# *Traffic Impact and Access Study*

# *Proposed Residential Development*

# *25 Rockwood Road*

## *Norfolk, Massachusetts*

*Prepared for*

***Stonebridge Homes, Inc.***

***October 2016***

*Prepared by*

**GREEN INTERNATIONAL AFFILIATES, INC.**
Civil and Structural Engineers

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# 1.0 INTRODUCTION AND EXECUTIVE SUMMARY

This report provides an analysis of the potential traffic and access impacts of a proposed 40B residential development project at 25 Rockwood Road in Norfolk, Massachusetts. The project site is located along the west side of Rockwood Road, and is shown in Figure 1. The proposed development project consists of a total of 36 residential townhouses. The project site is located less than 400 feet from the Norfolk MBTA Commuter Rail station. This report considers the potential impacts on the adjacent roadways and nearby intersections. Intersection capacity analyses were completed at each study intersection for the existing, future No-Build, and future Build conditions. An analysis of available stopping sight distance (SSD) and intersection sight distance (ISD) was also completed for the proposed site drive and emergency access roadway.

The analysis and evaluation in this report includes the collection of current traffic volumes, safety data review, and analysis of the roadway/site access interfaces. The guidelines of the Massachusetts Department of Transportation (MassDOT), as well as considering those of the Institute of Transportation Engineers (ITE), were used for completing this traffic impact and access study. The report contains descriptions of the existing characteristics of the abutting roadway network, current traffic conditions, estimated traffic impacts, and the access-egress characteristics of the proposed residential development project.

## EXISTING CONDITIONS

The study area for this report consisted of the intersections of Rockwood Road at Main Street, Rockwood Road at Ware Drive, Rockwood Road at Boardman Street, and the proposed Site Driveway intersection with Rockwood Road.

Rockwood Road, Main Street, Ware Drive, and Boardman Street are all two-lane, two-way roadways and fall under the jurisdiction of the Town of Norfolk. Rockwood Road and Main Street are classified as minor arterial roadways, Boardman Street is classified as a collector roadway, and Ware Drive is classified as a local roadway. Rockwood Road is also known as Route 115.

In the vicinity of the project site, a sidewalk is provided on the east side of Rockwood Road. The Freeman-Kennedy School is accessible via a driveway on the east side of Rockwood Road approximately 680 feet north of the proposed site driveway. The MBTA commuter rail Franklin line Norfolk station is located less than 400 feet south of the proposed site drive location, with an at-grade rail crossing across Rockwood Road. During the weekday peak periods, the headways are approximately 30 minutes. When the train arrives, a safety gate lowers for approximately four (4) minutes and stops northbound and southbound traffic on Rockwood Road.

Traffic data was collected on September 7-8, 2016 and indicates that the daily traffic volume on Rockwood Road in the vicinity of the proposed development project is approximately 8,890 vehicles per day (vpd). The weekday morning peak hour on Rockwood Road generally occurs between 7:00-8:00 AM and represents approximately 8.9% of the daily traffic. The weekday evening peak hour on Rockwood Road generally occurs between 5:00-6:00 PM and represents approximately 9.7% of the daily traffic.

The analysis of the existing conditions showed that there are no significant safety issues. The study area intersections generally operate well although motorists may experience relatively long delays exiting Boardman Street during the weekday peak hours under current conditions.

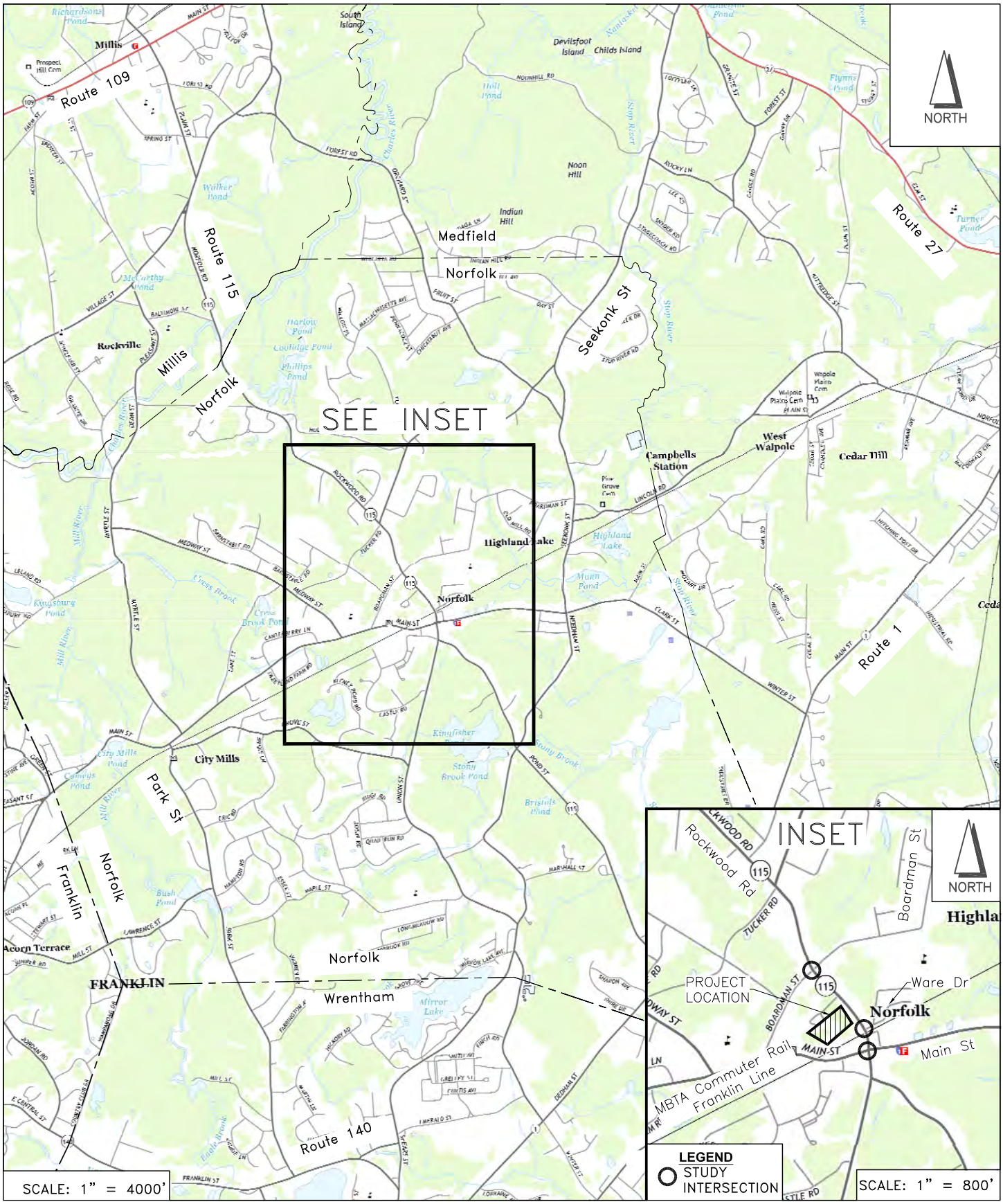


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**Figure 1**
**Project Location**
**25 Rockwood Road**
**Norfolk, MA**

## FUTURE CONDITIONS

A seven-year timeframe was used in the analysis that is consistent with current state guidelines. For the future No-Build analysis, a one percent background annual growth rate was applied, based on regional traffic growth data as well as relevant site-specific developments. Traffic volume forecasts of the proposed development project were based on models published by the Institute of Transportation Engineers (ITE) and observations of similar land uses. The project is expected to generate a relatively small amount of vehicle trips, approximately 244 vehicle trips per day with 21 and 24 vehicle trips during the morning and afternoon peak hours, respectively. The trips were distributed across the study area network based on existing traffic patterns.

The project is in close proximity to the Town Center, with many businesses (banks, a Dunkin Donuts, a Walgreen's, restaurants, etc.), Town Hall, the library, and the MBTA Commuter Rail Norfolk station, all of which are within a convenient walking distance of less than a quarter of a mile. Walking along Rockwood Road, the project site is located less than 400 feet from the MBTA commuter rail station, or approximately a 2-3 minute walk.

While there are periodic short durations of vehicle delays during the peak hours due to the commuter rail stops, overall traffic flows relatively freely within the project area. There are no apparent safety issues with the possible exception of pedestrians crossing.

The nearby attractions in the Town Center and the MBTA commuter rail station provide a great opportunity for vehicle trip generation to be reduced to lower than estimated, particularly over the course of the day, as walk trips can be made for multiple purposes. For this analysis, the number of vehicle trips generated by the proposed residential development project was reduced accordingly.

## CONCLUSIONS/RECOMMENDATIONS

This traffic report describes the analysis procedures, assumptions, and results of this traffic study. The following summarizes the traffic analysis findings:

- Compared to the Future No-Build conditions, there is negligible increase in delay at the roundabout of Main Street with Rockwood Road/Union Street, and the roundabout will continue to operate at high levels of service during the peak and off-peak hours. It is noted that there are short periods of time during peak hours when the commuter train prohibits traffic from crossing tracks that can delay vehicles on Rockwood Road back to the roundabout. However, the small additional traffic added as a result of the proposed development project will not significantly affect this characteristic, which would continue to occur regardless of the proposed project.
- There is a negligible increase in delay for the minor street approaches at the intersection of Rockwood Road at Boardman Street and at the intersection of Rockwood Road at Ware Drive.
- The available sight distance at the proposed site drive and at the proposed emergency access driveway exceed the minimum required distances.
- The project is expected to have minimal impact on the surrounding roadways and the study intersections and Rockwood Road has the capacity to accommodate the project.
- The analysis showed that site traffic will be able to enter and exit the site safely and efficiently with short delays.
- There are 108 total proposed parking spaces on-site, including 44 garage spaces, 48 general spaces intended for visitors, and 16 driveway spaces. This exceeds local requirements of 54

spaces for on-site parking and is expected to be more than adequate to accommodate all residents and visitors.

The analysis showed the proposed project could be accommodated by the study area with the existing transportation infrastructure. However, the following actions are suggested to enhance the transportation infrastructure and to encourage alternative modes of transportation:

- Along the west side of Rockwood Road, it is recommended that if the available public right-of-way (ROW) exists, to construct approximately 220 feet of sidewalk south of the proposed project site driveway to connect with the existing sidewalk on the west side of Rockwood Road that ends at Ware Drive.
- In order to maintain available sight distances, existing vegetation will need to be cleared and any proposed landscaping at the site driveway intersection with Rockwood Road should be low lying and set back.
- The site drive eastbound approach should be placed under STOP control at its intersection with Rockwood Road.
- Parking should be prohibited along the Site Drive to facilitate smooth circulation. The number of marked parking spaces is more than adequate to accommodate the anticipated demand.
- A Reduced Speed Limit Ahead sign (W3-5) is recommended to be installed approximately 100 feet in advance of the southbound reduction in the posted speed limit from 35 mph to 25 mph in the vicinity of the project site.
- Consider installing an intersection warning sign (W2-1) on the northbound and southbound Rockwood Road approaches to the intersection with Boardman Street to warn Rockwood Road drivers of the potential for conflicting vehicles.
- Consider installing pedestrian crossing signage (W11-2 and W16-7P) facing each direction of Rockwood Road traffic at the marked crosswalks that exist on Boardman Street, approximately 720 feet south of Boardman Street, and at Ware Drive.
- All existing and proposed signs agreed to by the Town should be maintained appropriately including periodic trimming of vegetation to avoid any blockage of sign legends.

# 2.0 EXISTING CONDITIONS

The following sections describe the existing transportation system in terms of physical and operational characteristics. The selection of the study area took into account the location and type of project and focused on the evaluation of the roadways and intersections in the vicinity of the site that will potentially be impacted by the proposed residential development project.

## 2.1 Existing Roadway Network

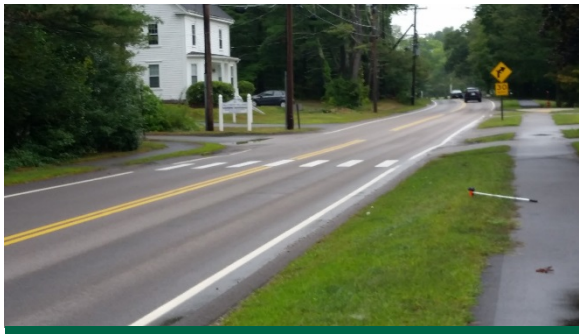
The study focused on the roadway network in the vicinity of the proposed project with an emphasis on the following three intersections:

- Rockwood Road at Boardman Street
- Rockwood Road at Ware Drive
- Rockwood Road/Union Street at Main Street

As part of this study, a field reconnaissance was conducted to verify the current physical and operational features in the study area. A description of the study roadways and intersections follows:

### 2.1.1 Rockwood Road (Route 115)

Rockwood Road (Route 115) in Norfolk is a state-numbered minor arterial roadway that falls under the jurisdiction of the Town. Rockwood Road generally runs in a north-south direction and connects with Main Street at its southern terminus and continues north into the Town of Millis. Regionally, Route 115 provides connections to Millis and Route 109 to the north and Foxborough, and Route 1 to the south.



*Rockwood Road near proposed site driveway, looking north*

In the vicinity of the project site, the posted speed limit along Rockwood Road is 35 mph north of the site driveway location and becomes 25 mph south of a point 80 feet north of the site driveway location. There is a railroad grade crossing with bells, lights, and gates activating when trains pass located approximately 280 feet south of the proposed site driveway location and immediately south of the intersection with Ware Drive. A curve and cross street warning sign with a 30 mph plaque is provided in both directions of Rockwood Road approaching Boardman Street. Street signs in the area are white posts with black lettering written vertically. Rockwood Road generally provides one 12 ft wide travel lane in each direction and a 1-2 ft shoulder on each side of the road. There is a 5 ft wide grass strip along the east side of Rockwood Road north of the railroad tracks and a 5 ft wide asphalt sidewalk in good condition. There is no sidewalk on the west side of Rockwood Road in the vicinity of the project site. Marked crosswalks across Rockwood Road are provided


*Rockwood Road north of proposed site driveway, looking south*

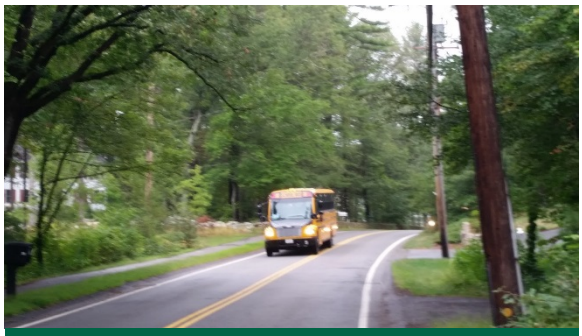
immediately south of Ware Drive, approximately 780 feet north of the grade crossing, and across the north leg at Boardman Street. In-street pedestrian warning signs are occasionally placed at the crosswalk at across the north leg at Boardman Street. Granite curb is present on both sides of Rockwood Road in the immediate vicinity of the Boardman Street intersection, Ware Drive intersection, and the Main Street roundabout, with Cape Cod berm elsewhere along Rockwood Road. Curb ramps at the marked crosswalks at Boardman Street and 780 feet north of the grade crossing are asphalt and in good condition, while curb ramps at Ware Drive and at Main Street are cement concrete in good condition.

The Freeman-Kennedy School is located on the east side of Rockwood Road. Although the primary school driveway connects with Boardman Street, a secondary access driveway for the school is located on the east side of Rockwood Road, approximately 700 ft north of the proposed project site driveway. A senior housing complex, Hillcrest Village, is located on the west side of Rockwood Road approximately 560 ft north of the proposed site driveway.

The project is located in close proximity to the Town Center and other key non-residential land uses including Town Hall, the library and many shops. In addition, the MBTA Commuter Rail Norfolk station on the Franklin line is located in the center within less than 400 feet of the proposed development. When trains approach or are at a stop, the safety gates across Rockwood Road were observed to be down for approximately four (4) minutes, with southbound queues reaching approximately the proposed site driveway location. Railroad crossing warning signage with plaques acknowledging that no horn is sounded are provided facing each direction of Rockwood Road. Section 2.4 specifically discusses the existing public transit system.

### 2.1.2 Boardman Street

Boardman Street is a two-way east/west roadway connecting Seekonk Street in the east with Main Street to the west. A 5 ft wide asphalt sidewalk in good condition is provided along the north side of Boardman Street separated from the roadway by a 2 ft wide grass buffer and an asphalt berm. One 11 ft wide travel lane is provided for each direction with approximately 1-2 ft wide shoulders. A proposed emergency access driveway will provide access to Boardman Street approximately 800 ft west of Rockwood Road and across from Medway Branch Road. There is no posted speed limit on Boardman Street in the vicinity of the project site drive. The Freeman-Kennedy School is located south of Boardman Street, with the primary school driveway approximately 1,700 ft east of Rockwood Road.



*Boardman Street, looking east near Medway Branch Road*

### 2.1.3 Main Street at Union Street/Rockwood Road (Route 115)


*Main Street at Rockwood Road, looking east*

Rockwood Road and Union Street are both minor arterial roadways that are owned and maintained by the Town of Norfolk. Main Street intersects Union Street and Rockwood Road at a roundabout. The roundabout was constructed in the early 2000's. Rockwood Road forms the northern leg of the intersection while Union Street is the southern leg. Main Street provides the east and west legs. The roundabout has an outside diameter of 100 ft and an inside diameter of 50 ft. There is also a 10 foot wide pavement stone mountable apron with an inside diameter of 30 feet. The roundabout has 10 foot wide crosswalks on each leg with pedestrian refuge islands. Each leg of the roundabout has signs warning drivers of the presence of the circular intersection and a 15 mph advisory speed limit sign approximately 250 feet prior to the roundabout. There is also a "yield ahead" sign and yield line pavement markings at each approach to the roundabout. At the northeast corner of the intersection, there is a gas station with a driveway approximately 35 feet from the intersection. North of the intersection is the Norfolk MBTA Commuter Rail Norfolk station.

### 2.1.4 Rockwood Road (Route 115) at Ware Drive

Ware Drive intersects Rockwood Road approximately 60 ft north of the railroad tracks at an unsignalized T-intersection. Rockwood Road forms the north and south legs with Ware Drive providing the east leg. Opposite Ware Drive is a residential driveway. The Ware Drive approach is under STOP sign control, while Rockwood Road operates freely (provided the railroad gates are up). There is no posted speed limit and no striping provided on Ware Drive. A warning sign facing westbound Ware Drive approaching Rockwood Road identifies the railroad crossing immediately south of the intersection on Rockwood Road. Ware Drive provides access to single-family homes. There is no through connection from Ware Drive.


*Ware Drive approaching Rockwood Road, looking west*

*Rockwood Road approaching Ware Drive, looking south*

### 2.1.5 Rockwood Road (Route 115) at Boardman Street

Boardman Street intersects Rockwood Road at a four-way unsignalized T-intersection. Boardman Street forms the east and west legs, both of which are under STOP sign control. Rockwood Road forms the north and south legs and flows freely. Crosswalks are provided across the north leg of Rockwood Road and the east leg of Boardman Street. An in-street pedestrian crossing sign is present on Rockwood Road.

*Boardman Street approaching Rockwood Road, looking east*

*Rockwood Road at Boardman Street, looking south*

## 2.2 Traffic Volumes

As part of this study, new traffic volume data were collected and used with historic data, to form the basis of the traffic analysis. The new data were collected on September 7-8, 2016 and consisted of weekday peak period (7:00-9:00 AM and 4:00-6:00 PM) manual turning movement counts (TMC) at the intersection of Rockwood Road and Ware Drive and the intersection of Rockwood Road and Boardman Street. The turning movement count data at the Main Street/Rockwood Road roundabout were collected on April 29, 2014, as part of a previous study[1]. The data at the roundabout were then adjusted upward by 1 percent annually to account for possible traffic growth since 2014. The count program also included a 48 hour Automatic Traffic Recorder (ATR) vehicle count on Rockwood Road from September 7 to September 8, 2016, 425 feet north of the proposed site driveway. The complete TMC and ATR data are included in the Appendix.

Table 2.1 summarizes the ATR data. The average weekday traffic on Rockwood Road is 8,891 vehicles per day (vpd), with 8.9 % occurring during the morning peak hour and 9.7 % occurring during the afternoon peak hour. The directional distribution of traffic on Rockwood Road is approximately 50% NB / 50% SB during both weekday morning and afternoon peak periods, and on a daily basis.

[1]Green International Affiliates, Inc. Boyde's Crossing Traffic Impact and Access Study, Norfolk, MA, April 2015.

*Table 2.1 –Summary of Rockwood Road Traffic Volumes*

| | WEEKDAY AVERAGE | AM PEAK HOUR | PM PEAK HOUR |
|---|---|---|---|
| Time Period | Daily | 7:00-8:00 | 5:00-6:00 |
| Traffic Volume[1] | 8,890 vpd | 790 vph | 860 vph |
| K-Factor[2] | - | 8.9% | 9.7% |
| Directional Distribution | 51.4% NB | 50.3% SB | 51.1% NB |
| Average Speed | 32 MPH NB / 33 MPH SB | | |
| 85th %-ile Speed | 37 MPH NB /37 MPH SB | | |

[1] vpd = volume per day, vph = volume per hour, volumes are rounded, based on ATR data (Sept. 7-8, 2016)
[2] percent of daily traffic that occurs during the peak hour

To develop the estimated average or typical volume conditions for analysis purposes, permanent traffic count station data maintained by the Massachusetts Department of Transportation (MassDOT) were reviewed. This review determined the seasonal variation of traffic flow on roadways in the general region and serves as the basis of any appropriate seasonal adjustments. The count station used to observe seasonal data was Station 6189 located on Interstate 95/Route 128 in Dedham north of Route 109. Although this permanent count station data is not representative of the study roadways herein, it does provide general seasonal variation characteristics within eastern Massachusetts. MassDOT does not maintain a permanent count station in closer proximity to the project site that could provide better seasonal variation data. The permanent count station data indicated that September average daily traffic volumes tended to be approximately 2.2% above annual average daily volumes. However, for a conservative analysis, observed traffic volumes were used as recorded and not adjusted downward. Figures 2 and 3 illustrate the 2016 existing weekday morning and afternoon peak hour traffic volumes, respectively.

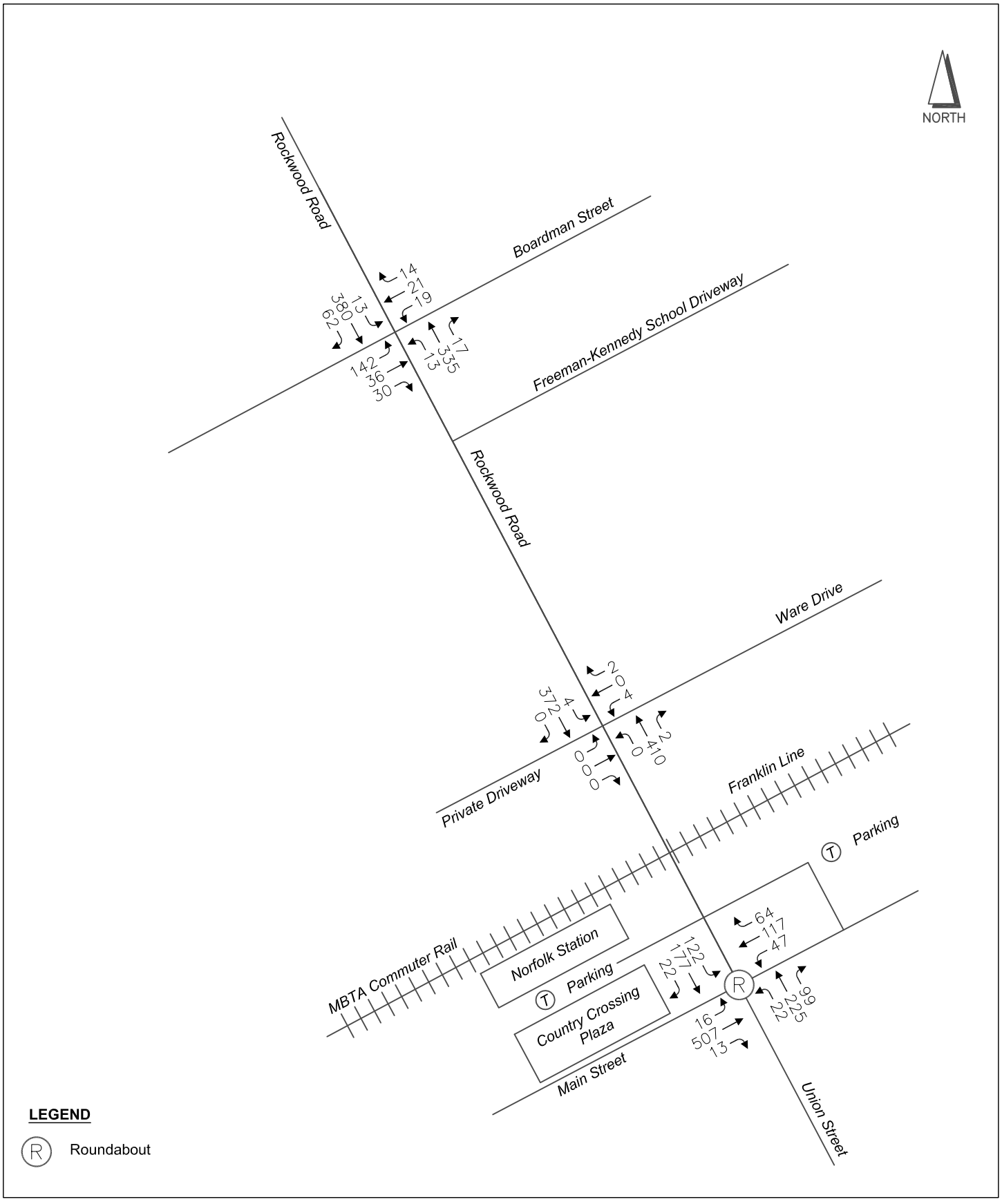



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**Figure 2**
**2016 Existing Traffic Volumes**
**Weekday Morning Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

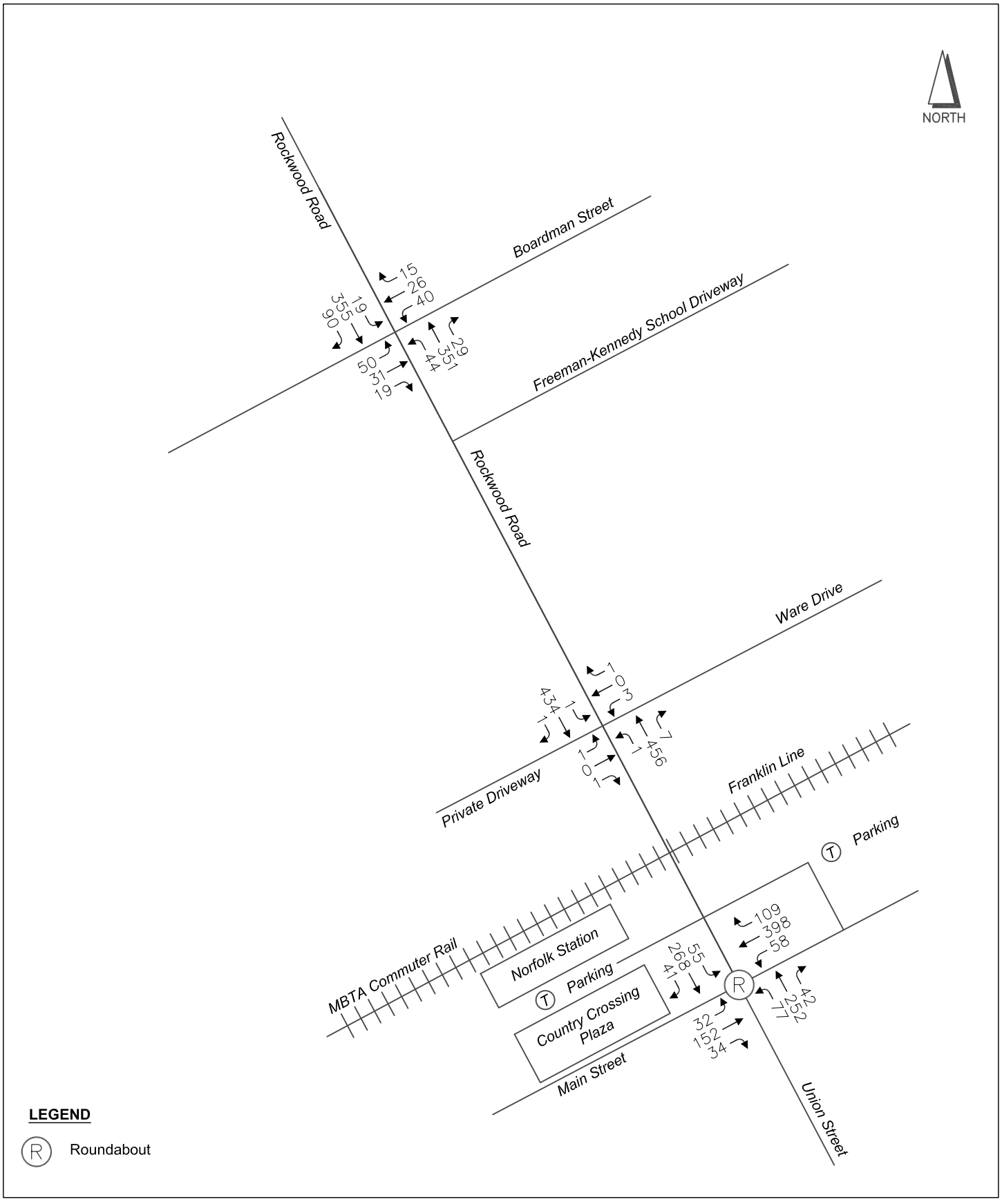


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**Figure 3**
**2016 Existing Traffic Volumes**
**Weekday Afternoon Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

## 2.3 Crash Experience

The crash history of the study intersections for the most recent three-year period available (2012-2014) was reviewed as part of the traffic impact & access study. Crash data presented in this report were obtained from the MassDOT Crash Record System (CRS). Table 2.2 summarizes the recent crash data. It should be noted that there were no reported crashes during the three-period examined at the intersection of Rockwood Road / Ware Drive.

The other two study intersections including the roundabout are averaging less than five reported crashes per year. Only one crash was reported as a personal injury crash with the others reported as property damage only.

Some of the relevant findings from reviewing the data have been noted below.

- At the intersection of Rockwood Road at Boardman Street, the crash rate was below the MassDOT District 5 average crash rate, while at the roundabout at Rockwood Road and Main Street, the crash rate was higher than the district average, although slightly less than five crashes per year.
- At the roundabout at Rockwood Road/Union Street and Main Street, all of the crashes involved property damage only.

As part of this safety review, the "crash rate", measured in crashes per million entering vehicles (MEV) for the study intersections was also determined. The standard MassDOT Crash Rate Worksheet was used to determine the crash rate at each location. The calculation of the crash rate relates the number of accidents at a location to the amount of traffic that passes through the location. It is a more comprehensive measure for identifying potentially hazardous locations compared to simple averages as it takes into account volume, although crash rates can skew higher due to low volumes. The calculated rate is compared to the MassDOT District-wide averages. Intersections experiencing crash rates greater than the above averages are potentially experiencing an unusually high number or higher than expected number of crashes relative to traffic volumes at that particular location and may warrant further investigation or improvements. MassDOT District 5, which includes the Town of Norfolk, has an average crash rate of 0.58 crashes per MEV for unsignalized intersections. It should be noted that typically roundabouts have lower severity crashes than stop controlled intersections due to low circulating speeds. The crash rate worksheets for each study intersection are included in the Appendix.

In conclusion, the crash data showed that there are no extraordinary safety issues at the intersections surrounding the project location.

*Table 2.2 – Summary of Reported Crash Data*

| | Rockwood Road at Boardman Street | | | Rockwood Road at Main Street | | |
|---|---|---|---|---|---|---|
| | 2012 | 2013 | 2014 | 2012 | 2013 | 2014 |
| ***Severity*** | | | | | | |
| Property Damage | 3 | | 2 | 2 | 5 | 5 |
| Injury | | | 1 | | | |
| Fatality | | | | | | |
| Unknown | | | | 1 | | 1 |
| ***Collision Type*** | | | | | | |
| Rear End | | | | 1 | 1 | 1 |
| Angle | 2 | | 2 | | 3 | 1 |
| Side Swipe | | | | 1 | 1 | 1 |
| Head On | | | | | | |
| Single Vehicle | 1 | | 1 | 1 | | 2 |
| Collision with Ped | | | | | | |
| Collision with Bike | | | | | | |
| Other/Unknown | | | | | | 1 |
| ***Time of Day*** | | | | | | |
| 6:01 AM – 10:00 AM | 2 | | 2 | | | 1 |
| 10:01 AM – 4:00 PM | 1 | | 1 | | 3 | 2 |
| 4:01 PM – 7:00 PM | | | | | 2 | 2 |
| 7:01 PM – 6:00 AM | | | | 3 | | 1 |
| ***Roadway Conditions*** | | | | | | |
| Dry | 1 | | 3 | | 5 | 6 |
| Wet | 2 | | | 3 | | |
| Snow/Ice | | | | | | |
| Other/Unknown | | | | | | |
| ***Season*** | | | | | | |
| Dec-Feb | 1 | | 1 | 1 | | |
| Mar-May | 1 | | | 1 | | |
| June-Aug | | | 1 | 1 | 2 | 3 |
| Sept-Nov | 1 | | 1 | | 3 | 3 |
| ***Light Conditions*** | | | | | | |
| Daylight | 2 | | 3 | | 3 | 5 |
| Dawn/Dusk | | | | 1 | 1 | |
| Dark (Unlit) | | | | | | |
| Dark (Lit) | 1 | | | 2 | 1 | 1 |
| Unknown | | | | | | |
| ***Totals*** | ***3*** | ***0*** | ***3*** | ***3*** | ***5*** | ***6*** |
| Annual Average Crashes | 2.00 | | | 4.67 | | |
| ***Intersection Crash Rate*** | ***0.45*** | | | ***0.83*** | | |
| MassDOT District 5 Average Crash Rate | 0.58 | | | 0.58 | | |

## 2.4 Existing Public Transit Network

The MBTA Commuter Rail Franklin line runs approximately 300 feet north of the intersection of Main Street and Rockwood Road and less than 400 feet south of the proposed site driveway. The Norfolk commuter rail station is located on the western side of Rockwood Road. The train runs approximately every half hour during the morning and evening peak periods. The train provides access to South Station in

Boston in about 50 minutes, and is a popular option for those who commute into Boston for work. The parking lot for the commuter rail station is on both sides of Rockwood Road north of the roundabout. The platform where passengers board the train is on the west side of Rockwood Road. An eight (8) foot wide crosswalk across Rockwood Road is located approximately 200 feet north of the intersection with Main Street, and is used by pedestrians who park in the lot on the eastern side of Rockwood Road to access the commuter rail station. The expected walking route from the edge of the driveway of the project site to the MBTA station is approximately 300 feet, or approximately a 2-3 minute walk via Rockwood Road. Bicycle parking is provided at the Norfolk MBTA Station.

During weekday peak periods, the departure times of inbound trains toward Boston are 5:08am, 5:44am, 6:19am, 6:49am, 7:22am, and 7:58am, while the departure time of outbound trains leaving Boston toward Franklin are 4:34pm, 5:33pm, 6:07pm, 6:35pm, and 7:34pm. When the train arrives, a safety gate lowers for approximately four (4) minutes and stops northbound and southbound traffic on Rockwood Road.

