MELROSE, MASSACHUSETTS

99 Washington Street Traffic Impact Study

Prepared for Oak Grove Mill, LLC

Prepared by Howard Stein Hudson

November 2019 updated December 10, 2019







99 Washington Street, Melrose Transportation Study

Prepared for Oak Grove Mill, LLC

Prepared by Howard Stein Hudson

November 20, 2019

In accordance with Chapter 235-16.1 of the Zoning Ordinance of the City of Melrose, I certify that this transportation study has been prepared under my immediate supervision and that I have experience and training in the field of traffic and transportation engineering.

Signed,

A. en (x

Keri Pyke, P.E., PTOE MA PE license #47252 Howard Stein Hudson November 20, 2019



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Introduction

In accordance with Chapter 235-16.1 of the Zoning Ordinance of the City of Melrose, Massachusetts, proponents of major construction projects are required to submit a transportation study to the City as part of the Site Plan submission criteria that assesses existing and future traffic conditions. Howard Stein Hudson (HSH) has prepared this study for Oak Grove Mill, LLC, a joint venture of Insight Partners and Eastern Real Estate (collectively the Proponent). The study presents the traffic and parking impacts associated with the proposed redevelopment of 99 Washington Street. This report has been prepared as part of the Site Plan Review process submission to the City.

Project Description

The Project Site at 99 Washington Street is currently occupied by a variety of commercial businesses, including a furniture store, several small offices, and a photo studio. Surface parking provided throughout the site serves the existing uses. With the proposed Project, the existing building will be renovated into a residential development as summarized in **Table 1** below.

Table 1. Proposed Development Program

Land Use	Proposed Project
Residential	Up to 141 units
Vehicle Parking	Approx. 172 spaces Including approx.158 spaces for residents and approx.14 spaces for visitors

Study Area

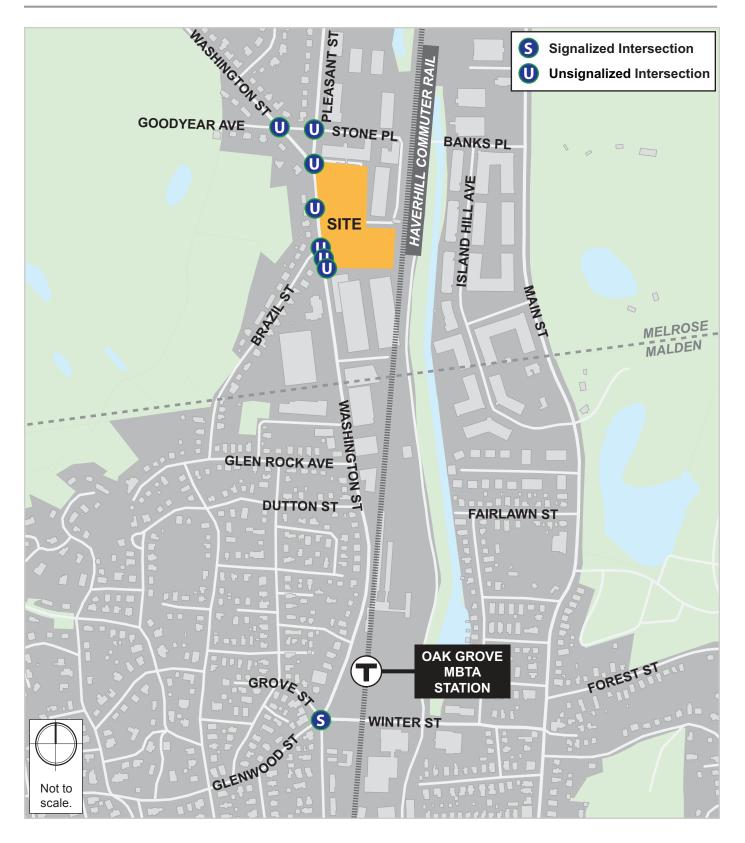
The study area intersections, as shown in **Figure 1** and listed below, include one signalized intersection and seven unsignalized intersections:

- Washington Street/Glenwood Street/Winter Street/Grove Street (signalized);
- Washington Street/ /Goodyear Avenue/Stone Place (unsignalized);
- Pleasant Street/Stone Place (unsignalized);
- Washington Street/Pleasant Street/99 Washington Street Site Driveway (unsignalized);
- Washington Street/99 Washington Street Site Driveway (unsignalized);
- Washington Street/Brazil Street/99 Washington Street Site Enter Driveway (unsignalized);
- Washington Street/99 Washington Street Site Exit Driveway (unsignalized); and
- Washington Street/37 Washington Street Site Driveway (unsignalized).





Figure 1. Study Area





Summary

Key transportation characteristics of the Project and analysis results include:

- The Project site is located within one of Melrose's Smart Growth Districts. While the primary purposes of such districts are to promote economic development and provide housing options to various income levels, the key transportation-related goals are to create pedestrian-friendly environments that promote walking, bicycling, and transit use and encourage reduced reliance on auto travel and auto ownership. The Proponent supports the goals of Smart Growth zoning and believes the Project will foster the use of alternative travel modes while adequately meeting tenant parking demands.
- The Project will provide a total of approximately 172 vehicle parking spaces, with approximately 158 designated to residential parking and 14 designated to visitor parking. The overall Project parking ratio will be 1.22 spaces per unit (172 spaces/141 units).
- Parking spaces will be rented separately from the units, or "unbundled", such that residents without a vehicle will not pay for parking. Parking spaces will be leased at market rates.
 Parking stickers will be obtained through the management office and residents will be assigned a specific, numbered space. Parking will not be leased to non-residents.
- In partnership with a car-share company, such as Zipcar, the Proponent is committed to establishing at least one car share space within the parking lot.
- Per the Smart Growth zoning, the Project is required to include seven on-site, secure bicycle parking spaces for residents. The Proponent, however, will construct many more than the zoning minimum and is committed to providing approximately 30 secure residential bicycle parking spaces interior to the building and approximately five visitor bicycle spaces exterior to the building.
- During the a.m. peak hour, the Project will generate 22 net new vehicle trips, and during the p.m. peak hour, the Project will generate 27 net new vehicle trips. The operational level of service at nearby intersections will not change as a result of the new Project vehicle trips.
- The Project's larger deliveries, move-in/move-out activity, and trash pick-up will occur offstreet at the rear of the building. Overall, the number of daily truck trips generated at the site is expected to significantly decrease because two existing businesses - Marty's Furniture and Fotronic Electronic Testing Equipment – will vacate the building and no longer generate truck trips.
- The Proponent is committed to implementing Transportation Management Plan (TMP) elements in an effort to minimize the number of Project vehicle trips on the adjacent

roadway network. TMP measures will promote the use of nearby public transportation services (including the MBTA Orange Line, buses, and commuter rail), walking, and bicycling, and other options to reduce single occupant vehicle trips.

- To encourage transit use, the Proponent will provide each new resident with one MBTA pass (monthly link) for one calendar month.
- With the reconfiguration of Project driveways, the total length of curb cut openings along Washington Street will be reduced by about 80 feet, improving the pedestrian realm along this important walking connection between the neighborhood and the MBTA's Oak Grove Station.
- Other pedestrian realm improvements include raised sidewalks across the driveways at the main entrance, and, in the rear parking lot, a crosswalk connecting between the parking area and the rear building entrance. New lighting will be installed throughout the site and along Washington Street to maximize visibility and safeguard pedestrian activity at night. At vehicle driveways, signs will be posted to alert drivers to pedestrian activity.



Existing Condition

Existing Roadway Descriptions

The study area includes the following roadways described below, categorized according to the Massachusetts Office of Transportation Planning classifications. All roadways are under the jurisdiction of the City of Melrose.

Washington Street is an urban minor arterial roadway under local jurisdiction running in a northsouth direction from Fellsway East in Melrose to the north and Exchange Street in Malden to the south. Within the project area, Washington Street is a two-way roadway and has a posted speed limit of 25 mph. A radar speed feedback sign near the Project site alerts northbound drivers on Washington Street of their travel speed. Concrete sidewalks are provided on both sides of Washington Street within the study area. On-street parking is only permitted along the west side of Washington Street between Brazil Street and the Malden city limit.

Pleasant Street is a two-way urban minor arterial roadway under local jurisdiction running in a north-south direction from West Wyoming Avenue to the north to Washington Street to the south. Melrose has a citywide speed limit of 25 mph, which applies to Pleasant Street. Concrete sidewalks are provided on both sides of the street within the study area. On-street parking is permitted along the west side of Pleasant Street only between the hours of 8:00 a.m. – 6:00 p.m.

Existing Intersection Description

Washington Street/Winter Street/Glenwood Street/Grove Street, located in Malden, is a signalized intersection with four approaches. The Glenwood Street eastbound approach consists of a shared left-turn/through/right-turn lane. The Winter Street westbound approach consists of a shared left-turn/through lane and a shared through lane with a channelized right-turn. Each of the Washington Street northbound and southbound approaches consist of a wide, unmarked single lane. Drivers, however, treat the approach as having two lanes. An MBTA bus stop is located on the west side Washington Street, north of the intersection. Crosswalks and wheelchair ramps are provided across all legs of the intersection. On-street parking is permitted along Grove Street. On-street resident permit parking is allowed on the east side of the south leg of Washington Street beginning approximately 75 feet south of the intersection.

Pleasant Street/Stone Place is an unsignalized intersection with four approaches. The Stone Place eastbound approach consists of a shared left-turn/through/right-turn lane. Providing access



and egress to a private parking lot, the Stone Place westbound approach consists of a shared leftturn/through/right-turn lane. Both the Stone Place approaches are stop-controlled. The Pleasant Street northbound and southbound approaches consist of a shared left-turn/through/right-turn lane and operate as free movements. A Massachusetts Bay Transportation Authority (MBTA) bus stop is located along each side of Pleasant Street, north of the intersection. A crosswalk and wheelchairs ramps are provided across the southbound approach only. On-street parking is not permitted in the vicinity of the intersection.

Washington Street/Stone Place/Goodyear Avenue is an unsignalized intersection with three approaches. The Goodyear Avenue eastbound approach and the Stone Place westbound approach each consist of a shared left-turn/through lane/right-turn lane. Both approaches are stop-controlled. The Washington Street southbound approach consists of a shared left-turn/through/right-turn lane and operates as a free movement. The south leg of Washington Street is one-way leaving the intersection. Crosswalks and wheelchair ramps are not provided across any of the approaches. Onstreet parking is not permitted in the vicinity of the intersection.

Washington Street/Pleasant Street/Site Driveway is an unsignalized intersection with four approaches. The Washington Street eastbound approach consists of a shared left-turn/through/right-turn lane. The Site Driveway westbound approach consists of a shared left-turn/right-turn lane. The Washington Street northbound approach consists of a shared through/right-turn lane and the Pleasant Street southbound approach consists of a shared left-turn/through lane. No crosswalks or wheelchair ramps are provided at this intersection. On-street parking is not permitted in the vicinity of the intersection.

Washington Street/Brazil Street/Site Driveway is an unsignalized intersection with three approaches. The Brazil Street eastbound is stop-controlled and consists of a shared left-turn/through/right-turn lane. The Washington Street northbound approach consists of a shared left-turn/through/right-turn lane. An MBTA bus stop is located along each side of Washington Street, south of the intersection. The Washington Street southbound approach consists of a shared left-turn/through/right-turn lane. Crosswalks and wheelchair ramps exist across the Brazil Street eastbound approach and the Washington Street southbound approach. On-street parking is not permitted in the vicinity of the intersection.

Existing Traffic Data

Turning movement counts (TMCs) and vehicle classification counts were conducted during the weekday a.m. and p.m. peak periods (7:00 - 9:00 a.m. and 4:00 - 6:00 p.m., respectively). The TMCs included automobile, truck, pedestrian, and bicycle movements. The traffic volume data for the



unsignalized intersections and existing site driveways were collected on Thursday, September 5, 2019. Counts at the signalized intersection of Washington Street/Winter Street/Glenwood Street were conducted on Wednesday, October 16, and October 22, 2019. The detailed traffic counts are provided in Appendix A.

As is standard practice to adjust traffic count data by a seasonal factor to obtain average annual volumes. To account for seasonal variation in traffic, the study team reviewed MassDOT's 2017 weekday seasonal adjustment factor for Group U4-U7 (Urban Minor Arterials, Major and Minor Collectors, and Local Road and Streets.). The seasonal adjustment factor for September is 0.92. Because application of this factor would have yielded volumes 8% lower than the actual counts, the study team conservatively chose not to apply a seasonal adjustment and to use the higher count data for analysis.

Figure 2 and Figure 3 present the existing intersection volumes for the weekday a.m. peak hour and weekday p.m. peak hour, respectively.



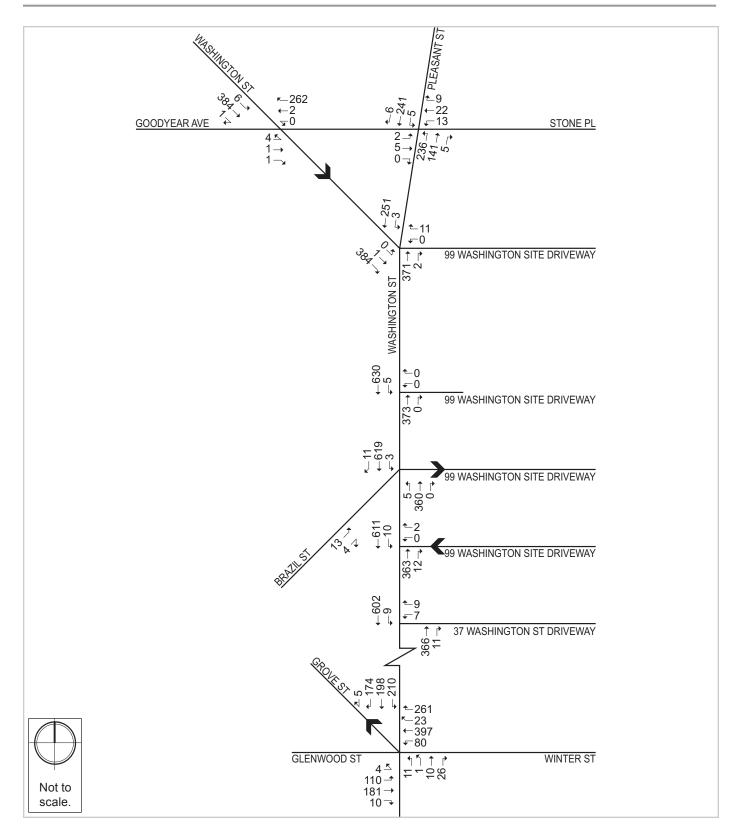


Figure 2. Existing (2019) Condition Traffic Volumes, Weekday a.m. Peak Hour



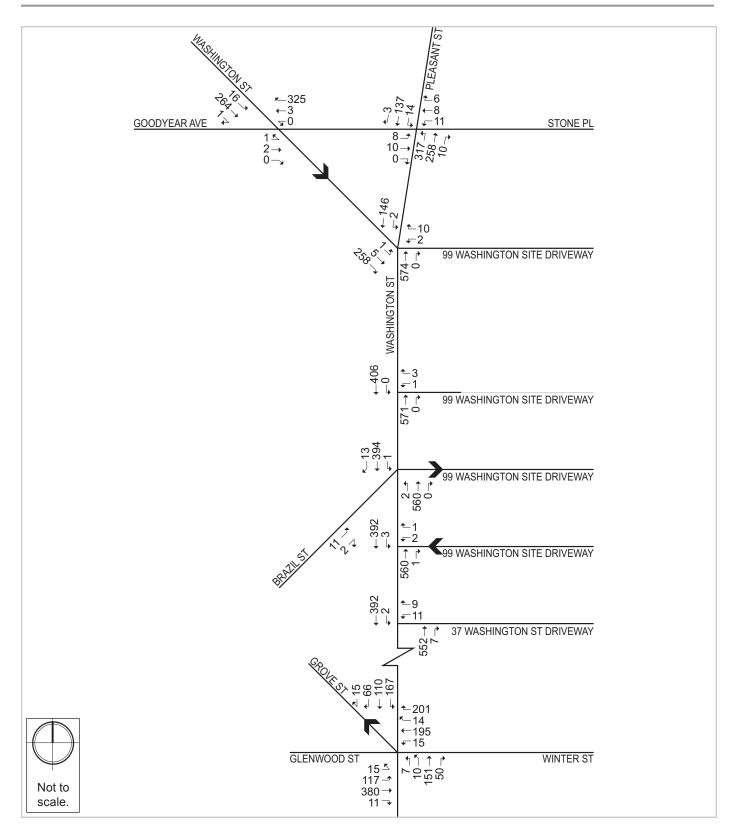


Figure 3. Existing (2019) Condition Traffic Volumes, Weekday p.m. Peak Hour



Crash History

To understand safety conditions at the study intersections, the study team obtained the last full available three years (2016-2018) of crash data from the State of Massachusetts and the Melrose Police Department. In MassDOT District 4, where the Project site is located, the average number of crashes is 0.73 crashes per million entering vehicles (MEV) at signalized intersections and 0.57 crashes per MEV at unsignalized intersections. Typically, study intersections with higher than average crash rates should be studied further by the jurisdictional agency.

Table 2 shows the crash summary information, including the number per location and the associated crash rates. Based on the results, no intersections in the study area exceed the District 4 average crash rate. Note that no pedestrians were involved in any of these crashes. Crash rate worksheets are provided in **Appendix A**.

	Signalized	Unsignalized				
Characteristic	Washington St./ Winter St./ Glenwood St./ Grove St.	Washington St./Goodyear Ave./Stone PI.	Pleasant St./ Stone Pl.	Washington St./Pleasant St./Site Driveway	Washington St./Brazil St./ Site Driveway	
Year						
2016	2	0	2	2	1	
2017	1	1	0	1	0	
2018	2	0	1	2	0	
Crash Type						
Angle	3	0	1	1	0	
Rear-end	0	0	0	1	1	
Single vehicle	0	1	1	0	0	
Sideswipe	0	0	1	0	0	
Head-on	2	0	0	1	0	
Parked Vehicle	0	0	0	0	0	
Pedestrian	0	0	0	0	0	
Not Reported	0	0	0	2	0	
Weather						
Clear	4	0	3	2	1	
Cloudy	0	0	0	1	0	
Rain	1	1	0	0	0	
Snow	0	0	0	0	0	
Not Reported	0	0	0	2	0	
Total Crashes	5	1	3	5	1	
Crash Rate ¹	0.25	0.13	0.34	0.41	0.08	
District Average	0.73	0.57				

Table 2.	Crach Histor	v at Study Intersections,	2016_2018
1 uote 2.		a u sinay miersections,	2010-2010

1 Crash rate = Crashes per million entering vehicles



Existing Parking

Several surface parking areas, with approximately 128 marked spaces, are located throughout the Project Site. A separate, fenced paved area is located in the rear of the site providing parking for trailer trucks, which could accommodate approximately an additional 90 surface parking spaces. As shown in **Figure 4**, on-street parking consists of residential permit parking and limited availability to the general public in the vicinity of the Project site.

Existing Car Sharing Locations

The increasingly popular car sharing services provide easy access to vehicular transportation for urban residents who do not own cars and employees who commute by transit but need short-term use of a vehicle. Zipcar, a local car-sharing provider, offers vehicles that are rented on an hourly basis, with vehicle costs (gas, maintenance, insurance, and parking) included in the rental fee. Vehicles are checked out for a specific time period and returned to their designated location.

Table 3 lists the two nearby Zipcar locations with a current total of four vehicles available.

Zipcar Location	Distance from Site
Oak Grove MBTA Station	Half-mile
Windsor at Oak Grove – 2 Island Hill Avenue	One mile

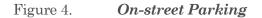
Table 3.Existing Zipcar Locations

Existing Public Transportation

The Project area is served by several MBTA public transportation options, including the Orange Line at Oak Grove Station and several bus routes. While the MBTA Haverhill Line tracks are adjacent to the Project site and pass through Oak Grove Station, commuter trains do not stop at Oak Grove Station. The nearest commuter rail station is about one-half mile north at Wyoming Hill. The Project site is located within 1/4-mile (10-minute walk) of the Orange Line and bus services summarized in **Table 4** and mapped in **Figure 5**. The transit-oriented nature of the Project site will allow residents to conveniently choose to forego auto ownership and to rely on public transportation for many of their daily trips.

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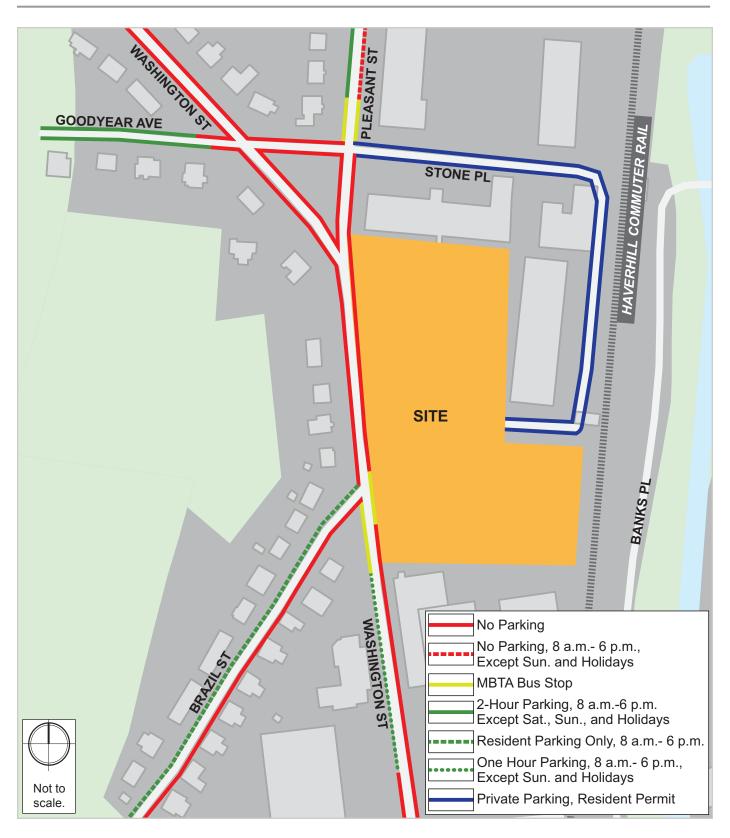
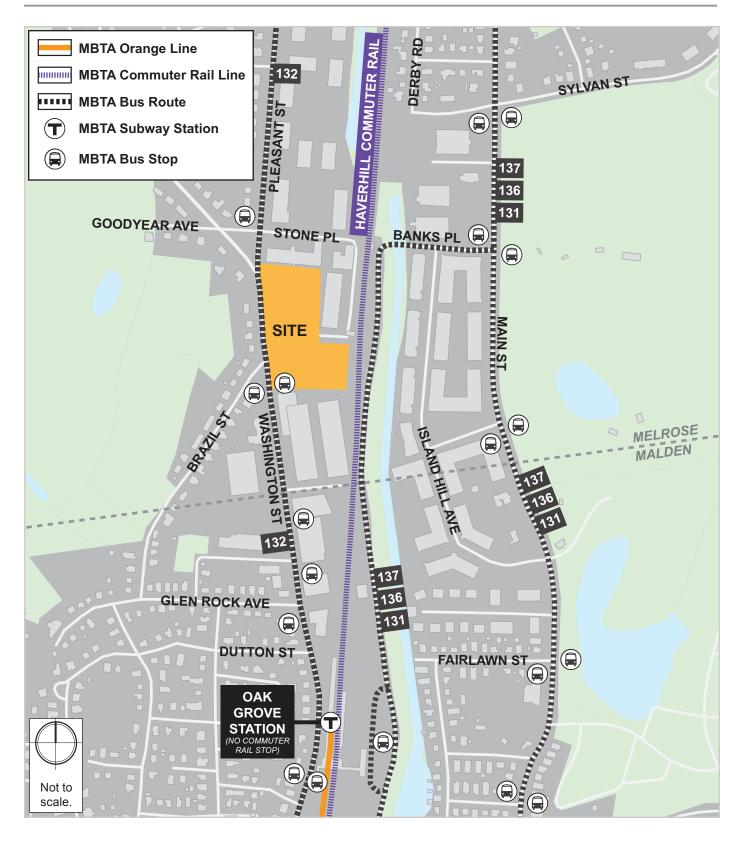




Figure 5. *Public Transportation*





Route	Description				
Commuter Rail	Haverhill to North Station Nearest stop is Wyoming Hill Station in Melrose. No service at Oak Grove.	30			
Orange Line	Oak Grove–Forest Hills	6			
Route 131	Melrose Highlands Station - Malden Center Station	20			
Route 132	Redstone Shopping Center – Malden Center Station	20-35			
Route 136	Reading Depot - Malden Station	5-30			
Route 137	Reading Depot - Malden Station	30-60			

Table 4.MBTA Transit Service in the Study Area

Headway is the time between vehicles. Source MBTA 2019.

Existing Pedestrian and Bicycle Conditions

The Project study area is equipped with adequate pedestrian accommodations. Sidewalks of sufficient width are generally provided along both sides of every study area roadway. Crosswalks are limited in the study area intersections and are usually provided across one or two legs the unsignalized intersections.

In recent years, bicycle use has increased and communities are incorporating bicycle facilities (bicycle lanes/paths) into the public realm. The City of Melrose is currently piloting a dockless bike share program, Lime (formerly known as LimeBike), where users can use their phones to find, unlock, and rent bikes for short-term use. Lime will station bikes in different "hot" spots around Melrose, including downtown and MBTA commuter rail and subway stations.

For this study, pedestrian crosswalk counts and bicycle turning movement counts were collected during peak hours at the study intersections, as shown in **Figure 6** and **Figure 7**, respectively. Pedestrian activity is moderate along Washington Street corridor with approximately 60 pedestrians per hour during the morning and approximately 80 pedestrians per hour during the evening.

Although the study area lacks adequate bicycle accommodations, Washington Street experiences moderate bicycle volumes; between 15-20 bicycles per hour were observed at study intersections during the a.m. and p.m. peak hours.



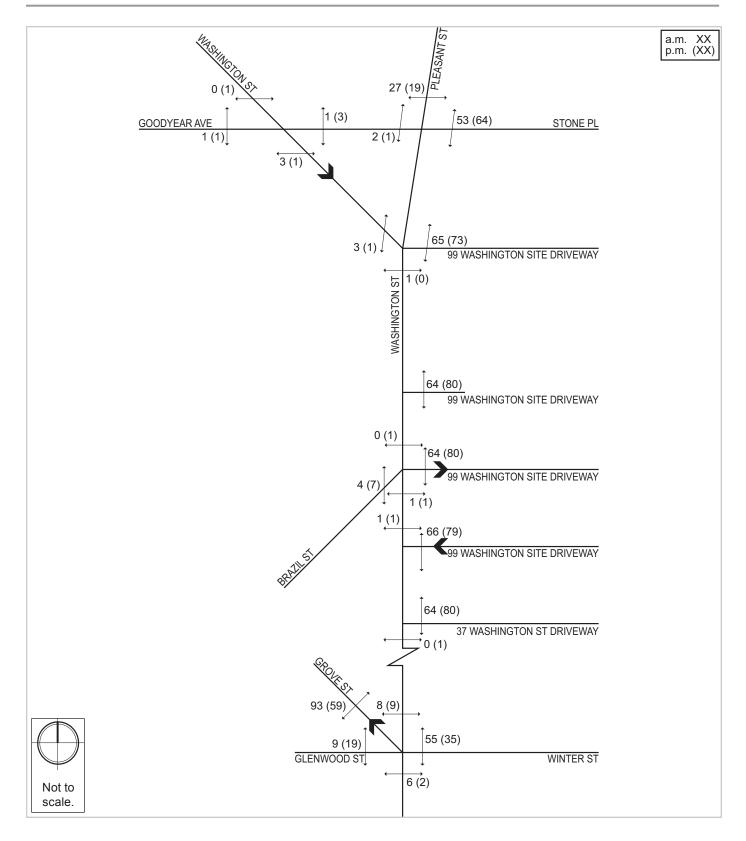


Figure 6. Existing (2019) Condition Pedestrian Volumes, Weekday a.m. and p.m. Peak Hours



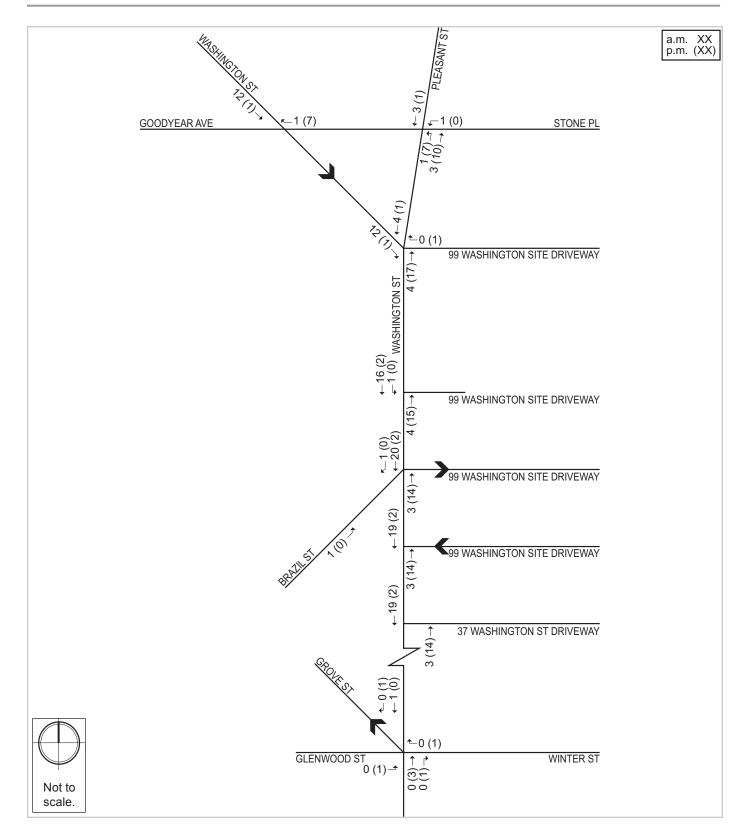


Figure 7. Existing (2019) Condition Bicycle Volumes, Weekday a.m. and p.m. Peak Hours



No-Build (2026) Condition

For transportation impact analyses, standard practice is to evaluate two future conditions: No-Build Condition (without the proposed project) and Build Condition (if the project is built). Typically, these conditions are projected to a future date seven years from the Existing (2019) Condition year. For this study, Year 2026 has been designated as the future year. The traffic volumes under the No-Build Condition are independent of the proposed Project and include existing traffic plus new traffic resulting from general background growth and identified new projects in the area.

Background Traffic Growth

The methodology to account for generic future background traffic growth is to evaluate how traffic volumes may be affected by changes in demographics, smaller development projects, or projects unforeseen at this time. Based on a review of recent and historic traffic data collected and to account for any additional unforeseen traffic growth, a 0.25% annual growth rate was applied to the existing intersection volumes over seven years to account for background growth by 2026. No-Build (2026) Condition traffic volumes, which incorporate the background growth rate, are shown in **Figure 8** and **Figure 9** for the a.m. and p.m. peak hours, respectively.



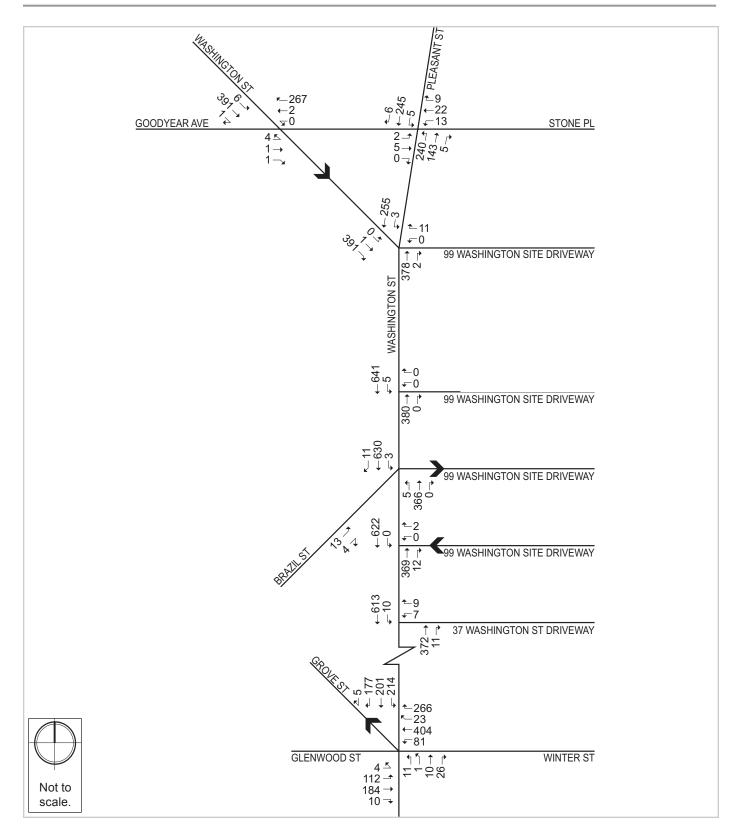


Figure 8. No-Build (2026) Condition Traffic Volumes, Weekday a.m. Peak Hour



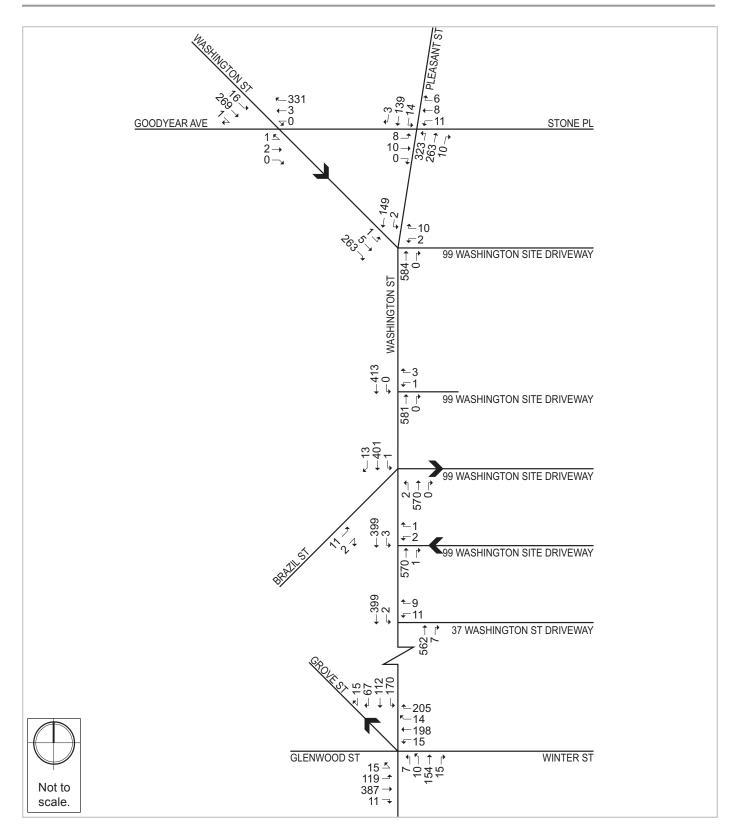


Figure 9. No-Build (2026) Condition Traffic Volumes, Weekday p.m. Peak Hour



Build (2026) Condition

Under the Build Condition new Project trips are incorporated into the traffic evaluation. Intersections volumes are typically the sum of No-Build Condition volumes and new volumes generated by the Project. Additionally, for this study, the trips generated by the active existing uses on the site were removed from the study intersections since those uses will no longer generate trips.

