

Middletown, Rhode Island  
**Newport National Golf Club**

*July 2019*

**TRAFFIC IMPACT STUDY**



**BETA**

6 Blackstone Valley Place  
Suite 101  
Lincoln, Rhode Island 02865  
401.333.2382  
[www.BETA-Inc.com](http://www.BETA-Inc.com)

# Newport National Golf Club

Middletown, Rhode Island

## TRAFFIC IMPACT STUDY

---

Prepared by: BETA GROUP, INC.

Prepared for: Mr. John Pereira  
Combined Properties, Inc.  
300 Commercial Street  
Malden, Massachusetts 02148

July 2019



July 29, 2019

Mr. John Pereira  
Combined Properties, Inc.  
300 Commercial Street  
Malden, MA 02148

**Re: Proposed Land Development Project  
Newport National Golf Club - West Course  
Mitchells Lane  
Middletown, Rhode Island**

Dear Mr. Pereira:

BETA Group, Inc., in accordance with our scope of services, has completed a traffic impact study for a proposed recreational land development project in the Town of Middletown, Rhode Island. The site is located on the westerly side of Mitchells Lane to the north of Wyatt Road. The property is defined by Assessor's Plat 124 Lot 29, which contains approximately 171.27 acres of land. The majority of the lot is used for agricultural purposes while portions of the property remain wooded.

Based upon information provided by *DiPrete Engineering* and review of the proposed site plan, it is our understanding that the recreational project includes construction of a 9-hole golf course, a club house, a maintenance building with associated parking. This project is part of the original *Newport National Golf Club* development approved in 2002 that included a 36 hole facility. To date only 18 holes have been constructed as part of the "East Course" that included only temporary support facilities. The additional holes and golf course buildings proposed as part of this project will function as single golf course in combination with the existing 18 holes, while moving the main management and facility operations to the new club house on the "West Course". Access and egress to the property will be provided at a new driveway on Mitchells Lane.

The study included herein, was conducted to determine the adequacy of the existing servicing roadways to accommodate anticipated traffic to be generated by the land development project. An analysis of potential impacts to the roadway capacity and safety has been completed, and is discussed in the following report.

Very truly yours,  
BETA Group, Inc.

A handwritten signature in black ink, appearing to read "Paul J. Bannon".

Paul J. Bannon  
Senior Project Manager

## TABLE OF CONTENTS

|   |    |
|---|----|
| 1.0 Introduction .....                    | 1  |
| 2.0 Project Area.....                     | 3  |
| 3.0 Existing Conditions .....             | 3  |
| 3.1 Roadways.....                         | 3  |
| 3.2 Intersections .....                   | 6  |
| 3.3 Traffic Data.....                     | 7  |
| 4.0 Safety Analysis.....                  | 7  |
| 5.0 Impact Analysis.....                  | 11 |
| 5.1 Trip Generation.....                  | 11 |
| 5.2 Future Traffic Conditions .....       | 13 |
| 5.3 Operation Analysis.....               | 15 |
| 6.0 Conclusions and Recommendations ..... | 17 |

## APPENDICES

- Appendix A: Traffic Volume Data
- Appendix B: Traffic Crash Data
- Appendix C: Trip Generation
- Appendix D: Operational Analysis

## LIST OF TABLES

|   |    |
|---|----|
| TABLE 1 – Trip Generation Estimate .....                      | 13 |
| TABLE 2 – Highway Capacity Manual Criteria .....              | 15 |
| TABLE 3 – Level of Service Summary (Existing Conditions)..... | 16 |
| TABLE 4 – Level of Service Summary (Future Conditions) .....  | 16 |

## LIST OF FIGURES

|  |    |
|--|----|
| FIGURE 1 – Project Vicinity Map .....        | 2  |
| FIGURE 2 – Project Area Map.....             | 4  |
| FIGURE 3 – Existing Traffic Volumes .....    | 8  |
| FIGURE 4 – Site Layout and Access Plan ..... | 12 |
| FIGURE 5 – Future Traffic Volumes .....      | 14 |

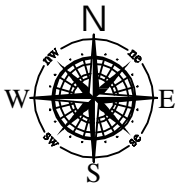
## 1.0 INTRODUCTION

The objective of the following study is to assess the potential traffic impacts associated with a proposed recreational land development project, the *Newport National Golf Club - West Course*, in the Town of Middletown, Rhode Island. The 171.27 acre parcel is situated on the westerly side of Mitchells Lane just north of Wyatt Road with a primary frontage on Mitchells Lane, and minor frontage on Wyatt Road. The proposed project is an expansion of the *Newport National Golf Club*, and includes construction of a 9-hole golf course, two buildings to accommodate a clubhouse (15,000 SF) and a maintenance facility (4,900 SF), and a parking lot. The new buildings and parking lot are proposed on the northerly end of the property and will become the primary operations and management location for the entire facility. Access to the *Newport National West Course* will be provided at a new driveway on Mitchells Lane, approximately a quarter of a mile south of the existing golf course entrance. A cart path interconnection will be provided between courses across Mitchell's Lane utilizing an existing easement area in the vicinity of the existing driveway. Refer to the Figure 1, Project Vicinity Map, on the following page for the project location within the community.

The study summarized herein focused on both traffic flow efficiency and safety along Mitchells Lane in the immediate project area, and specifically at its intersections with the site driveway, and major intersecting roadways of East Main Road (Route 138), and Wyatt Road. The impacts associated with the additional site related traffic have been defined and evaluated in accordance with standard traffic engineering guidelines and procedures.

The traffic engineering study completed for this project included the following:

- A traffic counting program to define the existing traffic patterns and operational characteristics along the servicing roadways, review of traffic record data from recent traffic studies in the vicinity of the project area and from historical data available from the RIDOT. The data collection specifically for this project included manual turning movement counts (TMC) at the Mitchells Lane intersections with East Main Road (Route 138) and with Wyatt Road.
- An analysis of accident records obtained from the Middletown Police Department for a recent traffic study in the project area to determine if there are any safety concerns relative to the frequency, severity or pattern of crashes in the project area.
- An inventory of the physical roadway characteristics of Mitchells Lane in the immediate site vicinity to determine the adequacy of the existing roadway geometric features in reference to safety and capacity.
- An estimate of future traffic volumes for the proposed development project was calculated using data from the "Trip Generation" Manual, an informational report published by the Institute of Transportation Engineers (ITE) and operational data provided by the golf course facility.
- Evaluation and analysis of the traffic safety and capacity issues for existing and future roadway conditions.
- Development of recommendations where necessary, that would be required to maintain safe and efficient traffic conditions in the project area.



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

## Figure 1 - Project Vicinity Map



## 2.0 PROJECT AREA

As noted in the previous section, the subject property is situated on the westerly side of Mitchells Lane to the north of Wyatt Road. The parcel contains approximately 171.27 acres of primarily agricultural land. A 9-hole golf course and two buildings are proposed to be constructed on the site with associated parking as part of an expansion of the *Newport National Golf Club*.

Land use in the immediate area can be defined as a mixture of medium density residential, recreational and agricultural properties. Just south of the site is *Sweet Berry Farm*. In addition, the *Sakonnet Greenway Trail* runs through properties conserved by the *Aquidneck Land Trust* on both sides of Mitchells Lane through both communities of Middletown and Portsmouth. The trail is a shared equestrian and pedestrian path with multiple loops on the west side of Mitchells Lane including a loop through the subject site. The trail connects to the east side of Mitchells Lane via an inroad signed shared use and runs along the perimeter of the *Newport National Golf Club* golf course northerly to *The Glen* in the Town of Portsmouth. Multiple parking areas for trail access are provided including three along Mitchells Lane, one on Wyatt Road, and one on Meadow Lane. Figure 2 on the following page depicts the general project area including the property boundaries of the subject parcel including the *Sakonnet Greenway Trail*.

Route 138 will serve as the primary access route to the site with Mitchells Lane and Wyatt Road providing immediate local access. Based upon the good operating characteristics of Mitchells Lane in the immediate area, and the minor amount of additional peak hour traffic anticipated with the small scale golf course use of the property, a study impact area was defined for this project. The limits of our analysis focused on Mitchells Lane from Wyatt Road northerly to East Main Road (Route 138).

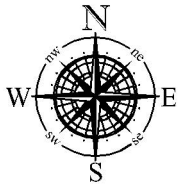
## 3.0 EXISTING CONDITIONS

### 3.1 ROADWAYS

#### Mitchells Lane

Mitchells Lane is a two-way, collector road extending from Wapping Road in the south to East Main Road (Route 138) in the north. The subject property is centrally located between these two roadways. Mitchells Lane along the property frontage is generally twenty feet wide delineated with a yellow centerline and white shoulder markings. No curbing or sidewalks typical of a rural residential roadway are provided.

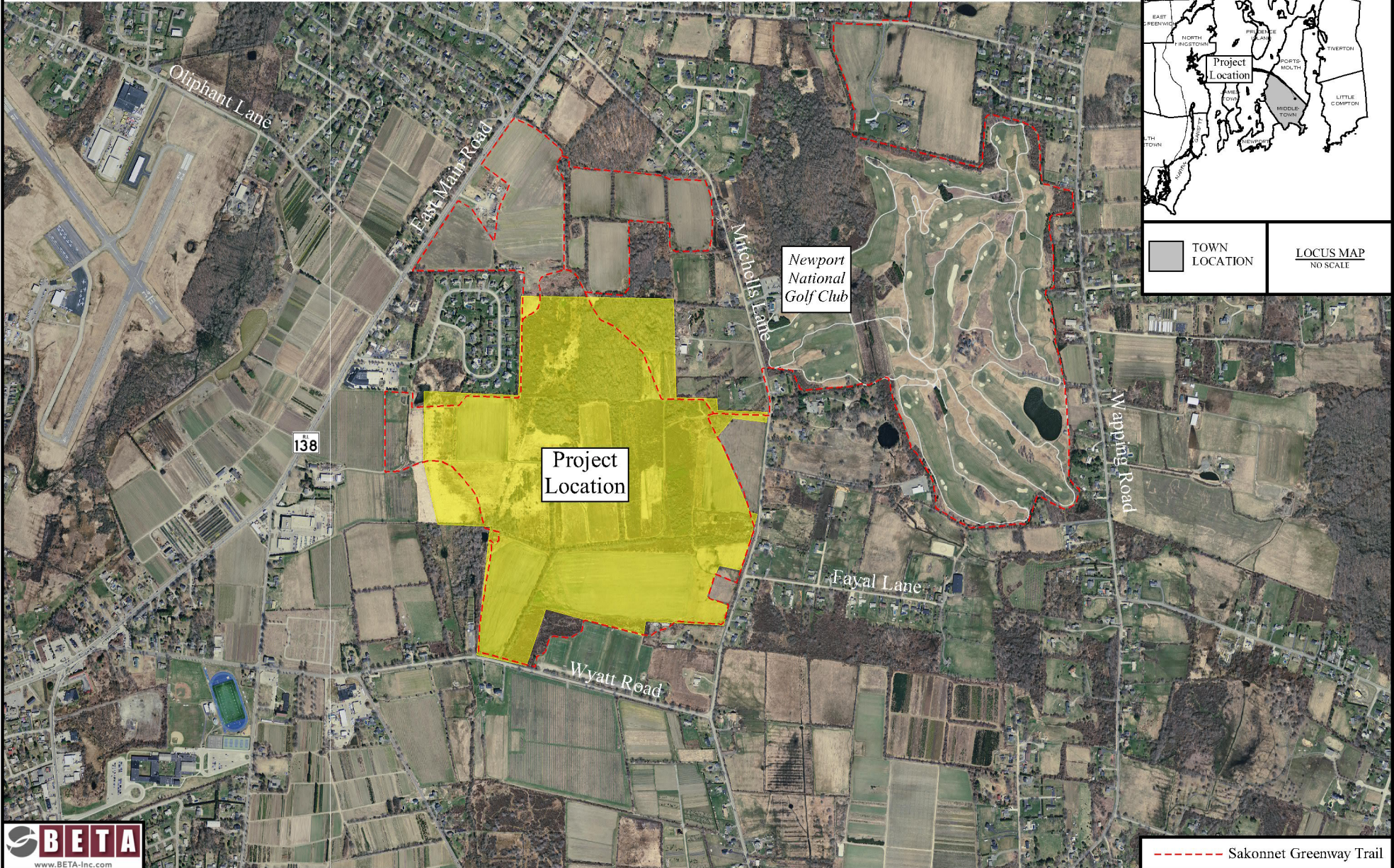
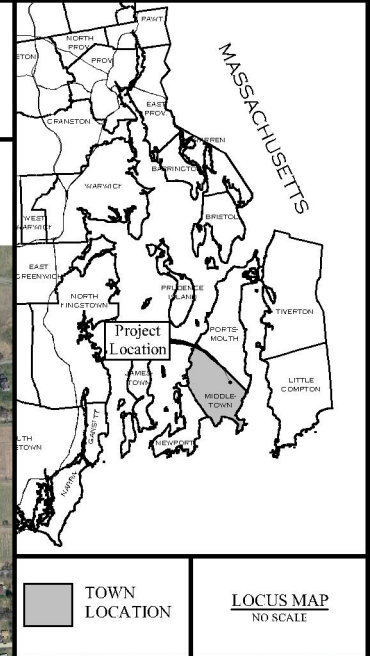




# Newport National West Course

MIDDLETOWN, RHODE ISLAND

## Figure 2 - Project Area Map



The pavement can be classified as being in fair to poor condition with visible alligator and longitudinal cracking, rutting, and patching. The speed limit in the project area is posted at 25 mph. In addition, lighting is provided for improved night-time visibility with cobra head light fixtures on utility poles situated sporadically along the roadway in the vicinity of horizontal curves and at intersecting side streets. The photograph on page 4 depicts the physical characteristics of Mitchells Lane looking south with the subject property to the right.

#### East Main Road (Route 138)

East Main Road (Route 138) is a four-lane roadway classified as an urban principal arterial that runs generally north/south between Boyds Lane to the north and West Main Road (Route 114) to the south.

East Main Road operates as a major north/south artery along the easterly side of Aquidneck Island in conjunction with West Main Road (Route 114) along the westerly side of the island. The roadway is approximately 42 feet wide consisting of two 10-foot travel lane and a 1-foot shoulder in each direction. The roadway pavement condition can be classified as being in fair condition with visible rutting,



patching and longitudinal cracking. There are no sidewalks available, though concrete curbing is present on both sides of the road in the project area. Small stone walls on roadway side slopes that include vegetation are present along this segment of East Main Road.

The speed limit is posted at 35 mph. Sporadic roadway lighting is located on utility poles along the easterly side of the road for nighttime illumination. The Rhode Island Public Transit Authority (RIPTA) provides bus service where a northbound bus stop is located between Mitchells Lane and Bramans Lane. The above photograph depicts the typical characteristics of East Main Road at the Middletown Town Line looking south with Mitchells Lane to the left.



#### Wyatt Road

Wyatt Road is classified as a collector road running generally in an east-west orientation from its intersection with Mitchells Lane westerly to East Main Road (Route 138). In the vicinity of Mitchells Lane, Wyatt

with Mitchells Lane westerly to East Main Road (Route 138). In the vicinity of Mitchells Lane, Wyatt

Road is approximately 22 feet wide consisting of a 10-foot travel lane and a 1-foot shoulder in each direction. The roadway pavement condition can be classified as being in fair to poor condition with visible rutting and extensive crack sealing. There is no curbing or sidewalks available, which is typical of a rural roadway. The speed limit is posted at 25 mph. There is no roadway lighting provided along the section of Wyatt Road between Mitchells Lane and Berkeley Avenue. The photograph on the previous page depicts the typical characteristics of Wyatt Road looking west from Mitchells Lane.

### 3.2 INTERSECTIONS

#### East Main Road (Route 138) at Mitchells Lane

Route 138 intersects Mitchells Lane to form a 3-Way, "T"-type junction with *Stop* control on the minor Mitchells Lane approach. A *Stop* sign and stop line are installed to define and enforce the intersection control, though the *Stop* sign should be upgraded to meet current safety standards relating to mounting height and reflectivity. The Route 138 northbound approach to the intersection provides a through lane and a shared through/right turn lane, while the Route 138 southbound approach provides a shared left turn/through lane and a through lane. The Mitchells Lane westbound approach to the intersection provides a single all-purpose lane.



There are no sidewalks at the intersection as steep sideslopes are present immediately adjacent to the edge of pavement or extending up from curbing along both sides of Route 138 to stone walls. Lighting is provided on a utility pole for nighttime illumination of the intersection. The above photograph depicts the typical characteristics of the intersection looking west along Mitchells Lane to the Route 138 junction.



#### Mitchells Lane at Wyatt Road

Mitchells Lane intersects Wyatt Road to form a 3-Way, "T"-type junction with all-way *Stop* control. A *Stop* sign and stop line are installed on each approach to the intersection to define and enforce the intersection control, though the *Stop* signs

should be upgraded to meet current safety standards for mounting height and visibility. All approaches to the intersection provide a single all-purpose lane. There is no curbing or sidewalks at the intersection or along either roadway in the project area. Lighting is provided on a utility pole for nighttime illumination of the intersection. The photograph on the previous page depicts the typical characteristics of the intersection looking south along Mitchells Lane to Wyatt Road.

### 3.3 TRAFFIC DATA

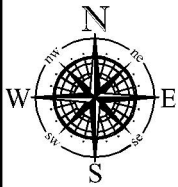
Existing traffic flow characteristics for this area were developed from a traffic counting program completed by BETA, recent traffic studies on the vicinity of the project area, and from historical data available from the RIDOT. The data collection included Manual Turning Movement Counts (TMC) at key study intersections and Automatic Traffic Recorder (ATR) along Mitchells Lane during peak summer traffic conditions in June and July 2019. The turning movement counts were collected during the peak weekday afternoon period between 4:00 and 6:00 PM and during the Saturday mid-day peak period between 11:00 AM and 1:00 PM at the Mitchell Lane intersections with East Main Road (Route 138), and with Wyatt Road. Complete count information can be found in the Appendix.

Route 138 along with West Main Road (Route 114) is influenced by Naval Station Newport, U.S. Naval Undersea Warfare Center (NUWC), Newport Hospital, Salve Regina University during the school year, and recreational beach and tourist areas during the summer months. Based upon record information from the RIDOT the roadway services 21,000 vehicles per day during an average month. During the summer months, Route 138 traffic can increase by 25% to approximately 26,000 vpd.

The manual turning movement count data found that Mitchells Lane during non-seasonal conditions services approximately 100 vehicles during the weekday afternoon peak hour with approximately 50 vehicles northbound and 50 vehicles southbound. During the Saturday mid-day peak hour, Mitchells Lane serviced 120 vehicles with approximately 60 vehicles northbound and 60 vehicles southbound. The results of the TMC data collection effort determined that the peak hours typically occur from 4:30 to 5:30 PM during the weekday afternoon peak period and 12:00 to 1:00 PM during the Saturday mid-day peak period. Figure 3 on the following page depicts the daily peak hour turning movement traffic volumes at the study intersections adjusted to represent peak summer conditions.