# 3.0 PROBABLE IMPACTS OF THE PROJECT

The potential impact of the proposed development project on the roadway network within the study area was evaluated and the results are described in this section. For this study, the year 2023 was selected for the future build out analysis. This allows for a 2 year permitting-construction start and a 5 year build out/full occupancy timeframe, and is consistent with current guidelines from MassDOT.

## 3.1 No-Build Traffic Volumes

The future year 2023 No-Build traffic volume networks were developed with the application of a background growth rate. Other site-specific planned development projects that could generate additional traffic flow within the study network were identified.

### 3.1.1 Background Traffic Growth

In order to determine an appropriate annual background growth rate, traffic growth and historical count trends in regard to traffic volumes across the commonwealth have been reviewed. Based upon review of local count stations, an annual growth rate of one percent (1%) per year for seven years was used to forecast future traffic volumes. Several MassDOT count stations in the larger region surrounding Norfolk were used in our analysis to gain an understanding of the regional growth rates. The one percent background rates would presumably account for some of the more remote growth in the region as well as potential nearby smaller residential and business growth that could result in added traffic through the study area. The MassDOT count station data are contained in the Appendix.

### 3.1.2 Site-Specific Developments

In addition to the general background growth rate, research on other specific development projects in the vicinity of the project was completed. The previously referenced Boyde's Crossing residential development project located on Main Street east of Rockwood Road in Norfolk was recently approved and is under construction. Consequently, peak hour vehicle trips, as shown in the Boyde's Crossing Traffic Impact and Access Study, were added to the roadway networks and included in the 2023 Future No-Build peak hour traffic volume networks.

### 3.1.3 No-Build Traffic Volumes

Consequently, the 2023 No-Build traffic volumes were estimated by applying a 1% annual background traffic growth rate for seven (7) years to the existing traffic volumes in the study area as well as adding in the estimated traffic from Boyde' Crossing. The estimated year 2023 No-Build traffic volumes projected for the weekday morning and evening peak hours are shown in Figures 4 and 5, respectively.

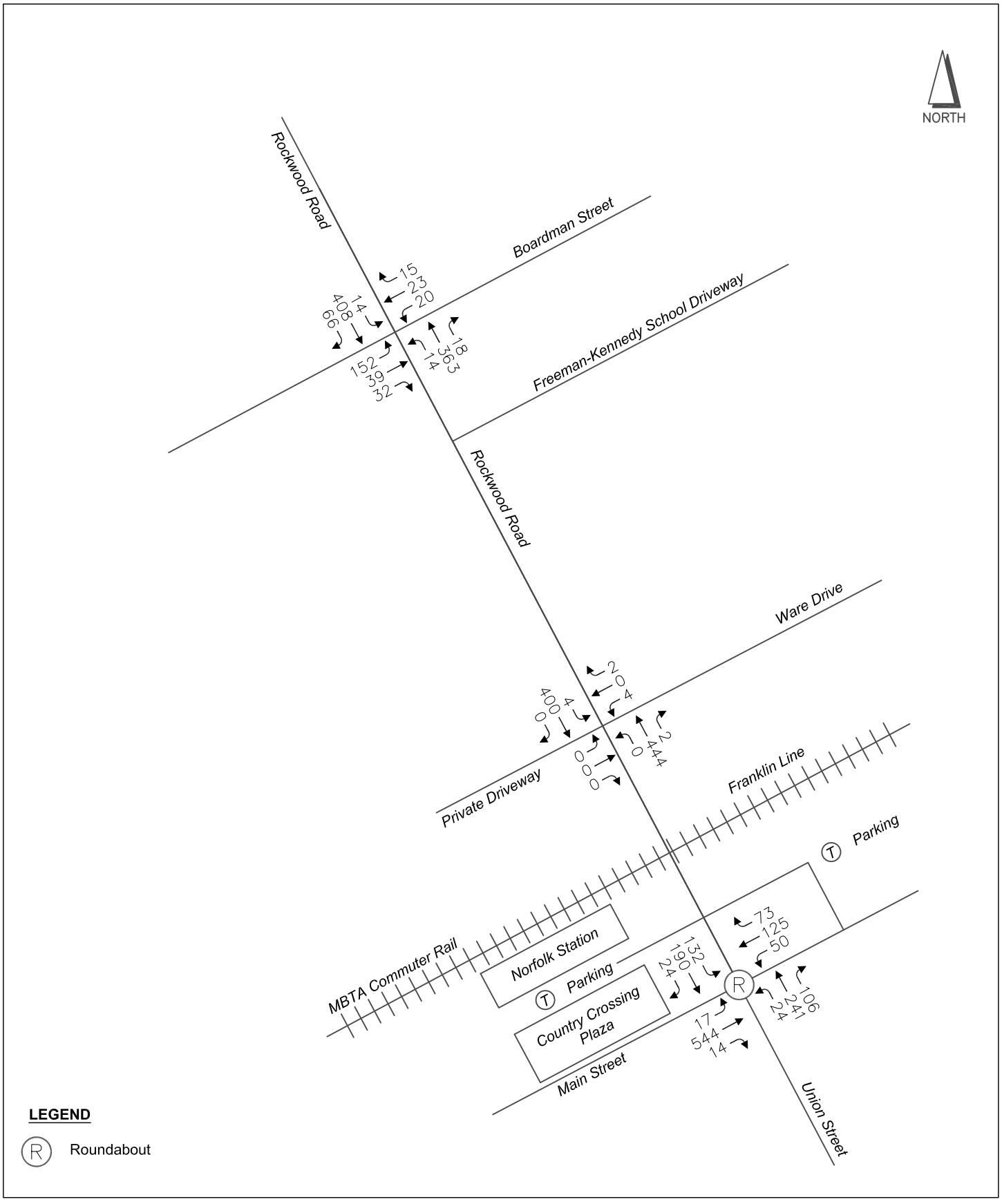


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**Figure 4**
**2023 No Build Traffic Volumes**
**Weekday Morning Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

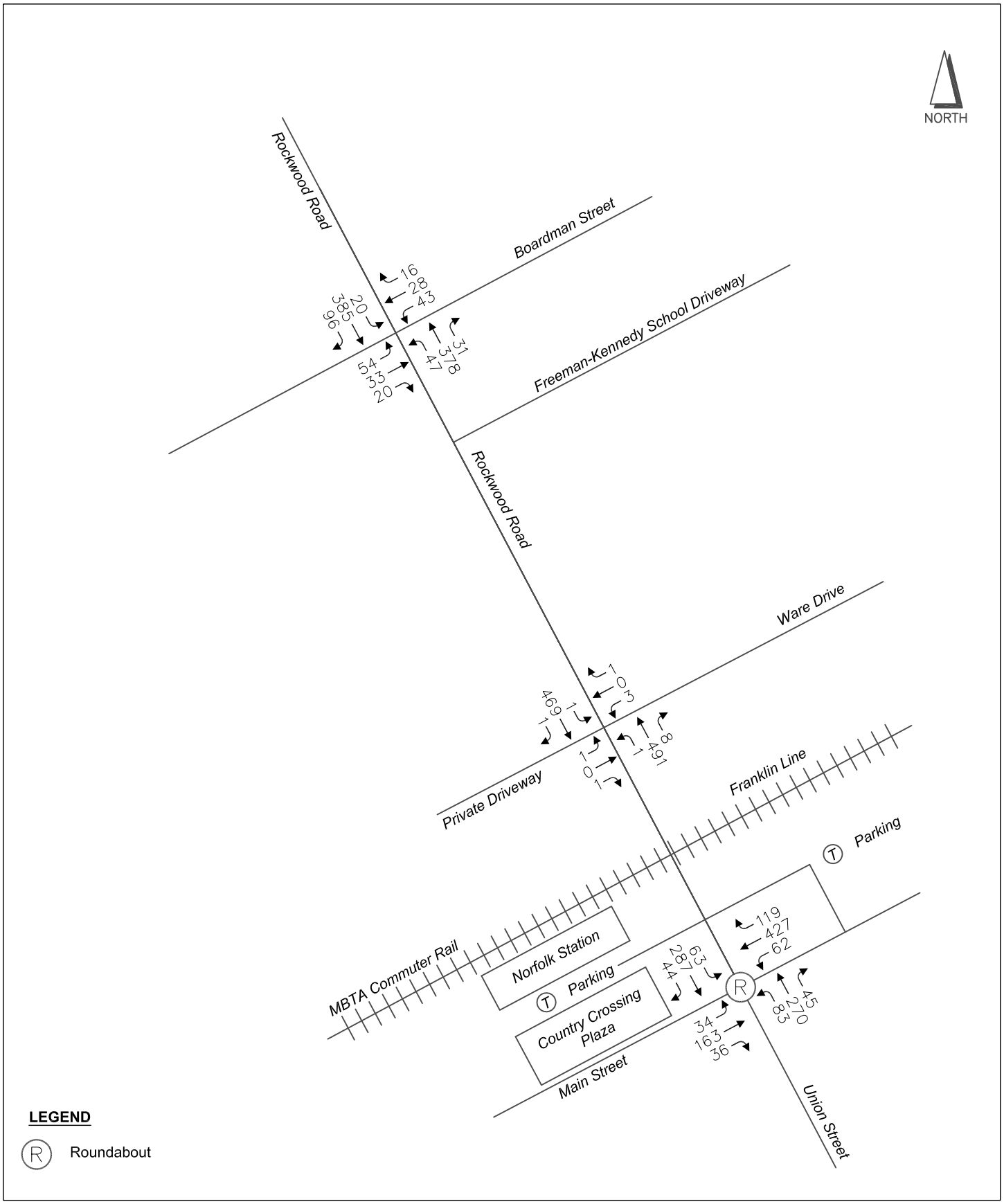


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**Figure 5**
**2023 No Build Traffic Volumes**
**Weekday Afternoon Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

## 3.2 Proposed Project Description

The proposed project at 25 Rockwood Road consists of 36 residential town houses, with 18 two-bedroom units and 18 three-bedroom units. A total of 108 parking spaces will be provided. This is to include 44 garage spaces, 16 driveway spaces, and 48 general spaces. The site driveway will be located on the west side of Rockwood Road approximately 280 feet north of the railroad crossing and approximately 1,220 feet south of the Boardman Street intersection. Emergency access will be provided onto Boardman Street approximately opposite Medway Branch Road, 800 feet west of Rockwood Road, pending an agreement with the Town of Norfolk to use land owned by the Town for the emergency vehicle access road.

The characteristics of the proposed project were compared to the existing housing supply in the Town of Norfolk to gain insight into the travel patterns that could be expected at the project site. The proposed townhouses will have an average of 2.5 bedrooms per unit. This is well below the existing average of 3.4 bedrooms per unit for all the residences in Norfolk.[2] As a result of the smaller units being proposed (relative to existing housing in Norfolk) and the proximity of the commuter rail station, it is likely that the proposed project will generate fewer new vehicle-trips than might otherwise be expected.

## 3.3 Site Generated Traffic Volumes

In this section, an estimate of traffic to be generated by the proposed project was completed, assigned to roadways/intersections within the study area, and added to the No-Build traffic volume network to develop the Build traffic volume networks.

### 3.3.1 Site Trip Generation

In order to estimate the number of trips that could be generated by the proposed residential development project, statistics published by the Institute of Transportation Engineers (ITE) in Trip Generation Manual for similar land uses were examined. The ITE trip generation statistics represent compilations of data from studies/projects throughout the United States collected over the past 30+ years on trip generation characteristics for different types of land uses. The data has been compiled to provide transportation analysts with guidelines in forecasting daily and peak hour volumes for the specified use.

The ITE report is based on observations of actual developments but in general, represent developments in suburban and rural settings with little or no transit or other modes available. Therefore, developments that are located near transit facilities and in village centers where walking is a viable travel mode are not reflected in the ITE models' trip generation rates. The proposed development is ideally situated to encourage the use of commuter rail as well as walking to and from the nearby land uses. The town center, including many shops, the library, and the town hall, can attract many trips over the course of a day. This could have an effect on reducing not only peak hour vehicle trips but also vehicle trips made over the course of the entire day.

In addition to proximity to the town center, the project is located within walking distance from the MBTA commuter rail station; it can be assumed that some percentage of the vehicle trips will be reduced based on the proximity. According to historical census work trip information, 7.9% of Norfolk residents use public transportation to commute to work. Since there is no bus service in Norfolk, it can be assumed that that

[2] *Based on data from the U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates. Relevant data are included in the appendix.*

same percentage uses the commuter rail. Given the close proximity of the project site to the Norfolk commuter rail station and the short walk, it is reasonable to assume that the percentage of public transportation trips could be higher at the proposed development project relative to the Town of Norfolk as a whole. Assuming all peak hour trips are work trips, a conservative 7.9% reduction for public transportation was applied. Additional walk trips to the nearby land uses is also likely but difficult to predict.

The 7.9% factor was also applied to the weekday 24-hour total although the reduction in vehicle trips could be greater during the non-peak time given the project's walkable proximity to the uses in the center.

Based on a review of the ITE Trip Generation Manual[3], Land Use Code (LUC) 230 – Residential Condominium/Townhouse was selected for the proposed 36 dwelling units. This land use most closely matches the residential units being proposed. The total weekday and peak hour estimated trips generated by the proposed project are summarized in Table 3.1. Detailed trip generation calculations for the proposed use are included in the Appendix.

***Table 3.1 – Summary of Site Trip Generation***

| | AM Peak Hour | | | PM Peak Hour | | | Weekday Daily | | |
|---|---|---|---|---|---|---|---|---|---|
| | Enter | Exit | Total | Enter | Exit | Total | Enter | Exit | Total |
| Total Trips | 4 | 19 | 23 | 17 | 9 | 26 | 132 | 132 | 264 |
| Reduction for Public Transportation | 0 | -2 | -2 | -1 | -1 | -2 | -10 | -10 | -20 |
| **Net New Vehicle Trips** | **4** | **17** | **21** | **16** | **8** | **24** | **122** | **122** | **244** |

Source: ITE Trip Generation 9th Edition, LUC 230

As shown in Table 3.1, based on the ITE LUC 230 model, and after applying the trip deduction for public transportation use, the proposed project is expected to generate a total of approximately 244 vehicle trips over the course of an average weekday including 122 entering trips and 122 exiting trips. The weekday morning peak hour is expected to generate approximately 21 total trips with 4 entering and 17 exiting the project site, and the weekday afternoon peak hour is expected to generate approximately 24 total trips with 16 entering and 8 exiting trips.

### 3.3.2 Site Trip Distribution/Assignment

The vehicle trips generated by the proposed project were then distributed onto the roadway network to develop the future build peak hour traffic volumes. Directional distribution of generated trips to and from the site is expected to follow existing traffic patterns which, in turn, are a function of regional population densities, shopping opportunities, areas of employment, and recreational activities. Journey to Work data from the American Community Survey were reviewed. Journey to work data identify the proportion of residents of a particular community that work in each municipality. This information was used to identify which routes residents of the proposed development project are most likely to use. These data generally confirm the accuracy of the trip distribution calculated using the ATR data. Figure 6 shows the trip distribution percentages used in the analysis.

[3] Institute of Transportation Engineers (ITE), Trip Generation Manual, Washington, D.C., 9th Edition, 2012.

### 3.3.3 Build Traffic Volumes

The vehicle trips estimated for the proposed development project were assigned to the study intersections and the study area roadways using the trip distribution percentages discussed above. Figures 7 and 8 show the additional traffic during the morning and afternoon peak hours due to the proposed project, respectively. The peak hour site traffic volumes were then added to future No-Build traffic volumes in order to establish the 2023 Build condition traffic volume networks. Figures 9 and 10 present the Build traffic volumes for the weekday morning and afternoon peak hours, respectively.

### 3.3.4 Estimated Peak Parking Demands

A review of the project related parking was completed. Based on the Town of Norfolk Bylaws, Section F.7.b.1.a, a minimum of 1.5 parking spaces per unit are required to accommodate residents and guests. Therefore, at least 54 parking spaces must be provided in the proposed residential development project. The proposed 108 parking spaces exceed this requirement.

In order to estimate peak parking demands, the ITE Parking Generation[4] manual was used. This manual, similar to the Trip Generation manual, is based on 30+ years of data gathered during peak parking periods in mostly suburban areas with free parking. The data is separated by land use, for this project Land Use Code (LUC) 230 – Residential Condominium/Townhouse was used. Based on the ITE Parking Generation data, a peak parking demand of 55 vehicles is to be expected. The anticipated peak parking demand closely matches the number of on-site parking spaces required by the Norfolk Zoning Bylaws. The 108 total parking spaces that are proposed on-site are expected to be more than adequate to accommodate all residents and visitors.

[4] Institute of Transportation Engineers (ITE), Parking Generation, Washington, D.C., 4th Edition, 2012.

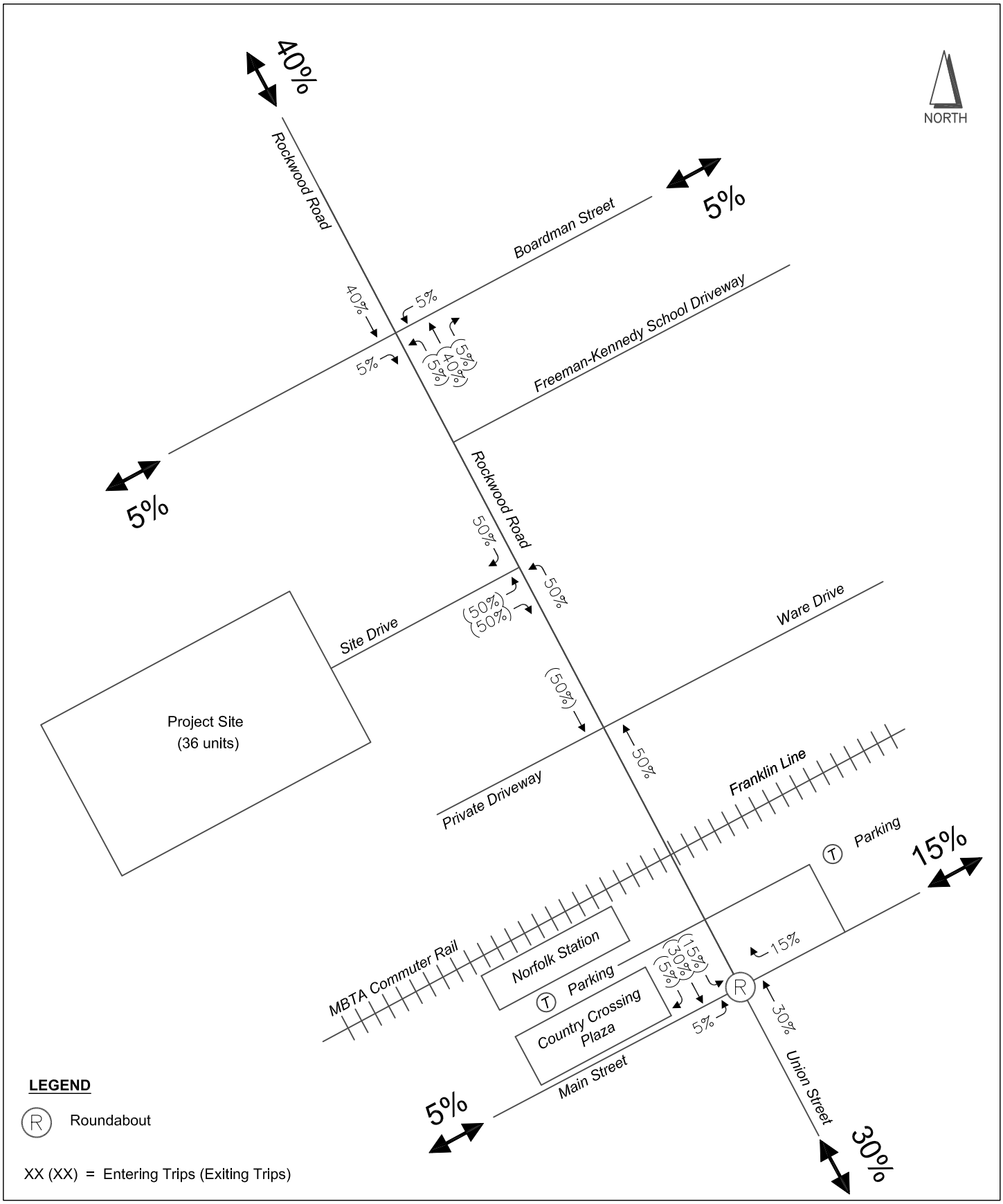


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**Figure 6**
**Estimated Trip Distribution**
**25 Rockwood Road**
**Norfolk, MA**

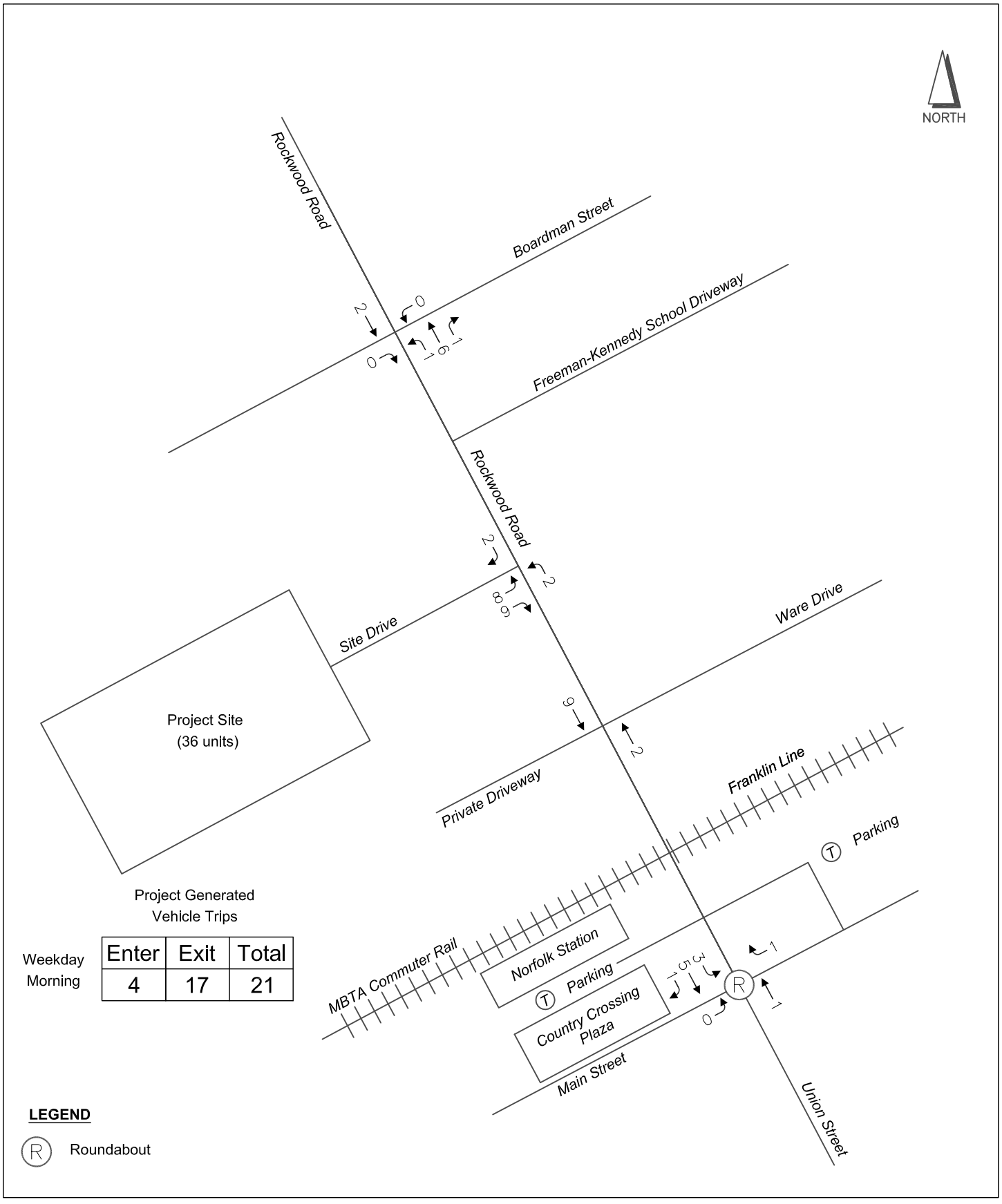


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**Figure 7**
**Site-Generated Vehicle Trips**
**Weekday Morning Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

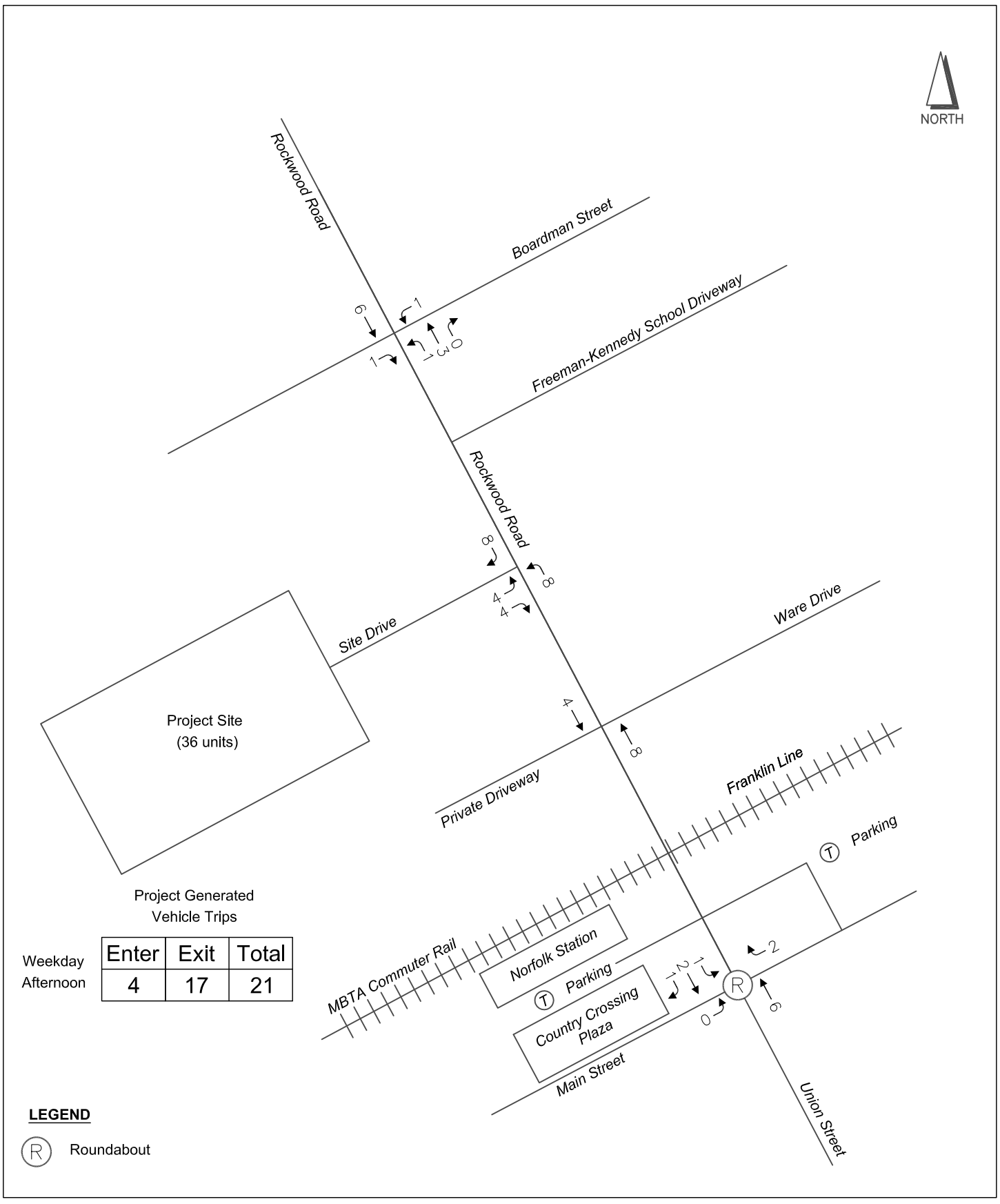


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**Figure 8**
**Site-Generated Vehicle Trips**
**Weekday Afternoon Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

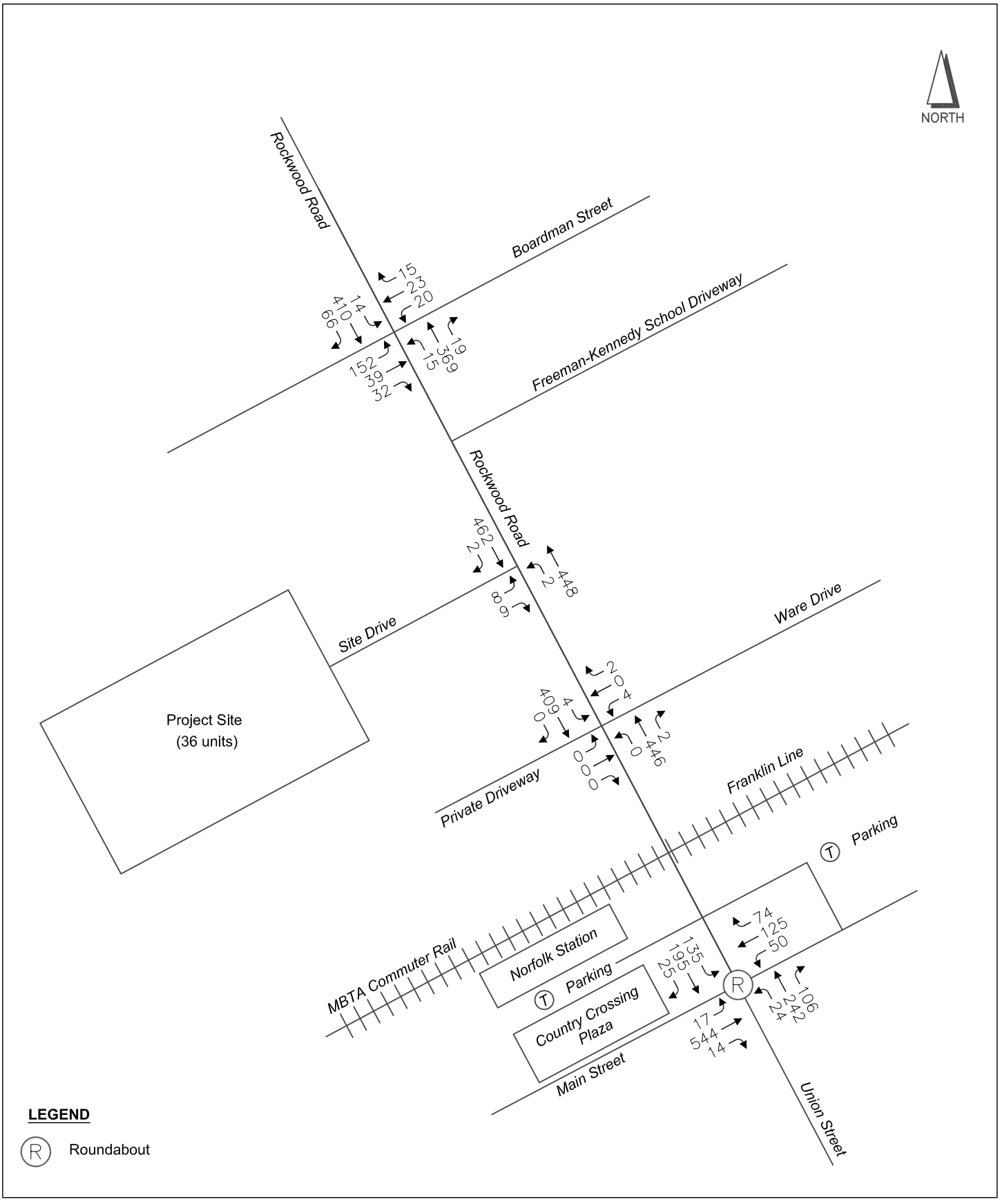


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**Figure 9**
**2023 Build Traffic Volumes**
**Weekday Morning Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

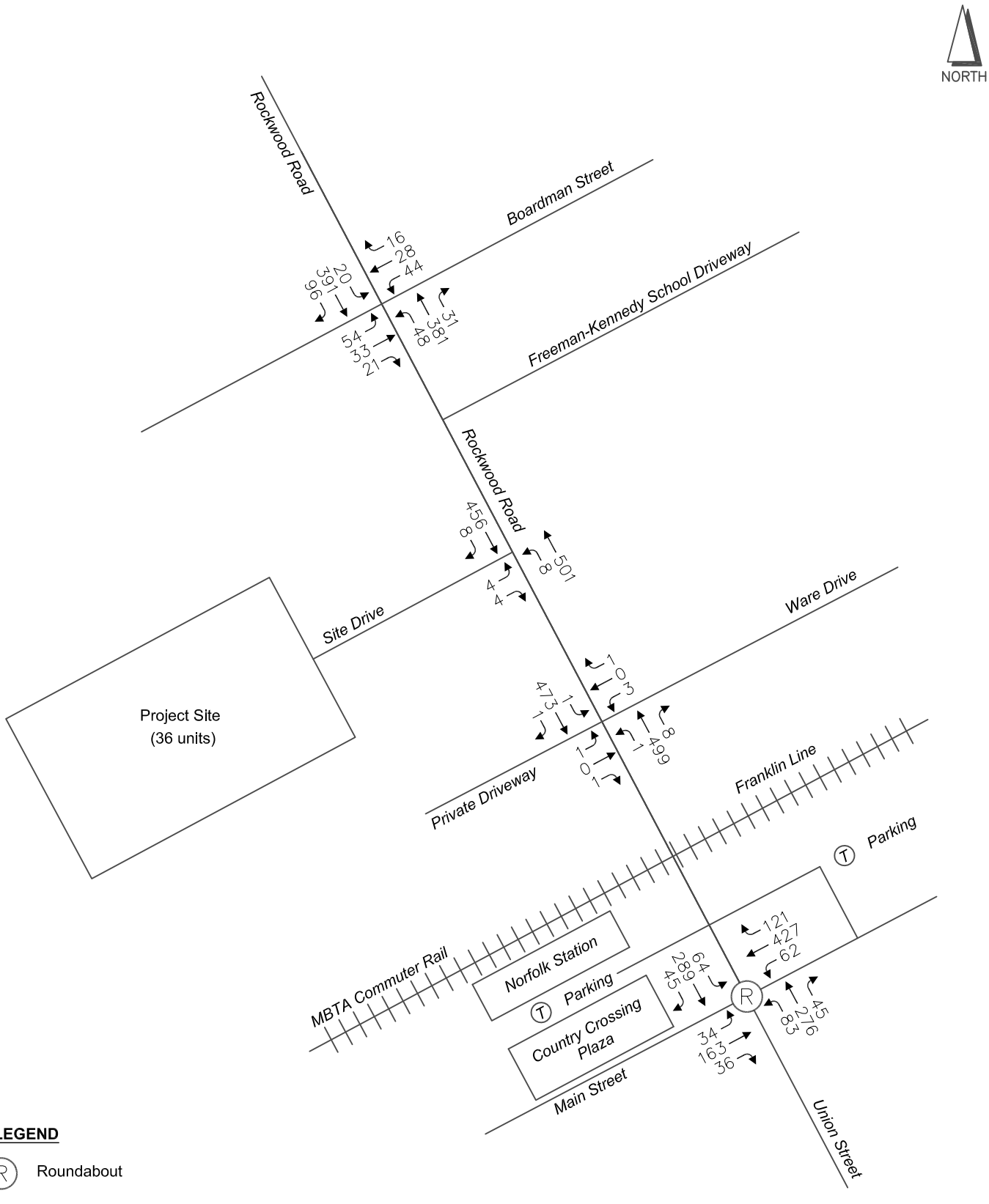


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**Figure 10**
**2023 Build Traffic Volumes**
**Weekday Afternoon Peak Hour**
**25 Rockwood Road**
**Norfolk, MA**

# 4.0 ANALYSIS

Previous sections of this report described the current conditions of the study intersections and the development of the 2023 No-Build and 2023 Build future traffic volume projections, including the site generated trip forecasts. Included in this section is an examination of the volume changes, and an intersection capacity/Level of Service (LOS) analysis for the study intersections under each condition.