Site Access and Circulation

The site plan for the proposed Project is shown in **Figure 10**. The primary pedestrian entrance to the building will be located on Washington Street at the building's residential lobby. Residents will also have secure access to the building from the rear parking area.

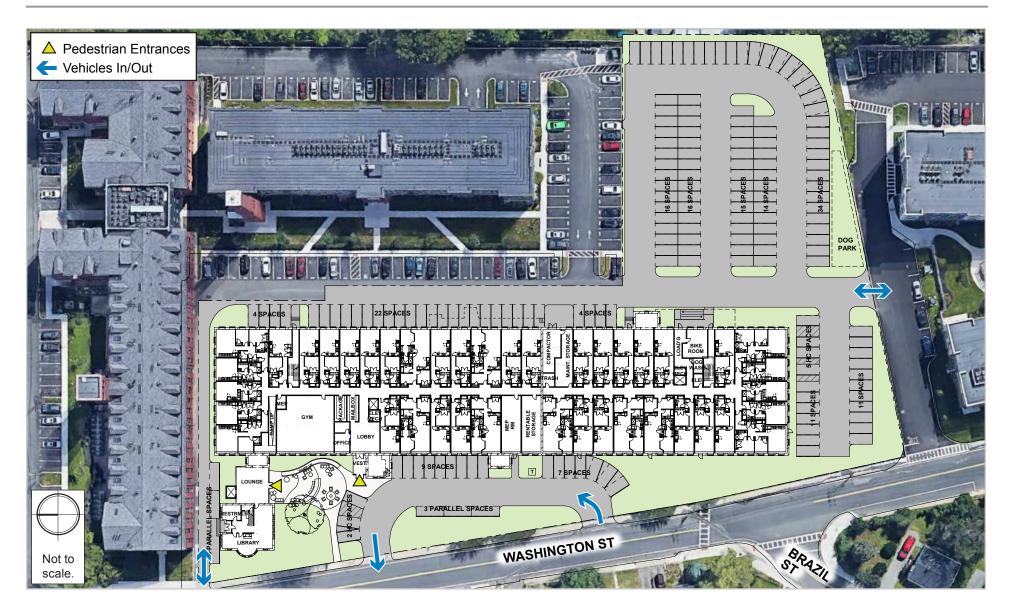
The current Project site has four driveways along Washington Street. With the redevelopment, the number of site driveways will be reduced to three with a reconfiguration that will better serve the Project and provide safer environment for pedestrians. Vehicle access and egress along Washington Street is described below:

- The two driveways (enter only and exit only) currently located at the southern end of the Site, opposite Brazil Street, will be removed. Note that the combined curbcut for these two existing driveways along the eastern side of Washington Street is approximately 90 feet in length. Through a shared easement with the adjacent 37 Washington Street, southern access and egress to the Project Site will occur via the existing 37 Washington Street driveway. Not only does this plan consolidate vehicle activity at one driveway (at 37 Washington Street) and remove the conflicting Site driveway turns opposite from Brazil Street, it also creates a better pedestrian realm by eliminating a 90-foot curb-cut adjacent to the sidewalk.
- As part of an enhanced main entrance to the building, the Proponent will create a one-way, counterclockwise circulation driveway with adjacent parking for about 22 vehicles, primarily designated to visitors and accessible/handicapped users. As part of the one-way circulation plan, the existing curbcut located central to the Site will remain and serve as an enter-only driveway. A new exit only curbcut will be constructed as part of the main entrance improvements.
- The existing site northern driveway, opposite where Washington Street merges into Pleasant Street, will remain in place.



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Figure 10. Site Plan





Parking

The Project site is located within one of Melrose's Smart Growth Districts. While the primary purposes of such districts are to promote economic development and provide housing options to various income levels, the key transportation-related goals are to create pedestrian-friendly environments that promotes walking, bicycling and transit use and encourage reduced reliance on auto travel and auto ownership. Under Smart Growth zoning, off-street residential vehicle parking may be provided between 1.0 - 1.5 spaces per unit. A parking ratio below 1.25 spaces per unit requires a Special Permit from the Melrose Planning Board.

The Project will provide a total of approximately 172 parking spaces, with approximately 158 designated to residential parking and 14 designated to visitor parking. With a planned overall parking ratio of 1.22 spaces per unit (172 spaces/141 units), the Proponent will seek a special permit from the Planning Board. The Proponent supports the goals of Smart Growth zoning and believes the Project's planned parking supply will adequately meet resident parking demands while promoting decreased reliance on auto ownership.

Loading and Service Activity

Because many of twelve current building tenants are small businesses, much of the existing delivery activity is limited to small package delivery, such as UPS and FedEX. The two exceptions, however, are 1) Marty's Furniture where large trucks deliver furniture to the site and then out to retail customers, and 2) Fotronic Electronic Testing Equipment, an on-line order based business, that ships new and refurbished electronic equipment nationwide. Combined, these two businesses comprise over 60% of building space and generate a significant number of truck trips throughout the week.

With the redevelopment of the Project Site, the number of daily truck trips generated at the site is expected to significantly decrease. Larger deliveries, move-in/move-out activity, and trash pick-up will continue to occur at the rear of the building. No on-street loading will be permitted. Smaller deliveries such as take-out food, laundry/dry cleaning, etc., will occur at the residential lobby entrance on Washington Street.

Bicycle Accommodations

Per Melrose's Smart Growth zoning, on-site, secure bicycle parking at the Project must be provided at a rate of one space per twenty dwelling units. Therefore, the Project is required to provide seven bicycle parking spaces (141 units/20 spaces). The Proponent, however, will construct many more spaces than the zoning minimum and is committed to providing approximately 30 secure residential



bicycle parking spaces interior to the building and approximately five visitor bicycle spaces exterior to the building.

Trip Generation Methodology

Trip generation is a complex, multi-step process that produces an estimate of vehicle trips, transit trips, walk trips, and bicycle trips associated with a proposed development and a specific land use program. A project's location and proximity to different travel modes determine how people will travel to and from a project site.

EXISTING ACTIVITY

When assessing a site with existing, active land uses, it is standard practice to estimate existing trips (based on land use) and subtract those trips from the projected new future trips. At the existing 95,000 sf building, the two largest tenants are Marty's Furniture and Fotronic Electronic, which together occupy about 60,500 sf. The remaining 34,500 sf is about 90% occupied by twelve other tenants.

Trip generation based on rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation* (10th edition, 2017) were applied to the existing uses. The following ITE Land Use Codes (LUC) were used:

- LUC 890 Furniture Store. A furniture store is a full-service retail facility that specializes in the sale of furniture and often carpeting. Furniture stores are generally large and may include storage areas. The sites surveyed included both traditional retail furniture stores and warehouse stores with showrooms. Although some home accessories may be sold, furniture stores primarily focus on the sale of pre-assembled furniture. A majority of items sold at these facilities must be ordered for delivery. This LUC is most appropriate for Marty's Furniture.
- LUC 710 General Office Building. A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional service, insurance companies, investment brokers, and tenant services, such as a bank or savings and loan institution, a restaurant, or cafeteria and service retail facilities. This LUC is most appropriate for the variety of other businesses that occupy 99 Washington Street.

Table 5 shows the vehicle trips, based on the ITE methodology, that the existing site currently generates.



Los III-s	Daily			a.m. Peak Hour			p.m. Peak Hour		
Land Use	enter	exit	total	enter	exit	total	enter	exit	total
Office	80	80	160	16	3	19	3	16	19
Furniture Store	69	69	138	4	2	6	5	6	11
Total	149	149	298	20	5	25	8	22	30

Table 5.Existing Site Vehicle Trip Generation

PROJECT ACTIVITY

As is standard practice, new trip generation is based on rates published in the ITE *Trip Generation* (10th edition, 2017). The ITE rates, available for a variety of land uses, produce "unadjusted" vehicle trip estimates, which are converted to person trips based on vehicle occupancy. Through application of the appropriate travel mode share information for the specific study area, the total person trips are "adjusted" to vehicle, transit, and walk/bicycle trips. Detailed trip generation worksheets are provided in **Appendix A**.

To estimate the unadjusted number of vehicular trips for the Project, the following ITE LUCs were used:

LUC 220 – Multifamily Housing Low-Rise "Residential". Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have one or two levels (floors).

Although the Project will have three levels and Mid-Rise Residential (LUC 221) is an alternative choice for buildings with three to ten levels, LUC 220 was chosen as more appropriate for this Project because LUC 220 results in a higher number of trips and, therefore, a more conservative (i.e. higher impact) analysis.

Travel Mode Shares

Travel mode shares reflect the distribution of person trips among automobiles, transit, and walking/bicycling. As previously presented in **Table 4** and **Figure 5**, the Project area is near the MBTA Oak Grove Station and several bus routes. The transit-oriented nature of the Project site will allow some residents to conveniently choose to forego auto ownership and rely on public transit for many of their daily trips.



The American Census Survey (ACS) provides travel mode share rates for residents traveling from home to work and back via walking/biking, transit, and vehicles by census tract. The Site is located in Census Tract 3364.01. An average of the travel mode shares from the census tracts were adopted for the Project's residential land use.

The unadjusted vehicular trips were converted to person-trips by using vehicle occupancy rates published by the Federal Highway Administration (FHWA)¹. The person-trips were then distributed to different modes according to the mode shares shown in Table 6.

Table 6. Peak Hour Travel Mode Shares and Vehicle Occupancy

Land Use	Т	Average Vehicle		
	Vehicle	Transit	Walk/Bicycle	Occupancy (AVO)
Residential	68%	27%	5%	1.18

Project Trip Generation

The travel mode share percentages shown in **Table 6** were applied to the number of person trips to develop walk/bicycle, transit, and vehicle trip generation estimates for the Project. Vehicle trips include automobiles, taxicabs, and transportation network company (TNC) services, such as Uber and Lyft. The trip generation or the Project by travel mode is shown in Table 7. The detailed trip generation information is provided in the Appendix A.

¹ Summary of Travel Trends: 2017 National Household Travel Survey; FHWA; Washington, D.C.; July 2018



Time Period/ Direction				Vehicle Trips			
		Walk/Bicycle Trips	Transit Trips	Private	Taxicab/TNC	Total Vehicle Trips	
	In	31	164	333	36	369	
Daily	Out	31	164	333	36	369	
	Total	62	328	666	72	738	
	In	1	5	9	3	12	
a.m. Peak Hour	Out	3	16	32	3	35	
	Total	4	21	41	6	47	
	In	3	16	32	3	35	
p.m. Peak Hour	Out	2	9	19	3	22	
	Total	5	25	51	6	57	

Table 7. Project Trip Generation – Residential Land Use

The net vehicle trip generation for the Project was determined by adjusting the Project-generated vehicle trips to account for the removal for the trips associated with the existing uses on the Project site. The net vehicle trip generation for the Project during the weekday a.m. and p.m. peak hours is shown in **Table 8**.

Time Period/ Direction		Project-Generated Vehicle Trips	Existing Vehicle Trips (removed)	Net New Vehicle Trips
	In	12	20	-8
a.m. Peak Hour	Out	35	5	30
	Total	47	25	22
	In	35	8	27
p.m. Peak Hour	Out	22	22	0
	Total	57	30	27

Table 8. Net Vehicle Trip Generation During Peak Hours

As shown in **Table 8**, the Project is expected to generate approximately 22 more vehicle trips than under the Existing Conditions during the weekday a.m. peak hour and 27 more vehicle trips during the weekday p.m. peak hour.

The Project is expected to generate approximately 21 transit person trips during the a.m. peak hour and approximately 25 transit person trips during the p.m. peak hour. These new transit person trips are expected to primarily use the Orange Line to commute into and out of Boston.

It should be noted that the MBTA is currently in the process of replacing old Orange Line cars with new cars and upgrading signals and track. Also, as part of the Encore Casino's mitigation plan with the State, the number of Orange Line trains in operation will increase. With these improvements, which will increase schedule reliability and decrease delays and travel times, the Project's small number of additional transit person trips will not affect operations on the Orange Line.

Vehicle Trip Distribution

A vehicle trip distribution pattern identifies the various travel paths for vehicles arriving at a destination and the corresponding departure travel paths. New vehicle trips generated to the Project site will include mostly residents.

The trip distribution for new Project trips was based on previous studies done in the Melrose area, existing counts, and knowledge of the roadway system in the area. Figure 11 shows the trip distribution pattern for Project trips entering and exiting the site driveways.

Build Traffic Volumes

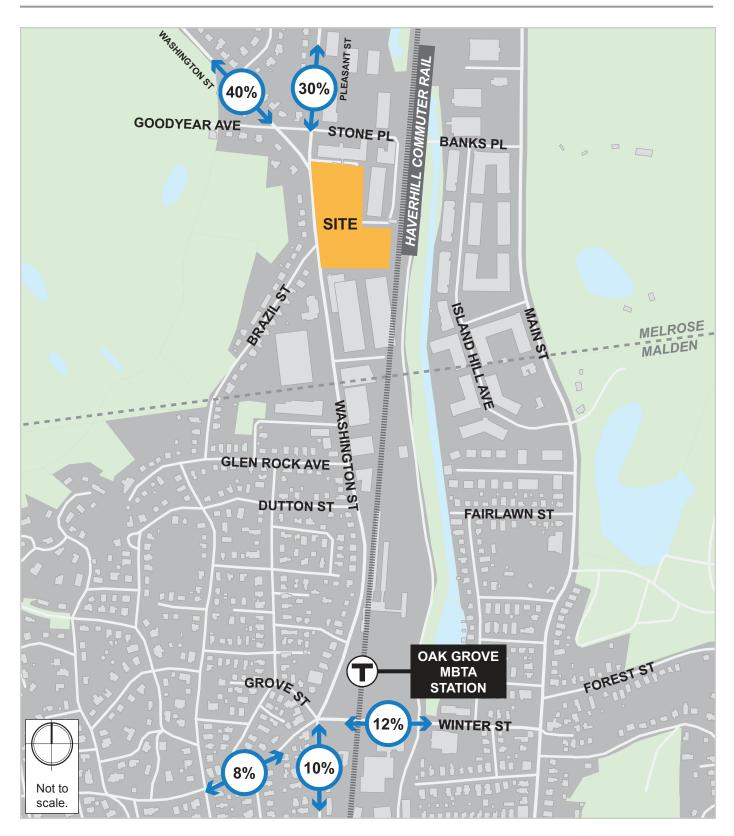
The Project-generated vehicle trips were distributed throughout the study area according to the trip distribution patterns. The Project-generated trips at the study area intersections are shown for the weekday a.m. peak hour and the weekday p.m. peak hour in **Figure 12** and **Figure 13**, respectively.

The trip assignments were added to the No-Build (2026) Condition vehicular traffic volumes to produce the Build (2026) Condition vehicular traffic volumes. The Build (2026) Condition a.m. and p.m. peak hour traffic volumes are shown in Figure 14 and Figure 15, respectively.











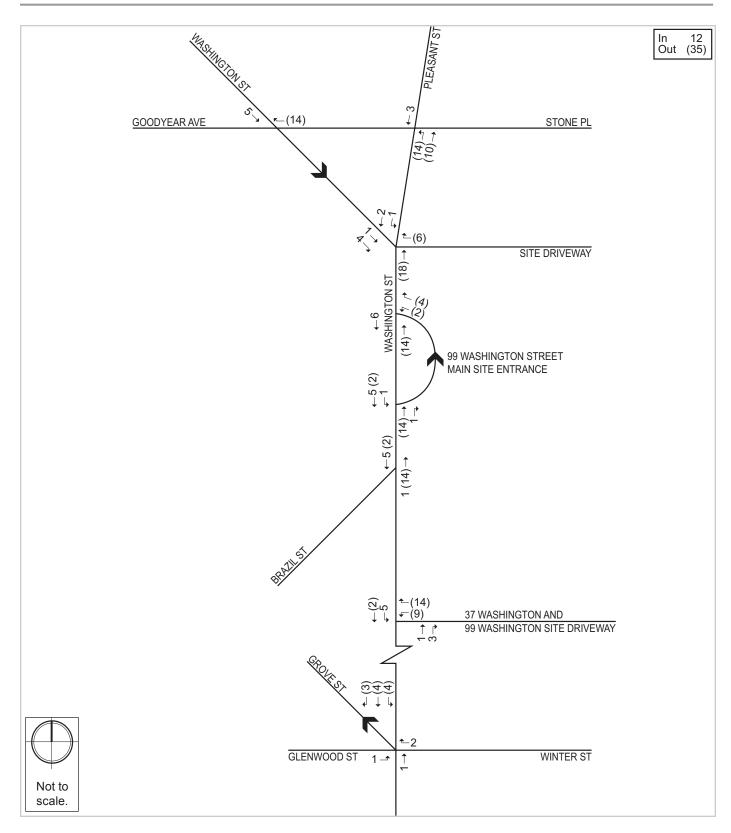


Figure 12. *Project-generated Vehicle Trips, Weekday a.m. Peak Hour*



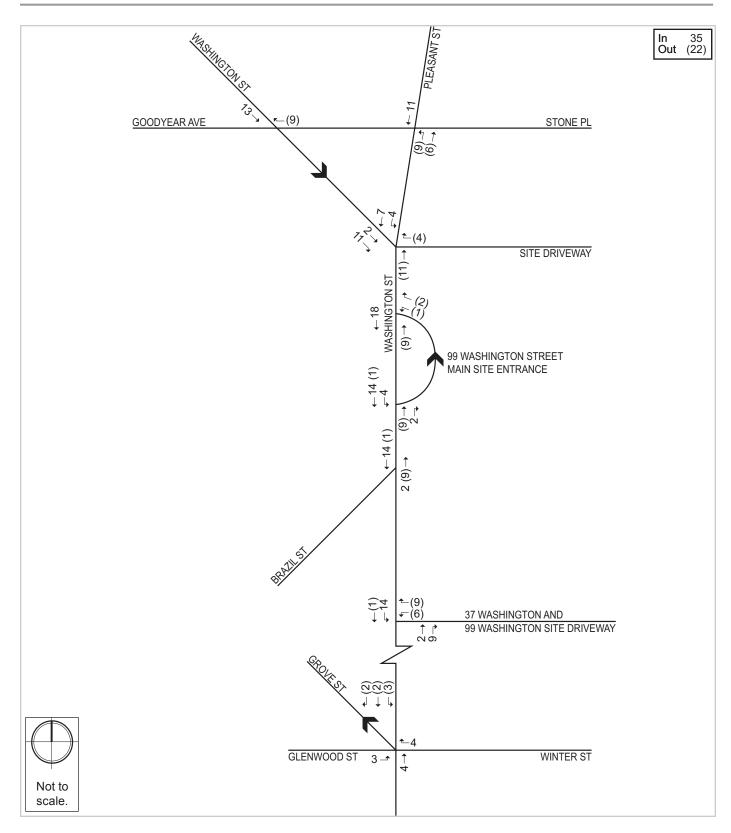


Figure 13. *Project-generated Vehicle Trips, Weekday p.m. Peak Hour*



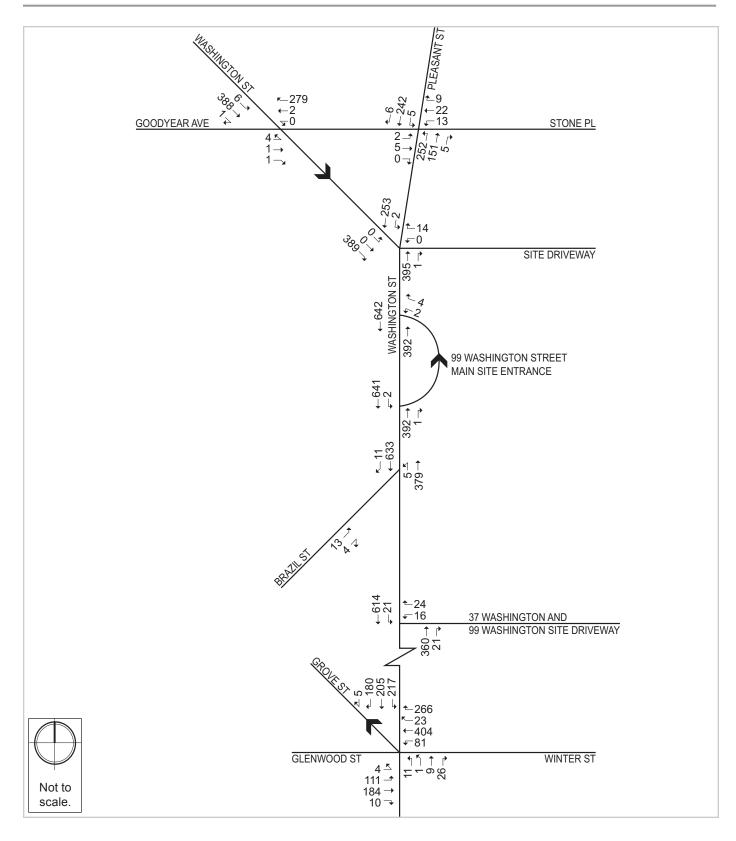


Figure 14. Build (2026) Condition Traffic Volumes, Weekday a.m. Peak Hour



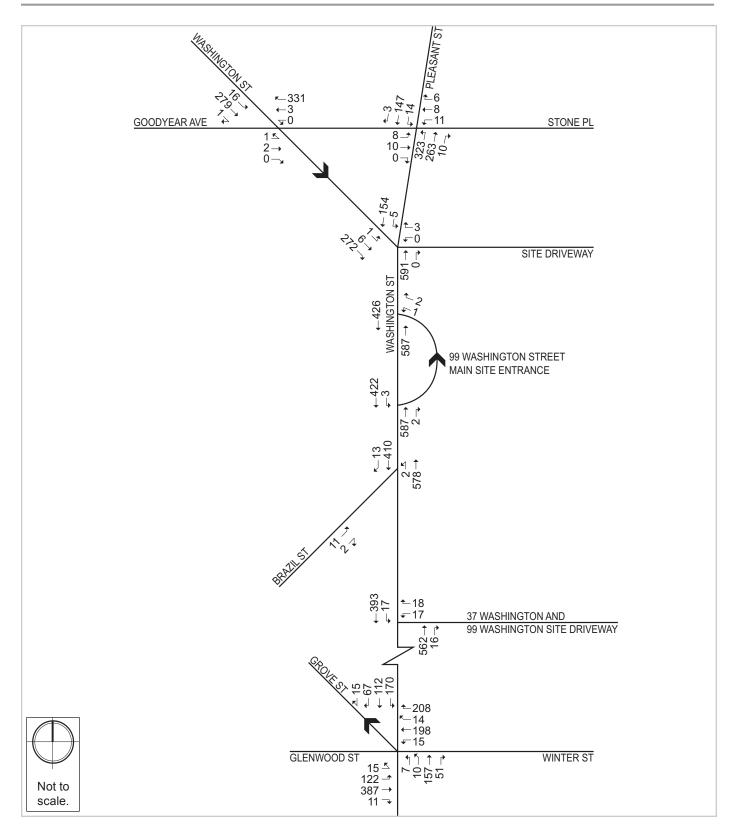


Figure 15. Build (2026) Condition Traffic Volumes, Weekday p.m. Peak Hour



Traffic Capacity Analysis

The measure of effectiveness for evaluating traffic operations is level of service (LOS), which is determined by assessing average delay incurred by vehicles at intersections and along intersection approaches. Trafficware's Synchro (version 9) software was used to calculate average delay and associated LOS at the study area intersections. This software is based on the traffic operational analysis methodology of the Transportation Research Board's *2010 Highway Capacity Manual* (*HCM*).

LOS designations are based on average delay per vehicle for all vehicles entering an intersection. **Table 9** displays the intersection level of service criteria. LOS A indicates the most favorable condition, with minimum traffic delay, while LOS F represents the worst condition. LOS E or F, however, is often typical for a stop-controlled minor street that intersects a major roadway.

Level of	Average Stopped De	elay (seconds/vehicle)
Service	Signalized Intersection	Unsignalized Intersection
A	≤10	≤10
В	>10 and ≤20	>10 and ≤15
С	>20 and ≤35	>15 and ≤25
D	>35 and ≤55	>25 and ≤35
E	>55 and ≤80	>35 and ≤50
F	>80	>50

Table 9.Intersection Level of Service Criteria

In addition to delay and LOS, the operational capacity and vehicular queues, as described below, are calculated and used to further quantify traffic operations at intersections.

- The volume-to-capacity ratio (v/c ratio) is a measure of congestion at an intersection approach. A v/c ratio below one indicates that the intersection approach has adequate capacity to process the arriving traffic volumes over the course of an hour. A v/c ratio of one or greater indicates that the traffic volume on the intersection approach exceeds capacity.
- The 95th percentile queue length, measured in feet, represents the farthest extent of the vehicle queue (to the last stopped vehicle) upstream from the stop line during 5% of all signal cycles. The 95th percentile queue will not be seen during each cycle. The queue would be this long only 5% of the time and would typically occur during peak hours.



Table 10 and **Table 11** present the a.m. and p.m. peak hour capacity analysis, respectively, for thestudy area intersections under each analysis condition: Existing (2019) Condition, No-Build (2026)Condition, and the Build (2026) Condition. The detailed analysis sheets are provided in the**Appendix A**. The sections below present the results for each condition.

Existing (2019) Traffic Operations

As shown under the Existing (2019) Conditions in **Table 10** and **Table 11**, a majority of the study intersection approaches operate at acceptable levels of service (LOS D or better) with the exception of the following intersections and movements:

The signalized intersection of **Washington Street/Glenwood Street/Winter Street** operates at LOS F during the a.m. peak hour and LOS E during the p.m. peak hour. The highest volumes at this intersection are in the east-west direction as commuters travel between Melrose/Malden neighborhoods east of the MBTA tracks and regional roadways to the west such as Fellsway East, Fellsway West, and I-93. The Glenwood Street eastbound approach operates at LOS F during the p.m. peak hour. The Winter Street westbound approach operates at LOS F during the a.m. peak hour. The Winter Street southbound shared left-turn/through movement operates at LOS F during both the peak hours.

The eastbound and westbound approaches, at the intersection of **Pleasant Street/Stone Place**, operate at LOS E during the p.m. peak hour only. Note that the eastbound and westbound approaches, controlled by stop signs, primarily serve residents at the Jack Flats residential development. The vehicle trips into and out of Jack Flats are relatively small during the p.m. peak hour (less than 25 per hour) while the northbound volumes along Pleasant Street are high due to background commuter traffic and significant pick-up activity at Oak Grove station. This combined activity results in delays for the side street traffic, which is typical for a stop-controlled minor side street that intersects with a major roadway.

No-Build (2026) Traffic Operations

As shown under the No-Build (2026) Condition, the study area intersections continue to operate at the same LOS as the Existing Condition with the exception of the Stone Place eastbound approach, at the intersection of **Pleasant Street/Stone Place**, which decreases from LOS E to F during the p.m. peak hour only



	Exi	sting (201	19) Cond	ition	No-	Build (20	26) Cond	ition	Βι	uild (2026	i) Conditi	on
Intersection/Movement	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)
			Sig	nalized I	ntersecti	ion						
Washington Street/Glenwood Street/Winter Street/Grove Street	F	>80.0	-	-	F	>80.0	-	-	F	>80.0	-	-
EB Glenwood St left/thru/right	С	33.4	0.79	#269	С	34.6	0.80	#276	С	34.4	0.80	#275
WB Winter St left/thru thru/right	F	>80.0	>1.00	#364	F	>80.0	>1.00	#386	F	>80.0	>1.00	#386
NB Washington St left/thru	В	19.4	0.10	25	В	19.5	0.11	26	В	19.5	0.11	25
NB Washington St right	В	18.4	0.02	0	В	18.4	0.02	0	В	18.4	0.02	0
SB Washington St left/thru	F	>80.0	>1.00	#453	F	>80.0	>1.00	#462	F	>80.0	>1.00	#471
SB Washington St right/hard right	С	22.1	0.33	97	С	22.2	0.34	100	С	22.3	0.35	102
			Unsi	gnalized	Intersect	tions						
Washington Street/ Goodyear Avenue/Stone Place	-	-	-	-	-	-	-	-	-	-	-	-
EB Goodyear Ave left/thru/right	С	16.5	0.04	3	С	16.7	0.04	3	С	17.1	0.04	3
WB Stone PI left/thru/right	А	9.5	0.26	25	А	9.5	0.26	26	А	9.6	0.27	28
SB Washington St left/thru/right	А	0.1	0.00	0	Α	0.1	0.00	0	А	0.1	0.00	0
Pleasant Street/Stone Place	-	-	-	-	-	-	-	-	-	-	-	-
EB Stone PI left/thru/right	D	28.5	0.05	4	D	29.2	0.05	4	D	30.9	0.05	4
WB Stone PI left/thru/right	D	31.0	0.32	33	D	32.1	0.33	34	D	34.6	0.35	36
NB Pleasant St left/thru/right	А	6.3	0.23		А	6.3	0.23	22	А	6.4	0.24	24
SB Pleasant St left/thru/right	А	0.2	0.00	0	А	0.2	0.00	0	А	0.2	0.00	0
Washington Street/ Pleasant Street/ 99 Wash. Site Driveway	-	-	-	-	-	-	-	-	-	-	-	-
EB Site Driveway left/right	С	16.9	0.58	95	С	17.4	0.60	100	С	17.1	0.59	97
WB Washington St left/thru/right	В	10.9	0.03	2	В	10.9	0.03	2	В	11.2	0.04	3
NB Washington St thru/right	А	0.0	0.25	0	А	0.0	0.26	0	А	0.0	0.27	0
SB Pleasant St left/thru	А	0.1	0.00	0	А	0.1	0.00	0	А	0.1	0.00	0

Table 10.Capacity Analysis Summary, Weekday a.m. Peak Hour



	Exi	sting (20 [.]	19) Cond	ition	No-	Build (20	26) Cond	lition	Βι	ild (2026) Conditi	ion
Intersection/Movement`	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)
Washington Street/New Site Driveway Exit Only									-	-	-	-
WB Site Driveway left/right		This is	a new ir	ntersectio	n under	Build Co	ndition		В	14.2	0.02	1
NB Washington St thru						Build CO	nantion		А	0.0	0.25	0
SB Washington St thru									А	0.0	0.41	0
Washington Street/Site Driveway	-	-	-	-	-	-	-	-	-	-	-	-
WB Site Driveway left/right	А	0.0	0.00	0	А	0.0	0.00	0	-	-	-	-
NB Washington St thru/right	А	0.0	0.25	0	А	0.0	0.26	0	А	0.0	0.27	0
SB Washington St left/thru	А	0.1	0.01	0	А	0.1	0.01	0	А	0.0	0.00	0
Washington Street/Brazil Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Brazil St left/thru/right	D	25.5	0.14	12	D	26.3	0.14	12	С	22.2	0.12	10
NB Washington St left/thru/right	Α	0.2	0.01	1	Α	0.2	0.01	1	А	0.2	0.01	1
SB Washington St left/thru/right	Α	0.1	0.00	0	А	0.1	0.00	0	А	0.0	0.45	0
Washington Street/Site Driveway	-	-	-	-	-	-	-	-				
WB Site Driveway left/right	В	10.7	0.01	1	В	10.7	0.01	1	This d	riveway v	vill be re	moved
NB Washington St thru/right	Α	0.0	0.25	0	Α	0.0	0.25	0	in	the Build	Condition	on.
SB Washington St left/thru	Α	0.3	0.01	1	Α	0.3	0.01	1				
Washington Street/			-	_	-	-	-	-	-	-	-	
37 Washington Street Driveway					_				_			
WB Site Driveway left/right 1)	С	16.3	0.06	5	С	16.6	0.06	5	С	17.4	0.15	13
NB Washington St thru/right	A	0.0	0.25	0	А	0.0	0.25	0	А	0.0	0.25	0
SB Washington St left/thru	Α	0.3	0.01	1	Α	0.3	0.01	1	А	0.6	0.02	2

Table 10. Capacity Analysis Summary, Weekday a.m. Peak Hour (cont'd)

95th percentile queues do not clear after two cycles. Actual queues may be longer.
Grey Shading indicates LOS E or F under the Existing Condition or a change from LOS D or better in a previous condition to LOS E or F.
1) 99 Washington Street will share this driveway with 37 Washington Street under the Build Condition.