## 4.0 SAFETY ANALYSIS

To determine if there are any limiting factors affecting safety relating to the access to the proposed recreational land development, *Newport National Golf Club - West Course* project, the physical characteristics of Mitchells Lane and East Main Road (Route 138) in the project area, and specifically at the proposed site access road intersection was investigated. These limiting factors would potentially include horizontal or vertical alignment changes or roadside obstructions that limit sight distances for vehicles traveling along the road, or entering the road from a side street or driveway location. In this instance, the sight distance standard is necessary to permit turning vehicles to safely enter and exit the site access road.



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

## Figure 3 - Existing Traffic Volumes



### 1 EAST MAIN ROAD (ROUTE '38)/MITCHELLS LANE



### 2 MITCHELLS LANE/WYATT ROAD



**LEGEND:**

- TURN LANE
- XXX WEEKDAY PM PEAK VOLUMES (4:30 TO 5:30)
- (XXX) SATURDAY MD PEAK VOLUMES (12:00 TO 1:00)
- ① STUDY INTERSECTION
- ⬇️ TRAFFIC SIGNAL

The vertical and horizontal alignment of Mitchells Lane in the project area can be described as generally level, with multiple horizontal curves along its length, including gradual curves just north and south of the subject property. No curve warning signs were observed at these locations altering motorist of the alignment changes, however, as previously mentioned, lighting is provided in the vicinity of the curves along the length of Mitchells Lane to help guide motorist. The physical features of Mitchells Lane described provide sight distances greater than 350 feet to the north and south of the proposed site access road intersection. These values are in excess of AASHTO's recommended minimum sight distance of 155 feet based on the posted speed limit of 25 mph, and the 305 for the measured 85th percentile speed of 40 mph for vehicles travelling along this section of road.



It should be noted that there was roadside vegetation observed along the westerly side of Mitchells Lane approximately 200 feet north of the proposed site driveway adjacent to the Greenway Trail entrance. This vegetation (small trees and brush), if not maintained during the growing season could potentially restrict sight lines for vehicles exiting the proposed site access road and the Greenway Trail driveway. The adjacent photograph depicts the small amount of vegetation referenced. To provide improved sight lines at the existing trail driveway and new driveway intersection, appropriate trimming and clearing of this vegetation within the town right of way should be reviewed, and the appropriate treatment completed, though some of this vegetation will be removed as part of the extension of the Sakonnet Greenway Trail being completed as part of this project. The trail will be extended and formalized along the westerly side of Mitchells Lane north to the existing trail entrance on the easterly side of the road. All parking for trail access in this area will be provided on the westerly side of Mitchells Lane adjacent to the new golf course driveway. Appropriate crossing markings and signs are proposed to provide a safe crossing for pedestrians and horses. Refer to the concept plan in the Appendix for a depiction of the crossing proposal.



The vertical and horizontal alignment of East Main Road in the project area can be described as generally level and straight with a minor horizontal curve at Mitchells Lane. These physical features provide sight distances in excess of 500 feet to the north and south of the Mitchells Lane intersection. These values are greater than AASHTO's recommended minimum stopping sight distance of 250 feet for the posted speed limit

of 35 mph, and the 425 feet based on the actual measured 85th percentile speed of 50 mph observed along this section of road. It should be noted that during the growing season, vegetation on both corners of the intersection was observed immediately behind and extending over the small stone walls that are present along the easterly side of Route 138 on top of the roadside slope. This vegetation (small trees, hedges, and brush) could potentially restrict both the sight lines for vehicles exiting Mitchells Lane and visibility of the *Stop* sign on Mitchells Lane if allowed to mature further and become overgrown during the growing season. The photograph on the previous page depicts the small amount of vegetation referenced. To maintain available sight lines at the intersection, appropriate trimming and clearing of this vegetation should be completed on a regular basis during the summer months.

As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any significant physical roadway safety deficiencies exist within the defined study area. Also as part of our analysis, a review of accident statistics was completed. Data was reviewed from the Town of Middletown Police Department to determine if any location in the immediate vicinity of the development experienced a high frequency or pattern of accidents.

At the intersection of Route 138 with Mitchells Lane, a total of thirteen crashes (avg. three per year) occurred over the study period (2015-2018), with four involving an injury. Summarizing the data, nine of the crashes were rear end crashes, three were side-swipe collisions, and one was an angle type collision. It is important to note that ten of the total thirteen accidents (8 rear-end, 2 side-swipe) at the intersection of Route 138 with Mitchells Lane were a direct result of southbound left turning vehicles. The southbound accidents may be attributed to limited advanced visibility of Mitchells Lane to approaching southbound motorists, coupled with poor visibility of the Mitchells Lane street name sign that would help identify the side street location. In addition, there were no observed intersection warning signs to alert motorist of the junction. This physical condition results in left turn vehicles having to abruptly stop when they come upon the intersection in order to make the turning maneuver, thus causing rear-end and side-swipe collisions when vehicles are forced to change lanes. Also, all of the crashes at the intersection of Route 138 with Mitchells Lane occurred during daylight hours of which the majority (85%) occurred on dry roadway conditions.

In addition, five crashes occurred along a midblock section of Mitchells Lane between Route 138 and Wyatt Road with none occurring at the intersection of Mitchells Lane with Wyatt Road. Summarizing the data, four of the accidents, with one involving injuries, were single vehicle crashes and one was an angle crash. Two of the single vehicle crashes involved vehicles striking a deer and two involved drivers losing control of their vehicles during inclement weather due to poor roadway conditions. The angle crash occurred when a vehicle was struck while taking a wide right turn into a driveway.

Based upon the historical accident data obtained from the local police, and a review of existing roadway geometry, physical features, and operations, roadway or traffic related safety improvements could be investigated to improve safety at the unsignalized intersection of Route 138 with Mitchells Lane. The sight line/poor visibility concerns identified at the intersection of Mitchells Lane with Route 138 could be mitigated with proper safety enhancements. As previously mentioned, it is recommended that the vegetation immediately behind the small stone wall on the northeast and southeast corners of the intersection of Mitchells Lane with Route 138 be trimmed or removed as necessary to maintain sight lines for vehicles exiting

Mitchells Lane including improved visibility of the *Stop* sign. It is also recommended that the *Stop* signs at both the intersections of Mitchells Lane with Route 138 and Wyatt Road be replaced to meet current safety standards. The new signs at Route 138 could also be supplemented with advanced warning signs and/or pavement markings on Mitchells Lane to emphasize the primary traffic control device and the need to stop at Route 138 where the road ends. Also, appropriate advanced intersection warning signs could be installed on Route 138 along with relocating the existing Mitchells Lane street name sign to an optimum location visible to approaching southbound motorists.

In regard to the proposed conditions resulting from the golf course development, it is recommended that appropriate pavement markings (crosswalks) with associated advanced warning signs be placed for each of the crossings proposed. This includes the golf cart crossing between courses in the vicinity of the existing site driveway for the East Course, and at the new Sakonnet Greenway Trail crossing at the existing trail head to the East Course. These conceptual crossing details can be found in the Appendix.

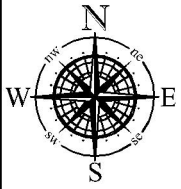
## 5.0 IMPACT ANALYSIS

### 5.1 TRIP GENERATION

To determine the traffic impact of a proposed development, estimates of anticipated traffic to be generated by a particular land use must be calculated. As previously discussed, the site development proposal includes construction of the second phase of the *Newport National Golf Club* to include a 9-hole golf course, a formal clubhouse, and maintenance facility with associated parking along the westerly side of Mitchells Lane just north of Wyatt Road. The clubhouse and maintenance facility will replace the existing temporary facilities built for the East Course during the first phase of the golf course project. Access will be provided from a new driveway on Mitchells Lane. Figure 4 on the following page depicts the site layout and access plan, prepared by *DiPrete Engineering*.

For this site, estimated traffic volumes for the golf course were based on operational data provided by *Newport National Golf Club* at the existing 18-hole golf course, and the use of trip generation factors. These factors are taken from the "Trip Generation" manual, an informational report published by the Institute of Transportation Engineers (ITE), a national professional organization for traffic and transportation engineers. The data provided in the ITE report are based on extensive traffic studies for various types of land uses (residential, commercial, industrial, etc.). This data has been found to be very reliable and provides a sound basis for estimating future trips to new developments. For the proposed *Newport National Golf Club - West Course* project, Land Use Code 430 Golf Course was found to be the most appropriate land use code to estimate site related vehicle trips.

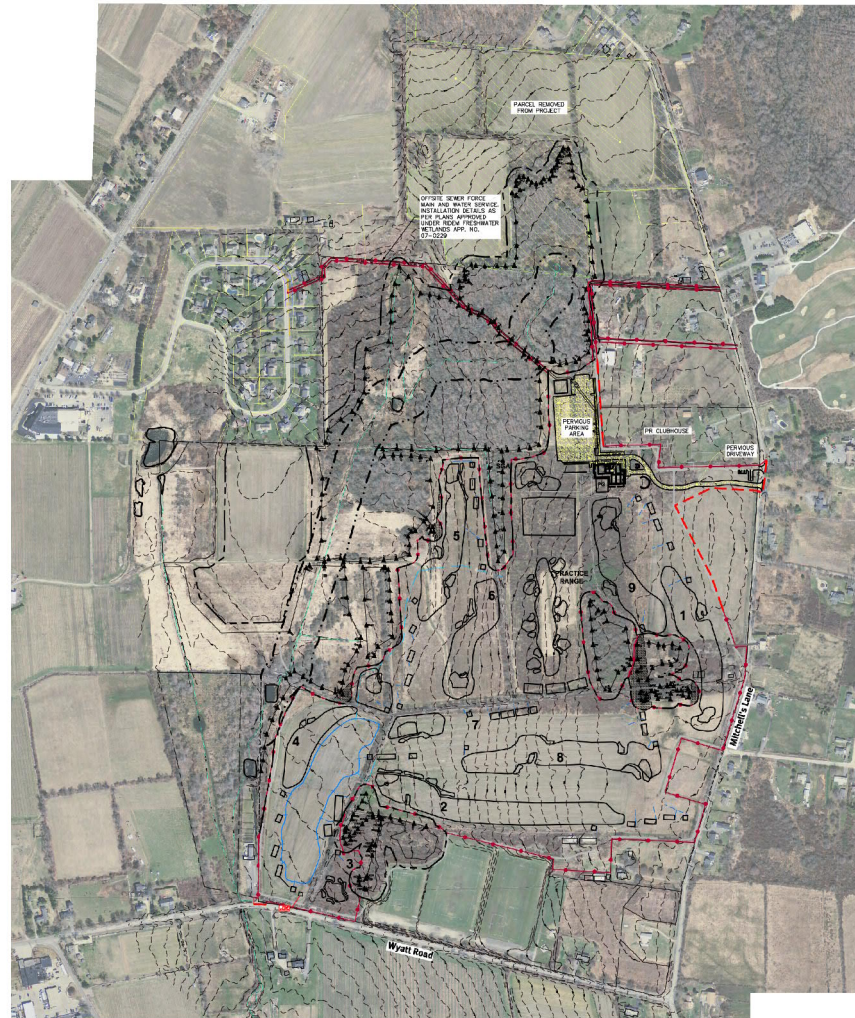
In addition to this method, as noted, operational data at the *Newport National Golf Club* was obtained for development of trip rates for this specific business. Other record data for golf courses obtained by our office was also reviewed for consistency of this land use in Rhode Island. The ITE manual suggests that if a similar or like land use is available in the region of study, data could be obtained to confirm the ITE rates, or to use the independent study rates if they are more appropriate. The applicable worksheets from the ITE manual and the data for the existing facility are included in the Appendix, and are summarized in Table 1.



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

## Figure 4 - Site Layout



Site Plan provided by DiPrete Engineering

TABLE 1 – Trip Generation Estimate

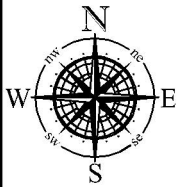
|   | Description                | Enter | Exit | Total |
|---|----------------------------|-------|------|-------|
| <b>ITE Estimated Trip Volumes (9 Holes)</b> |                            |       |      |       |
| <i>PM Peak Hour</i>                         |                            |       |      |       |
| ITE Land Use Code 430                       | Golf Course                | 14    | 13   | 27    |
| Independent Study                           | Newport National Golf Club | 13    | 13   | 26    |
| <i>Saturday MD Peak Hour</i>                |                            |       |      |       |
| ITE Land Use Code 430                       | Golf Course (              | 14    | 14   | 28    |
| Independent Study                           | Newport National Golf Club | 12    | 12   | 24    |

The volume of actual site-generated trips is in conjunction with the adjacent weekday afternoon and Saturday mid-day peak traffic periods between the hours of 4:30-5:30 PM and 12:00-1:00 PM, respectively. Please note that in order to be conservative, the number of entering players within the peak traffic periods studied for this project was designated as one trip and corresponded to the number of exiting players. The ITE trip estimate volumes overall, were a little higher than the actual site-generated trip volumes assuming noted entering/exiting players, so in an effort to be conservative in our analysis, the ITE trip values were utilized as an estimate of future site trips at the new 9-hole golf course.

## 5.2 FUTURE TRAFFIC CONDITIONS

In order to properly assess the impacts of a development, future traffic conditions of area roadways should be estimated for the period when the development is constructed and fully occupied. Typically, the expansion of base traffic is calculated when a project is to be constructed over an extended period (+3 to 5 years). It is anticipated that the *Newport National Golf Club - West Course* could be open and fully operational within a 12-18 month period. Since this project will be completed in such a short time frame where roadway volumes will be substantially the same, a future no-build scenario was not considered necessary in accordance with industry standard guidelines.

In developing the intersection volumes to be analyzed under the build condition, a directional distribution of the site traffic was estimated. The distribution was based on current traffic patterns in the area and operational information provided by the owner. It is estimated that 40% of the site traffic will arrive from and depart to the north and 60% will arrive from and depart to the south. Figure 5 on the following page depicts the estimated future build traffic condition during the weekday afternoon and Saturday mid-day peak hours studied for this project. Site distribution figures are provided in the Appendix.



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

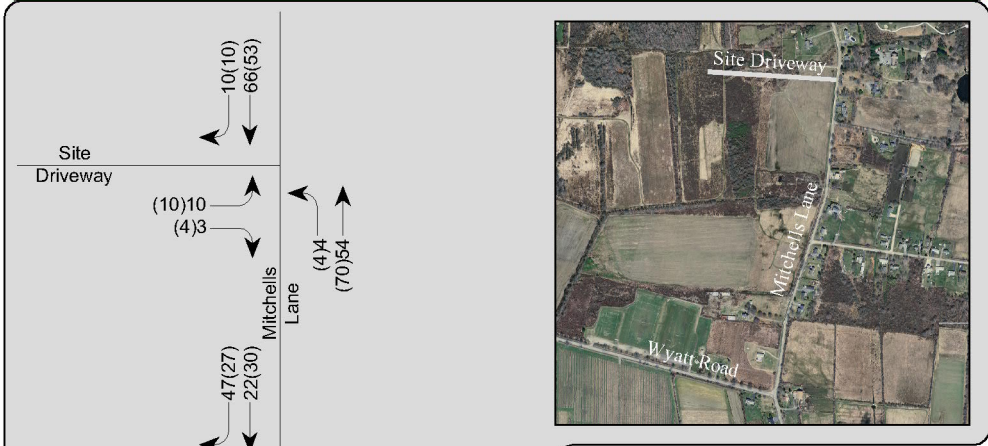
## Figure 5 - Future Traffic Volumes



### 1 EAST MAIN ROAD (ROUTE '38)/MITCHELLS LANE



### 2/3 MITCHELLS LANE/SITE DRIVEWAY & MITCHELLS LANEWYATT ROAD



**LEGEND:**

- ↔ TURN LANE
- XXX WEEKDAY PM PEAK VOLUMES (4:30 TO 5:30)
- (XXX) SATURDAY MD PEAK VOLUMES (12:00 TO 1:00)
- ① STUDY INTERSECTION
- ⬇️ TRAFFIC SIGNAL

### 5.3 OPERATION ANALYSIS

The key to any traffic impact analysis is the evaluation of roadway operations during peak traffic periods on the servicing roadway system. This situation would occur when the site-generated traffic, combined with the traffic volumes on the main roadway, result in the highest one-hour volume serviced along a roadway segment, or through an intersection. Review of the record traffic data found that the weekday PM and Saturday MD peak hours would represent this worst-case combination of site-generated traffic with the servicing roadway peak traffic period.

The Highway Capacity Manual analysis methodology provides the most accurate means of evaluating traffic capacity and delays for roadways and intersections. The results of this procedure are expressed in terms of Level of Service (LOS). Level of Service is a qualitative measure of traffic flow efficiency based on anticipated vehicle delays. For example, LOS "A" represents the best condition with little or no delay, while LOS "F" indicates that the roadway/intersection is at full capacity resulting in extended vehicle delays and potential queuing. Table 2 outlines the Level of Service delay criteria presented in the Highway Capacity Manual for unsignalized and signalized intersections.

**TABLE 2 – Highway Capacity Manual Criteria**

| <b>Level of Service</b> | <b>Unsignalized Delay<br/>Per Vehicle (sec)</b> | <b>Signalized Delay<br/>Per Vehicle (sec)</b> |
|-------------------------|---|---|
| A                       | <10   | <10   |
| B                       | >10 and <15                                     | >10 and <20                                   |
| C                       | >15 and <25                                     | >20 and <35                                   |
| D                       | >25 and <35                                     | >35 and <55                                   |
| E                       | >35 and <50                                     | >55 and <80                                   |
| F                       | >50   | >80   |

The unsignalized intersections of Mitchell Road with the proposed site driveway, East Main Road (Route 138), and with Wyatt Road were analyzed for the weekday PM and Saturday MD peak hours using summer traffic volume conditions. The capacity analysis worksheets are included in the Appendix and Tables 3 and 4 on the following page summarize the results of the analyses.

Table 3 depicts the current operating conditions at the Mitchells Lane intersections with Route 138 and with Wyatt Road. As can be seen in the table, the southbound left turn traffic from Route 138 onto Mitchells Lane operates efficiently with the critical movements experiencing minor delays of under 15 seconds, representing Levels of Service (LOS) B or better during both the weekday afternoon and Saturday mid-day peak hours. The movement that experiences greater delays is the minor Mitchells Lane westbound approach during the

weekday afternoon peak period where it operates at LOS F with typically only two to three vehicles waiting to turn onto the main roadway at any one time. This is due to the minor volume of left turning traffic experiencing greater delays to turn across both directions of travel. Right turning vehicles experience much shorter delays. In addition, the all-way *Stop* controlled intersection of Mitchells Lane with Wyatt Road operates efficiently at LOS A for all critical movements during both the weekday PM and Saturday MD peak hours with no movement experiencing excessive delays or queuing.