## 4.1 Traffic Volume Increases

A comparison of No-Build and Build volumes on the surrounding roadway system was completed. As discussed in Section 3.3 of this report, the project is expected to generate 21 vehicle trips during the weekday morning peak hour and 24 vehicle trips during the weekday evening peak hour. The study roadway and intersections are expected to experience a modest increase in traffic volumes. Table 4.1 summarizes the volume changes from No-Build to Full-Build on each of the study roadways.

***Table 4.1 – Summary of Estimated Roadway Traffic Increases***

| | AM Peak Hour | | | | PM Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|
| | 2023 No Build | 2023 Build | Increase | % Increase | 2023 No Build | 2023 Build | Increase | % Increase |
| **Rockwood Road** | | | | | | | | |
| North of the project | 850 | 860 | 10 | 1.2% | 898 | 910 | 12 | 1.3% |
| South of the project | 845 | 856 | 11 | 1.3% | 958 | 970 | 12 | 1.3% |
| **Boardman Street** | | | | | | | | |
| West of Rockwood Rd | 103 | 104 | 1 | 1.0% | 171 | 172 | 1 | 0.6% |
| East of Rockwood Rd | 71 | 72 | 1 | 1.4% | 84 | 85 | 1 | 1.2% |

As indicated in Table 4.1, there is a relatively low increase in traffic volume on each of the study roads due to the proposed project. Compared to the expected No Build traffic volumes, the increase on any roadway segment is less than 1.5%, and is less than the normal daily variation of traffic on Rockwood Road.

## 4.2 Intersection Capacity Analysis

The three study intersections were examined with regard to flow rates, capacity, and delay characteristics to determine the Level of Service (LOS), as described in the Highway Capacity Manual (HCM), for the existing and future (No-Build and Build) traffic conditions. Level of Service is an indicator of operating conditions which occur on a given roadway or intersection while accommodating varying levels of traffic volumes. It is a qualitative measure that accounts for a number of operational factors including roadway geometry, speed, traffic composition, travel delay, freedom to maneuver, and driver expectation. When all of these measures are assessed and a Level of Service is assigned to a roadway or intersection, it is equivalent to presenting an “index” to the operational qualities of the section under study. Level of Service is classified into six levels that are designated ‘A’ through ‘F’ based on the control delay ranges they fall under. Additionally, a movement with a volume-to-capacity ratio of over 1.00 also operates at LOS ‘F’, regardless of delay. The LOS delay criteria for unsignalized intersections is presented in Table 4.2.

*Table 4.2 – Level of Service Criteria for Unsignalized Intersections*

| LOS | UNSIGNALIZED INTERSECTION (SEC) |
|---|---|
| A | ≤10 |
| B | >10 and ≤15 |
| C | >15 and ≤25 |
| D | >25 and ≤35 |
| E | >35 and ≤50 |
| F | >50 or v/c ≥1.0 |

In practice, any given roadway/intersection may operate at a wide LOS range depending upon time of day, day of week, or period of year. It should be noted that for unsignalized intersections, the Level of Service is not computed for the intersection as a whole. Instead, the level of service is determined by the computed or measured control delay for each individual critical movement. This is done because the majority of traffic on the major roadway at an unsignalized intersection may travel through the intersection freely, and experience no delay at all.

The intersections of Rockwood Road at Boardman Street, Rockwood Road at Ware Drive, and Rockwood Road at the Site Drive were evaluated using the Synchro 9 computer software that implements the procedures established in the HCM 2010 to complete the analysis. The intersection of Main Street and Rockwood Road/Union Street was evaluated using the Georgia Department of Transportation (GDOT) Roundabout Analysis Tool. The tool produces HCM 2010 results, and also its own calibrated results. The HCM 2010 results assume some additional delay due to driver inexperience, while the calibrated results remove this additional delay for future driver experience. Both Synchro and the GDOT Roundabout Analysis Tool are approved by MassDOT for traffic operations analysis. Using the existing roadway features and the intersection controls, traffic operations at the study intersections were evaluated for existing as well as future conditions. Analysis results are presented in Tables 4.3 and 4.4 for the study intersections. Full worksheets presenting Synchro and GDOT outputs are provided in the Appendix.

*Table 4.3 – Morning Peak Hour Analysis*

| | Existing | | | | 2023 No Build | | | | 2023 Build | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Delay (s) | LOS | v/c | 95th % Q (ft) | Delay (s) | LOS | v/c | 95th % Q (ft) | Delay (s) | LOS | v/c | 95th % Q (ft) |
| **Main Street at Rockwood Road/Union Street** | | | | | | | | | | | | |
| Main Street EB LTR | 13.0 | B | 0.63 | 115 | 14.0 | B | 0.65 | 124 | 14.0 | B | 0.65 | 126 |
| Main Street WB LTR | 6.0 | A | 0.23 | 23 | 6.0 | A | 0.26 | 26 | 6.0 | A | 0.26 | 26 |
| Union Street NB LTR | 12.0 | B | 0.49 | 69 | 14.0 | B | 0.55 | 85 | 14.0 | B | 0.56 | 86 |
| Rockwood Road SB LTR | 6.0 | A | 0.31 | 33 | 7.0 | A | 0.34 | 37 | 7.0 | A | 0.34 | 39 |
| **Rockwood Road at Driveway/Ware Drive** | | | | | | | | | | | | |
| Driveway EB LTR | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 |
| Ware Drive WB LTR | 17.1 | C | 0.02 | 3 | 18.4 | C | 0.02 | 3 | 18.6 | C | 0.03 | 3 |
| Rockwood Road NB L | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 |
| Rockwood Road SB L | 0.1 | A | 0.00 | 0 | 0.1 | A | 0.00 | 0 | 0.1 | A | 0.00 | 0 |
| **Rockwood Road at Boardman Street** | | | | | | | | | | | | |
| Boardman St EB LTR | 60.0 | F | 0.83 | 165 | 103.1 | F | 1.00 | 235 | 108.8 | F | 1.02 | 243 |
| Boardman St WB LTR | 21.4 | C | 0.21 | 20 | 24.3 | C | 0.25 | 25 | 24.7 | C | 0.25 | 25 |
| Rockwood Road NB L | 0.3 | A | 0.01 | 0 | 0.3 | A | 0.01 | 0 | 0.3 | A | 0.02 | 0 |
| Rockwood Road SB L | 0.2 | A | 0.01 | 0 | 0.2 | A | 0.01 | 0 | 0.2 | A | 0.01 | 0 |
| **Site Drive** | | | | | | | | | | | | |
| Site Drive EB LR | - | - | - | - | - | - | - | - | 15.1 | C | 0.05 | 5 |
| Rockwood Road NB LT | - | - | - | - | - | - | - | - | 0.0 | A | 0.00 | 0 |

*Table 4.4 – Afternoon Peak Hour Analysis*

| | Existing | | | | 2023 No Build | | | | 2023 Build | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Delay (s) | LOS | v/c | 95th % Q (ft) | Delay (s) | LOS | v/c | 95th % Q (ft) | Delay (s) | LOS | v/c | 95th % Q (ft) |
| **Main Street at Rockwood Road/Union Street** | | | | | | | | | | | | |
| Main Street EB LTR | 6.0 | A | 0.25 | 24 | 7.0 | A | 0.27 | 28 | 7.0 | A | 0.27 | 28 |
| Main Street WB LTR | 13.0 | B | 0.63 | 116 | 15.0 | C | 0.69 | 147 | 16.0 | C | 0.70 | 150 |
| Union Street NB LTR | 7.0 | A | 0.37 | 44 | 8.0 | A | 0.41 | 50 | 8.0 | A | 0.41 | 51 |
| Rockwood Road SB LTR | 10.0 | B | 0.47 | 64 | 12.0 | B | 0.53 | 79 | 12.0 | B | 0.53 | 80 |
| **Rockwood Road at Driveway/Ware Drive** | | | | | | | | | | | | |
| Driveway EB LTR | 16.7 | C | 0.01 | 0 | 18.1 | C | 0.01 | 0 | 18.3 | C | 0.01 | 0 |
| Ware Drive WB LTR | 21.3 | C | 0.02 | 3 | 23.6 | C | 0.02 | 3 | 23.9 | C | 0.02 | 3 |
| Rockwood Road NB LTR | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 |
| Rockwood Road SB LTR | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 | 0.0 | A | 0.00 | 0 |
| **Rockwood Road at Boardman Street** | | | | | | | | | | | | |
| Boardman St EB LTR | 38.5 | E | 0.52 | 68 | 53.0 | F | 0.64 | 93 | 55.4 | F | 0.66 | 98 |
| Boardman St WB LTR | 34.9 | D | 0.44 | 50 | 45.6 | E | 0.54 | 70 | 48.4 | E | 0.56 | 73 |
| Rockwood Road NB LTR | 0.9 | A | 0.05 | 3 | 0.9 | A | 0.05 | 5 | 0.9 | A | 0.05 | 5 |
| Rockwood Road SB LTR | 0.3 | A | 0.02 | 3 | 0.3 | A | 0.02 | 3 | 0.3 | A | 0.02 | 3 |
| **Site Drive** | | | | | | | | | | | | |
| Site Drive EB LR | - | - | - | - | - | - | - | - | 15.8 | C | 0.03 | 3 |
| Rockwood Road NB LT | - | - | - | - | - | - | - | - | 0.1 | A | 0.01 | 0 |

The intersection capacity analysis indicated the following:

- Under existing conditions, the study intersections generally operate well, with the exception of Rockwood Road at Boardman Street where the eastbound exit approach experiences relatively long peak hour delays, particularly during the morning peak hour.
- There are negligible increases in delay between the 2023 No Build and 2023 Build conditions.
- Relative to the 2023 No-Build conditions, the 95th percentile queue lengths are expected to increase by less than half of a car length at each approach to all of the study intersections.
- Drivers entering and exiting the proposed site driveway will not experience significant delays and operate at acceptable peak hour levels of service.

In summary, the analyses show that the proposed project will have minimal effects on nearby traffic operations and Rockwood Road has the capacity to safely accommodate the new traffic.

## 4.3 Sight Distance Analysis

Adequate sight distance is an important safety consideration at intersections. The focus of this sight distance analysis was the intersection of Rockwood Road at the proposed site drive. The study examined stopping sight distance (SSD) and intersection sight distance (ISD).

SSD, which is the more important of the two, is the distance required for an approaching driver on an uncontrolled approach to perceive and react accordingly to an obstruction in the roadway. The values are based on a perception-reaction time of 2.5 seconds and braking distance required under wet, level pavements. ISD is based on the time required to perceive, react, and complete desired exiting maneuver from the proposed driveway once the driver decides to execute the maneuver. Values for exiting sight distance represent the time to (1) turn left or right, in addition to accelerating to the operating speed of the roadway, without causing approaching vehicles on Rockwood Road to reduce speed by more than 10 mph, and (2) upon turning left, to clear the near half of the intersection without conflicting with the vehicles approaching from the left.

ISD is more related to operations and to some degree, the convenience or inconvenience of oncoming motorists. When the roadway is either on an upgrade or downgrade, grade correction factors may be applied. Minimum criteria are defined by the American Association of State and Highway Transportation Officials (AASHTO). SSD relates specifically to safety. As indicated by AASHTO, if the ISD at least meets or exceeds the SSD criteria, then there is adequate safe sight distance available for motorists to safely avoid collisions. In this case, the ISD was estimated since the proposed driveway is not currently built and thick brush and vegetation exists where the drive will be located. The estimate was made using a combination of field review and plan and aerial analysis. The vegetation will be cleared when the project and driveway is being constructed and will maximize the available intersection sight distance to the extent feasible.

The posted speed limit signs were noted on Rockwood Road northbound is 35 mph north of a point 80 feet north of the site driveway and 25 mph southbound at a point approximately 80 feet north of the site driveway. Based on the data collected and the speed zone locations, a vehicle speed of 35 mph was used in the sight distance analysis for Rockwood Road in the southbound direction approaching the site, while a speed of 25 mph was used in the northbound direction in the sight distance analysis. This lower travel speed in the northbound direction is consistent with the roadway characteristics of vehicles traveling through Norfolk town center including commercial parking, the train station, driveways, and the rail crossing. In addition, while conservatively the 35 mph speed was used for analysis on the southbound approach to the site drive, a lower speed could have been used in the southbound direction given that north of the site drive, the posted speeds are reduced from 35 mph to 25 mph and vehicles are beginning to slow.

A sight distance analysis was also conducted at the intersection of Boardman Street at the proposed emergency access driveway to be located approximately opposite Medway Branch Road. There is no posted speed limit on Boardman Street, so the prima facie speed limit of 30 mph was used in the analysis. Table 4.5 presents the AASHTO criteria and a summary of the sight distance analysis.

*Table 4.5 – Summary of Sight Distance Analysis*

| Location | Sight Distance | | |
|---|---|---|---|
| | | Vehicle Speed | |
| | Measured (ft) | Minimum Required (ft) | Desirable (ft) |
| **Stopping Sight Distance** | | | |
| Rockwood Rd at Site Driveway | | | |
| Rockwood Rd Northbound | 350 | 150 [A] | - |
| Rockwood Rd Southbound | 310 | 250 [B] | - |
| Boardman St at Proposed Emergency Access Road | | | |
| Boardman St Eastbound | 800+ | 200 [C] | - |
| Boardman St Westbound | 445 | 200 [C] | - |
| **Intersection Sight Distance** | | | |
| Rockwood Rd at Site Driveway | | | |
| Vehicles Exiting the Project Site, looking South | 270[d] | 150 [A] | 335 [A] |
| Vehicles Exiting the Project Site, looking North | 255[d] | 250 [B] | 390 [B] |
| Boardman St at Proposed Emergency Access Road | | | |
| Vehicles exiting Project Site, looking west | 295 | 200 [C] | 335 [C] |
| Vehicles exiting Project Site, looking east | 330 | 200 [C] | 335 [C] |

[A] Based on an assumed northbound travel speed of 25 mph
[B] Based on the posted speed limit southbound of 35 mph, speeds approaching the Center are reduced to 25 posted limit north of the site drive and a lower speed could be used to evaluate adequacy.
[C] Based on the prima facie speed limit of 30 mph, Because there is no posted speed limit along Boardman Street
[d] Estimated distance could increase to approx. 300 feet looking south and 275+ feet looking north after site drive construction and selective vegetative clearing and re-grading.

As indicated in Table 4.5, the available stopping sight distances and intersection sight distances exceed the minimum requirements at the project site driveways including the emergency access drive on Boardman Street. Following driveway construction and appropriate vegetative trimming and clearing, the available ISD is expected to meet or exceed the minimum sight distances in all directions.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

This traffic report describes the analysis procedures, assumptions, and results of this traffic study. The following summarizes the traffic analysis findings:

- The proposed development is estimated to generate a relatively low amount of new vehicle trips. Given its location, there is the high likelihood of substantial walk trips to the train station, town center, and the land uses in the vicinity of the development.
- The project is expected to have minimal impact on the surrounding roadways and the study intersections and Rockwood Road has the capacity to accommodate the project.
- The analysis showed that site traffic would be able to enter and exit the site safely and efficiently with short delays.
- Compared to the Future No-Build conditions, there is negligible increase in delay at the roundabout of Main Street with Rockwood Road/Union Street, and the roundabout will continue to operate at high levels of service during the peak and off-peak hours. It is noted that there are short periods of time during peak hours when the commuter train prohibits traffic from crossing tracks that can delay vehicles on Rockwood Road back to the roundabout. However, the small additional traffic added as a result of the proposed development project will not significantly affect this characteristic, which would continue to occur regardless of the proposed project.
- There is a negligible increase in delay for the minor street approaches at the intersection of Rockwood Road at Boardman Street and at the intersection of Rockwood Road at Ware Drive.
- The available sight distances at the proposed site drive and at the proposed emergency access driveway will exceed the minimum required distances.
- The 108 total proposed parking spaces on-site, including 44 garage spaces, 48 general spaces intended for visitors, and 16 driveway spaces exceeds the Town requirements of 54 spaces for on-site parking and is expected to be more than adequate to accommodate all residents and visitors.

The analysis showed the proposed project could be accommodated by the study area with the existing transportation infrastructure. However, the following actions are suggested to enhance the transportation infrastructure and to encourage alternative modes of transportation:

- Along the west side of Rockwood Road, it is recommended that if the available public right-of-way (ROW) exists, to construct approximately 220 feet of sidewalk south of the proposed project site driveway to connect with the existing sidewalk on the west side of Rockwood Road that ends at Ware Drive.
- In order to maintain available sight distances, existing vegetation will need to be cleared and any proposed landscaping at the site driveway intersection with Rockwood Road should be low lying and set back.
- The site drive eastbound approach should be placed under STOP control at its intersection with Rockwood Road.
- Parking should be prohibited along the Site Drive to facilitate smooth circulation. The number of marked parking spaces is more than adequate to accommodate the anticipated demand.

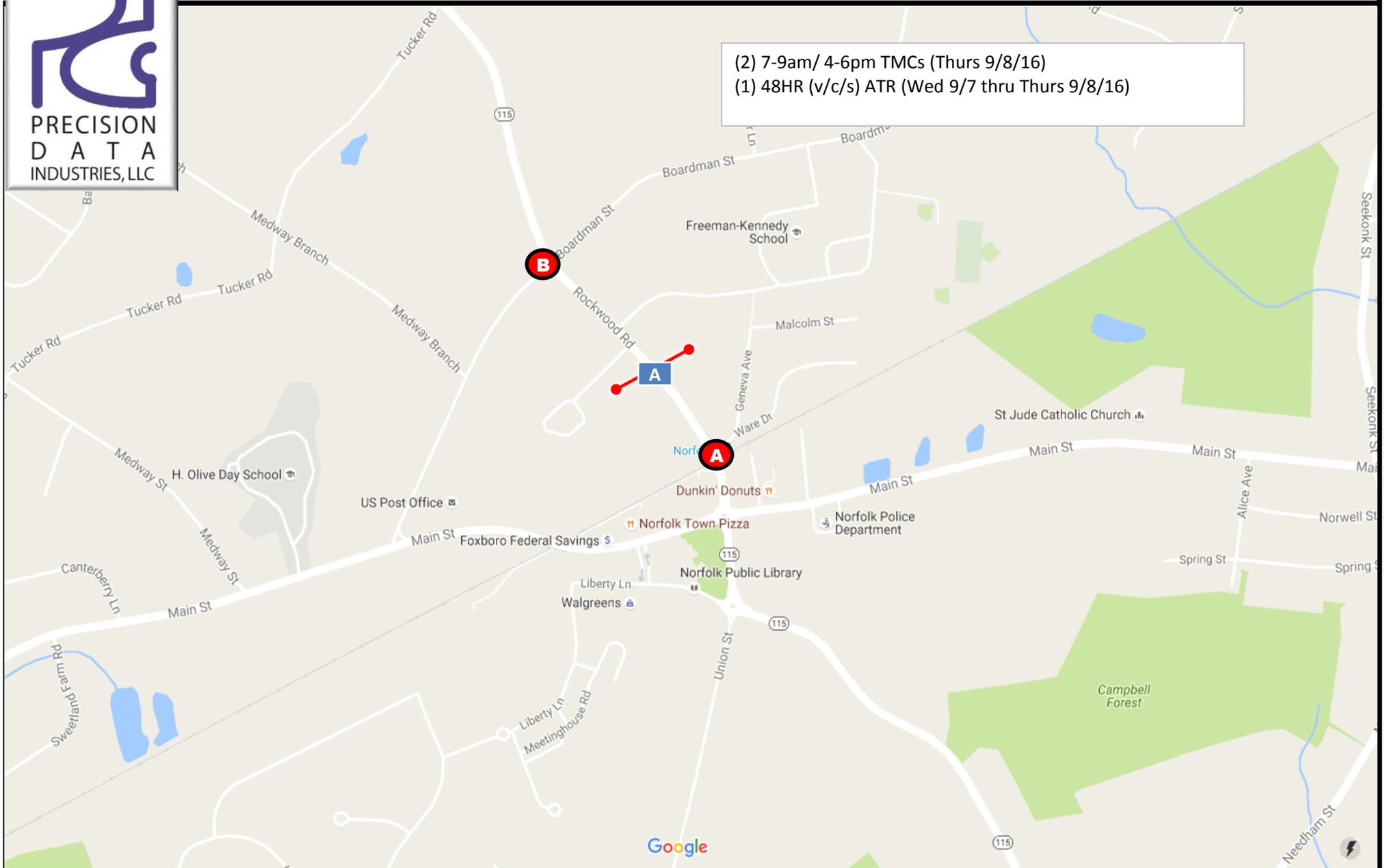
- A Reduced Speed Limit Ahead sign (W3-5) is recommended to be installed approximately 100 feet in advance of the southbound reduction in the posted speed limit from 35 mph to 25 mph in the vicinity of the project site.
- Consider installing an intersection warning sign (W2-1) on the northbound and southbound Rockwood Road approaches to the intersection with Boardman Street to warn Rockwood Road drivers of the potential for conflicting vehicles.
- Consider installing pedestrian crossing signage (W11-2 and W16-7P) facing each direction of Rockwood Road traffic at the marked crosswalks at Boardman Street, approximately 720 feet south of Boardman Street, and at Ware Drive.
- All existing and proposed signs agreed to by the Town should be maintained appropriately including periodic trimming of vegetation to avoid any blockage of sign legends.

# *APPENDIX A-TRAFFIC VOLUMES*

# Location Map: 165254 Norfolk, MA

PRECISION DATA INDUSTRIES, LLC

(2) 7-9am/ 4-6pm TMCs (Thurs 9/8/16)
(1) 48HR (v/c/s) ATR (Wed 9/7 thru Thurs 9/8/16)




| Client: | Engineer: | Site Code: | Date: | PDI Job # | City, State: |
|---|---|---|---|---|---|
| Green International | J. Sobel | 16071 | Wed 9/7 thru Thurs 9/8/16 | 165254 | Norfolk, MA |

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165254 A Volume
Site Code: 16071

| Start | SB | | | | NB | | | | Combined | | | | 07-Sep-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | A.M. | | P.M. | | A.M. | | P.M. | | A.M. | | P.M. | | Wed |
| 12:00 | 4 | | 47 | | 1 | | 47 | | 5 | | 94 | | |
| 12:15 | 4 | | 49 | | 2 | | 62 | | 6 | | 111 | | |
| 12:30 | 5 | | 61 | | 3 | | 52 | | 8 | | 113 | | |
| 12:45 | 0 | 13 | 54 | 211 | 0 | 6 | 53 | 214 | 0 | 19 | 107 | 425 | |
| 01:00 | 1 | | 57 | | 4 | | 67 | | 5 | | 124 | | |
| 01:15 | 1 | | 49 | | 3 | | 53 | | 4 | | 102 | | |
| 01:30 | 1 | | 68 | | 2 | | 56 | | 3 | | 124 | | |
| 01:45 | 1 | 4 | 55 | 229 | 1 | 10 | 53 | 229 | 2 | 14 | 108 | 458 | |
| 02:00 | 0 | | 57 | | 2 | | 61 | | 2 | | 118 | | |
| 02:15 | 0 | | 78 | | 2 | | 70 | | 2 | | 148 | | |
| 02:30 | 0 | | 79 | | 0 | | 93 | | 0 | | 172 | | |
| 02:45 | 0 | 0 | 66 | 280 | 1 | 5 | 92 | 316 | 1 | 5 | 158 | 596 | |
| 03:00 | 1 | | 96 | | 0 | | 66 | | 1 | | 162 | | |
| 03:15 | 0 | | 79 | | 0 | | 59 | | 0 | | 138 | | |
| 03:30 | 2 | | 86 | | 1 | | 85 | | 3 | | 171 | | |
| 03:45 | 2 | 5 | 94 | 355 | 1 | 2 | 70 | 280 | 3 | 7 | 164 | 635 | |
| 04:00 | 1 | | 99 | | 1 | | 112 | | 2 | | 211 | | |
| 04:15 | 2 | | 85 | | 0 | | 93 | | 2 | | 178 | | |
| 04:30 | 1 | | 92 | | 5 | | 75 | | 6 | | 167 | | |
| 04:45 | 7 | 11 | 90 | 366 | 3 | 9 | 98 | 378 | 10 | 20 | 188 | 744 | |
| 05:00 | 4 | | 117 | | 6 | | 96 | | 10 | | 213 | | |
| 05:15 | 11 | | 108 | | 16 | | 107 | | 27 | | 215 | | |
| 05:30 | 24 | | 99 | | 16 | | 121 | | 40 | | 220 | | |
| 05:45 | 17 | 56 | 92 | 416 | 24 | 62 | 98 | 422 | 41 | 118 | 190 | 838 | |
| 06:00 | 48 | | 102 | | 39 | | 68 | | 87 | | 170 | | |
| 06:15 | 53 | | 78 | | 59 | | 113 | | 112 | | 191 | | |
| 06:30 | 80 | | 67 | | 72 | | 60 | | 152 | | 127 | | |
| 06:45 | 71 | 252 | 68 | 315 | 69 | 239 | 93 | 334 | 140 | 491 | 161 | 649 | |
| 07:00 | 125 | | 54 | | 76 | | 71 | | 201 | | 125 | | |
| 07:15 | 94 | | 38 | | 68 | | 53 | | 162 | | 91 | | |
| 07:30 | 85 | | 38 | | 130 | | 40 | | 215 | | 78 | | |
| 07:45 | 86 | 390 | 20 | 150 | 125 | 399 | 47 | 211 | 211 | 789 | 67 | 361 | |
| 08:00 | 76 | | 42 | | 83 | | 42 | | 159 | | 84 | | |
| 08:15 | 69 | | 39 | | 95 | | 48 | | 164 | | 87 | | |
| 08:30 | 78 | | 30 | | 91 | | 30 | | 169 | | 60 | | |
| 08:45 | 95 | 318 | 21 | 132 | 112 | 381 | 41 | 161 | 207 | 699 | 62 | 293 | |
| 09:00 | 72 | | 19 | | 69 | | 23 | | 141 | | 42 | | |
| 09:15 | 52 | | 9 | | 65 | | 25 | | 117 | | 34 | | |
| 09:30 | 42 | | 17 | | 61 | | 16 | | 103 | | 33 | | |
| 09:45 | 52 | 218 | 17 | 62 | 52 | 247 | 21 | 85 | 104 | 465 | 38 | 147 | |
| 10:00 | 50 | | 6 | | 47 | | 9 | | 97 | | 15 | | |
| 10:15 | 64 | | 4 | | 44 | | 17 | | 108 | | 21 | | |
| 10:30 | 46 | | 4 | | 62 | | 11 | | 108 | | 15 | | |
| 10:45 | 60 | 220 | 9 | 23 | 53 | 206 | 11 | 48 | 113 | 426 | 20 | 71 | |
| 11:00 | 45 | | 3 | | 56 | | 6 | | 101 | | 9 | | |
| 11:15 | 45 | | 2 | | 67 | | 6 | | 112 | | 8 | | |
| 11:30 | 48 | | 5 | | 78 | | 7 | | 126 | | 12 | | |
| 11:45 | 61 | 199 | 2 | 12 | 61 | 262 | 6 | 25 | 122 | 461 | 8 | 37 | |
| Total | 1686 | | 2551 | | 1828 | | 2703 | | 3514 | | 5254 | | |
| Percent | 48.0% | | 48.6% | | 52.0% | | 51.4% | | | | | | |
| Day Total | | 4237 | | | | 4531 | | | | 8768 | | | |
| Peak | 07:00 | - | 05:00 | - | 07:30 | - | 04:45 | - | 07:00 | - | 05:00 | - | - | - |
| Vol. | 390 | - | 416 | - | 433 | - | 422 | - | 789 | - | 838 | - | - | - |
| P.H.F. | 0.780 | | 0.889 | | 0.833 | | 0.872 | | 0.917 | | 0.952 | | | |

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165254 A Volume
Site Code: 16071

| Start | SB | | | | NB | | | | Combined | | | | 08-Sep-16 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Time | A.M. | | P.M. | | A.M. | | P.M. | | A.M. | | P.M. | | Thu |
| 12:00 | 2 | | 65 | | 5 | | 53 | | 7 | | 118 | | |
| 12:15 | 1 | | 68 | | 3 | | 71 | | 4 | | 139 | | |
| 12:30 | 5 | | 51 | | 1 | | 49 | | 6 | | 100 | | |
| 12:45 | 1 | 9 | 56 | 240 | 1 | 10 | 58 | 231 | 2 | 19 | 114 | 471 | |
| 01:00 | 1 | | 40 | | 0 | | 61 | | 1 | | 101 | | |
| 01:15 | 3 | | 58 | | 1 | | 58 | | 4 | | 116 | | |
| 01:30 | 1 | | 63 | | 1 | | 63 | | 2 | | 126 | | |
| 01:45 | 1 | 6 | 79 | 240 | 1 | 3 | 41 | 223 | 2 | 9 | 120 | 463 | |
| 02:00 | 0 | | 80 | | 0 | | 56 | | 0 | | 136 | | |
| 02:15 | 1 | | 70 | | 4 | | 79 | | 5 | | 149 | | |
| 02:30 | 0 | | 60 | | 0 | | 86 | | 0 | | 146 | | |
| 02:45 | 0 | 1 | 57 | 267 | 0 | 4 | 88 | 309 | 0 | 5 | 145 | 576 | |
| 03:00 | 0 | | 98 | | 0 | | 64 | | 0 | | 162 | | |
| 03:15 | 2 | | 71 | | 2 | | 58 | | 4 | | 129 | | |
| 03:30 | 3 | | 100 | | 1 | | 76 | | 4 | | 176 | | |
| 03:45 | 0 | 5 | 99 | 368 | 1 | 4 | 90 | 288 | 1 | 9 | 189 | 656 | |
| 04:00 | 0 | | 106 | | 0 | | 89 | | 0 | | 195 | | |
| 04:15 | 2 | | 97 | | 3 | | 72 | | 5 | | 169 | | |
| 04:30 | 2 | | 90 | | 4 | | 118 | | 6 | | 208 | | |
| 04:45 | 7 | 11 | 97 | 390 | 2 | 9 | 88 | 367 | 9 | 20 | 185 | 757 | |
| 05:00 | 11 | | 104 | | 7 | | 123 | | 18 | | 227 | | |
| 05:15 | 8 | | 103 | | 10 | | 85 | | 18 | | 188 | | |
| 05:30 | 21 | | 99 | | 17 | | 154 | | 38 | | 253 | | |
| 05:45 | 23 | 63 | 117 | 423 | 35 | 69 | 93 | 455 | 58 | 132 | 210 | 878 | |
| 06:00 | 40 | | 95 | | 48 | | 115 | | 88 | | 210 | | |
| 06:15 | 32 | | 100 | | 65 | | 104 | | 97 | | 204 | | |
| 06:30 | 76 | | 79 | | 76 | | 96 | | 152 | | 175 | | |
| 06:45 | 73 | 221 | 76 | 350 | 76 | 265 | 56 | 371 | 149 | 486 | 132 | 721 | |
| 07:00 | 118 | | 52 | | 93 | | 50 | | 211 | | 102 | | |
| 07:15 | 88 | | 43 | | 88 | | 67 | | 176 | | 110 | | |
| 07:30 | 92 | | 61 | | 107 | | 59 | | 199 | | 120 | | |
| 07:45 | 107 | 405 | 41 | 197 | 97 | 385 | 45 | 221 | 204 | 790 | 86 | 418 | |
| 08:00 | 76 | | 39 | | 105 | | 34 | | 181 | | 73 | | |
| 08:15 | 75 | | 33 | | 102 | | 30 | | 177 | | 63 | | |
| 08:30 | 64 | | 23 | | 78 | | 32 | | 142 | | 55 | | |
| 08:45 | 90 | 305 | 27 | 122 | 98 | 383 | 38 | 134 | 188 | 688 | 65 | 256 | |
| 09:00 | 58 | | 15 | | 63 | | 33 | | 121 | | 48 | | |
| 09:15 | 52 | | 17 | | 64 | | 25 | | 116 | | 42 | | |
| 09:30 | 53 | | 17 | | 55 | | 11 | | 108 | | 28 | | |
| 09:45 | 50 | 213 | 11 | 60 | 60 | 242 | 15 | 84 | 110 | 455 | 26 | 144 | |
| 10:00 | 51 | | 14 | | 55 | | 13 | | 106 | | 27 | | |
| 10:15 | 51 | | 7 | | 46 | | 19 | | 97 | | 26 | | |
| 10:30 | 52 | | 9 | | 65 | | 10 | | 117 | | 19 | | |
| 10:45 | 63 | 217 | 11 | 41 | 53 | 219 | 11 | 53 | 116 | 436 | 22 | 94 | |
| 11:00 | 55 | | 4 | | 57 | | 18 | | 112 | | 22 | | |
| 11:15 | 51 | | 8 | | 52 | | 17 | | 103 | | 25 | | |
| 11:30 | 63 | | 4 | | 57 | | 6 | | 120 | | 10 | | |
| 11:45 | 68 | 237 | 4 | 20 | 62 | 228 | 5 | 46 | 130 | 465 | 9 | 66 | |
| Total | 1693 | | 2718 | | 1821 | | 2782 | | 3514 | | 5500 | | |
| Percent | 48.2% | | 49.4% | | 51.8% | | 50.6% | | | | | | |
| Day Total | | 4411 | | | | 4603 | | | | 9014 | | | |
| Peak | 07:00 | - | 05:00 | - | 07:30 | - | 05:30 | - | 07:00 | - | 05:00 | - | - | - |
| Vol. | 405 | - | 423 | - | 411 | - | 466 | - | 790 | - | 878 | - | - | - |
| P.H.F. | 0.858 | | 0.904 | | 0.960 | | 0.756 | | 0.936 | | 0.868 | | | |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