	Exis	sting (201	l9) Condi	ition	No-	Build (20	26) Cond	ition	В	uild (2026	i) Conditi	on
Intersection/Movement	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)
			Sig	nalized Ir	ntersection	on						
Washington Street/Glenwood Street/Winter Street/Grove Street	E	60.2	-	-	Е	66.3	-	-	Е	69.2	-	-
EB Glenwood St left/thru/right	F	>80.0	>1.00	#469	F	>80.0	>1.00	#488	F	>80.0	>1.00	#496
WB Winter St left/thru thru/right	С	32.3	0.64	#126	С	32.5	0.64	#128	С	32.6	0.65	#128
NB Washington St left/thru	С	23.0	0.41	135	С	23.1	0.41	138	С	23.2	0.42	140
NB Washington St right	В	18.5	0.04	0	В	18.5	0.04	10	В	18.5	0.04	10
SB Washington St left/thru	Е	79.3	>1.00	#322	F	>80.0	>1.00	#329	F	>80.0	>1.00	#330
SB Washington St right/hard right	В	18.7	0.06	29	В	18.7	0.06	30	В	18.7	0.06	30
			Unsic	nalized I	ntersect	ions						
Washington Street/ Goodyear Avenue/Stone Place	-	-	-	-	-	-	-	-	-	-	-	-
EB Goodyear Ave left/thru/right	С	15.1	0.02	1	С	15.3	0.02	1	С	15.5	0.02	1
WB Stone PI left/thru/right	В	10.4	0.39	47	В	10.5	0.40	48	В	10.5	0.40	48
SB Washington St left/thru/right	Α	0.5	0.01	1	А	0.5	0.01	1	Α	0.5	0.01	1
Pleasant Street/Stone Place	-	-	-	-	-	-	-	-	-	-	-	-
EB Stone PI left/thru/right	E	48.0	0.22	20	F	>50.0	0.23	21	F	>50.0	0.24	21
WB Stone PI left/thru/right	E	42.0	0.29	28	E	44.3	0.31	30	E	45.2	0.31	31
NB Pleasant St left/thru/right	A	5.9	0.27	28	Α	5.9	0.28	29	Α	6.0	0.28	29
SB Pleasant St left/thru/right	A	0.8	0.01	1	A	0.8	0.01	1	Α	0.8	0.01	1
Washington Street/ Pleasant Street/ Site Driveway	-	-	-	-	-	-	-	-	-	-	-	-
EB Site Driveway left/right	В	11.5	0.34	38	В	11.6	0.35	39	В	11.9	0.36	42
WB Washington St left/thru/right	С	17.5	0.06	5	С	17.8	0.07	5	В	13.6	0.01	1
NB Washington St thru/right	A	0.0	0.42	0	А	0.0	0.42	0	Α	0.0	0.43	0
SB Pleasant St left/thru	Α	0.1	0.00	0	Α	0.1	0.00	0	Α	0.4	0.01	1

Table 11.Capacity Analysis Summary, Weekday p.m. Peak Hour



Table 11. Capacity Analysis Summary, Weekday p.m. Peak Hour (cont'd)

	Ex	isting (20	19) Conc	lition	No-	Build (20	26) Conc	lition	В	uild (2026) Condit	ion
Intersection/Movement`	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)	LOS	Delay (s)	V/C Ratio	95 th % Queue (ft.)
Washington Street/New Site Driveway Exit Only		•							-	-	-	-
WB Site Driveway left/right		This is a	new inte	rsection i	n the Bu	ild Condi	ition only	<i>ı</i> .	С	15.2	0.01	1
NB Washington St thru							-		А	0.0	0.38	0
SB Washington St thru									А	0.0	0.27	0
Washington Street/Site Driveway	-	-	-	-	-	-	-	-	-	-	-	-
WB Site Driveway left/right	С	15.4	0.02	0	С	15.6	0.02	2	-	-	-	-
NB Washington St thru/right	А	0.0	0.41	0	А	0.0	0.42	0	А	0.0	0.43	0
SB Washington St left/thru	А	0.0	0.00	0	Α	0.0	0.00	0	Α	0.1	0.00	0
Washington Street/Brazil Street	-	-	-	-	-	-	-	-	-	-	-	-
EB Brazil St left/thru/right	С	24.3	0.08	6	D	25.0	0.08	7	С	21.3	0.07	5
NB Washington St left/thru/right	А	0.0	0.00	0	А	0.0	0.00	0	А	0.0	0.00	0
SB Washington St left/thru/right	А	0.0	0.00	0	Α	0.0	0.00	0	А	0.0	0.26	0
Washington Street/Site Driveway	-	-	-	-	-	-	-	-				
WB Site Driveway left/right	С	19.0	0.02	1	С	19.4	0.02	1	This d	riveway v	vill be re	moved
NB Washington St thru/right	Α	0.0	0.41	0	А	0.0	0.41	0	in	the Build	Conditi	on.
SB Washington St left/thru	Α	0.1	0.00	0	А	0.1	0.00	0				
Washington Street/	_		-	-	-		_		-		_	_
37 Washington Street Driveway												
WB Site Driveway left/right 1)	С	19.3	0.13	11	С	19.8	0.13	11	С	21.4	0.22	21
NB Washington St thru/right	A	0.0	0.41	0	A	0.0	0.41	0	A	0.0	0.42	0
SB Washington St left/thru	Α	0.1	0.00	0	Α	0.1	0.00	0	A	0.6	0.02	2

95th percentile queues do not clear after two cycles. Actual queues may be longer.
Grey Shading indicates LOS E or F under the Existing Condition or a change from LOS D or better in a previous condition to LOS E or F.
1) 99 Washington Street will share this driveway with 37 Washington Street under the Build Condition.

Build (2026) Traffic Operations

All intersections continue to operate at the same overall LOS as under the No-Build (2026) Condition during the a.m. and p.m. peak hours, indicating that the Project will not adversely affect traffic operations in the study area.

Transportation Management Plan

While the Project will not impact traffic operations in the study area, the Proponent is committed to implementing a Transportation Management Plan (TMP) program for residents in an effort to minimize the number of Project vehicle trips on the adjacent transportation network. TMP measures will promote the use of public transportation (including the MBTA rapid transit, bus, and commuter rail), walking, and bicycling, and other options to reduce single occupant vehicle trips. TMP measures may include, but are not limited to, the following:

- Transportation Coordinator The Project will designate a transportation coordinator to manage all transportation issues associated with the Project. The transportation coordinator will oversee transportation issues related to deliveries and move-in/move-out activity. The transportation coordinator will work with residents as they move in and to raise awareness of public transportation.
- **Car Share** In partnership with a car-share company, such as Zipcar, the Proponent is committed to establishing at least one car share space within the parking lot.
- **Parking Management** Parking spaces will be rented separately from the units, or "unbundled", such that residents without a vehicle will not pay for parking. Parking spaces will be leased at market rates. Parking stickers will be obtained through the management office and residents will be assigned a specific, numbered space. Parking will not be leased to non-residents.
- **Resident Orientation Packets** These packets will provide all new residents with information about available public transportation options (such as the nearby MBTA Orange Line and bus service), as well as local car-sharing services.
- **Real time MBTA Travel Time information** The Proponent will install an electronic display monitor in the residential lobby to provide real time information on nearby transit service.



- **MBTA Passes** To encourage transit use, the Proponent will provide each new resident with one MBTA pass (monthly link) for one calendar month.
- Bicycle Storage The Proponent is committed to providing approximately 30 secure residential bicycle parking spaces interior to the building and approximately five visitor bicycle spaces exterior to the building. These 35 spaces exceed the minimum of seven spaces required under Melrose's Smart Growth zoning.
- Pedestrian Safety With the reconfiguration of Project driveways, the total length of curb cut openings along Washington Street will be reduced by about 80 feet, improving the pedestrian realm along this important walking connection between the neighborhood and the MBTA's Oak Grove Station. Other pedestrian realm improvements include raised sidewalks across the driveways at the main entrance, and, in the rear parking lot, a crosswalk connecting between the parking area and the rear building entrance. New lighting will be installed throughout the site and along Washington Street to maximize visibility and safeguard pedestrian activity at night. At vehicle driveways, signs will be posted to alert drivers to pedestrian activity.



Engineers + Planners

Appendix A

99 WASHINGTON STREET



Appendix A

- Count Data
- Crash Data
- Trip Generation
- Intersection LOS/Synchro Reports



Count Data

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 1 Location: Melrose, MA Washington Street Street 1: Stone Place/Goodyear Avenue Street 2: 9/5/2019 Count Date: Day of Week: Thursday Clouds & Sun, 70°F Weather:

BOSTON TRAFFIC DATA PO BOX 1723, Framingham, MA 01701 Office: 978-746-1259 DataRequest@BostonTrafficData.com

www.BostonTrafficData.com

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						PASSEN	GER CA	ко <i>е пе</i>	AVI VENI	ULES UU	<i>IVIDIINED</i>					
		Washingt Northl					ton Street bound				r Avenue bound				e Place bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	3	81	1	0	1	0	0	0	0	0	63
7:15 AM	0	0	0	0	0	2	102	0	0	0	0	0	0	0	0	65
7:30 AM	0	0	0	0	0	1	103	0	0	2	0	1	0	0	0	69
7:45 AM	0	0	0	0	0	1	94	1	0	0	1	0	0	0	0	68
8:00 AM	0	0	0	0	0	2	85	0	0	2	0	0	0	0	2	60
8:15 AM	0	0	0	0	0	3	87	0	0	0	0	0	0	0	1	67
8:30 AM	0	0	0	0	0	0	77	0	0	0	0	0	0	0	0	61
8:45 AM	0	0	0	0	0	2	67	0	0	0	0	1	0	0	0	54
		Washingt	on Street			Washing	ton Street			Goodvea	r Avenue			Stone	Place	
		Washingt Northl				•	ton Street				r Avenue				e Place bound	
Start Time	U-Turn	Washingt Northl Left	bound	Right	U-Turn	•	ton Street bound Thru	Right	U-Turn		r Avenue bound Thru	Right	U-Turn		Place bound Thru	Right
Start Time 4:00 PM	U-Turn 0	North		Right 0	U-Turn 0	South	bound	Right 0	U-Turn 0	Eastb	ound	Right 0	U-Turn 0	West	bound	Right 62
		North Left	bound Thru	Ŭ		South Left	bound Thru	Ŭ		Eastb	ound Thru	0		West Left	bound	U U
4:00 PM	0	Northl Left 0	bound Thru 0	Ő	0	South Left 2	bound Thru 57	Ŭ	0	Eastt Left 1	ound Thru	Ő	0	West Left 2	bound Thru 1	62
4:00 PM 4:15 PM	0	Northl Left 0 0	bound Thru 0 0	0	0	South Left 2 5	bound Thru 57 45	0	0	Eastt Left 1	oound Thru 0 1	0 0	0	West Left 2 0	bound Thru 1 0	62 80
4:00 PM 4:15 PM 4:30 PM	0 0 0	Northl Left 0 0 0	bound Thru 0 0 0	0 0 0	0 0 1	South Left 2 5	bound Thru 57 45 52	0 1 0	0 0 0	Eastb Left 1 0 1	oound Thru 0 1 0	0 0 0	0 0 0	West Left 2 0 0	bound Thru 1 0 0	62 80 67
4:00 PM 4:15 PM 4:30 PM 4:45 PM	0 0 0 0	Northl Left 0 0 0 0	bound Thru 0 0 0 0	0 0 0 0	0 0 1 0	South Left 2 5	bound Thru 57 45 52 60	0 1 0 0	0 0 0 0	Eastb Left 1 0 1 0	oound Thru 0 1 0 0	0 0 0 0	0 0 0 0	West Left 2 0 0 0	bound Thru 1 0 0 3	62 80 67 75
4:00 PM 4:15 PM 4:30 PM 4:45 PM 5:00 PM	0 0 0 0 0	Northl Left 0 0 0 0 0 0	bound Thru 0 0 0 0 0	0 0 0 0 0	0 0 1 0 0	South Left 2 5	bound Thru 57 45 52 60 71	0 1 0 0 0	0 0 0 0 0 0	Eastt Left 0 1 0 0 0	oound Thru 0 1 0 0	0 0 0 0 0	0 0 0 0 0	West Left 2 0 0 0 0 0	bound Thru 1 0 0 3 0	80 67 75 105

AWITEAK HOUK		waaning	ion oneer			vvasiningi	ion oneer			Obbuyea	Avenue			Otone	1 lace	
7:15 AM		North	bound			South	bound			Eastb	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	0	0	0	0	6	384	1	0	4	1	1	0	0	2	262
PHF		0.	00			0.	94			0.	50			0.	96	
HV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.5%

PM PEAK HOUR		Washing	ton Street			Washing	on Street			Goodyea	r Avenue			Stone	Place	
5:00 PM		North	bound			South	bound			Eastb	bound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	0	0	0	0	16	264	1	1	1	2	0	0	0	3	325
PHF		0.	00			0.	92			0.	50			0.	78	
HV %	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 1 Location: Melrose, MA Washington Street Street 1: Stone Place/Goodyear Avenue Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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HEAVY VEHICLES

		•	ton Street bound			South	ton Street bound			Goodyea Eastb	r Avenue oound				e Place bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
7:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	0	0	0	0	1	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	2
		Washing	ton Street			Washing	ton Street			Goodyea	r Avenue			Stone	Place	
		Washing	ton Street			Washing	ton Street			Goodyea	r Avenue			Stone	Place	
		North	bound			South	bound			Eastb	ound	_		West	bound	
Start Time	U-Turn	North Left	bound Thru	Right	U-Turn	South Left		Right	U-Turn	Eastb Left	ound Thru	Right	U-Turn	West Left	bound Thru	Right
4:00 PM	0	North Left 0	bound Thru 0	0	0	South Left 0	bound Thru 1	Ő	0	Eastb Left 0	oound Thru 0	0	0	West Left 0	bound Thru 0	1
4:00 PM 4:15 PM	0	North Left 0 0	bound Thru 0 0	0	0 0	South Left 0 0	bound	0	000	Eastb Left 0 0	oound Thru 0 0	0	0 0	West Left 0 0	bound Thru 0 0	1 3
4:00 PM 4:15 PM 4:30 PM	0 0 0	North Left 0 0 0	bound Thru 0 0 0	0 0 0	0 0 0	South Left 0 0 0	bound Thru 1 0 1	0 0 0	0 0 0	Eastb Left 0 0 0	oound Thru 0 0 0	0 0 0	0 0 0	West Left 0 0 0	bound Thru 0 0 0	1 3 0
4:00 PM 4:15 PM	0	North Left 0 0	bound Thru 0 0	0	0 0	South Left 0 0	bound Thru 1	0	000	Eastb Left 0 0	oound Thru 0 0	0	0 0	West Left 0 0	bound Thru 0 0	1 3
4:00 PM 4:15 PM 4:30 PM	0 0 0	North Left 0 0 0	bound Thru 0 0 0	0 0 0	0 0 0	South Left 0 0 0	bound Thru 1 0 1	0 0 0	0 0 0	Eastb Left 0 0 0	oound Thru 0 0 0	0 0 0	0 0 0	West Left 0 0 0	bound Thru 0 0 0	1 3 0
4:00 PM 4:15 PM 4:30 PM 4:45 PM	0 0 0 0	North Left 0 0 0 0	bound Thru 0 0 0 0	0 0 0 0	0 0 0 0	South Left 0 0 0 0	bound Thru 1 0 1	0 0 0 0	0 0 0 0	Eastb Left 0 0 0 0	oound Thru 0 0 0 0	0 0 0 0	0 0 0 0	West Left 0 0 0 0	bound Thru 0 0 0 0	1 3 0 0
4:00 PM 4:15 PM 4:30 PM 4:45 PM 5:00 PM	0 0 0 0 0	North Left 0 0 0 0 0	bound Thru 0 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	South Left 0 0 0 0 0 0 0	bound Thru 1 0 1 0 1 1	0 0 0 0 0	0 0 0 0 0 0	Eastb Left 0 0 0 0 0	oound Thru 0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	West Left 0 0 0 0 0	bound Thru 0 0 0 0 0 0 0	1 3 0 0 0

AM PEAK HOUR		Washingt	ton Street			Washing	on Street			Goodyea	r Avenue			Stone	Place	
7:00 AM		North	bound			South	bound			Eastb	bound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	5
PHF		0.	00			0.	25			0.	00			0.	63	

Γ	PM PEAK HOUR		Washing	ton Street			Washing	on Street			Goodyea	r Avenue			Stone	Place	
	4:00 PM		North	bound			South	bound			Eastb	ound			West	oound	
	to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	4
	PHF		0.	00			0.	50			0.	00			0.	33	

Client: Ben Lippman 444_C47_HSH Project #: BTD #: Location 1 Melrose, MA Location: Street 1: Washington Street Street 2: Stone Place/Goodyear Avenue 9/5/2019 Count Date: Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PEDESTRIANS & BICYCLES

										OLLO							
		Wa	shington St	reet		Wa	ashington St	reet		Go	odyear Ave	nue			Stone Place	e	
			Northbound	ł			Southbound	b			Eastbound				Westbound	ł	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	1	
7:15 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	
7:30 AM	0	0	0	0	0	3	0	2	0	0	0	1	0	0	0	0	
7:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	
8:00 AM	0	0	0	0	0	3	0	1	0	0	0	0	0	0	1	0	
8:15 AM	0	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	
8:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	1	

			shington St Northbound				ashington St Southbound			Go	odyear Ave Eastbound				Stone Place Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	
4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	
5:15 PM	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	1	
5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	2	
5:45 PM	0	0	0	1	0	0	0	0	0	0	0	0	0	0	3	0	

AM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet		Go	odyear Ave	nue		:	Stone Place	9	
7:15 AM			Northbound	l .			Southbound	ł			Eastbound				Westbound	l	
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
8:15 AM	0	0	0	0	0	12	0	3	0	0	0	1	0	0	1	1	

PM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet		Go	odyear Ave	nue			Stone Place	9	
5:00 PM			Northbound				Southbound	1			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	0	0	0	1	0	1	0	1	0	0	0	1	0	0	7	3	

¹ Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 2 Melrose, MA Location: Pleasant Street Street 1: Street 2: Stone Place 9/5/2019 Count Date: Day of Week: Thursday Weather: Clouds & Sun, 70°F

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PASSENGER CARS & HEAVY VEHICLES COMBINED Pleasant Street Pleasant Street Stone Place Stone Place Northbound Southbound Eastbound Westbound Start Time U-Turn Left Thru Right U-Turn Left Thru Right U-Turn Left Thru Right U-Turn Left Thru Right 7:00 AM 7:15 AM 7:30 AM 7:45 AM 8:00 AM 8:15 AM 8:30 AM 8:45 AM Pleasant Street Pleasant Street Stone Place Stone Place Northbound Southbound Eastbound Westbound Start Time U-Turn Left Thru Right U-Turn Left Thru Right U-Turn Left Thru Right U-Turn Left Thru Right 4:00 PM 4:15 PM 4:30 PM 4:45 PM 5:00 PM 5:15 PM 5:30 PM 5:45 PM AM PEAK HOUR Pleasant Street Pleasant Street Stone Place Stone Place 7:15 AM Northbound Southbound Eastbound Westbound U-Turn U-Turn to Left Thru Right Left Thru Right U-Turn Left Thru Right U-Turn Left Thru Right 8:15 AM PHF 0.85 0.75 0.88 0.69 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% 0.0% HV % 0.0% 1.7% 4.3% 0.0% 1.2% 0.0% 0.0% 0.0% 0.0%

PM PEAK HOUR		Pleasar	nt Street			Pleasar	nt Street			Stone	Place			Stone	Place	
5:00 PM		North	bound			South	bound			Eastb	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	317	258	10	0	14	137	3	0	8	10	0	0	11	8	6
PHF		0.	81			0.	90			0.	75			0.	63	
HV %	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	1.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 2 Location: Melrose, MA Pleasant Street Street 1: Stone Place Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:



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								HEAVY V	EHICLES	;						
		Pleasar	nt Street			Pleasar	nt Street			Stone	Place			Stone	Place	
		North	bound			South	bound			Eastb	bound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	2	1	0	0	0	2	0	0	1	0	0	0	0	0	0
7:15 AM	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	2	2	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45 AM	0	2	2	0	0	0	3	0	0	0	0	0	0	0	0	0
		North	nt Street bound			South	nt Street bound			Stone Eastb					bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0
4:15 PM	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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
AM PEAK HOUR			nt Street				nt Street				Place			Stone		
7:00 AM			bound	•			bound			Eastb					bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	0	5	6	0	0	0	5	0	0	1	0	0	0	0	0	0
PHF		0.	69			0.	63			0.	25			0.	.00	

PM PEAK HOU	2	Pleasar	nt Street			Pleasar	nt Street			Stone	Place			Stone	Place	
4:00 PM		North	bound			South	bound			Eastb	ound			West	oound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
5:00 PM	0	4	6	0	0	0	3	0	0	0	0	0	0	0	0	0
PHF		0.	63			0.	38			0.	00			0.	00	

Client:	Ben Lippman
Project #:	444_C47_HSH
BTD #:	Location 2
Location:	Melrose, MA
Street 1:	Pleasant Street
Street 2:	Stone Place
Count Date:	9/5/2019
Day of Week:	Thursday
Weather:	Clouds & Sun, 70°F



PEDESTRIANS & BICYCLES

									 5 a 2.0 .	0220							
		Р	leasant Stre	et		P	leasant Stre	eet			Stone Place	e			Stone Place	9	
			Northbound	1			Southbound	d			Eastbound				Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	2	0	3	0	0	0	0	0	0	0	10	
7:15 AM	0	1	0	0	0	0	0	2	0	0	0	0	0	0	0	10	
7:30 AM	0	1	0	0	0	0	0	9	0	0	0	1	1	0	0	11	
7:45 AM	0	1	0	0	0	2	0	5	0	0	0	0	0	0	0	18	
8:00 AM	1	0	0	0	0	1	0	11	0	0	0	1	0	0	0	14	
8:15 AM	0	1	0	0	0	3	0	1	0	0	0	0	0	0	0	12	
8:30 AM	0	0	1	0	0	0	0	9	0	0	0	0	0	0	0	15	
8:45 AM	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	8	

			easant Stre Northbound				leasant Stre Southbound				Stone Place Eastbound				Stone Place Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	2	0	0	5	0	0	0	1	0	0	0	6	
4:15 PM	1	1	0	0	0	0	0	2	0	0	0	0	0	0	0	5	
4:30 PM	1	1	0	0	0	0	0	3	0	0	0	0	0	0	0	9	
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
5:00 PM	1	1	0	0	0	0	0	6	0	0	0	0	0	0	0	15	
5:15 PM	1	2	0	0	0	0	0	3	0	0	0	0	0	0	0	13	
5:30 PM	2	3	0	0	0	0	0	3	0	0	0	0	0	0	0	17	
5:45 PM	3	4	0	0	0	1	0	7	0	0	0	1	0	0	0	19	

AM PEAK HOUR ¹		P	easant Stre	et		Р	leasant Stre	et		:	Stone Place	9		:	Stone Place		
7:15 AM			Northbound	l .			Southbound	1			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
8:15 AM	1	3	0	0	0	3	0	27	0	0	0	2	1	0	0	53	

PM PEAK HOUL	ર 1	Р	easant Stre	et		Р	leasant Stre	et			Stone Place	e			Stone Place	9	
5:00 PM			Northbound				Southbound				Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	7	10	0	0	0	1	0	19	0	0	0	1	0	0	0	64	

¹ Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 3 Location: Melrose, MA Washington Street Street 1: Street 2: Pleasant Street Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PASSENGER CARS & HEAVY VEHICLES COMBINED

						PASSEN	IGER CA	RS & HEA	AVY VEH	ICLES CO	MBINED					
		•	ton Street bound				nt Street bound			Washingto Eastb					eway bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	78	0	0	1	50	0	0	0	1	80	0	0	0	0
7:15 AM	0	0	90	0	0	1	84	0	0	0	0	102	0	0	0	1
7:30 AM	0	0	93	0	0	2	63	0	0	0	0	104	0	0	0	3
7:45 AM	0	0	107	0	0	0	47	0	0	0	1	93	0	0	0	5
8:00 AM	0	0	81	2	0	0	57	0	0	0	0	85	0	0	0	2
8:15 AM	0	0	102	0	0	0	61	0	0	1	0	86	0	0	0	1
8:30 AM	0	0	103	0	0	1	44	0	0	1	0	76	0	0	0	4
8:45 AM	0	0	83	0	0	2	62	0	0	0	1	67	0	0	0	1
		•	ton Street bound				nt Street			Washingto Eastb					eway bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	120	0	0	1	29	0	0	1	0	58	0	0	0	0
4:15 PM	0	0	122	0	0	0	39	0	0	0	2	43	0	1	0	1
4:30 PM	0	0	110	0	0	0	34	0	0	0	0	52	0	1	0	2
4:45 PM	0	0	130	0	0	2	36	0	0	0	0	60	0	0	0	4
5:00 PM	0	0	177	0	0	1	32	0	0	0	0	71	0	0	0	3
5:15 PM	0	0	131	0	0	1	34	0	0	0	1	56	0	1	0	4
5:30 PM	0	0	113	0	0	0	44	0	0	1	1	64	0	0	0	1
5:45 PM	0	0	153	0	0	0	36	0	0	0	3	67	0	1	0	2
AM PEAK HOUR 7:15 AM	Washington Street Pleasant Street Northbound Southbound									Washingto Eastb					eway bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	0	371	2	0	3	251	0	0	0	1	384	0	0	0	11
PHF	0.87 0.75									0.9	93			0.	.55	
HV %	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%	1.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PM PEAK HOUR	l	Washing	ton Street			Pleasa	nt Street			Washingto	on Street			Driv	ewav	

PM PEAK HOUR	1	Washingt	on Street			Pleasan	t Street			Washingt	on Street			Drive	eway	
5:00 PM		North	oound			South	bound			Eastb	ound			West	oound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	0	574	0	0	2	146	0	0	1	5	258	0	2	0	10
			.	-	-	-	140	•	0		0	200	v	L	v	10
PHF		0.8		•		0.8	-	Ŭ	0	. 0.9	93	200			60	

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 3 Location: Melrose, MA Washington Street Street 1: Street 2: Pleasant Street Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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Office: 978-746-1259 DataRequest@BostonTrafficData.com www.BostonTrafficData.com

HEAVY VEHICLES

								HEAVI V	EHICLES	2						
		Washing	ton Street			Pleasa	nt Street			Washingt	on Street			Driv	eway	
			bound			South	bound			Eastb				West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
8:45 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0

			on Street				nt Street			Washingt					eway	
		North	bound			South	bound			Eastb	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	4	0	0	0	0	0	0	0	0	1	0	0	0	0
4:15 PM	0	0	3	0	0	0	1	0	0	0	1	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	1	0	0	0	0
4:45 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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

AM PEAK HOUR		Washing	ton Street			Pleasar	nt Street			Washingto	on Street			Drive	eway	
7:00 AM		North	bound			South	bound			Eastb	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	0	0	11	0	0	0	5	0	0	0	0	0	0	0	0	0
PHF		0.	.69			0.	63			0.0	00			0.	00	

Γ	PM PEAK HOUR		Washing	ton Street			Pleasar	nt Street			Washingt	on Street			Drive	eway	
	4:00 PM		North	bound			South	bound			Eastb	ound			West	oound	
	to	U-Turn					Left	Thru	Right	U-Turn	Hard Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	10	0	0	0	3	0	0	0	1	2	0	0	0	0
_	PHF		0 0 10 0 0.63				0.	38			0.7	75			0.	00	

Client:	Ben Lippman
Project #:	444_C47_HSH
BTD #:	Location 3
Location:	Melrose, MA
Street 1:	Washington Street
Street 2:	Pleasant Street
Count Date:	9/5/2019
Day of Week:	Thursday
Weather:	Clouds & Sun, 70°F



PEDESTRIANS & BICYCLES

								FLDI	LOTINIAN	S & DIC I	JLLO							
		Wa	shington St	reet		P	leasant Stre	eet			Wa	shington St	reet			Driveway		
			Northbound				Southbound	d				Eastbound				Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED		Hard Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	2	0	0		0	0	2	0	0	0	0	11	
7:15 AM	0	1	0	0	0	0	0	0		0	0	3	0	0	0	0	12	
7:30 AM	0	1	0	0	0	1	0	0		0	0	4	1	0	0	0	13	
7:45 AM	0	1	0	1	0	2	0	0		0	0	2	2	0	0	0	19	
8:00 AM	0	1	0	0	0	1	0	0		0	0	3	0	0	0	0	21	
8:15 AM	0	1	0	0	0	3	0	0		0	0	6	0	0	0	0	11	
8:30 AM	0	0	0	0	0	0	0	0		0	0	2	0	0	0	0	18	
8:45 AM	0	0	0	0	0	1	0	0		0	0	3	0	0	0	0	8	

		Wa	shington St Northbound	reet			leasant Stre Southbound				shington St Eastbound				Driveway Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Hard Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	6	
4:15 PM	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	7	
4:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	21	
5:15 PM	0	3	0	0	0	0	0	0	0	0	1	0	0	0	0	11	
5:30 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	16	
5:45 PM	0	7	0	0	0	1	0	0	0	0	0	1	0	0	1	25	

AM PEAK HOUR ¹		Wa	shington St	reet		Р	leasant Stre	et		Wa	shington St	reet			Driveway		
7:15 AM			Northbound				Southbound				Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Hard Left	Thru	Right	PED	Left	Thru	Right	PED	1
8:15 AM	0	4	0	1	0	4	0	0	0	0	12	3	0	0	0	65	

PM PEAK HOUR ¹		Wa	shington Str	reet		Р	leasant Stre	et		Wa	shington St	reet			Driveway		
5:00 PM			Northbound				Southbound	ł			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Hard Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	0	17	0	0	0	1	0	0	0	0	1	1	0	0	1	73	

¹ Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 4 Melrose, MA Location: Washington Street Street 1: Street 2: **Brazil Street** Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

PHF

HV %

0.0%

0.81

0.5%

0.0%

0.0%

0.0%



PASSENGER CARS & HEAVY VEHICLES COMBINED

						PASSEN	GER CAI	73 & <i>ПЕ</i> А	AVY VERI	CLES CC	IVIDINED					
		Washing	ton Street			Washing	on Street			Brazil	Street					
		North	bound			South	bound			Eastb	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	1	77	0	0	0	128	0	0	1	0	0	0	0	0	0
7:15 AM	0	2	85	0	0	0	183	2	0	5	0	2	0	0	0	0
7:30 AM	0	1	91	0	0	0	166	1	0	2	0	1	0	0	0	0
7:45 AM	0	1	102	0	0	0	135	2	0	5	0	0	0	0	0	0
8:00 AM	0	1	82	0	0	0	135	6	0	1	0	1	0	0	0	0
8:15 AM	0	2	99	0	0	0	141	4	0	2	0	1	0	0	0	0
8:30 AM	0	3	100	0	0	0	118	2	0	3	0	0	0	0	0	0
8:45 AM	0	1	79	0	0	0	127	2	0	4	0	0	0	0	0	0
		0	ton Street			0	on Street				Street					
			bound				bound			Eastb					bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	117	0	0	0	84	2	0	1	0	0	0	0	0	0
4:15 PM	0	0	119	0	0	0	77	3	0	5	0	0	0	0	0	0
4:30 PM	0	1	106	0	0	0	84	2	0	2	0	0	0	0	0	0
4:45 PM	0	0	124	0	0	0	94	1	0	5	0	0	0	0	0	0
5:00 PM	0	0	173	0	0	0	100	3	0	4	0	0	0	0	0	0
5:15 PM	0	1	127	0	0	0	87	4	0	3	0	1	0	0	0	0
5:30 PM	0	0	112	0	0	0	107	1	0	0	0	1	0	0	0	0
5:45 PM	0	1	148	0	0	0	100	5	0	4	0	0	0	0	0	0
			_								_					
AM PEAK HOUR			ton Street				on Street			Brazil						
7:15 AM			bound	B			bound	B		Eastb		B			bound	D : 1.4
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	5	360	0	0	0	619	11	0	13	0	4	0	0	0	0
PHF		-	89	• • • • •			85	• • • •		0.	÷ ·	• • • • •		-	00	
HV %	0.0%	0.0%	2.2%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	l						0 1 1			D	<u>.</u>					
PM PEAK HOUR		•	ton Street			•	on Street			Brazil						
5:00 PM			bound	D: 14			bound	D: 14		Eastb		D: 14			bound	D : 14
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	2	560	0	0	0	394	13	0	11	0	2	0	0	0	0

0.81

0.0%

0.0%

0.0%

0.0%

0.94

1.0%

0.0%

0.0%

0.0%

0.00

0.0%

0.0%

0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 4 Location: Melrose, MA Washington Street Street 1: Street 2: **Brazil Street** Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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Office: 978-746-1259 DataRequest@BostonTrafficData.com www.BostonTrafficData.com

HEAVY VEHICLES

								NEAVI V	ENICLES							
		Washing	ton Street			Washing	ton Street			Brazil	Street					
		North	bound			South	bound			East	bound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0

		Washing	ton Street			Washing	ton Street			Brazil	Street					
		North	bound			South	bound			East	oound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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

Γ	AM PEAK HOUR		Washing	ton Street			Washing	on Street			Brazil	Street					
	7:00 AM		North	bound			South	bound			Eastb	ound			West	bound	
	to	U-Turn					Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	8:00 AM	0	0	9	0	0	0	5	0	0	0	0	0	0	0	0	0
_	PHF		0.	75			0.	63			0.	00			0.	00	

Γ	PM PEAK HOUR		Washing	ton Street			Washing	on Street			Brazil	Street					
	4:00 PM		North	bound			South	bound			Eastb	ound			West	oound	
	to	U-Turn					Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	8	0	0	0	5	0	0	0	0	0	0	0	0	0
	PHF		0.	67			0.	63			0.	00			0.	00	

Client:	Ben Lippman
Project #:	444_C47_HSH
BTD #:	Location 4
Location:	Melrose, MA
Street 1:	Washington Street
Street 2:	Brazil Street
Count Date:	9/5/2019
Day of Week:	Thursday
Weather:	Clouds & Sun, 70°F



PEDESTRIANS & BICYCLES

		Wa	shington St	reet		Wa	ashington St	reet			Brazil Stree	t					
			Northbound				Southbound				Eastbound				Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	5	0	0	0	0	0	1	0	0	0	0	
7:15 AM	0	1	0	0	0	3	0	0	0	0	0	1	0	0	0	0	
7:30 AM	0	1	0	0	0	3	0	0	1	0	0	1	0	0	0	0	
7:45 AM	0	1	0	0	0	4	0	0	0	0	0	1	0	0	0	0	
8:00 AM	0	0	0	0	0	10	1	0	0	0	0	1	0	0	0	0	
8:15 AM	0	1	0	0	0	9	0	0	0	0	0	1	0	0	0	0	
8:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	
8:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	

			shington St Northbound				shington St Southbound				Brazil Stree Eastbound				Westbound		
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	3	0	0	0	0	
4:45 PM	0	4	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
5:00 PM	0	3	0	0	0	0	0	0	0	0	0	2	0	0	0	0	
5:15 PM	0	2	0	0	0	1	0	0	0	0	0	1	0	0	0	0	
5:30 PM	0	5	0	0	0	0	0	1	0	0	0	2	0	0	0	0	
5:45 PM	0	4	0	0	0	1	0	0	0	0	0	2	0	0	0	0	

