2	-	-	-	-	553	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1275	-	-	-	276	769
Mov Cap-2 Maneuver	-	-	-	-	276	-
Stage 1	-	-	-	-	660	-
Stage 2	-	-	-	-	553	-

Approach NB SB SE

HCM Control Delay, s	3.1	0	11.8
HCM LOS			B

Minor Lane/Major Mvmt NBL NBT SELn1 SELn2 SBT SBR

Capacity (veh/h)	1275	-	276	769	-	-
HCM Lane V/C Ratio	0.127	-	0.074	0.158	-	-
HCM Control Delay (s)	8.2	0	19.1	10.6	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	0.2	0.6	-	-

Intersection

Int Delay, s/veh 0.3

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	3	128	179	10	4	2
Future Vol, veh/h	3	128	179	10	4	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	3	145	203	11	5	2

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	214	0	-	0	360	209
Stage 1	-	-	-	-	209	-
Stage 2	-	-	-	-	151	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1368	-	-	-	643	836
Stage 1	-	-	-	-	831	-
Stage 2	-	-	-	-	882	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1368	-	-	-	642	836
Mov Cap-2 Maneuver	-	-	-	-	642	-
Stage 1	-	-	-	-	829	-
Stage 2	-	-	-	-	882	-

Approach SE NW SW

HCM Control Delay, s	0.2	0	10.2
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1368	-	696
HCM Lane V/C Ratio	-	-	0.002	-	0.01
HCM Control Delay (s)	-	-	7.6	0	10.2
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0

6: Site Driveway
HCM 6th TWSC

2029 No-Build PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 0

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	0	0	0	0	0	0
Future Vol, veh/h	0	0	0	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	0	0	-	0	1	0
Stage 1	-	-	-	-	0	-
Stage 2	-	-	-	-	1	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	1022	-
Mov Cap-2 Maneuver	-	-	-	-	1022	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	1022	-

Approach SE NW SW

HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

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

3: Highland St & Asbury St HCM 6th TWSC

2029 Build AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 19.5

Movement	NBL	NBT	SBT	SBR	SEL	SER
Lane Configurations						
Traffic Vol, veh/h	83	324	297	32	108	156
Future Vol, veh/h	83	324	297	32	108	156
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	64	64	64	64	64	64
Heavy Vehicles, %	2	2	3	3	1	1
Mvmt Flow	130	506	464	50	169	244

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	514	0	0 1255 489
Stage 1	-	-	- 489 -
Stage 2	-	-	- 766 -
Critical Hdwy	4.12	-	- 6.41 6.21
Critical Hdwy Stg 1	-	-	- 5.41 -
Critical Hdwy Stg 2	-	-	- 5.41 -
Follow-up Hdwy	2.218	-	- 3.509 3.309
Pot Cap-1 Maneuver	1052	-	- 190 581
Stage 1	-	-	- 619 -
Stage 2	-	-	- 461 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1052	-	- ~ 157 581
Mov Cap-2 Maneuver	-	-	- ~ 157 -
Stage 1	-	-	- 513 -
Stage 2	-	-	- 461 -

Approach	NB	SB	SE
HCM Control Delay, s	1.8	0	71.2
HCM LOS			F

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
Capacity (veh/h)	1052	-	157	581	-	-
HCM Lane V/C Ratio	0.123	-	1.075	0.42	-	-
HCM Control Delay (s)	8.9	0	151.4	15.6	-	-
HCM Lane LOS	A	A	F	C	-	-
HCM 95th %tile Q(veh)	0.4	-	8.7	2.1	-	-

Notes

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

5: Asbury St & Canter Brook Ln
HCM 6th TWSC

2029 Build AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 0.5

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	3	253	114	1	11	2
Future Vol, veh/h	3	253	114	1	11	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	65	65	65	65	65	65
Heavy Vehicles, %	2	2	2	2	0	0
Mvmt Flow	5	389	175	2	17	3

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	177	0	-	0	575	176
Stage 1	-	-	-	-	176	-
Stage 2	-	-	-	-	399	-
Critical Hdwy	4.12	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.218	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1399	-	-	-	483	872
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	682	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1399	-	-	-	481	872
Mov Cap-2 Maneuver	-	-	-	-	481	-
Stage 1	-	-	-	-	855	-
Stage 2	-	-	-	-	682	-

Approach SE NW SW

HCM Control Delay, s	0.1	0	12.2
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1399	-	517
HCM Lane V/C Ratio	-	-	0.003	-	0.039
HCM Control Delay (s)	-	-	7.6	0	12.2
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

6: Site Driveway
HCM 6th TWSC

2029 Build AM
Timing Plan: Weekday AM

Intersection

Int Delay, s/veh 0.4

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	1	245	113	3	11	2
Future Vol, veh/h	1	245	113	3	11	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	266	123	3	12	2