165254 A Class
Site Code: 16071

SB

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/07/1 | | | | | | | | | | | | | | |
| 6 | 0 | 10 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 13 |
| 01:00 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 03:00 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 04:00 | 0 | 3 | 5 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 05:00 | 0 | 38 | 15 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 56 |
| 06:00 | 4 | 177 | 45 | 4 | 16 | 1 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 252 |
| 07:00 | 6 | 289 | 77 | 0 | 11 | 2 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 390 |
| 08:00 | 4 | 231 | 55 | 6 | 12 | 4 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 318 |
| 09:00 | 2 | 143 | 48 | 3 | 13 | 5 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 218 |
| 10:00 | 3 | 150 | 41 | 3 | 15 | 1 | 0 | 3 | 4 | 0 | 0 | 0 | 0 | 220 |
| 11:00 | 2 | 132 | 41 | 1 | 11 | 3 | 1 | 1 | 7 | 0 | 0 | 0 | 0 | 199 |
| 12 PM | 3 | 141 | 49 | 1 | 9 | 3 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 211 |
| 13:00 | 3 | 150 | 50 | 2 | 13 | 1 | 0 | 3 | 7 | 0 | 0 | 0 | 0 | 229 |
| 14:00 | 5 | 172 | 67 | 3 | 24 | 6 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 280 |
| 15:00 | 6 | 227 | 86 | 6 | 23 | 2 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 355 |
| 16:00 | 7 | 257 | 72 | 2 | 22 | 3 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 366 |
| 17:00 | 10 | 301 | 82 | 0 | 21 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 416 |
| 18:00 | 10 | 234 | 48 | 0 | 20 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 315 |
| 19:00 | 0 | 120 | 24 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 150 |
| 20:00 | 1 | 101 | 19 | 0 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 132 |
| 21:00 | 0 | 43 | 12 | 0 | 6 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 62 |
| 22:00 | 0 | 20 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 23 |
| 23:00 | 0 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 12 |
| Total | 66 | 2956 | 845 | 31 | 239 | 33 | 3 | 23 | 41 | 0 | 0 | 0 | 0 | 4237 |
| Percent | 1.6% | 69.8% | 19.9% | 0.7% | 5.6% | 0.8% | 0.1% | 0.5% | 1.0% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 07:00 | 07:00 | 07:00 | 08:00 | 06:00 | 09:00 | 07:00 | 10:00 | 11:00 | | | | | 07:00 |
| Vol. | 6 | 289 | 77 | 6 | 16 | 5 | 1 | 3 | 7 | | | | | 390 |
| PM Peak | 17:00 | 17:00 | 15:00 | 15:00 | 14:00 | 14:00 | 12:00 | 15:00 | 13:00 | | | | | 17:00 |
| Vol. | 10 | 301 | 86 | 6 | 24 | 6 | 1 | 5 | 7 | | | | | 416 |

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City, State: Norfolk, MA
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165254 A Class
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SB

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/08/1 | | | | | | | | | | | | | | |
| 6 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 9 |
| 01:00 | 0 | 3 | 2 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 02:00 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 03:00 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 04:00 | 0 | 5 | 2 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| 05:00 | 2 | 38 | 17 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 63 |
| 06:00 | 3 | 153 | 38 | 1 | 19 | 1 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 221 |
| 07:00 | 8 | 297 | 73 | 5 | 17 | 3 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 405 |
| 08:00 | 5 | 210 | 58 | 5 | 18 | 5 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 305 |
| 09:00 | 3 | 144 | 39 | 2 | 19 | 3 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 213 |
| 10:00 | 4 | 131 | 50 | 3 | 20 | 5 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 217 |
| 11:00 | 5 | 159 | 41 | 2 | 19 | 2 | 1 | 3 | 5 | 0 | 0 | 0 | 0 | 237 |
| 12 PM | 2 | 162 | 49 | 3 | 18 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 240 |
| 13:00 | 3 | 164 | 40 | 5 | 20 | 0 | 0 | 2 | 6 | 0 | 0 | 0 | 0 | 240 |
| 14:00 | 1 | 179 | 54 | 4 | 26 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 267 |
| 15:00 | 3 | 242 | 85 | 7 | 25 | 2 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 368 |
| 16:00 | 9 | 284 | 60 | 1 | 31 | 2 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 390 |
| 17:00 | 11 | 312 | 78 | 1 | 17 | 2 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 423 |
| 18:00 | 7 | 262 | 55 | 1 | 24 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 350 |
| 19:00 | 3 | 154 | 27 | 0 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 197 |
| 20:00 | 1 | 92 | 23 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 122 |
| 21:00 | 0 | 48 | 9 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 60 |
| 22:00 | 0 | 32 | 6 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 41 |
| 23:00 | 0 | 16 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| Total | 70 | 3101 | 810 | 40 | 308 | 30 | 4 | 21 | 26 | 1 | 0 | 0 | 0 | 4411 |
| Percent | 1.6% | 70.3% | 18.4% | 0.9% | 7.0% | 0.7% | 0.1% | 0.5% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 07:00 | 07:00 | 07:00 | 07:00 | 10:00 | 08:00 | 11:00 | 11:00 | 11:00 | | | | | 07:00 |
| Vol. | 8 | 297 | 73 | 5 | 20 | 5 | 1 | 3 | 5 | | | | | 405 |
| PM Peak | 17:00 | 17:00 | 15:00 | 15:00 | 16:00 | 12:00 | 12:00 | 13:00 | 13:00 | 16:00 | | | | 17:00 |
| Vol. | 11 | 312 | 85 | 7 | 31 | 4 | 2 | 2 | 6 | 1 | | | | 423 |

PRECISION
D A T A
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Rockwood Road (Route 115)
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165254 A Class
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NB

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/07/1 | | | | | | | | | | | | | | |
| 6 | 0 | 4 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 01:00 | 0 | 5 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 02:00 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 03:00 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 04:00 | 0 | 5 | 3 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 05:00 | 0 | 36 | 18 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 62 |
| 06:00 | 2 | 158 | 48 | 3 | 23 | 0 | 0 | 2 | 2 | 1 | 0 | 0 | 0 | 239 |
| 07:00 | 7 | 270 | 85 | 4 | 19 | 4 | 0 | 4 | 6 | 0 | 0 | 0 | 0 | 399 |
| 08:00 | 5 | 260 | 72 | 5 | 22 | 5 | 1 | 2 | 9 | 0 | 0 | 0 | 0 | 381 |
| 09:00 | 8 | 148 | 54 | 5 | 27 | 2 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 247 |
| 10:00 | 1 | 134 | 43 | 0 | 18 | 3 | 0 | 2 | 5 | 0 | 0 | 0 | 0 | 206 |
| 11:00 | 3 | 156 | 64 | 2 | 22 | 4 | 1 | 2 | 8 | 0 | 0 | 0 | 0 | 262 |
| 12 PM | 4 | 136 | 49 | 0 | 17 | 3 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 214 |
| 13:00 | 1 | 148 | 47 | 2 | 21 | 2 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 229 |
| 14:00 | 5 | 212 | 63 | 4 | 23 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 316 |
| 15:00 | 3 | 181 | 74 | 3 | 17 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 280 |
| 16:00 | 4 | 273 | 74 | 0 | 22 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 378 |
| 17:00 | 6 | 301 | 86 | 1 | 26 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 422 |
| 18:00 | 5 | 241 | 67 | 1 | 19 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 334 |
| 19:00 | 1 | 162 | 34 | 1 | 12 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 211 |
| 20:00 | 1 | 126 | 24 | 0 | 9 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 161 |
| 21:00 | 1 | 66 | 14 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 85 |
| 22:00 | 0 | 38 | 9 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 48 |
| 23:00 | 1 | 19 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 25 |
| Total | 58 | 3086 | 937 | 31 | 314 | 32 | 3 | 18 | 51 | 1 | 0 | 0 | 0 | 4531 |
| Percent | 1.3% | 68.1% | 20.7% | 0.7% | 6.9% | 0.7% | 0.1% | 0.4% | 1.1% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 09:00 | 07:00 | 07:00 | 08:00 | 09:00 | 08:00 | 08:00 | 07:00 | 08:00 | 06:00 | | | | 07:00 |
| Vol. | 8 | 270 | 85 | 5 | 27 | 5 | 1 | 4 | 9 | 1 | | | | 399 |
| PM Peak | 17:00 | 17:00 | 17:00 | 14:00 | 17:00 | 14:00 | 16:00 | 16:00 | 13:00 | | | | | 17:00 |
| Vol. | 6 | 301 | 86 | 4 | 26 | 4 | 1 | 3 | 8 | | | | | 422 |

PRECISION
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Rockwood Road (Route 115)
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NB

| Start Time | Bikes | Cars & Trailers | 2 Axle Long | Buses | 2 Axle 6 Tire | 3 Axle Single | 4 Axle Single | <5 Axl Double | 5 Axle Double | >6 Axl Double | <6 Axl Multi | 6 Axle Multi | >6 Axl Multi | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/08/1 | | | | | | | | | | | | | | |
| 6 | 0 | 6 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 01:00 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 02:00 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 03:00 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:00 | 0 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 05:00 | 1 | 49 | 12 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 69 |
| 06:00 | 4 | 171 | 57 | 2 | 23 | 2 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 265 |
| 07:00 | 11 | 254 | 74 | 4 | 37 | 0 | 1 | 3 | 1 | 0 | 0 | 0 | 0 | 385 |
| 08:00 | 6 | 264 | 66 | 8 | 29 | 3 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 383 |
| 09:00 | 4 | 159 | 46 | 3 | 25 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 242 |
| 10:00 | 1 | 139 | 57 | 4 | 9 | 4 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 219 |
| 11:00 | 1 | 150 | 48 | 5 | 16 | 3 | 1 | 1 | 3 | 0 | 0 | 0 | 0 | 228 |
| 12 PM | 5 | 171 | 38 | 5 | 10 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 231 |
| 13:00 | 2 | 152 | 47 | 1 | 14 | 1 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 223 |
| 14:00 | 3 | 206 | 66 | 6 | 25 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 309 |
| 15:00 | 3 | 197 | 67 | 2 | 17 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 288 |
| 16:00 | 8 | 254 | 76 | 1 | 26 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 367 |
| 17:00 | 12 | 321 | 86 | 0 | 32 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 455 |
| 18:00 | 5 | 299 | 48 | 0 | 18 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 371 |
| 19:00 | 4 | 156 | 43 | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 221 |
| 20:00 | 2 | 105 | 23 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 134 |
| 21:00 | 1 | 68 | 10 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 84 |
| 22:00 | 0 | 43 | 7 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 53 |
| 23:00 | 0 | 33 | 12 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 46 |
| Total | 73 | 3213 | 891 | 42 | 317 | 19 | 3 | 11 | 34 | 0 | 0 | 0 | 0 | 4603 |
| Percent | 1.6% | 69.8% | 19.4% | 0.9% | 6.9% | 0.4% | 0.1% | 0.2% | 0.7% | 0.0% | 0.0% | 0.0% | 0.0% | |
| AM Peak | 07:00 | 08:00 | 07:00 | 08:00 | 07:00 | 10:00 | 07:00 | 07:00 | 08:00 | | | | | 07:00 |
| Vol. | 11 | 264 | 74 | 8 | 37 | 4 | 1 | 3 | 7 | | | | | 385 |
| PM Peak | 17:00 | 17:00 | 17:00 | 14:00 | 17:00 | 13:00 | 17:00 | 15:00 | 13:00 | | | | | 17:00 |
| Vol. | 12 | 321 | 86 | 6 | 32 | 1 | 1 | 1 | 6 | | | | | 455 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

165254 A Speed
Site Code: 16071

SB

| Start Time | 1 14 | 15 19 | 20 24 | 25 29 | 30 34 | 35 39 | 40 44 | 45 49 | 50 54 | 55 59 | 60 64 | 65 69 | 70 9999 | Total | 85th % ile | Ave Speed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/07/ 16 | 0 | 0 | 1 | 2 | 5 | 2 | 2 | 0 | **1** | 0 | 0 | 0 | 0 | 13 | 41 | 34 |
| 01:00 | 0 | 0 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 42 | 36 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | * | * |
| 03:00 | 0 | 0 | 0 | 0 | 1 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 42 | 38 |
| 04:00 | 0 | 0 | 0 | 0 | 3 | 4 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 11 | 42 | 38 |
| 05:00 | 0 | 1 | 0 | 2 | 23 | 24 | 5 | 0 | 1 | 0 | 0 | 0 | 0 | 56 | 38 | 35 |
| 06:00 | 0 | 3 | 4 | 31 | 113 | 89 | 10 | **2** | 0 | 0 | 0 | 0 | 0 | 252 | 37 | 33 |
| 07:00 | **15** | **15** | **33** | 37 | **159** | **119** | 11 | 1 | 0 | 0 | 0 | 0 | 0 | **390** | 37 | 31 |
| 08:00 | 4 | 8 | 10 | **49** | 148 | 78 | **20** | 1 | 0 | 0 | 0 | 0 | 0 | 318 | 37 | 32 |
| 09:00 | 0 | 3 | 9 | 31 | 96 | 66 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 218 | 37 | 33 |
| 10:00 | 0 | 2 | 3 | 23 | 97 | 84 | 11 | 0 | 0 | 0 | 0 | 0 | 0 | 220 | 37 | 34 |
| 11:00 | 0 | 1 | 5 | 19 | 81 | 81 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 199 | 37 | 34 |
| 12 PM | 0 | 1 | 4 | 19 | 84 | 87 | 14 | **2** | 0 | 0 | 0 | 0 | 0 | 211 | 38 | 34 |
| 13:00 | 0 | 3 | 6 | 19 | 89 | 87 | **25** | 0 | 0 | 0 | 0 | 0 | 0 | 229 | 38 | 34 |
| 14:00 | 2 | 0 | 4 | 30 | 117 | 108 | 18 | 1 | 0 | 0 | 0 | 0 | 0 | 280 | 37 | 34 |
| 15:00 | 4 | 3 | 10 | 35 | 141 | 147 | 15 | 0 | 0 | 0 | 0 | 0 | 0 | 355 | 37 | 33 |
| 16:00 | 1 | 3 | **11** | 11 | 154 | **161** | 24 | 1 | 0 | 0 | 0 | 0 | 0 | 366 | 38 | 34 |
| 17:00 | **8** | 3 | 10 | **52** | **179** | 140 | 23 | 1 | 0 | 0 | 0 | 0 | 0 | **416** | 37 | 33 |
| 18:00 | 2 | **7** | 0 | 18 | 152 | 117 | 17 | 2 | 0 | 0 | 0 | 0 | 0 | 315 | 37 | 34 |
| 19:00 | 0 | 0 | 4 | 18 | 51 | 64 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 150 | 38 | 34 |
| 20:00 | 1 | 0 | 2 | 6 | 53 | 61 | 8 | 0 | **1** | 0 | 0 | 0 | 0 | 132 | 38 | 35 |
| 21:00 | 0 | 0 | 0 | 0 | 22 | 33 | 6 | 0 | 1 | 0 | 0 | 0 | 0 | 62 | 38 | 36 |
| 22:00 | 0 | 0 | 0 | 2 | 5 | 8 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 23 | 42 | 37 |
| 23:00 | 0 | 0 | 0 | 1 | 4 | 4 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 12 | 41 | 36 |
| Total | 37 | 53 | 116 | 406 | 1778 | 1566 | 262 | 15 | 4 | 0 | 0 | 0 | 0 | 4237 | | |
| % | 0.9% | 1.3% | 2.7% | 9.6% | 42.0% | 37.0% | 6.2% | 0.4% | 0.1% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| AM Peak | 07:00 | 07:00 | 07:00 | 08:00 | 07:00 | 07:00 | 08:00 | 06:00 | 00:00 | | | | | 07:00 | | |
| Vol. | 15 | 15 | 33 | 49 | 159 | 119 | 20 | 2 | 1 | | | | | 390 | | |
| PM Peak | 17:00 | 18:00 | 16:00 | 17:00 | 17:00 | 16:00 | 13:00 | 12:00 | 20:00 | | | | | 17:00 | | |
| Vol. | 8 | 7 | 11 | 52 | 179 | 161 | 25 | 2 | 1 | | | | | 416 | | |

Stats

| | |
|---|---|
| 15th Percentile : | 29 MPH |
| 50th Percentile : | 33 MPH |
| 85th Percentile : | 37 MPH |
| 95th Percentile : | 40 MPH |
| Mean Speed(Average) : | 33 MPH |
| 10 MPH Pace Speed : | 30-39 MPH |
| Number in Pace : | 3344 |
| Percent in Pace : | 78.9% |
| Number of Vehicles > 30 MPH : | 3269 |
| Percent of Vehicles > 30 MPH : | 77.2% |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

165254 A Speed
Site Code: 16071

SB

| Start Time | 1 14 | 15 19 | 20 24 | 25 29 | 30 34 | 35 39 | 40 44 | 45 49 | 50 54 | 55 59 | 60 64 | 65 69 | 70 9999 | Total | 85th % ile | Ave Speed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/08/ 16 | 0 | 0 | 2 | 1 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 42 | 34 |
| 01:00 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 | 44 | 36 |
| 02:00 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 43 | 42 |
| 03:00 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 5 | 45 | 43 |
| 04:00 | 0 | 0 | 1 | 0 | 1 | 3 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 11 | 44 | 39 |
| 05:00 | 0 | 0 | 0 | 2 | 15 | 33 | 10 | **3** | 0 | 0 | 0 | 0 | 0 | 63 | 40 | 37 |
| 06:00 | 2 | 2 | 0 | 17 | 91 | 91 | **18** | 0 | 0 | 0 | 0 | 0 | 0 | 221 | 38 | 34 |
| 07:00 | 15 | **14** | **21** | 36 | **190** | **116** | 12 | 1 | 0 | 0 | 0 | 0 | 0 | **405** | 36 | 31 |
| 08:00 | **22** | 11 | 14 | **68** | 116 | 62 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 305 | 36 | 30 |
| 09:00 | 3 | 3 | 5 | 17 | 77 | 96 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 213 | 37 | 34 |
| 10:00 | 0 | 1 | 3 | 24 | 89 | 87 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 217 | 37 | 34 |
| 11:00 | 5 | 3 | 8 | 30 | 84 | 99 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 237 | 37 | 33 |
| 12 PM | 0 | 0 | 11 | 29 | 100 | 88 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 240 | 37 | 33 |
| 13:00 | **12** | 3 | 5 | 26 | 120 | 67 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 240 | 36 | 32 |
| 14:00 | 0 | 1 | 3 | 25 | 128 | 98 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 267 | 37 | 34 |
| 15:00 | 10 | 6 | 5 | **61** | 165 | 107 | 12 | 1 | **1** | 0 | 0 | 0 | 0 | 368 | 37 | 32 |
| 16:00 | 6 | **10** | **14** | 33 | 149 | 147 | **29** | **2** | 0 | 0 | 0 | 0 | 0 | 390 | 38 | 33 |
| 17:00 | 12 | 9 | 8 | 21 | **193** | **161** | 18 | 1 | 0 | 0 | 0 | 0 | 0 | **423** | 37 | 33 |
| 18:00 | 1 | 2 | 1 | 39 | 184 | 109 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 350 | 37 | 33 |
| 19:00 | 1 | 2 | 2 | 12 | 76 | 92 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 197 | 38 | 34 |
| 20:00 | 0 | 0 | 2 | 8 | 41 | 49 | 21 | 1 | 0 | 0 | 0 | 0 | 0 | 122 | 39 | 35 |
| 21:00 | 0 | 0 | 0 | 0 | 21 | 25 | 12 | 2 | 0 | 0 | 0 | 0 | 0 | 60 | 41 | 37 |
| 22:00 | 0 | 0 | 0 | 2 | 13 | 15 | 10 | 1 | 0 | 0 | 0 | 0 | 0 | 41 | 41 | 36 |
| 23:00 | 0 | 0 | 0 | 1 | 4 | 11 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 20 | 41 | 37 |
| Total | 89 | 67 | 106 | 452 | 1858 | 1561 | 257 | 20 | 1 | 0 | 0 | 0 | 0 | 4411 | | |
| % | 2.0% | 1.5% | 2.4% | 10.2% | 42.1% | 35.4% | 5.8% | 0.5% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| AM Peak | 08:00 | 07:00 | 07:00 | 08:00 | 07:00 | 07:00 | 06:00 | 05:00 | | | | | | 07:00 | | |
| Vol. | 22 | 14 | 21 | 68 | 190 | 116 | 18 | 3 | | | | | | 405 | | |
| PM Peak | 13:00 | 16:00 | 16:00 | 15:00 | 17:00 | 17:00 | 16:00 | 16:00 | 15:00 | | | | | 17:00 | | |
| Vol. | 12 | 10 | 14 | 61 | 193 | 161 | 29 | 2 | 1 | | | | | 423 | | |

Stats

| | |
|---|---|
| 15th Percentile : | 28 MPH |
| 50th Percentile : | 33 MPH |
| 85th Percentile : | 37 MPH |
| 95th Percentile : | 40 MPH |
| Mean Speed(Average) : | 33 MPH |
| 10 MPH Pace Speed : | 30-39 MPH |
| Number in Pace : | 3419 |
| Percent in Pace : | 77.5% |
| Number of Vehicles > 30 MPH : | 3325 |
| Percent of Vehicles > 30 MPH : | 75.4% |

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

165254 A Speed
Site Code: 16071

NB

| Start Time | 1 14 | 15 19 | 20 24 | 25 29 | 30 34 | 35 39 | 40 44 | 45 49 | 50 54 | 55 59 | 60 64 | 65 69 | 70 9999 | Total | 85th % ile | Ave Speed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/07/ 16 | 0 | 0 | 0 | 0 | 2 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 37 | 35 |
| 01:00 | 0 | 0 | 0 | 1 | 6 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 10 | 45 | 36 |
| 02:00 | 0 | 0 | 0 | 1 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 40 | 36 |
| 03:00 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 22 | 20 |
| 04:00 | 0 | 0 | 0 | 0 | 3 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 38 | 36 |
| 05:00 | 0 | 0 | 1 | 7 | 21 | 27 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 62 | 38 | 34 |
| 06:00 | 0 | 0 | 4 | 26 | 94 | 101 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 239 | 37 | 34 |
| 07:00 | 0 | 4 | 5 | 55 | **182** | **125** | **24** | **4** | 0 | 0 | 0 | 0 | 0 | **399** | 37 | 33 |
| 08:00 | **17** | **6** | **27** | **80** | 156 | 85 | 8 | 1 | **1** | 0 | 0 | 0 | 0 | 381 | 36 | 30 |
| 09:00 | 4 | 5 | 4 | 37 | 108 | 79 | 8 | 1 | 1 | 0 | 0 | 0 | 0 | 247 | 37 | 32 |
| 10:00 | 0 | 1 | 11 | 32 | 95 | 58 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 206 | 37 | 32 |
| 11:00 | 2 | 0 | 8 | 41 | 102 | 93 | 13 | 3 | 0 | 0 | 0 | 0 | 0 | 262 | 37 | 33 |
| 12 PM | 0 | 0 | 6 | 32 | 101 | 59 | 14 | **2** | 0 | 0 | 0 | 0 | 0 | 214 | 37 | 33 |
| 13:00 | **1** | 0 | 2 | 34 | 98 | 78 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 229 | 37 | 33 |
| 14:00 | 1 | 1 | **10** | 45 | 140 | 96 | 21 | 2 | 0 | 0 | 0 | 0 | 0 | 316 | 37 | 33 |
| 15:00 | 1 | 1 | 5 | 40 | 130 | 90 | 11 | 2 | 0 | 0 | 0 | 0 | 0 | 280 | 37 | 33 |
| 16:00 | 1 | 0 | 3 | 42 | 167 | **138** | **26** | 1 | 0 | 0 | 0 | 0 | 0 | 378 | 37 | 34 |
| 17:00 | 1 | 2 | 9 | **73** | **193** | 116 | 26 | 2 | 0 | 0 | 0 | 0 | 0 | **422** | 37 | 33 |
| 18:00 | 1 | 0 | 3 | 31 | 171 | 109 | 17 | 2 | 0 | 0 | 0 | 0 | 0 | 334 | 37 | 34 |
| 19:00 | 0 | 1 | 0 | 29 | 93 | 72 | 15 | 1 | 0 | 0 | 0 | 0 | 0 | 211 | 37 | 34 |
| 20:00 | 1 | **3** | 5 | 21 | 60 | 61 | 9 | 1 | 0 | 0 | 0 | 0 | 0 | 161 | 37 | 33 |
| 21:00 | 0 | 0 | 1 | 6 | 40 | 35 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 85 | 37 | 34 |
| 22:00 | 0 | 0 | 0 | 3 | 28 | 15 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 48 | 37 | 34 |
| 23:00 | 0 | 0 | 0 | 2 | 7 | 12 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 25 | 39 | 36 |
| Total | 30 | 25 | 105 | 638 | 1997 | 1461 | 246 | 27 | 2 | 0 | 0 | 0 | 0 | 4531 | | |
| % | 0.7% | 0.6% | 2.3% | 14.1% | 44.1% | 32.2% | 5.4% | 0.6% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| AM Peak | 08:00 | 08:00 | 08:00 | 08:00 | 07:00 | 07:00 | 07:00 | 07:00 | 08:00 | | | | | 07:00 | | |
| Vol. | 17 | 6 | 27 | 80 | 182 | 125 | 24 | 4 | 1 | | | | | 399 | | |
| PM Peak | 13:00 | 20:00 | 14:00 | 17:00 | 17:00 | 16:00 | 16:00 | 12:00 | | | | | | 17:00 | | |
| Vol. | 1 | 3 | 10 | 73 | 193 | 138 | 26 | 2 | | | | | | 422 | | |

Stats

| | |
|---|---|
| 15th Percentile : | 28 MPH |
| 50th Percentile : | 32 MPH |
| 85th Percentile : | 37 MPH |
| 95th Percentile : | 39 MPH |
| Mean Speed(Average) : | 33 MPH |
| 10 MPH Pace Speed : | 30-39 MPH |
| Number in Pace : | 3458 |
| Percent in Pace : | 76.3% |
| Number of Vehicles > 30 MPH : | 3334 |
| Percent of Vehicles > 30 MPH : | 73.6% |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Rockwood Road (Route 115)
south of Hillcrest Village
City, State: Norfolk, MA
Client: Green International/ J. Sobel

165254 A Speed
Site Code: 16071

NB

| Start Time | 1 14 | 15 19 | 20 24 | 25 29 | 30 34 | 35 39 | 40 44 | 45 49 | 50 54 | 55 59 | 60 64 | 65 69 | 70 9999 | Total | 85th % ile | Ave Speed |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 09/08/ 16 | 0 | 0 | 0 | 0 | 4 | 3 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 41 | 36 |
| 01:00 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 38 | 37 |
| 02:00 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 0 | 0 | **1** | 0 | 0 | 0 | 4 | 56 | 42 |
| 03:00 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 37 | 31 |
| 04:00 | 0 | 0 | 1 | 0 | 2 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 38 | 35 |
| 05:00 | 0 | 0 | 1 | 2 | 26 | 27 | 9 | **3** | **1** | 0 | 0 | 0 | 0 | 69 | 40 | 36 |
| 06:00 | 0 | 0 | 3 | 32 | 122 | 92 | 16 | 0 | 0 | 0 | 0 | 0 | 0 | 265 | 37 | 34 |
| 07:00 | **3** | **4** | 17 | 43 | 150 | **142** | **24** | 0 | 0 | 1 | 0 | 0 | **1** | **385** | 37 | 33 |
| 08:00 | 1 | 2 | **33** | **98** | **166** | 69 | 13 | 1 | 0 | 0 | 0 | 0 | 0 | 383 | 35 | 31 |
| 09:00 | 2 | 1 | 6 | 47 | 99 | 74 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 242 | 37 | 33 |
| 10:00 | 1 | 0 | 4 | 43 | 90 | 66 | 14 | 1 | 0 | 0 | 0 | 0 | 0 | 219 | 37 | 33 |
| 11:00 | 0 | 0 | 7 | 32 | 109 | 68 | 10 | 2 | 0 | 0 | 0 | 0 | 0 | 228 | 37 | 33 |
| 12 PM | 1 | 0 | 1 | 39 | 104 | 72 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 231 | 37 | 33 |
| 13:00 | 0 | 1 | 7 | 42 | 92 | 64 | 16 | 0 | **1** | 0 | 0 | 0 | 0 | 223 | 37 | 33 |
| 14:00 | 0 | 1 | **20** | 60 | 155 | 64 | 8 | 1 | 0 | 0 | 0 | 0 | 0 | 309 | 36 | 32 |
| 15:00 | 0 | 3 | 15 | 58 | 142 | 66 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 288 | 36 | 32 |
| 16:00 | **3** | 2 | 4 | 48 | 162 | 121 | **27** | 0 | 0 | 0 | 0 | 0 | 0 | 367 | 37 | 33 |
| 17:00 | 1 | **6** | 11 | **67** | **198** | **148** | 23 | 1 | 0 | 0 | 0 | 0 | 0 | **455** | 37 | 33 |
| 18:00 | 1 | 2 | 15 | 55 | 163 | 123 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 371 | 37 | 33 |
| 19:00 | 0 | 0 | 3 | 19 | 102 | 84 | 11 | **2** | 0 | 0 | 0 | 0 | 0 | 221 | 37 | 34 |
| 20:00 | 0 | 1 | 8 | 12 | 47 | 53 | 12 | 1 | 0 | 0 | 0 | 0 | 0 | 134 | 38 | 34 |
| 21:00 | 0 | 0 | 4 | 7 | 33 | 33 | 6 | 1 | 0 | 0 | 0 | 0 | 0 | 84 | 38 | 34 |
| 22:00 | 0 | 0 | 0 | 1 | 29 | 14 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 53 | 39 | 35 |
| 23:00 | 0 | 0 | 0 | 2 | 20 | 12 | 11 | 1 | 0 | 0 | 0 | 0 | 0 | 46 | 41 | 36 |
| Total | 13 | 24 | 160 | 707 | 2017 | 1406 | 257 | 14 | 2 | 2 | 0 | 0 | 1 | 4603 | | |
| % | 0.3% | 0.5% | 3.5% | 15.4% | 43.8% | 30.5% | 5.6% | 0.3% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | | | |
| AM Peak | 07:00 | 07:00 | 08:00 | 08:00 | 08:00 | 07:00 | 07:00 | 05:00 | 05:00 | 02:00 | | | 07:00 | 07:00 | | |
| Vol. | 3 | 4 | 33 | 98 | 166 | 142 | 24 | 3 | 1 | 1 | | | 1 | 385 | | |
| PM Peak | 16:00 | 17:00 | 14:00 | 17:00 | 17:00 | 17:00 | 16:00 | 19:00 | 13:00 | | | | | 17:00 | | |
| Vol. | 3 | 6 | 20 | 67 | 198 | 148 | 27 | 2 | 1 | | | | | 455 | | |

Stats

| | |
|---|---|
| 15th Percentile : | 27 MPH |
| 50th Percentile : | 32 MPH |
| 85th Percentile : | 37 MPH |
| 95th Percentile : | 39 MPH |
| Mean Speed(Average) : | 33 MPH |
| 10 MPH Pace Speed : | 30-39 MPH |
| Number in Pace : | 3423 |
| Percent in Pace : | 74.4% |
| Number of Vehicles > 30 MPH : | 3296 |
| Percent of Vehicles > 30 MPH : | 71.6% |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 A
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Cars - Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 0 | 124 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 92 | 0 | 0 | 0 | 0 | 0 | 0 | 219 |
| 07:15 AM | 0 | 87 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 180 |
| 07:30 AM | 0 | 91 | 2 | 0 | 0 | 0 | 2 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 0 | 207 |
| 07:45 AM | 0 | 99 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 84 | 0 | 0 | 0 | 0 | 0 | 0 | 185 |
| Total | 0 | 401 | 4 | 0 | 3 | 0 | 6 | 0 | 2 | 375 | 0 | 0 | 0 | 0 | 0 | 0 | 791 |
| 08:00 AM | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 0 | 222 |
| 08:15 AM | 0 | 79 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 0 | 176 |
| 08:30 AM | 0 | 60 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 86 | 0 | 0 | 0 | 0 | 0 | 0 | 147 |
| 08:45 AM | 0 | 101 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 194 |
| Total | 0 | 335 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 400 | 0 | 0 | 0 | 0 | 0 | 0 | 739 |
| Grand Total | 0 | 736 | 4 | 0 | 5 | 0 | 8 | 0 | 2 | 775 | 0 | 0 | 0 | 0 | 0 | 0 | 1530 |
| Apprch % | 0 | 99.5 | 0.5 | 0 | 38.5 | 0 | 61.5 | 0 | 0.3 | 99.7 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 48.1 | 0.3 | 0 | 0.3 | 0 | 0.5 | 0 | 0.1 | 50.7 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Cars | 0 | 702 | 3 | 0 | 4 | 0 | 8 | 0 | 2 | 719 | 0 | 0 | 0 | 0 | 0 | 0 | 1438 |
| % Cars | 0 | 95.4 | 75 | 0 | 80 | 0 | 100 | 0 | 100 | 92.8 | 0 | 0 | 0 | 0 | 0 | 0 | 94 |
| Heavy Vehicles | 0 | 34 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 92 |
| % Heavy Vehicles | 0 | 4.6 | 25 | 0 | 20 | 0 | 0 | 0 | 0 | 7.2 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 87 | 2 | 0 | 89 | 1 | 0 | 2 | 0 | 3 | 1 | 87 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 180 |
| 07:30 AM | 0 | 91 | 2 | 0 | 93 | 0 | 0 | 2 | 0 | 2 | 0 | 112 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 207 |
| 07:45 AM | 0 | 99 | 0 | 0 | 99 | 1 | 0 | 0 | 0 | 1 | 1 | 84 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 185 |
| 08:00 AM | 0 | 95 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 222 |
| Total Volume | 0 | 372 | 4 | 0 | 376 | 2 | 0 | 4 | 0 | 6 | 2 | 410 | 0 | 0 | 412 | 0 | 0 | 0 | 0 | 0 | 794 |
| % App. Total | 0 | 98.9 | 1.1 | 0 | | 33.3 | 0 | 66.7 | 0 | | 0.5 | 99.5 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .939 | .500 | .000 | .949 | .500 | .000 | .500 | .000 | .500 | .500 | .807 | .000 | .000 | .811 | .000 | .000 | .000 | .000 | .000 | .894 |
| Cars | 0 | 354 | 3 | 0 | 357 | 1 | 0 | 4 | 0 | 5 | 2 | 377 | 0 | 0 | 379 | 0 | 0 | 0 | 0 | 0 | 741 |
| % Cars | 0 | 95.2 | 75.0 | 0 | 94.9 | 50.0 | 0 | 100 | 0 | 83.3 | 100 | 92.0 | 0 | 0 | 92.0 | 0 | 0 | 0 | 0 | 0 | 93.3 |
| Heavy Vehicles | 0 | 18 | 1 | 0 | 19 | 1 | 0 | 0 | 0 | 1 | 0 | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 53 |
| % Heavy Vehicles | 0 | 4.8 | 25.0 | 0 | 5.1 | 50.0 | 0 | 0 | 0 | 16.7 | 0 | 8.0 | 0 | 0 | 8.0 | 0 | 0 | 0 | 0 | 0 | 6.7 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 A
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Cars