A	M PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet		I	Brazil Stree	t					
	7:15 AM			Northbound	l .			Southbound	1			Eastbound				Westbound	l	
	to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
	8:15 AM	0	3	0	0	0	20	1	0	1	0	0	4	0	0	0	0	

PM PEAK H	IOUR ¹		Wa	shington St	reet		Wa	ashington St	reet			Brazil Stree	t					
5:00 PM	4			Northbound				Southbound	1			Eastbound				Westbound		
to		Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	Л	0	14	0	0	0	2	0	1	0	0	0	7	0	0	0	0	

¹ Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 5 Melrose, MA Location: Street 1: Washington Street 99 Washington Street Driveway Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

HV %

0.0%

0.0%

0.5%

0.0%

0.0%

0.0%

1.0%

0.0%

0.0%

0.0%

0.0%

0.0%

0.0%

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PASSENGER CARS & HEAVY VEHICLES COMBINED

			<u> </u>							CLES CC			00.14		0 D .	
		Washingt					ton Street						99 V		Street Drive	eway
0 			bound	D: 17			bound	D: 17			bound	D : 14			bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	78	0	0	2	128	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	90	0	0	1	185	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	93	0	0	0	167	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	107	0	0	3	137	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	83	0	0	1	141	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	101	0	0	2	145	0	0	0	0	0	0	0	0	1
8:30 AM	0	0	102	1	0	0	120	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	83	0	0	0	129	0	0	0	0	0	0	0	0	0
		North	ton Street			South	ton Street bound				oound			West	Street Drive	,
Start Time	U-Turn	Left	Thru	Right 0	U-Turn 0	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM						1	86	0	0	0	0	0	0	0	0	2
4:15 PM					0	3	80	0	0	0	0	0	0	0	0	0
4:30 PM	30 PM 0 0 108				0	1	86	0	0	0	0	0	0	0	0	2
4:45 PM	45 PM 0 0 129				0	1	95	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	177	0	0	0	103	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	130	0	0	0	91	0	0	0	0	0	0	0	0	1
5:30 PM	0	0	112	0	0	0	108	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	152	0	0	0	104	0	0	0	0	0	0	1	0	1
AM PEAK HOUR 7:15 AM		North	ton Street		=	South	ton Street				ound			West	Street Drive	,
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	0	373	0	0	5	630	0	0	0	0	0	0	0	0	0
PHF		0.					85			-	00			-	00	
HV %	0.0%	0.0%	2.7%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PM PEAK HOUR 5:00 PM		•	ton Street bound			•	ton Street bound			East	bound		99 V	0	Street Drive	eway
to	to U-Turn Left Thru Right						Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM 0 0 571 0					0	0	406	0	0	0	0	0	0	1	0	3
PHF		0.	81				94			0.	00			0.	50	

0.0%

0.0%

0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 5 Location: Melrose, MA Washington Street Street 1: 99 Washington Street Driveway Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

BOSTON TRAFFIC DATA PO BOX 1723, Framingham, MA 01701 Office: 978.746.1259

Office: 978-746-1259 DataRequest@BostonTrafficData.com www.BostonTrafficData.com

HEAVY VEHICLES

								HEAVY V	EHICLES)						
		Washing	ton Street			Washing	ton Street						99 V	Vashington	Street Drive	eway
		North	bound			South	bound			East	oound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	4	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	4	0	0	0	3	0	0	0	0	0	0	0	0	0

		Washing	ton Street			Washing	ton Street						99 V	Vashington	Street Drive	eway
		North	bound			South	bound			Eastb	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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

AM PEAK HOUR		Washingt	ton Street			Washing	on Street						99 V	Vashington	Street Drive	eway
7:00 AM		North	bound			South	bound			Eastb	ound			West	oound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:00 AM	0	0	11	0	0	0	5	0	0	0	0	0	0	0	0	0
PHF		0.	69			0.	63			0.	00			0.	00	

1	PM PEAK HOUR		Washing	ton Street			Washing	ton Street						99 V	Vashington	Street Drive	eway
	4:00 PM		North	bound			South	bound			Eastb	bound			West	bound	
	to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	8	0	0	0	4	0	0	0	0	0	0	0	0	0
	PHF		0.	67			0.	50			0.	00			0.	00	

Client: Ben Lippman 444_C47_HSH Project #: BTD #: Location 5 Melrose, MA Location: Street 1: Washington Street Street 2: 99 Washington Street Driveway 9/5/2019 Count Date: Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PEDESTRIANS & BICYCLES

			shington St			Wa	ashington St Southbound	reet			E a a the a sum of				ngton Stree		
			Northbound				Southbound	נ			Eastbound				Westbound	1	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	12	
7:15 AM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	11	
7:30 AM	0	1	0	0	0	5	0	0	0	0	0	0	0	0	0	14	
7:45 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	20	
8:00 AM	0	1	0	0	1	4	0	0	0	0	0	0	0	0	0	19	
8:15 AM	0	1	0	0	0	9	0	0	0	0	0	0	0	0	0	12	
8:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	17	
8:45 AM	0	0	0	0	0	4	0	0	0	0	0	0	0	0	0	9	

			shington St Northbound			Wa	shington St Southbound	treet d			Eastbound			99 Washi	ngton Street Westbound	t Driveway	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	5	
4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	9	
4:30 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
4:45 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
5:00 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	23	
5:15 PM	0	3	0	0	0	1	0	0	0	0	0	0	0	0	0	13	
5:30 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	19	
5:45 PM	0	5	0	0	0	1	0	0	0	0	0	0	0	0	0	25	

AM PEAK HOUR ¹]	Wa	shington St	reet			Wa	shington St	reet						99 Washii	ngton Street	Driveway	
7:15 AM			Northbound	l .			:	Southbound	Ł			Eastbound				Westbound		
to	Northbound Left Thru Right PED					Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
8:15 AM	0	4	0	0		1	16	0	0	0	0	0	0	0	0	0	64	

PM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet						99 Washii	ngton Street	Driveway	
5:00 PM			Northbound				Southbound	ł			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	0	15	0	0	0	2	0	0	0	0	0	0	0	0	0	80	

¹Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 6 Melrose, MA Location: Street 1: Washington Street 99 Washington Entrance (Fotronic) Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

HV %

0.0%

0.0%

0.5%

0.0%

0.0%

0.0%

1.0%

0.0%

0.0%

0.0%

0.0%

0.0%

0.0%

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PASSENGER CARS & HEAVY VEHICLES COMBINED

										OLLS CC			00.14/			(F , ·)
		Washing					ton Street						99 wash		e Entrance	(Fotronic)
0, , T			bound	D: 17			bound	D : 14			bound	D : 17			bound	D : 14
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	78	0	0	0	128	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	87	0	0	0	185	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	92	0	0	0	167	0	0	0	0	0	0	1	0	0
7:45 AM	0	0	103	0	0	0	135	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	83	0	0	3	133	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	101	0	0	1	141	0	0	0	0	0	0	1	0	0
8:30 AM	0	0	102	0	0	0	118	0	0	0	0	0	0	0	0	1
8:45 AM	0	0	80	0	0	0	127	0	0	0	0	0	0	0	0	0
		North	ton Street bound			South	ton Street bound				oound			West	e Entrance	·
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	117	0	0	0	84	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	119	0	0	0	77	0	0	0	0	0	0	1	0	0
4:30 PM	0	0	106	0	0	0	84	0	0	0	0	0	0	0	0	1
4:45 PM	0	0	123	0	0	0	94	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	172	0	0	0	100	0	0	0	0	0	0	0	0	1
5:15 PM	0	0	128	0	0	0	88	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	112	0	0	1	107	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	149	0	0	0	100	0	0	0	0	0	0	0	0	0
AM PEAK HOUR 7:15 AM		North	ton Street bound	1		South	ton Street bound				pound	1		West	e Entrance	·
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	0	365	0	0	3	620	0	0	0	0	0	0	1	0	0
PHF		-	89				84			-	.00				25	
HV %	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
PM PEAK HOUR 5:00 PM			ton Street bound			•	ton Street bound			East	oound		99 Wash	0	e Entrance	(Fotronic)
to	S S S S S S S S S S S S S S S S S S S						Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM							395	0	0	0	0	0	0	0	0	1
PHF						0.	92			0.	.00			0.	25	

0.0%

0.0%

0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 6 Location: Melrose, MA Washington Street Street 1: 99 Washington Entrance (Fotronic) Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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Office: 978-746-1259 DataRequest@BostonTrafficData.com www.BostonTrafficData.com

HEAVY VEHICLES

								NEAVI V	EHICLES							
		Washing	ton Street			Washing	ton Street						99 Wash	ington Drive	e Entrance	(Fotronic)
		North	bound			South	bound			East	bound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0

		Washing	ton Street			Washing	ton Street						99 Wash	ington Drive	e Entrance	(Fotronic)
		North	bound			South	bound			East	oound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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

AM PEAK	HOUR		Washingt	ton Street			Washing	on Street						99 Washi	ington Drive	e Entrance (Fotronic)
8:00 AI	М		North	bound			South	bound			Eastb	ound			West	bound	
to		U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
9:00 AI	М	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0
PHF			0.	63			0.	38			0.	00			0.	00	

Γ	PM PEAK HOUR		Washing	ton Street			Washing	on Street						99 Washi	ington Drive	e Entrance (Fotronic)
	4:00 PM		North	bound			South	bound			Eastb	ound			West	bound	
	to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0
_	PHF		0.	75			0.	63			0.	00			0.	00	

Client: Ben Lippman 444_C47_HSH Project #: BTD #: Location 6 Melrose, MA Location: Street 1: Washington Street Street 2: 99 Washington Entrance (Fotronic) 9/5/2019 Count Date: Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PEDESTRIANS & BICYCLES

		Wa	shington St Northbound	reet		Wa	ashington St Southbound	reet 1			Eastbound		99	Washingtor	n Drive Entr Westbound	ance (Fotro I	nic)
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	15	
7:15 AM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	11	
7:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	16	
7:45 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	20	
8:00 AM	0	0	0	1	0	10	0	0	0	0	0	0	0	0	0	17	
8:15 AM	0	1	0	0	0	9	0	1	0	0	0	0	0	0	0	12	
8:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	16	
8:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	9	

			shington St Northbound				ashington S Southboun				Eastbound		99	Washingto	n Drive Entr Westbound	ance (Fotro	nic)
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	Ő	0	0	0	0	1	0	0	Ő	0	0	0	Ő	4	
4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
4:30 PM	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	13	
4:45 PM	0	4	0	0	0	0	0	2	0	0	0	0	0	0	0	4	
5:00 PM	0	3	0	0	0	0	0	1	0	0	0	0	0	0	0	24	
5:15 PM	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	15	
5:30 PM	0	5	0	1	0	0	0	1	0	0	0	0	0	0	0	14	
5:45 PM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	27	

AM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet			99 Washington Drive Entrance (Fotronic)								
7:15 AM			Northbound	l .	Southbound					Eastbound					Westbound				
to	Left	Thru	Right	PED	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
8:15 AM	0	3	0	1	0	19	0	0		0	0	0	0		0	0	0	64	

PM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet			99 Washington Drive Entrance (Fotronic)								
5:00 PM			Northbound	l	Southbound					Eastbound					Westbound				
to	Left	Thru	Right	PED	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	
6:00 PM	0	14	0	1	0	2	0	3		0	0	0	0		0	0	0	80	

¹Peak hours corresponds to vehicular peak hours.

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 7 Location: Melrose, MA Washington Street Street 1: 99 Washington St Dr Exit (Fotronic) Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PASSENGER CARS & HEAVY VEHICLES COMBINED

						PASSEN	GER CAI	KS & HEA	AVY VEHI	CLES CC	JWBINED					
		Washingt	ton Street			Washing	ton Street						99 Washi	ngton St Dr	iveway Exit	(Fotronic)
		North	bound			South	bound			East	oound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	1	0	78	0	0	0	128	0	0	0	0	0	0	1	0	0
7:15 AM	0	0	87	3	0	1	184	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	92	3	0	2	166	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	101	4	0	5	130	0	0	0	0	0	0	0	0	2
8:00 AM	0	0	83	2	0	2	131	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	99	8	0	3	139	0	0	0	0	0	0	0	0	2
8:30 AM	0	0	102	2	0	2	116	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	80	0	0	1	126	0	0	0	0	0	0	0	0	0

		Washingt	on Street			Washing	on Street						99 Washi	ngton St Dr	iveway Exit	(Fotronic)
		North	bound			South	bound			Eastb	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	117	2	0	0	84	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	119	5	0	0	78	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	106	2	0	0	84	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	123	0	0	2	92	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	172	1	0	1	99	0	0	0	0	0	0	1	0	0
5:15 PM	0	0	128	0	0	2	86	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	111	0	0	0	107	0	0	0	0	0	0	0	0	1
5:45 PM	0	0	149	0	0	0	100	0	0	0	0	0	0	1	0	0

AM PEAK HOUR		Washing	on Street			Washingt	on Street						99 Washii	ngton St Dr	iveway Exit	(Fotronic)
7:15 AM		North	oound			South	bound			Eastb	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0	0	363	12	0	10	611	0	0	0	0	0	0	0	0	2
								•	•	•	-	-	-	-	-	
PHF		0.	89			0.	_	•		0.	00	•	•	0.	25	

PM PEAK HOUR]	Washing	on Street			Washingt	on Street						99 Washi	ngton St Dr	iveway Exit	(Fotronic)
5:00 PM		North	bound			South	bound			East	oound			West	oound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	0	560	1	0	3	392	0	0	0	0	0	0	2	0	1
PHF		0.	81			0.	92			0.	00			0.	75	
HV %	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 7 Location: Melrose, MA Washington Street Street 1: 99 Washington St Dr Exit (Fotronic) Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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HEAVY VEHICLES

									ncavi v	ENICLES							
			Washing	ton Street			Washing	ton Street						99 Washi	ngton St Dr	iveway Exit	(Fotronic)
			North	bound			South	bound			East	oound			West	bound	
Sta	art Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:0	00 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:'	15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:3	30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:4	45 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
8:0	00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:1	15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:3	30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:4	45 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0

		Washing	ton Street			Washing	ton Street						99 Washi	ngton St Dr	iveway Exit	(Fotronic)
		North	bound			South	bound			East	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	2	0	0	0	1	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

AM PEAK HOUR		Washingt	ton Street			Washing	on Street						99 Washii	ngton St Dri	iveway Exit	(Fotronic)
8:00 AM		North	bound			South	bound			Eastb	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
9:00 AM	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0
PHF		0.	63			0.	38			0.	00			0.	00	

PN	A PEAK HOUR		Washing	ton Street			Washing	ton Street						99 Washii	ngton St Dri	iveway Exit	(Fotronic)
	4:00 PM		North	bound			South	bound			Eastb	ound			West	bound	
	to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	0
	PHF		0.	75			0.	63			0.0	00			0.	00	

Client: Ben Lippman 444_C47_HSH Project #: BTD #: Location 7 Melrose, MA Location: Street 1: Washington Street Street 2: 99 Washington St Dr Exit (Fotronic) 9/5/2019 Count Date: Day of Week: Thursday Clouds & Sun, 70°F Weather:

PEDESTRIANS & BICYCLES

		Wa	shington St	reet		Wa	shington St	reet					99 V	Nashington	St Drivewa	y Exit (Fotro	onic)
			Northbound	l			Southbound	b			Eastbound				Westbound	I	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	14	
7:15 AM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	14	
7:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	16	
7:45 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	19	
8:00 AM	0	0	0	0	0	10	0	1	0	0	0	0	0	0	0	17	
8:15 AM	0	1	0	1	0	9	0	0	0	0	0	0	0	0	0	12	
8:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	17	
8:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	9	

			shington St Northbound			Wa	ashington St Southbound	reet d			Eastbound		99 \	Washington	St Drivewa Westbound	y Exit (Fotro	onic)
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
4:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
5:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
5:15 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	14	
5:30 PM	0	5	0	0	0	0	0	1	0	0	0	0	0	0	0	12	
5:45 PM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	0	29	

AM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet					99 V	Vashington	St Drivewa	y Exit (Fotre	onic)
7:15 AM			Northbound				Southbound	1			Eastbound				Westbound	l .	
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
8:15 AM	0	3	0	0	0	19	0	1	0	0	0	0	0	0	0	66	

PM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet					99 V	Vashington	St Drivewa	y Exit (Fotro	onic)
5:00 PM			Northbound	l			Southbound	l			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	0	14	0	0	0	2	0	1	0	0	0	0	0	0	0	79	

¹ Peak hours corresponds to vehicular peak hours.



Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 8 Location: Melrose, MA Washington Street Street 1: 37 Washington Street Driveway Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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PASSENGER CARS & HEAVY VEHICLES COMBINED

		Washing	on Street				ton Street			CLES CC	JWIDINED		37 V	Vashington	Street Driv	0.11/21/
			bound				bound			Fast	oound		57 V		bound	sway
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	79	1	0	0	130	0	0	0	0	0	0	2	0	0
7:15 AM	0	0	88	3	0	1	183	0	0	0	0	0	0	1	0	2
7:30 AM	0	0	93	3	0	2	164	0	0	0	0	0	0	2	0	2
7:45 AM	0	0	102	4	0	5	125	0	0	0	0	0	0	1	0	3
8:00 AM	0	0	83	1	0	1	130	0	0	0	0	0	0	3	0	2
8:15 AM	0	0	105	7	0	2	137	0	0	0	0	0	0	1	0	2
8:30 AM	0	0	103	2	0	2	114	0	0	0	0	0	0	1	0	1
8:45 AM	0	0	79	0	0	1	125	0	0	0	0	0	0	1	0	1
		Washing					ton Street						37 V	Vashington		eway
r		North					bound				pound	n			oound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	118	2	0	0	84	0	0	0	0	0	0	2	0	1
4:15 PM	0	0	123	5	0	0	78	0	0	0	0	0	0	0	0	1
4:30 PM	0	0	106	2	0	0	84	0	0	0	0	0	0	1	0	2
4:45 PM	0	0	123	0	0	2	91	0	0	0	0	0	0	2	0	1
5:00 PM	0	0	172	1	0	1	99	0	0	0	0	0	0	3	0	1
5:15 PM	0	0	123	2	0	1	85	0	0	0	0	0	0	4	0	5
5:30 PM	0	0	110	4	0	0	107	0	0	0	0	0	0	1	0	1
5:45 PM	0	0	147	0	0	0	101	0	0	0	0	0	0	3	0	2
AM PEAK HOUR	1	Machine	on Chroat			Maabiaa	Law Chroat						07 V	lookington	Chroat Drive	
7:15 AM			ton Street bound				ton Street bound			Footh	oound		37 V	Vashington Westl		eway
/:15 AM to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
8:15 AM	0-1011	0	366	11	0-1011	<u>9</u>	602	0	0-1011	0	0	0	0-1011	7	0	9
PHF		•	89		•		83	v	U	•	00	v	v		80	
HV %	0.0%	0.0%	1.6%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
11, 10	0.070	0.070		0.070	01070	,	0.070	0.070	0.070	0.070	0.070	0.070	0.070	01070	0.070	0.070
PM PEAK HOUR		Washing	ton Street			Washing	ton Street						37 V	Vashington	Street Drive	ewav
5:00 PM		•	bound				bound			East	oound			West		,
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
6:00 PM	0	0	552	7	0	2	392	Ö	0	0	0	Ö	0	11	0	9
PHF	PHF 0.81						92			-	00			-	56	
HV %	0.0%	0.0%	0.5%	0.0%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	9.1%	0.0%	0.0%

Client: Ben Lippman Project #: 444_C47_HSH BTD #: Location 8 Location: Melrose, MA Washington Street Street 1: 37 Washington Street Driveway Street 2: Count Date: 9/5/2019 Day of Week: Thursday Clouds & Sun, 70°F Weather:

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HEAVY VEHICLES

								HEAVIV	ENICLES)						
		Washing	ton Street			Washing	ton Street						37 V	Vashington	Street Drive	eway
		North	bound			South	bound			Eastb	oound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30 AM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
8:00 AM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:30 AM	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	4	0	0	0	4	0	0	0	0	0	0	0	0	0

		Washing	ton Street			Washing	ton Street						37 V	Vashington	Street Drive	eway
		North	bound			South	bound			Eastb	ound			West	bound	
Start Time	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	0	0	0	2	0	0	0	0	0	0	0	0	0
4:15 PM	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0
4:30 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	1
5:00 PM	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	2	0	0	0	0	0	0	1	0	0
5:30 PM	0	0	2	0	0	0	1	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

AM PEAK HOUR	1	Washing	ton Street			Washing	on Street						37 V	Vashington	Street Drive	eway
8:00 AM		North	bound			South	bound			East	ound			West	bound	
to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
9:00 AM	0	0	10	0	0	0	6	0	0	0	0	0	0	0	0	0
PHF		0.	63			0.	38			0.	00			0.	00	

[PM PEAK HOUR		Washingt	on Street			Washing	on Street						37 W	/ashington	Street Drive	∋way
	4:00 PM		North	bound			South	bound			Eastb	bound			West	bound	
	to	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right
	5:00 PM	0	0	6	0	0	0	5	0	0	0	0	0	0	0	0	1
	PHF		0.	75			0.	63			0.	00			0.	25	

Client:	Ben Lippman
Project #:	444_C47_HSH
BTD #:	Location 8
Location:	Melrose, MA
Street 1:	Washington Street
Street 2:	37 Washington Street Driveway
Count Date:	9/5/2019
Day of Week:	Thursday
Weather:	Clouds & Sun, 70°F

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PEDESTRIANS & BICYCLES

			Wa	shington St	reet		Wa	ashington St	reet						37 Washii	ngton Stree	t Driveway	
				Northbound	l			Southbound	b			Eastbound				Westbound	ł	
S	Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
7	7:00 AM	0	0	0	0	0	5	0	0	0	0	0	0	0	0	0	15	
7	7:15 AM	0	1	0	0	0	3	0	0	0	0	0	0	0	0	0	13	
7	7:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	16	
7	7:45 AM	0	1	0	0	0	4	0	0	0	0	0	0	0	0	0	19	
8	8:00 AM	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	17	
8	8:15 AM	0	1	0	1	0	9	0	1	0	0	0	0	0	0	0	12	
8	8:30 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	17	
8	8:45 AM	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	10	

			shington St Northbound				shington Si Southboun				Eastbound			37 Washi	ngton Stree Westbound	t Driveway I	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
4:00 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
4:15 PM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	12	
4:30 PM	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	14	
4:45 PM	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	4	
5:00 PM	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	24	
5:15 PM	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	14	
5:30 PM	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	13	
5:45 PM	0	4	0	1	0	1	0	0	0	0	0	0	0	0	0	29	

AM PEAK HOUR ¹		Wa	shington St	reet		Wa	shington St	reet						37 Washir	ngton Street	t Driveway	
7:15 AM			Northbound	l .			Southbound	1			Eastbound				Westbound	l	
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
8:15 AM	0	3	0	0	0	19	0	0	0	0	0	0	0	0	0	65	

PM PEAK HOUR ¹		Wa	shington Sti	reet		Wa	ashington St	reet						37 Washii	ngton Street	Driveway	
5:00 PM			Northbound				Southbound	ł			Eastbound				Westbound		
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	
6:00 PM	0	14	0	1	0	2	0	0	0	0	0	0	0	0	0	80	

¹ Peak hours corresponds to vehicular peak hours.

Client: Mike White 481_C54_HSH Project #: BTD #: Location 1 Location: Malden, MA Washington Street/Glenwood Street Street 1: Street 2: Winter Street/Grove Street 10/22/2019 Count Date: Day of Week: Tuesday Mostly Cloudy, 55°F Weather:



PASSENGER CARS & HEAVY VEHICLES COMBINED

		Washingto Northb					ton Street				od Street				r Street tbound				Street	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	2	4	36	10	48	15	15	1	1	25	65	2	4	45	1	42	0	0	0	0
4:15 PM	1	1	28	8	32	18	19	3	1	23	97	4	2	48	3	43	0	0	0	0
4:30 PM	0	1	36	16	45	21	16	1	2	28	81	0	3	36	0	51	0	0	0	0
4:45 PM	2	2	27	10	36	28	13	0	3	17	91	0	4	35	0	34	0	0	0	0
5:00 PM	1	2	32	6	44	22	13	5	3	28	95	2	4	65	4	50	0	0	0	0
5:15 PM	1	3	43	15	42	38	16	1	2	28	97	2	4	39	4	59	0	0	0	0
5:30 PM	2	1	41	18	37	27	13	7	6	37	92	4	5	46	1	33	0	0	0	0
5:45 PM	3	4	35	11	44	23	24	2	4	24	96	3	2	45	5	59	0	0	0	0

PM PEAK HOUR		Washingt	on Street			Washing	ton Street			Glenwo	od Street			Winter	r Street			Grove	Street	
5:00 PM		North	bound			South	bound			East	oound			West	bound			Southea	stbound	
to	Left								Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
6:00 PM	7	7 10 151 50 167 110 66 15						15	15	117	380	11	15	195	14	201	0	0	0	0
PHF		0.8	88			0.	92			0.	.94			0.	.86			0.	00	
HV %	0.0%	0.0%	1.3%	4.0%	0.6%	3.6%	1.5%	6.7%	0.0%	0.9%	0.3%	9.1%	6.7%	1.0%	0.0%	0.5%	0.0%	0.0%	0.0%	0.0%

Client: Mike White 481_C54_HSH Project #: BTD #: Location 1 Location: Malden, MA Street 1: Washington Street/Glenwood Street Street 2: Winter Street/Grove Street 10/22/2019 Count Date: Day of Week: Tuesday Mostly Cloudy, 55°F Weather:



HEAVY VEHICLES

		Washingto Northb					ton Street				od Street				r Street tbound				e Street astbound	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	2	1	0	0	1	0	0	0	0	0	0	0	0	2	0	0	0	0
4:15 PM	0	0	0	0	2	1	0	0	0	0	0	0	0	0	1	2	0	0	0	0
4:30 PM	0	0	1	1	2	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0
4:45 PM	0	0	1	0	0	0	1	0	0	1	0	0	0	1	0	1	0	0	0	0
5:00 PM	0	0	0	1	1	2	0	1	0	1	1	0	0	2	0	0	0	0	0	0
5:15 PM	0	0	1	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0
5:30 PM	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
5:45 PM	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0

PM PEAK HOUR		Washingto	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
4:15 PM		Northb	ound			South	bound			East	bound			West	bound			Southea	stbound	
to	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
5:15 PM	0	0	2	2	5	3	3	1	0	2	2	0	0	3	1	3	0	0	0	0
PHF		0.5	50			0	.75			0	.50			0	.58			0.	00	

Client:	Mike White
Project #:	481_C54_HSH
BTD #:	Location 1
Location:	Malden, MA
Street 1:	Washington Street/Glenwood Street
Street 2:	Winter Street/Grove Street
Count Date:	10/22/2019
Day of Week:	Tuesday
Weather:	Mostly Cloudy, 55°F



PEDESTRIANS & BICYCLES

		Washing North	ton Street bound			Washing South	ton Street bound				od Street			Winter West				Grove Southea	Street	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	3	0	0	0	9
4:15 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	7
4:30 PM	0	0	0	3	0	1	0	0	0	1	0	2	0	0	0	9	0	0	0	15
4:45 PM	0	0	0	2	0	0	0	2	0	0	0	3	0	0	0	5	0	0	0	7
5:00 PM	0	0	0	0	0	0	0	2	0	0	0	7	0	0	0	5	0	0	0	17
5:15 PM	0	1	0	1	0	0	0	0	1	0	0	4	0	0	0	11	0	0	0	9
5:30 PM	0	1	1	1	0	0	0	3	0	0	0	6	0	0	0	7	0	0	0	17
5:45 PM	0	1	0	0	0	0	1	4	0	0	0	2	0	0	1	12	0	0	0	16
5.45 PIVI	U		U	0	0	0		4	U	U	U	Z	0	0		12	U	0	0	10

PM PEAK HOUR		Washing	ton Street				Washing	ton Street				Glenwoo	od Street			Winter	Street			Grove	Street	
5:00 PM		North			Southbound							East	ound			West	bound			Southea	astbound	
to	Left	Thru	Right	PED		Left	Thru	Right	PED		Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
6:00 PM	0	3	1	2		0	0	1	9		1	0	0	19	0	0	1	35	0	0	0	59
NOTE D 11				11 00 10			1	1.1														

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.

Client: Mike White 481_C54_HSH Project #: BTD #: Location 1 Location: Malden, MA Washington Street/Glenwood Street Street 1: Street 2: Winter Street/Grove Street 10/17/2019 Count Date: Day of Week: Thursday Cloudy, 55°F Weather:



PASSENGER CARS &	HEAVY VEHICLES COMBINED
FASSENGER CARS &	HEAVI VEHICLES CONDINED

								1 AGOLIG	OLN OAN											
		Washingt	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
		North	bound			South	nbound			East	bound			West	bound			Southea	astbound	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	2	3	63	39	52	2	1	23	45	0	4	94	1	39	0	0	0	0
7:15 AM	4	0	1	8	57	50	35	1	0	25	56	1	19	104	2	37	0	0	0	0
7:30 AM	3	0	4	7	58	60	49	1	1	17	59	2	27	99	3	58	0	0	0	0
7:45 AM	6	0	4	7	44	38	38	2	2	29	35	3	19	93	4	68	0	0	0	0
8:00 AM	2	1	1	5	55	58	45	0	0	32	44	5	19	108	6	62	0	0	0	0
8:15 AM	0	0	1	7	53	42	42	2	1	32	43	0	15	97	10	73	0	0	0	0
8:30 AM	1	0	2	5	47	56	39	3	0	35	52	1	12	61	4	58	0	0	0	0
8:45 AM	4	0	4	16	49	49	34	7	3	40	29	3	5	38	0	45	0	0	0	0

		Washingt					ton Street				od Street				r Street				Street	
		North	oound			South	bound			East	bound			West	bound			Southea	astbound	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	1	0	2	0	47	0	32	3	2	53	68	1	0	44	2	43	0	0	0	0
4:15 PM	2	0	0	1	38	0	21	3	1	47	61	3	1	49	2	56	0	0	0	0
4:30 PM	2	0	2	1	51	1	24	4	2	48	89	0	0	61	3	58	0	0	0	0
4:45 PM	1	0	2	3	48	0	18	2	2	45	84	1	1	52	3	40	0	0	0	0
5:00 PM	2	0	10	3	65	0	35	2	1	47	101	1	0	51	2	50	0	0	0	0
5:15 PM	0	0	14	3	51	1	54	4	1	40	109	1	1	47	4	55	0	0	0	0
5:30 PM	1	0	7	3	47	0	35	2	7	54	94	0	0	46	3	57	0	0	0	0
5:45 PM	0	0	1	4	54	0	25	4	2	59	84	1	0	53	2	48	0	0	0	0

AM PEAK HOUR		Washingt	on Street			Washing	ton Street			Glenwoo	od Street			Winte	r Street			Grove	Street	
7:30 AM		North	oound			South	bound			Eastb	ound			West	bound			Southea	stbound	
to	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
8:30 AM	11 1 10 26 210 198 174						5	4	110	181	10	80	397	23	261	0	0	0	0	
PHF	0.71 0.87									0.	94			0	.98			0.0	00	
HV %	0.71 0.87 0.0% 0.0% 0.0% 1.0% 0.0% 1.7%						0.0%	0.0%	4.5%	1.1%	0.0%	0.0%	0.8%	4.3%	1.1%	0.0%	0.0%	0.0%	0.0%	

PM PEAK HOUR		Washingto	on Street			Washing	ton Street			Glenwoo	od Street			Winte	r Street			Grove	Street	
5:00 PM		Northb	ound			South	bound			East	ound			West	tbound			Southea	stbound	
to	Left	Left Soft Left Thru Right Left Thru Right Hard							Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
6:00 PM	3	3 0 32 13 217 1 149 12							11	200	388	3	1	197	11	210	0	0	0	0
PHF		0.71 0.86								0.	97			0	.98			0.0	00	
HV %	0.0%								0.0%	1.5%	0.8%	0.0%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Notes:

Due to the storm, there was a road block on Northbound leg from 4 pm to 6 pm.

Vehicles were permitted drive Northbound direction. Vehicles were NOT permitted to drive onto Northbound leg.