TABLE 3 – Level of Service Summary (Existing Conditions)

| Location / Movement  | EXISTING CONDITIONS  |       |  |                       |       |  |
|--|----------------------|-------|--|-----------------------|-------|--|
|  | Weekday PM Peak Hour |       |  | Saturday MD Peak Hour |       |  |
|  | LOS                  | Delay | 95 <sup>th</sup> % Queue Length (veh.) | LOS                   | Delay | 95 <sup>th</sup> % Queue Length (veh.) |
| <b><i>East Main Road (Route 138) at Mitchells Lane (Two-Way Stop Controlled)</i></b> |                      |       |  |                       |       |  |
| East Main Road (Route 138) SB Left   | B                    | 14.9  | 1                                      | A                     | 10.0  | 1                                      |
| Mitchells Lane WB  | F                    | 67.8  | 3                                      | C                     | 22.7  | 2                                      |
| <b><i>Mitchells Lane at Wyatt Road (All-Way Stop Controlled)</i></b>                 |                      |       |  |                       |       |  |
| Mitchells Lane NB  | A                    | 7.7   | 1                                      | A                     | 8.1   | 1                                      |
| Mitchells Lane SB  | A                    | 7.0   | 1                                      | A                     | 7.3   | 1                                      |
| Wyatt Road EB  | A                    | 7.4   | 1                                      | A                     | 7.7   | 1                                      |

TABLE 4 – Level of Service Summary (Future Conditions)

| Location / Movement  | FUTURE BUILD CONDITIONS |       |  |                       |       |  |
|--|-------------------------|-------|--|-----------------------|-------|--|
|  | Weekday PM Peak Hour    |       |  | Saturday MD Peak Hour |       |  |
|  | LOS                     | Delay | 95 <sup>th</sup> % Queue Length (veh.) | LOS                   | Delay | 95 <sup>th</sup> % Queue Length (veh.) |
| <b><i>East Main Road (Route 138) at Mitchells Lane (Two-Way Stop Controlled)</i></b> |                         |       |  |                       |       |  |
| East Main Road (Route 138) SB Left   | C                       | 15.4  | 1                                      | B                     | 10.1  | 1                                      |
| Mitchells Lane WB  | F                       | 107.0 | 4                                      | C                     | 24.4  | 2                                      |
| <b><i>Mitchells Lane at Site Driveway (Two-Way Stop Controlled)</i></b>              |                         |       |  |                       |       |  |
| Mitchells Lane NB  | A                       | 7.4   | 1                                      | A                     | 7.4   | 1                                      |
| Site Driveway EB   | A                       | 9.2   | 1                                      | A                     | 9.2   | 1                                      |
| <b><i>Mitchells Lane at Wyatt Road (All-Way Stop Controlled)</i></b>                 |                         |       |  |                       |       |  |
| Mitchells Lane NB  | A                       | 8.1   | 1                                      | A                     | 8.2   | 1                                      |
| Mitchells Lane SB  | A                       | 7.4   | 1                                      | A                     | 7.5   | 1                                      |
| Wyatt Road EB  | A                       | 7.9   | 1                                      | A                     | 8.0   | 1                                      |

Table 4 on the previous page presents the future conditions at the study intersections where the analysis found that the estimated increase in traffic during the peak periods resulting from the proposed *Newport National Golf Club - West Course* project, will not adversely impact overall traffic operations along Mitchells Lane, specifically at the defined study intersections reviewed for this project. The unsignalized intersection of Route 138 with Mitchells Lane will continue to operate in an acceptable manner at LOS C or better during both the peak periods analyzed for this study. The minor Mitchells Lane westbound approach to Route 138 will continue to operate with greater delays at LOS F during the weekday afternoon peak hour as previously described. In addition, the all-way *Stop* controlled intersection of Mitchells Lane with Wyatt Road will continue to operate efficiently at LOS A for all critical movements during both the weekday PM and Saturday MD peak hours with no movement experiencing excessive delays or queuing.

## 6.0 CONCLUSIONS AND RECOMMENDATIONS

In summary, the study has shown that the proposed recreational expansion project access and circulation plan has been designed to provide a level of traffic safety and efficiency on the servicing roadway system. The safety of the study intersections were reviewed for geometry and sight distances. The intersections reviewed were determined to provide sufficient sight distances in accordance with AASHTO criteria for visibility and decision making of drivers attempting to enter/exit main street traffic from a side street or driveway location.

In reference to safety, as previously noted, we recommend the following measures be implemented at the study locations:

### **Mitchells Lane at Site Driveway Intersection:**

1. Minor clearing of roadside vegetation for sight line enhancement.

### **Mitchells Lane at Route 138 Intersection:**

1. Minor clearing of roadside vegetation for sight line enhancement.
2. Replacement of the *Stop* sign on Mitchells Lane.
3. Installation of appropriate *Stop Ahead* sign and/or pavement markings on Mitchells Lane to emphasize the primary traffic control device.
4. Relocation of the Mitchells Lane street name sign for improved visibility of the intersection for Route 138 southbound traffic.
5. Installation of intersection warning signs on Route 138 to alert Route 138 motorist of the approaching intersection.

### **Mitchells Lane at Wyatt Road Intersection:**

1. Replace *Stop* signs on each approach to the intersection.

### **Mitchells Lane between Route 138 and Wyatt Road:**

1. Installation of crosswalks and applicable warning signs at the golf cart crossing and the Sakonnet Greenway Trail crossing per the concept plans provided.

The results of the operational analysis determined that the estimated minor increase in traffic during the peak periods resulting from the proposed *Newport National Golf Club - West Course* project will have a negligible effect on overall traffic operations along the servicing roadways, particularly during the daily weekday afternoon and Saturday mid-day peak hours when the new golf course would generate its highest daily traffic volumes.

Therefore, based upon the data collected on the servicing roadways, the analysis completed as part of this study, it can be concluded that the future traffic conditions resulting from the proposed expansion project with the recommended mitigation, will provide for adequate and safe access to a public street, and will not have a detrimental effect on public safety and welfare in the study area.

# APPENDIX

- A. Traffic Volume Data
- B. Traffic Crash Data
- C. Trip Generation
- D. Operational Analysis
- E. Conceptual Figures

# APPENDIX A – Traffic Volume Data

---

## **Automatic Traffic Recorder Count**

East Main Road (Route 138)

Mitchells Lane

## **Intersection Turning Movement Count**

East Main Road (Route 138) at Mitchells Lane

Mitchells Lane at Wyatt Road

A

---

**Automatic Traffic Recorder Count**

East Main Road (Route 138)

Mitchells Lane

East Main Road (Route 138)



Project Name: Middletown Sports Complex P: 401.333.2382 F: 401.333.9215  
 Town/City: Middletown, RI  
 Roadway: E. Main Road  
 Location: 500' South of Meadow Lane

E. Main  
 Site Code: 465201  
 Date Start: 25-May-14  
 Date End: 09-Jun-14

| Start Time | 26-May-14<br>Mon | 27-May-14<br>Tue | 28-May-14<br>Wed | 29-May-14<br>Thu | 30-May-14<br>Fri | Weekday<br>Average | 31-May-14<br>Sat | 01-Jun-14<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | 169              | 86               | 87               | 73               | 118              | 107                | 188              | 211              |
| 01:00      | 111              | 41               | 41               | 46               | 50               | 58                 | 117              | 161              |
| 02:00      | 62               | 19               | 27               | 29               | 20               | 31                 | 55               | 85               |
| 03:00      | 16               | 21               | 15               | 16               | 32               | 20                 | 23               | 20               |
| 04:00      | 43               | 71               | 65               | 62               | 68               | 62                 | 33               | 35               |
| 05:00      | 117              | 243              | 214              | 216              | 244              | 207                | 115              | 101              |
| 06:00      | 292              | 897              | 882              | 914              | 962              | 789                | 388              | 270              |
| 07:00      | 472              | 1973             | 1930             | 1884             | 1829             | 1618               | 813              | 525              |
| 08:00      | 774              | <b>2055</b>      | <b>2017</b>      | <b>2062</b>      | <b>2058</b>      | 1793               | 1258             | 717              |
| 09:00      | 972              | 1678             | 1606             | 1514             | 1578             | 1470               | 1588             | 1178             |
| 10:00      | 1172             | 1441             | 1356             | 1427             | 1614             | 1402               | 1770             | 1327             |
| 11:00      | <b>1476</b>      | 1585             | 1438             | 1453             | 1685             | 1527               | <b>1982</b>      | <b>1518</b>      |
| 12:00 PM   | 1451             | 1594             | 1554             | 1607             | 1750             | 1591               | <b>1861</b>      | <b>1766</b>      |
| 01:00      | 1527             | 1648             | 1564             | 1667             | 1736             | 1628               | 1753             | 1695             |
| 02:00      | <b>1537</b>      | 1882             | 1782             | 1893             | 1987             | 1816               | 1762             | 1723             |
| 03:00      | 1452             | 2107             | 2111             | 2101             | 2286             | 2011               | 1833             | 1693             |
| 04:00      | 1424             | <b>2202</b>      | <b>2150</b>      | <b>2343</b>      | <b>2348</b>      | 2093               | 1658             | 1572             |
| 05:00      | 1207             | 2148             | 2013             | 2230             | 2135             | 1947               | 1448             | 1329             |
| 06:00      | 1053             | 1437             | 1265             | 1503             | 1590             | 1370               | 1252             | 1147             |
| 07:00      | 845              | 980              | 916              | 1071             | 1131             | 989                | 918              | 869              |
| 08:00      | 626              | 658              | 716              | 780              | 844              | 725                | 743              | 652              |
| 09:00      | 333              | 392              | 423              | 520              | 596              | 453                | 645              | 425              |
| 10:00      | 246              | 241              | 227              | 325              | 436              | 295                | 534              | 275              |
| 11:00      | 141              | 143              | 153              | 223              | 302              | 192                | 423              | 151              |
| Total      | 17518            | 25542            | 24552            | 25959            | 27399            |                    | 23160            | 19445            |
| Percentage | 72.4%            | 105.6%           | 101.5%           | 107.3%           | 113.2%           |                    | 95.7%            | 80.4%            |
| AM Peak    | 11:00            | 08:00            | 08:00            | 08:00            | 08:00            |                    | 11:00            | 11:00            |
| Vol.       | 1476             | 2055             | 2017             | 2062             | 2058             |                    | 1982             | 1518             |
| PM Peak    | 14:00            | 16:00            | 16:00            | 16:00            | 16:00            |                    | 12:00            | 12:00            |
| Vol.       | 1537             | 2202             | 2150             | 2343             | 2348             |                    | 1861             | 1766             |

Project Name: Middletown Sports Complex P: 401.333.2382 F: 401.333.9215  
 Town/City: Middletown, RI  
 Roadway: E. Main Road  
 Location: 500' South of Meadow Lane

E. Main  
 Site Code: 465201  
 Date Start: 25-May-14  
 Date End: 09-Jun-14

| Start Time | 02-Jun-14<br>Mon | 03-Jun-14<br>Tue | 04-Jun-14<br>Wed | 05-Jun-14<br>Thu | 06-Jun-14<br>Fri | Weekday<br>Average | 07-Jun-14<br>Sat | 08-Jun-14<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | 71               | 88               | 86               | 100              | 101              | 89                 | 207              | 264              |
| 01:00      | 40               | 43               | 34               | 83               | 59               | 52                 | 141              | 175              |
| 02:00      | 21               | 18               | 25               | 32               | 31               | 25                 | 90               | 87               |
| 03:00      | 28               | 22               | 23               | 37               | 24               | 27                 | 29               | 40               |
| 04:00      | 64               | 69               | 74               | 132              | 62               | 80                 | 47               | 37               |
| 05:00      | 233              | 240              | 235              | 233              | 256              | 239                | 169              | 90               |
| 06:00      | 892              | 883              | 879              | 849              | 897              | 880                | 450              | 253              |
| 07:00      | 1899             | 1874             | 1820             | 1828             | 1778             | 1840               | 855              | 514              |
| 08:00      | <b>2036</b>      | <b>2071</b>      | <b>1986</b>      | <b>1955</b>      | <b>1972</b>      | 2004               | 1342             | 748              |
| 09:00      | 1611             | 1643             | 1558             | 1510             | 1614             | 1587               | 1756             | 1239             |
| 10:00      | 1493             | 1450             | 1373             | 1357             | 1591             | 1453               | 1955             | 1442             |
| 11:00      | 1532             | 1455             | 1432             | 1420             | 1663             | 1500               | <b>2122</b>      | <b>1649</b>      |
| 12:00 PM   | 1643             | 1588             | 1503             | 1482             | 1778             | 1599               | <b>2208</b>      | <b>1761</b>      |
| 01:00      | 1602             | 1596             | 1556             | 1510             | 1806             | 1614               | 2164             | 1664             |
| 02:00      | 1890             | 1895             | 1748             | 1684             | 2080             | 1859               | 1924             | 1705             |
| 03:00      | 2215             | 2130             | 1943             | 1827             | 2244             | 2072               | 1955             | 1710             |
| 04:00      | <b>2338</b>      | <b>2345</b>      | <b>2250</b>      | <b>2076</b>      | <b>2353</b>      | 2272               | 2031             | 1745             |
| 05:00      | 1979             | 2104             | 2072             | 1925             | 2099             | 2036               | 1659             | 1441             |
| 06:00      | 1370             | 1491             | 1415             | 1237             | 1491             | 1401               | 1465             | 1250             |
| 07:00      | 991              | 991              | 911              | 896              | 1034             | 965                | 1192             | 900              |
| 08:00      | 740              | 741              | 694              | 671              | 954              | 760                | 998              | 798              |
| 09:00      | 450              | 486              | 452              | 525              | 705              | 524                | 762              | 492              |
| 10:00      | 251              | 301              | 253              | 290              | 534              | 326                | 626              | 300              |
| 11:00      | 156              | 136              | 187              | 194              | 360              | 207                | 429              | 160              |
| Total      | 25545            | 25660            | 24509            | 23853            | 27486            |                    | 26576            | 20464            |
| Percentage | 100.5%           | 101.0%           | 96.5%            | 93.9%            | 108.2%           |                    | 104.6%           | 80.5%            |
| AM Peak    | 08:00            | 08:00            | 08:00            | 08:00            | 08:00            |                    | 11:00            | 11:00            |
| Vol.       | 2036             | 2071             | 1986             | 1955             | 1972             |                    | 2122             | 1649             |
| PM Peak    | 16:00            | 16:00            | 16:00            | 16:00            | 16:00            |                    | 12:00            | 12:00            |
| Vol.       | 2338             | 2345             | 2250             | 2076             | 2353             |                    | 2208             | 1761             |

Project Name: Middletown Sports Complex P: 401.333.2382 F: 401.333.9215  
 Town/City: Middletown, RI  
 Roadway: E. Main Road  
 Location: 500' South of Meadow Lane

E. Main  
 Site Code: 465201  
 Date Start: 25-May-14  
 Date End: 09-Jun-14

| Start Time | 09-Jun-14<br>Mon | 10-Jun-14<br>Tue | 11-Jun-14<br>Wed | 12-Jun-14<br>Thu | 13-Jun-14<br>Fri | Weekday<br>Average | 14-Jun-14<br>Sat | 15-Jun-14<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | 82               | *                | *                | *                | *                | 82                 | *                | *                |
| 01:00      | 65               | *                | *                | *                | *                | 65                 | *                | *                |
| 02:00      | 24               | *                | *                | *                | *                | 24                 | *                | *                |
| 03:00      | 12               | *                | *                | *                | *                | 12                 | *                | *                |
| 04:00      | 74               | *                | *                | *                | *                | 74                 | *                | *                |
| 05:00      | 249              | *                | *                | *                | *                | 249                | *                | *                |
| 06:00      | 920              | *                | *                | *                | *                | 920                | *                | *                |
| 07:00      | 1914             | *                | *                | *                | *                | 1914               | *                | *                |
| 08:00      | 2072             | *                | *                | *                | *                | 2072               | *                | *                |
| 09:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 10:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 11:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 12:00 PM   | *                | *                | *                | *                | *                | *                  | *                | *                |
| 01:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 02:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 03:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 04:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 05:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 06:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 07:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 08:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 09:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 10:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| 11:00      | *                | *                | *                | *                | *                | *                  | *                | *                |
| Total      | 5412             | 0                | 0                | 0                | 0                |                    | 0                | 0                |
| Percentage | 100.0%           | 0.0%             | 0.0%             | 0.0%             | 0.0%             |                    | 0.0%             | 0.0%             |
| AM Peak    | 08:00            |                  |                  |                  |                  |                    |                  |                  |
| Vol.       | 2072             |                  |                  |                  |                  |                    |                  |                  |
| PM Peak    |                  |                  |                  |                  |                  |                    |                  |                  |
| Vol.       |                  |                  |                  |                  |                  |                    |                  |                  |
| Total      |                  | 51202            | 49061            |                  |                  |                    |                  |                  |

Mitchells Lane

**BETA Group, Inc.**

701 George Washington Highway  
Lincoln, Rhode Island 02865

Project: Newport National  
Town/City: Middletown, RI  
Roadway: Mitchells Lane  
Location: 345 Mitchells Lane

Site Code: 06062019

| Start Time | 03-Jun-19<br>Mon | 04-Jun-19<br>Tue | 05-Jun-19<br>Wed | 06-Jun-19<br>Thu | 07-Jun-19<br>Fri | Weekday<br>Average | 08-Jun-19<br>Sat | 09-Jun-19<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | *                | *                | *                | *                | *                | 6                  | 8                | 9                |
| 01:00      | *                | *                | *                | *                | *                | 2                  | 3                | 5                |
| 02:00      | *                | *                | *                | *                | *                | 0                  | 1                | 2                |
| 03:00      | *                | *                | *                | *                | *                | 1                  | 2                | 0                |
| 04:00      | *                | *                | *                | *                | *                | 7                  | 7                | 6                |
| 05:00      | *                | *                | *                | *                | *                | 19                 | 16               | 7                |
| 06:00      | *                | *                | *                | *                | *                | 58                 | 41               | 24               |
| 07:00      | *                | *                | *                | *                | *                | 98                 | 59               | 43               |
| 08:00      | *                | *                | *                | *                | *                | 109                | 95               | 80               |
| 09:00      | *                | *                | *                | *                | *                | 63                 | 130              | 166              |
| 10:00      | *                | *                | *                | *                | 112              | 112                | 153              | 130              |
| 11:00      | *                | *                | *                | *                | 94               | 94                 | 126              | 170              |
| 12:00 PM   | *                | *                | *                | *                | 92               | 92                 | 147              | 132              |
| 01:00      | *                | *                | *                | *                | 107              | 107                | 116              | 132              |
| 02:00      | *                | *                | *                | *                | 112              | 112                | 141              | 152              |
| 03:00      | *                | *                | *                | *                | 130              | 130                | 155              | 124              |
| 04:00      | *                | *                | *                | 127              | 113              | 120                | 133              | 128              |
| 05:00      | *                | *                | *                | 103              | 87               | 95                 | 110              | 82               |
| 06:00      | *                | *                | *                | 90               | 80               | 85                 | 86               | 72               |
| 07:00      | *                | *                | *                | 69               | 29               | 49                 | 60               | 54               |
| 08:00      | *                | *                | *                | 49               | 39               | 44                 | 47               | 25               |
| 09:00      | *                | *                | *                | 11               | 26               | 18                 | 38               | 23               |
| 10:00      | *                | *                | *                | 9                | 20               | 14                 | 28               | 6                |
| 11:00      | *                | *                | *                | 3                | 16               | 10                 | 13               | 5                |
| Total      | 0                | 0                | 0                | 461              | 1420             |                    | 1715             | 1577             |
| Percentage | 0.0%             | 0.0%             | 0.0%             | 31.9%            | 98.3%            |                    | 118.7%           | 109.1%           |
| AM Peak    | -                | -                | -                | -                | 10:00            | -                  | 10:00            | 11:00            |
| Vol.       | -                | -                | -                | -                | 112              | -                  | 153              | 170              |
| PM Peak    | -                | -                | -                | 16:00            | 15:00            | -                  | 15:00            | 14:00            |
| Vol.       | -                | -                | -                | 127              | 130              | -                  | 155              | 152              |