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 0 | 121 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 0 | 211 |
| 07:15 AM | 0 | 85 | 2 | 0 | 1 | 0 | 2 | 0 | 1 | 79 | 0 | 0 | 0 | 0 | 0 | 0 | 170 |
| 07:30 AM | 0 | 88 | 1 | 0 | 0 | 0 | 2 | 0 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 0 | 194 |
| 07:45 AM | 0 | 90 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 78 | 0 | 0 | 0 | 0 | 0 | 0 | 169 |
| Total | 0 | 384 | 3 | 0 | 2 | 0 | 6 | 0 | 2 | 347 | 0 | 0 | 0 | 0 | 0 | 0 | 744 |
| 08:00 AM | 0 | 91 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 117 | 0 | 0 | 0 | 0 | 0 | 0 | 208 |
| 08:15 AM | 0 | 77 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 0 | 166 |
| 08:30 AM | 0 | 58 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 83 | 0 | 0 | 0 | 0 | 0 | 0 | 142 |
| 08:45 AM | 0 | 92 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 84 | 0 | 0 | 0 | 0 | 0 | 0 | 178 |
| Total | 0 | 318 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 372 | 0 | 0 | 0 | 0 | 0 | 0 | 694 |
| Grand Total | 0 | 702 | 3 | 0 | 4 | 0 | 8 | 0 | 2 | 719 | 0 | 0 | 0 | 0 | 0 | 0 | 1438 |
| Apprch % | 0 | 99.6 | 0.4 | 0 | 33.3 | 0 | 66.7 | 0 | 0.3 | 99.7 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 48.8 | 0.2 | 0 | 0.3 | 0 | 0.6 | 0 | 0.1 | 50 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:00 AM | 0 | 121 | 0 | 0 | 121 | 1 | 0 | 2 | 0 | 3 | 0 | 87 | 0 | 0 | 87 | 0 | 0 | 0 | 0 | 0 | 211 |
| 07:15 AM | 0 | 85 | 2 | 0 | 87 | 1 | 0 | 2 | 0 | 3 | 1 | 79 | 0 | 0 | 80 | 0 | 0 | 0 | 0 | 0 | 170 |
| 07:30 AM | 0 | 88 | 1 | 0 | 89 | 0 | 0 | 2 | 0 | 2 | 0 | 103 | 0 | 0 | 103 | 0 | 0 | 0 | 0 | 0 | 194 |
| 07:45 AM | 0 | 90 | 0 | 0 | 90 | 0 | 0 | 0 | 0 | 0 | 1 | 78 | 0 | 0 | 79 | 0 | 0 | 0 | 0 | 0 | 169 |
| Total Volume | 0 | 384 | 3 | 0 | 387 | 2 | 0 | 6 | 0 | 8 | 2 | 347 | 0 | 0 | 349 | 0 | 0 | 0 | 0 | 0 | 744 |
| % App. Total | 0 | 99.2 | 0.8 | 0 | | 25 | 0 | 75 | 0 | | 0.6 | 99.4 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .793 | .375 | .000 | .800 | .500 | .000 | .750 | .000 | .667 | .500 | .842 | .000 | .000 | .847 | .000 | .000 | .000 | .000 | .000 | .882 |

PRECISION
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Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 A
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 07:15 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 07:30 AM | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 13 |
| 07:45 AM | 0 | 9 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| Total | 0 | 17 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 47 |
| 08:00 AM | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| 08:15 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 0 | 10 |
| 08:30 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 5 |
| 08:45 AM | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 16 |
| Total | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 28 | 0 | 0 | 0 | 0 | 0 | 0 | 45 |
| Grand Total | 0 | 34 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 56 | 0 | 0 | 0 | 0 | 0 | 0 | 92 |
| Apprch % | 0 | 97.1 | 2.9 | 0 | 100 | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 37 | 1.1 | 0 | 1.1 | 0 | 0 | 0 | 0 | 60.9 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 10 |
| 07:30 AM | 0 | 3 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 13 |
| 07:45 AM | 0 | 9 | 0 | 0 | 9 | 1 | 0 | 0 | 0 | 1 | 0 | 6 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 16 |
| 08:00 AM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 0 | 0 | 10 | 0 | 0 | 0 | 0 | 0 | 14 |
| Total Volume | 0 | 18 | 1 | 0 | 19 | 1 | 0 | 0 | 0 | 1 | 0 | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 53 |
| % App. Total | 0 | 94.7 | 5.3 | 0 | | 100 | 0 | 0 | 0 | | 0 | 100 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .500 | .250 | .000 | .528 | .250 | .000 | .000 | .000 | .250 | .000 | .825 | .000 | .000 | .825 | .000 | .000 | .000 | .000 | .000 | .828 |

PRECISION
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N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 A
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Peds and Bicycles

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | Right | Thru | Left | Peds SB | Peds NB | Right | Thru | Left | Peds WB | Peds EB | Right | Thru | Left | Peds NB | Peds SB | Int. Total |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 08:30 AM | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 5 |
| 08:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 |
| Grand Total | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 10 | 1 | 0 | 1 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 1 | 36 |
| Apprch % | 0 | 0 | 0 | 0 | 100 | 0 | 0 | 0 | 90.9 | 9.1 | 0 | 4.3 | 0 | 95.7 | 0 | 0 | 0 | 0 | 0 | 100 | |
| Total % | 0 | 0 | 0 | 0 | 2.8 | 0 | 0 | 0 | 27.8 | 2.8 | 0 | 2.8 | 0 | 61.1 | 0 | 0 | 0 | 0 | 0 | 2.8 | |

| | Rockwood Road (Route 115) From North | | | | | | Ware Drive (Geneva Drive) From East | | | | | | Rockwood Road (Route 115) From South | | | | | | Driveway From West | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | App. Total | Right | Thru | Left | Peds SB | Peds NB | App. Total | Right | Thru | Left | Peds WB | Peds EB | App. Total | Right | Thru | Left | Peds NB | Peds SB | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 07:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:15 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 17 | 0 | 17 | 0 | 0 | 0 | 0 | 0 | 0 | 21 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 5 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| Total Volume | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 | 0 | 8 | 0 | 0 | 0 | 22 | 0 | 22 | 0 | 0 | 0 | 0 | 0 | 0 | 30 |
| % App. Total | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 100 | 0 | | 0 | 0 | 0 | 100 | 0 | | 0 | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .500 | .000 | .500 | .000 | .000 | .000 | .324 | .000 | .324 | .000 | .000 | .000 | .000 | .000 | .000 | .357 |

PRECISION
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N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 A
Site Code : 16071
Start Date : 9/8/2016
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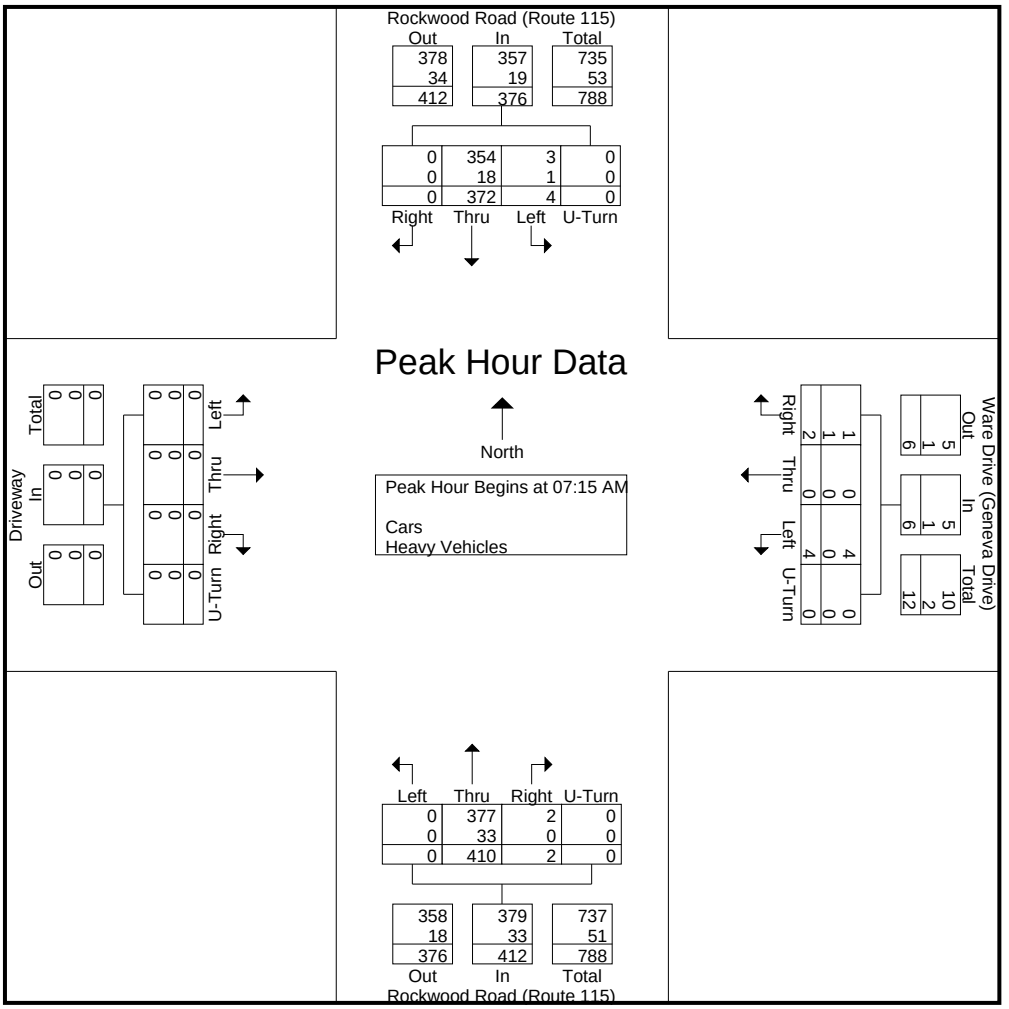
| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:15 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:15 AM | 0 | 87 | 2 | 0 | 89 | 1 | 0 | 2 | 0 | 3 | 1 | 87 | 0 | 0 | 88 | 0 | 0 | 0 | 0 | 0 | 180 |
| 07:30 AM | 0 | 91 | 2 | 0 | 93 | 0 | 0 | 2 | 0 | 2 | 0 | 112 | 0 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 207 |
| 07:45 AM | 0 | 99 | 0 | 0 | 99 | 1 | 0 | 0 | 0 | 1 | 1 | 84 | 0 | 0 | 85 | 0 | 0 | 0 | 0 | 0 | 185 |
| 08:00 AM | 0 | 95 | 0 | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 127 | 0 | 0 | 127 | 0 | 0 | 0 | 0 | 0 | 222 |
| Total Volume | 0 | 372 | 4 | 0 | 376 | 2 | 0 | 4 | 0 | 6 | 2 | 410 | 0 | 0 | 412 | 0 | 0 | 0 | 0 | 0 | 794 |
| % App. Total | 0 | 98.9 | 1.1 | 0 | | 33.3 | 0 | 66.7 | 0 | | 0.5 | 99.5 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .939 | .500 | .000 | .949 | .500 | .000 | .500 | .000 | .500 | .500 | .807 | .000 | .000 | .811 | .000 | .000 | .000 | .000 | .000 | .894 |
| Cars | 0 | 354 | 3 | 0 | 357 | 1 | 0 | 4 | 0 | 5 | 2 | 377 | 0 | 0 | 379 | 0 | 0 | 0 | 0 | 0 | 741 |
| % Cars | 0 | 95.2 | 75.0 | 0 | 94.9 | 50.0 | 0 | 100 | 0 | 83.3 | 100 | 92.0 | 0 | 0 | 92.0 | 0 | 0 | 0 | 0 | 0 | 93.3 |
| Heavy Vehicles | 0 | 18 | 1 | 0 | 19 | 1 | 0 | 0 | 0 | 1 | 0 | 33 | 0 | 0 | 33 | 0 | 0 | 0 | 0 | 0 | 53 |
| % Heavy Vehicles | 0 | 4.8 | 25.0 | 0 | 5.1 | 50.0 | 0 | 0 | 0 | 16.7 | 0 | 8.0 | 0 | 0 | 8.0 | 0 | 0 | 0 | 0 | 0 | 6.7 |



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File Name : 165254 AA
Site Code : 16071
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Page No : 1

Groups Printed- Cars - Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 0 | 100 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 85 | 0 | 0 | 0 | 0 | 0 | 0 | 190 |
| 04:15 PM | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 85 | 2 | 0 | 1 | 0 | 0 | 0 | 189 |
| 04:30 PM | 0 | 82 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 205 |
| 04:45 PM | 0 | 100 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 197 |
| Total | 0 | 382 | 3 | 0 | 1 | 0 | 4 | 0 | 3 | 385 | 2 | 0 | 1 | 0 | 0 | 0 | 781 |
| 05:00 PM | 0 | 110 | 0 | 0 | 0 | 0 | 2 | 0 | 2 | 122 | 0 | 0 | 0 | 0 | 0 | 0 | 236 |
| 05:15 PM | 1 | 100 | 0 | 0 | 1 | 0 | 0 | 0 | 2 | 92 | 1 | 0 | 1 | 0 | 1 | 0 | 199 |
| 05:30 PM | 0 | 112 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 147 | 0 | 0 | 0 | 0 | 0 | 0 | 261 |
| 05:45 PM | 0 | 112 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 210 |
| Total | 1 | 434 | 1 | 0 | 1 | 0 | 3 | 0 | 7 | 456 | 1 | 0 | 1 | 0 | 1 | 0 | 906 |
| Grand Total | 1 | 816 | 4 | 0 | 2 | 0 | 7 | 0 | 10 | 841 | 3 | 0 | 2 | 0 | 1 | 0 | 1687 |
| Apprch % | 0.1 | 99.4 | 0.5 | 0 | 22.2 | 0 | 77.8 | 0 | 1.2 | 98.5 | 0.4 | 0 | 66.7 | 0 | 33.3 | 0 | |
| Total % | 0.1 | 48.4 | 0.2 | 0 | 0.1 | 0 | 0.4 | 0 | 0.6 | 49.9 | 0.2 | 0 | 0.1 | 0 | 0.1 | 0 | |
| Cars | 1 | 797 | 4 | 0 | 1 | 0 | 7 | 0 | 9 | 829 | 3 | 0 | 2 | 0 | 1 | 0 | 1654 |
| % Cars | 100 | 97.7 | 100 | 0 | 50 | 0 | 100 | 0 | 90 | 98.6 | 100 | 0 | 100 | 0 | 100 | 0 | 98 |
| Heavy Vehicles | 0 | 19 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| % Heavy Vehicles | 0 | 2.3 | 0 | 0 | 50 | 0 | 0 | 0 | 10 | 1.4 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 110 | 0 | 0 | 110 | 0 | 0 | 2 | 0 | 2 | 2 | 122 | 0 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 236 |
| 05:15 PM | 1 | 100 | 0 | 0 | 101 | 1 | 0 | 0 | 0 | 1 | 2 | 92 | 1 | 0 | 95 | 1 | 0 | 1 | 0 | 2 | 199 |
| 05:30 PM | 0 | 112 | 1 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 1 | 147 | 0 | 0 | 148 | 0 | 0 | 0 | 0 | 0 | 261 |
| 05:45 PM | 0 | 112 | 0 | 0 | 112 | 0 | 0 | 1 | 0 | 1 | 2 | 95 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 | 210 |
| Total Volume | 1 | 434 | 1 | 0 | 436 | 1 | 0 | 3 | 0 | 4 | 7 | 456 | 1 | 0 | 464 | 1 | 0 | 1 | 0 | 2 | 906 |
| % App. Total | 0.2 | 99.5 | 0.2 | 0 | | 25 | 0 | 75 | 0 | | 1.5 | 98.3 | 0.2 | 0 | | 50 | 0 | 50 | 0 | | |
| PHF | .250 | .969 | .250 | .000 | .965 | .250 | .000 | .375 | .000 | .500 | .875 | .776 | .250 | .000 | .784 | .250 | .000 | .250 | .000 | .250 | .868 |
| Cars | 1 | 428 | 1 | 0 | 430 | 0 | 0 | 3 | 0 | 3 | 6 | 449 | 1 | 0 | 456 | 1 | 0 | 1 | 0 | 2 | 891 |
| % Cars | 100 | 98.6 | 100 | 0 | 98.6 | 0 | 0 | 100 | 0 | 75.0 | 85.7 | 98.5 | 100 | 0 | 98.3 | 100 | 0 | 100 | 0 | 100 | 98.3 |
| Heavy Vehicles | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 15 |
| % Heavy Vehicles | 0 | 1.4 | 0 | 0 | 1.4 | 100 | 0 | 0 | 0 | 25.0 | 14.3 | 1.5 | 0 | 0 | 1.7 | 0 | 0 | 0 | 0 | 0 | 1.7 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 AA
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Cars

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 0 | 99 | 2 | 0 | 0 | 0 | 2 | 0 | 1 | 82 | 0 | 0 | 0 | 0 | 0 | 0 | 186 |
| 04:15 PM | 0 | 95 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 84 | 2 | 0 | 1 | 0 | 0 | 0 | 183 |
| 04:30 PM | 0 | 78 | 1 | 0 | 1 | 0 | 1 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 0 | 201 |
| 04:45 PM | 0 | 97 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 193 |
| Total | 0 | 369 | 3 | 0 | 1 | 0 | 4 | 0 | 3 | 380 | 2 | 0 | 1 | 0 | 0 | 0 | 763 |
| 05:00 PM | 0 | 108 | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 119 | 0 | 0 | 0 | 0 | 0 | 0 | 230 |
| 05:15 PM | 1 | 99 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 92 | 1 | 0 | 1 | 0 | 1 | 0 | 197 |
| 05:30 PM | 0 | 111 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 144 | 0 | 0 | 0 | 0 | 0 | 0 | 257 |
| 05:45 PM | 0 | 110 | 0 | 0 | 0 | 0 | 1 | 0 | 2 | 94 | 0 | 0 | 0 | 0 | 0 | 0 | 207 |
| Total | 1 | 428 | 1 | 0 | 0 | 0 | 3 | 0 | 6 | 449 | 1 | 0 | 1 | 0 | 1 | 0 | 891 |
| Grand Total | 1 | 797 | 4 | 0 | 1 | 0 | 7 | 0 | 9 | 829 | 3 | 0 | 2 | 0 | 1 | 0 | 1654 |
| Apprch % | 0.1 | 99.4 | 0.5 | 0 | 12.5 | 0 | 87.5 | 0 | 1.1 | 98.6 | 0.4 | 0 | 66.7 | 0 | 33.3 | 0 | |
| Total % | 0.1 | 48.2 | 0.2 | 0 | 0.1 | 0 | 0.4 | 0 | 0.5 | 50.1 | 0.2 | 0 | 0.1 | 0 | 0.1 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 108 | 0 | 0 | 108 | 0 | 0 | 2 | 0 | 2 | 1 | 119 | 0 | 0 | 120 | 0 | 0 | 0 | 0 | 0 | 230 |
| 05:15 PM | 1 | 99 | 0 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 2 | 92 | 1 | 0 | 95 | 1 | 0 | 1 | 0 | 2 | 197 |
| 05:30 PM | 0 | 111 | 1 | 0 | 112 | 0 | 0 | 0 | 0 | 0 | 1 | 144 | 0 | 0 | 145 | 0 | 0 | 0 | 0 | 0 | 257 |
| 05:45 PM | 0 | 110 | 0 | 0 | 110 | 0 | 0 | 1 | 0 | 1 | 2 | 94 | 0 | 0 | 96 | 0 | 0 | 0 | 0 | 0 | 207 |
| Total Volume | 1 | 428 | 1 | 0 | 430 | 0 | 0 | 3 | 0 | 3 | 6 | 449 | 1 | 0 | 456 | 1 | 0 | 1 | 0 | 2 | 891 |
| % App. Total | 0.2 | 99.5 | 0.2 | 0 | | 0 | 0 | 100 | 0 | | 1.3 | 98.5 | 0.2 | 0 | | 50 | 0 | 50 | 0 | | |
| PHF | .250 | .964 | .250 | .000 | .960 | .000 | .000 | .375 | .000 | .375 | .750 | .780 | .250 | .000 | .786 | .250 | .000 | .250 | .000 | .250 | .867 |

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File Name : 165254 AA
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Ware Drive (Geneva Drive) From East | | | | Rockwood Road (Route 115) From South | | | | Driveway From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:15 PM | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 04:30 PM | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:45 PM | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Total | 0 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 18 |
| 05:00 PM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 05:15 PM | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:30 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 05:45 PM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| Total | 0 | 6 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 15 |
| Grand Total | 0 | 19 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 12 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| Apprch % | 0 | 100 | 0 | 0 | 100 | 0 | 0 | 0 | 7.7 | 92.3 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 57.6 | 0 | 0 | 3 | 0 | 0 | 0 | 3 | 36.4 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:15 PM | | | | | | | | | | | | | | | | | | | | | |
| 04:15 PM | 0 | 5 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 6 |
| 04:30 PM | 0 | 4 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:45 PM | 0 | 3 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 05:00 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 1 | 3 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 6 |
| Total Volume | 0 | 14 | 0 | 0 | 14 | 0 | 0 | 0 | 0 | 0 | 1 | 5 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 20 |
| % App. Total | 0 | 100 | 0 | 0 | | 0 | 0 | 0 | 0 | | 16.7 | 83.3 | 0 | 0 | | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .700 | .000 | .000 | .700 | .000 | .000 | .000 | .000 | .000 | .250 | .417 | .000 | .000 | .375 | .000 | .000 | .000 | .000 | .000 | .833 |

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E/W: Ware Drive/ Driveway
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 AA
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Peds and Bicycles

| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | Right | Thru | Left | Peds SB | Peds NB | Right | Thru | Left | Peds WB | Peds EB | Right | Thru | Left | Peds NB | Peds SB | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 5 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 8 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 0 | 0 | 0 | 1 | 9 | 0 | 0 | 0 | 0 | 0 | 20 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 11 | 0 | 0 | 0 | 4 | 10 | 0 | 0 | 0 | 0 | 0 | 32 |
| Grand Total | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 6 | 14 | 0 | 0 | 0 | 4 | 12 | 0 | 0 | 0 | 0 | 0 | 37 |
| Apprch % | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 70 | 0 | 0 | 0 | 25 | 75 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 2.7 | 0 | 0 | 0 | 0 | 0 | 0 | 16.2 | 37.8 | 0 | 0 | 0 | 10.8 | 32.4 | 0 | 0 | 0 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | | Ware Drive (Geneva Drive) From East | | | | | | Rockwood Road (Route 115) From South | | | | | | Driveway From West | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | App. Total | Right | Thru | Left | Peds SB | Peds NB | App. Total | Right | Thru | Left | Peds WB | Peds EB | App. Total | Right | Thru | Left | Peds NB | Peds SB | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 3 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 8 | 10 | 0 | 0 | 0 | 1 | 9 | 10 | 0 | 0 | 0 | 0 | 0 | 0 | 20 |
| 05:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| Total Volume | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 6 | 11 | 17 | 0 | 0 | 0 | 4 | 10 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 32 |
| % App. Total | 0 | 100 | 0 | 0 | 0 | | 0 | 0 | 0 | 35.3 | 64.7 | | 0 | 0 | 0 | 28.6 | 71.4 | | 0 | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .250 | .000 | .000 | .000 | .250 | .000 | .000 | .000 | .500 | .344 | .425 | .000 | .000 | .000 | .333 | .278 | .350 | .000 | .000 | .000 | .000 | .000 | .000 | .400 |

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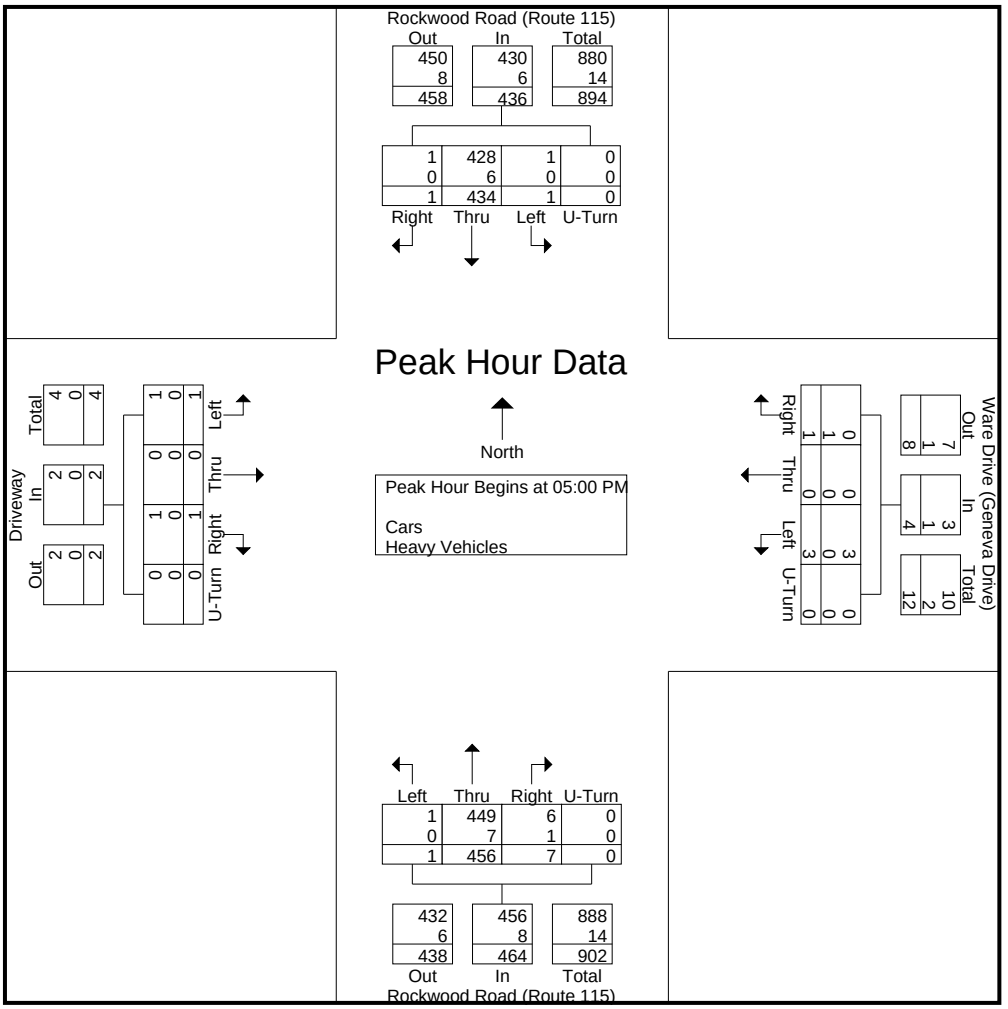
| | Rockwood Road (Route 115) From North | | | | | Ware Drive (Geneva Drive) From East | | | | | Rockwood Road (Route 115) From South | | | | | Driveway From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 110 | 0 | 0 | 110 | 0 | 0 | 2 | 0 | 2 | 2 | 122 | 0 | 0 | 124 | 0 | 0 | 0 | 0 | 0 | 236 |
| 05:15 PM | 1 | 100 | 0 | 0 | 101 | 1 | 0 | 0 | 0 | 1 | 2 | 92 | 1 | 0 | 95 | 1 | 0 | 1 | 0 | 2 | 199 |
| 05:30 PM | 0 | 112 | 1 | 0 | 113 | 0 | 0 | 0 | 0 | 0 | 1 | 147 | 0 | 0 | 148 | 0 | 0 | 0 | 0 | 0 | 261 |
| 05:45 PM | 0 | 112 | 0 | 0 | 112 | 0 | 0 | 1 | 0 | 1 | 2 | 95 | 0 | 0 | 97 | 0 | 0 | 0 | 0 | 0 | 210 |
| Total Volume | 1 | 434 | 1 | 0 | 436 | 1 | 0 | 3 | 0 | 4 | 7 | 456 | 1 | 0 | 464 | 1 | 0 | 1 | 0 | 2 | 906 |
| % App. Total | 0.2 | 99.5 | 0.2 | 0 | | 25 | 0 | 75 | 0 | | 1.5 | 98.3 | 0.2 | 0 | | 50 | 0 | 50 | 0 | | |
| PHF | .250 | .969 | .250 | .000 | .965 | .250 | .000 | .375 | .000 | .500 | .875 | .776 | .250 | .000 | .784 | .250 | .000 | .250 | .000 | .250 | .868 |
| Cars | 1 | 428 | 1 | 0 | 430 | 0 | 0 | 3 | 0 | 3 | 6 | 449 | 1 | 0 | 456 | 1 | 0 | 1 | 0 | 2 | 891 |
| % Cars | 100 | 98.6 | 100 | 0 | 98.6 | 0 | 0 | 100 | 0 | 75.0 | 85.7 | 98.5 | 100 | 0 | 98.3 | 100 | 0 | 100 | 0 | 100 | 98.3 |
| Heavy Vehicles | 0 | 6 | 0 | 0 | 6 | 1 | 0 | 0 | 0 | 1 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 0 | 0 | 0 | 15 |
| % Heavy Vehicles | 0 | 1.4 | 0 | 0 | 1.4 | 100 | 0 | 0 | 0 | 25.0 | 14.3 | 1.5 | 0 | 0 | 1.7 | 0 | 0 | 0 | 0 | 0 | 1.7 |



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E/W: Boardman Street
City, State: Norfolk, MA
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File Name : 165254 B
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Groups Printed- Cars - Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 11 | 122 | 2 | 0 | 6 | 8 | 9 | 0 | 4 | 78 | 1 | 0 | 8 | 5 | 34 | 0 | 288 |
| 07:15 AM | 15 | 70 | 1 | 0 | 3 | 3 | 0 | 0 | 6 | 85 | 3 | 0 | 8 | 8 | 48 | 0 | 250 |
| 07:30 AM | 17 | 95 | 4 | 0 | 2 | 7 | 3 | 0 | 4 | 92 | 4 | 0 | 8 | 13 | 29 | 0 | 278 |
| 07:45 AM | 19 | 93 | 6 | 0 | 3 | 3 | 7 | 0 | 3 | 80 | 5 | 0 | 6 | 10 | 31 | 0 | 266 |
| Total | 62 | 380 | 13 | 0 | 14 | 21 | 19 | 0 | 17 | 335 | 13 | 0 | 30 | 36 | 142 | 0 | 1082 |
| 08:00 AM | 13 | 66 | 7 | 0 | 4 | 3 | 6 | 0 | 5 | 96 | 9 | 0 | 8 | 9 | 17 | 0 | 243 |
| 08:15 AM | 20 | 76 | 2 | 0 | 3 | 4 | 2 | 0 | 3 | 88 | 1 | 0 | 11 | 9 | 24 | 0 | 243 |
| 08:30 AM | 16 | 56 | 4 | 0 | 3 | 4 | 1 | 0 | 1 | 62 | 2 | 0 | 14 | 4 | 28 | 0 | 195 |
| 08:45 AM | 13 | 72 | 2 | 0 | 1 | 17 | 3 | 0 | 4 | 78 | 19 | 0 | 5 | 7 | 18 | 0 | 239 |
| Total | 62 | 270 | 15 | 0 | 11 | 28 | 12 | 0 | 13 | 324 | 31 | 0 | 38 | 29 | 87 | 0 | 920 |
| Grand Total | 124 | 650 | 28 | 0 | 25 | 49 | 31 | 0 | 30 | 659 | 44 | 0 | 68 | 65 | 229 | 0 | 2002 |
| Apprch % | 15.5 | 81 | 3.5 | 0 | 23.8 | 46.7 | 29.5 | 0 | 4.1 | 89.9 | 6 | 0 | 18.8 | 18 | 63.3 | 0 | |
| Total % | 6.2 | 32.5 | 1.4 | 0 | 1.2 | 2.4 | 1.5 | 0 | 1.5 | 32.9 | 2.2 | 0 | 3.4 | 3.2 | 11.4 | 0 | |
| Cars | 117 | 622 | 24 | 0 | 21 | 32 | 29 | 0 | 25 | 616 | 39 | 0 | 63 | 58 | 218 | 0 | 1864 |
| % Cars | 94.4 | 95.7 | 85.7 | 0 | 84 | 65.3 | 93.5 | 0 | 83.3 | 93.5 | 88.6 | 0 | 92.6 | 89.2 | 95.2 | 0 | 93.1 |
| Heavy Vehicles | 7 | 28 | 4 | 0 | 4 | 17 | 2 | 0 | 5 | 43 | 5 | 0 | 5 | 7 | 11 | 0 | 138 |
| % Heavy Vehicles | 5.6 | 4.3 | 14.3 | 0 | 16 | 34.7 | 6.5 | 0 | 16.7 | 6.5 | 11.4 | 0 | 7.4 | 10.8 | 4.8 | 0 | 6.9 |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:00 AM | 11 | 122 | 2 | 0 | 135 | 6 | 8 | 9 | 0 | 23 | 4 | 78 | 1 | 0 | 83 | 8 | 5 | 34 | 0 | 47 | 288 |
| 07:15 AM | 15 | 70 | 1 | 0 | 86 | 3 | 3 | 0 | 0 | 6 | 6 | 85 | 3 | 0 | 94 | 8 | 8 | 48 | 0 | 64 | 250 |
| 07:30 AM | 17 | 95 | 4 | 0 | 116 | 2 | 7 | 3 | 0 | 12 | 4 | 92 | 4 | 0 | 100 | 8 | 13 | 29 | 0 | 50 | 278 |
| 07:45 AM | 19 | 93 | 6 | 0 | 118 | 3 | 3 | 7 | 0 | 13 | 3 | 80 | 5 | 0 | 88 | 6 | 10 | 31 | 0 | 47 | 266 |
| Total Volume | 62 | 380 | 13 | 0 | 455 | 14 | 21 | 19 | 0 | 54 | 17 | 335 | 13 | 0 | 365 | 30 | 36 | 142 | 0 | 208 | 1082 |
| % App. Total | 13.6 | 83.5 | 2.9 | 0 | | 25.9 | 38.9 | 35.2 | 0 | | 4.7 | 91.8 | 3.6 | 0 | | 14.4 | 17.3 | 68.3 | 0 | | |
| PHF | .816 | .779 | .542 | .000 | .843 | .583 | .656 | .528 | .000 | .587 | .708 | .910 | .650 | .000 | .913 | .938 | .692 | .740 | .000 | .813 | .939 |
| Cars | 60 | 366 | 13 | 0 | 439 | 12 | 17 | 17 | 0 | 46 | 16 | 315 | 11 | 0 | 342 | 27 | 35 | 136 | 0 | 198 | 1025 |
| % Cars | 96.8 | 96.3 | 100 | 0 | 96.5 | 85.7 | 81.0 | 89.5 | 0 | 85.2 | 94.1 | 94.0 | 84.6 | 0 | 93.7 | 90.0 | 97.2 | 95.8 | 0 | 95.2 | 94.7 |
| Heavy Vehicles | 2 | 14 | 0 | 0 | 16 | 2 | 4 | 2 | 0 | 8 | 1 | 20 | 2 | 0 | 23 | 3 | 1 | 6 | 0 | 10 | 57 |
| % Heavy Vehicles | 3.2 | 3.7 | 0 | 0 | 3.5 | 14.3 | 19.0 | 10.5 | 0 | 14.8 | 5.9 | 6.0 | 15.4 | 0 | 6.3 | 10.0 | 2.8 | 4.2 | 0 | 4.8 | 5.3 |