Client: Mike White 481_C54_HSH Project #: BTD #: Location 1 Location: Malden, MA Washington Street/Glenwood Street Street 1: Street 2: Winter Street/Grove Street 10/17/2019 Count Date: Thursday Day of Week: Cloudy, 55°F Weather:

5:00 PM

PHF

2

0

0.50

0

0

3

1

0

0.50

0



									E	IEAVY V	EHICLES									
		Washingto	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
		Northb	ound			South	bound			East	bound			West	bound			Southea	astbound	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
7:00 AM	0	0	0	0	1	1	4	0	0	1	3	0	0	2	1	0	0	0	0	0
7:15 AM	0	0	1	0	0	0	1	0	0	1	3	0	1	0	0	0	0	0	0	0
7:30 AM	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45 AM	0	0	0	0	0	0	1	0	0	1	0	0	0	2	0	1	0	0	0	0
8:00 AM	0	0	0	0	0	0	1	0	0	2	1	0	0	0	0	1	0	0	0	0
8:15 AM	0	0	0	0	1	0	0	0	0	2	1	0	0	1	1	1	0	0	0	0
8:30 AM	0	0	0	0	1	0	3	0	0	0	2	0	0	0	0	0	0	0	0	0
8:45 AM	0	0	1	0	0	0	0	0	0	1	1	0	0	1	0	0	0	0	0	0
															a			-	a	

		Washingt	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
		North	bound			South	bound			East	oound			West	bound			Southea	astbound	
Start Time	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
4:00 PM	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	1	0	0	0	0
4:15 PM	1	0	0	0	2	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0
4:30 PM	0	0	0	0	1	1	0	0	0	1	3	0	0	0	0	0	0	0	0	0
4:45 PM	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	2	0	0	0	0
5:00 PM	0	0	0	0	0	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	0
5:45 PM	0	0	0	0	1	0	0	0	0	2	1	0	0	1	0	0	0	0	0	0
									•											

AM PEAK HOUR		Washingt	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
7:00 AM		North	bound			South	bound			East	bound			West	bound			Southea	stbound	
to	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right
8:00 AM	0	0	1	0	2	1	7	0	0	3	6	0	1	4	1	1	0	0	0	0
PHF		0.2	25			0	.42			0	.56			0	.58			0.	00	
PM PEAK HOUR		Washingt	on Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
4:00 PM		North	bound			South	bound			East	bound			West	bound			Southea	stbound	
to	Left	Soft Left	Thru	Right	Left	Thru	Right	Hard Right	Hard Left	Left	Thru	Right	Left	Thru	Soft Right	Right	U-Turn	Left	Thru	Right

4

0.56

4

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Client:	Mike White
Project #:	481_C54_HSH
BTD #:	Location 1
Location:	Malden, MA
Street 1:	Washington Street/Glenwood Street
Street 2:	Winter Street/Grove Street
Count Date:	10/17/2019
Day of Week:	Thursday
Weather:	Cloudy, 55°F



									PEDE	ESTRIAN	S & BICY	CLES								
		Washing	ton Street			Washing	ton Street			Glenwo	od Street			Winte	r Street			Grove	Street	
		North	bound			South	bound			East	bound			West	bound			Southea	astbound	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
7:00 AM	0	0	0	3	0	0	0	5	0	1	0	4	0	0	0	4	0	0	0	19
7:15 AM	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	8	0	0	0	15
7:30 AM	0	0	0	0	0	0	0	4	0	0	0	1	0	0	0	11	0	0	0	21
7:45 AM	0	0	0	0	0	1	0	1	0	0	0	3	0	0	0	2	0	0	0	23
8:00 AM	0	0	0	3	0	0	0	2	0	0	0	4	0	0	0	22	0	0	0	26
8:15 AM	0	0	0	3	0	0	0	1	0	0	0	1	0	0	0	20	0	0	0	23
8:30 AM	0	0	0	0	0	0	0	1	0	0	0	2	0	0	0	17	0	0	0	25
8:45 AM	0	0	0	2	0	0	1	0	0	1	0	0	0	0	0	13	0	0	0	20

		Washingt North					ton Street bound			Glenwoo Eastb					r Street bound				e Street astbound	
Start Time	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
4:00 PM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	15
4:15 PM	0	0	0	1	0	0	0	2	0	0	0	7	0	0	0	3	0	0	0	5
4:30 PM	0	0	0	5	0	0	0	0	0	0	0	3	0	0	0	5	0	0	0	7
4:45 PM	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	10	0	0	0	15
5:00 PM	0	0	0	1	0	0	0	0	0	0	0	2	0	0	0	13	0	0	0	12
5:15 PM	0	0	0	0	0	0	0	1	0	0	0	3	0	0	0	6	0	0	0	8
5:30 PM	0	1	0	2	0	0	0	2	0	0	0	2	0	0	0	9	0	0	0	7
5:45 PM	0	0	0	2	0	0	0	5	0	0	0	5	0	0	0	10	0	0	0	26
AM PEAK HOUR		Washing					ton Street			Glenwoo					Street				Street	
7:30 AM		North		252			bound	050		East					bound	050			astbound	
to	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
8:30 AM	0	0	0	6	0	1	0	8	0	0	0	9	0	0	0	55	0	0	0	93

ſ	PM PEAK HOUR		Washingt	on Street				Washingt	on Street			Glenwoo	od Street			Winter	Street			Grove	Street	
	5:00 PM		Northbound					South	bound			Eastb	ound			Westb	ound			Southea	stbound	
	to	Left	Thru	Right	PED		Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED	Left	Thru	Right	PED
	6:00 PM	0	1	0	5		0	0	0	8	0	0	0	12	0	0	0	38	0	0	0	53

NOTE: Peak hour summaries here correspond to peak hours identified for passenger car and heavy vehicles combined.



Crash Data



CITY/TOWN :	Melrose			COUNT DA	TE:	9/5/2019
DISTRICT : 4	UNSIGN	ALIZED :	X	SIGNA	LIZED :	
		~ IN1	FERSECTION	I DATA ~		
MAJOR STREET :	Washington					
MINOR STREET(S) :						
	Stone Place					
INTERSECTION DIAGRAM (Label Approaches)	↑ North	6000	PEAK HOUF	Washington St		
APPROACH :	1	2	3	4	5	Total Peak Hourly
DIRECTION :	AM	РМ				Approach Volume
PEAK HOURLY VOLUMES :	661	612				1,273
"K FACTOR :	0.180	INTERS	ECTION ADT APPROACH		AL DAILY	7,072
TOTAL # OF CRASHES :	1	# OF YEARS :	3	CRASHES	GE # OF PER YEAR (.):	0.33
CRASH RATE CALC	ULATION :	0.13	RATE =	<u>(A*1,0</u> (V	000,000) * 365)	
Comments : Project Title & Date:		t 4 Average (on Street, 9/2		Crashes from	2016-2018.	



CITY/TOWN :	Melrose			COUNT DA	TE :	9/5/2019
DISTRICT : 4		ALIZED :	X	1	LIZED :	
	-	- INI	FERSECTION			
		~ 111	IERSECTION			
MAJOR STREET :	Pleasant Stre	eet				
MINOR STREET(S) :	Stone Place					
INTERSECTION DIAGRAM (Label Approaches)	↑ North	Ston	e Place	Pleasant St		
			PEAK HOUP	R VOLUMES		Total Peak
APPROACH :	1	2	3	4	5	Hourly
DIRECTION :	AM	PM				Approach Volume
PEAK HOURLY VOLUMES :	685	782				1,467
"K FACTOR :	0.180	INTERSI	ECTION ADT APPROACH	. ,	AL DAILY	8,150
TOTAL # OF CRASHES :	3	# OF YEARS :	3	CRASHES	GE # OF PER YEAR (.):	1.00
CRASH RATE CALC	ULATION :	0.34	RATE =	<u>(A*1,</u> (V	000,000) * 365)	
Comments :	Below Distric	t 4 Average (0.34<0.58). C	Crashes from	2016-2018.	
Project Title & Date:	99 Washingt	on Street, 9/2	25/2019			



CITY/TOWN :	Melrose			COUNT DA	TE :	9/5/2019
DISTRICT : 4	UNSIGN	ALIZED :	Х	SIGNA	LIZED :	
		~ IN1	ERSECTION	I DATA ~		
MAJOR STREET :	Washington	Street				
MINOR STREET(S) :	Pleasant Stre	eet				
	Site Drivewa	у				
INTERSECTION DIAGRAM (Label Approaches)	↑ North		PEAK HOUR		riveway	
APPROACH :	1	2	3	4	5	Total Peak Hourly
DIRECTION :	AM	PM				Approach Volume
PEAK HOURLY VOLUMES :	1,023	998				2,021
"K FACTOR :	0.180	INTERS	ECTION ADT APPROACH		AL DAILY	11,228
TOTAL # OF CRASHES :	5	# OF YEARS :	3	CRASHES	GE # OF PER YEAR (.):	1.67
CRASH RATE CALC	ULATION :	0.41	RATE =	<u>(A*1,</u> (V	000,000) * 365)	
Comments : Project Title & Date:		t 4 Average (on Street, 9/2		Crashes from	2016-2018.	



CITY/TOWN :	Melrose			COUNT DA	TE :	9/5/2019
DISTRICT : 4		ALIZED :	x	1	LIZED :	
	-	~ 101	FERSECTION			
MAJOR STREET :	Washington	Street				
MINOR STREET(S) :	Brazil Street					
	Site Drivewa	у				
INTERSECTION DIAGRAM (Label Approaches)	N orth		PEAK HOUF	Washington St	Iveway.	
APPROACH :	1	2	3	4	5	Total Peak
DIRECTION :	AM	PM				Hourly Approach Volume
PEAK HOURLY VOLUMES :	1,015	983				1,998
"K FACTOR :	0.180	INTERSE	ECTION ADT APPROACH	. ,	AL DAILY	11,100
TOTAL # OF CRASHES :	1	# OF YEARS :	3	CRASHES	GE # OF PER YEAR (.):	0.33
CRASH RATE CALC	ULATION :	0.08	RATE =	<u>(A*1,</u> (V	000,000) * 365)	
Comments : Project Title & Date:		et 4 Average (on Street, 9/2	0.08<0.58). C	Crashes from	2016-2018.	



CITY/TOWN :	Malden			COUNT DA	TE: <u>10/17/1</u>	9 & 10/22/19
DISTRICT : 4	UNSIGN	ALIZED :		SIGNA	LIZED :	X
		~ IN1	FERSECTION	I DATA ~		
MAJOR STREET :	Washington					
MINOR STREET(S) :	Winter Stree	t				
	Glenwood St	reet				
	Grove Street					
INTERSECTION DIAGRAM (Label Approaches)	↑ North	Greening	A Dreet	Winter	Street	
			PEAK HOUP			
APPROACH :	1	2	3	4	5	Total Peak Hourly
DIRECTION :	AM	PM				Approach Volume
PEAK HOURLY VOLUMES :	1,701	1,524				3,225
"K " FACTOR :	0.180	INTERSE	ECTION ADT APPROACH		AL DAILY	17,917
TOTAL # OF CRASHES :	5	# OF YEARS :	3	CRASHES	GE # OF PER YEAR (.):	1.67
CRASH RATE CALC	ULATION :	0.25	RATE =	<u>(A*1,</u> (V	000,000) * 365)	
Comments :	Below Distric	t 4 Average (0.25<0.73). (Crashes from	2016-2018.	
Project Title & Date:						



Trip Generation



Existing Trip Generation

99 Washington Street, Melrose

Existing Trip Generation Assessment

HOWARD STEIN HUDSON 23-Sep-2019

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate ¹	Primary Person Trips	Transit Share ²	Transit Person- Trips	Walk/Bike/ Other Share ²	Walk/ Bike/ Other Trips		Auto Person- Trips	Private Auto Person-Trips	Assumed Local Auto Occupancy Rate ³	Primary AutoTrips
Daily Peak Hour																
Office Building ⁴	16.5	Total		9.740	160	1.18	188	0%	0	0%	0	100%	188	188	1.18	160
	KSF	In	50%	4.870	80	1.18	94	0%	0	0%	0	100%	94	94	1.18	80
		Out	50%	4.870	80	1.18	94	0%	0	0%	0	100%	94	94	1.18	80
Furniture Store ⁵	22	Total		6.300	138	1.82	252	0%	0	0%	0	100%	252	252	1.82	138
	KSF	In	50%	3.150	69	1.82	126	0%	0	0%	0	100%	126	126	1.82	69
		Out	50%	3.150	69	1.82	126	0%	0	0%	0	100%	126	126	1.82	69
Total		Total			298		440		0		0		440			298
		In			149		220		0		0		220			149
		Out			149		220		0		0		220			149
AM Peak Hour																
Office Building ⁴	16.5	Total		1.16	19	1.18	23		0		0		23	23	1.18	19
	KSF	In	86%	0.998	16	1.18	19	0%	0	0%	0	100%	19	19	1.18	16
		Out	14%	0.162	3	1.18	4	0%	0	0%	0	100%	4	4	1.18	3
Furniture Store ⁵	22	Total		0.260	6	1.82	11		0		0		11	11	1.82	6
	KSF	In	71%	0.185	4	1.82	7	0%	0	0%	0	100%	7	7	1.82	4
		Out	29%	0.075	2	1.82	4	0%	0	0%	0	100%	4	4	1.82	2
Total		Total			25		34		0		0		34	•		25
		In			20		26		0		0		26			20
		Out			5		8		0		0		8			5
PM Peak Hour																
Office Building ⁴	16.5	Total		1.15	19	1.18	23		0		0		23	23	1.18	19
-	KSF	In	16%	0.184	3	1.18	4	0%	0	0%	0	100%	4	4	1.18	3
		Out	84%	0.966	16	1.18	19	0%	0	0%	0	100%	19	19	1.18	16
Furniture Store ⁵	22	Total		0.520	11	1.82	20		0		0		20	20	1.82	11
	KSF	In	47%	0.244	5	1.82	9	0%	0	0%	0	100%	9	9	1.82	5
		Out	53%	0.276	6	1.82	11	0%	0	0%	0	100%	11	11	1.82	6
Total		Total		-	30	-	43		0		0	-	43		*	30
		In			8		13		0		0		13			8
		Out			22		30		0		0		30			22

1. 2017 National vehicle occupancy rates - 1.18:home to work; 1.82: family/personal business; 1.82: shopping; 2.1 social/recreational

2. Assume all trips to office and furniture are made via auto

3. Local vehicle occupancy rates based on 2017 National vehicle occupancy rates

4. ITE Trip Generation Manual, 10th Edition, LUC 710 (General Office Building), average rate

5. ITE Trip Generation Manual, 10th Edition, LUC 890 (Furniture Store), average rate



Proposed Trip Generation

99 Washington Street, Melrose

Proposed Trip Generation Assessment

HOWARD STEIN HUDSON 23-Sep-2019

XX HARD CODED TO BALANCE (Manually change formatting)

Land Use	Size	Category	Directional Split	Average Trip Rate	Unadjusted Vehicle Trips	Assumed National Vehicle Occupancy Rate ¹	Unadjusted Person-Trips	Transit Share ³	Transit Person- Trips	Walk/Bike/ Other Share	Walk/ Bike/ ³ Other Trips	Auto Share ³	Auto Person- Trips	% Taxi/ TNC ⁴	Taxi/TNC Person- Trips		Primary Auto- Person Trips	Assumed Local Auto Occupancy Rate ⁵	Taxi/TNC Auto Trips	Primary AutoTrips	Total Auto + Taxi/TNC Trips	Net New Auto Trips
Daily Peak Hour							1			-				1								
Multifamily Housing (Low Rise) ⁶	141	Total		7.320	1,032	1.18	1,218	27%	328	5%	62	68%	828	5%	42	1.18	786	1.18	72	666	738	
	units	In	50%	3.660	516	1.18	609	27%	164	5%	31	68%	414	5%	21	1.18	393	1.18	36	333	369	
		Out	50%	3.660	516	1.18	609	27%	164	5%	31	68%	414	5%	21	1.18	393	1.18	36	333	369	
Total		Total			1,032		1,218		328		62		828						72	666	738	440
		In			516		609		164		31		414						36	333	369	220
		Out			516		609		164		31		414						36	333	369	220
AM Peak Hour																						
Multifamily Housing (Low Rise) ⁶	141	Total		0.460	65	1.18	77		21		4		52	5%	3	1.18	49	1.18	6	41	47	
	units	In	23%	0.106	15	1.18	18	27%	5	5%	1	68%	12	5%	1	1.18	11	1.18	3	9	12	
		Out	77%	0.354	50	1.18	59	27%	16	5%	3	68%	40	5%	2	1.18	38	1.18	3	32	35	
Total		Total			65		77		21		4		52						6	41	47	22
		In			15		18		5		1		12						3	9	12	-8
		Out			50		59		16		3		40						3	32	35	30
PM Peak Hour																						
Multifamily Housing (Low Rise) ⁶	141	Total		0.560	79	1.18	93		25		5		63	5%	3	1.18	60	1.18	6	51	57	1
	units	In	63%	0.353	50	1.18	59	27%	16	5%	3	68%	40	5%	2	1.18	38	1.18	3	32	35	
		Out	37%	0.207	29	1.18	34	27%	9	5%	2	68%	23	5%	1	1.18	22	1.18	3	19	22	
Total		Total			79		93		25		5		63						6	51	57	27
		In			50		59		16		3		40						3	32	35	27
		Out			29		34		9	1	2		23						3	19	22	0

1. 2017 National vehicle occupancy rates - 1.18:home to work; 1.82: family/personal business; 1.82: shopping; 2.1 social/recreational

2. Based on ITE Trip Generation Handbook, 3rd Edition method

3. Mode shares for residential based on U.S. Census Bureau, 2013-2017 American Community Survey.

4. Assumed Taxi/TNC percentage

5. Local vehicle occupancy rates based on 2017 National vehicle occupancy rates

6. ITE Trip Generation Manual, 10th Edition, LUC 220 (Multifamily Housing Low-Rise (1-2 floors), average rate



Intersection LOS/Synchro Reports



Existing (2019) Condition

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	
Lane Configurations			4		4î þ			र्स	1		ا	R.		
Traffic Volume (vph)	4	110	181	80	397	11	1	10	26	210	198	174		
Future Volume (vph)	4	110	181	80	397	11	1	10	26	210	198	174		
Furn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot		
Protected Phases	2	2	23		3			1			1	1	4	
ermitted Phases	3	3		3		1	1		1	1				
etector Phase	2	2	23	3	3	1	1	1	1	1	1	1		
witch Phase														
linimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0	
linimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0	
otal Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	
otal Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%	
ellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	
II-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
ost Time Adjust (s)	1.0	1.0		1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	
otal Lost Time (s)					4.0			4.0	4.0		4.0	4.0		
ead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None	
ct Effct Green (s)	Mux	IVICIA	23.8	WIGA	11.4	max	IVIGA	17.6	17.6	IVIGA	17.6	17.6	None	
ctuated g/C Ratio			0.36		0.17			0.27	0.27		0.27	0.27		
/c Ratio			0.78		1.32			0.10	0.07		1.18	0.43		
Control Delay			35.1		180.1			24.4	0.3		133.4	16.5		
lueue Delav			0.0		0.0			0.0	0.0		0.0	0.0		
otal Delay			35.1		180.1			24.4	0.3		133.4	16.5		
OS			D		F			C 24.4	A		F	B		
pproach Delay			35.1		180.1			11.1			97.7	5		
pproach LOS			D		F			В			F			
			D					D						
tersection Summary														
Cycle Length: 76														
ctuated Cycle Length: 66.4														
atural Cycle: 110														
ontrol Type: Semi Act-Uncoor laximum v/c Ratio: 1.32	u													
	2				toroodi									
tersection Signal Delay: 118.2					tersection									
tersection Capacity Utilization nalysis Period (min) 15	177.5%			10	CU Level o	Service L)							
	to - Charl			MM C										
plits and Phases: 8: Washir	ngton Stree	et & Glenwo	ood Stree			ove Street			-	_				25
1 Ø1				4	Ø2					Ø3				ÅÅ _{Ø4}
1s				16 s					15 s					24 s

	-+	-	Ť	1	ţ	1
Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	325	776	30	37	469	206
v/c Ratio	0.78	1.32	0.10	0.07	1.18	0.43
Control Delay	35.1	180.1	24.4	0.3	133.4	16.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.1	180.1	24.4	0.3	133.4	16.5
Queue Length 50th (ft)	118	~252	11	0	~301	42
Queue Length 95th (ft)	#269	#364	25	0	#453	97
Internal Link Dist (ft)	377	369	306		848	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	416	589	295	501	397	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.78	1.32	0.10	0.07	1.18	0.43
Intersection Summary						
 Volume exceeds capacity, 	aueue is the	eoretically	infinite.			
Queue shown is maximum						

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

	٢	٦	-	\mathbf{r}	4	-	*	•	1	٦	Ť	~	1	Ŧ	1	×J
Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations			4			ብጉ					र्स	1		ę	r.	
Traffic Volume (vph)	4	110	181	10	80	397	23	261	11	1	10	26	210	198	174	5
Future Volume (vph)	4	110	181	10	80	397	23	261	11	1	10	26	210	198	174	5
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11
Fotal Lost time (s)			4.0			4.0					4.0	4.0		4.0	4.0	
ane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00	
rpb, ped/bikes			1.00			1.00					1.00	1.00		1.00	1.00	
lpb, ped/bikes			1.00			1.00					1.00	1.00		1.00	1.00	
rt			1.00			0.94					1.00	0.85		1.00	0.85	
It Protected			0.98			0.99					0.97	1.00		0.97	1.00	
atd. Flow (prot)			1813			3357					1851	1615		1782	1531	
It Permitted			0.24			0.87					0.59	1.00		0.82	1.00	
Satd. Flow (perm)			445			2932					1116	1615		1503	1531	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.98	0.98	0.98	0.98	0.71	0.71	0.71	0.71	0.87	0.87	0.87	0.87
Adj. Flow (vph)	0.94	0.94	193	0.94	0.98	405	23	266	0.71	0.71	0.71	37	241	228	200	6
RTOR Reduction (vph)	4	0	193	0	02	405	23	200	0	0	0	27	241	220	200	0
ane Group Flow (vph)	0	0	324	0	0	690	0	0	0	0	30	10	0	469	132	0
	U		324	U	0	090	U	U	U	U	30	10	0	409	132	93
Confl. Peds. (#/hr)		10													1	93
Confl. Bikes (#/hr)	00/	E0/	10/	00/	00/	10/	407	1%	00/	0%	0%	0%	10/	00/	1 2%	0%
leavy Vehicles (%)	0%	5%	1%	0%	0%	1%	4%	1%	0%				1%	0%		0%
	D.P+P	D.P+P	NA		Perm	NA			Perm	Perm	NA	Perm	Perm	NA	Prot	
Protected Phases	2	2	23		0	3					1		1	1	1	
ermitted Phases	3	3			3				1	1		1	1			
ctuated Green, G (s)			23.8			11.4					17.6	17.6		17.6	17.6	
ffective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6	
Actuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26	
Clearance Time (s)						4.0					4.0	4.0		4.0	4.0	
/ehicle Extension (s)						2.0					2.0	2.0		2.0	2.0	
ane Grp Cap (vph)			411			499					293	424		395	402	
/s Ratio Prot			c0.15												0.09	
/s Ratio Perm			0.13			c0.24					0.03	0.01		c0.31		
/c Ratio			0.79			1.38					0.10	0.02		1.19	0.33	
Jniform Delay, d1			19.3			27.8					18.7	18.3		24.7	19.9	
Progression Factor			1.00			1.00					1.00	1.00		1.00	1.00	
ncremental Delay, d2			14.1			184.2					0.7	0.1		107.0	2.2	
)elay (s)			33.4			211.9					19.4	18.4		131.7	22.1	
evel of Service			С			F					В	В		F	С	
pproach Delay (s)			33.4			211.9					18.8			98.2		
pproach LOS			С			F					В			F		
ntersection Summary																
CM 2000 Control Delay			131.8	Н	CM 2000 L	evel of Se	rvice		F							
CM 2000 Volume to Capacity ra	atio		0.88													
ctuated Cycle Length (s)			66.9	Si	um of lost	time (s)			14.0							
tersection Capacity Utilization			77.5%		U Level of				D							
nalysis Period (min)			15													
Critical Lane Group																

c Critical Lane Group

		Jup										
	٠	-	\mathbf{r}	1	+	×.	1	Ť	1	1	ŧ	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4						4	
Traffic Volume (veh/h)	4	1	1	0	2	262	0	0	0	6	384	1
Future Volume (Veh/h)	4	1	1	0	2	262	0	0	0	6	384	1
Sign Control	4	Stop	1	0	Stop	202	U	Free	U	U	Free	
Grade											0%	
		0%			0%			0%				
Peak Hour Factor	0.50	0.50	0.50	0.96	0.96	0.96	0.92	0.92	0.92	0.94	0.94	0.94
Hourly flow rate (vph)	8	2	2	0	2	273	0	0	0	6	409	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
	696	422	410	424	422	0	410			0		
vC, conflicting volume	090	422	410	424	422	U	410			U		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	696	422	410	424	422	0	410			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	75	100			100		
cM capacity (veh/h)	267	525	646	539	524	1085	1160			1636		
Direction, Lane #	EB 1	WB 1	SB 1		-							
Volume Total	12		416									
		275										
Volume Left	8	0	6									
Volume Right	2	273	1									
cSH	326	1077	1636									
Volume to Capacity	0.04	0.26	0.00									
Queue Length 95th (ft)	3	25	0									
Control Delay (s)	16.5	9.5	0.1									
Lane LOS	С	A	A									
Approach Delay (s)	16.5	9.5	0.1									
Approach LOS	С	A										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			43.6%	10	U Level o	fSonvior			А			
			43.0%	IC	O LEVELO	I GELVICE			A			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								4				
Traffic Volume (veh/h)	2	⇔ 5	0	13	↔ 22	9	236	141	5	5	4) 241	6
Future Volume (Veh/h)	2	5	0	13	22	9	236	141	5	5	241	6
Sign Control	-	Stop	Ű	10	Stop		200	Free	Ű	Ű	Free	ů
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.85	0.85	0.85	0.75	0.75	0.75
Hourly flow rate (vph)	2	6	0.00	19	32	13	278	166	6	7	321	8
Pedestrians	-	U	U	10	02	10	210	100	v	,	021	Ū
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)								Hone			NUNG	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1093	1067	325	1067	1068	169	329			172		
vC1, stage 1 conf vol	1095	1007	325	1007	1000	109	329			172		
vC2, stage 2 conf vol												
vC2, stage 2 coni voi vCu, unblocked vol	1093	1067	325	1067	1068	169	329			172		
tC, single (s)	7.1	6.5	525 6.2	7.1	6.5	6.2	329 4.1			4.1		
tC, 2 stage (s)	1.1	C.0	0.2	1.1	0.0	0.2	4.1			4.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
				3.5 88	4.0	3.3 99	2.2			100		
p0 queue free %	99	97	100									
cM capacity (veh/h)	135	172	721	162	172	880	1231			1417		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	64	450	336								
Volume Left	2	19	278	7								
Volume Right	0	13	6	8								
cSH	161	201	1231	1417								
Volume to Capacity	0.05	0.32	0.23	0.00								
Queue Length 95th (ft)	4	33	22	0								
Control Delay (s)	28.5	31.0	6.3	0.2								
Lane LOS	D	D	А	А								
Approach Delay (s)	28.5	31.0	6.3	0.2								
Approach LOS	D	D										
Intersection Summary												
Average Delay			5.9									
Intersection Capacity Utilization			47.4%	IC	U Level of	Service			А			
Analysis Period (min)			15	10	0 10001 01	0011100			7			
Analysis Fellou (IIIII)			10									

				,								
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		-	•	•				•	-		•	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4î			<u>स</u>	
Traffic Volume (veh/h)	0	1	384	0	0	11	0	371	2	3	251	0
Future Volume (Veh/h)	0	1	384	0	0	11	0	371	2	3	251	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.55	0.55	0.55	0.87	0.87	0.87	0.75	0.75	0.75
Hourly flow rate (vph)	0.00	1	413	0.00	0.00	20	0.01	426	2	4	335	0
Pedestrians					, in the second s	20	ů	120	-		500	Ů
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
								None			None	
Median type								NONE			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	790	771	335	1184	770	427	335			428		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	790	771	335	1184	770	427	335			428		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	42	100	100	97	100			100		
cM capacity (veh/h)	300	332	712	70	332	632	1236			1142		
					502	302	.200					
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	414	20	428	339								
Volume Left	0	0	0	4								
Volume Right	413	20	2	0								
cSH	710	632	1700	1142								
Volume to Capacity	0.58	0.03	0.25	0.00								
Queue Length 95th (ft)	95	2	0	0								
Control Delay (s)	16.9	10.9	0.0	0.1								
Lane LOS	C	B		A								
Approach Delay (s)	16.9	10.9	0.0	0.1								
Approach LOS	C	B	0.0	0.1								
	5	5										
Intersection Summary			0.(
Average Delay			6.1									
Intersection Capacity Utilization			50.1%	IC	U Level of	f Service			A			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4						4			4	
Traffic Volume (veh/h)	13	0	4	0	0	0	5	360	0	3	619	11
Future Volume (Veh/h)	13	0	4	0	0	0	5	360	0	3	619	11
Sign Control	10	Stop	+	0	Stop	0	J	Free	v	J	Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.61		0.61	0.92	0%	0.92	0.89	0%	0.89	0.05	0%	0.85
		0.61 0						404		0.85		
Hourly flow rate (vph)	21	0	7	0	0	0	6	404	0	4	728	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1158	1158	734	1166	1165	404	741			404		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1158	1158	734	1166	1165	404	741			404		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	1.1	0.0	0.2	7.1	0.5	0.2	4.1			4.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
							2.2			100		
p0 queue free %	88	100	98	100	100	100						
cM capacity (veh/h)	173	196	423	167	192	647	875			1166		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	28	410	745									
Volume Left	21	6	4									
Volume Right	7	0	13									
cSH	203	875	1166									
Volume to Capacity	0.14	0.01	0.00									
Queue Length 95th (ft)	12	1	0									
Control Delay (s)	25.5	0.2	0.1									
Lane LOS	D	A	A									
Approach Delay (s)	25.5	0.2	0.1									
Approach LOS	D											
Intersection Summary												
Average Delay			0.7									
			44.9%	10	U Level o	Contine			٨			
Intersection Capacity Utilization			44.9% 15	IC	U Level 0	Service			A			
Analysis Period (min)			15									

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			4
Traffic Volume (veh/h)	0	0	373	0	5	630
Future Volume (Veh/h)	0	0	373	0	5	630
Sign Control	Stop	Ū	Free	Ŭ	U	Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.87	0.87	0.85	0.85
Hourly flow rate (vph)	0.20	0.20	429	0.07	6	741
Pedestrians	U	U	420	Ŭ	U	741
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			NONG			NUNG
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1182	429			429	
vC1, stage 1 conf vol	1102	723			723	
vC2, stage 2 conf vol						
vCu, unblocked vol	1182	429			429	
tC, single (s)	6.4	6.2			425	
tC, 2 stage (s)	0.4	0.2			7.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	210	630			1141	
					1141	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	429	747			
Volume Left	0	0	6			
Volume Right	0	0	0			
cSH	1700	1700	1141			
Volume to Capacity	0.00	0.25	0.01			
Queue Length 95th (ft)	0	0	0			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	A		Α			
Approach Delay (s)	0.0	0.0	0.1			
Approach LOS	А					
Intersection Summary						
			0.1			
Average Delay				10	- امريما -	(Candian
Intersection Capacity Utilization			40.5%	IC	U Level o	I SELVICE
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4		002	4
Traffic Volume (veh/h)	0	2	363	12	10	611
Future Volume (Veh/h)	0	2	363	12	10	611
Sign Control		2	Free	12	10	Free
	Stop					
Grade	0%	0.05	0%	0.00	0.04	0%
Peak Hour Factor	0.25	0.25	0.89	0.89	0.84	0.84
Hourly flow rate (vph)	0	8	408	13	12	727
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1166	414			421	
vC1, stage 1 conf vol		114			121	
vC2, stage 2 conf vol						
vC2, stage 2 coni voi vCu, unblocked vol	1166	414			421	
tC, single (s)	6.4	6.2			421	
	0.4	0.2			4.1	
tC, 2 stage (s)	2.5	0.0			0.0	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	214	642			1149	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	8	421	739		_	
Volume Left			12			
	0	0				
Volume Right	8	13	0			
cSH	642	1700	1149			
Volume to Capacity	0.01	0.25	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	10.7	0.0	0.3			
Lane LOS	В		Α			
Approach Delay (s)	10.7	0.0	0.3			
Approach LOS	В					
Intersection Summary						
			0.0			
Average Delay			0.2			
Intersection Capacity Utilization			50.2%	IC	U Level o	Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4î			स्
Traffic Volume (veh/h)	7	9	366	11	9	602
Future Volume (Veh/h)	7	9	366	11	9	602
Sign Control	Stop	Ŭ	Free		Ŭ	Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	9	11	411	12	11	725
Pedestrians	9		411	12		125
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)			News			Mana
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1164	417			423	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1164	417			423	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	215	640			1147	
			00.4			
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	423	736			
Volume Left	9	0	11			
Volume Right	11	12	0			
cSH	339	1700	1147			
Volume to Capacity	0.06	0.25	0.01			
Queue Length 95th (ft)	5	0	1			
Control Delay (s)	16.3	0.0	0.3			
Lane LOS	С		Α			
Approach Delay (s)	16.3	0.0	0.3			
Approach LOS	С					
Intersection Summary	_					
			0.4			
Average Delay			0.4			
Intersection Capacity Utilization			48.9%	IC	U Level o	Service
Analysis Period (min)			15			

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	
Lane Configurations			4		ፋጉ			स्	1		र्स	1		
Traffic Volume (vph)	15	117	380	15	195	7	10	151	50	167	110	66		
Future Volume (vph)	15	117	380	15	195	7	10	151	50	167	110	66		
Turn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot		
Protected Phases	2	2	23		3			1			1	1	4	
Permitted Phases	3	3		3		1	1		1	1				
Detector Phase	2	2	23	3	3	1	1	1	1	1	1	1		
Switch Phase														
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0	
Minimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0	
Total Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	
Total Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
Lost Time Adjust (s)	1.0	1.0		1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	210	
Total Lost Time (s)					4.0			4.0	4.0		4.0	4.0		
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None	
Act Effct Green (s)			23.8		11.4			17.6	17.6		17.6	17.6		
Actuated g/C Ratio			0.36		0.17			0.27	0.27		0.27	0.27		
v/c Ratio			1.11		0.75			0.40	0.12		1.00	0.19		
Control Delay			97.8		24.0			26.6	2.4		85.8	6.0		
Queue Delay			0.0		0.0			0.0	0.0		0.0	0.0		
Total Delay			97.8		24.0			26.6	2.4		85.8	6.0		
LOS			F		С			С	А		F	А		
Approach Delay			97.8		24.0			21.1			67.8			
Approach LOS			F		С			С			E			
Intersection Summary														
Cycle Length: 76														
Actuated Cycle Length: 66.4														
Natural Cycle: 100														
Control Type: Semi Act-Uncoord	d													
Maximum v/c Ratio: 1.11	u													
Intersection Signal Delay: 58.0				In	tersection	LOSE								
Intersection Capacity Utilization	80.2%				U Level o)							
Analysis Period (min) 15	00.270			IC.	O LEVEL U	I SCINCE L								
Splits and Phases: 8: Washin	ngton Stree	et & Glenwo	ood Stree			ove Street			شغر ا	_				
₩ _{Ø1}				Ž ,	Ø2					Ø3				
21 s				16 s					15 s	2.0				24 s