**BETA Group, Inc.**  
 701 George Washington Highway  
 Lincoln, Rhode Island 02865

Project: Newport National  
 Town/City: Middletown, RI  
 Roadway: Mitchells Lane  
 Location: 345 Mitchells Lane

Site Code: 06062019

| Start Time | 10-Jun-19<br>Mon | 11-Jun-19<br>Tue | 12-Jun-19<br>Wed | 13-Jun-19<br>Thu | 14-Jun-19<br>Fri | Weekday<br>Average | 15-Jun-19<br>Sat | 16-Jun-19<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | 1                | 2                | 0                | 3                | 3                | 2                  | *                | *                |
| 01:00      | 1                | 1                | 0                | 3                | 3                | 2                  | *                | *                |
| 02:00      | 0                | 0                | 0                | 1                | 1                | 0                  | *                | *                |
| 03:00      | 4                | 1                | 2                | 1                | 0                | 2                  | *                | *                |
| 04:00      | 13               | 8                | 5                | 9                | 10               | 9                  | *                | *                |
| 05:00      | 11               | 11               | 18               | 17               | 18               | 15                 | *                | *                |
| 06:00      | 56               | 39               | 52               | 35               | 51               | 47                 | *                | *                |
| 07:00      | 85               | <b>83</b>        | 93               | 73               | 93               | 85                 | *                | *                |
| 08:00      | <b>99</b>        | 81               | <b>118</b>       | <b>88</b>        | 94               | 96                 | *                | *                |
| 09:00      | 70               | 54               | 84               | 47               | 94               | 70                 | *                | *                |
| 10:00      | 72               | 54               | 87               | 58               | 94               | 73                 | *                | *                |
| 11:00      | 95               | 70               | 103              | 75               | <b>109</b>       | 90                 | *                | *                |
| 12:00 PM   | 88               | 63               | 102              | 61               | 123              | 87                 | *                | *                |
| 01:00      | 86               | 76               | 99               | 56               | 99               | 83                 | *                | *                |
| 02:00      | 91               | 83               | 101              | 81               | 108              | 93                 | *                | *                |
| 03:00      | <b>112</b>       | 108              | 110              | <b>112</b>       | <b>130</b>       | 114                | *                | *                |
| 04:00      | 109              | <b>122</b>       | <b>150</b>       | 91               | 129              | 120                | *                | *                |
| 05:00      | 101              | 87               | 100              | 57               | *                | 86                 | *                | *                |
| 06:00      | 70               | 54               | 67               | 47               | *                | 60                 | *                | *                |
| 07:00      | 30               | 44               | 41               | 31               | *                | 36                 | *                | *                |
| 08:00      | 31               | 44               | 33               | 28               | *                | 34                 | *                | *                |
| 09:00      | 12               | 31               | 14               | 20               | *                | 19                 | *                | *                |
| 10:00      | 7                | 13               | 9                | 7                | *                | 9                  | *                | *                |
| 11:00      | 7                | 8                | 7                | 4                | *                | 6                  | *                | *                |
| Total      | 1251             | 1137             | 1395             | 1005             | 1159             |                    | 0                | 0                |
| Percentage | 101.1%           | 91.8%            | 112.7%           | 81.2%            | 93.6%            |                    | 0.0%             | 0.0%             |
| AM Peak    | 08:00            | 07:00            | 08:00            | 08:00            | 11:00            | -                  | -                | -                |
| Vol.       | 99               | 83               | 118              | 88               | 109              | -                  | -                | -                |
| PM Peak    | 15:00            | 16:00            | 16:00            | 15:00            | 15:00            | -                  | -                | -                |
| Vol.       | 112              | 122              | 150              | 112              | 130              | -                  | -                | -                |
| Total      |                  | 1137             | 1395             |                  |                  |                    |                  |                  |

# Automatic Traffic Recorder Data

Project Name: Newport National  
 Community: Middletown  
 Street Name: Mitchells Lane  
 Site Location: South of Newport National driveway

Date Start: 19-Jul-19  
 Date End: 26-Jul-19

| Start Time | 15-Jul-19<br>Mon | 16-Jul-19<br>Tue | 17-Jul-19<br>Wed | 18-Jul-19<br>Thu | 19-Jul-19<br>Fri | Weekday<br>Average | 20-Jul-19<br>Sat | 21-Jul-19<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | *                | *                | *                | *                | *                | *                  | 6                | 8                |
| 01:00      | *                | *                | *                | *                | *                | *                  | 8                | 6                |
| 02:00      | *                | *                | *                | *                | *                | *                  | 2                | 3                |
| 03:00      | *                | *                | *                | *                | *                | *                  | 2                | 2                |
| 04:00      | *                | *                | *                | *                | *                | *                  | 4                | 6                |
| 05:00      | *                | *                | *                | *                | *                | *                  | 20               | 18               |
| 06:00      | *                | *                | *                | *                | *                | *                  | 29               | 29               |
| 07:00      | *                | *                | *                | *                | *                | *                  | 89               | 93               |
| 08:00      | *                | *                | *                | *                | *                | *                  | 188              | 147              |
| 09:00      | *                | *                | *                | *                | *                | *                  | 260              | 120              |
| 10:00      | *                | *                | *                | *                | *                | *                  | 206              | 107              |
| 11:00      | *                | *                | *                | *                | *                | *                  | 153              | 114              |
| 12:00 PM   | *                | *                | *                | *                | *                | *                  | 148              | 131              |
| 01:00      | *                | *                | *                | *                | *                | *                  | 156              | 112              |
| 02:00      | *                | *                | *                | *                | *                | *                  | 164              | 134              |
| 03:00      | *                | *                | *                | *                | 181              | 181                | 147              | 138              |
| 04:00      | *                | *                | *                | *                | 164              | 164                | 153              | 159              |
| 05:00      | *                | *                | *                | *                | 115              | 115                | 123              | 135              |
| 06:00      | *                | *                | *                | *                | 93               | 93                 | 108              | 133              |
| 07:00      | *                | *                | *                | *                | 61               | 61                 | 102              | 103              |
| 08:00      | *                | *                | *                | *                | 57               | 57                 | 74               | 81               |
| 09:00      | *                | *                | *                | *                | 30               | 30                 | 23               | 29               |
| 10:00      | *                | *                | *                | *                | 13               | 13                 | 15               | 13               |
| 11:00      | *                | *                | *                | *                | 8                | 8                  | 15               | 6                |
| Total      | 0                | 0                | 0                | 0                | 722              |                    | 2195             | 1827             |
| Percentage | 0.0%             | 0.0%             | 0.0%             | 0.0%             | 100.0%           |                    | 304.0%           | 253.0%           |
| AM Peak    | -                | -                | -                | -                | -                | -                  | 09:00            | 08:00            |
| Vol.       | -                | -                | -                | -                | -                | -                  | 260              | 147              |
| PM Peak    | -                | -                | -                | -                | 15:00            | -                  | 14:00            | 16:00            |
| Vol.       | -                | -                | -                | -                | 181              | -                  | 164              | 159              |

# Automatic Traffic Recorder Data

Project Name: Newport National  
 Community: Middletown  
 Street Name: Mitchells Lane  
 Site Location: South of Newport National driveway

Date Start: 19-Jul-19  
 Date End: 26-Jul-19

| Start Time | 22-Jul-19<br>Mon | 23-Jul-19<br>Tue | 24-Jul-19<br>Wed | 25-Jul-19<br>Thu | 26-Jul-19<br>Fri | Weekday<br>Average | 27-Jul-19<br>Sat | 28-Jul-19<br>Sun |
|------------|------------------|------------------|------------------|------------------|------------------|--------------------|------------------|------------------|
| 12:00 AM   | 4                | 3                | 2                | 4                | 2                | 3                  | *                | *                |
| 01:00      | 4                | 1                | 0                | 3                | 1                | 2                  | *                | *                |
| 02:00      | 3                | 1                | 0                | 4                | 1                | 2                  | *                | *                |
| 03:00      | 1                | 3                | 1                | 0                | 0                | 1                  | *                | *                |
| 04:00      | 6                | 6                | 5                | 4                | 7                | 6                  | *                | *                |
| 05:00      | 19               | 13               | 17               | 16               | 19               | 17                 | *                | *                |
| 06:00      | 47               | 27               | 43               | 42               | 50               | 42                 | *                | *                |
| 07:00      | 88               | 73               | 85               | 103              | 88               | 87                 | *                | *                |
| 08:00      | <b>125</b>       | <b>98</b>        | <b>113</b>       | <b>140</b>       | 123              | 120                | *                | *                |
| 09:00      | 76               | 48               | 78               | 109              | <b>143</b>       | 91                 | *                | *                |
| 10:00      | 87               | 36               | 96               | 107              | 139              | 93                 | *                | *                |
| 11:00      | 83               | 50               | 97               | 129              | 137              | 99                 | *                | *                |
| 12:00 PM   | 87               | 81               | 92               | 107              | 117              | 97                 | *                | *                |
| 01:00      | 94               | 56               | 101              | 117              | 134              | 100                | *                | *                |
| 02:00      | 99               | 76               | 104              | 121              | 157              | 111                | *                | *                |
| 03:00      | 102              | 89               | 107              | <b>162</b>       | <b>177</b>       | 127                | *                | *                |
| 04:00      | <b>120</b>       | <b>113</b>       | <b>144</b>       | 156              | *                | 133                | *                | *                |
| 05:00      | 88               | 70               | 122              | 111              | *                | 98                 | *                | *                |
| 06:00      | 64               | 54               | 86               | 114              | *                | 80                 | *                | *                |
| 07:00      | 38               | 31               | 61               | 65               | *                | 49                 | *                | *                |
| 08:00      | 32               | 31               | 47               | 28               | *                | 34                 | *                | *                |
| 09:00      | 19               | 25               | 29               | 24               | *                | 24                 | *                | *                |
| 10:00      | 6                | 14               | 14               | 16               | *                | 12                 | *                | *                |
| 11:00      | 2                | 8                | 5                | 8                | *                | 6                  | *                | *                |
| Total      | 1294             | 1007             | 1449             | 1690             | 1295             |                    | 0                | 0                |
| Percentage | 90.2%            | 70.2%            | 101.0%           | 117.9%           | 90.3%            |                    | 0.0%             | 0.0%             |
| AM Peak    | 08:00            | 08:00            | 08:00            | 08:00            | 09:00            | -                  | -                | -                |
| Vol.       | 125              | 98               | 113              | 140              | 143              | -                  | -                | -                |
| PM Peak    | 16:00            | 16:00            | 16:00            | 15:00            | 15:00            | -                  | -                | -                |
| Vol.       | 120              | 113              | 144              | 162              | 177              | -                  | -                | -                |
| Total      |                  | 1007             | 1449             |                  |                  |                    |                  |                  |

A

---

**Intersection Turning Movement Count**

East Main Road (Route 138) at Mitchells Lane

Mitchells Lane at Wyatt Road

East Main Road (Route 138) at Mitchells Lane



www.BETA-inc.com

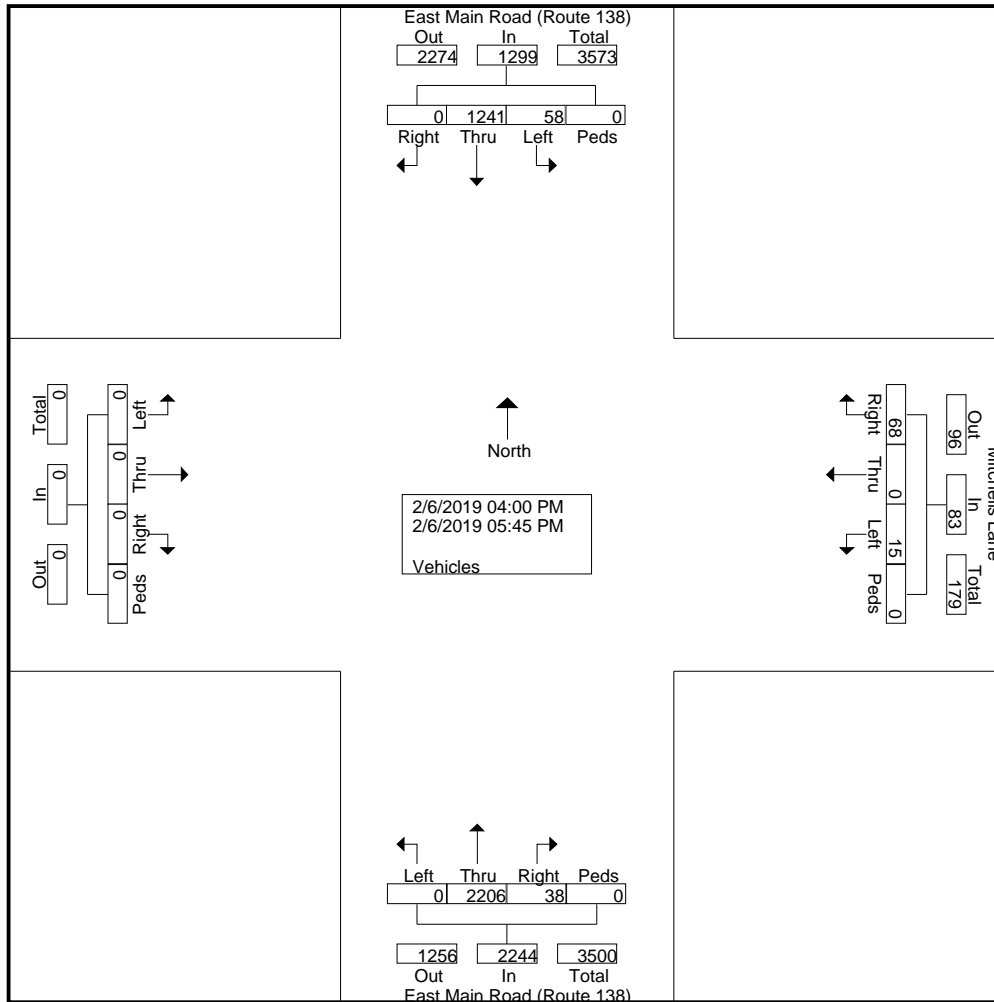
6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Route 138 at Mitchells Lane  
Weather: Mostly Cloudy/30s

File Name : Mtichells at Route 138 - PM  
Site Code : 641401  
Start Date : 2/6/2019  
Page No : 1

Groups Printed- Vehicles

| Start Time  | East Main Road (Route 138) Southbound |      |       |      |            | Mitchells Lane Westbound |      |       |      |            | East Main Road (Route 138) Northbound |      |       |      |            | Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|---------------------------------------|------|-------|------|------------|-----------|------|-------|------|------------|------------|
|             | Left                                  | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                                  | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total |            |
| 04:00 PM    | 9                                     | 159  | 0     | 0    | 168        | 3                        | 0    | 12    | 0    | 15         | 0                                     | 296  | 5     | 0    | 301        | 0         | 0    | 0     | 0    | 0          | 484        |
| 04:15 PM    | 7                                     | 164  | 0     | 0    | 171        | 0                        | 0    | 7     | 0    | 7          | 0                                     | 296  | 5     | 0    | 301        | 0         | 0    | 0     | 0    | 0          | 479        |
| 04:30 PM    | 2                                     | 149  | 0     | 0    | 151        | 2                        | 0    | 5     | 0    | 7          | 0                                     | 287  | 7     | 0    | 294        | 0         | 0    | 0     | 0    | 0          | 452        |
| 04:45 PM    | 9                                     | 168  | 0     | 0    | 177        | 1                        | 0    | 13    | 0    | 14         | 0                                     | 268  | 4     | 0    | 272        | 0         | 0    | 0     | 0    | 0          | 463        |
| Total       | 27                                    | 640  | 0     | 0    | 667        | 6                        | 0    | 37    | 0    | 43         | 0                                     | 1147 | 21    | 0    | 1168       | 0         | 0    | 0     | 0    | 0          | 1878       |
| 05:00 PM    | 11                                    | 152  | 0     | 0    | 163        | 1                        | 0    | 12    | 0    | 13         | 0                                     | 265  | 3     | 0    | 268        | 0         | 0    | 0     | 0    | 0          | 444        |
| 05:15 PM    | 11                                    | 174  | 0     | 0    | 185        | 7                        | 0    | 8     | 0    | 15         | 0                                     | 321  | 6     | 0    | 327        | 0         | 0    | 0     | 0    | 0          | 527        |
| 05:30 PM    | 6                                     | 119  | 0     | 0    | 125        | 1                        | 0    | 7     | 0    | 8          | 0                                     | 256  | 4     | 0    | 260        | 0         | 0    | 0     | 0    | 0          | 393        |
| 05:45 PM    | 3                                     | 156  | 0     | 0    | 159        | 0                        | 0    | 4     | 0    | 4          | 0                                     | 217  | 4     | 0    | 221        | 0         | 0    | 0     | 0    | 0          | 384        |
| Total       | 31                                    | 601  | 0     | 0    | 632        | 9                        | 0    | 31    | 0    | 40         | 0                                     | 1059 | 17    | 0    | 1076       | 0         | 0    | 0     | 0    | 0          | 1748       |
| Grand Total | 58                                    | 1241 | 0     | 0    | 1299       | 15                       | 0    | 68    | 0    | 83         | 0                                     | 2206 | 38    | 0    | 2244       | 0         | 0    | 0     | 0    | 0          | 3626       |
| Apprch %    | 4.5                                   | 95.5 | 0     | 0    |            | 18.1                     | 0    | 81.9  | 0    |            | 0                                     | 98.3 | 1.7   | 0    |            | 0         | 0    | 0     | 0    |            |            |
| Total %     | 1.6                                   | 34.2 | 0     | 0    | 35.8       | 0.4                      | 0    | 1.9   | 0    | 2.3        | 0                                     | 60.8 | 1     | 0    | 61.9       | 0         | 0    | 0     | 0    | 0          |            |