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Groups Printed- Cars

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 11 | 120 | 2 | 0 | 6 | 5 | 8 | 0 | 4 | 78 | 1 | 0 | 8 | 4 | 34 | 0 | 281 |
| 07:15 AM | 15 | 68 | 1 | 0 | 3 | 3 | 0 | 0 | 6 | 78 | 3 | 0 | 7 | 8 | 47 | 0 | 239 |
| 07:30 AM | 17 | 91 | 4 | 0 | 0 | 6 | 3 | 0 | 4 | 84 | 3 | 0 | 7 | 13 | 25 | 0 | 257 |
| 07:45 AM | 17 | 87 | 6 | 0 | 3 | 3 | 6 | 0 | 2 | 75 | 4 | 0 | 5 | 10 | 30 | 0 | 248 |
| Total | 60 | 366 | 13 | 0 | 12 | 17 | 17 | 0 | 16 | 315 | 11 | 0 | 27 | 35 | 136 | 0 | 1025 |
| 08:00 AM | 13 | 62 | 6 | 0 | 2 | 3 | 6 | 0 | 5 | 87 | 6 | 0 | 7 | 9 | 16 | 0 | 222 |
| 08:15 AM | 18 | 74 | 1 | 0 | 3 | 4 | 2 | 0 | 2 | 81 | 1 | 0 | 11 | 9 | 21 | 0 | 227 |
| 08:30 AM | 13 | 54 | 3 | 0 | 3 | 4 | 1 | 0 | 1 | 59 | 2 | 0 | 13 | 3 | 28 | 0 | 184 |
| 08:45 AM | 13 | 66 | 1 | 0 | 1 | 4 | 3 | 0 | 1 | 74 | 19 | 0 | 5 | 2 | 17 | 0 | 206 |
| Total | 57 | 256 | 11 | 0 | 9 | 15 | 12 | 0 | 9 | 301 | 28 | 0 | 36 | 23 | 82 | 0 | 839 |
| Grand Total | 117 | 622 | 24 | 0 | 21 | 32 | 29 | 0 | 25 | 616 | 39 | 0 | 63 | 58 | 218 | 0 | 1864 |
| Apprch % | 15.3 | 81.5 | 3.1 | 0 | 25.6 | 39 | 35.4 | 0 | 3.7 | 90.6 | 5.7 | 0 | 18.6 | 17.1 | 64.3 | 0 | |
| Total % | 6.3 | 33.4 | 1.3 | 0 | 1.1 | 1.7 | 1.6 | 0 | 1.3 | 33 | 2.1 | 0 | 3.4 | 3.1 | 11.7 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:00 AM | 11 | 120 | 2 | 0 | 133 | 6 | 5 | 8 | 0 | 19 | 4 | 78 | 1 | 0 | 83 | 8 | 4 | 34 | 0 | 46 | 281 |
| 07:15 AM | 15 | 68 | 1 | 0 | 84 | 3 | 3 | 0 | 0 | 6 | 6 | 78 | 3 | 0 | 87 | 7 | 8 | 47 | 0 | 62 | 239 |
| 07:30 AM | 17 | 91 | 4 | 0 | 112 | 0 | 6 | 3 | 0 | 9 | 4 | 84 | 3 | 0 | 91 | 7 | 13 | 25 | 0 | 45 | 257 |
| 07:45 AM | 17 | 87 | 6 | 0 | 110 | 3 | 3 | 6 | 0 | 12 | 2 | 75 | 4 | 0 | 81 | 5 | 10 | 30 | 0 | 45 | 248 |
| Total Volume | 60 | 366 | 13 | 0 | 439 | 12 | 17 | 17 | 0 | 46 | 16 | 315 | 11 | 0 | 342 | 27 | 35 | 136 | 0 | 198 | 1025 |
| % App. Total | 13.7 | 83.4 | 3 | 0 | | 26.1 | 37 | 37 | 0 | | 4.7 | 92.1 | 3.2 | 0 | | 13.6 | 17.7 | 68.7 | 0 | | |
| PHF | .882 | .763 | .542 | .000 | .825 | .500 | .708 | .531 | .000 | .605 | .667 | .938 | .688 | .000 | .940 | .844 | .673 | .723 | .000 | .798 | .912 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 B
Site Code : 16071
Start Date : 9/8/2016


Groups Printed- Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 07:00 AM | 0 | 2 | 0 | 0 | 0 | 3 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 7 |
| 07:15 AM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 0 | 1 | 0 | 1 | 0 | 11 |
| 07:30 AM | 0 | 4 | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 8 | 1 | 0 | 1 | 0 | 4 | 0 | 21 |
| 07:45 AM | 2 | 6 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 5 | 1 | 0 | 1 | 0 | 1 | 0 | 18 |
| Total | 2 | 14 | 0 | 0 | 2 | 4 | 2 | 0 | 1 | 20 | 2 | 0 | 3 | 1 | 6 | 0 | 57 |
| 08:00 AM | 0 | 4 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 9 | 3 | 0 | 1 | 0 | 1 | 0 | 21 |
| 08:15 AM | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 0 | 0 | 3 | 0 | 16 |
| 08:30 AM | 3 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 0 | 11 |
| 08:45 AM | 0 | 6 | 1 | 0 | 0 | 13 | 0 | 0 | 3 | 4 | 0 | 0 | 0 | 5 | 1 | 0 | 33 |
| Total | 5 | 14 | 4 | 0 | 2 | 13 | 0 | 0 | 4 | 23 | 3 | 0 | 2 | 6 | 5 | 0 | 81 |
| Grand Total | 7 | 28 | 4 | 0 | 4 | 17 | 2 | 0 | 5 | 43 | 5 | 0 | 5 | 7 | 11 | 0 | 138 |
| Apprch % | 17.9 | 71.8 | 10.3 | 0 | 17.4 | 73.9 | 8.7 | 0 | 9.4 | 81.1 | 9.4 | 0 | 21.7 | 30.4 | 47.8 | 0 | |
| Total % | 5.1 | 20.3 | 2.9 | 0 | 2.9 | 12.3 | 1.4 | 0 | 3.6 | 31.2 | 3.6 | 0 | 3.6 | 5.1 | 8 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | | | | | | | | | | | | |
| 08:00 AM | 0 | 4 | 1 | 0 | 5 | 2 | 0 | 0 | 0 | 2 | 0 | 9 | 3 | 0 | 12 | 1 | 0 | 1 | 0 | 2 | 21 |
| 08:15 AM | 2 | 2 | 1 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 1 | 7 | 0 | 0 | 8 | 0 | 0 | 3 | 0 | 3 | 16 |
| 08:30 AM | 3 | 2 | 1 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 3 | 1 | 1 | 0 | 0 | 2 | 11 |
| 08:45 AM | 0 | 6 | 1 | 0 | 7 | 0 | 13 | 0 | 0 | 13 | 3 | 4 | 0 | 0 | 7 | 0 | 5 | 1 | 0 | 6 | 33 |
| Total Volume | 5 | 14 | 4 | 0 | 23 | 2 | 13 | 0 | 0 | 15 | 4 | 23 | 3 | 0 | 30 | 2 | 6 | 5 | 0 | 13 | 81 |
| % App. Total | 21.7 | 60.9 | 17.4 | 0 | | 13.3 | 86.7 | 0 | 0 | | 13.3 | 76.7 | 10 | 0 | | 15.4 | 46.2 | 38.5 | 0 | | |
| PHF | .417 | .583 | 1.00 | .000 | .821 | .250 | .250 | .000 | .000 | .288 | .333 | .639 | .250 | .000 | .625 | .500 | .300 | .417 | .000 | .542 | .614 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 B
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Peds and Bicycles

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | Right | Thru | Left | Peds SB | Peds NB | Right | Thru | Left | Peds WB | Peds EB | Right | Thru | Left | Peds NB | Peds SB | Int. Total |
| 07:00 AM | 0 | 0 | 0 | 4 | 1 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 07:15 AM | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 07:30 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 07:45 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 3 |
| Total | 0 | 1 | 0 | 5 | 1 | 0 | 0 | 0 | 5 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 14 |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 08:30 AM | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 08:45 AM | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Total | 0 | 1 | 0 | 5 | 2 | 0 | 0 | 0 | 7 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| Grand Total | 0 | 2 | 0 | 10 | 3 | 0 | 0 | 0 | 12 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 31 |
| Apprch % | 0 | 13.3 | 0 | 66.7 | 20 | 0 | 0 | 0 | 92.3 | 7.7 | 0 | 100 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 100 | |
| Total % | 0 | 6.5 | 0 | 32.3 | 9.7 | 0 | 0 | 0 | 38.7 | 3.2 | 0 | 3.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6.5 | |

| | Rockwood Road (Route 115) From North | | | | | | Boardman Street From East | | | | | | Rockwood Road (Route 115) From South | | | | | | Boardman Street From West | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | App. Total | Right | Thru | Left | Peds SB | Peds NB | App. Total | Right | Thru | Left | Peds WB | Peds EB | App. Total | Right | Thru | Left | Peds NB | Peds SB | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 08:00 AM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 08:00 AM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 08:15 AM | 0 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 08:30 AM | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 3 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| 08:45 AM | 0 | 1 | 0 | 0 | 2 | 3 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| Total Volume | 0 | 1 | 0 | 5 | 2 | 8 | 0 | 0 | 0 | 7 | 1 | 8 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 17 |
| % App. Total | 0 | 12.5 | 0 | 62.5 | 25 | | 0 | 0 | 0 | 87.5 | 12.5 | | 0 | 100 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .250 | .000 | .417 | .250 | .667 | .000 | .000 | .000 | .438 | .250 | .500 | .000 | .250 | .000 | .000 | .000 | .250 | .000 | .000 | .000 | .000 | .000 | .000 | .607 |

PRECISION
D A T A
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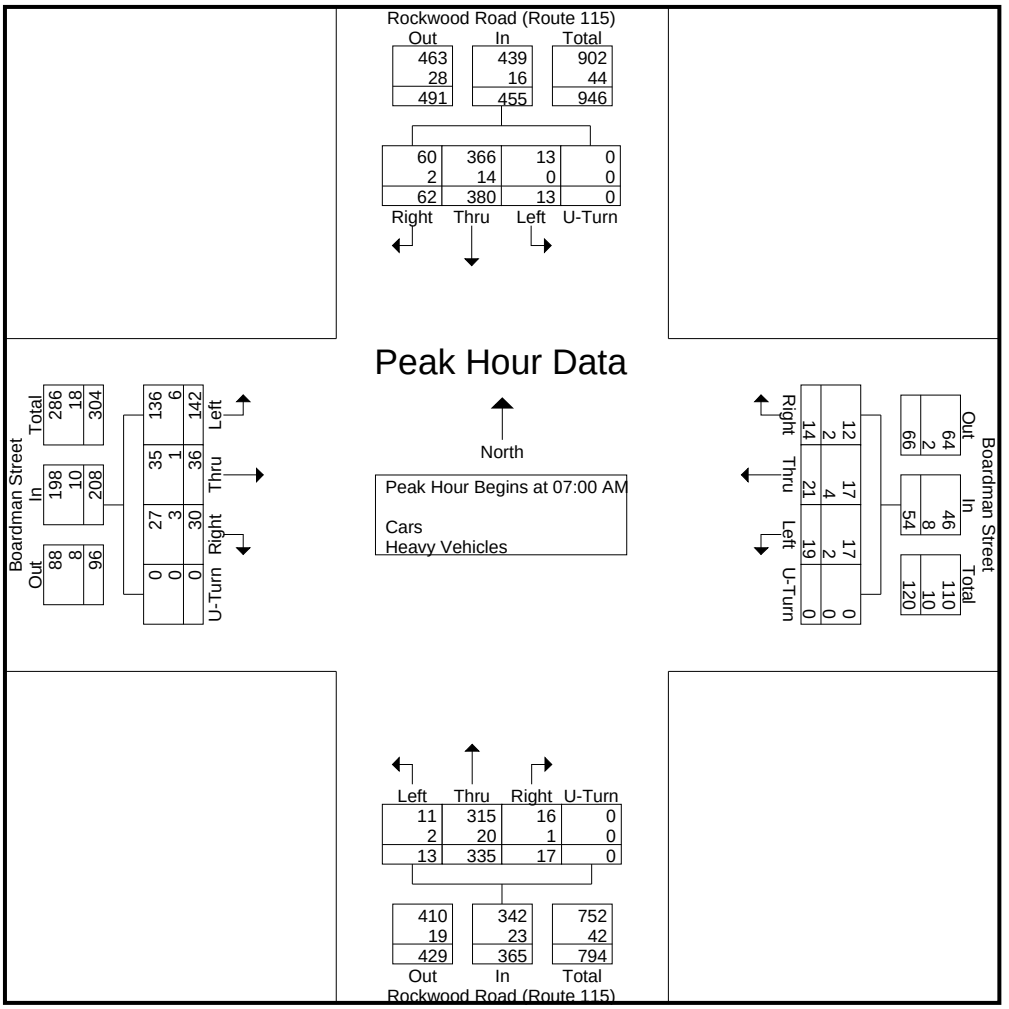
N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 B
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 07:00 AM | | | | | | | | | | | | | | | | | | | | | |
| 07:00 AM | 11 | 122 | 2 | 0 | 135 | 6 | 8 | 9 | 0 | 23 | 4 | 78 | 1 | 0 | 83 | 8 | 5 | 34 | 0 | 47 | 288 |
| 07:15 AM | 15 | 70 | 1 | 0 | 86 | 3 | 3 | 0 | 0 | 6 | 6 | 85 | 3 | 0 | 94 | 8 | 8 | 48 | 0 | 64 | 250 |
| 07:30 AM | 17 | 95 | 4 | 0 | 116 | 2 | 7 | 3 | 0 | 12 | 4 | 92 | 4 | 0 | 100 | 8 | 13 | 29 | 0 | 50 | 278 |
| 07:45 AM | 19 | 93 | 6 | 0 | 118 | 3 | 3 | 7 | 0 | 13 | 3 | 80 | 5 | 0 | 88 | 6 | 10 | 31 | 0 | 47 | 266 |
| Total Volume | 62 | 380 | 13 | 0 | 455 | 14 | 21 | 19 | 0 | 54 | 17 | 335 | 13 | 0 | 365 | 30 | 36 | 142 | 0 | 208 | 1082 |
| % App. Total | 13.6 | 83.5 | 2.9 | 0 | | 25.9 | 38.9 | 35.2 | 0 | | 4.7 | 91.8 | 3.6 | 0 | | 14.4 | 17.3 | 68.3 | 0 | | |
| PHF | .816 | .779 | .542 | .000 | .843 | .583 | .656 | .528 | .000 | .587 | .708 | .910 | .650 | .000 | .913 | .938 | .692 | .740 | .000 | .813 | .939 |
| Cars | 60 | 366 | 13 | 0 | 439 | 12 | 17 | 17 | 0 | 46 | 16 | 315 | 11 | 0 | 342 | 27 | 35 | 136 | 0 | 198 | 1025 |
| % Cars | 96.8 | 96.3 | 100 | 0 | 96.5 | 85.7 | 81.0 | 89.5 | 0 | 85.2 | 94.1 | 94.0 | 84.6 | 0 | 93.7 | 90.0 | 97.2 | 95.8 | 0 | 95.2 | 94.7 |
| Heavy Vehicles | 2 | 14 | 0 | 0 | 16 | 2 | 4 | 2 | 0 | 8 | 1 | 20 | 2 | 0 | 23 | 3 | 1 | 6 | 0 | 10 | 57 |
| % Heavy Vehicles | 3.2 | 3.7 | 0 | 0 | 3.5 | 14.3 | 19.0 | 10.5 | 0 | 14.8 | 5.9 | 6.0 | 15.4 | 0 | 6.3 | 10.0 | 2.8 | 4.2 | 0 | 4.8 | 5.3 |



PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 BB
Site Code : 16071
Start Date : 9/8/2016


Groups Printed- Cars - Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 19 | 87 | 4 | 0 | 3 | 9 | 7 | 0 | 4 | 73 | 4 | 0 | 5 | 5 | 17 | 0 | 237 |
| 04:15 PM | 26 | 86 | 2 | 0 | 2 | 7 | 1 | 0 | 6 | 70 | 4 | 0 | 5 | 1 | 18 | 0 | 228 |
| 04:30 PM | 27 | 73 | 6 | 0 | 1 | 4 | 2 | 0 | 4 | 100 | 5 | 0 | 3 | 5 | 15 | 0 | 245 |
| 04:45 PM | 23 | 82 | 9 | 0 | 6 | 9 | 11 | 0 | 4 | 69 | 6 | 0 | 0 | 9 | 21 | 0 | 249 |
| Total | 95 | 328 | 21 | 0 | 12 | 29 | 21 | 0 | 18 | 312 | 19 | 0 | 13 | 20 | 71 | 0 | 959 |
| 05:00 PM | 26 | 74 | 4 | 0 | 3 | 6 | 13 | 0 | 12 | 83 | 13 | 0 | 4 | 8 | 10 | 0 | 256 |
| 05:15 PM | 19 | 87 | 8 | 0 | 6 | 10 | 14 | 0 | 1 | 72 | 10 | 0 | 5 | 12 | 15 | 0 | 259 |
| 05:30 PM | 22 | 102 | 2 | 0 | 3 | 4 | 6 | 0 | 7 | 124 | 7 | 0 | 6 | 3 | 15 | 0 | 301 |
| 05:45 PM | 23 | 92 | 5 | 0 | 3 | 6 | 7 | 0 | 9 | 72 | 14 | 0 | 4 | 9 | 10 | 0 | 254 |
| Total | 90 | 355 | 19 | 0 | 15 | 26 | 40 | 0 | 29 | 351 | 44 | 0 | 19 | 32 | 50 | 0 | 1070 |
| Grand Total | 185 | 683 | 40 | 0 | 27 | 55 | 61 | 0 | 47 | 663 | 63 | 0 | 32 | 52 | 121 | 0 | 2029 |
| Apprch % | 20.4 | 75.2 | 4.4 | 0 | 18.9 | 38.5 | 42.7 | 0 | 6.1 | 85.8 | 8.2 | 0 | 15.6 | 25.4 | 59 | 0 | |
| Total % | 9.1 | 33.7 | 2 | 0 | 1.3 | 2.7 | 3 | 0 | 2.3 | 32.7 | 3.1 | 0 | 1.6 | 2.6 | 6 | 0 | |
| Cars | 182 | 677 | 40 | 0 | 27 | 54 | 60 | 0 | 46 | 657 | 63 | 0 | 32 | 50 | 121 | 0 | 2009 |
| % Cars | 98.4 | 99.1 | 100 | 0 | 100 | 98.2 | 98.4 | 0 | 97.9 | 99.1 | 100 | 0 | 100 | 96.2 | 100 | 0 | 99 |
| Heavy Vehicles | 3 | 6 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 6 | 0 | 0 | 0 | 2 | 0 | 0 | 20 |
| % Heavy Vehicles | 1.6 | 0.9 | 0 | 0 | 0 | 1.8 | 1.6 | 0 | 2.1 | 0.9 | 0 | 0 | 0 | 3.8 | 0 | 0 | 1 |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 26 | 74 | 4 | 0 | 104 | 3 | 6 | 13 | 0 | 22 | 12 | 83 | 13 | 0 | 108 | 4 | 8 | 10 | 0 | 22 | 256 |
| 05:15 PM | 19 | 87 | 8 | 0 | 114 | 6 | 10 | 14 | 0 | 30 | 1 | 72 | 10 | 0 | 83 | 5 | 12 | 15 | 0 | 32 | 259 |
| 05:30 PM | 22 | 102 | 2 | 0 | 126 | 3 | 4 | 6 | 0 | 13 | 7 | 124 | 7 | 0 | 138 | 6 | 3 | 15 | 0 | 24 | 301 |
| 05:45 PM | 23 | 92 | 5 | 0 | 120 | 3 | 6 | 7 | 0 | 16 | 9 | 72 | 14 | 0 | 95 | 4 | 9 | 10 | 0 | 23 | 254 |
| Total Volume | 90 | 355 | 19 | 0 | 464 | 15 | 26 | 40 | 0 | 81 | 29 | 351 | 44 | 0 | 424 | 19 | 32 | 50 | 0 | 101 | 1070 |
| % App. Total | 19.4 | 76.5 | 4.1 | 0 | | 18.5 | 32.1 | 49.4 | 0 | | 6.8 | 82.8 | 10.4 | 0 | | 18.8 | 31.7 | 49.5 | 0 | | |
| PHF | .865 | .870 | .594 | .000 | .921 | .625 | .650 | .714 | .000 | .675 | .604 | .708 | .786 | .000 | .768 | .792 | .667 | .833 | .000 | .789 | .889 |
| Cars | 90 | 354 | 19 | 0 | 463 | 15 | 26 | 39 | 0 | 80 | 29 | 347 | 44 | 0 | 420 | 19 | 31 | 50 | 0 | 100 | 1063 |
| % Cars | 100 | 99.7 | 100 | 0 | 99.8 | 100 | 100 | 97.5 | 0 | 98.8 | 100 | 98.9 | 100 | 0 | 99.1 | 100 | 96.9 | 100 | 0 | 99.0 | 99.3 |
| Heavy Vehicles | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 7 |
| % Heavy Vehicles | 0 | 0.3 | 0 | 0 | 0.2 | 0 | 0 | 2.5 | 0 | 1.2 | 0 | 1.1 | 0 | 0 | 0.9 | 0 | 3.1 | 0 | 0 | 1.0 | 0.7 |

PRECISION
D A T A
INDUSTRIES, LLC
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 BB
Site Code : 16071
Start Date : 9/8/2016


Groups Printed- Cars

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 18 | 87 | 4 | 0 | 3 | 9 | 7 | 0 | 3 | 72 | 4 | 0 | 5 | 5 | 17 | 0 | 234 |
| 04:15 PM | 25 | 84 | 2 | 0 | 2 | 7 | 1 | 0 | 6 | 69 | 4 | 0 | 5 | 1 | 18 | 0 | 224 |
| 04:30 PM | 26 | 72 | 6 | 0 | 1 | 3 | 2 | 0 | 4 | 100 | 5 | 0 | 3 | 5 | 15 | 0 | 242 |
| 04:45 PM | 23 | 80 | 9 | 0 | 6 | 9 | 11 | 0 | 4 | 69 | 6 | 0 | 0 | 8 | 21 | 0 | 246 |
| Total | 92 | 323 | 21 | 0 | 12 | 28 | 21 | 0 | 17 | 310 | 19 | 0 | 13 | 19 | 71 | 0 | 946 |
| 05:00 PM | 26 | 74 | 4 | 0 | 3 | 6 | 12 | 0 | 12 | 82 | 13 | 0 | 4 | 8 | 10 | 0 | 254 |
| 05:15 PM | 19 | 87 | 8 | 0 | 6 | 10 | 14 | 0 | 1 | 71 | 10 | 0 | 5 | 11 | 15 | 0 | 257 |
| 05:30 PM | 22 | 102 | 2 | 0 | 3 | 4 | 6 | 0 | 7 | 122 | 7 | 0 | 6 | 3 | 15 | 0 | 299 |
| 05:45 PM | 23 | 91 | 5 | 0 | 3 | 6 | 7 | 0 | 9 | 72 | 14 | 0 | 4 | 9 | 10 | 0 | 253 |
| Total | 90 | 354 | 19 | 0 | 15 | 26 | 39 | 0 | 29 | 347 | 44 | 0 | 19 | 31 | 50 | 0 | 1063 |
| Grand Total | 182 | 677 | 40 | 0 | 27 | 54 | 60 | 0 | 46 | 657 | 63 | 0 | 32 | 50 | 121 | 0 | 2009 |
| Apprch % | 20.2 | 75.3 | 4.4 | 0 | 19.1 | 38.3 | 42.6 | 0 | 6 | 85.8 | 8.2 | 0 | 15.8 | 24.6 | 59.6 | 0 | |
| Total % | 9.1 | 33.7 | 2 | 0 | 1.3 | 2.7 | 3 | 0 | 2.3 | 32.7 | 3.1 | 0 | 1.6 | 2.5 | 6 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 26 | 74 | 4 | 0 | 104 | 3 | 6 | 12 | 0 | 21 | 12 | 82 | 13 | 0 | 107 | 4 | 8 | 10 | 0 | 22 | 254 |
| 05:15 PM | 19 | 87 | 8 | 0 | 114 | 6 | 10 | 14 | 0 | 30 | 1 | 71 | 10 | 0 | 82 | 5 | 11 | 15 | 0 | 31 | 257 |
| 05:30 PM | 22 | 102 | 2 | 0 | 126 | 3 | 4 | 6 | 0 | 13 | 7 | 122 | 7 | 0 | 136 | 6 | 3 | 15 | 0 | 24 | 299 |
| 05:45 PM | 23 | 91 | 5 | 0 | 119 | 3 | 6 | 7 | 0 | 16 | 9 | 72 | 14 | 0 | 95 | 4 | 9 | 10 | 0 | 23 | 253 |
| Total Volume | 90 | 354 | 19 | 0 | 463 | 15 | 26 | 39 | 0 | 80 | 29 | 347 | 44 | 0 | 420 | 19 | 31 | 50 | 0 | 100 | 1063 |
| % App. Total | 19.4 | 76.5 | 4.1 | 0 | | 18.8 | 32.5 | 48.8 | 0 | | 6.9 | 82.6 | 10.5 | 0 | | 19 | 31 | 50 | 0 | | |
| PHF | .865 | .868 | .594 | .000 | .919 | .625 | .650 | .696 | .000 | .667 | .604 | .711 | .786 | .000 | .772 | .792 | .705 | .833 | .000 | .806 | .889 |

PRECISION
D A T A
INDUSTRIES, LLC
46 Morton Street, Framingham, MA 01702
Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 BB
Site Code : 16071
Start Date : 9/8/2016


Groups Printed- Heavy Vehicles

| | Rockwood Road (Route 115) From North | | | | Boardman Street From East | | | | Rockwood Road (Route 115) From South | | | | Boardman Street From West | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Right | Thru | Left | U-Turn | Int. Total |
| 04:00 PM | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 04:15 PM | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:30 PM | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 04:45 PM | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 3 |
| Total | 3 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | 13 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 2 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:45 PM | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 4 | 0 | 0 | 0 | 1 | 0 | 0 | 7 |
| Grand Total | 3 | 6 | 0 | 0 | 0 | 1 | 1 | 0 | 1 | 6 | 0 | 0 | 0 | 2 | 0 | 0 | 20 |
| Apprch % | 33.3 | 66.7 | 0 | 0 | 0 | 50 | 50 | 0 | 14.3 | 85.7 | 0 | 0 | 0 | 100 | 0 | 0 | |
| Total % | 15 | 30 | 0 | 0 | 0 | 5 | 5 | 0 | 5 | 30 | 0 | 0 | 0 | 10 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 04:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 04:00 PM | 1 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 3 |
| 04:15 PM | 1 | 2 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 4 |
| 04:30 PM | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 3 |
| 04:45 PM | 0 | 2 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 | 3 |
| Total Volume | 3 | 5 | 0 | 0 | 8 | 0 | 1 | 0 | 0 | 1 | 1 | 2 | 0 | 0 | 3 | 0 | 1 | 0 | 0 | 1 | 13 |
| % App. Total | 37.5 | 62.5 | 0 | 0 | | 0 | 100 | 0 | 0 | | 33.3 | 66.7 | 0 | 0 | | 0 | 100 | 0 | 0 | | |
| PHF | .750 | .625 | .000 | .000 | .667 | .000 | .250 | .000 | .000 | .250 | .250 | .500 | .000 | .000 | .375 | .000 | .250 | .000 | .000 | .250 | .813 |

PRECISION
D A T A
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Office: 508-875-0100 Fax: 508-875-0118
Email: datarequests@pdillc.com

N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 BB
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

Groups Printed- Peds and Bicycles

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | Right | Thru | Left | Peds SB | Peds NB | Right | Thru | Left | Peds WB | Peds EB | Right | Thru | Left | Peds NB | Peds SB | Int. Total |
| 04:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 04:30 PM | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 8 |
| 04:45 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| Total | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 1 | 1 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 05:45 PM | 0 | 0 | 0 | 6 | 4 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| Total | 0 | 0 | 0 | 6 | 4 | 0 | 0 | 0 | 5 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| Grand Total | 0 | 0 | 0 | 6 | 7 | 0 | 0 | 1 | 6 | 13 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 33 |
| Apprch % | 0 | 0 | 0 | 46.2 | 53.8 | 0 | 0 | 5 | 30 | 65 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Total % | 0 | 0 | 0 | 18.2 | 21.2 | 0 | 0 | 3 | 18.2 | 39.4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |

| | Rockwood Road (Route 115) From North | | | | | | Boardman Street From East | | | | | | Rockwood Road (Route 115) From South | | | | | | Boardman Street From West | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | Peds EB | Peds WB | App. Total | Right | Thru | Left | Peds SB | Peds NB | App. Total | Right | Thru | Left | Peds WB | Peds EB | App. Total | Right | Thru | Left | Peds NB | Peds SB | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| 05:15 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 |
| 05:30 PM | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| 05:45 PM | 0 | 0 | 0 | 6 | 4 | 10 | 0 | 0 | 0 | 4 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 |
| Total Volume | 0 | 0 | 0 | 6 | 4 | 10 | 0 | 0 | 0 | 5 | 9 | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 24 |
| % App. Total | 0 | 0 | 0 | 60 | 40 | | 0 | 0 | 0 | 35.7 | 64.3 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | |
| PHF | .000 | .000 | .000 | .250 | .250 | .250 | .000 | .000 | .000 | .313 | .375 | .500 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .429 |

PRECISION
D A T A
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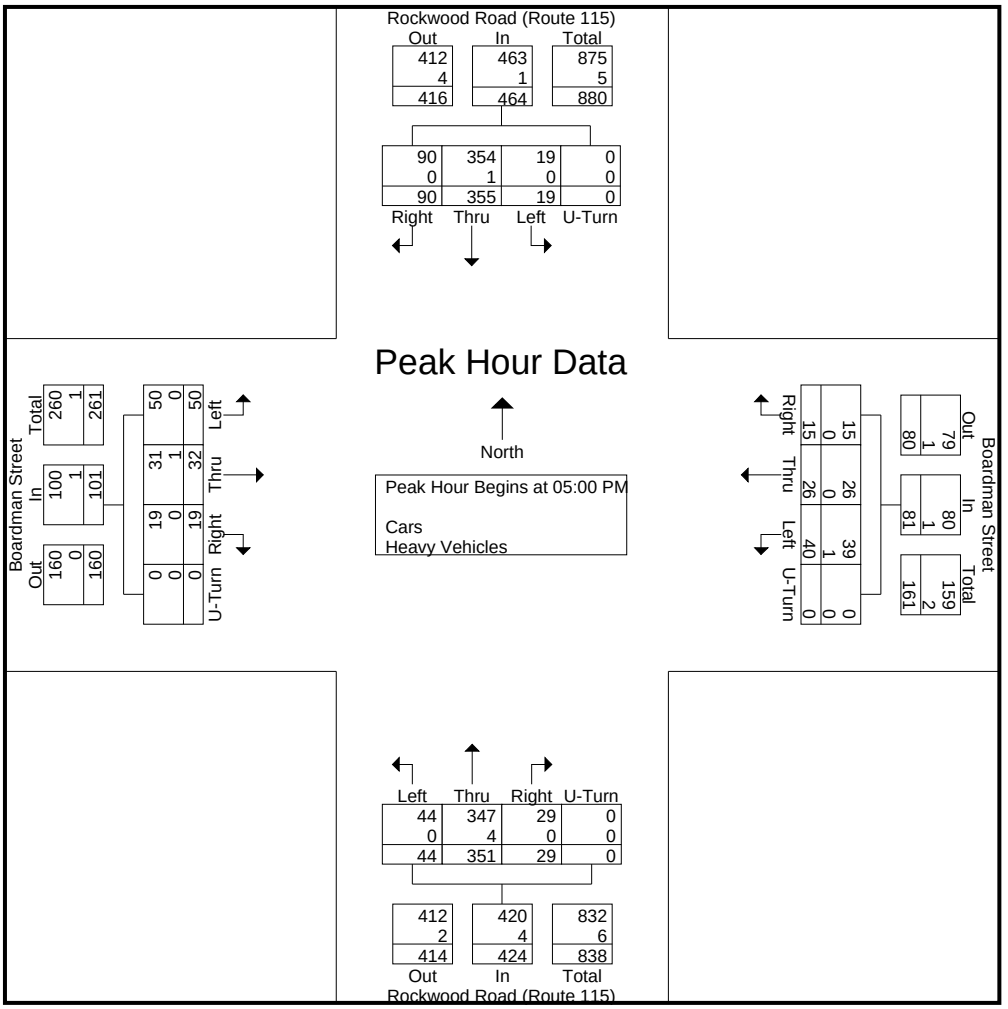
N/S: Rockwood Road (Route 115)
E/W: Boardman Street
City, State: Norfolk, MA
Client: Green International/ J. Sobel

File Name : 165254 BB
Site Code : 16071
Start Date : 9/8/2016
Page No : 1

| | Rockwood Road (Route 115) From North | | | | | Boardman Street From East | | | | | Rockwood Road (Route 115) From South | | | | | Boardman Street From West | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Start Time | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Right | Thru | Left | U-Turn | App. Total | Int. Total |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 | | | | | | | | | | | | | | | | | | | | | |
| Peak Hour for Entire Intersection Begins at 05:00 PM | | | | | | | | | | | | | | | | | | | | | |
| 05:00 PM | 26 | 74 | 4 | 0 | 104 | 3 | 6 | 13 | 0 | 22 | 12 | 83 | 13 | 0 | 108 | 4 | 8 | 10 | 0 | 22 | 256 |
| 05:15 PM | 19 | 87 | 8 | 0 | 114 | 6 | 10 | 14 | 0 | 30 | 1 | 72 | 10 | 0 | 83 | 5 | 12 | 15 | 0 | 32 | 259 |
| 05:30 PM | 22 | 102 | 2 | 0 | 126 | 3 | 4 | 6 | 0 | 13 | 7 | 124 | 7 | 0 | 138 | 6 | 3 | 15 | 0 | 24 | 301 |
| 05:45 PM | 23 | 92 | 5 | 0 | 120 | 3 | 6 | 7 | 0 | 16 | 9 | 72 | 14 | 0 | 95 | 4 | 9 | 10 | 0 | 23 | 254 |
| Total Volume | 90 | 355 | 19 | 0 | 464 | 15 | 26 | 40 | 0 | 81 | 29 | 351 | 44 | 0 | 424 | 19 | 32 | 50 | 0 | 101 | 1070 |
| % App. Total | 19.4 | 76.5 | 4.1 | 0 | | 18.5 | 32.1 | 49.4 | 0 | | 6.8 | 82.8 | 10.4 | 0 | | 18.8 | 31.7 | 49.5 | 0 | | |
| PHF | .865 | .870 | .594 | .000 | .921 | .625 | .650 | .714 | .000 | .675 | .604 | .708 | .786 | .000 | .768 | .792 | .667 | .833 | .000 | .789 | .889 |
| Cars | 90 | 354 | 19 | 0 | 463 | 15 | 26 | 39 | 0 | 80 | 29 | 347 | 44 | 0 | 420 | 19 | 31 | 50 | 0 | 100 | 1063 |
| % Cars | 100 | 99.7 | 100 | 0 | 99.8 | 100 | 100 | 97.5 | 0 | 98.8 | 100 | 98.9 | 100 | 0 | 99.1 | 100 | 96.9 | 100 | 0 | 99.0 | 99.3 |
| Heavy Vehicles | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 4 | 0 | 0 | 4 | 0 | 1 | 0 | 0 | 1 | 7 |
| % Heavy Vehicles | 0 | 0.3 | 0 | 0 | 0.2 | 0 | 0 | 2.5 | 0 | 1.2 | 0 | 1.1 | 0 | 0 | 0.9 | 0 | 3.1 | 0 | 0 | 1.0 | 0.7 |



# *APPENDIX B-CRASH RATE CALCULATIONS*

# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Norfolk COUNT DAT 9/8/2016

DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

**~ INTERSECTION DATA ~**

MAJOR STREET : Rockwood Road (Route 115)

MINOR STREET(S) : Main Street

**INTERSECTION DIAGRAM (Label Approaches)**

↑ *North*


**PEAK HOUR VOLUMES**

| APPROACH : | 1 | 2 | 3 | 4 | 5 | Total Peak Hourly Approach Volume |
|---|---|---|---|---|---|---|
| DIRECTION : | EB | WB | NB | SB | | |
| PEAK HOURLY VOLUMES (AM/PM) : | 213 | 554 | 363 | 357 | | **1,487** |

" K " FACTOR : **0.097** INTERSECTION ADT ( **V** ) = TOTAL DAILY APPROACH VOLUME : **15,330**

TOTAL # OF CRASHES : 14 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( **A** ) : **4.67**

**CRASH RATE CALCULATION :** **0.83** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 5 average crash rate at unsignalized intersections is 0.58/MEV.