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Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	556	494	191	57	302	88
v/c Ratio	1.11	0.75	0.40	0.12	1.00	0.19
Control Delay	97.8	24.0	26.6	2.4	85.8	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	97.8	24.0	26.6	2.4	85.8	6.0
Queue Length 50th (ft)	~279	62	79	0	~175	0
Queue Length 95th (ft)	#469	#126	135	9	#322	29
Internal Link Dist (ft)	377	369	306		856	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	502	660	472	485	301	475
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.11	0.75	0.40	0.12	1.00	0.19
Intersection Summary						
 Volume exceeds capacity 	, aueue is the	eoretically	infinite.			
Queue shown is maximum						

 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations			\$			€î}•					र्भ	1		र्भ	1	
Traffic Volume (vph)	15	117	380	11	15	195	14	201	7	10	151	50	167	110	66	15
Future Volume (vph)	15	117	380	11	15	195	14	201	7	10	151	50	167	110	66	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11
Total Lost time (s)			4.0			4.0	.=				4.0	4.0		4.0	4.0	
Lane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00	
Frpb, ped/bikes			1.00			0.90					1.00	1.00		1.00	1.00	
Flpb, ped/bikes			1.00			1.00					0.99	1.00		1.00	1.00	
Frt			1.00			0.92					1.00	0.85		1.00	0.85	
Flt Protected			0.99			1.00					1.00	1.00		0.97	1.00	
Satd. Flow (prot)			1855			2990					1862	1553		1745	1517	
Flt Permitted			0.48			0.92					0.95	1.00		0.63	1.00	
Satd. Flow (perm)			900			2769					1783	1553		1139	1517	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	124	404	12	17	227	16	234	8	11	172	57	182	120	72	16
RTOR Reduction (vph)	0	0	1	0	0	194	0	0	0	0	0	42	0	0	65	0
Lane Group Flow (vph)	0	0	555	0	0	300	0	0	0	0	191	15	0	302	23	0
Confl. Peds. (#/hr)	59						59			59						59
Confl. Bikes (#/hr)																1
Heavy Vehicles (%)	0%	1%	0%	9%	7%	1%	0%	0%	0%	0%	1%	4%	1%	4%	2%	7%
Turn Type	D.P+P	D.P+P	NA		Perm	NA			Perm	Perm	NA	Perm	Perm	NA	Prot	
Protected Phases	2	2	23			3					1			1	1	
Permitted Phases	3	3			3				1	1		1	1			
Actuated Green, G (s)			23.8			11.4					17.6	17.6		17.6	17.6	
Effective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6	
Actuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26	
Clearance Time (s)						4.0					4.0	4.0		4.0	4.0	
Vehicle Extension (s)						2.0					2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)			497			471					469	408		299	399	
v/s Ratio Prot			c0.21											2	0.02	
v/s Ratio Perm			c0.19			0.11					0.11	0.01		c0.27		
v/c Ratio			1.12			0.64					0.41	0.04		1.01	0.06	
Uniform Delay, d1			21.6			25.8					20.3	18.3		24.7	18.4	
Progression Factor			1.00			1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2			76.6			6.4					2.6	0.2		54.6	0.3	
Delay (s)			98.2			32.3					23.0	18.5		79.3	18.7	
Level of Service			F			С					С	В		E	В	
Approach Delay (s)			98.2			32.3					21.9			65.6		
Approach LOS			F			С					С			E		
Intersection Summary																
HCM 2000 Control Delay			60.2	H	CM 2000 L	evel of Se	ervice		E							
HCM 2000 Volume to Capacity	/ ratio		0.84													
Actuated Cycle Length (s)			66.9	Si	um of lost	time (s)			14.0							
Intersection Capacity Utilization	n		80.2%	IC	U Level of	Service			D							
Analysis Period (min)			15													
c Critical Lano Group																

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LDL		LDR	VUDL		WDR	NDL	INDT	NUN	ODL		ODIX
	4		0	0	4	205	0	0	0	40	4	4
Traffic Volume (veh/h)	1	2	0	0	3	325	0	0	0	16	264	1
Future Volume (Veh/h)	1	2	0	0	3	325	U	0	0	16	264	1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.78	0.78	0.78	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	0	0	4	417	0	0	0	17	287	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	740	322	288	324	322	0	288			0		
vC1, stage 1 conf vol	740	JZZ	200	524	522	U	200			0		
vC1, stage 1 confi vol												
vC2, stage 2 coni voi vCu, unblocked vol	740	322	288	324	322	0	288			0		
	740			324 7.1		0				4.1		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	99	62	100			99		
cM capacity (veh/h)	204	593	756	625	592	1091	1286			1636		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	6	421	305									
Volume Left	2	0	17									
Volume Right	0	417	1									
cSH	363	1082	1636									
Volume to Capacity	0.02	0.39	0.01									
Queue Length 95th (ft)	1	47	0.01									
Control Delay (s)	15.1	10.4	0.5									
Lane LOS	C	10.4 B	0.5 A									
Approach Delay (s)	15.1	10.4	0.5									
	15.1 C	10.4 B	0.5									
Approach LOS	U	В										
Intersection Summary												
Average Delay			6.3									
Intersection Capacity Utilization			41.8%	IC	U Level of	f Service			А			
Analysis Period (min)			15									

	٦	-	\mathbf{i}	4	+	×	1	Ť	1	1	ţ	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								4				
Traffic Volume (veh/h)	8	↔ 10	0	11	⇔ 8	6	317	258	10	14	4 137	3
Future Volume (Veh/h)	8	10	0	11	8	6	317	258	10	14	137	3
Sign Control	-	Stop			Stop	-	• · · ·	Free			Free	-
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.63	0.63	0.63	0.81	0.81	0.81	0.90	0.90	0.90
Hourly flow rate (vph)	11	13	0	17	13	10	391	319	12	16	152	3
Pedestrians		10	Ŭ		10	10	001	010	12	10	102	Ŭ
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)								NULLE			NULLE	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1309	1298	154	1299	1294	325	155			331		
vC1, stage 1 conf vol	1309	1290	154	1299	1294	325	100			331		
vC2, stage 2 conf vol	4000	4000	454	4000	4004	205	455			224		
vCu, unblocked vol	1309 7.1	1298 6.5	154 6.2	1299 7.1	1294 6.5	325 6.2	155 4.1			331 4.1		
tC, single (s)	7.1	0.5	b.2	7.1	0.5	b.2	4.1			4.1		
tC, 2 stage (s)	0.5	4.0		0.5	4.0		0.0			0.0		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	89	89	100	83	89	99	73			99		
cM capacity (veh/h)	98	117	898	101	118	721	1438			1240		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	40	722	171								
Volume Left	11	17	391	16								
Volume Right	0	10	12	3								
cSH	107	136	1438	1240								
Volume to Capacity	0.22	0.29	0.27	0.01								
Queue Length 95th (ft)	20	28	28	1								
Control Delay (s)	48.0	42.0	5.9	0.8								
Lane LOS	E	E	A	A								
Approach Delay (s)	48.0	42.0	5.9	0.8								
Approach LOS	E	E										
Intersection Summary												
Average Delay			7.5									
			53.2%	10	U Level of	0						
Intersection Capacity Utilization				IC	U Level of	Service			A			
Analysis Period (min)			15									

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	501	EDT		•	WDT	MDE			-	0.01		000
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			₽			र्भ	
Traffic Volume (veh/h)	1	5	258	2	0	10	0	574	0	2	146	0
Future Volume (Veh/h)	1	5	258	2	0	10	0	574	0	2	146	0
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.60	0.60	0.60	0.81	0.81	0.81	0.84	0.84	0.84
Hourly flow rate (vph)	1	5	277	3	0	17	0	709	0	2	174	0
Pedestrians		Ŭ	211	Ŭ	v		v	100	U	-	114	U
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	904	887	174	1166	887	709	174			709		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	904	887	174	1166	887	709	174			709		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	7.1	0.0	0.2	7.1	0.0	0.2	7.1			7.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
				3.5 97		3.3 96	100					
p0 queue free %	100	98	68		100					100		
cM capacity (veh/h)	249	285	875	116	285	438	1415			899		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	283	20	709	176								
Volume Left	1	3	0	2								
Volume Right	277	17	0	0								
cSH	837	309	1700	899								
Volume to Capacity	0.34	0.06	0.42	0.00								
Queue Length 95th (ft)	38	0.00	0.42	0.00								
Control Delay (s)	30 11.5		0.0	0.1								
		17.5	0.0									
Lane LOS	В	C	0.0	A								
Approach Delay (s)	11.5	17.5	0.0	0.1								
Approach LOS	В	С										
Intersection Summary												
Average Delay			3.0									
Intersection Capacity Utilization			53.3%	IC	U Level of	f Service			А			
Analysis Period (min)			15	10	2 201010	2000						
			10									

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								•	-			-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$						\$			\$	
Traffic Volume (veh/h)	11	0	2	0	0	0	2	560	0	1	394	13
Future Volume (Veh/h)	11	0	2	0	0	0	2	560	0	1	394	13
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.81	0.81	0.81	0.94	0.94	0.94
Hourly flow rate (vph)	14	0	2	0	0	0	2	691	0	1	419	14
Pedestrians		Ŭ	-	Ŭ	Ŭ	Ŭ	-		Ŭ			
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
								none			none	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked	1100	1100	100	4405	4400	00/	100			004		
vC, conflicting volume	1123	1123	426	1125	1130	691	433			691		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1123	1123	426	1125	1130	691	433			691		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	100	100	100	100			100		
cM capacity (veh/h)	184	207	633	181	203	445	1137			913		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	16	693	434									
Volume Left	14	2	1									
Volume Right	2	0	14									
cSH	202	1137	913									
Volume to Capacity	0.08	0.00	0.00									
	0.08		0.00									
Queue Length 95th (ft)		0										
Control Delay (s)	24.3	0.0	0.0									
Lane LOS	C	A	A									
Approach Delay (s)	24.3	0.0	0.0									
Approach LOS	С											
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			41.0%	IC	U Level o	f Service			А			
Analysis Period (min)			15									

HCIVI Unsignalized Inte	ciscoli	on Cap	acity A	laiysis		
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	Ŧ	>	1	1	-	*
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			đ.
Traffic Volume (veh/h)	1	3	571	0	0	406
Future Volume (Veh/h)	1	3	571	0	0	406
Sign Control	Stop	Ŭ	Free	Ŭ	, in the second s	Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.81	0.81	0.94	0.94
Hourly flow rate (vph)	2	6	705	0.01	0.04	432
Pedestrians	-	Ū	100	v	Ŭ	102
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			NONG			NUNG
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1137	705			705	
vC1, stage 1 conf vol	1107	,00			705	
vC2, stage 2 conf vol						
vCu, unblocked vol	1137	705			705	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	0.4	0.2			4.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	225	99 440			902	
					90Z	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	8	705	432			
Volume Left	2	0	0			
Volume Right	6	0	0			
cSH	355	1700	902			
Volume to Capacity	0.02	0.41	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	15.4	0.0	0.0			
Lane LOS	С					
Approach Delay (s)	15.4	0.0	0.0			
Approach LOS	С					
	-					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			40.1%	IC	U Level o	f Service
Analysis Period (min)			15			

HCM Unsignalized Inte	1300110	on Cap	aony A	larysis		
	•	•	t	1	1	1
	*	•	I	(-	*
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	۰Y		4î			स
Traffic Volume (veh/h)	2	1	560	1	3	392
Future Volume (Veh/h)	2	1	560	1	3	392
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.75	0.75	0.81	0.81	0.92	0.92
Hourly flow rate (vph)	3	1	691	1	3	426
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1124	692			692	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1124	692			692	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	100			100	
cM capacity (veh/h)	229	448			912	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	692	429			
Volume Left	4	692 0	429			
Volume Left Volume Right	3 1	1	3			
cSH	261	1700	912			
Volume to Capacity	0.02	0.41	0.00			
Queue Length 95th (ft)	0.02	0.41	0.00			
Queue Length 95th (π) Control Delay (s)	19.0	0.0	0.1			
Lane LOS	19.0 C	0.0	0.1 A			
Approach Delay (s)	19.0	0.0	0.1			
Approach LOS	19.0 C	0.0	0.1			
	U					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			39.5%	IC	U Level o	f Service
Analysis Period (min)			15			

Percent Blockage kight turn flare (veh) Aedian storage veh) Jpstream signal (ft) X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C1, stage 1 conf vol C2, stage 2 conf vol C2, stage (s) 6.5 6.2 4.1 C, 2 stage (s) 7 F (s) 6.5 6.2 4.1 C, 2 stage (s) 7 F (s) 196 100 M capacity (veh/h) 222 451 914 Direction Lane # WB 1 NB 1 SB 1 Volume Total 36 690 428 Volume Lotal 36 690 428 Volume Lotal 36 690 428 Volume Lotal 36 690 0 SH 287 1700 914 Volume Copacity 0.13 0.41 0.00 Dueue Length 95th (ft) 11 0 0 C capacity (s) 19.3 0.0 0.1 ane LOS C A vpproach LOS C Hersection Summary Werage Delay 0 SH 287 1700 914 Volume State 287 193 C A State 287 193 C A State 287 193 C A State 287 193 C A State 287 194 C C A State 287 C C A C C C C A C C C A C C C C A C C C C C C C C C C C A C C C C C C C C C C C C C C C C C C C	HCM Unsignalized Inte			aoity Al	narysis		
Average WBL WBR NBR SBL SBT are Configurations M 1 9 552 7 2 392 irartic Volume (veh/h) 11 9 552 7 2 392 irute Volume (veh/h) 11 9 552 7 2 392 ign Control Stop Free Free Free Free idade 0% 0% 0% 0% 0% veak Hour Factor 0.56 0.56 0.81 0.92 0.92 odurly flow rate (vph) 20 16 681 9 2 426 vedestrians ane Width (ft) Valking Speed (ft/s) Verset Blockage			•	+	*	1	1
ane Configurations V I 9 552 7 2 392 iraffic Volume (veh/h) 11 9 552 7 2 392 sign Control Stop Free Free Free srade 0% 0% 0% 0% beak Hour Factor 0.56 0.56 0.81 0.81 0.81 0.92 iourly flow rate (vph) 20 16 681 9 2 426 vetestrians ane Wdfh (ft) 20 16 681 9 2 426 vetestrians ane Wdfh (ft) 20 16 681 9 2 426 vetestrians ane Wdfh (ft) 20 16 681 9 2 426 Validit unt fare (veh) Arrow None None None None Colume (veh) Colume for for (veh) Colume for for Colume for for for for Colume		¥		1	<i>r</i>	-	*
ane Configurations ♥ ↓	Movement	WBI	WBR	NBT	NBR	SBI	SBT
raffic Volume (veh/h) 11 9 552 7 2 392 iture Volume (veh/h) 00 0% 0% 0% Pree Free Free Vetaestrians 0.06 0.81 0.81 0.92 0.92 iture Volk (ft) Veh/h) 20 16 681 9 2 426 Vetaestrians 0.06 681 9 2 426 Vetaestrians 0.07 0.6 Vetaestrians 0.07 0.07 0.07 0.07 0.07 0.07 0.07 0.0			TIDI		HUR	ODL	
iuture Volume (Veh/h) 11 9 552 7 2 392 ign Control Stop Free			0		7	2	202
Sign Control Stop Free Free grade 0% 0% 0% barde 0% 0% 0% barde 0.56 0.81 0.81 0.82 0.92 lourly flow rate (vph) 20 16 681 9 2 426 ane Width (ft) 20 16 681 9 2 426 value Very flow rate (vph) 20 16 681 9 2 426 ane Width (ft) Value (vph) 20 16 681 9 2 426 value (vph) 20 16 681 9 2 426 Value (vph) 20 None None None None None Jograde (vpl) Jograde (vpl) Jograde (vpl) Jograde (vpl) Jograde (vpl) Zograde (vpl) Zograd (vpl) Zograde (vpl) Zograd (v	Future Volume (Veh/h)						
Drace 0% 0% 0% Peak Hour Factor 0.56 0.56 0.81 0.92 0.92 Vedestrians 0 6 681 9 2 426 Pedestrians 0 6 681 9 2 426 Valing Speed (ft/s) Fercent Blockage Valing Speed (ft/s) Fercent Blockage Valing Speed (ft/s) Fercent Blockage C.			9		1	2	
Peak Hour Factor 0.56 0.56 0.81 0.81 0.92 0.92 lourly flow rate (vph) 20 16 681 9 2 426 Valking Speed (ft/s) Percent Blockage Right turn flare (veh) Percent Blockage None None None Addian storage veh) Distream signal (ft) X None Mone X, platoon unblocked C, conflicting volume 1116 686 690 C(1, stage 1 conf vol C2, stage 2 conf vol C2, stage 1 conf vol C2, stage (s) F(s) 3.6 3.3 2.2 0							
Houry flow rate (vph) 20 16 681 9 2 426 Vedestrians ane Width (ft) Valking Speed (ft/s) Image:							
Pedestrians							
ane Width (ft) Valking Speed (ft/s) Percent Blockage Vight turn flare (veh) Aedian storage veh) Jestream signal (ft) X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol Cu, unblocked vol 1116 C, single (s) 6.5 C, 2 stage (s) F(s) 3.6 Sige (s) F(s) 3.6 Ouquee free % 91 96 100 Mcapacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Left 20 0 /olume Left 20 0 SH 20 2 /olume to Capacity 0.13 0.41 /olume to Capacity 13 0.41 /olume to Capacity 19.3 0.0 /olume to Capacity 19.3 0.0 /olume to Capacity 19.3 0.0		20	16	681	9	2	426
Valking Speed (ft/s) Vareau Blockage Vight turn flare (veh) Aedian type None Aedian storage veh) Jpstream signal (ft) X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C4, stage 3 conf vol C2, stage 4 conf vol C3, stage 2 conf vol C4, stage 3 conf vol C4, stage 1 conf vol C2, stage 5 F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Total 36 690 428 /olume Left 20 0 2 /olume Logh 95th (ft) 11 0 0 20 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							
Percent Blockage None None Vight turn flare (veh) None None Aedian storage veh)							
None None None Aedian storage veh) ////////////////////////////////////	Walking Speed (ft/s)						
None None None Aedian storage veh) Jpstream signal (ft) X, platoon unblocked X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, unblocked vol 1116 686 690 C, single (s) 6.5 6.2 4.1 C, 2 stage (s) F S 2.2 F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Total 36 690 428 /olume Left 20 0 2 /olume Loft 20 0 2 /olume to Capacity 0.13 0.41 0.00 /oueu Length 95th (ft) 11 0 0 /olume to Capacity 0.13 0.41 0.00 /oueu Length 95th (ft)	Percent Blockage						
Adeian storage veh) /pstream signal (ft) X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol	Right turn flare (veh)						
Jpstream signal (ft) X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage (s) 6.5 6.2 4.1 C, 2 stage (s) F F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Jirrection, Lane # WB 1 NB 1 SB 1 Jirrection, Lane # WB 1 NB 1 SB 1 Jirrection, Lane # WB 1 NB 1 SB 1 /olume Total 36 690 428 /olume Right 16 9 0 SH 287 1700 914 /olume Right 16 9 0 SH 287 1700 914 /olume Left 20 0 2 Jueue Length 95th (ft) 11 0 0 Jueue Length 95th (ft) 11 0 Jueue Length 95th (ft) 11 0 Jueue Length 95th (ft) 11 0 Jueue Length 95th (ft) 11 Jueue Length 95th (ft)	Median type			None			None
Jpstream signal (ft) X, platon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage (s) 6.5 6.2 4.1 C, 2 stage (s) F F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 <i>Jirrection</i> , Lane # WB 1 NB 1 SB 1 <i>Jirrection</i> , Lane # WB 1 NB 1 SB 1 <i>Journal 1</i> 36 690 428 <i>Journal 36</i> 690 428 <i>Journal 37</i> 700 914 <i>Journal 30</i> 41 0.00 Dueue Length 95th (ft) 11 0 0 <i>Journal 10</i> 0 <i>Journal 10 <i>Journal 10</i> 0 <i>Journal 10 <i>Journal 10</i> 0 <i>Journal 10 <i>Journal 10</i> 0 <i></i></i></i></i>	Median storage veh)						
X, platoon unblocked C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol Cu, unblocked vol 1116 686 690 C3, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol 65 6.2 4.1 C, 2 stage (s) F F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 914 58 100 Olume Cotal 36 690 428 60 690 60 60 /olume Left 20 0 2 60 2 60 2 60 <td>Upstream signal (ft)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Upstream signal (ft)						
C, conflicting volume 1116 686 690 C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage (s) 65 6.2 4.1 C, 2 stage (s) 7 F(s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 Volume Left 20 0 2 Volume Left 20 0 2 Volume Left 20 0 2 Volume Left 69 0 SH 287 1700 914 Volume Logh 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 ane LOS C A vpproach LOS C Hersection Summary Werage Delay 0 39.5% ICU Level of Service A	pX, platoon unblocked						
C1, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol Cu, unblocked vol 1116 686 690 C, single (s) 6.5 6.2 4.1 C, 2 stage (s)	vC, conflicting volume	1116	686			690	
C2, stage 2 conf vol Cu, unblocked vol 1116 686 690 C, single (s) 6.5 6.2 4.1 C, solge (s)	vC1, stage 1 conf vol						
Cu, unblocked vol 1116 686 690 C, single (s) 6.5 6.2 4.1 C, 2 stage (s) F 7 7 F (s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Total 36 690 428 /olume Left 20 0 2 /olume Left 20 0 2 /olume Logt 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 Joueu Length 95th (ft) 11 0 0 Jourot Delay (s) 19.3 0.0 0.1 ane LOS C A A veproach LOS C A A verage Delay 0.6 1 39.5%	vC2, stage 2 conf vol						
C, single (s) 6.5 6.2 4.1 C, 2 stage (s) F (s) 3.6 3.3 2.2 10 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 Volume Total 3.6 690 428 Volume Right 1.6 9 0 SH 287 1700 914 Volume Capacity 0.13 0.41 0.00 Queue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 control Delay (s) 19.3 0.0 0.1 Approach Delay (s) 19.3 0.0 0.1 verage Delay 0.6 ttersection Capacity Utilization 39.5% ICU Level of Service A		1116	686			690	
C, 2 stage (s) F (s) 3.6 3.3 2.2 00 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 Volume Total 36 690 428 Volume Right 16 9 0 SH 287 1700 914 Volume to Capacity 0.13 0.41 0.00 Jueue Length 95th (th) 11 0 0 Jueue Length 95th (th) 11 0 0 Johrson Delay (s) 19.3 0.0 0.1 ane LOS C A veproach Delay (s) 19.3 0.0 0.1 upproach LOS C A verage Delay 0.6 1 ntersection Capacity Utilization 39.5% ICU Level of Service A							
F(s) 3.6 3.3 2.2 0 queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Left 20 0 2 /olume Right 16 9 0 /SH 287 1700 914 /olume to Capacity 0.13 0.41 0.00 Queue Length 95th (ft) 11 0 0 200 C A A A vpproach Delay (s) 19.3 0.0 0.1 ane LOS C A vpproach LOS C A verage Delay 0.6 6 intersection Capacity Utilization 39.5% ICU Level of Service A		0.0	0.2				
O queue free % 91 96 100 M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 Volume Total 36 690 428 Volume Right 16 9 0 Volume Right 16 9 0 SH 287 1700 914 Volume Legt 0.00 2 Volume (spit) 11 0 0 Queue Length 95th (ft) 11 0 0 Optrach Delay (s) 19.3 0.0 0.1 Approach LOS C A verage Delay 0.6 1 mersection Capacity Utilization 39.5% ICU Level of Service A		3.6	33			22	
M capacity (veh/h) 222 451 914 Direction, Lane # WB 1 NB 1 SB 1 /olume Total 36 690 428 /olume Left 20 0 2 /olume Right 16 9 0 SH 287 1700 914 /olume to Capacity 0.13 0.41 0.00 Queue Length 95th (ft) 11 0 0 Optrocholeay (s) 19.3 0.0 0.1 .ane LOS C A vpproach Delay (s) 19.3 0.0 0.1 .ane LOS C A vpproach LOS C A verage Delay (s) 19.3 0.0 0.1 verage Delay S C.6 E E							
Witching WB 1 NB 1 SB 1 /folume Total 36 690 428 /olume Left 20 0 2 /olume Right 16 9 0 SH 287 1700 914 /olume to Capacity 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 John to Delay (s) 19.3 0.0 0.1 John to Delay (s) 19.3 0.0 0.1 upproach Delay (s) 19.3 0.0 0.1 werage Delay 0.6 1 mersection Capacity Utilization 39.5% ICU Level of Service A							
Volume Total 36 690 428 Volume Left 20 0 2 Volume Right 16 9 0 SH 287 1700 914 Volume to Capacity 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 ane LOS C A Approach Delay (s) 19.3 0.0 0.1 werage Delay 0.6 1 1 hersection Capacity Utilization 39.5% ICU Level of Service A						314	
Volume Left 20 0 2 Volume Right 16 9 0 SH 287 1700 914 Volume to Capacity 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 ane LOS C A vpproach LOS C ntersection Summary werage Delay 0.6 ntersection Capacity Utilization	Direction, Lane #		NB 1				
Volume Left 20 0 2 Volume Right 16 9 0 SH 287 1700 914 Volume to Capacity 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 ane LOS C A vpproach LOS C ntersection Summary werage Delay 0.6 ntersection Capacity Utilization	Volume Total	36	690	428			
Volume Right 16 9 0 SH 287 1700 914 Volume to Capacity 0.13 0.41 0.00 Jueue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 .ane LOS C A upproach Delay (s) 19.3 0.0 0.1 .ane LOS C A upproach LOS C Hersection Summary werage Delay 0.6 ICU Level of Service A	Volume Left						
SH 287 1700 914 /olume to Capacity 0.13 0.41 0.00 Queue Length 95th (ft) 11 0 0 Jointrol Delay (s) 19.3 0.0 0.1 Jane LOS C A Vporach Delay (s) 19.3 0.0 0.1 Intersection Summary Verage Delay 0.6 Intersection Capacity Utilization 39.5% ICU Level of Service A	Volume Right						
Volume to Capacity 0.13 0.41 0.00 Jaueu Length 95th (ft) 11 0 0 Schrtol Delay (s) 19.3 0.0 0.1 ane LOS C A opproach Delay (s) 19.3 0.0 0.1 ntersection Summary 0.6 ICU Level of Service A	cSH						
Queue Length 95th (ft) 11 0 0 Control Delay (s) 19.3 0.0 0.1 ane LOS C A opproach Delay (s) 19.3 0.0 0.1 opproach LOS C A verge Delay C 0.6 ttersection Capacity Utilization 39.5% ICU Level of Service A							
Control Delay (s) 19.3 0.0 0.1 ane LOS C A \pproach Delay (s) 19.3 0.0 0.1 \pproach LOS C A							
c A \pprach Delay (s) 19.3 0.0 0.1 \pprach LOS C C C ntersection Summary 0.6 C C werage Delay 0.6 C C							
upproach Delay (s) 19.3 0.0 0.1 upproach LOS C 0.6 ntersection Capacity Utilization 39.5% ICU Level of Service			0.0				
pproach LOS C tersection Summary verage Delay 0.6 tersection Capacity Utilization 39.5% ICU Level of Service A			0.0				
ntersection Summary werage Delay 0.6 tersection Capacity Utilization 39.5% ICU Level of Service A			0.0	0.1			
Iverage Delay 0.6 ntersection Capacity Utilization 39.5% ICU Level of Service A		U					
ntersection Capacity Utilization 39.5% ICU Level of Service A	Intersection Summary						
	Average Delay			0.6			
	Intersection Capacity Utilization			39.5%	IC	U Level o	f Service
	Analysis Period (min)			15			



No-Build (2026) Condition

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	
Lane Configurations			4		4î þ			र्स	1		ا	r.		
Traffic Volume (vph)	4	112	184	81	404	11	1	10	26	214	201	177		
Future Volume (vph)	4	112	184	81	404	11	1	10	26	214	201	177		
Furn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot		
Protected Phases	2	2	23		3			1			1	1	4	
ermitted Phases	3	3		3		1	1		1	1				
Detector Phase	2	2	23	3	3	1	1	1	1	1	1	1		
witch Phase														
linimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0	
linimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0	
otal Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	
otal Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%	
ellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	
II-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
ost Time Adjust (s)	1.0	1.0		1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	
otal Lost Time (s)					4.0			4.0	4.0		4.0	4.0		
ead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	
ead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
ecall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None	
ct Effct Green (s)	IVIDA	IVICA	23.8	IVIDA	11.4	IVIDA	IVIDA	17.6	17.6	IVIDA	17.6	17.6	NULLE	
ctuated g/C Ratio			0.36		0.17			0.27	0.27		0.27	0.27		
/c Ratio			0.30		1.50			0.27	0.27		1.20	0.27		
control Delay			36.3		258.6			24.6	0.07		140.9	16.7		
lueue Delav			0.0		2.30.0			0.0	0.0		0.0	0.0		
otal Delay			36.3		258.6			24.6	0.0		140.9	16.7		
OS			30.3 D		200.0 F			24.0 C	0.3 A		140.9 F	10.7 B		
pproach Delay			36.3		258.6			11.2	А		г 103.1	D		
pproach LOS			30.3 D		200.0 F			11.2 B			103.1 F			
			D		F			В			F			
tersection Summary														
cycle Length: 76														
ctuated Cycle Length: 66.4														
atural Cycle: 120														
ontrol Type: Semi Act-Uncoor	ď													
laximum v/c Ratio: 1.50														
tersection Signal Delay: 153.6					tersection									
tersection Capacity Utilization	n 80.7%			IC	CU Level o	f Service [)							
nalysis Period (min) 15														
plits and Phases: 8: Washir	ngton Stree	et & Glenwo	ood Stree			ove Street								
₩ _{Ø1}					Ø2				-	Ø3				Å₿ø4
101				-	202				15 c	<u>د</u> ש			_	

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Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	330	789	30	37	477	209
v/c Ratio	0.80	1.50	0.11	0.07	1.20	0.44
Control Delay	36.3	258.6	24.6	0.3	140.9	16.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	258.6	24.6	0.3	140.9	16.7
Queue Length 50th (ft)	121	~274	11	0	~309	43
Queue Length 95th (ft)	#276	#386	26	0	#462	100
Internal Link Dist (ft)	377	369	306		848	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	415	526	280	501	397	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	1.50	0.11	0.07	1.20	0.44
Intersection Summary						
 Volume exceeds capacity, 	queue is the	eoretically	infinite.			
Queue shown is maximum						

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

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Movement	EBL2	-	EBT	EBR	-	WBT	WBR	WBR2	NDL 2	NBL	NBT	•	SBL	CDT	SBR	SBR2
	EBLZ	EBL		EBK	WBL		WBK	WBR2	NBL2	NBL		NBR	SBL	SBT		SBR2
Lane Configurations		110	4	10	01	41	22	2//	11	1	4	1	014	4		r.
Traffic Volume (vph)	4	112	184	10	81	404	23	266	11	1	10	26	214	201	177	5
Future Volume (vph)	4	112	184	10	81	404	23	266	11	1	10	26	214	201	177	5
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
ane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11
otal Lost time (s)			4.0			4.0					4.0	4.0		4.0	4.0	
ane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00	
rpb, ped/bikes			1.00			0.89					1.00	1.00		1.00	1.00	
lpb, ped/bikes			1.00			1.00					0.97	1.00		1.00	1.00	
rt			1.00			0.94					1.00	0.85		1.00	0.85	
It Protected			0.98			0.99					0.97	1.00		0.97	1.00	
atd. Flow (prot)			1809			2998					1796	1615		1781	1531	
It Permitted			0.24			0.87					0.57	1.00		0.82	1.00	
Satd. Flow (perm)			444			2616					1056	1615		1502	1531	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.98	0.98	0.98	0.98	0.71	0.71	0.71	0.71	0.87	0.87	0.87	0.87
Adj. Flow (vph)	4	119	196	11	83	412	23	271	15	1	14	37	246	231	203	6
TOR Reduction (vph)	0	0	1	0	0	86	0	0	0	0	0	27	0	0	74	0
ane Group Flow (vph)	0	0	329	0	0	703	0	0	0	0	30	10	0	477	135	0
Confl. Peds. (#/hr)	93	0	J27	0	0	705	93	0	0	93	50	10	U	477	155	93
Confl. Bikes (#/hr)	73						73			73					1	1
leavy Vehicles (%)	0%	5%	1%	0%	0%	1%	4%	1%	0%	0%	0%	0%	1%	0%	2%	0%
	D.P+P	D.P+P	NA	070	Perm	NA	4 /0	1 70	Perm	Perm	NA	Perm	Perm	NA	Prot	078
					Perm	NA 3			Perm	Perm	NA 1	Perm	Perm	NA 1	Prot 1	
rotected Phases	2	2	23		2	3			1	1	1	1	1	I	1	
ermitted Phases	3	3			3				1	1		1	1			
ctuated Green, G (s)			23.8			11.4					17.6	17.6		17.6	17.6	
ffective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6	
ctuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26	
learance Time (s)						4.0					4.0	4.0		4.0	4.0	
ehicle Extension (s)						2.0					2.0	2.0		2.0	2.0	
ane Grp Cap (vph)			410			445					277	424		395	402	
/s Ratio Prot			c0.15												0.09	
's Ratio Perm			0.14			c0.27					0.03	0.01		c0.32		
/c Ratio			0.80			1.58					0.11	0.02		1.21	0.34	
Iniform Delay, d1			19.4			27.8					18.7	18.3		24.7	19.9	
rogression Factor			1.00			1.00					1.00	1.00		1.00	1.00	
cremental Delay, d2			15.2			271.2					0.8	0.1		115.0	2.3	
elay (s)			34.6			299.0					19.5	18.4		139.6	22.2	
evel of Service			C			F					B	B		F	C	
pproach Delay (s)			34.6			299.0					18.9	5		103.8	5	
pproach LOS			54.0 C			277.0 F					В			F		
tersection Summary			U								U					
			170.8		CM 2000 L	oval of Cr	nuico		F							
CM 2000 Control Delay				Н	CIVI 2000 L	Level of Se	er vice		F							
CM 2000 Volume to Capacity ra	atio		0.93													
ctuated Cycle Length (s)			66.9		um of lost				14.0							
tersection Capacity Utilization			80.7%	IC	U Level of	Service			D							
nalysis Period (min)			15													
Critical Lane Group																

c Critical Lane Group

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Movement	EBL	EBT	EBR	▼ WBL	WBT	WBR	NBL	NBT	NBR	SBL	▼ SBT	SBR
Lane Configurations	LDL	4	LDK	WDL		WDR	NDL	NDT	NDK	JDL		JUK
Traffic Volume (veh/h)	4	4) 1	1	0	↔ 2	267	0	0	0	6	↔ 391	1
Future Volume (Veh/h)	4	1	1	0	2	267	0	0	0	0 6	391	1
Sign Control	4	Stop	1	U	Stop	207	U	Free	U	U	Free	1
Sign Control Grade		5top 0%			Stop 0%			Free 0%			Free 0%	
Grade Peak Hour Factor	0.50		0.50	0.0/	0%	0.96	0.92	0%	0.92	0.04	0%	0.94
		0.50		0.96						0.94		
Hourly flow rate (vph)	8	2	2	0	2	278	0	0	0	6	416	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	708	428	416	432	429	0	417			0		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	708	428	416	432	429	0	417			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	7.1	0.5	0.2	7.1	0.5	0.2	4.1			4.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	74	100			100		
cM capacity (veh/h)	261	520	641	533	520	1085	1153			1636		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	12	280	423									
Volume Left	8	0	6									
Volume Right	2	278	1									
cSH	319	1077	1636									
Volume to Capacity	0.04	0.26	0.00									
Queue Length 95th (ft)	3	26	0									
Control Delay (s)	16.7	9.5	0.1									
Lane LOS	С	A	A									
Approach Delay (s)	16.7	9.5	0.1									
Approach LOS	C	A	0.1									
Intersection Summary			_	_	_		_			_		_
			4.1					_	_			
Average Delay												
Intersection Capacity Utilization			44.3%	IC	U Level of	f Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								4				
Traffic Volume (veh/h)	2	⇔ 5	0	13	↔ 22	9	240	143	5	5	4 245	6
Future Volume (Veh/h)	2	5	0	13	22	9	240	143	5	5	245	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.85	0.85	0.85	0.75	0.75	0.75
Hourly flow rate (vph)	2	6	0	19	32	13	282	168	6	7	327	8
Pedestrians	_	-							-			
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)								Hone			AUTIC	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1109	1083	331	1083	1084	171	335			174		
vC1, stage 1 conf vol	1107	1005	551	1005	1004	171	333			174		
vC2, stage 2 conf vol												
vCu, unblocked vol	1109	1083	331	1083	1084	171	335			174		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	7.1	0.5	0.2	7.1	0.5	0.2	4.1			4.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	88	81	99	77			100		
cM capacity (veh/h)	131	168	715	157	167	878	1224			1415		
1 3					107	0/0	1224			1415		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	64	456	342								
Volume Left	2	19	282	7								
Volume Right	0	13	6	8								
cSH	157	196	1224	1415								
Volume to Capacity	0.05	0.33	0.23	0.00								
Queue Length 95th (ft)	4	34	22	0								
Control Delay (s)	29.2	32.1	6.3	0.2								
Lane LOS	D	D	А	A								
Approach Delay (s)	29.2	32.1	6.3	0.2								
Approach LOS	D	D										
Intersection Summary												
Average Delay			6.0									
Intersection Capacity Utilization			48.0%	IC	U Level of	Service			А			
Analysis Period (min)			15	10	0 2010/0	0011100						
Andrysis Foriod (IIIII)			15									