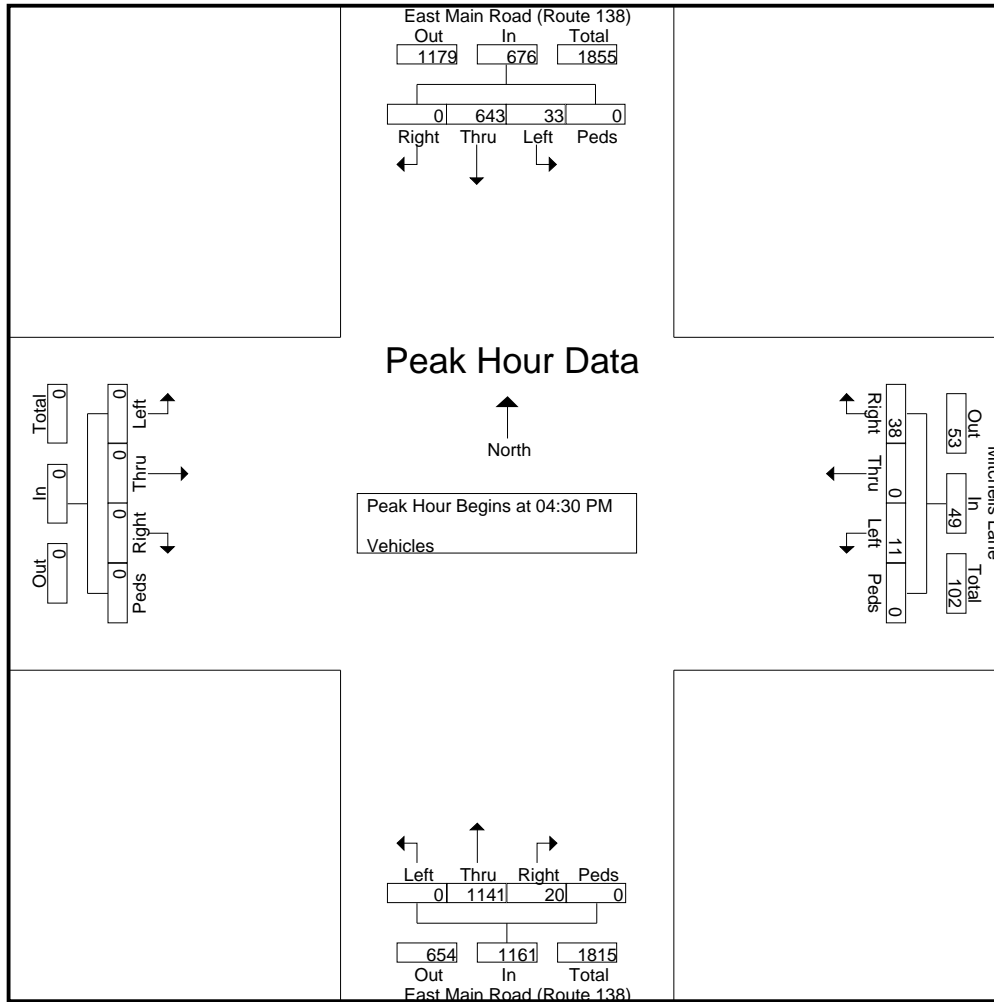
www.BETA-inc.com

6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Route 138 at Mitchells Lane  
Weather: Mostly Cloudy/30s

File Name : Mtichells at Route 138 - PM  
Site Code : 641401  
Start Date : 2/6/2019  
Page No : 2

| Start Time   | East Main Road (Route 138) Southbound |      |       |      |            | Mitchells Lane Westbound |      |       |      |            | East Main Road (Route 138) Northbound |      |       |      |            | Eastbound |      |       |      |            | Int. Total |
|--|---------------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|---------------------------------------|------|-------|------|------------|-----------|------|-------|------|------------|------------|
|  | Left                                  | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                                  | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1 |                                       |      |       |      |            |                          |      |       |      |            |                                       |      |       |      |            |           |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 04:30 PM       |                                       |      |       |      |            |                          |      |       |      |            |                                       |      |       |      |            |           |      |       |      |            |            |
| 04:30 PM   | 2                                     | 149  | 0     | 0    | 151        | 2                        | 0    | 5     | 0    | 7          | 0                                     | 287  | 7     | 0    | 294        | 0         | 0    | 0     | 0    | 0          | 452        |
| 04:45 PM   | 9                                     | 168  | 0     | 0    | 177        | 1                        | 0    | 13    | 0    | 14         | 0                                     | 268  | 4     | 0    | 272        | 0         | 0    | 0     | 0    | 0          | 463        |
| 05:00 PM   | 11                                    | 152  | 0     | 0    | 163        | 1                        | 0    | 12    | 0    | 13         | 0                                     | 265  | 3     | 0    | 268        | 0         | 0    | 0     | 0    | 0          | 444        |
| 05:15 PM   | 11                                    | 174  | 0     | 0    | 185        | 7                        | 0    | 8     | 0    | 15         | 0                                     | 321  | 6     | 0    | 327        | 0         | 0    | 0     | 0    | 0          | 527        |
| Total Volume   | 33                                    | 643  | 0     | 0    | 676        | 11                       | 0    | 38    | 0    | 49         | 0                                     | 1141 | 20    | 0    | 1161       | 0         | 0    | 0     | 0    | 0          | 1886       |
| % App. Total   |                                       |      |       |      |            |                          |      |       |      |            |                                       |      |       |      |            |           |      |       |      |            |            |
| PHF  | .750                                  | .924 | .000  | .000 | .914       | .393                     | .000 | .731  | .000 | .817       | .000                                  | .889 | .714  | .000 | .888       | .000      | .000 | .000  | .000 | .000       | .895       |





www.BETA-inc.com

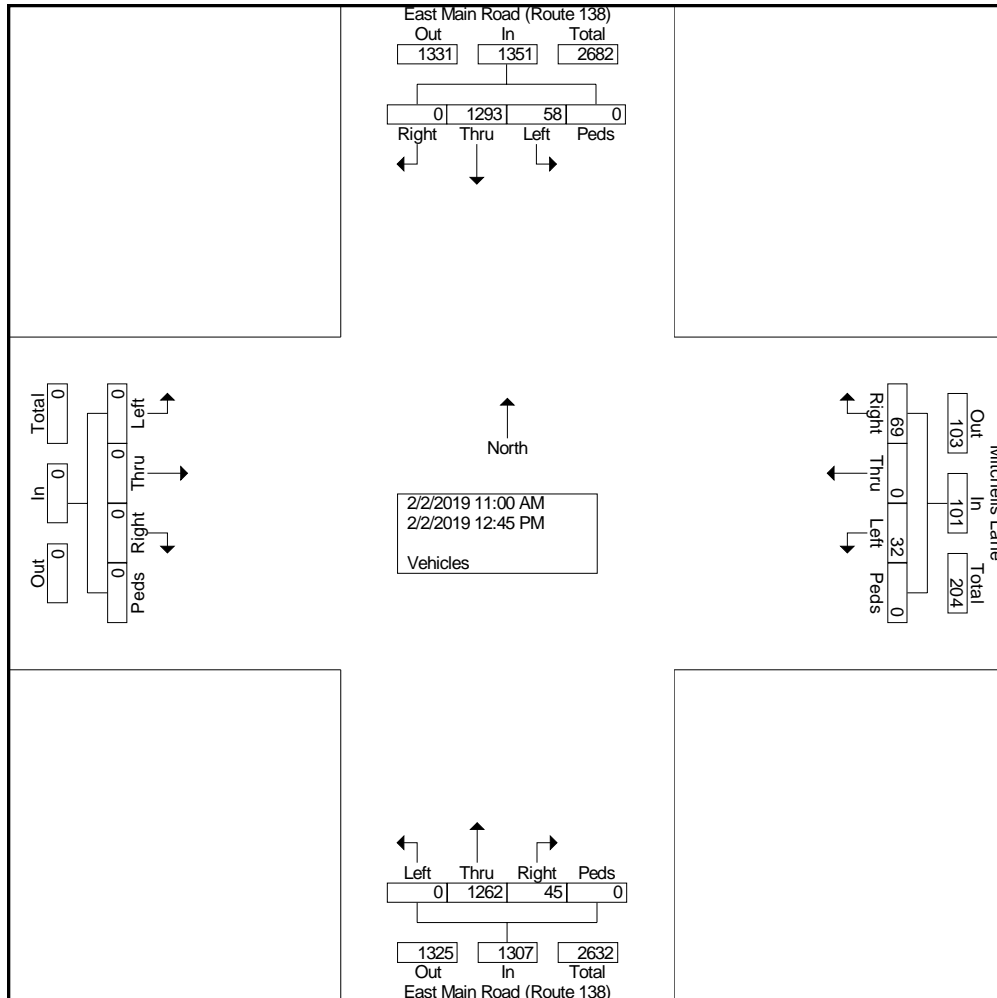
6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Route 138  
Weather: Sunny/40s

File Name : Mitchells at Route 138 - Sat MD  
Site Code : 641401  
Start Date : 2/2/2019  
Page No : 1

Groups Printed- Vehicles

| Start Time  | East Main Road (Route 138) Southbound |      |       |      |            | Mitchells Lane Westbound |      |       |      |            | East Main Road (Route 138) Northbound |      |       |      |            | Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|---------------------------------------|------|-------|------|------------|-----------|------|-------|------|------------|------------|
|             | Left                                  | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                                  | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total |            |
| 11:00 AM    | 4                                     | 152  | 0     | 0    | 156        | 2                        | 0    | 6     | 0    | 8          | 0                                     | 135  | 4     | 0    | 139        | 0         | 0    | 0     | 0    | 0          | 303        |
| 11:15 AM    | 6                                     | 170  | 0     | 0    | 176        | 5                        | 0    | 5     | 0    | 10         | 0                                     | 157  | 5     | 0    | 162        | 0         | 0    | 0     | 0    | 0          | 348        |
| 11:30 AM    | 10                                    | 189  | 0     | 0    | 199        | 2                        | 0    | 12    | 0    | 14         | 0                                     | 154  | 0     | 0    | 154        | 0         | 0    | 0     | 0    | 0          | 367        |
| 11:45 AM    | 8                                     | 158  | 0     | 0    | 166        | 2                        | 0    | 9     | 0    | 11         | 0                                     | 158  | 7     | 0    | 165        | 0         | 0    | 0     | 0    | 0          | 342        |
| Total       | 28                                    | 669  | 0     | 0    | 697        | 11                       | 0    | 32    | 0    | 43         | 0                                     | 604  | 16    | 0    | 620        | 0         | 0    | 0     | 0    | 0          | 1360       |
| 12:00 PM    | 6                                     | 146  | 0     | 0    | 152        | 3                        | 0    | 5     | 0    | 8          | 0                                     | 187  | 7     | 0    | 194        | 0         | 0    | 0     | 0    | 0          | 354        |
| 12:15 PM    | 5                                     | 166  | 0     | 0    | 171        | 10                       | 0    | 15    | 0    | 25         | 0                                     | 151  | 6     | 0    | 157        | 0         | 0    | 0     | 0    | 0          | 353        |
| 12:30 PM    | 9                                     | 170  | 0     | 0    | 179        | 3                        | 0    | 11    | 0    | 14         | 0                                     | 166  | 10    | 0    | 176        | 0         | 0    | 0     | 0    | 0          | 369        |
| 12:45 PM    | 10                                    | 142  | 0     | 0    | 152        | 5                        | 0    | 6     | 0    | 11         | 0                                     | 154  | 6     | 0    | 160        | 0         | 0    | 0     | 0    | 0          | 323        |
| Total       | 30                                    | 624  | 0     | 0    | 654        | 21                       | 0    | 37    | 0    | 58         | 0                                     | 658  | 29    | 0    | 687        | 0         | 0    | 0     | 0    | 0          | 1399       |
| Grand Total | 58                                    | 1293 | 0     | 0    | 1351       | 32                       | 0    | 69    | 0    | 101        | 0                                     | 1262 | 45    | 0    | 1307       | 0         | 0    | 0     | 0    | 0          | 2759       |
| Apprch %    | 4.3                                   | 95.7 | 0     | 0    |            | 31.7                     | 0    | 68.3  | 0    |            | 0                                     | 96.6 | 3.4   | 0    |            | 0         | 0    | 0     | 0    | 0          |            |
| Total %     | 2.1                                   | 46.9 | 0     | 0    | 49         | 1.2                      | 0    | 2.5   | 0    | 3.7        | 0                                     | 45.7 | 1.6   | 0    | 47.4       | 0         | 0    | 0     | 0    | 0          |            |





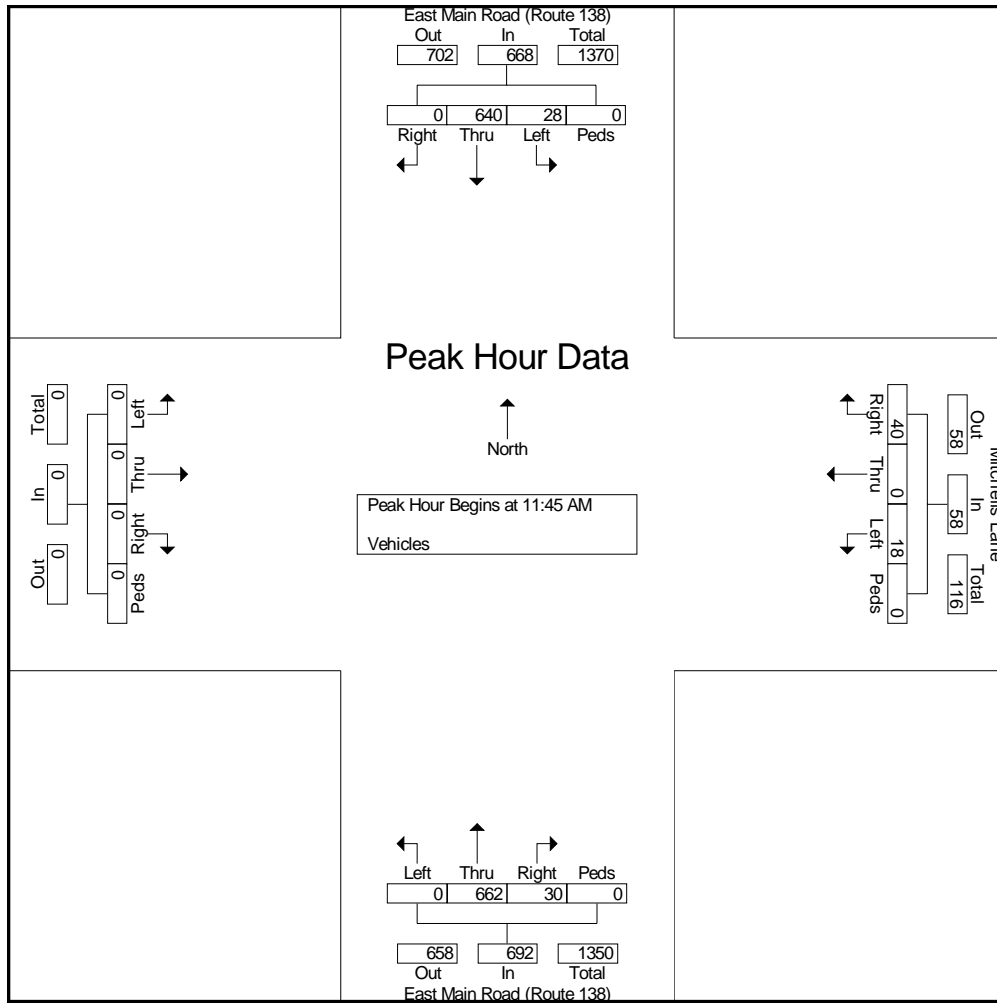
www.BETA-inc.com

6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Route 138  
Weather: Sunny/40s

File Name : Mitchells at Route 138 - Sat MD  
Site Code : 641401  
Start Date : 2/2/2019  
Page No : 2

| Start Time   | East Main Road (Route 138) Southbound |      |       |      |            | Mitchells Lane Westbound |      |       |      |            | East Main Road (Route 138) Northbound |      |       |      |            | Eastbound |      |       |      |            | Int. Total |
|--|---------------------------------------|------|-------|------|------------|--------------------------|------|-------|------|------------|---------------------------------------|------|-------|------|------------|-----------|------|-------|------|------------|------------|
|  | Left                                  | Thru | Right | Peds | App. Total | Left                     | Thru | Right | Peds | App. Total | Left                                  | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1 |                                       |      |       |      |            |                          |      |       |      |            |                                       |      |       |      |            |           |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 11:45 AM       |                                       |      |       |      |            |                          |      |       |      |            |                                       |      |       |      |            |           |      |       |      |            |            |
| 11:45 AM   | 8                                     | 158  | 0     | 0    | 166        | 2                        | 0    | 9     | 0    | 11         | 0                                     | 158  | 7     | 0    | 165        | 0         | 0    | 0     | 0    | 0          | 342        |
| 12:00 PM   | 6                                     | 146  | 0     | 0    | 152        | 3                        | 0    | 5     | 0    | 8          | 0                                     | 187  | 7     | 0    | 194        | 0         | 0    | 0     | 0    | 0          | 354        |
| 12:15 PM   | 5                                     | 166  | 0     | 0    | 171        | 10                       | 0    | 15    | 0    | 25         | 0                                     | 151  | 6     | 0    | 157        | 0         | 0    | 0     | 0    | 0          | 353        |
| 12:30 PM   | 9                                     | 170  | 0     | 0    | 179        | 3                        | 0    | 11    | 0    | 14         | 0                                     | 166  | 10    | 0    | 176        | 0         | 0    | 0     | 0    | 0          | 369        |
| Total Volume   | 28                                    | 640  | 0     | 0    | 668        | 18                       | 0    | 40    | 0    | 58         | 0                                     | 662  | 30    | 0    | 692        | 0         | 0    | 0     | 0    | 0          | 1418       |
| % App. Total   | 4.2                                   | 95.8 | 0     | 0    |            | 31                       | 0    | 69    | 0    |            | 0                                     | 95.7 | 4.3   | 0    |            | 0         | 0    | 0     | 0    |            |            |
| PHF  | .778                                  | .941 | .000  | .000 | .933       | .450                     | .000 | .667  | .000 | .580       | .000                                  | .885 | .750  | .000 | .892       | .000      | .000 | .000  | .000 | .000       | .961       |