Project Title & Date:

# INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Norfolk COUNT DAT 9/8/2016

DISTRICT : 5 UNSIGNALIZED : X SIGNALIZED :

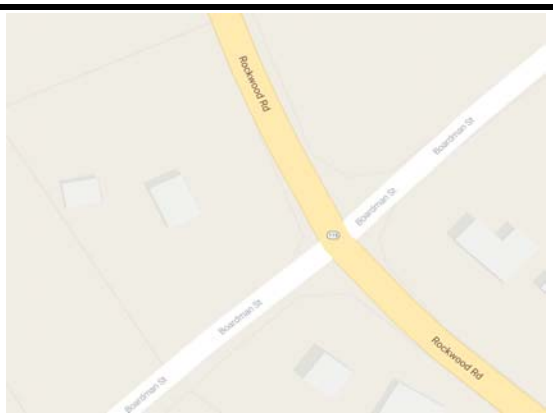
**~ INTERSECTION DATA ~**

MAJOR STREET : Rockwood Road (Route 115)

MINOR STREET(S) : Boardman Street

**INTERSECTION DIAGRAM (Label Approaches)**

↑ *North*




**PEAK HOUR VOLUMES**

| APPROACH : | 1 | 2 | 3 | 4 | 5 | Total Peak Hourly Approach Volume |
|---|---|---|---|---|---|---|
| DIRECTION : | EB | WB | NB | SB | | |
| PEAK HOURLY VOLUMES (AM/PM) : | 208 | 54 | 365 | 455 | | **1,082** |

" K " FACTOR : **0.089** INTERSECTION ADT ( **V** ) = TOTAL DAILY APPROACH VOLUME : **12,157**

TOTAL # OF CRASHES : 6 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( **A** ) : **2.00**

**CRASH RATE CALCULATION :** **0.45** RATE = $\frac{(A * 1{,}000{,}000)}{(V * 365)}$

Comments : MassDOT District 5 average crash rate at unsignalized intersections is 0.58/MEV.

Project Title & Date:

# *APPENDIX C-MASSDOT COUNT STATION DATA*

**GREEN INTERNATIONAL AFFILIATES, INC.**
**Civil and Structural Engineers**
239 Littleton Road, Suite 3
WESTFORD, MA 01886

| | | | |
|---|---|---|---|
| JOB | 16071 TIAS 25 Rockwood Road | | |
| SHEET NO. | 1 | OF | 1 |
| CALCULATED BY | JF | DATE | 9/14/2016 |
| CHECKED BY | JS | DATE | 9/14/2016 |
| DESCRIPTION | Annual Traffic Growth and Seasonal Data | | |

| **16071 TIAS 25 Rockwood Road** | | |
|---|---|---|
| ***Annual Growth Rate*** | | |
| **Route 9** | **MassDOT continuous count, location ID 307 - East of Route 20, Westborough** | |
| **year** | **2007** | **2015** |
| **Daily traffic volume** | 49742 | 51474 |
| **average annual growth rate (relative to 2007)** | | 0.44% |
| | | |
| **Route 146** | **MassDOT continuous count, location ID 310 - South of Purgatory Road, Sutton** | |
| **year** | **2007** | **2015** |
| **Daily traffic volume** | 30892 | 35737 |
| **average annual growth rate (relative to 2007)** | | 1.96% |
| | | |
| **Route 24** | **MassDOT continuous count, location ID 6237 - South of Route 139, Stoughton** | |
| **year** | **2007** | **2015** |
| **Daily traffic volume** | 114300 | 115842 |
| **average annual growth rate (relative to 2007)** | | 0.17% |

| | |
|---|---|
| **Average Annual Growth:** | 0.9% |
| **Say:** | 1.0% |

***Seasonal Adjustment Factor***

| **I-95/Route 128** | **MassDOT continuous count, location ID 6189 - North of Route 109, Dedham** | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Month** | January | February | March | April | May | June | July | August | September | October | November | December | Average |
| **Average Total Daily Traffic 2005** | 138000 | 132174 | 136654 | 142226 | 145240 | 152638 | 138350 | 146758 | 142964 | 139299 | 131242 | 132683 | 139852 |
| **Seasonal Adjustment Factor** | 0.9868 | 0.9451 | 0.9771 | 1.0170 | 1.0385 | 1.0914 | 0.9893 | 1.0494 | 1.0222 | 0.9960 | 0.9384 | 0.9487 | - |

note - 2005 data is the most recent available for this station

| | |
|---|---|
| **Average Seasonal Factor (January)** | 0.9868 |
| **Resulting Seasonal Adjustment Factor:** | 101.5% |

# *APPENDIX D-BEDROOMS PER HOUSEHOLD DATA*

DP04

# SELECTED HOUSING CHARACTERISTICS

## 2010-2014 American Community Survey 5-Year Estimates

Supporting documentation on code lists, subject definitions, data accuracy, and statistical testing can be found on the American Community Survey website in the Data and Documentation section.

Sample size and data quality measures (including coverage rates, allocation rates, and response rates) can be found on the American Community Survey website in the Methodology section.

Although the American Community Survey (ACS) produces population, demographic and housing unit estimates, it is the Census Bureau's Population Estimates Program that produces and disseminates the official estimates of the population for the nation, states, counties, cities and towns and estimates of housing units for states and counties.

| Subject | Norfolk town, Norfolk County, Massachusetts | | | |
|---|---|---|---|---|
| | Estimate | Margin of Error | Percent | Percent Margin of Error |
| HOUSING OCCUPANCY | | | | |
| Total housing units | 3,276 | +/-155 | 3,276 | (X) |
| Occupied housing units | 3,185 | +/-149 | 97.2% | +/-1.8 |
| Vacant housing units | 91 | +/-60 | 2.8% | +/-1.8 |
| | | | | |
| Homeowner vacancy rate | 2.2 | +/-1.7 | (X) | (X) |
| Rental vacancy rate | 0.0 | +/-17.6 | (X) | (X) |
| | | | | |
| UNITS IN STRUCTURE | | | | |
| Total housing units | 3,276 | +/-155 | 3,276 | (X) |
| 1-unit, detached | 3,020 | +/-172 | 92.2% | +/-1.8 |
| 1-unit, attached | 146 | +/-47 | 4.5% | +/-1.5 |
| 2 units | 48 | +/-31 | 1.5% | +/-1.0 |
| 3 or 4 units | 13 | +/-16 | 0.4% | +/-0.5 |
| 5 to 9 units | 41 | +/-27 | 1.3% | +/-0.8 |
| 10 to 19 units | 0 | +/-19 | 0.0% | +/-1.1 |
| 20 or more units | 0 | +/-19 | 0.0% | +/-1.1 |
| Mobile home | 8 | +/-13 | 0.2% | +/-0.4 |
| Boat, RV, van, etc. | 0 | +/-19 | 0.0% | +/-1.1 |
| | | | | |
| YEAR STRUCTURE BUILT | | | | |
| Total housing units | 3,276 | +/-155 | 3,276 | (X) |
| Built 2010 or later | 53 | +/-36 | 1.6% | +/-1.1 |
| Built 2000 to 2009 | 352 | +/-76 | 10.7% | +/-2.4 |
| Built 1990 to 1999 | 362 | +/-85 | 11.1% | +/-2.5 |
| Built 1980 to 1989 | 979 | +/-112 | 29.9% | +/-3.2 |
| Built 1970 to 1979 | 597 | +/-136 | 18.2% | +/-3.9 |
| Built 1960 to 1969 | 337 | +/-95 | 10.3% | +/-2.9 |
| Built 1950 to 1959 | 257 | +/-79 | 7.8% | +/-2.5 |
| Built 1940 to 1949 | 57 | +/-35 | 1.7% | +/-1.1 |
| Built 1939 or earlier | 282 | +/-98 | 8.6% | +/-2.9 |
| | | | | |
| ROOMS | | | | |
| Total housing units | 3,276 | +/-155 | 3,276 | (X) |
| 1 room | 0 | +/-19 | 0.0% | +/-1.1 |
| 2 rooms | 40 | +/-28 | 1.2% | +/-0.9 |

| Subject | Norfolk town, Norfolk County, Massachusetts | | | |
|---|---|---|---|---|
| | Estimate | Margin of Error | Percent | Percent Margin of Error |
| 3 rooms | 50 | +/-41 | 1.5% | +/-1.3 |
| 4 rooms | 199 | +/-75 | 6.1% | +/-2.3 |
| 5 rooms | 206 | +/-88 | 6.3% | +/-2.7 |
| 6 rooms | 335 | +/-91 | 10.2% | +/-2.7 |
| 7 rooms | 497 | +/-131 | 15.2% | +/-4.1 |
| 8 rooms | 939 | +/-152 | 28.7% | +/-4.2 |
| 9 rooms or more | 1,010 | +/-117 | 30.8% | +/-3.2 |
| Median rooms | 7.8 | +/-0.2 | (X) | (X) |
| | | | | |
| BEDROOMS | | | | |
| Total housing units | 3,276 | +/-155 | 3,276 | (X) |
| No bedroom | 7 | +/-10 | 0.2% | +/-0.3 |
| 1 bedroom | 107 | +/-40 | 3.3% | +/-1.2 |
| 2 bedrooms | 330 | +/-90 | 10.1% | +/-2.8 |
| 3 bedrooms | 1,112 | +/-159 | 33.9% | +/-4.5 |
| 4 bedrooms | 1,543 | +/-176 | 47.1% | +/-4.6 |
| 5 or more bedrooms | 177 | +/-66 | 5.4% | +/-2.0 |
| | | | | |
| HOUSING TENURE | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| Owner-occupied | 3,005 | +/-143 | 94.3% | +/-2.1 |
| Renter-occupied | 180 | +/-67 | 5.7% | +/-2.1 |
| | | | | |
| Average household size of owner-occupied unit | 3.01 | +/-0.09 | (X) | (X) |
| Average household size of renter-occupied unit | 1.66 | +/-0.20 | (X) | (X) |
| | | | | |
| YEAR HOUSEHOLDER MOVED INTO UNIT | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| Moved in 2010 or later | 312 | +/-87 | 9.8% | +/-2.6 |
| Moved in 2000 to 2009 | 1,202 | +/-124 | 37.7% | +/-3.5 |
| Moved in 1990 to 1999 | 771 | +/-115 | 24.2% | +/-3.5 |
| Moved in 1980 to 1989 | 568 | +/-111 | 17.8% | +/-3.3 |
| Moved in 1970 to 1979 | 199 | +/-70 | 6.2% | +/-2.2 |
| Moved in 1969 or earlier | 133 | +/-53 | 4.2% | +/-1.6 |
| | | | | |
| VEHICLES AVAILABLE | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| No vehicles available | 43 | +/-26 | 1.4% | +/-0.8 |
| 1 vehicle available | 441 | +/-92 | 13.8% | +/-2.7 |
| 2 vehicles available | 1,822 | +/-160 | 57.2% | +/-4.6 |
| 3 or more vehicles available | 879 | +/-134 | 27.6% | +/-4.1 |
| | | | | |
| HOUSE HEATING FUEL | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| Utility gas | 311 | +/-73 | 9.8% | +/-2.3 |
| Bottled, tank, or LP gas | 170 | +/-63 | 5.3% | +/-2.0 |
| Electricity | 85 | +/-38 | 2.7% | +/-1.2 |
| Fuel oil, kerosene, etc. | 2,490 | +/-166 | 78.2% | +/-3.1 |
| Coal or coke | 0 | +/-19 | 0.0% | +/-1.1 |
| Wood | 83 | +/-48 | 2.6% | +/-1.5 |
| Solar energy | 0 | +/-19 | 0.0% | +/-1.1 |
| Other fuel | 26 | +/-39 | 0.8% | +/-1.2 |
| No fuel used | 20 | +/-22 | 0.6% | +/-0.7 |
| | | | | |
| SELECTED CHARACTERISTICS | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| Lacking complete plumbing facilities | 8 | +/-12 | 0.3% | +/-0.4 |
| Lacking complete kitchen facilities | 0 | +/-19 | 0.0% | +/-1.1 |
| No telephone service available | 11 | +/-16 | 0.3% | +/-0.5 |

| Subject | Norfolk town, Norfolk County, Massachusetts | | | |
|---|---|---|---|---|
| | Estimate | Margin of Error | Percent | Percent Margin of Error |
| | | | | |
| OCCUPANTS PER ROOM | | | | |
| Occupied housing units | 3,185 | +/-149 | 3,185 | (X) |
| 1.00 or less | 3,178 | +/-147 | 99.8% | +/-0.3 |
| 1.01 to 1.50 | 0 | +/-19 | 0.0% | +/-1.1 |
| 1.51 or more | 7 | +/-10 | 0.2% | +/-0.3 |
| | | | | |
| VALUE | | | | |
| Owner-occupied units | 3,005 | +/-143 | 3,005 | (X) |
| Less than $50,000 | 26 | +/-23 | 0.9% | +/-0.8 |
| $50,000 to $99,999 | 8 | +/-12 | 0.3% | +/-0.4 |
| $100,000 to $149,999 | 8 | +/-13 | 0.3% | +/-0.4 |
| $150,000 to $199,999 | 44 | +/-33 | 1.5% | +/-1.1 |
| $200,000 to $299,999 | 191 | +/-62 | 6.4% | +/-2.0 |
| $300,000 to $499,999 | 1,808 | +/-145 | 60.2% | +/-4.0 |
| $500,000 to $999,999 | 902 | +/-121 | 30.0% | +/-3.9 |
| $1,000,000 or more | 18 | +/-18 | 0.6% | +/-0.6 |
| Median (dollars) | 445,900 | +/-8,263 | (X) | (X) |
| | | | | |
| MORTGAGE STATUS | | | | |
| Owner-occupied units | 3,005 | +/-143 | 3,005 | (X) |
| Housing units with a mortgage | 2,358 | +/-167 | 78.5% | +/-4.2 |
| Housing units without a mortgage | 647 | +/-129 | 21.5% | +/-4.2 |
| | | | | |
| SELECTED MONTHLY OWNER COSTS (SMOC) | | | | |
| Housing units with a mortgage | 2,358 | +/-167 | 2,358 | (X) |
| Less than $300 | 0 | +/-19 | 0.0% | +/-1.5 |
| $300 to $499 | 0 | +/-19 | 0.0% | +/-1.5 |
| $500 to $699 | 8 | +/-13 | 0.3% | +/-0.5 |
| $700 to $999 | 10 | +/-16 | 0.4% | +/-0.7 |
| $1,000 to $1,499 | 202 | +/-69 | 8.6% | +/-2.7 |
| $1,500 to $1,999 | 262 | +/-83 | 11.1% | +/-3.3 |
| $2,000 or more | 1,876 | +/-136 | 79.6% | +/-4.0 |
| Median (dollars) | 2,652 | +/-153 | (X) | (X) |
| | | | | |
| Housing units without a mortgage | 647 | +/-129 | 647 | (X) |
| Less than $100 | 0 | +/-19 | 0.0% | +/-5.3 |
| $100 to $199 | 0 | +/-19 | 0.0% | +/-5.3 |
| $200 to $299 | 10 | +/-14 | 1.5% | +/-2.2 |
| $300 to $399 | 0 | +/-19 | 0.0% | +/-5.3 |
| $400 or more | 637 | +/-128 | 98.5% | +/-2.2 |
| Median (dollars) | 929 | +/-60 | (X) | (X) |
| | | | | |
| SELECTED MONTHLY OWNER COSTS AS A PERCENTAGE OF HOUSEHOLD INCOME (SMOCAPI) | | | | |
| Housing units with a mortgage (excluding units where SMOCAPI cannot be computed) | 2,349 | +/-165 | 2,349 | (X) |
| Less than 20.0 percent | 972 | +/-126 | 41.4% | +/-4.6 |
| 20.0 to 24.9 percent | 378 | +/-81 | 16.1% | +/-3.3 |
| 25.0 to 29.9 percent | 323 | +/-73 | 13.8% | +/-2.9 |
| 30.0 to 34.9 percent | 245 | +/-82 | 10.4% | +/-3.5 |
| 35.0 percent or more | 431 | +/-107 | 18.3% | +/-4.3 |
| | | | | |
| Not computed | 9 | +/-14 | (X) | (X) |
| | | | | |
| Housing unit without a mortgage (excluding units where SMOCAPI cannot be computed) | 647 | +/-129 | 647 | (X) |
| Less than 10.0 percent | 242 | +/-80 | 37.4% | +/-9.8 |
| 10.0 to 14.9 percent | 176 | +/-76 | 27.2% | +/-9.1 |
| 15.0 to 19.9 percent | 56 | +/-32 | 8.7% | +/-5.1 |

| Subject | Norfolk town, Norfolk County, Massachusetts | | | |
|---|---|---|---|---|
| | Estimate | Margin of Error | Percent | Percent Margin of Error |
| 20.0 to 24.9 percent | 62 | +/-39 | 9.6% | +/-6.0 |
| 25.0 to 29.9 percent | 26 | +/-23 | 4.0% | +/-3.6 |
| 30.0 to 34.9 percent | 0 | +/-19 | 0.0% | +/-5.3 |
| 35.0 percent or more | 85 | +/-45 | 13.1% | +/-6.8 |
| | | | | |
| Not computed | 0 | +/-19 | (X) | (X) |
| | | | | |
| GROSS RENT | | | | |
| Occupied units paying rent | 162 | +/-65 | 162 | (X) |
| Less than $200 | 17 | +/-18 | 10.5% | +/-11.9 |
| $200 to $299 | 0 | +/-19 | 0.0% | +/-19.3 |
| $300 to $499 | 8 | +/-12 | 4.9% | +/-7.8 |
| $500 to $749 | 11 | +/-17 | 6.8% | +/-10.2 |
| $750 to $999 | 26 | +/-24 | 16.0% | +/-14.4 |
| $1,000 to $1,499 | 23 | +/-23 | 14.2% | +/-14.1 |
| $1,500 or more | 77 | +/-56 | 47.5% | +/-20.7 |
| Median (dollars) | 1,400 | +/-572 | (X) | (X) |
| | | | | |
| No rent paid | 18 | +/-19 | (X) | (X) |
| | | | | |
| GROSS RENT AS A PERCENTAGE OF HOUSEHOLD INCOME (GRAPI) | | | | |
| Occupied units paying rent (excluding units where GRAPI cannot be computed) | 162 | +/-65 | 162 | (X) |
| Less than 15.0 percent | 0 | +/-19 | 0.0% | +/-19.3 |
| 15.0 to 19.9 percent | 20 | +/-22 | 12.3% | +/-13.0 |
| 20.0 to 24.9 percent | 62 | +/-46 | 38.3% | +/-22.1 |
| 25.0 to 29.9 percent | 35 | +/-33 | 21.6% | +/-18.8 |
| 30.0 to 34.9 percent | 17 | +/-19 | 10.5% | +/-12.2 |
| 35.0 percent or more | 28 | +/-27 | 17.3% | +/-15.9 |
| | | | | |
| Not computed | 18 | +/-19 | (X) | (X) |

Data are based on a sample and are subject to sampling variability. The degree of uncertainty for an estimate arising from sampling variability is represented through the use of a margin of error. The value shown here is the 90 percent margin of error. The margin of error can be interpreted roughly as providing a 90 percent probability that the interval defined by the estimate minus the margin of error and the estimate plus the margin of error (the lower and upper confidence bounds) contains the true value. In addition to sampling variability, the ACS estimates are subject to nonsampling error (for a discussion of nonsampling variability, see Accuracy of the Data). The effect of nonsampling error is not represented in these tables.

Households not paying cash rent are excluded from the calculation of median gross rent.

Telephone service data are not available for certain geographic areas due to problems with data collection. See Errata Note #93 for details.

While the 2010-2014 American Community Survey (ACS) data generally reflect the February 2013 Office of Management and Budget (OMB) definitions of metropolitan and micropolitan statistical areas; in certain instances the names, codes, and boundaries of the principal cities shown in ACS tables may differ from the OMB definitions due to differences in the effective dates of the geographic entities.

Estimates of urban and rural population, housing units, and characteristics reflect boundaries of urban areas defined based on Census 2010 data. As a result, data for urban and rural areas from the ACS do not necessarily reflect the results of ongoing urbanization.

Source: U.S. Census Bureau, 2010-2014 American Community Survey 5-Year Estimates

Explanation of Symbols:

1. An '**' entry in the margin of error column indicates that either no sample observations or too few sample observations were available to compute a standard error and thus the margin of error. A statistical test is not appropriate.
2. An '-' entry in the estimate column indicates that either no sample observations or too few sample observations were available to compute an estimate, or a ratio of medians cannot be calculated because one or both of the median estimates falls in the lowest interval

or upper interval of an open-ended distribution.

3. An '-' following a median estimate means the median falls in the lowest interval of an open-ended distribution.
4. An '+' following a median estimate means the median falls in the upper interval of an open-ended distribution.
5. An '***' entry in the margin of error column indicates that the median falls in the lowest interval or upper interval of an open-ended distribution. A statistical test is not appropriate.
6. An '*****' entry in the margin of error column indicates that the estimate is controlled. A statistical test for sampling variability is not appropriate.
7. An 'N' entry in the estimate and margin of error columns indicates that data for this geographic area cannot be displayed because the number of sample cases is too small.
8. An '(X)' means that the estimate is not applicable or not available.

# *APPENDIX E-TRIP GENERATION DATA*

## *TRIP GENERATION WORKSHEET*

LAND USE: *Residential Condominium*
LAND USE CODE: 230 Independant Variable---Trips per Dwelling Unit

JOB: 25 Rockwood Road Norfolk
JOB NUMBER: 16071 Number of Units: 36

***WEEKDAY***

| RATES: | Total Trip Ends | | | Directional Dist. | | Number |
|---|---|---|---|---|---|---|
| | Average | Low | High | Enter | Exit | of Studies |
| DAILY | 5.81 | 1.53 | 11.79 | 50% | 50% | 56 |
| AM PEAK | 0.44 | 0.15 | 1.61 | 17% | 83% | 59 |
| PM PEAK | 0.52 | 0.18 | 1.24 | 67% | 33% | 62 |
| PK GEN AM | 0.44 | 0.15 | 0.97 | 19% | 81% | 54 |
| PK GEN PM | 0.52 | 0.18 | 1.24 | 64% | 36% | 52 |

| | BY AVERAGE | | | BY REGRESSION* | | | |
|---|---|---|---|---|---|---|---|
| | Total | Enter | Exit | Total | Enter | Exit | R2 |
| DAILY | 209 | 105 | 105 | 264 | 132 | 132 | 0.80 |
| AM PEAK | 16 | 3 | 13 | 23 | 4 | 19 | 0.76 |
| PM PEAK | 19 | 13 | 6 | 26 | 17 | 9 | 0.80 |
| PK GEN AM | 16 | 3 | 13 | 22 | 4 | 18 | 0.80 |
| PK GEN PM | 19 | 12 | 7 | 48 | 31 | 17 | 0.82 |

***SATURDAY***

| RATES: | Total Trip Ends | | | Directional Dist. | | Number |
|---|---|---|---|---|---|---|
| | Average | Low | High | Enter | Exit | of Studies |
| DAILY | 5.67 | 1.17 | 11.4 | 50% | 50% | 30 |
| PEAK HR | 0.47 | 0.14 | 0.93 | 54% | 46% | 27 |

| | BY AVERAGE | | | BY REGRESSION* | | | |
|---|---|---|---|---|---|---|---|
| | Total | Enter | Exit | Total | Enter | Exit | R2 |
| DAILY | 204 | 102 | 102 | 558 | 279 | 279 | 0.84 |
| PEAK HR | 17 | 9 | 8 | 53 | 29 | 24 | 0.84 |

* Use with caution. Regression not valid for small developments.

***SUNDAY***

| RATES: | Total Trip Ends | | | Directional Dist. | | Number |
|---|---|---|---|---|---|---|
| | Average | Low | High | Enter | Exit | of Studies |
| DAILY | 4.84 | 1.36 | 8.56 | 50% | 50% | 30 |
| PEAK HR | 0.45 | 0.16 | 1.07 | 49% | 51% | 27 |

| | BY AVERAGE | | | BY REGRESSION* | | | |
|---|---|---|---|---|---|---|---|
| | Total | Enter | Exit | Total | Enter | Exit | R2 |
| DAILY | 174 | 87 | 87 | 470 | 235 | 235 | 0.88 |
| PEAK HR | 16 | 8 | 8 | 58 | 29 | 30 | 0.78 |

* Use with caution. Regression not valid for small developments.

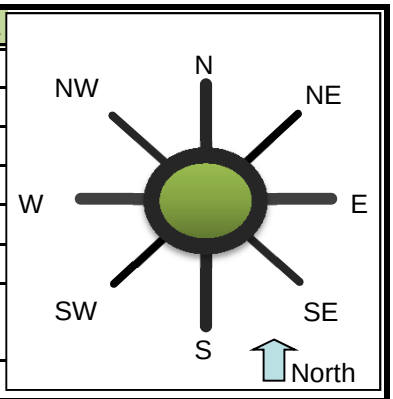
**SOURCE: Trip Generation, 9th Edition, Institute of Transportation Engineers, 2012**

# *APPENDIX F-INTERSECTION CAPACITY WORKSHEETS*

## General & Site Information

v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2016 Existing AM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| | N (1), vph | | | 64 | | 225 | | 16 | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | 122 | | | | 99 | | 507 | |
| (TO) | SE (4), vph | | | | | | | | |
| | S (5), vph | 177 | | 47 | | | | 47 | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | 22 | | 117 | | 22 | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 321 | 0 | 228 | 0 | 346 | 0 | 570 | 0 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 70 | 0 | 245 | 0 | 17 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 133 | 0 | 0 | 0 | 108 | 0 | 551 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 192 | 0 | 51 | 0 | 0 | 0 | 51 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 24 | 0 | 127 | 0 | 24 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 349 | 0 | 248 | 0 | 376 | 0 | 620 | 0 |
| Conflicting flow, pcu/h | 202 | 0 | 286 | 0 | 701 | 0 | 376 | 0 |

| Roundabout Type | Standard Single Lane or Urban Compact |
|---|---|
| **Enter type here…** | Standard Single Lane |

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 923 | NA | 849 | NA | 561 | NA | 776 | NA |
| Entry Flow Rates, vph | 349 | NA | 248 | NA | 376 | NA | 620 | NA |
| **V/C ratio** | **0.38** | | **0.29** | | **0.67** | | **0.80** | |
| **Control Delay, s/veh** | **8** | | **7** | | **22** | | **24** | |
| LOS | A | | A | | C | | C | |
| **95th % Queue (ft)** | **44** | | **30** | | **126** | | **208** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 1134 | NA | 1060 | NA | 761 | NA | 987 | NA |
| Entry Flow Rates, vph | 349 | NA | 248 | NA | 376 | NA | 620 | NA |
| **V/C ratio** | **0.31** | | **0.23** | | **0.49** | | **0.63** | |
| **Control Delay, sec/pcu** | **6** | | **6** | | **12** | | **13** | |
| LOS | A | | A | | B | | B | |
| **95th % Queue (ft)** | **33** | | **23** | | **69** | | **115** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 12.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 142 | 36 | 30 | 19 | 21 | 14 | 13 | 335 | 17 | 13 | 380 | 62 |
| Future Vol, veh/h | 142 | 36 | 30 | 19 | 21 | 14 | 13 | 335 | 17 | 13 | 380 | 62 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 5 | 5 | 5 | 15 | 15 | 15 | 6 | 6 | 6 | 4 | 4 | 4 |
| Mvmt Flow | 151 | 38 | 32 | 20 | 22 | 15 | 14 | 356 | 18 | 14 | 404 | 66 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 877 | 867 | 437 | 893 | 891 | 365 | 470 | 0 | 0 | 374 | 0 | 0 |
| Stage 1 | 465 | 465 | - | 393 | 393 | - | - | - | - | - | - | - |
| Stage 2 | 412 | 402 | - | 500 | 498 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.15 | 6.55 | 6.25 | 7.25 | 6.65 | 6.35 | 4.16 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.545 | 4.045 | 3.345 | 3.635 | 4.135 | 3.435 | 2.254 | - | - | 2.236 | - | - |
| Pot Cap-1 Maneuver | 266 | 288 | 613 | 249 | 268 | 652 | 1071 | - | - | 1174 | - | - |
| Stage 1 | 572 | 558 | - | 606 | 584 | - | - | - | - | - | - | - |
| Stage 2 | 611 | 595 | - | 529 | 523 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 237 | 279 | 613 | 206 | 259 | 652 | 1071 | - | - | 1174 | - | - |
| Mov Cap-2 Maneuver | 237 | 279 | - | 206 | 259 | - | - | - | - | - | - | - |
| Stage 1 | 562 | 549 | - | 596 | 574 | - | - | - | - | - | - | - |
| Stage 2 | 564 | 585 | - | 459 | 515 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 60 | 21.4 | 0.3 | 0.2 |
| HCM LOS | F | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1071 | - | - | 268 | 277 | 1174 | - | - |
| HCM Lane V/C Ratio | 0.013 | - | - | 0.826 | 0.207 | 0.012 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | - | 60 | 21.4 | 8.1 | 0 | - |
| HCM Lane LOS | A | A | - | F | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 6.6 | 0.8 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 410 | 2 | 4 | 372 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 410 | 2 | 4 | 372 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 0 | 0 | 0 | 17 | 17 | 17 | 8 | 8 | 8 | 5 | 5 | 5 |
| Mvmt Flow | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 461 | 2 | 4 | 418 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 890 | 890 | 418 | 889 | 889 | 462 | 418 | 0 | 0 | 463 | 0 | 0 |
| Stage 1 | 427 | 427 | - | 462 | 462 | - | - | - | - | - | - | - |
| Stage 2 | 463 | 463 | - | 427 | 427 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.27 | 6.67 | 6.37 | 4.18 | - | - | 4.15 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.653 | 4.153 | 3.453 | 2.272 | - | - | 2.245 | - | - |
| Pot Cap-1 Maneuver | 266 | 284 | 639 | 248 | 267 | 570 | 1110 | - | - | 1083 | - | - |
| Stage 1 | 610 | 589 | - | 552 | 540 | - | - | - | - | - | - | - |
| Stage 2 | 583 | 568 | - | 577 | 560 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 264 | 283 | 639 | 247 | 266 | 570 | 1110 | - | - | 1083 | - | - |
| Mov Cap-2 Maneuver | 264 | 283 | - | 247 | 266 | - | - | - | - | - | - | - |
| Stage 1 | 610 | 586 | - | 552 | 540 | - | - | - | - | - | - | - |
| Stage 2 | 581 | 568 | - | 574 | 557 | - | - | - | - | - | - | - |

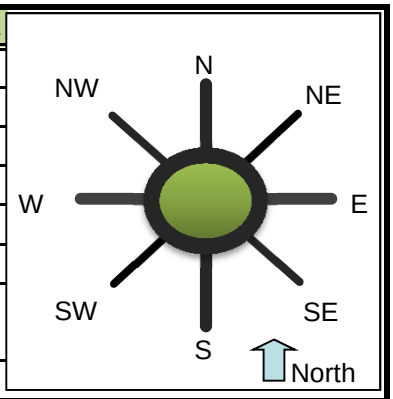
| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 17.1 | 0 | 0.1 |
| HCM LOS | A | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1110 | - | - | - | 305 | 1083 | - | - |
| HCM Lane V/C Ratio | - | - | - | - | 0.022 | 0.004 | - | - |
| HCM Control Delay (s) | 0 | - | - | 0 | 17.1 | 8.3 | 0 | - |
| HCM Lane LOS | A | - | - | A | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | 0 | - | - |

## General & Site Information

v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2016 Existing PM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
|---|---|---|---|---|---|---|---|---|---|
| | N (1), vph | | | 109 | | 252 | | 32 | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | 55 | | | | 42 | | 152 | |
| (TO) | SE (4), vph | | | | | | | | |
| | S (5), vph | 268 | | 58 | | | | 34 | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | 41 | | 398 | | 77 | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 364 | 0 | 565 | 0 | 371 | 0 | 218 | 0 |

## Volume Characteristics

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

## Entry/Conflicting Flows

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 118 | 0 | 274 | 0 | 35 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 60 | 0 | 0 | 0 | 46 | 0 | 165 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 291 | 0 | 63 | 0 | 0 | 0 | 37 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 45 | 0 | 433 | 0 | 84 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 396 | 0 | 614 | 0 | 403 | 0 | 237 | 0 |
| Conflicting flow, pcu/h | 579 | 0 | 392 | 0 | 260 | 0 | 414 | 0 |

## Roundabout Type

**Standard Single Lane or Urban Compact**

**Enter type here…** Standard Single Lane

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 633 | NA | 763 | NA | 871 | NA | 747 | NA |
| Entry Flow Rates, vph | 396 | NA | 614 | NA | 403 | NA | 237 | NA |
| **V/C ratio** | **0.62** | | **0.80** | | **0.46** | | **0.32** | |
| **Control Delay, s/veh** | **18** | | **25** | | **10** | | **9** | |
| LOS | C | | D | | A | | A | |
| **95th % Queue (ft)** | **109** | | **212** | | **62** | | **34** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 839 | NA | 974 | NA | 1083 | NA | 957 | NA |
| Entry Flow Rates, vph | 396 | NA | 614 | NA | 403 | NA | 237 | NA |
| **V/C ratio** | **0.47** | | **0.63** | | **0.37** | | **0.25** | |
| **Control Delay, sec/pcu** | **10** | | **13** | | **7** | | **6** | |
| LOS | B | | B | | A | | A | |
| **95th % Queue (ft)** | **64** | | **116** | | **44** | | **24** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 6.8 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 50 | 32 | 19 | 40 | 26 | 15 | 44 | 351 | 29 | 19 | 355 | 90 |
| Future Vol, veh/h | 50 | 32 | 19 | 40 | 26 | 15 | 44 | 351 | 29 | 19 | 355 | 90 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 56 | 36 | 21 | 45 | 29 | 17 | 49 | 394 | 33 | 21 | 399 | 101 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1025 | 1018 | 449 | 1031 | 1053 | 411 | 500 | 0 | 0 | 427 | 0 | 0 |
| Stage 1 | 492 | 492 | - | 510 | 510 | - | - | - | - | - | - | - |
| Stage 2 | 533 | 526 | - | 521 | 543 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 214 | 238 | 612 | 212 | 227 | 643 | 1069 | - | - | 1143 | - | - |
| Stage 1 | 560 | 549 | - | 548 | 539 | - | - | - | - | - | - | - |
| Stage 2 | 532 | 530 | - | 540 | 521 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 174 | 218 | 612 | 167 | 208 | 643 | 1069 | - | - | 1143 | - | - |
| Mov Cap-2 Maneuver | 174 | 218 | - | 167 | 208 | - | - | - | - | - | - | - |
| Stage 1 | 526 | 535 | - | 515 | 507 | - | - | - | - | - | - | - |
| Stage 2 | 459 | 498 | - | 473 | 507 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 38.5 | 34.9 | 0.9 | 0.3 |
| HCM LOS | E | D | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1069 | - | - | 217 | 209 | 1143 | - | - |
| HCM Lane V/C Ratio | 0.046 | - | - | 0.523 | 0.435 | 0.019 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 38.5 | 34.9 | 8.2 | 0 | - |
| HCM Lane LOS | A | A | - | E | D | A | A | - |
| HCM 95th %tile Q(veh) | 0.1 | - | - | 2.7 | 2 | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 456 | 7 | 1 | 434 | 1 |
| Future Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 456 | 7 | 1 | 434 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 0 | 0 | 25 | 25 | 25 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mvmt Flow | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 524 | 8 | 1 | 499 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1033 | 1036 | 499 | 1032 | 1032 | 528 | 500 | 0 | 0 | 532 | 0 | 0 |
| Stage 1 | 502 | 502 | - | 530 | 530 | - | - | - | - | - | - | - |
| Stage 2 | 531 | 534 | - | 502 | 502 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.35 | 6.75 | 6.45 | 4.12 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.725 | 4.225 | 3.525 | 2.218 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 213 | 233 | 576 | 191 | 212 | 508 | 1064 | - | - | 1041 | - | - |
| Stage 1 | 555 | 545 | - | 493 | 491 | - | - | - | - | - | - | - |
| Stage 2 | 536 | 528 | - | 511 | 506 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 212 | 233 | 576 | 190 | 212 | 508 | 1064 | - | - | 1041 | - | - |
| Mov Cap-2 Maneuver | 212 | 233 | - | 190 | 212 | - | - | - | - | - | - | - |
| Stage 1 | 554 | 544 | - | 493 | 491 | - | - | - | - | - | - | - |
| Stage 2 | 534 | 527 | - | 509 | 505 | - | - | - | - | - | - | - |