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	126	0	-	0	393	125
Stage 1	-	-	-	-	125	-
Stage 2	-	-	-	-	268	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1460	-	-	-	611	926
Stage 1	-	-	-	-	901	-
Stage 2	-	-	-	-	777	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1460	-	-	-	610	926
Mov Cap-2 Maneuver	-	-	-	-	610	-
Stage 1	-	-	-	-	900	-
Stage 2	-	-	-	-	777	-

Approach SE NW SW

HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1460	-	644
HCM Lane V/C Ratio	-	-	0.001	-	0.022
HCM Control Delay (s)	-	-	7.5	0	10.7
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0.1

3: Highland St & Asbury St HCM 6th TWSC

2029 Build PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 3.6

Movement	NBL	NBT	SBT	SBR	SEL	SER
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Lane Configurations						
Traffic Vol, veh/h	156	252	233	42	21	116
Future Vol, veh/h	156	252	233	42	21	116
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	50	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	2	2	1	1
Mvmt Flow	168	271	251	45	23	125

Major/Minor	Major1	Major2	Minor2
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Conflicting Flow All	296	0	0	881	274
Stage 1	-	-	-	274	-
Stage 2	-	-	-	607	-
Critical Hdwy	4.11	-	-	6.41	6.21
Critical Hdwy Stg 1	-	-	-	5.41	-
Critical Hdwy Stg 2	-	-	-	5.41	-
Follow-up Hdwy	2.209	-	-	3.509	3.309
Pot Cap-1 Maneuver	1271	-	-	318	767
Stage 1	-	-	-	774	-
Stage 2	-	-	-	546	-
Platoon blocked, %	-	-	-	-	-
Mov Cap-1 Maneuver	1271	-	-	268	767
Mov Cap-2 Maneuver	-	-	-	268	-
Stage 1	-	-	-	653	-
Stage 2	-	-	-	546	-

Approach	NB	SB	SE
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HCM Control Delay, s	3.2	0	12
HCM LOS			B

Minor Lane/Major Mvmt	NBL	NBT	SELn1	SELn2	SBT	SBR
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Capacity (veh/h)	1271	-	268	767	-	-
HCM Lane V/C Ratio	0.132	-	0.084	0.163	-	-
HCM Control Delay (s)	8.3	0	19.7	10.6	-	-
HCM Lane LOS	A	A	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	0.3	0.6	-	-

Intersection

Int Delay, s/veh 0.2

Movement SEL SET NWT NWR SWL SWR

Lane Configurations						
Traffic Vol, veh/h	2	133	188	10	4	2
Future Vol, veh/h	2	133	188	10	4	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	88	88	88	88	88	88
Heavy Vehicles, %	0	0	1	1	0	0
Mvmt Flow	2	151	214	11	5	2

Major/Minor Major1 Major2 Minor2

Conflicting Flow All	225	0	-	0	375	220
Stage 1	-	-	-	-	220	-
Stage 2	-	-	-	-	155	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1356	-	-	-	630	825
Stage 1	-	-	-	-	821	-
Stage 2	-	-	-	-	878	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1356	-	-	-	629	825
Mov Cap-2 Maneuver	-	-	-	-	629	-
Stage 1	-	-	-	-	819	-
Stage 2	-	-	-	-	878	-

Approach SE NW SW

HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt NWT NWR SEL SETSWLn1

Capacity (veh/h)	-	-	1356	-	683
HCM Lane V/C Ratio	-	-	0.002	-	0.01
HCM Control Delay (s)	-	-	7.7	0	10.3
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0

6: Site Driveway
HCM 6th TWSC

2029 Build PM
Timing Plan: Weekday PM

Intersection

Int Delay, s/veh 0.3

Movement	SEL	SET	NWT	NWR	SWL	SWR
Lane Configurations						
Traffic Vol, veh/h	2	131	181	9	5	2
Future Vol, veh/h	2	131	181	9	5	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	2	142	197	10	5	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	207	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.12	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.218	-	-
Pot Cap-1 Maneuver	1364	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1364	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	SE	NW	SW
HCM Control Delay, s	0.1	0	10.3
HCM LOS			B

Minor Lane/Major Mvmt	NWT	NWR	SEL	SET	SWLn1
Capacity (veh/h)	-	-	1364	-	693
HCM Lane V/C Ratio	-	-	0.002	-	0.011
HCM Control Delay (s)	-	-	7.6	0	10.3
HCM Lane LOS	-	-	A	A	B
HCM 95th %tile Q(veh)	-	-	0	-	0