Mitchells Lane at Wyatt Road



www.BETA-inc.com

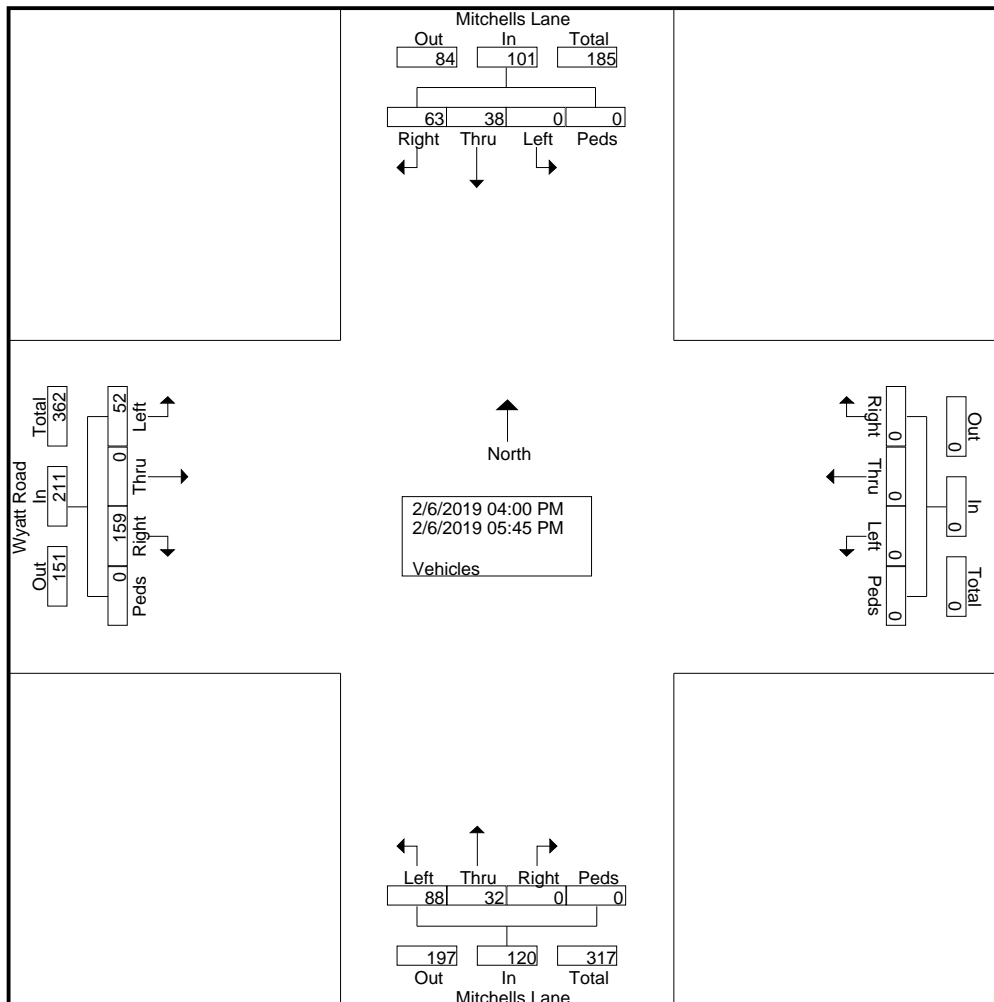
6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Wyatt Road  
Weather: Mostly Cloudy/30s

File Name : Mitchells at Wyatt - PM  
Site Code : 641402  
Start Date : 2/6/2019  
Page No : 1

Groups Printed- Vehicles

| Start Time  | Mitchells Lane Southbound |      |       |      |            | Westbound |      |       |      |            | Mitchells Lane Northbound |      |       |      |            | Wyatt Road Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|------|-------|------|------------|---------------------------|------|-------|------|------------|----------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. Total |            |
| 04:00 PM    | 0                         | 3    | 11    | 0    | 14         | 0         | 0    | 0     | 0    | 0          | 15                        | 3    | 0     | 0    | 18         | 4                    | 0    | 27    | 0    | 31         | 63         |
| 04:15 PM    | 0                         | 3    | 9     | 0    | 12         | 0         | 0    | 0     | 0    | 0          | 12                        | 4    | 0     | 0    | 16         | 4                    | 0    | 29    | 0    | 33         | 61         |
| 04:30 PM    | 0                         | 6    | 6     | 0    | 12         | 0         | 0    | 0     | 0    | 0          | 11                        | 6    | 0     | 0    | 17         | 9                    | 0    | 14    | 0    | 23         | 52         |
| 04:45 PM    | 0                         | 5    | 10    | 0    | 15         | 0         | 0    | 0     | 0    | 0          | 12                        | 7    | 0     | 0    | 19         | 6                    | 0    | 21    | 0    | 27         | 61         |
| Total       | 0                         | 17   | 36    | 0    | 53         | 0         | 0    | 0     | 0    | 0          | 50                        | 20   | 0     | 0    | 70         | 23                   | 0    | 91    | 0    | 114        | 237        |
| 05:00 PM    | 0                         | 3    | 5     | 0    | 8          | 0         | 0    | 0     | 0    | 0          | 9                         | 4    | 0     | 0    | 13         | 6                    | 0    | 20    | 0    | 26         | 47         |
| 05:15 PM    | 0                         | 10   | 10    | 0    | 20         | 0         | 0    | 0     | 0    | 0          | 8                         | 3    | 0     | 0    | 11         | 10                   | 0    | 14    | 0    | 24         | 55         |
| 05:30 PM    | 0                         | 4    | 7     | 0    | 11         | 0         | 0    | 0     | 0    | 0          | 12                        | 2    | 0     | 0    | 14         | 6                    | 0    | 22    | 0    | 28         | 53         |
| 05:45 PM    | 0                         | 4    | 5     | 0    | 9          | 0         | 0    | 0     | 0    | 0          | 9                         | 3    | 0     | 0    | 12         | 7                    | 0    | 12    | 0    | 19         | 40         |
| Total       | 0                         | 21   | 27    | 0    | 48         | 0         | 0    | 0     | 0    | 0          | 38                        | 12   | 0     | 0    | 50         | 29                   | 0    | 68    | 0    | 97         | 195        |
| Grand Total | 0                         | 38   | 63    | 0    | 101        | 0         | 0    | 0     | 0    | 0          | 88                        | 32   | 0     | 0    | 120        | 52                   | 0    | 159   | 0    | 211        | 432        |
| Apprch %    | 0                         | 37.6 | 62.4  | 0    |            | 0         | 0    | 0     | 0    |            | 73.3                      | 26.7 | 0     | 0    |            | 24.6                 | 0    | 75.4  | 0    |            |            |
| Total %     | 0                         | 8.8  | 14.6  | 0    | 23.4       | 0         | 0    | 0     | 0    | 0          | 20.4                      | 7.4  | 0     | 0    | 27.8       | 12                   | 0    | 36.8  | 0    | 48.8       |            |





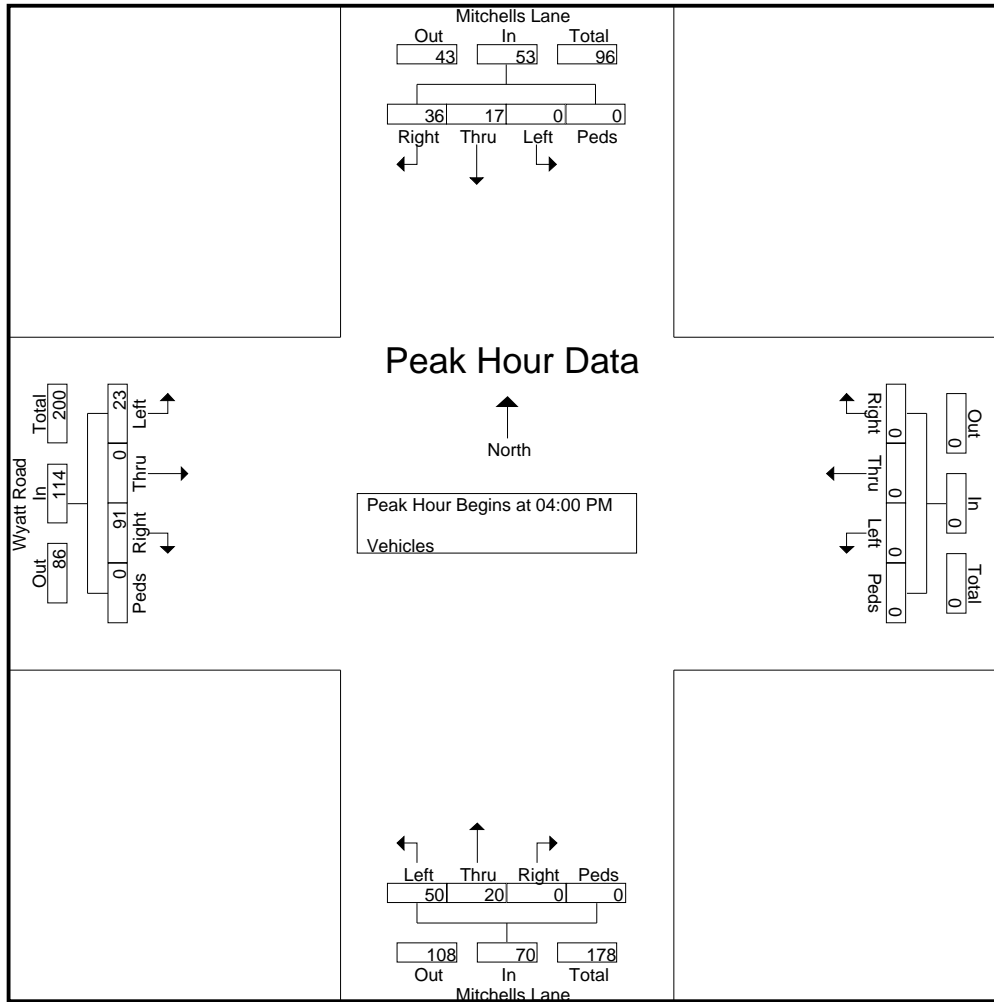
www.BETA-inc.com

6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Wyatt Road  
Weather: Mostly Cloudy/30s

File Name : Mitchells at Wyatt - PM  
Site Code : 641402  
Start Date : 2/6/2019  
Page No : 2

| Start Time   | Mitchells Lane Southbound |      |       |      |            | Westbound |      |       |      |            | Mitchells Lane Northbound |      |       |      |            | Wyatt Road Eastbound |      |       |      |            | Int. Total |
|--|---------------------------|------|-------|------|------------|-----------|------|-------|------|------------|---------------------------|------|-------|------|------------|----------------------|------|-------|------|------------|------------|
|  | Left                      | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left                 | Thru | Right | Peds | App. 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   | 0                         | 3    | 11    | 0    | 14         | 0         | 0    | 0     | 0    | 0          | 15                        | 3    | 0     | 0    | 18         | 4                    | 0    | 27    | 0    | 31         | 63         |
| 04:15 PM   | 0                         | 3    | 9     | 0    | 12         | 0         | 0    | 0     | 0    | 0          | 12                        | 4    | 0     | 0    | 16         | 4                    | 0    | 29    | 0    | 33         | 61         |
| 04:30 PM   | 0                         | 6    | 6     | 0    | 12         | 0         | 0    | 0     | 0    | 0          | 11                        | 6    | 0     | 0    | 17         | 9                    | 0    | 14    | 0    | 23         | 52         |
| 04:45 PM   | 0                         | 5    | 10    | 0    | 15         | 0         | 0    | 0     | 0    | 0          | 12                        | 7    | 0     | 0    | 19         | 6                    | 0    | 21    | 0    | 27         | 61         |
| Total Volume   | 0                         | 17   | 36    | 0    | 53         | 0         | 0    | 0     | 0    | 0          | 50                        | 20   | 0     | 0    | 70         | 23                   | 0    | 91    | 0    | 114        | 237        |
| % App. Total   | 0                         | 32.1 | 67.9  | 0    |            | 0         | 0    | 0     | 0    |            | 71.4                      | 28.6 | 0     | 0    |            | 20.2                 | 0    | 79.8  | 0    |            |            |
| PHF  | .000                      | .708 | .818  | .000 | .883       | .000      | .000 | .000  | .000 | .000       | .833                      | .714 | .000  | .000 | .921       | .639                 | .000 | .784  | .000 | .864       | .940       |





www.BETA-inc.com

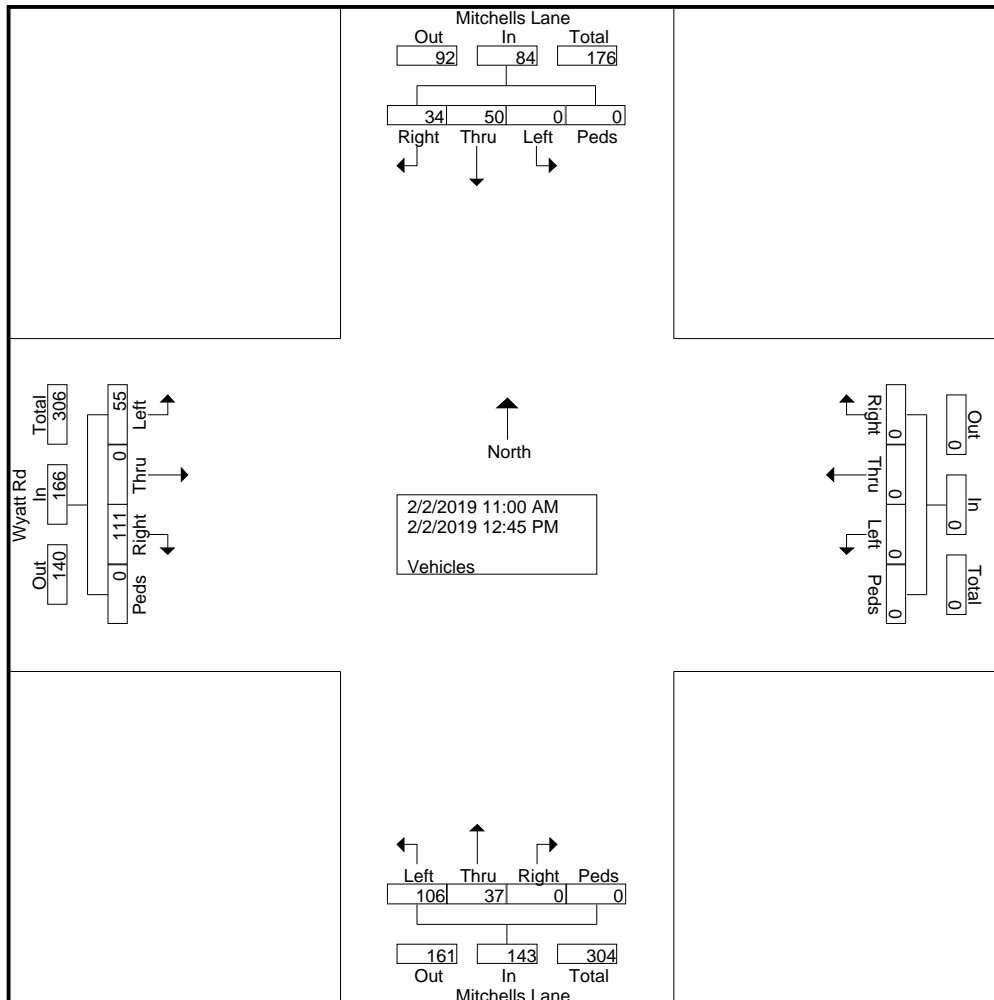
6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Wyatt Road  
Weather: Sunny/40s

File Name : Mitchells at Wyatt - Sat MD  
Site Code : 641402  
Start Date : 2/2/2019  
Page No : 1

Groups Printed- Vehicles

| Start Time  | Mitchells Lane Southbound |      |       |      |            | Westbound |      |       |      |            | Mitchells Lane Northbound |      |       |      |            | Wyatt Rd Eastbound |      |       |      |            | Int. Total |
|-------------|---------------------------|------|-------|------|------------|-----------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
|             | Left                      | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total |            |
| 11:00 AM    | 0                         | 9    | 5     | 0    | 14         | 0         | 0    | 0     | 0    | 0          | 28                        | 3    | 0     | 0    | 31         | 3                  | 0    | 13    | 0    | 16         | 61         |
| 11:15 AM    | 0                         | 3    | 3     | 0    | 6          | 0         | 0    | 0     | 0    | 0          | 13                        | 3    | 0     | 0    | 16         | 4                  | 0    | 12    | 0    | 16         | 38         |
| 11:30 AM    | 0                         | 8    | 4     | 0    | 12         | 0         | 0    | 0     | 0    | 0          | 6                         | 6    | 0     | 0    | 12         | 6                  | 0    | 20    | 0    | 26         | 50         |
| 11:45 AM    | 0                         | 7    | 3     | 0    | 10         | 0         | 0    | 0     | 0    | 0          | 9                         | 3    | 0     | 0    | 12         | 8                  | 0    | 12    | 0    | 20         | 42         |
| Total       | 0                         | 27   | 15    | 0    | 42         | 0         | 0    | 0     | 0    | 0          | 56                        | 15   | 0     | 0    | 71         | 21                 | 0    | 57    | 0    | 78         | 191        |
| 12:00 PM    | 0                         | 4    | 2     | 0    | 6          | 0         | 0    | 0     | 0    | 0          | 14                        | 4    | 0     | 0    | 18         | 6                  | 0    | 11    | 0    | 17         | 41         |
| 12:15 PM    | 0                         | 3    | 4     | 0    | 7          | 0         | 0    | 0     | 0    | 0          | 9                         | 8    | 0     | 0    | 17         | 4                  | 0    | 18    | 0    | 22         | 46         |
| 12:30 PM    | 0                         | 8    | 5     | 0    | 13         | 0         | 0    | 0     | 0    | 0          | 9                         | 6    | 0     | 0    | 15         | 11                 | 0    | 15    | 0    | 26         | 54         |
| 12:45 PM    | 0                         | 8    | 8     | 0    | 16         | 0         | 0    | 0     | 0    | 0          | 18                        | 4    | 0     | 0    | 22         | 13                 | 0    | 10    | 0    | 23         | 61         |
| Total       | 0                         | 23   | 19    | 0    | 42         | 0         | 0    | 0     | 0    | 0          | 50                        | 22   | 0     | 0    | 72         | 34                 | 0    | 54    | 0    | 88         | 202        |
| Grand Total | 0                         | 50   | 34    | 0    | 84         | 0         | 0    | 0     | 0    | 0          | 106                       | 37   | 0     | 0    | 143        | 55                 | 0    | 111   | 0    | 166        | 393        |
| Apprch %    | 0                         | 59.5 | 40.5  | 0    |            | 0         | 0    | 0     | 0    | 0          | 74.1                      | 25.9 | 0     | 0    |            | 33.1               | 0    | 66.9  | 0    |            |            |
| Total %     | 0                         | 12.7 | 8.7   | 0    | 21.4       | 0         | 0    | 0     | 0    | 0          | 27                        | 9.4  | 0     | 0    | 36.4       | 14                 | 0    | 28.2  | 0    | 42.2       |            |