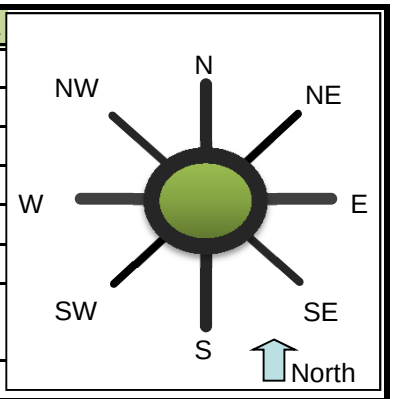
| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 16.7 | 21.3 | 0 | 0 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1064 | - | - | 310 | 225 | 1041 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.007 | 0.02 | 0.001 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | - | 16.7 | 21.3 | 8.5 | 0 | - |
| HCM Lane LOS | A | A | - | C | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0.1 | 0 | - | - |

## General & Site Information

v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2023 No Build AM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| | N (1), vph | | | **73** | | **241** | | **17** | |
| **Exit** | NE (2), vph | | | | | | | | |
| **Legs** | E (3), vph | **132** | | | | **106** | | **544** | |
| **(TO)** | SE (4), vph | | | | | | | | |
| | S (5), vph | **190** | | **50** | | | | **14** | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | **24** | | **125** | | **24** | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 346 | 0 | 248 | 0 | 371 | 0 | 575 | 0 |

| *Volume Characteristics* | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| *Entry/Conflicting Flows* | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 79 | 0 | 262 | 0 | 18 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 143 | 0 | 0 | 0 | 115 | 0 | 591 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 207 | 0 | 54 | 0 | 0 | 0 | 15 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 26 | 0 | 136 | 0 | 26 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 376 | 0 | 270 | 0 | 403 | 0 | 625 | 0 |
| Conflicting flow, pcu/h | 216 | 0 | 307 | 0 | 753 | 0 | 404 | 0 |

| *Roundabout Type* | **Standard Single Lane or Urban Compact** |
|---|---|
| **Enter type here…** | Standard Single Lane |

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 910 | NA | 832 | NA | 532 | NA | 754 | NA |
| Entry Flow Rates, vph | 376 | NA | 270 | NA | 403 | NA | 625 | NA |
| **V/C ratio** | **0.41** | | **0.32** | | **0.76** | | **0.83** | |
| **Control Delay, s/veh** | **9** | | **8** | | **29** | | **28** | |
| LOS | A | | A | | D | | D | |
| **95th % Queue (ft)** | **51** | | **35** | | **166** | | **231** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 1121 | NA | 1043 | NA | 730 | NA | 965 | NA |
| Entry Flow Rates, vph | 376 | NA | 270 | NA | 403 | NA | 625 | NA |
| **V/C ratio** | **0.34** | | **0.26** | | **0.55** | | **0.65** | |
| **Control Delay, sec/pcu** | **7** | | **6** | | **14** | | **14** | |
| LOS | A | | A | | B | | B | |
| **95th % Queue (ft)** | **37** | | **26** | | **85** | | **124** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 21.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 152 | 39 | 32 | 20 | 23 | 15 | 14 | 363 | 18 | 14 | 408 | 66 |
| Future Vol, veh/h | 152 | 39 | 32 | 20 | 23 | 15 | 14 | 363 | 18 | 14 | 408 | 66 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 5 | 5 | 5 | 15 | 15 | 15 | 6 | 6 | 6 | 4 | 4 | 4 |
| Mvmt Flow | 162 | 41 | 34 | 21 | 24 | 16 | 15 | 386 | 19 | 15 | 434 | 70 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 945 | 934 | 469 | 963 | 960 | 396 | 504 | 0 | 0 | 405 | 0 | 0 |
| Stage 1 | 499 | 499 | - | 426 | 426 | - | - | - | - | - | - | - |
| Stage 2 | 446 | 435 | - | 537 | 534 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.15 | 6.55 | 6.25 | 7.25 | 6.65 | 6.35 | 4.16 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.545 | 4.045 | 3.345 | 3.635 | 4.135 | 3.435 | 2.254 | - | - | 2.236 | - | - |
| Pot Cap-1 Maneuver | 239 | 263 | 588 | 223 | 244 | 626 | 1040 | - | - | 1143 | - | - |
| Stage 1 | 548 | 539 | - | 582 | 564 | - | - | - | - | - | - | - |
| Stage 2 | 586 | 575 | - | 505 | 504 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 208 | 253 | 588 | 179 | 235 | 626 | 1040 | - | - | 1143 | - | - |
| Mov Cap-2 Maneuver | 208 | 253 | - | 179 | 235 | - | - | - | - | - | - | - |
| Stage 1 | 538 | 529 | - | 571 | 553 | - | - | - | - | - | - | - |
| Stage 2 | 535 | 564 | - | 431 | 495 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 103.1 | 24.3 | 0.3 | 0.2 |
| HCM LOS | F | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1040 | - | - | 237 | 248 | 1143 | - | - |
| HCM Lane V/C Ratio | 0.014 | - | - | 1.001 | 0.249 | 0.013 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 103.1 | 24.3 | 8.2 | 0 | - |
| HCM Lane LOS | A | A | - | F | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 9.4 | 1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 444 | 2 | 4 | 400 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 444 | 2 | 4 | 400 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 0 | 0 | 0 | 17 | 17 | 17 | 8 | 8 | 8 | 5 | 5 | 5 |
| Mvmt Flow | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 499 | 2 | 4 | 449 | 0 |

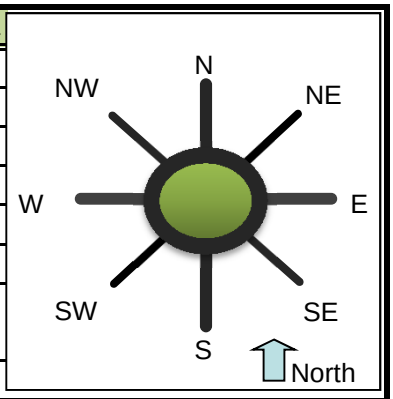
| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 959 | 959 | 449 | 958 | 958 | 500 | 449 | 0 | 0 | 501 | 0 | 0 |
| Stage 1 | 458 | 458 | - | 500 | 500 | - | - | - | - | - | - | - |
| Stage 2 | 501 | 501 | - | 458 | 458 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.27 | 6.67 | 6.37 | 4.18 | - | - | 4.15 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.653 | 4.153 | 3.453 | 2.272 | - | - | 2.245 | - | - |
| Pot Cap-1 Maneuver | 239 | 259 | 614 | 223 | 243 | 542 | 1080 | - | - | 1048 | - | - |
| Stage 1 | 587 | 570 | - | 526 | 519 | - | - | - | - | - | - | - |
| Stage 2 | 556 | 546 | - | 555 | 542 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 237 | 258 | 614 | 222 | 242 | 542 | 1080 | - | - | 1048 | - | - |
| Mov Cap-2 Maneuver | 237 | 258 | - | 222 | 242 | - | - | - | - | - | - | - |
| Stage 1 | 587 | 567 | - | 526 | 519 | - | - | - | - | - | - | - |
| Stage 2 | 554 | 546 | - | 552 | 539 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 18.4 | 0 | 0.1 |
| HCM LOS | A | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1080 | - | - | - | 276 | 1048 | - | - |
| HCM Lane V/C Ratio | - | - | - | - | 0.024 | 0.004 | - | - |
| HCM Control Delay (s) | 0 | - | - | 0 | 18.4 | 8.4 | 0 | - |
| HCM Lane LOS | A | - | - | A | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | 0 | - | - |

## General & Site Information v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2023 No Build PM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| | N (1), vph | | | 119 | | 270 | | 34 | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | 63 | | | | 45 | | 163 | |
| (TO) | SE (4), vph | | | | | | | | |
| | S (5), vph | 287 | | 62 | | | | 36 | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | 44 | | 427 | | 83 | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 394 | 0 | 608 | 0 | 398 | 0 | 233 | 0 |

| Volume Characteristics | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

| Entry/Conflicting Flows | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 129 | 0 | 293 | 0 | 37 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 68 | 0 | 0 | 0 | 49 | 0 | 177 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 312 | 0 | 67 | 0 | 0 | 0 | 39 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 48 | 0 | 464 | 0 | 90 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 428 | 0 | 661 | 0 | 433 | 0 | 253 | 0 |
| Conflicting flow, pcu/h | 622 | 0 | 421 | 0 | 283 | 0 | 448 | 0 |

| Roundabout Type | Standard Single Lane or Urban Compact |
|---|---|
| **Enter type here…** | Standard Single Lane |

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 607 | NA | 742 | NA | 852 | NA | 722 | NA |
| Entry Flow Rates, vph | 428 | NA | 661 | NA | 433 | NA | 253 | NA |
| **V/C ratio** | **0.71** | | **0.89** | | **0.51** | | **0.35** | |
| **Control Delay, s/veh** | **22** | | **35** | | **11** | | **9** | |
| LOS | C | | E | | B | | A | |
| **95th % Queue (ft)** | **143** | | **287** | | **73** | | **39** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 811 | NA | 952 | NA | 1063 | NA | 932 | NA |
| Entry Flow Rates, vph | 428 | NA | 661 | NA | 433 | NA | 253 | NA |
| **V/C ratio** | **0.53** | | **0.69** | | **0.41** | | **0.27** | |
| **Control Delay, sec/pcu** | **12** | | **15** | | **8** | | **7** | |
| LOS | B | | C | | A | | A | |
| **95th % Queue (ft)** | **79** | | **147** | | **50** | | **28** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 8.9 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 54 | 33 | 20 | 43 | 28 | 16 | 47 | 378 | 31 | 20 | 385 | 96 |
| Future Vol, veh/h | 54 | 33 | 20 | 43 | 28 | 16 | 47 | 378 | 31 | 20 | 385 | 96 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 61 | 37 | 22 | 48 | 31 | 18 | 53 | 425 | 35 | 22 | 433 | 108 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1103 | 1096 | 487 | 1109 | 1133 | 442 | 540 | 0 | 0 | 460 | 0 | 0 |
| Stage 1 | 531 | 531 | - | 548 | 548 | - | - | - | - | - | - | - |
| Stage 2 | 572 | 565 | - | 561 | 585 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 190 | 214 | 583 | 188 | 204 | 618 | 1034 | - | - | 1112 | - | - |
| Stage 1 | 534 | 528 | - | 522 | 519 | - | - | - | - | - | - | - |
| Stage 2 | 507 | 510 | - | 514 | 499 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 149 | 193 | 583 | 143 | 184 | 618 | 1034 | - | - | 1112 | - | - |
| Mov Cap-2 Maneuver | 149 | 193 | - | 143 | 184 | - | - | - | - | - | - | - |
| Stage 1 | 497 | 513 | - | 486 | 483 | - | - | - | - | - | - | - |
| Stage 2 | 428 | 475 | - | 445 | 485 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 53 | 45.6 | 0.9 | 0.3 |
| HCM LOS | F | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1034 | - | - | 188 | 182 | 1112 | - | - |
| HCM Lane V/C Ratio | 0.051 | - | - | 0.639 | 0.537 | 0.02 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | - | 53 | 45.6 | 8.3 | 0 | - |
| HCM Lane LOS | A | A | - | F | E | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 3.7 | 2.8 | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 491 | 8 | 1 | 469 | 1 |
| Future Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 491 | 8 | 1 | 469 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 0 | 0 | 25 | 25 | 25 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mvmt Flow | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 564 | 9 | 1 | 539 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1114 | 1118 | 540 | 1114 | 1114 | 569 | 540 | 0 | 0 | 574 | 0 | 0 |
| Stage 1 | 542 | 542 | - | 571 | 571 | - | - | - | - | - | - | - |
| Stage 2 | 572 | 576 | - | 543 | 543 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.35 | 6.75 | 6.45 | 4.12 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.725 | 4.225 | 3.525 | 2.218 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 187 | 209 | 546 | 167 | 189 | 481 | 1028 | - | - | 1004 | - | - |
| Stage 1 | 528 | 523 | - | 467 | 470 | - | - | - | - | - | - | - |
| Stage 2 | 509 | 505 | - | 485 | 484 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 186 | 209 | 546 | 166 | 189 | 481 | 1028 | - | - | 1004 | - | - |
| Mov Cap-2 Maneuver | 186 | 209 | - | 166 | 189 | - | - | - | - | - | - | - |
| Stage 1 | 527 | 522 | - | 467 | 470 | - | - | - | - | - | - | - |
| Stage 2 | 507 | 504 | - | 483 | 484 | - | - | - | - | - | - | - |

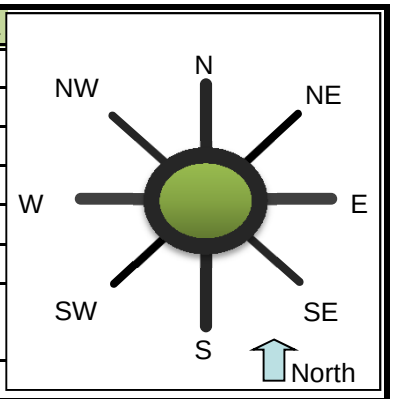
| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 18.1 | 23.6 | 0 | 0 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1028 | - | - | 277 | 198 | 1004 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.008 | 0.023 | 0.001 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 18.1 | 23.6 | 8.6 | 0 | - |
| HCM Lane LOS | A | A | - | C | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0.1 | 0 | - | - |

## General & Site Information

v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2023 Build AM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| | N (1), vph | | | 74 | | 242 | | 17 | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | 135 | | | | 106 | | 544 | |
| (TO) | SE (4), vph | | | | | | | | |
| | S (5), vph | 195 | | 50 | | | | 14 | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | 25 | | 125 | | 24 | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 355 | 0 | 249 | 0 | 372 | 0 | 575 | 0 |

## Volume Characteristics

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

## Entry/Conflicting Flows

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 80 | 0 | 263 | 0 | 18 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 147 | 0 | 0 | 0 | 115 | 0 | 591 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 212 | 0 | 54 | 0 | 0 | 0 | 15 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 27 | 0 | 136 | 0 | 26 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 386 | 0 | 271 | 0 | 404 | 0 | 625 | 0 |
| Conflicting flow, pcu/h | 216 | 0 | 308 | 0 | 757 | 0 | 413 | 0 |

## Roundabout Type

**Standard Single Lane or Urban Compact**

**Enter type here…** Standard Single Lane

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 910 | NA | 831 | NA | 530 | NA | 748 | NA |
| Entry Flow Rates, vph | 386 | NA | 271 | NA | 404 | NA | 625 | NA |
| **V/C ratio** | **0.42** | | **0.33** | | **0.76** | | **0.84** | |
| **Control Delay, s/veh** | **9** | | **8** | | **29** | | **28** | |
| LOS | A | | A | | D | | D | |
| **95th % Queue (ft)** | **53** | | **36** | | **169** | | **236** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 1121 | NA | 1042 | NA | 728 | NA | 958 | NA |
| Entry Flow Rates, vph | 386 | NA | 271 | NA | 404 | NA | 625 | NA |
| **V/C ratio** | **0.34** | | **0.26** | | **0.56** | | **0.65** | |
| **Control Delay, sec/pcu** | **7** | | **6** | | **14** | | **14** | |
| LOS | A | | A | | B | | B | |
| **95th % Queue (ft)** | **39** | | **26** | | **86** | | **126** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 22.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 152 | 39 | 32 | 20 | 23 | 15 | 15 | 369 | 19 | 14 | 410 | 66 |
| Future Vol, veh/h | 152 | 39 | 32 | 20 | 23 | 15 | 15 | 369 | 19 | 14 | 410 | 66 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 | 94 |
| Heavy Vehicles, % | 5 | 5 | 5 | 15 | 15 | 15 | 6 | 6 | 6 | 4 | 4 | 4 |
| Mvmt Flow | 162 | 41 | 34 | 21 | 24 | 16 | 16 | 393 | 20 | 15 | 436 | 70 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 956 | 946 | 471 | 974 | 971 | 403 | 506 | 0 | 0 | 413 | 0 | 0 |
| Stage 1 | 501 | 501 | - | 435 | 435 | - | - | - | - | - | - | - |
| Stage 2 | 455 | 445 | - | 539 | 536 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.15 | 6.55 | 6.25 | 7.25 | 6.65 | 6.35 | 4.16 | - | - | 4.14 | - | - |
| Critical Hdwy Stg 1 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.15 | 5.55 | - | 6.25 | 5.65 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.545 | 4.045 | 3.345 | 3.635 | 4.135 | 3.435 | 2.254 | - | - | 2.236 | - | - |
| Pot Cap-1 Maneuver | 235 | 258 | 587 | 219 | 240 | 620 | 1038 | - | - | 1135 | - | - |
| Stage 1 | 547 | 538 | - | 575 | 559 | - | - | - | - | - | - | - |
| Stage 2 | 579 | 570 | - | 504 | 503 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 204 | 248 | 587 | 175 | 231 | 620 | 1038 | - | - | 1135 | - | - |
| Mov Cap-2 Maneuver | 204 | 248 | - | 175 | 231 | - | - | - | - | - | - | - |
| Stage 1 | 536 | 528 | - | 564 | 548 | - | - | - | - | - | - | - |
| Stage 2 | 528 | 559 | - | 429 | 493 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 108.8 | 24.7 | 0.3 | 0.2 |
| HCM LOS | F | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1038 | - | - | 233 | 244 | 1135 | - | - |
| HCM Lane V/C Ratio | 0.015 | - | - | 1.018 | 0.253 | 0.013 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 108.8 | 24.7 | 8.2 | 0 | - |
| HCM Lane LOS | A | A | - | F | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 9.7 | 1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 446 | 2 | 4 | 409 | 0 |
| Future Vol, veh/h | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 446 | 2 | 4 | 409 | 0 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 0 | 0 | 0 | 17 | 17 | 17 | 8 | 8 | 8 | 5 | 5 | 5 |
| Mvmt Flow | 0 | 0 | 0 | 4 | 0 | 2 | 0 | 501 | 2 | 4 | 460 | 0 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 972 | 972 | 460 | 971 | 971 | 502 | 460 | 0 | 0 | 503 | 0 | 0 |
| Stage 1 | 469 | 469 | - | 502 | 502 | - | - | - | - | - | - | - |
| Stage 2 | 503 | 503 | - | 469 | 469 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.27 | 6.67 | 6.37 | 4.18 | - | - | 4.15 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.27 | 5.67 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.653 | 4.153 | 3.453 | 2.272 | - | - | 2.245 | - | - |
| Pot Cap-1 Maneuver | 234 | 254 | 605 | 218 | 238 | 540 | 1070 | - | - | 1046 | - | - |
| Stage 1 | 579 | 564 | - | 525 | 518 | - | - | - | - | - | - | - |
| Stage 2 | 555 | 545 | - | 547 | 536 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 232 | 253 | 605 | 217 | 237 | 540 | 1070 | - | - | 1046 | - | - |
| Mov Cap-2 Maneuver | 232 | 253 | - | 217 | 237 | - | - | - | - | - | - | - |
| Stage 1 | 579 | 561 | - | 525 | 518 | - | - | - | - | - | - | - |
| Stage 2 | 553 | 545 | - | 544 | 533 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 0 | 18.6 | 0 | 0.1 |
| HCM LOS | A | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1070 | - | - | - | 271 | 1046 | - | - |
| HCM Lane V/C Ratio | - | - | - | - | 0.025 | 0.004 | - | - |
| HCM Control Delay (s) | 0 | - | - | 0 | 18.6 | 8.5 | 0 | - |
| HCM Lane LOS | A | - | - | A | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | - | 0.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.3 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 8 | 9 | 2 | 448 | 462 | 2 |
| Future Vol, veh/h | 8 | 9 | 2 | 448 | 462 | 2 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 9 | 10 | 2 | 487 | 502 | 2 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 994 | 503 | 504 | 0 | - | 0 |
| Stage 1 | 503 | - | - | - | - | - |
| Stage 2 | 491 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 272 | 569 | 1061 | - | - | - |
| Stage 1 | 607 | - | - | - | - | - |
| Stage 2 | 615 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 271 | 569 | 1061 | - | - | - |
| Mov Cap-2 Maneuver | 271 | - | - | - | - | - |
| Stage 1 | 607 | - | - | - | - | - |
| Stage 2 | 613 | - | - | - | - | - |

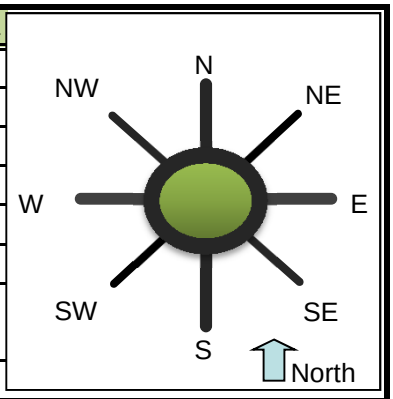
| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.1 | 0 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1061 | - | 375 | - | - |
| HCM Lane V/C Ratio | 0.002 | - | 0.049 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | 15.1 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.2 | - | - |

## General & Site Information

v2.1

| | |
|---|---|
| Analyst: | Jon Freeman |
| Agency/Co: | Green International Affiliates |
| Date: | 9/15/2016 |
| Project or PI#: | 16071 |
| Year, Peak Hour: | 2023 Build PM Peak Hour |
| County/District: | Norfolk, MA |
| Intersection Name: | Rockwood Road/Union Street at Main Street |




## Volumes

| | | Entry Legs (FROM) | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N (1) | NE (2) | E (3) | SE (4) | S (5) | SW (6) | W (7) | NW (8) |
| | N (1), vph | | | 121 | | 276 | | 34 | |
| Exit | NE (2), vph | | | | | | | | |
| Legs | E (3), vph | 64 | | | | 45 | | 163 | |
| (TO) | SE (4), vph | | | | | | | | |
| | S (5), vph | 289 | | 62 | | | | 36 | |
| | SW (6), vph | | | | | | | | |
| | W (7), vph | 45 | | 427 | | 83 | | | |
| | NW (8), vph | | | | | | | | |
| Output | Total Vehicles | 398 | 0 | 610 | 0 | 404 | 0 | 233 | 0 |

## Volume Characteristics

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| % Cars | 100% | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % Heavy Vehicles | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| % Bicycle | 0% | 0% | 0% | 0% | 0% | 0% | 0% | 0% |
| # of Pedestrians **(ped/hr)** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| *PHF* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* | *0.92* |
| $F_{HV}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| $F_{ped}$ | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |

## Entry/Conflicting Flows

| | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Flow to Leg # N (1), pcu/h | 0 | 0 | 132 | 0 | 300 | 0 | 37 | 0 |
| NE (2), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E (3), pcu/h | 70 | 0 | 0 | 0 | 49 | 0 | 177 | 0 |
| SE (4), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| S (5), pcu/h | 314 | 0 | 67 | 0 | 0 | 0 | 39 | 0 |
| SW (6), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| W (7), pcu/h | 49 | 0 | 464 | 0 | 90 | 0 | 0 | 0 |
| NW (8), pcu/h | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Entry flow, pcu/h | 433 | 0 | 663 | 0 | 439 | 0 | 253 | 0 |
| Conflicting flow, pcu/h | 622 | 0 | 427 | 0 | 284 | 0 | 451 | 0 |

## Roundabout Type

**Standard Single Lane or Urban Compact**

**Enter type here…** Standard Single Lane

## *Results: Approach Measures of Effectiveness*

| HCM 2010 Model (build) | N | NE | E | SE | S | SW | W | NW |
|---|---|---|---|---|---|---|---|---|
| Entry Capacity, vph | 607 | NA | 737 | NA | 851 | NA | 720 | NA |
| Entry Flow Rates, vph | 433 | NA | 663 | NA | 439 | NA | 253 | NA |
| **V/C ratio** | **0.71** | | **0.90** | | **0.52** | | **0.35** | |
| **Control Delay, s/veh** | **23** | | **37** | | **11** | | **9** | |
| LOS | C | | E | | B | | A | |
| **95th % Queue (ft)** | **147** | | **295** | | **76** | | **40** | |
| **Calibrated Model (future)** | **N** | **NE** | **E** | **SE** | **S** | **SW** | **W** | **NW** |
| Entry Capacity, vph | 811 | NA | 947 | NA | 1062 | NA | 929 | NA |
| Entry Flow Rates, vph | 433 | NA | 663 | NA | 439 | NA | 253 | NA |
| **V/C ratio** | **0.53** | | **0.70** | | **0.41** | | **0.27** | |
| **Control Delay, sec/pcu** | **12** | | **16** | | **8** | | **7** | |
| LOS | B | | C | | A | | A | |
| **95th % Queue (ft)** | **80** | | **150** | | **51** | | **28** | |

**Notes:** v2.1

Unit Legend:
vph = vehicles per hour
PHF = peak hour factor
$F_{HV}$ = heavy vehicle factor
pcu = passenger car unit

## *Bypass Lane Merge Point Analysis (if applicable)*

| Bypass Characteristics | Bypass #1 | Bypass #2 | Bypass #3 | Bypass #4 | Bypass #5 | Bypass #6 |
|---|---|---|---|---|---|---|
| Select Entry Leg from Bypass (FROM) | | | | | | |
| Select Exit Leg for Bypass (TO) | | | | | | |
| **Does the bypass have a dedicated receiving lane?** | | | | | | |
| *Volumes* | | | | | | |
| Right Turn Volume removed from Entry Leg | | | | | | |
| *Volume Characteristics (for entry leg)* | | | | | | |
| PHF | | | | | | |
| $F_{HV}$ | | | | | | |
| $F_{ped}$ | | | | | | |
| ***NOTE: Volume Characteristics for Exit Leg are already taken into account*** | | | | | | |
| *Entry/Conflicting Flows* | | | | | | |
| Entry Flow, pcu/hr | | | | | | |
| Conflicting Flow, pcu/hr | | | | | | |
| **Bypass Lane Results (HCM 2010 Model)** | | | | | | |
| Entry Capacity of Bypass, vph | | | | | | |
| Flow Rates of Exiting Traffic, vph | | | | | | |
| **V/C ratio** | | | | | | |
| **Control Delay, s/veh** | | | | | | |
| LOS | | | | | | |
| **95th % Queue (ft)** | | | | | | |
| *Approach w/Bypass Delay, s/veh* | | | | | | |
| *Approach w/Bypass LOS* | | | | | | |

| Intersection | |
|---|---|
| Int Delay, s/veh | 9.3 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 54 | 33 | 21 | 44 | 28 | 16 | 48 | 381 | 31 | 20 | 391 | 96 |
| Future Vol, veh/h | 54 | 33 | 21 | 44 | 28 | 16 | 48 | 381 | 31 | 20 | 391 | 96 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 | 89 |
| Heavy Vehicles, % | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 |
| Mvmt Flow | 61 | 37 | 24 | 49 | 31 | 18 | 54 | 428 | 35 | 22 | 439 | 108 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1116 | 1109 | 493 | 1122 | 1145 | 446 | 547 | 0 | 0 | 463 | 0 | 0 |
| Stage 1 | 538 | 538 | - | 553 | 553 | - | - | - | - | - | - | - |
| Stage 2 | 578 | 571 | - | 569 | 592 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.11 | 6.51 | 6.21 | 7.11 | 6.51 | 6.21 | 4.11 | - | - | 4.1 | - | - |
| Critical Hdwy Stg 1 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.11 | 5.51 | - | 6.11 | 5.51 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.509 | 4.009 | 3.309 | 3.509 | 4.009 | 3.309 | 2.209 | - | - | 2.2 | - | - |
| Pot Cap-1 Maneuver | 186 | 210 | 578 | 184 | 200 | 614 | 1027 | - | - | 1109 | - | - |
| Stage 1 | 529 | 524 | - | 519 | 516 | - | - | - | - | - | - | - |
| Stage 2 | 503 | 506 | - | 509 | 496 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 145 | 189 | 578 | 139 | 180 | 614 | 1027 | - | - | 1109 | - | - |
| Mov Cap-2 Maneuver | 145 | 189 | - | 139 | 180 | - | - | - | - | - | - | - |
| Stage 1 | 491 | 509 | - | 482 | 479 | - | - | - | - | - | - | - |
| Stage 2 | 424 | 470 | - | 440 | 482 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 55.4 | 48.4 | 0.9 | 0.3 |
| HCM LOS | F | E | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1027 | - | - | 185 | 177 | 1109 | - | - |
| HCM Lane V/C Ratio | 0.053 | - | - | 0.656 | 0.559 | 0.02 | - | - |
| HCM Control Delay (s) | 8.7 | 0 | - | 55.4 | 48.4 | 8.3 | 0 | - |
| HCM Lane LOS | A | A | - | F | E | A | A | - |
| HCM 95th %tile Q(veh) | 0.2 | - | - | 3.9 | 2.9 | 0.1 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.1 |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 499 | 8 | 1 | 473 | 1 |
| Future Vol, veh/h | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 499 | 8 | 1 | 473 | 1 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Stop | Stop | Stop | Stop | Free | Free | Free | Free | Free | Free |
| RT Channelized | - | - | None | - | - | None | - | - | None | - | - | None |
| Storage Length | - | - | - | - | - | - | - | - | - | - | - | - |
| Veh in Median Storage, # | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Grade, % | - | 0 | - | - | 0 | - | - | 0 | - | - | 0 | - |
| Peak Hour Factor | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 | 87 |
| Heavy Vehicles, % | 0 | 0 | 0 | 25 | 25 | 25 | 2 | 2 | 2 | 1 | 1 | 1 |
| Mvmt Flow | 1 | 0 | 1 | 3 | 0 | 1 | 1 | 574 | 9 | 1 | 544 | 1 |

| Major/Minor | Minor2 | | | Minor1 | | | Major1 | | | Major2 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Conflicting Flow All | 1128 | 1132 | 544 | 1127 | 1127 | 578 | 545 | 0 | 0 | 583 | 0 | 0 |
| Stage 1 | 547 | 547 | - | 580 | 580 | - | - | - | - | - | - | - |
| Stage 2 | 581 | 585 | - | 547 | 547 | - | - | - | - | - | - | - |
| Critical Hdwy | 7.1 | 6.5 | 6.2 | 7.35 | 6.75 | 6.45 | 4.12 | - | - | 4.11 | - | - |
| Critical Hdwy Stg 1 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Critical Hdwy Stg 2 | 6.1 | 5.5 | - | 6.35 | 5.75 | - | - | - | - | - | - | - |
| Follow-up Hdwy | 3.5 | 4 | 3.3 | 3.725 | 4.225 | 3.525 | 2.218 | - | - | 2.209 | - | - |
| Pot Cap-1 Maneuver | 183 | 205 | 543 | 164 | 186 | 475 | 1024 | - | - | 996 | - | - |
| Stage 1 | 525 | 521 | - | 462 | 465 | - | - | - | - | - | - | - |
| Stage 2 | 503 | 501 | - | 482 | 482 | - | - | - | - | - | - | - |
| Platoon blocked, % | | | | | | | | - | - | | - | - |
| Mov Cap-1 Maneuver | 182 | 205 | 543 | 163 | 186 | 475 | 1024 | - | - | 996 | - | - |
| Mov Cap-2 Maneuver | 182 | 205 | - | 163 | 186 | - | - | - | - | - | - | - |
| Stage 1 | 524 | 520 | - | 462 | 465 | - | - | - | - | - | - | - |
| Stage 2 | 501 | 500 | - | 480 | 482 | - | - | - | - | - | - | - |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| HCM Control Delay, s | 18.3 | 23.9 | 0 | 0 |
| HCM LOS | C | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | NBR | EBLn1 | WBLn1 | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|
| Capacity (veh/h) | 1024 | - | - | 273 | 195 | 996 | - | - |
| HCM Lane V/C Ratio | 0.001 | - | - | 0.008 | 0.024 | 0.001 | - | - |
| HCM Control Delay (s) | 8.5 | 0 | - | 18.3 | 23.9 | 8.6 | 0 | - |
| HCM Lane LOS | A | A | - | C | C | A | A | - |
| HCM 95th %tile Q(veh) | 0 | - | - | 0 | 0.1 | 0 | - | - |

| Intersection | |
|---|---|
| Int Delay, s/veh | 0.2 |

| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Vol, veh/h | 4 | 4 | 8 | 501 | 456 | 8 |
| Future Vol, veh/h | 4 | 4 | 8 | 501 | 456 | 8 |
| Conflicting Peds, #/hr | 0 | 0 | 0 | 0 | 0 | 0 |
| Sign Control | Stop | Stop | Free | Free | Free | Free |
| RT Channelized | - | None | - | None | - | None |
| Storage Length | 0 | - | - | - | - | - |
| Veh in Median Storage, # | 0 | - | - | 0 | 0 | - |
| Grade, % | 0 | - | - | 0 | 0 | - |
| Peak Hour Factor | 92 | 92 | 92 | 92 | 92 | 92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 4 | 4 | 9 | 545 | 496 | 9 |

| Major/Minor | Minor2 | | Major1 | | Major2 | |
|---|---|---|---|---|---|---|
| Conflicting Flow All | 1062 | 500 | 504 | 0 | - | 0 |
| Stage 1 | 500 | - | - | - | - | - |
| Stage 2 | 562 | - | - | - | - | - |
| Critical Hdwy | 6.42 | 6.22 | 4.12 | - | - | - |
| Critical Hdwy Stg 1 | 5.42 | - | - | - | - | - |
| Critical Hdwy Stg 2 | 5.42 | - | - | - | - | - |
| Follow-up Hdwy | 3.518 | 3.318 | 2.218 | - | - | - |
| Pot Cap-1 Maneuver | 247 | 571 | 1061 | - | - | - |
| Stage 1 | 609 | - | - | - | - | - |
| Stage 2 | 571 | - | - | - | - | - |
| Platoon blocked, % | | | | - | - | - |
| Mov Cap-1 Maneuver | 244 | 571 | 1061 | - | - | - |
| Mov Cap-2 Maneuver | 244 | - | - | - | - | - |
| Stage 1 | 609 | - | - | - | - | - |
| Stage 2 | 564 | - | - | - | - | - |

| Approach | EB | NB | SB |
|---|---|---|---|
| HCM Control Delay, s | 15.8 | 0.1 | 0 |
| HCM LOS | C | | |

| Minor Lane/Major Mvmt | NBL | NBT | EBLn1 | SBT | SBR |
|---|---|---|---|---|---|
| Capacity (veh/h) | 1061 | - | 342 | - | - |
| HCM Lane V/C Ratio | 0.008 | - | 0.025 | - | - |
| HCM Control Delay (s) | 8.4 | 0 | 15.8 | - | - |
| HCM Lane LOS | A | A | C | - | - |
| HCM 95th %tile Q(veh) | 0 | - | 0.1 | - | - |