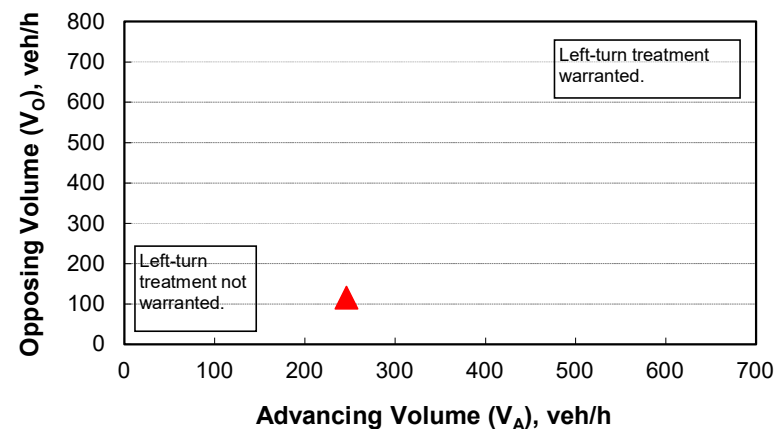
AUXILIARY LANE WARRANTS ANALYSIS

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:	43
Percent of left-turns in advancing volume (V_A), %:	0%
Advancing volume (V_A), veh/h:	246
Opposing volume (V_O), veh/h:	116

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	2305
Guidance for determining the need for a major-road left-turn bay:	
Left-turn treatment NOT warranted.	

**CALIBRATION CONSTANTS**

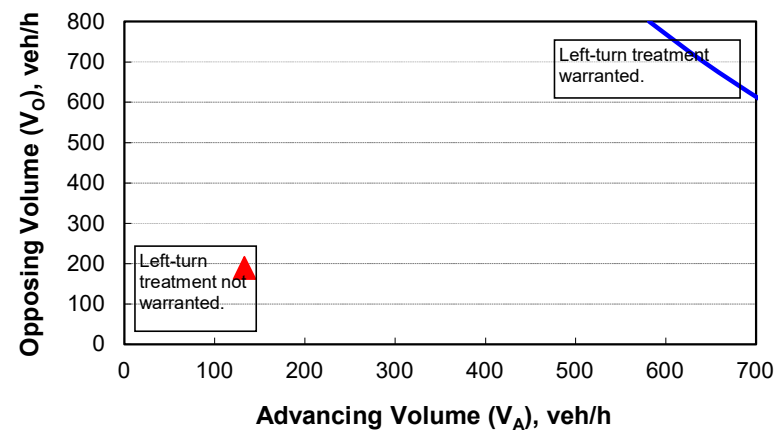
Variable	Value
Average time for making left-turn, s:	3.0
Critical headway, s:	5.0
Average time for left-turn vehicle to clear the advancing lane, s:	1.9

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:	43
Percent of left-turns in advancing volume (V_A), %:	2%
Advancing volume (V_A), veh/h:	133
Opposing volume (V_O), veh/h:	190

OUTPUT

Variable	Value
Limiting advancing volume (V_A), veh/h:	1099
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:	43
Major-road volume (one direction), veh/h:	116
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	1274
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

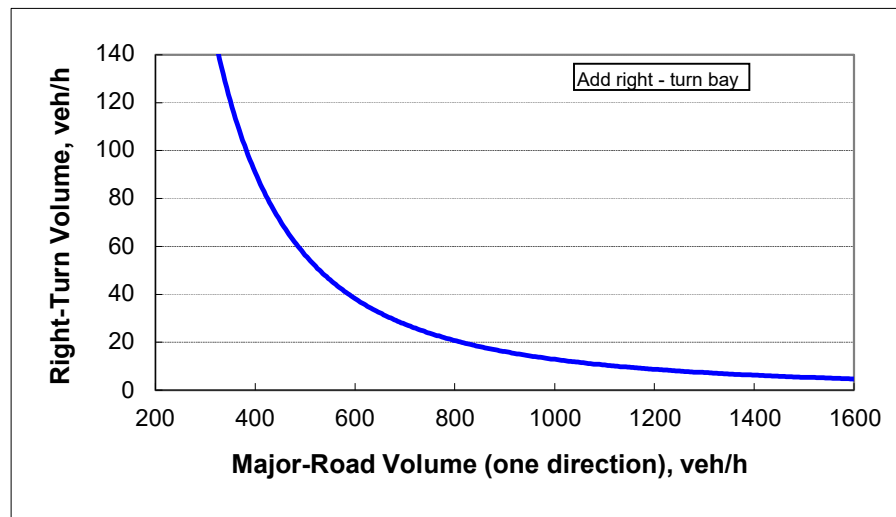


Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

INPUT

Roadway geometry:	2-lane roadway
Variable	Value
Major-road speed, mph:	43
Major-road volume (one direction), veh/h:	190
Right-turn volume, veh/h:	9

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	445
Guidance for determining the need for a major-road right-turn bay for a 2-lane roadway:	
Do NOT add right-turn bay.	