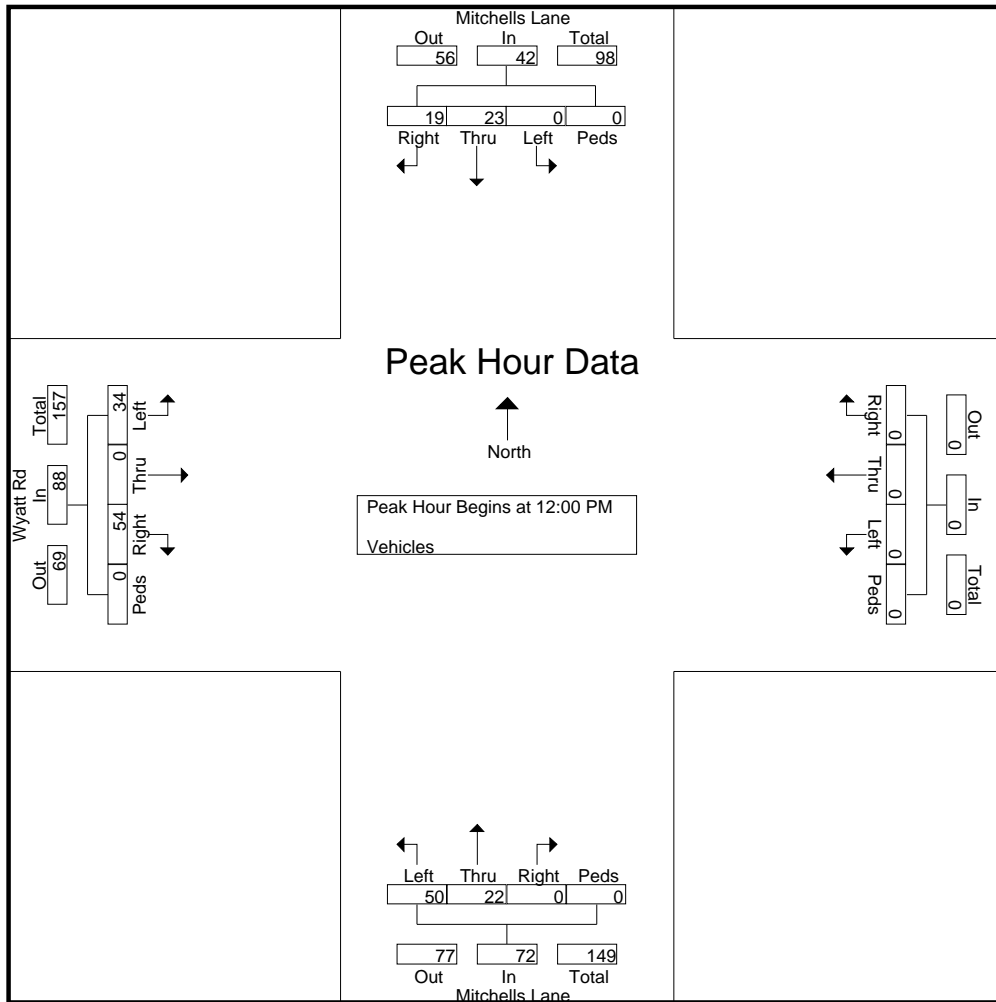
www.BETA-inc.com

6 Blackstone Valley Place  
Lincoln, RI 02865

Project: Newport National  
Town/City: Middletown, RI  
Int.: Mitchells Lane at Wyatt Road  
Weather: Sunny/40s

File Name : Mitchells at Wyatt - Sat MD  
Site Code : 641402  
Start Date : 2/2/2019  
Page No : 2

| Start Time   | Mitchells Lane Southbound |      |       |      |            | Westbound |      |       |      |            | Mitchells Lane Northbound |      |       |      |            | Wyatt Rd Eastbound |      |       |      |            | Int. Total |
|--|---------------------------|------|-------|------|------------|-----------|------|-------|------|------------|---------------------------|------|-------|------|------------|--------------------|------|-------|------|------------|------------|
|  | Left                      | Thru | Right | Peds | App. Total | Left      | Thru | Right | Peds | App. Total | Left                      | Thru | Right | Peds | App. Total | Left               | Thru | Right | Peds | App. Total |            |
| Peak Hour Analysis From 11:00 AM to 12:45 PM - Peak 1 of 1 |                           |      |       |      |            |           |      |       |      |            |                           |      |       |      |            |                    |      |       |      |            |            |
| Peak Hour for Entire Intersection Begins at 12:00 PM       |                           |      |       |      |            |           |      |       |      |            |                           |      |       |      |            |                    |      |       |      |            |            |
| 12:00 PM   | 0                         | 4    | 2     | 0    | 6          | 0         | 0    | 0     | 0    | 0          | 14                        | 4    | 0     | 0    | 18         | 6                  | 0    | 11    | 0    | 17         | 41         |
| 12:15 PM   | 0                         | 3    | 4     | 0    | 7          | 0         | 0    | 0     | 0    | 0          | 9                         | 8    | 0     | 0    | 17         | 4                  | 0    | 18    | 0    | 22         | 46         |
| 12:30 PM   | 0                         | 8    | 5     | 0    | 13         | 0         | 0    | 0     | 0    | 0          | 9                         | 6    | 0     | 0    | 15         | 11                 | 0    | 15    | 0    | 26         | 54         |
| 12:45 PM   | 0                         | 8    | 8     | 0    | 16         | 0         | 0    | 0     | 0    | 0          | 18                        | 4    | 0     | 0    | 22         | 13                 | 0    | 10    | 0    | 23         | 61         |
| Total Volume   | 0                         | 23   | 19    | 0    | 42         | 0         | 0    | 0     | 0    | 0          | 50                        | 22   | 0     | 0    | 72         | 34                 | 0    | 54    | 0    | 88         | 202        |
| % App. Total   | 0                         | 54.8 | 45.2  | 0    |            | 0         | 0    | 0     | 0    | 0          | 69.4                      | 30.6 | 0     | 0    |            | 38.6               | 0    | 61.4  | 0    |            |            |
| PHF  | .000                      | .719 | .594  | .000 | .656       | .000      | .000 | .000  | .000 | .000       | .694                      | .688 | .000  | .000 | .818       | .654               | .000 | .750  | .000 | .846       | .828       |



## APPENDIX B – Traffic Crash Data

---

### **January 2015 through December 2018**

East Main Road at Mitchells Lane

### **January 2015 through December 2017**

Mitchells Lane

**East Main Road (Route 138) at Mitchells Lane**

|                               | 2015     | 2016     | 2017     | 2018     | Total     | Percent |
|-------------------------------|----------|----------|----------|----------|-----------|---------|
| <b>Collision Type</b>         |          |          |          |          |           |         |
| Rear End                      | 4        | 3        | 1        | 1        | 9         | 69%     |
| Angle                         | 0        | 0        | 0        | 1        | 1         | 8%      |
| Head-On                       | 0        | 0        | 0        | 0        | 0         | 0%      |
| Pedestrian                    | 0        | 0        | 0        | 0        | 0         | 0%      |
| Sideswipe, Same Direction     | 0        | 1        | 0        | 2        | 3         | 23%     |
| Sideswipe, Opposite Direction | 0        | 0        | 0        | 0        | 0         | 0%      |
| Collision with Object         | 0        | 0        | 0        | 0        | 0         | 0%      |
| Collision with Deer           | 0        | 0        | 0        | 0        | 0         | 0%      |
| <b>Accident Severity</b>      |          |          |          |          |           |         |
| Property                      | 3        | 4        | 1        | 1        | 9         | 69%     |
| Injury                        | 1        | 0        | 0        | 3        | 4         | 31%     |
| <b>Light Condition</b>        |          |          |          |          |           |         |
| Daylight                      | 4        | 4        | 1        | 4        | 13        | 100%    |
| Dawn                          | 0        | 0        | 0        | 0        | 0         | 0%      |
| Dusk                          | 0        | 0        | 0        | 0        | 0         | 0%      |
| Dark - Lighted                | 0        | 0        | 0        | 0        | 0         | 0%      |
| Dark - Not Lighted            | 0        | 0        | 0        | 0        | 0         | 0%      |
| Other                         | 0        | 0        | 0        | 0        | 0         | 0%      |
| Unknown                       | 0        | 0        | 0        | 0        | 0         | 0%      |
| <b>Road Condition</b>         |          |          |          |          |           |         |
| Dry                           | 3        | 3        | 1        | 4        | 11        | 85%     |
| Wet                           | 1        | 1        | 0        | 0        | 2         | 15%     |
| Snow                          | 0        | 0        | 0        | 0        | 0         | 0%      |
| Slush                         | 0        | 0        | 0        | 0        | 0         | 0%      |
| Ice/Frost                     | 0        | 0        | 0        | 0        | 0         | 0%      |
| Other                         | 0        | 0        | 0        | 0        | 0         | 0%      |
| Unknown                       | 0        | 0        | 0        | 0        | 0         | 0%      |
| <b>Hour of Day</b>            |          |          |          |          |           |         |
| 6:00 AM - 9:00 AM             | 0        | 0        | 0        | 1        | 1         | 8%      |
| 9:00 AM - 3:00 PM             | 2        | 4        | 1        | 2        | 9         | 69%     |
| 3:00 PM - 6:00 PM             | 2        | 0        | 0        | 1        | 3         | 23%     |
| 6:00 PM - 6:00 AM             | 0        | 0        | 0        | 0        | 0         | 0%      |
| <b>Total Accidents:</b>       | <b>4</b> | <b>4</b> | <b>1</b> | <b>4</b> | <b>13</b> |         |

**Mitchells Lane from Wyatt Road to East Main Road**

|                          |                               | 2015     | 2016     | 2017     | Total    | Percent |
|--------------------------|-------------------------------|----------|----------|----------|----------|---------|
| <b>Collision Type</b>    |                               |          |          |          |          |         |
|                          | Rear End                      | 0        | 0        | 0        | 0        | 0%      |
|                          | Angle                         | 0        | 0        | 1        | 1        | 20%     |
|                          | Head-On                       | 0        | 0        | 0        | 0        | 0%      |
|                          | Pedestrian                    | 0        | 0        | 0        | 0        | 0%      |
|                          | Sideswipe, Same Direction     | 0        | 0        | 0        | 0        | 0%      |
|                          | Sideswipe, Opposite Direction | 0        | 0        | 0        | 0        | 0%      |
|                          | Collision with Object         | 0        | 1        | 1        | 2        | 40%     |
|                          | Collision with Deer           | 0        | 1        | 1        | 2        | 40%     |
| <b>Accident Severity</b> |                               |          |          |          |          |         |
|                          | Property                      | 0        | 2        | 2        | 4        | 80%     |
|                          | Injury                        | 0        | 0        | 1        | 1        | 20%     |
| <b>Light Condition</b>   |                               |          |          |          |          |         |
|                          | Daylight                      | 0        | 1        | 1        | 2        | 40%     |
|                          | Dawn                          | 0        | 0        | 0        | 0        | 0%      |
|                          | Dusk                          | 0        | 1        | 1        | 2        | 40%     |
|                          | Dark - Lighted                | 0        | 0        | 0        | 0        | 0%      |
|                          | Dark - Not Lighted            | 0        | 0        | 1        | 1        | 20%     |
|                          | Other                         | 0        | 0        | 0        | 0        | 0%      |
|                          | Unknown                       | 0        | 0        | 0        | 0        | 0%      |
| <b>Road Condition</b>    |                               |          |          |          |          |         |
|                          | Dry                           | 0        | 2        | 2        | 4        | 80%     |
|                          | Wet                           | 0        | 0        | 0        | 0        | 0%      |
|                          | Snow                          | 0        | 0        | 0        | 0        | 0%      |
|                          | Slush                         | 0        | 0        | 0        | 0        | 0%      |
|                          | Ice/Frost                     | 0        | 0        | 1        | 1        | 20%     |
|                          | Other                         | 0        | 0        | 0        | 0        | 0%      |
|                          | Unknown                       | 0        | 0        | 0        | 0        | 0%      |
| <b>Hour of Day</b>       |                               |          |          |          |          |         |
|                          | 6:00 AM - 9:00 AM             | 0        | 1        | 0        | 1        | 20%     |
|                          | 9:00 AM - 3:00 PM             | 0        | 0        | 1        | 1        | 20%     |
|                          | 3:00 PM - 6:00 PM             | 0        | 1        | 1        | 2        | 40%     |
|                          | 6:00 PM - 6:00 AM             | 0        | 0        | 1        | 1        | 20%     |
| <b>Total Accidents:</b>  |                               | <b>0</b> | <b>2</b> | <b>3</b> | <b>5</b> |         |

# APPENDIX C – Trip Generation

---

## ITE Trip Generation Summary

## Site Trip Distribution

## ITE Land Use Code

ITE Land Use Code 430 – Golf Course

C

---

**ITE Trip Generation Summary**

## Trip Generation Summary

### Summary;

|                              | <u>Description</u>         | <u>Enter</u> | <u>Exit</u> | <u>Total</u> |
|------------------------------|----------------------------|--------------|-------------|--------------|
| <i>PM Peak Hour</i>          |                            |              |             |              |
| ITE Land Use Code 430        | Golf Course                | 41           | 38          | 79           |
| Independent Study            | Newport National Golf Club | 41           | 37          | 78           |
| <i>Saturday MD Peak Hour</i> |                            |              |             |              |
| ITE Land Use Code 430        | Golf Course                | 41           | 41          | 82           |
| Independent Study            | Newport National Golf Club | 35           | 35          | 70           |

**Calculations;****ITE Land Use Code 430****Golf Course****(27 Holes)**

Independent Variable (X) = Number of Holes

$X = 27$

PM Peak*Directional Distribution:*

53% Entering 47% Exiting

$T = 2.91 (X)$

Enter: 41

$T = 2.91 \cdot 27$

Exit: 38

$T = 79$

Total: 79

Sat. MD Peak*Directional Distribution:*

50% Entering 50% Exiting

$T = 3.03 (X)$

Enter: 41

$T = 3.03 \cdot 27$

Exit: 41

$T = 82$

Total: 82

**Independent Study****Newport National Golf Club**

Independent Variable (X) = Number of Holes

$X = 27$

PM Peak*Directional Distribution:*

53% Entering 47% Exiting

$T = 2.88 (X)$

Enter: 41

$T = 2.88 \cdot 27$

Exit: 37

$T = 78$

Total: 78

Sat. MD Peak*Directional Distribution:*

50% Entering 50% Exiting

$T = 2.56 (X)$

Enter: 35

$T = 2.56 \cdot 27$

Exit: 35

$T = 70$

Total: 70

**Trip Rate Calculation - Newport National Golf Club in Middletown, RI****(18 Holes)**

Trips/Hole

RATE:

PM Peak Hour

$$\begin{aligned} \text{Rate} &= 52 \text{ Trips} \div 18 \text{ Holes} \\ &= 2.88 \text{ trips per hole} \end{aligned}$$

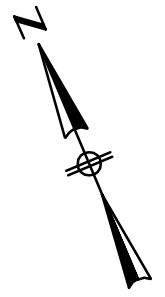
Sat. MD Peak Hour

$$\begin{aligned} \text{Rate} &= 46 \text{ Trips} \div 18 \text{ Holes} \\ &= 2.56 \text{ trips per hole} \end{aligned}$$

C

---

**Site Trip Distribution**



13

12

3

3

East Main Road  
(Route 138)

Mitchells Lane

**SITE**

Site Trips:

Enter: 41  
Exit: 38  
Total: 79

West Course  
Site Driveway

16

15

23

25

Wyatt Road

15

8

15

15

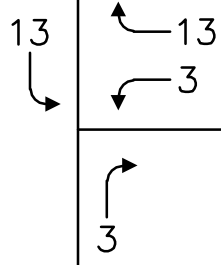
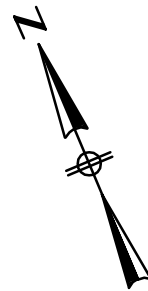
10



www.BETA-Inc.com

WEEKDAY TRAFFIC DISTRIBUTION  
PM PEAK HOUR BUILD

NEWPORT NATIONAL WEST COURSE  
MIDDLETOWN, RHODE ISLAND

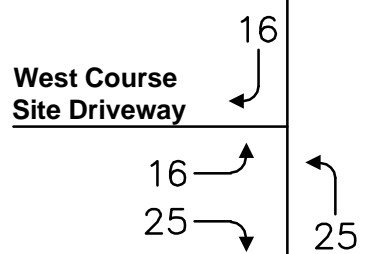


East Main Road  
(Route 138)

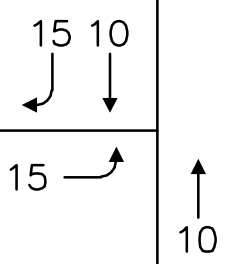
Mitchells Lane

**SITE**

Site Trips:  
Enter: 41  
Exit: 41  
Total: 82



Wyatt Road



SATURDAY TRAFFIC DISTRIBUTION  
MD PEAK HOUR BUILD

NEWPORT NATIONAL WEST COURSE  
MIDDLETOWN, RHODE ISLAND

C

---

**ITE Land Use Code**

ITE Land Use Code 430 – Golf Course

## **Land Use: 430 Golf Course**

### **Description**

Golf courses include 9-, 18-, 27- and 36-hole municipal courses. Some sites may also have driving ranges and clubhouses with a pro shop, restaurant, lounge, and banquet facilities. Miniature golf course (Land Use 431), golf driving range (Land Use 432), and multipurpose recreational facility (Land Use 435) are related uses.

### **Additional Data**

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Alberta (CAN), California, New Jersey, New York, Oregon, Pennsylvania, and Vermont.