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		-	\mathbf{r}	1	-		1	T.	1	1	÷	~
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		\$			4			¢Î			र्स	
Traffic Volume (veh/h)	0	1	391	0	0	11	0	378	2	3	255	0
Future Volume (Veh/h)	0	1	391	0	0	11	0	378	2	3	255	0
Sign Control	5	Stop	0,1	5	Stop		5	Free	-	5	Free	Ŭ
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.55	0.55	0.55	0.87	0.87	0.87	0.75	0.75	0.75
Hourly flow rate (vph)	0.73	0.73	420	0.55	0.55	20	0.87	434	2	4	340	0.75
Pedestrians	U	1	420	U	U	20	U	434	2	4	J40	U
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)								Maria			News	
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	803	784	340	1204	783	435	340			436		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	803	784	340	1204	783	435	340			436		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	41	100	100	97	100			100		
cM capacity (veh/h)	294	326	707	66	327	625	1230			1134		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total												
	421	20	436	344								
Volume Left	0	0	0	4								
Volume Right	420	20	2	0								
cSH	705	625	1700	1134								
Volume to Capacity	0.60	0.03	0.26	0.00								
Queue Length 95th (ft)	100	2	0	0								
Control Delay (s)	17.4	10.9	0.0	0.1								
Lane LOS	С	В		А								
Approach Delay (s)	17.4	10.9	0.0	0.1								
Approach LOS	С	В										
Intersection Summary												
Average Delay			6.2									
Intersection Capacity Utilization			50.9%	10	U Level o	f Sonvico			А			
Analysis Period (min)			15	IC.	O LEVEL U	SCINC			л			
Analysis r chuu (IIIII)			10									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4						4			4	
Traffic Volume (veh/h)	13	0	4	0	0	0	5	366	0	3	630	11
Future Volume (Veh/h)	13	0	4	0	0	0	5	366	0	3	630	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.61	0.61	0.61	0.92	0.92	0.92	0.89	0.89	0.89	0.85	0.85	0.85
Hourly flow rate (vph)	21	0.01	7	0.72	0.72	0.72	6	411	0	4	741	13
Pedestrians	21	0	,	U	U	U	U	411	U	-	741	15
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
								None			NONe	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked	1170	1170	740	110/	1105	411	75.4			411		
vC, conflicting volume	1178	1178	748	1186	1185	411	754			411		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1178	1178	748	1186	1185	411	754			411		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	87	100	98	100	100	100	99			100		
cM capacity (veh/h)	168	190	416	162	187	641	865			1159		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	28	417	758									
Volume Left	21	6	4									
Volume Right	7	0	13									
cSH	197	865	1159									
Volume to Capacity	0.14	0.01	0.00									
Queue Length 95th (ft)	12	1	0.00									
Control Delay (s)	26.3	0.2	0.1									
Lane LOS	20.5 D	0.2 A	A									
Approach Delay (s)	26.3	0.2	0.1									
Approach LOS	20.5 D	0.2	0.1									
	D											
Intersection Summary												
Average Delay			0.7									
Intersection Capacity Utilization			45.5%	IC	U Level o	f Service			A			
Analysis Period (min)			15									

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		1		002	4
Traffic Volume (veh/h)	0	0	380	0	5	641
Future Volume (Veh/h)	0	0	380	0	5	641
		U	Free	0	5	Free
Sign Control	Stop					
Grade	0%	0.05	0%	0.07	0.05	0%
Peak Hour Factor	0.25	0.25	0.87	0.87	0.85	0.85
Hourly flow rate (vph)	0	0	437	0	6	754
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1203	437			437	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1203	437			437	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	0.4	0.2			4.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			99	
cM capacity (veh/h)	204	624			1134	
					1134	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	0	437	760			
Volume Left	0	0	6			
Volume Right	0	0	0			
cSH	1700	1700	1134			
Volume to Capacity	0.00	0.26	0.01			
Queue Length 95th (ft)	0.00	0.20	0.01			
Control Delay (s)	0.0	0.0	0.1			
Lane LOS	0.0 A	0.0	0.1 A			
	A 0.0	0.0	A 0.1			
Approach Delay (s)		0.0	U. I			
Approach LOS	А					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			41.1%	IC	U Level o	Service
Analysis Period (min)			15	10	2 201010	2 51 1100
/ indigois i criod (initi)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		ţ,			د أ
Traffic Volume (veh/h)	0	2	369	12	10	622
Future Volume (Veh/h)	0	2	369	12	10	622
Sign Control	Stop	-	Free		.5	Free
Grade	0%		0%			0%
Peak Hour Factor	0.25	0.25	0.89	0.89	0.84	0.84
Hourly flow rate (vph)	0.25	0.23	415	13	12	740
Pedestrians	0	0	чIJ	13	12	740
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
			None			NONe
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked	4407	100			100	
vC, conflicting volume	1186	422			428	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1186	422			428	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	99			99	
cM capacity (veh/h)	208	636			1142	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	8	428	752			
Volume Left		428	12			
	0	13				
Volume Right cSH	8		0			
	636	1700	1142			
Volume to Capacity	0.01	0.25	0.01			
Queue Length 95th (ft)	1	0	1			
Control Delay (s)	10.7	0.0	0.3			
Lane LOS	В		А			
Approach Delay (s)	10.7	0.0	0.3			
Approach LOS	В					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			50.7%	IC	U Level o	f Service
Analysis Period (min)			15	10	O LOVEI O	
Analysis Fonou (IIIII)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		12			<u>्</u>
Traffic Volume (veh/h)	7	9	372	11	9	613
Future Volume (Veh/h)	7	9	372	11	9	613
Sign Control	Stop	,	Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.80	0.80	0.89	0.89	0.83	0%
Hourly flow rate (vph)	0.80	0.80	0.89 418	0.89	0.83	0.83
	9	11	418	12	11	/39
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1185	424			430	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1185	424			430	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	96	98			99	
cM capacity (veh/h)	209	634			1140	
					1140	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	20	430	750			
Volume Left	9	0	11			
Volume Right	11	12	0			
cSH	331	1700	1140			
Volume to Capacity	0.06	0.25	0.01			
Queue Length 95th (ft)	5	0.25	0.01			
Control Delay (s)	16.6	0.0	0.3			
Lane LOS	10.0 C	0.0	0.3 A			
Approach Delay (s)	16.6	0.0	0.3			
Approach LOS	10.0 C	0.0	0.5			
	U					
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			49.5%	IC	U Level o	Service
Analysis Period (min)			15	10	2 201010	2 51 1100
			15			

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4		
Lane Configurations			4		4î»			स्	1		स्	1			
Traffic Volume (vph)	15	119	387	15	198	7	10	154	51	170	112	67			
Future Volume (vph)	15	119	387	15	198	7	10	154	51	170	112	67			
Turn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot			
Protected Phases	2	2	23		3			1			1	1	4		
Permitted Phases	3	3		3		1	1		1	1					
Detector Phase	2	2	23	3	3	1	1	1	1	1	1	1			
Switch Phase															
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0		
Minimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0		
Total Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0		
Total Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%		
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0		
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0		
Lost Time Adjust (s)	1.0	1.0		1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0		
Total Lost Time (s)					4.0			4.0	4.0		4.0	4.0			
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None		
Act Effct Green (s)	max	max	23.8	max	11.4	man	man	17.6	17.6	max	17.6	17.6	Homo		
Actuated g/C Ratio			0.36		0.17			0.27	0.27		0.27	0.27			
v/c Ratio			1.15		0.76			0.41	0.12		1.03	0.19			
Control Delay			111.3		24.3			26.8	2.5		92.1	6.1			
Queue Delay			0.0		0.0			0.0	0.0		0.0	0.0			
Total Delay			111.3		24.3			26.8	2.5		92.1	6.1			
LOS			F		C			C	A		F	A			
Approach Delay			111.3		24.3			21.2			72.8				
Approach LOS			F		C			С			E				
Intersection Summary															
Cycle Length: 76															
Actuated Cycle Length: 66.4															
Natural Cycle: 110															
Control Type: Semi Act-Uncoord	d														
Maximum v/c Ratio: 1.15															
Intersection Signal Delay: 63.8				In	tersection	LOS: E									
Intersection Capacity Utilization	81.3%				U Level o)								
Analysis Period (min) 15	/ 0						-								
Splits and Phases: 8: Washin	ngton Stree	et & Glenw	ood Stree			ove Street			لغي ا	_				**	
W Ø1				丸	Ø2					Ø3				A Aga	
21 s				16 s					15 s					24 s	

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Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	567	501	194	58	307	89
v/c Ratio	1.15	0.76	0.41	0.12	1.03	0.19
Control Delay	111.3	24.3	26.8	2.5	92.1	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	111.3	24.3	26.8	2.5	92.1	6.1
Queue Length 50th (ft)	~296	63	80	0	~181	0
Queue Length 95th (ft)	#488	#128	138	10	#329	30
Internal Link Dist (ft)	377	369	306		856	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	495	663	472	474	299	475
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.15	0.76	0.41	0.12	1.03	0.19
Intersection Summary						
 Volume exceeds capacity 	, aueue is the	eoretically	infinite.			
Queue shown is maximum						

 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2
Lane Configurations			4			4 î b					र्स	1		र्भ	1	
Traffic Volume (vph)	15	119	387	11	15	198	14	205	7	10	154	51	170	112	67	15
Future Volume (vph)	15	119	387	11	15	198	14	205	7	10	154	51	170	112	67	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11
Total Lost time (s)			4.0			4.0					4.0	4.0		4.0	4.0	
Lane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00	
Frpb, ped/bikes			1.00			0.90					1.00	0.98		1.00	1.00	
Flpb, ped/bikes			1.00			1.00					0.99	1.00		1.00	1.00	
Frt			1.00			0.92					1.00	0.85		1.00	0.85	
Fit Protected			0.99			1.00					1.00	1.00		0.97	1.00	
Satd. Flow (prot)			1856			2989					1863	1515		1745	1517	
Flt Permitted			0.46			0.92					0.95	1.00		0.63	1.00	
Satd. Flow (perm)			861			2768					1783	1515		1129	1517	
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	127	412	12	17	230	16	238	8	11	175	58	185	122	73	16
RTOR Reduction (vph)	0	0	1	0	0	197	0	0	0	0	0	43	0	0	66	0
Lane Group Flow (vph)	0	0	566	0	0	304	0	0	0	0	194	15	0	307	23	0
Confl. Peds. (#/hr)	59						59			59						59
Confl. Bikes (#/hr)												3				
Heavy Vehicles (%)	0%	1%	0%	9%	7%	1%	0%	0%	0%	0%	1%	4%	1%	4%	2%	7%
Turn Type	D.P+P	D.P+P	NA		Perm	NA			Perm	Perm	NA	Perm	Perm	NA	Prot	
Protected Phases	2	2	23			3					1			1	1	
Permitted Phases	3	3			3				1	1		1	1			
Actuated Green, G (s)			23.8			11.4					17.6	17.6		17.6	17.6	
Effective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6	
Actuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26	
Clearance Time (s)						4.0					4.0	4.0		4.0	4.0	
Vehicle Extension (s)						2.0					2.0	2.0		2.0	2.0	
Lane Grp Cap (vph)			490			471					469	398		297	399	
v/s Ratio Prot			c0.21												0.02	
v/s Ratio Perm			c0.20			0.11					0.11	0.01		c0.27		
v/c Ratio			1.16			0.64					0.41	0.04		1.03	0.06	
Uniform Delay, d1			21.6			25.9					20.4	18.4		24.7	18.4	
Progression Factor			1.00			1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2			91.1			6.7					2.7	0.2		61.2	0.3	
Delay (s)			112.6			32.5					23.1	18.5		85.9	18.7	
Level of Service			F			С					С	В		F	В	
Approach Delay (s)			112.6			32.5					22.0			70.8		
Approach LOS			F			С					С			E		
Intersection Summary																
HCM 2000 Control Delay			66.3	Н	CM 2000 I	_evel of Se	ervice		E							
HCM 2000 Volume to Capacity	y ratio		0.86													
Actuated Cycle Length (s)			66.9		um of lost				14.0							
Intersection Capacity Utilization	n		81.3%	IC	U Level o	r Service			D							
Analysis Period (min)			15													
 Unical Lane Group 																

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	202	4	-2011		4		.,62			200	4	2211
Traffic Volume (veh/h)	1	2	0	0	3	331	0	0	0	16	269	1
Future Volume (Veh/h)	1	2	0	0	3	331	0	0	0	16	269	1
Sign Control	1	Stop	U	U	Stop	331	U	Free	v	10	Free	
Sign Control Grade		510p 0%			5top 0%						Free 0%	
	0.50		0.50	0.70		0.70	0.00	0%	0.00	0.00		0.02
Peak Hour Factor	0.50	0.50	0.50	0.78	0.78	0.78	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	0	0	4	424	0	0	0	17	292	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	752	326	292	328	327	0	293			0		
vC1, stage 1 conf vol		020		020	027	5	275					
vC2, stage 2 conf vol												
vCu, unblocked vol	752	326	292	328	327	0	293			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
	7.1	0.0	0.2	7.1	0.0	0.2	4.1			4.1		
tC, 2 stage (s)	2.5	4.0	3.3	2.5	4.0	3.3	2.2			2.2		
tF (s)	3.5			3.5	4.0		2.2					
p0 queue free %	99	99	100	100	99	61	100			99		
cM capacity (veh/h)	198	589	752	620	589	1091	1280			1636		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	6	428	310									
Volume Left	2	0	17									
Volume Right	0	424	1									
cSH	356	1082	1636									
Volume to Capacity	0.02	0.40	0.01									
Queue Length 95th (ft)	1	48	1									
Control Delay (s)	15.3	10.5	0.5									
Lane LOS	C	B	A									
Approach Delay (s)	15.3	10.5	0.5									
Approach LOS	13.5 C	10.3 B	0.0									
	C	D	_	_	_	_		_	_		_	_
Intersection Summary												
Average Delay			6.4									
Intersection Capacity Utilization			42.4%	IC	U Level o	f Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4				
Traffic Volume (veh/h)	8	10	0	11	8	6	323	263	10	14	4) 139	3
Future Volume (Veh/h)	8	10	0	11	8	6	323	263	10	14	139	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.63	0.63	0.63	0.81	0.81	0.81	0.90	0.90	0.90
Hourly flow rate (vph)	11	13	0.75	17	13	10	399	325	12	16	154	3
Pedestrians		15	U	17	15	10	377	525	12	10	154	5
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
								NOLIG			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked	1000	1000	454	1000	1010	004	457			0.07		
vC, conflicting volume	1333	1322	156	1323	1318	331	157			337		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1333	1322	156	1323	1318	331	157			337		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	88	88	100	82	89	99	72			99		
cM capacity (veh/h)	93	112	896	96	113	715	1435			1234		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	40	736	173								
Volume Left	11	17	399	16								
Volume Right	0	10	12	3								
cSH	103	131	1435	1234								
Volume to Capacity	0.23	0.31	0.28	0.01								
Queue Length 95th (ft)	21	30	29	1								
Control Delay (s)	50.5	44.3	5.9	0.8								
Lane LOS	F	E	A	A								
Approach Delay (s)	50.5	44.3	5.9	0.8								
Approach LOS	50.5 F	E	5.7	0.0								
		-										
Intersection Summary												
Average Delay			7.7									
Intersection Capacity Utilization			53.9%	IC	U Level of	Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			f,			र्स	
Traffic Volume (veh/h)	1	5	263	2	0	10	0	584	0	2	149	0
Future Volume (Veh/h)	1	5	263	2	0	10	0	584	0	2	149	0
Sign Control		Stop		-	Stop		-	Free	-	-	Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.60	0.60	0.60	0.81	0.81	0.81	0.84	0.84	0.84
Hourly flow rate (vph)	0.75	5	283	3	0.00	17	0.01	721	0.01	2	177	0.04
Pedestrians		J	203	3	J	17	J	121	v	4	177	0
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
								None			Nono	
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	919	902	177	1188	902	721	177			721		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	919	902	177	1188	902	721	177			721		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	68	97	100	96	100			100		
cM capacity (veh/h)	244	279	871	111	279	431	1411			890		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	289	20	721	179								
Volume Left	209	20	0	2								
Volume Right	283	3 17	0	2								
cSH	833	301	1700	890								
Volume to Capacity	0.35	0.07	0.42	0.00								
Queue Length 95th (ft)	39	5	0	0								
Control Delay (s)	11.6	17.8	0.0	0.1								
Lane LOS	В	С		А								
Approach Delay (s)	11.6	17.8	0.0	0.1								
Approach LOS	В	С										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			54.1%	IC	U Level of	Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	202	4	2011					4		002	4	0011
Traffic Volume (veh/h)	11	4> 0	2	0	0	0	2	570	0	1	401	13
Future Volume (Veh/h)	11	0	2	0	0	0	2	570	0	1	401	13
Sign Control	11	Stop	2	U	Stop	U	2	Free	U	1	Free	13
Grade		510p 0%			0%			0%			0%	
	0.04		0.04	0.00		0.00	0.04		0.04	0.04		0.04
Peak Hour Factor	0.81	0.81	0.81	0.92	0.92	0.92	0.81	0.81	0.81	0.94	0.94	0.94
Hourly flow rate (vph)	14	0	2	0	0	0	2	704	0	1	427	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1144	1144	434	1146	1151	704	441			704		
vC1, stage 1 conf vol			101	1110	1101	701				701		
vC2, stage 2 conf vol												
vCu, unblocked vol	1144	1144	434	1146	1151	704	441			704		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	441			4.1		
	7.1	0.0	0.2	7.1	C.0	0.2	4.1			4.1		
tC, 2 stage (s)	0.5	1.0	0.0	0.5		0.0	0.0			0.0		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	92	100	100	100	100	100	100			100		
cM capacity (veh/h)	178	201	626	175	197	437	1130			903		
Direction, Lane #	EB 1	NB 1	SB 1									
Volume Total	16	706	442									
Volume Left	14	2	1									
Volume Right	2	0	14									
cSH	196	1130	903									
Volume to Capacity	0.08	0.00	0.00									
Queue Length 95th (ft)	0.08	0.00	0.00									
Control Delay (s)	25.0	0.0	0.0									
Lane LOS												
	D	A	A									
Approach Delay (s)	25.0	0.0	0.0									
Approach LOS	D											
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			41.5%	IC	U Level o	f Service			А			
Analysis Period (min)			15									

HCM Unsignalized intersection Capacity Analysis						
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	¥		¢î			स्
Traffic Volume (veh/h)	1	3	581	0	0	413
Future Volume (Veh/h)	1	3	581	0	0	413
Sign Control	Stop	Ū	Free	0	Ū	Free
Grade	0%		0%			0%
Peak Hour Factor	0.50	0.50	0.81	0.81	0.94	0.94
Hourly flow rate (vph)	2	6	717	0.01	0.74	439
Pedestrians	-	Ū			Ū	107
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			110110			110110
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1156	717			717	
vC1, stage 1 conf vol	1100					
vC2, stage 2 conf vol						
vCu, unblocked vol	1156	717			717	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.1	0.2				
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	219	433			893	
					373	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	8	717	439			
Volume Left	2	0	0			
Volume Right	6	0	0			
cSH	348	1700	893			
Volume to Capacity	0.02	0.42	0.00			
Queue Length 95th (ft)	2	0	0			
Control Delay (s)	15.6	0.0	0.0			
Lane LOS	С					
Approach Delay (s)	15.6	0.0	0.0			
Approach LOS	С					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			40.6%	10	U Level o	f Convico
Analysis Period (min)			40.6%	IC	U Level 0	Service
Analysis Period (min)			15			

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	•	· ·		1		+
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		12			<u>स</u>
Traffic Volume (veh/h)	2	1	570	1	3	399
Future Volume (Veh/h)	2	1	570	1	3	399
Sign Control	Stop		Free		3	Free
Grade	510p 0%		0%			0%
		0.75		0.01	0.02	
Peak Hour Factor	0.75	0.75	0.81 704	0.81	0.92	0.92
Hourly flow rate (vph)	3	1	/04	1	3	434
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1144	704			705	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1144	704			705	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	0.4	0.2			4.1	
tF (s)	3.5	3.3			2.2	
p0 queue free %	3.5 99	3.3 100			100	
cM capacity (veh/h)	222	440			902	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	4	705	437			
Volume Left	3	0	3			
Volume Right	1	1	0			
cSH	254	1700	902			
Volume to Capacity	0.02	0.41	0.00			
Queue Length 95th (ft)	1	0	0			
Control Delay (s)	19.4	0.0	0.1			
Lane LOS	С		A			
Approach Delay (s)	19.4	0.0	0.1			
Approach LOS	С					
Intersection Summary						
Average Delay			0.1		_	
				10		Contra
Intersection Capacity Utilization			40.1%	IC	U Level o	Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y	TT DI	1	NDI	JDL	<u>الاد</u>
Traffic Volume (veh/h)	11	9	562	7	2	€ 399
	11	9	562	7		399
Future Volume (Veh/h)		9		/	2	
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.56	0.56	0.81	0.81	0.92	0.92
Hourly flow rate (vph)	20	16	694	9	2	434
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1136	698			703	
vC1, stage 1 conf vol		2.5				
vC2, stage 2 conf vol						
vCu, unblocked vol	1136	698			703	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)	0.5	0.2			4.1	
tF (s)	3.6	3.3			2.2	
	3.0 91	3.3 96			100	
p0 queue free %						
cM capacity (veh/h)	216	444			904	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	36	703	436			
Volume Left	20	0				
Volume Right	16	9	0			
cSH	280	1700	904			
Volume to Capacity	0.13	0.41	0.00			
	0.13	0.41	0.00			
Queue Length 95th (ft)						
Control Delay (s)	19.8	0.0	0.1			
Lane LOS	С	0.6	A			
Approach Delay (s)	19.8	0.0	0.1			
Approach LOS	С					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			40.0%	IC	U Level o	f Service
Analysis Period (min)			15			
· . · · · · · · · · · · · · · · · · · ·						



Build (2026) Condition

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4	
Lane Configurations			4		ፋጉ			स्	1		र्भ	r.		
Traffic Volume (vph)	4	111	184	81	404	11	1	9	26	217	205	180		
Future Volume (vph)	4	111	184	81	404	11	1	9	26	217	205	180		
Turn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot		
Protected Phases	2	2	23		3			1			1	1	4	
Permitted Phases	3	3		3		1	1		1	1				
Detector Phase	2	2	23	3	3	1	1	1	1	1	1	1		
Switch Phase														
Minimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0	
Minimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0	
Total Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0	
Total Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%	
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0	
Lost Time Adjust (s)	1.0	1.0		1.0	0.0	1.0	1.0	0.0	0.0	1.0	0.0	0.0	0.0	
Total Lost Time (s)					4.0			4.0	4.0		4.0	4.0		
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None	
Act Effct Green (s)	IVIdX	IVIdX	23.8	IVIdX	11.4	IVIdX	IVIdX	17.6	17.6	IVIdX	17.6	17.6	None	
Actuated g/C Ratio			23.0		0.17			0.27	0.27		0.27	0.27		
v/c Ratio			0.30		1.50			0.27	0.27		1.22	0.27		
Control Delay			36.3		258.6			24.7	0.07		1.22	17.0		
Queue Delay			0.0		238.0			0.0	0.0		0.0	0.0		
Total Delay			36.3		258.6			24.7	0.0		147.8	17.0		
LOS			30.3 D		258.0 F			24.7 C	0.3 A		147.8 F	17.0 B		
Approach Delay			36.3		г 258.6			11.0	A		F 107.9	В		
Approach LOS			30.3 D		208.0 E			11.0 B			107.9 F			
Approach LOS			D		F			В			F			
Intersection Summary														
Cycle Length: 76														
Actuated Cycle Length: 66.4														
Natural Cycle: 120														
Control Type: Semi Act-Uncoo	ord													
Maximum v/c Ratio: 1.50														
Intersection Signal Delay: 155.					tersection									
Intersection Capacity Utilizatio	n 81.1%			IC	U Level o	f Service [)							
Analysis Period (min) 15														
Splits and Phases: 8: Wash	inaton Stree	et & Glenw	ood Stree	t/Winter St	treet & Gro	we Street								
	gion once	a oroniw	554 5666						-	-				2.5
1 _{Ø1}				<u></u>	Ø2					Ø3				ÅÅ Ø4
21 s				16 s					15 s					24 s

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Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	329	789	29	37	485	213
v/c Ratio	0.79	1.50	0.11	0.07	1.22	0.44
Control Delay	36.3	258.6	24.7	0.3	147.8	17.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.3	258.6	24.7	0.3	147.8	17.0
Queue Length 50th (ft)	120	~274	11	0	~317	45
Queue Length 95th (ft)	#275	#386	25	0	#471	102
Internal Link Dist (ft)	377	369	306		848	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	414	526	271	501	398	479
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.79	1.50	0.11	0.07	1.22	0.44
Intersection Summary						
 Volume exceeds capacity, 	aueue is the	eoretically	infinite.			
Queue shown is maximum						

95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

TICIN Signalized Inters	CCUON	Capac	пу Апа	19313													
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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	_
Lane Configurations	LULL	202	4	EBR		4î þ		TIDILE.	HDEL	HDE		1	002	<u>برون</u>	1	OBILE	
Traffic Volume (vph)	4	111	184	10	81	404	23	266	11	1	9	26	217	205	180	5	
Future Volume (vph)	4	111	184	10	81	404	23	266	11	1	9	26	217	205	180	5	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	
Total Lost time (s)	12	12	4.0	12	12	4.0	12	12	12	12	4.0	4.0		4.0	4.0		
Lane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00		
Frpb, ped/bikes			1.00			0.89					1.00	1.00		1.00	1.00		
Flpb, ped/bikes			1.00			1.00					0.97	1.00		1.00	1.00		
Fit			1.00			0.94					1.00	0.85		1.00	0.85		
It Protected			0.98			0.99					0.97	1.00		0.97	1.00		
Satd. Flow (prot)			1809			2998					1794	1615		1782	1531		
It Permitted			0.24			0.87					0.56	1.00		0.82	1.00		
Satd. Flow (perm)			443			2617					1026	1615		1504	1531		
	0.94	0.94	0.94	0.94	0.98	0.98	0.98	0.00	0.71	0.71	0.71		0.87	0.87	0.87	0.87	
Peak-hour factor, PHF	0.94	0.94	196	0.94	0.98		23	0.98 271	0.71	0.71	13	0.71 37	249	236	207	0.87	
dj. Flow (vph)						412						37					
TOR Reduction (vph)	0	0	1 328	0	0	86	0	0	0	0	0 29	10	0	0	74 139	0	
ane Group Flow (vph)	0	0	328	0	0	703		0	0		29	10	0	485	139		
onfl. Peds. (#/hr)	93						93			93						93	
onfl. Bikes (#/hr)	00/	50/	40/	00/	00/	40/	10/	40/	00/	00/	00/	00/	40/	00/	1	1	
eavy Vehicles (%)	0%	5%	1%	0%	0%	1%	4%	1%	0%	0%	0%	0%	1%	0%	2%	0%	
urn Type	D.P+P	D.P+P	NA		Perm	NA			Perm	Perm	NA	Perm	Perm	NA	Prot		
rotected Phases	2	2	23			3					1		-	1	1		
ermitted Phases	3	3			3				1	1		1	1				
ctuated Green, G (s)			23.8			11.4					17.6	17.6		17.6	17.6		
fective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6		
ctuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26		
learance Time (s)						4.0					4.0	4.0		4.0	4.0		
ehicle Extension (s)						2.0					2.0	2.0		2.0	2.0		
ine Grp Cap (vph)			410			445					269	424		395	402		
's Ratio Prot			c0.15												0.09		
/s Ratio Perm			0.14			c0.27					0.03	0.01		c0.32			
c Ratio			0.80			1.58					0.11	0.02		1.23	0.35		
niform Delay, d1			19.4			27.8					18.7	18.3		24.7	20.0		
rogression Factor			1.00			1.00					1.00	1.00		1.00	1.00		
cremental Delay, d2			15.0			271.2					0.8	0.1		123.0	2.4		
elay (s)			34.4			299.0					19.5	18.4		147.7	22.3		
evel of Service			С			F					В	В		F	С		
pproach Delay (s)			34.4			299.0					18.9			109.4			
pproach LOS			С			F					В			F			
ntersection Summary																	
ICM 2000 Control Delay			172.6	H	CM 2000 I	evel of Se	ervice		F								
ICM 2000 Volume to Capacity r	atio		0.93														
Actuated Cycle Length (s)			66.9	Su	um of lost	time (s)			14.0								
ntersection Capacity Utilization			81.1%	IC	U Level o	Service			D								
nalysis Period (min)			15														
 Critical Lana Croup 																	

c Critical Lane Group

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4						4	
Traffic Volume (veh/h)	4	1	1	0	2	279	0	0	0	6	388	1
Future Volume (Veh/h)	4	1	1	0	2	279	0	0	0	6	388	1
Sign Control	4	Stop	1	U	Stop	217	U	Free	v	U	Free	
Sign Control Grade												
	0.50	0%	0.50	0.0/	0%	0.07	0.02	0%	0.00	0.04	0%	0.04
Peak Hour Factor	0.50	0.50	0.50	0.96	0.96	0.96	0.92	0.92	0.92	0.94	0.94	0.94
Hourly flow rate (vph)	8	2	2	0	2	291	0	0	0	6	413	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	718	426	414	428	426	0	414			0		
vC1, stage 1 conf vol	/10	420	414	420	420	U	414			U		
vC2, stage 2 conf vol	74.0	10/		100	10/	0				0		
vCu, unblocked vol	718	426	414	428	426	0	414			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	100	100	100	73	100			100		
cM capacity (veh/h)	253	522	643	535	522	1085	1156			1636		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	12	293	420									
Volume Left	8	0	6									
Volume Right	2	291	1									
cSH	311	1077	1636									
Volume to Capacity	0.04	0.27	0.00									
Queue Length 95th (ft)	3	28	0									
Control Delay (s)	17.1	9.6	0.1									
Lane LOS	C	7.0 A	0.1 A									
Approach Delay (s)	17.1	9.6	0.1									
		9.0 A	0.1									
Approach LOS	С	A										
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			44.9%	IC	U Level of	f Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					4			4				
Traffic Volume (veh/h)	2	⇔ 5	0	13	22	9	252	151	5	5	4 242	6
Future Volume (Veh/h)	2	5	0	13	22	9	252	151	5	5	242	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.88	0.88	0.88	0.69	0.69	0.69	0.85	0.85	0.85	0.75	0.75	0.75
Hourly flow rate (vph)	2	6	0	19	32	13	296	178	6	7	323	8
Pedestrians	_	-	-						-			
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1143	1117	327	1117	1118	181	331			184		
vC1, stage 1 conf vol	1145	1117	527	1117	1110	101	551			104		
vC2, stage 2 conf vol												
vCu, unblocked vol	1143	1117	327	1117	1118	181	331			184		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	7.1	0.5	0.2	7.1	0.5	0.2	4.1			7.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	96	100	87	4.0	99	76			100		
cM capacity (veh/h)	121	158	719	147	158	867	1228			1403		
1 3					100	007	1220			1405		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	8	64	480	338								
Volume Left	2	19	296	7								
Volume Right	0	13	6	8								
cSH	147	184	1228	1403								
Volume to Capacity	0.05	0.35	0.24	0.00								
Queue Length 95th (ft)	4	36	24	0								
Control Delay (s)	30.9	34.6	6.4	0.2								
Lane LOS	D	D	A	А								
Approach Delay (s)	30.9	34.6	6.4	0.2								
Approach LOS	D	D										
Intersection Summary												
Average Delay			6.3									
Intersection Capacity Utilization			48.9%	10	U Level of	Service			А			
Analysis Period (min)			40.976	IC.	O LEVELU	JEIVICE			A			
Analysis Penou (min)			10									

Movement EBL EBT EBR WBL WBT WBR NBL NBT NBR SBL SBT SBR
Lane Configurations
Traffic Volume (veh/h) 0 0 389 0 14 0 395 1 2 253 0
Future Volume (Veh/h) 0 0 389 0 0 14 0 395 1 2 253 0
Sign Control Stop Stop Free Free
Grade 0% 0% 0% 0%
Peak Hour Factor 0.93 0.93 0.93 0.55 0.55 0.55 0.87 0.87 0.87 0.75 0.75 0.75
Hourly flow rate (vph) 0 0 418 0 0 25 0 454 1 3 337 0
Pedestrians
Lane Width (ft)
Valking Speed (ft/s)
Percent Blockage
Right um flare (veh)
Nedian type None None
Median storage veh)
Upstream signal (ft)
pX, platoon unblocked
vC, conflicting volume 822 798 337 1216 798 454 337 455
vC1, stage 1 conf vol
vC2, stage 2 conf vol
vCu, unblocked vol 822 798 337 1216 798 454 337 455
tC, single (s) 7.1 6.5 6.2 7.1 6.5 6.2 4.1 4.1
tC, 2 stage (s)
tF (s) 3.5 4.0 3.3 3.5 4.0 3.3 2.2 2.2
p0 queue free % 100 100 41 100 100 96 100 100
cM capacity (veh/h) 282 320 710 65 321 610 1234 1116
Direction, Lane # EB 1 WB 1 NB 1 SB 1
Volume Total 418 25 455 340
Volume Right 418 25 1 0
SH 710 610 1700 1116
Volume to Canacity 0.50 0.04 0.37 0.00
Volume to Capacity 0.59 0.04 0.27 0.00
Queue Length 95th (ft) 97 3 0 0
Queue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1
Queue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A
Queue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A Approach Delay (s) 17.1 11.2 0.0 0.1
Queue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A
Oueue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A Approach Delay (s) 17.1 11.2 0.0 0.1 Approach Delay (s) 17.1 11.2 0.0 0.1 Intersection Summary C B Intersection Summary
Oueue Length 95th (ft) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A Approach Delay (s) 17.1 11.2 0.0 0.1 Approach LOS C B A
Oueue Length 95th (tt) 97 3 0 0 Control Delay (s) 17.1 11.2 0.0 0.1 Lane LOS C B A Approach Delay (s) 17.1 11.2 0.0 0.1 Approach Delay (s) 17.1 11.2 0.0 0.1 Approach LOS C B Intersection Summary

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Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	۰Y		-	र्भ	•	
Traffic Volume (veh/h)	13	4	5	379	633	11
Future Volume (Veh/h)	13	4	5	379	633	11
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.61	0.61	0.89	0.89	0.85	0.85
Hourly flow rate (vph)	21	7	6	426	745	13
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1190	752	758			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1190	752	758			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	0.4	0.2	-1-1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	90	98	99			
cM capacity (veh/h)	208	414	862			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	28	432	758			
Volume Left	21	6	0			
Volume Right	7	0	13			
cSH	237	862	1700			
Volume to Capacity	0.12	0.01	0.45			
Queue Length 95th (ft)	10	1	0			
Control Delay (s)	22.2	0.2	0.0			
Lane LOS	C	A	2.5			
Approach Delay (s)	22.2	0.2	0.0			
Approach LOS	C		2.0			
	U					
Intersection Summary						
Average Delay			0.6			
Intersection Capacity Utilization			44.0%	IC	CU Level of	Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			1		562	<u>्</u>
Traffic Volume (veh/h)	0	0	392	1	2	641
Future Volume (Veh/h)	0	0	392	1	2	641
Sign Control	Stop	U	Free	1	2	Free
Grade	5i0p 0%		0%			0%
		0.25		0.07	0.05	
Peak Hour Factor	0.25	0.25	0.87	0.87	0.85	0.85
Hourly flow rate (vph)	0	0	451	1	2	754
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1210	452			452	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1210	452			452	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	0.7	0.2				
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	203	612			1119	
					1119	
Direction, Lane #	NB 1	SB 1				
Volume Total	452	756				
Volume Left	0	2				
Volume Right	1	0				
cSH	1700	1119				
Volume to Capacity	0.27	0.00				
Queue Length 95th (ft)	0.27	0.00				
Control Delay (s)	0.0	0.0				
Lane LOS	0.0	0.0 A				
Approach Delay (s)	0.0	0.0				
Approach LOS	0.0	0.0				
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			38.7%	IC	U Level o	f Service
Analysis Period (min)			15	10		
analysis r choa (min)			15			

HCM Unsignalized Inte	secli	оп Сар	acity A	narysis		
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		1			4
Traffic Volume (veh/h)	2	4	392	0	0	642
Future Volume (Veh/h)	2	4	392	0	0	642
Sign Control	Stop		Free	0	0	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	426	0.72	0.72	698
Pedestrians	2		420	U	0	070
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)			None			NUIG
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1124	426			426	
vC1, stage 1 conf vol	1124	420			420	
vC2, stage 2 conf vol						
vC2, stage 2 coni voi vCu, unblocked vol	1124	426			426	
tC, single (s)	6.4	420			420	
	0.4	0.2			4.1	
tC, 2 stage (s)	2.5	2.2			2.2	
tF (s)	3.5	3.3			2.2	
p0 queue free %	99	99			100	
cM capacity (veh/h)	227	628			1133	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	6	426	698			
Volume Left	2	0	0			
Volume Right	4	0	0			
cSH	396	1700	1700			
Volume to Capacity	0.02	0.25	0.41			
Queue Length 95th (ft)	0.02	0.25	0.41			
Control Delay (s)	14.2	0.0	0.0			
Lane LOS	В	0.0	0.0			
Approach Delay (s)	14.2	0.0	0.0			
Approach LOS	В	0.0	0.0			
	Б					
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			43.8%	IC	CU Level o	f Service
Analysis Period (min)			15			

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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			4
Traffic Volume (veh/h)	16	24	360	21	21	614
Future Volume (Veh/h)	16	24	360	21	21	614
Sign Control	Stop	24	Free	21	21	Free
Grade	0%	0.00	0%	0.00	0.00	0%
Peak Hour Factor	0.80	0.80	0.89	0.89	0.83	0.83
Hourly flow rate (vph)	20	30	404	24	25	740
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1206	416			428	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1206	416			428	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	0.4	0.2			4.1	
tF (s)	3.5	3.3			2.2	
	3.5 90	3.3 95			2.2 98	
p0 queue free %						
cM capacity (veh/h)	200	641			1142	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total	50	428	765			
Volume Left	20	420	25			
Volume Right	30	24	0			
cSH	341	1700	1142			
Volume to Capacity	0.15	0.25	0.02			
Queue Length 95th (ft)	13	0	2			
Control Delay (s)	17.4	0.0	0.6			
Lane LOS	С		А			
Approach Delay (s)	17.4	0.0	0.6			
Approach LOS	С					
Intersection Summary						
Average Delay			1.1			
Intersection Capacity Utilization			59.3%	IC	U Level o	Service
Analysis Period (min)			15	10	2 201010	2011100
			15			

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Lane Group	EBL2	EBL	EBT	WBL	WBT	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	Ø4		
Lane Configurations			4		ፋኩ			र्स	1		स्	1			
Traffic Volume (vph)	15	122	387	15	198	7	10	157	51	170	112	67			
Future Volume (vph)	15	122	387	15	198	7	10	157	51	170	112	67			
Turn Type	D.P+P	D.P+P	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Prot			
Protected Phases	2	2	23		3			1			1	1	4		
Permitted Phases	3	3		3		1	1		1	1					
Detector Phase	2	2	23	3	3	1	1	1	1	1	1	1			
Switch Phase															
Vinimum Initial (s)	5.0	5.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	1.0		
Vinimum Split (s)	9.0	9.0		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	24.0		
Total Split (s)	16.0	16.0		15.0	15.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	24.0		
Total Split (%)	21.1%	21.1%		19.7%	19.7%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	27.6%	32%		
Yellow Time (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0		
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.0		
_ost Time Adjust (s)	1.0				0.0			0.0	0.0		0.0	0.0	0.0		
Total Lost Time (s)					4.0			4.0	4.0		4.0	4.0			
Lead/Lag	Lag	Lag		Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lead	Lag		
Lead-Lag Optimize?	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Recall Mode	Max	Max		Max	Max	Max	Max	Max	Max	Max	Max	Max	None		
Act Effct Green (s)	max	max	23.8	man	11.4	max	man	17.6	17.6	max	17.6	17.6	Tiono		
Actuated g/C Ratio			0.36		0.17			0.27	0.27		0.27	0.27			
//c Ratio			1.17		0.76			0.42	0.12		1.04	0.19			
Control Delay			118.8		24.2			26.9	2.5		94.5	6.1			
Queue Delay			0.0		0.0			0.0	0.0		0.0	0.0			
Total Delay			118.8		24.2			26.9	2.5		94.5	6.1			
LOS			F		С			С	A		F	А			
Approach Delay			118.8		24.2			21.3			74.7				
Approach LOS			F		С			С			E				
Intersection Summary															
Cycle Length: 76			_	_											
Actuated Cycle Length: 66.4															
Natural Cycle: 110															
Control Type: Semi Act-Uncoor	d														
Maximum v/c Ratio: 1.17	u														
Intersection Signal Delay: 66.6				In	tersection	LOS' F									
ntersection Capacity Utilization	81.8%				CU Level o)								
Analysis Period (min) 15	01.070				C LOTOI U	CONTROL L									
Splits and Phases: 8: Washir	ngton Stree	et & Glenw	ood Stree			ove Street									
₩ _{Ø1}				Ž	02				- 14	Ø3				A 804	
21 6				16 s					15 s	20				245	

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Lane Group	EBT	WBT	NBT	NBR	SBT	SBR
Lane Group Flow (vph)	570	505	197	58	307	89
v/c Ratio	1.17	0.76	0.42	0.12	1.04	0.19
Control Delay	118.8	24.2	26.9	2.5	94.5	6.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	118.8	24.2	26.9	2.5	94.5	6.1
Queue Length 50th (ft)	~304	63	82	0	~182	0
Queue Length 95th (ft)	#496	#128	140	10	#330	30
Internal Link Dist (ft)	377	369	306		856	
Turn Bay Length (ft)				65		65
Base Capacity (vph)	489	666	472	485	296	475
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.76	0.42	0.12	1.04	0.19
Intersection Summary						
 Volume exceeds capacity, 	queue is the	oretically i	nfinite.			
Queue shown is maximum	after two cyc	les.				

 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Synchro 9 Report
HCM Signalized Intersection Capacity Analysis

TOW Signalized Inters	ection	Capac	пу Апа	19313													
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Movement	EBL2	EBL	EBT	EBR	WBL	WBT	WBR	WBR2	NBL2	NBL	NBT	NBR	SBL	SBT	SBR	SBR2	
Lane Configurations			\$			4î>					ŧ	1		ę	1		
Traffic Volume (vph)	15	122	387	11	15	198	14	208	7	10	157	51	170	112	67	15	
Future Volume (vph)	15	122	387	11	15	198	14	208	7	10	157	51	170	112	67	15	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12	11	11	11	11	
Fotal Lost time (s)			4.0			4.0					4.0	4.0		4.0	4.0		
ane Util. Factor			1.00			0.95					1.00	1.00		1.00	1.00		
Frpb, ped/bikes			1.00			0.90					1.00	1.00		1.00	1.00		
-Ipb, ped/bikes			1.00			1.00					0.99	1.00		1.00	1.00		
Frt			1.00			0.92					1.00	0.85		1.00	0.85		
Flt Protected			0.99			1.00					1.00	1.00		0.97	1.00		
Satd. Flow (prot)			1856			2985					1863	1553		1745	1517		
Flt Permitted			0.44			0.92					0.95	1.00		0.62	1.00		
Satd. Flow (perm)			830			2764					1785	1553		1120	1517		
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.86	0.86	0.86	0.86	0.88	0.88	0.88	0.88	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	16	130	412	12	17	230	16	242	8	11	178	58	185	122	73	16	
RTOR Reduction (vph)	0	0	1	0	0	201	0	0	0	0	0	43	0	0	66	0	
ane Group Flow (vph)	0	0	569	0	0	304	0	0	0	0	197	15	0	307	23	0	
Confl. Peds. (#/hr)	59	Ū	007	0	U	001	59	0		59		10	0	007	20	59	
leavy Vehicles (%)	0%	1%	0%	9%	7%	1%	0%	0%	0%	0%	1%	4%	1%	4%	2%	7%	
	D.P+P	D.P+P	NA	770	Perm	NA	070	070	Perm	Perm	NA	Perm	Perm	NA	Prot	770	
Protected Phases	2	2	23		T CITI	3			T CHI	T CITI	1	T CHI	T GIIII	1	1		
ermitted Phases	3	2	2 3		3	5			1	1		1	1				
ctuated Green, G (s)	5	5	23.8		5	11.4					17.6	17.6		17.6	17.6		
Effective Green, g (s)			23.8			11.4					17.6	17.6		17.6	17.6		
Actuated g/C Ratio			0.36			0.17					0.26	0.26		0.26	0.26		
Clearance Time (s)			0.50			4.0					4.0	4.0		4.0	4.0		
/ehicle Extension (s)						2.0					2.0	2.0		2.0	2.0		
ane Grp Cap (vph)			485			470					469	408		294	399		
/s Ratio Prot			c0.22			470					407	400		274	0.02		
/s Ratio Perm			c0.22			0.11					0.11	0.01		c0.27	0.02		
/c Ratio			1.17			0.65					0.11	0.01		1.04	0.06		
Jniform Delay, d1			21.6			25.9					20.4	18.3		24.7	18.4		
Progression Factor			1.00			1.00					1.00	1.00		1.00	1.00		
ncremental Delay, d2			98.2			6.7					2.8	0.2		64.5	0.3		
Delay (s)			119.8			32.6					23.2	18.5		89.2	18.7		
evel of Service			F			32.0 C					23.2 C	10.5 B		07.2 F	10.7 B		
Approach Delay (s)			119.8			32.6					22.1	D		73.3	D		
Approach LOS			F			32.0 C					22.1 C			73.3 E			
			Ľ			U					C			Ľ			
ntersection Summary																	
HCM 2000 Control Delay			69.2	Н	CM 2000 I	evel of Se	ervice		E								
HCM 2000 Volume to Capacity ra	atio		0.87														
Actuated Cycle Length (s)			66.9		um of lost				14.0								
Intersection Capacity Utilization			81.8%	IC	U Level o	Service			D								
Analysis Period (min)			15														
c Critical Lane Group																	

c Critical Lane Group

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	٦	-	\mathbf{r}	1	+	•	1	†	1	1	Ŧ	-
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	LUL	4	LDR	TIDE		TUDIC	NDE	ND1	NDR	JDL	4	JDR
Traffic Volume (veh/h)	1	↔ 2	0	0	↔ 3	331	0	0	0	16	279	1
	1	2	0	0	3	331	0	0	0	16	279	1
Future Volume (Veh/h)	I		U	U		331	U		U	10		1
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.50	0.50	0.50	0.78	0.78	0.78	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	4	0	0	4	424	0	0	0	17	303	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	764	338	304	340	338	0	304			0		
vC1, stage 1 conf vol	704	220	304	340	200	U	304			U		
vC2, stage 2 conf vol	7/ 4	220	201	240	220	0	204			0		
vCu, unblocked vol	764	338	304	340	338	0	304			0		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	100	100	99	61	100			99		
cM capacity (veh/h)	195	581	741	610	580	1091	1268			1636		
Direction, Lane #	EB 1	WB 1	SB 1									
Volume Total	6	428	321									
Volume Left	2	0	17									
Volume Right	0	424	1									
cSH	350	1082	1636									
Volume to Capacity	0.02	0.40	0.01									
Queue Length 95th (ft)	0.02	48	0.01									
Control Delay (s)	15.5	10.5	0.5									
Lane LOS	15.5 C	10.5 B	0.5 A									
Approach Delay (s)	15.5	10.5	0.5									
Approach LOS	С	В										
Intersection Summary												
Average Delay			6.3									
Intersection Capacity Utilization			42.9%	IC	U Level of	Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		4			4			4				
Traffic Volume (veh/h)	8	10	0	11	8	6	323	263	10	14	4 147	3
Future Volume (Veh/h)	8	10	0	11	8	6	323	263	10	14	147	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.75	0.75	0.75	0.63	0.63	0.63	0.81	0.81	0.81	0.90	0.90	0.90
Hourly flow rate (vph)	11	13	0	17	13	10	399	325	12	16	163	3
Pedestrians			-									
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)								TIONC			None	
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1342	1332	164	1332	1327	331	166			337		
vC1, stage 1 conf vol	1342	1332	104	1332	1327	331	100			337		
vC2, stage 2 conf vol												
vCu, unblocked vol	1342	1332	164	1332	1327	331	166			337		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
	7.1	C.0	0.2	7.1	0.0	0.2	4.1			4.1		
tC, 2 stage (s)	25	4.0	2.2	2.5	10	2.2	2.2			2.2		
tF (s)	3.5	4.0	3.3	3.5	4.0 88	3.3	72			2.2		
p0 queue free %	88	88	100	82		99						
cM capacity (veh/h)	91	111	885	94	111	715	1424			1234		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	24	40	736	182								
Volume Left	11	17	399	16								
Volume Right	0	10	12	3								
cSH	101	129	1424	1234								
Volume to Capacity	0.24	0.31	0.28	0.01								
Queue Length 95th (ft)	21	31	29	1								
Control Delay (s)	51.5	45.2	6.0	0.8								
Lane LOS	F	E	А	А								
Approach Delay (s)	51.5	45.2	6.0	0.8								
Approach LOS	F	E										
Intersection Summary												
Average Delay		_	7.7	_								_
Intersection Capacity Utilization			54.3%	10	U Level of	Soniec			А			
			54.3% 15	IC	U Level of	Service			А			
Analysis Period (min)			15									

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	202	4	LBIX		4	mon	HDL	4	HBR	ODE	4	OBIT
Traffic Volume (veh/h)	1	6	272	0	0	3	0	591	0	5	154	0
Future Volume (Veh/h)	1	6	272	0	0	3	0	591	0	5	154	0
Sign Control	1	Stop	212	U	Stop	3	U	Free	U	J	Free	U
Grade		510p 0%			510p 0%			0%			0%	
Peak Hour Factor	0.93		0.93	0.60	0.60	0.60	0.81		0.81	0.84	0%	0.84
		0.93						0.81				
Hourly flow rate (vph)	1	6	292	0	0	5	0	730	0	6	183	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	930	925	183	1220	925	730	183			730		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	930	925	183	1220	925	730	183			730		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)	7.1	0.5	0.2	7.1	0.5	0.2	4.1			4.1		
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	98	66	100	100	99	100			99		
cM capacity (veh/h)	245	269	865	103	269	426	1404			883		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	299	5	730	189								
Volume Left	1	0	0	6								
Volume Right	292	5	0	0								
cSH	821	426	1700	883								
Volume to Capacity	0.36	0.01	0.43	0.01								
Queue Length 95th (ft)	42	1	0	1								
Control Delay (s)	11.9	13.6	0.0	0.4								
Lane LOS	B	B	0.0	A								
Approach Delay (s)	11.9	13.6	0.0	0.4								
Approach LOS	B	13.0 B	0.0	0.4								
	U	U										
Intersection Summary Average Delay			3.0									
				10	III and 1	Conde			D			
Intersection Capacity Utilization Analysis Period (min)			55.8%	IC	U Level of	Service			В			
			15									

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	≯	\mathbf{i}	1		ŧ	-
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	۰Y			र्भ	1⇒	
Traffic Volume (veh/h)	11	2	2	578	410	13
Future Volume (Veh/h)	11	2	2	578	410	13
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.94	0.94
Hourly flow rate (vph)	14	2	2	714	436	14
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1161	443	450			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1161	443	450			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)	0.4	0.2	4.1			
tF (s)	3.5	3.3	2.2			
p0 queue free %	94	100	100			
cM capacity (veh/h)	217	619	1121			
Direction, Lane #	EB 1	NB 1	SB 1			
Volume Total	16	716	450			
Volume Left	14	2	0			
Volume Right	2	0	14			
cSH	237	1121	1700			
Volume to Capacity	0.07	0.00	0.26			
Queue Length 95th (ft)	5	0	0			
Control Delay (s)	21.3	0.0	0.0			
Lane LOS	C	A	0.0			
Approach Delay (s)	21.3	0.0	0.0			
Approach LOS	C	0.0	0.0			
	U	_	_	_	_	_
Intersection Summary						
Average Delay			0.3			
Intersection Capacity Utilization			42.0%	IC	CU Level of	Service
Analysis Period (min)			15			

ane Configurations 1 4 raffic Volume (veh/h) 0 0 587 2 3 422 ign Control Stop Free Free Free 1 </th <th></th> <th></th> <th></th> <th>paony</th> <th></th> <th></th> <th></th>				paony			
VBR VBR VBR SBL SBL ane Configurations 1 2 3 422 ane Configurations 2 3 422 ing Control Stop 587 2 3 422 uture Volume (Veh/h) 0 0 587 2 3 422 ign Control Stop Free Free Free Free Free ign Control 0 0 725 2 3 449 edestrians 0 727 3 449 64611 ight turn flare (veh) Iedian type None None None 1612 ight turn flare (veh) 181 726 727 172 12 12 12 12 12		1	•	+	*	~	
ane Configurations							•
ane Configurations Image: configurations Image: configurations Image: configurations raffic Volume (veh/h) 0 0 587 2 3 422 ign Control Stop Free Free Free rade 0% 0% 0% 0% eak Hour Factor 0.50 0.51 0.81 0.94 0.94 ourly flow rate (vph) 0 0 725 2 3 449 edestrians ane Width (th) 0 0 725 2 3 449 aded configurations ane Width (th) //aking Speed (tivs) ercent Blockage ight turn fare (veh) bitter (veh) ane Width (th) //aking Speed (tivs) ercent Blockage ight turn fare (veh) ane Width (th) ane Width (th) //aking Speed (tivs) ercent Blockage ight turn fare (veh) ane Width (th) ane Width (th) //akint Configurations istorage veh) pstram signal (th) x pstram signal (th) x //akint Configurations	Movement	WBL	WBR	NBT	NBR	SBL	SBT
raffic Volume (veh/h) 0 0 5 587 2 3 422 uture Volume (Veh/h) 0 0 587 2 3 422 ign Control Stop Free Free rade 0% 0% 0% eak Hour Factor 0.50 0.50 0.81 0.81 0.94 0.94 outry flow rate (vph) 0 0 725 2 3 449 edestinas ane Width (ft) Jaking Speed (tr/s) ercent Blockage ight turn flare (veh) letian type None None letian storage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C1, stage 1 conf vol C2, stage 2 conf vol C3, stage 5 3 3 2.2 0 queue free % 100 100 100 frecton, Lane # NB 1 SB 1 recton, Lane # NB 1 SB 1 varage Dight 2 0 SH 1700 886 olume Left 0 3 olume Right 2 0 SH 1700 0.1 HT 200 SH 1700 0.1 HT 200 SH 1700 0.1 SH							
uture Volume (Veh/h) 0 0 587 2 3 422 ign Control Stop Free Free irade 0% 0% 0% eak Hour Factor 0.50 0.50 0.81 0.81 0.94 0.94 ourly flow rate (vph) 0 0 725 2 3 449 edestrians ane Width (ft) //aking Speed (ft/s) erecnt Blockage ight turn flare (veh) ledian storage veh) sptream signal (ft) X, platon unblocked C, conflicting volume 1181 726 727 C1, stage 1 conf vol C2, stage 1 conf vol C2, stage 2 conf vol C2, stage 5 3 3 3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 irection, Lane <i>#</i> NB 1 SB 1 olume F Total 727 452 olume Right 2 0 SH 1700 886 olume Right 2 0 SH 1700 886 olume Right 2 0 SH 1700 886 olume LOS A H 1700 0 186 Outure Logs A SH 1700 0 SH 1700 0	Traffic Volume (veh/h)	0	0			3	
ign Control Slop Free Free rade 0% 0% 0% eak Hour Factor 0.50 0.51 0.81 0.81 0.94 0.94 ourly flow rate (vph) 0 0 725 2 3 449 edestrians ane Width (ft) ////////////////////////////////////	Future Volume (Veh/h)						
rade 0% 0% 0% eak Hour Factor 0.50 0.50 0.81 0.81 0.94 0.94 eak Hour Factor 0.50 0.50 0.81 0.81 0.94 0.94 edestrians 0 0 725 2 3 449 edestrians ane Width (ft) 725 2 3 449 edestrians ane Width (ft) 727 2 3 449 edian type None None None Factor 727 edian type None None Control (ft) 727 727 727 C, stage 1 conf vol 1181 726 727 727 727 727 C, stage (s) 6.4 6.2 4.1 727	Sign Control	Stop		Free			Free
eak Hour Factor 0.50 0.50 0.81 0.81 0.94 0.94 ourly flow rate (vph) 0 0 725 2 3 449 destrians ane Width (ft)	Grade						
ourly flow rate (vph) 0 0 725 2 3 449 edestrians ane Width (ft) 1					0.81	0.94	
edestrians ane Width (ft) Jaking Speed (ft/s) ercent Blockage ight turn flare (veh) ledian storage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 C, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 1 conf vol C3, stage 1 conf vol C4, stage 1 conf vol C3, stage 1 conf vol C4, stage 1 conf vol Guume Let 0 control Delay (s) 0, 0 0, 0 0, 0 0, 0<							
ane Width (ft) //aking Speed (ft/s) ercent Blockage ight lum flare (veh) ledian storage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage (s) 5 (s) 3.5 3.3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 <i>irection</i> , Lane # NB 1 SB 1 olume Total 727 452 olume Left 0 3 olume Right 2 0 SH 1700 886 Olume total 727 452 olume Lotal 727	Pedestrians	0		720	-		,
/alking Speed (ft/s) ercent Blockage ight turn flare (veh) ledian type None None ledian type None let None ledian type None ledian t							
ercent Blockage ight turn flare (veh) ledian storage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C, stage 1 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 3 5 3.3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 irrection, Lane # NB1 SB1 olume Total 727 452 olume Right 2 0 SH 1700 886 olume Right 2 0 SH 1700 886 olume Length 95th (ft) 0 0 0 ontrol Delay (s) 0.0 0.1 pproach Delay (s) 0.0 0.1 pproach Delay (s) 0.0 0.1 pproach LOS Verage Delay 0 0.0 tersection Summary Verage Delay 0 0.0 tersection Capacity Utilization 34.3% ICU Level of Service A							
light lum flare (veh) ledian storage veh) pstream signal (f) X, platoon unblocked C, conflicting volume 1181 726 727 C1, stage 1 conf vol C2, stage 2 conf vol C1, stage 1 conf vol C2, stage 2 conf vol C1, stage 1 conf vol C2, stage 2 conf vol C2, stage							
Iedian type None None ledian tsorage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C1, stage 1 conf vol C2, stage 2 conf vol C1, unblocked vol 1181 726 727 C2, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C3, stage (s) S stage (s) S stage (s) S stage (s)							
ledian storage veh) pstream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, unblocked vol 1181 726 727 , single (s) 6.4 6.2 4.1 C, 2 stage (s) (s) 3.5 3.3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 irrection, Lane # NB1 SB1 olume Total 727 452 olume total 727 452 olume Lotal 727 455 olume Lotal 727 455 Verage Delay (s) 0.0 0.1 proach LOS tersection Summary verage Delay (s) 0.0 Level of Service A	Median type			Nono			None
pistream signal (ft) X, platoon unblocked C, conflicting volume 1181 726 727 C1, stage 1 conf vol C2, stage 2 conf vol 0 C2, stage (s) 6.4 6.2 4.1 C, single (s) 6.4 6.2 4.1 C, stage (s) 0 100 100 M capacity (velvh) 211 428 886 Viewel free % 100 100 100 M capacity (velvh) 211 428 886 Viewel free % 100 100 100 M capacity (velvh) 211 428 886 Viewel free % 0 3 0 olume Total 727 452 0 100 olume Right 2 0 1 100 olume Capacity 0.43 0.00 1 100 ueue Length 95th (ft) 0 0 1 100 100	Modian storago vob)			NULLE			NULLE
X, platoon unblocked 727 C, conflicting volume 1181 726 727 C1, stage 1 conf vol 726 727 C2, stage 2 conf vol 727 727 C1, stage 1 conf vol 1181 726 727 C2, single (s) 6.4 6.2 4.1 726 2, single (s) 727 7 7 7 C(s) 3.5 3.3 2.2 7 7 Q queue free % 100 100 100 100 M capacity (velvh) 211 428 886 100 100 direction, Lane # NB 1 SB 1 1000 100 100 olume Total 727 452 100 100 100 100 Olume Left 0 3 0.00 100 <t< td=""><td></td><td></td><td></td><td></td><td></td><td></td><td></td></t<>							
C, conflicting volume 1181 726 727 C1, stage 2 conf vol C2, stage 2 conf vol C2, stage 2 conf vol C2, unblocked vol 1181 726 727 2, single (s) 6.4 6.2 4.1 2, 2 stage (s) (s) 3.5 3.3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 irrection, Lane # NB 1 SB 1 olume Total 727 452 olume Lot 0 3 olume Left 0 3 olume Right 2 0 SH 1700 886 olume I Capacity 0.43 0.00 ueue Length 95th (ft) 0 0 ontrol Delay (s) 0.0 0.1 aproach Delay (s) 0.0 0.1 pproach LOS tersection Summary verage Delay 0,0 tersection Capacity Utilization 34.3% ICU Level of Service A	nY platoon unblockod						
C1, stage 1 conf vol C2, stage 2 conf vol C, single (s) 6.4 O queue free % 100 O queue free % 100 M Capacity (veh/h) 211 428 886 irrection, Lane # NB1 SB1 0 olume Total 727 452 0 olume Right 2 0 0 ontrol Delay (s) 0.0 oute Locapacity 0.43 oute Logs (s) 0.0 ueue Length 95th (ft) 0 ontrol Delay (s) 0.0 tersection Summary Verage Delay verage Delay 0.0 teresection C	vC conflicting volume	1101	704			727	
C2, stage 2 conf vol Cu, unblocked vol 1181 726 727 Cu, jonblocked vol 1181 726 727 S, single (s) 6.2 4.1 C, 2 stage (s)	vC1_stage 1_confive	1101	/20			121	
Cu, unblocked vol 1181 726 727 , single (s) 6.4 6.2 4.1 2, stage (s) - - i'(s) 3.5 3.3 2.2 0 queue free % 100 100 100 M capacity (veh/h) 211 428 886 irrection, Lane # NB1 SB1 - olume Total 727 452 - olume Left 0 3 - olume Left 0 3 - olume Left 0 0 - olume Logacity 0.43 0.00 - ueue Length 95th (ft) 0 0 - ontrol Delay (s) 0.0 0.1 - are LOS A - - verage Delay 0.0 - - tersection Capacity Utilization 34.3% ICU Level of Service A							
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tersection Capacity Utilization 34.3% ICU Level of Service A	Intersection Summary						
	Average Delay						
	Intersection Capacity Utilization			34.3%	10	CU Level o	f Service
	Analysis Period (min)			15			

HCIVI Unsignalized Inte	section	оп Сар	acity A	naiysis		
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	*	· ·	I	1		÷
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		4			•
Traffic Volume (veh/h)	1	2	587	0	0	426
Future Volume (Veh/h)	1	2	587	0	0	426
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	2	638	0	0	463
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1101	638			638	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1101	638			638	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	100	100			100	
cM capacity (veh/h)	235	477			946	
Direction, Lane #	WB 1	NB 1	SB 1			
				_		
Volume Total	3	638	463			
Volume Left	1	0	0			
Volume Right		1700	0			
cSH Values to Consolition	355	1700	1700			
Volume to Capacity	0.01	0.38	0.27			
Queue Length 95th (ft)	1 15 0	0	0			
Control Delay (s)	15.2	0.0	0.0			
Lane LOS	C	0.0	0.0			
Approach Delay (s)	15.2	0.0	0.0			
Approach LOS	С					
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			40.9%	IC	U Level o	Service
Analysis Period (min)			15			
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Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	WBL M	WDR	INBT	NDR	JDL	<u>्ठा</u>
Traffic Volume (veh/h)	17	18	562	16	17	€ 393
Future Volume (Veh/h)	17	18	562 562	16	17	393 393
Sign Control		18	Free	10	17	Free
Sign Control Grade	Stop 0%		Free 0%			Free 0%
Grade Peak Hour Factor	0%	0.56	0%	0.81	0.92	0%
Hourly flow rate (vph)	30	32	694	20	18	427
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1167	704			714	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1167	704			714	
tC, single (s)	6.5	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.6	3.3			2.2	
p0 queue free %	85	93			98	
cM capacity (veh/h)	203	440			895	
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total		714				
	62 30		445			
Volume Left	30 32	0 20	18			
Volume Right cSH	32 281	20 1700	0 895			
Volume to Capacity	0.22	0.42	0.02			
Queue Length 95th (ft)	21	0	2			
Control Delay (s)	21.4	0.0	0.6			
Lane LOS	С	0.0	A			
Approach Delay (s)	21.4	0.0	0.6			
Approach LOS	С					
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			44.5%	ICI	U Level of	Service
Analysis Period (min)			15			



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