### **Source Numbers**

378, 407, 440, 629, 728, 925, 940, 970

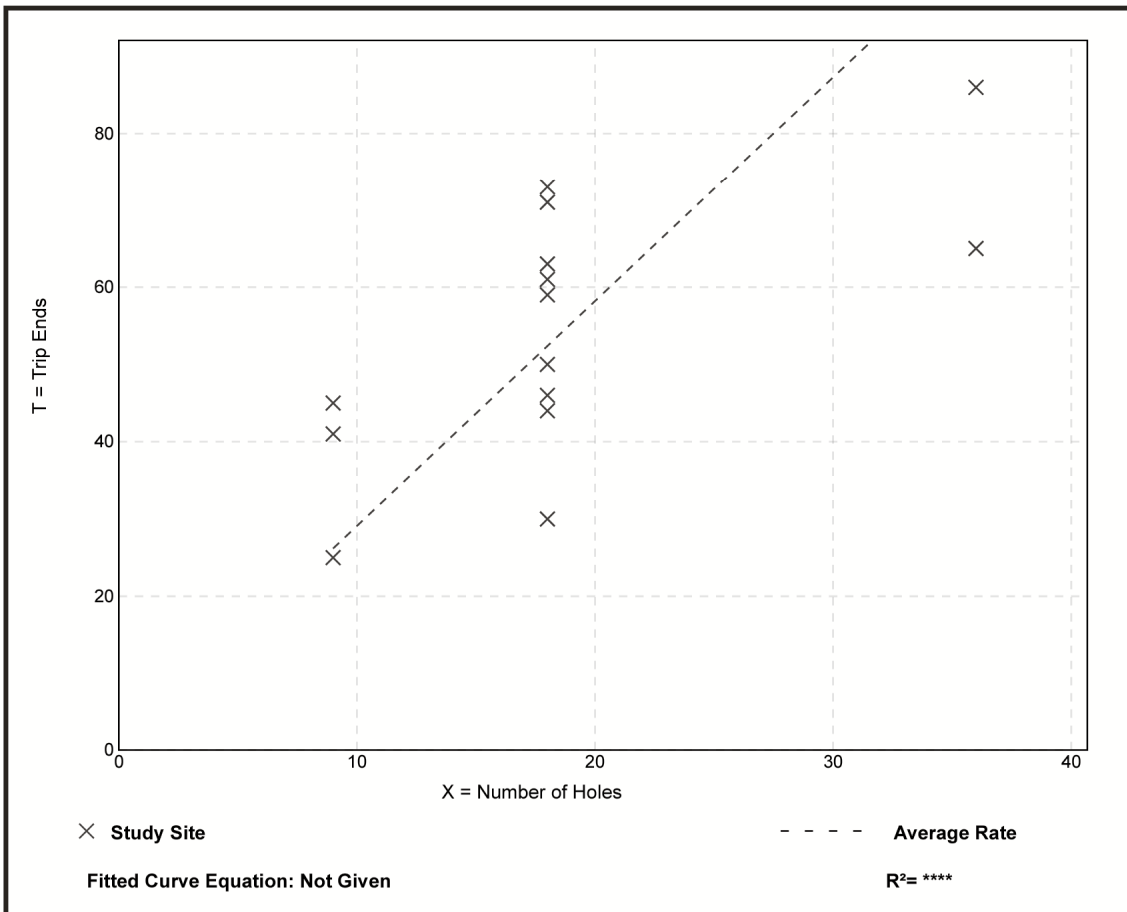
# Golf Course (430)

**Vehicle Trip Ends vs: Holes**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 14  
 Avg. Num. of Holes: 19  
 Directional Distribution: 53% entering, 47% exiting

### Vehicle Trip Generation per Hole

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 2.91         | 1.67 - 5.00    | 0.93               |

### Data Plot and Equation



# Golf Course (430)

Vehicle Trip Ends vs: Holes  
On a: Saturday, Peak Hour of Generator

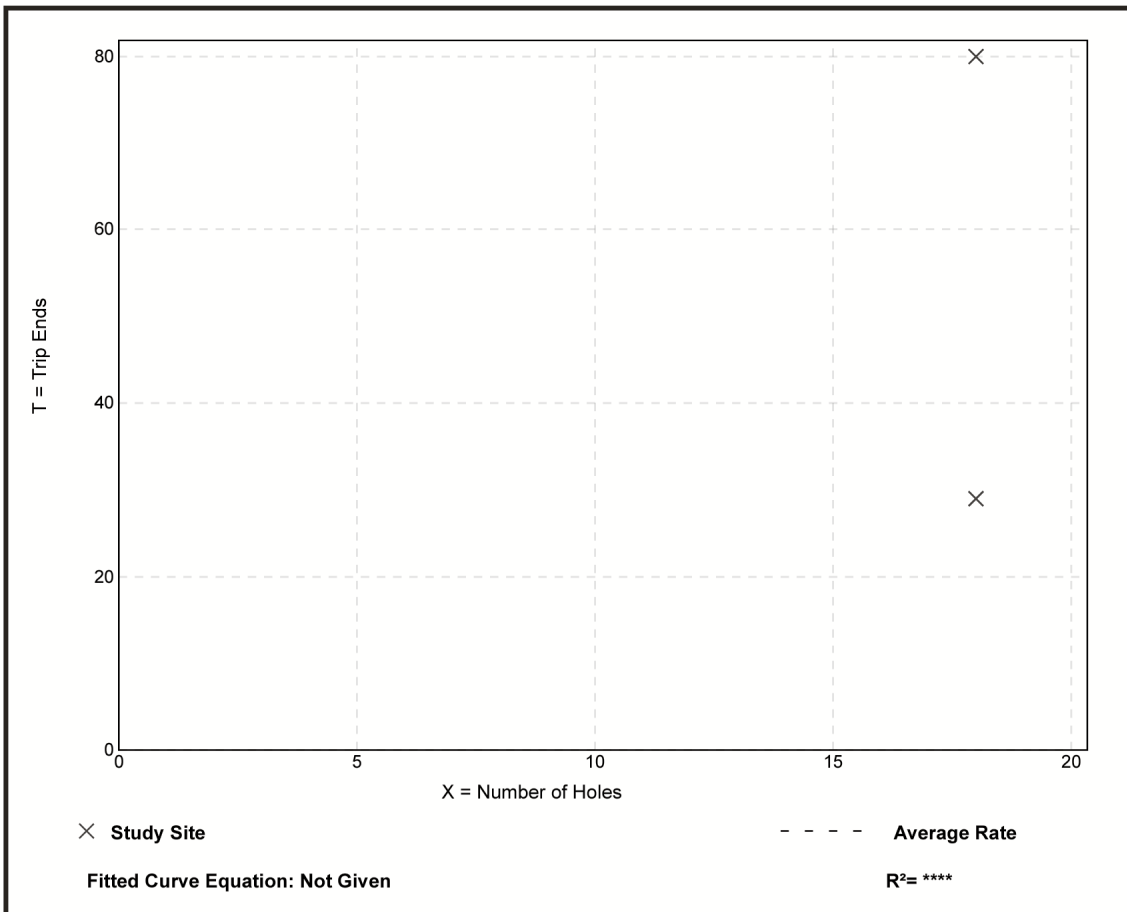
Setting/Location: General Urban/Suburban  
Number of Studies: 2  
Avg. Num. of Holes: 18  
Directional Distribution: 49% entering, 51% exiting

## Vehicle Trip Generation per Hole

| Average Rate | Range of Rates | Standard Deviation |
|--------------|----------------|--------------------|
| 3.03         | 1.61 - 4.44    | *                  |

## Data Plot and Equation

Caution – Small Sample Size



## APPENDIX D – Operational Analysis

---

### Existing Conditions

East Main Road (Route 138) at Mitchells Lane  
Mitchells Lane at Wyatt Road

### Future Build Conditions

East Main Road (Route 138) at Mitchells Lane  
Mitchells Lane at Site Driveway  
Mitchells Lane at Wyatt Road

D

---

**Existing Weekday PM / Saturday MD Peak Hour**

East Main Road (Route 138) at Mitchells Lane  
Mitchells Lane at Wyatt Road

East Main Road (Route 138) at Mitchells Lane

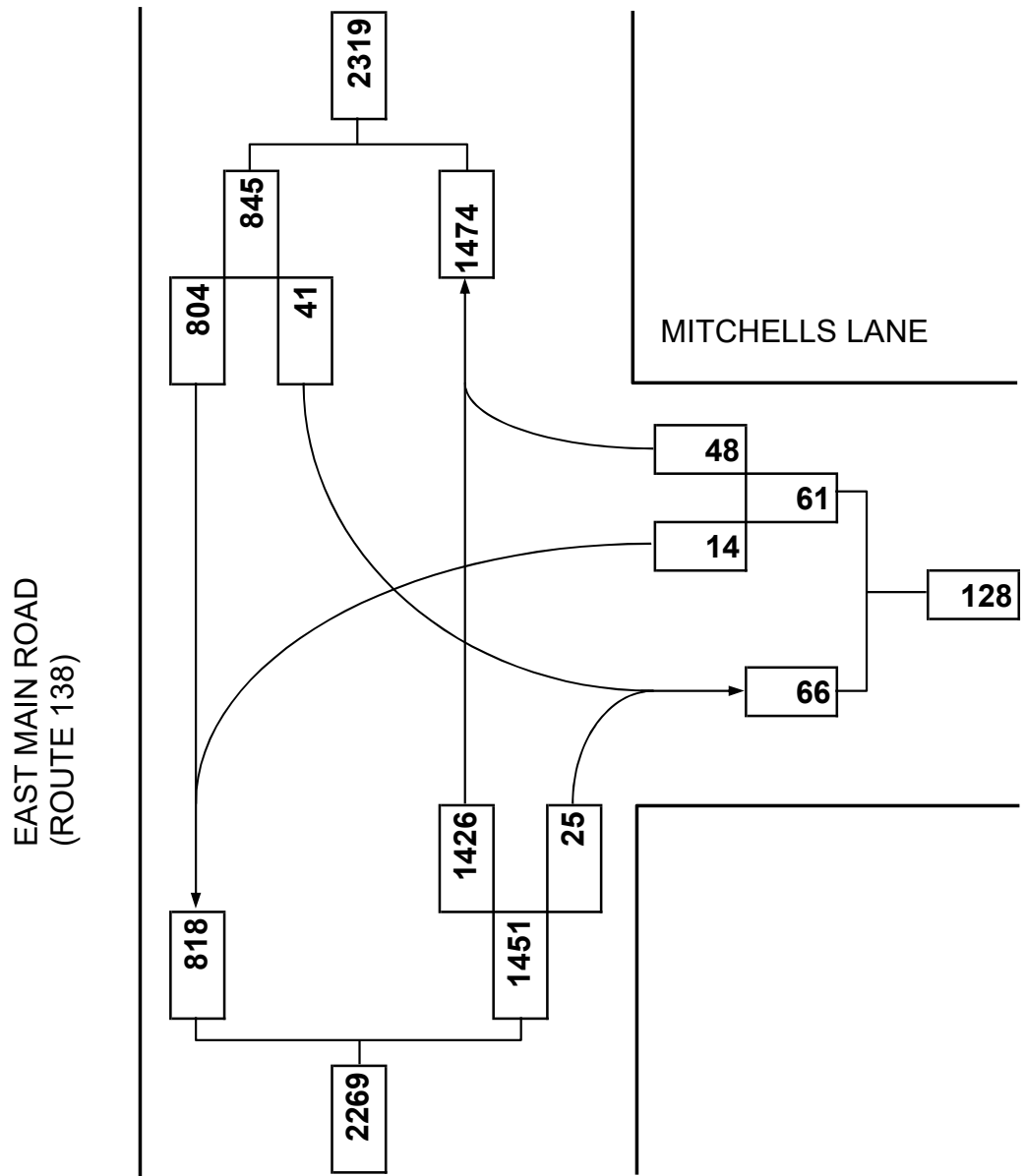


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

|                       |                          |                      |                   |
|-----------------------|--------------------------|----------------------|-------------------|
| <b>Major Street:</b>  | East Main Road (Rte 138) | <b>Minor Street:</b> | Mitchells Lane    |
| <b>City/Town:</b>     | Middletown, RI           | <b>Day of Week:</b>  | Weekday           |
| <b>Reference No.:</b> | 6414                     | <b>Peak Period:</b>  | 4:30 PM - 5:30 PM |
| <b>Existing:</b>      | PM Peak Hour             | <b>Future:</b>       | n/a               |

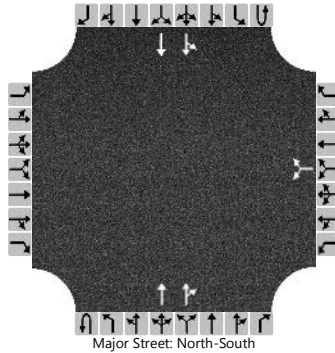
NORTH  
▲



# HCS7 Two-Way Stop-Control Report

| General Information      |                              |  |  | Site Information           |                           |  |  |
|--------------------------|------------------------------|--|--|----------------------------|---------------------------|--|--|
| Analyst                  | Traffic Dept.                |  |  | Intersection               | Route 138 at Mitchells Ln |  |  |
| Agency/Co.               | BETA Group, Inc.             |  |  | Jurisdiction               | Middletown, RI            |  |  |
| Date Performed           | 4/17/2019                    |  |  | East/West Street           | Mitchells Lane            |  |  |
| Analysis Year            | 2019                         |  |  | North/South Street         | E. Main Road (Route 138)  |  |  |
| Time Analyzed            | Existing PM Peak Hour        |  |  | Peak Hour Factor           | 0.90                      |  |  |
| Intersection Orientation | North-South                  |  |  | Analysis Time Period (hrs) | 0.25                      |  |  |
| Project Description      | Newport National West Course |  |  |                            |                           |  |  |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |    |    |    | Northbound |   |      |    | Southbound |    |     |   |
|----------------------------|-----------|----|----|----|-----------|----|----|----|------------|---|------|----|------------|----|-----|---|
|                            | U         | L  | T  | R  | U         | L  | T  | R  | U          | L | T    | R  | U          | L  | T   | R |
| Movement                   |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Priority                   |           | 10 | 11 | 12 |           | 7  | 8  | 9  | 1U         | 1 | 2    | 3  | 4U         | 4  | 5   | 6 |
| Number of Lanes            |           | 0  | 0  | 0  |           | 0  | 1  | 0  |            | 0 | 2    | 0  |            | 0  | 2   | 0 |
| Configuration              |           |    |    |    |           |    | LR |    |            |   | T    | TR |            | LT | T   |   |
| Volume (veh/h)             |           |    |    |    |           | 14 |    | 48 |            |   | 1426 | 25 |            | 41 | 804 |   |
| Percent Heavy Vehicles (%) |           |    |    |    |           | 0  |    | 0  |            |   |      |    |            | 0  |     |   |
| Proportion Time Blocked    |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Percent Grade (%)          |           |    |    |    | 0         |    |    |    |            |   |      |    |            |    |     |   |
| Right Turn Channelized     |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Median Type   Storage      | Undivided |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |

## Critical and Follow-up Headways

|                              |  |  |  |  |  |      |  |      |  |  |  |  |  |      |  |  |
|------------------------------|--|--|--|--|--|------|--|------|--|--|--|--|--|------|--|--|
| Base Critical Headway (sec)  |  |  |  |  |  | 7.5  |  | 6.9  |  |  |  |  |  | 4.1  |  |  |
| Critical Headway (sec)       |  |  |  |  |  | 6.80 |  | 6.90 |  |  |  |  |  | 4.10 |  |  |
| Base Follow-Up Headway (sec) |  |  |  |  |  | 3.5  |  | 3.3  |  |  |  |  |  | 2.2  |  |  |
| Follow-Up Headway (sec)      |  |  |  |  |  | 3.50 |  | 3.30 |  |  |  |  |  | 2.20 |  |  |

## Delay, Queue Length, and Level of Service

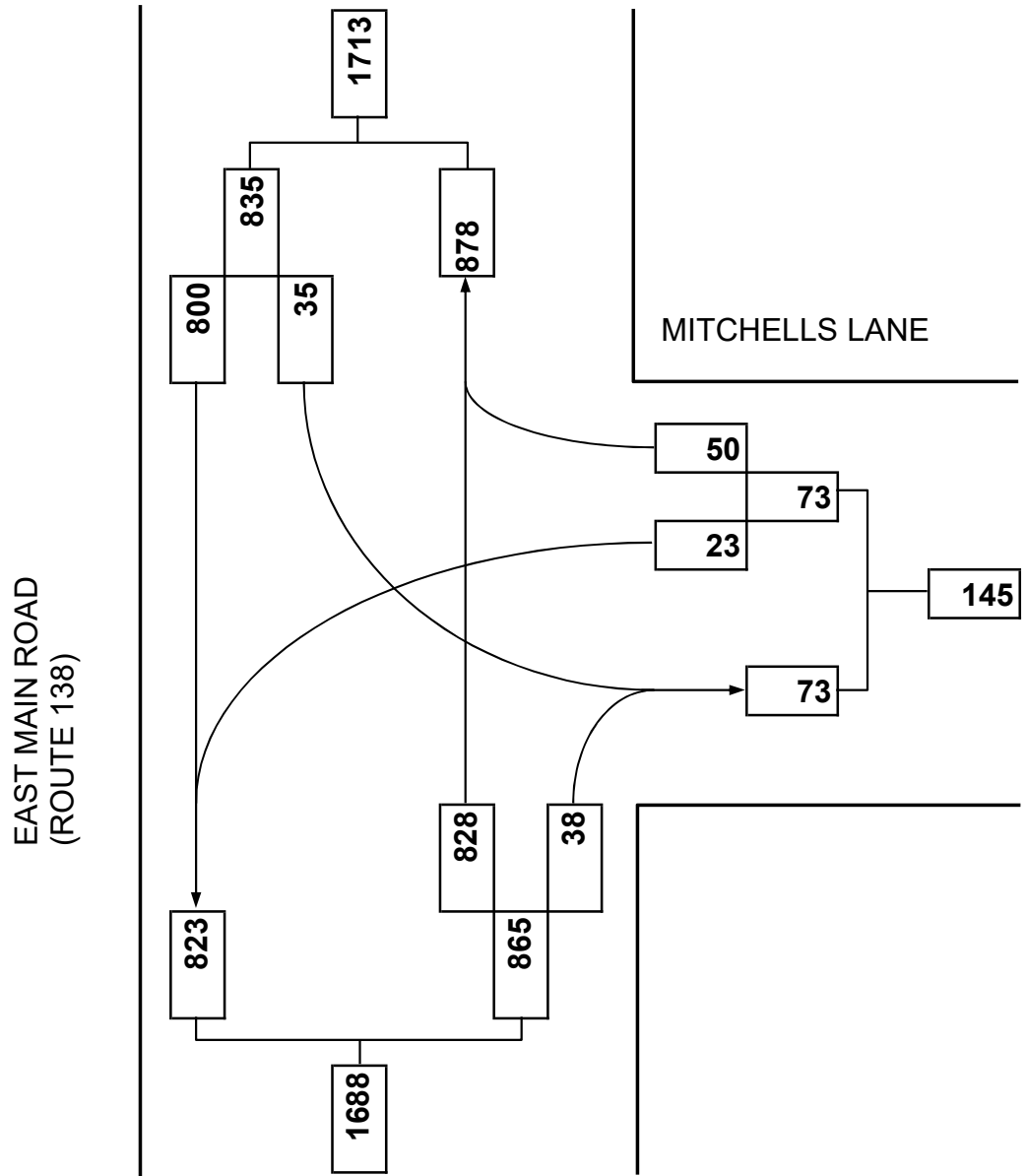
|   |  |  |  |  |      |      |  |  |  |  |  |  |     |      |  |  |
|---|--|--|--|--|------|------|--|--|--|--|--|--|-----|------|--|--|
| Flow Rate, v (veh/h)                    |  |  |  |  |      | 69   |  |  |  |  |  |  |     | 46   |  |  |
| Capacity, c (veh/h)                     |  |  |  |  |      | 121  |  |  |  |  |  |  |     | 410  |  |  |
| v/c Ratio                               |  |  |  |  |      | 0.57 |  |  |  |  |  |  |     | 0.11 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |  |  |  |  |      | 2.8  |  |  |  |  |  |  |     | 0.4  |  |  |
| Control Delay (s/veh)                   |  |  |  |  |      | 67.8 |  |  |  |  |  |  |     | 14.9 |  |  |
| Level of Service (LOS)                  |  |  |  |  |      | F    |  |  |  |  |  |  |     | B    |  |  |
| Approach Delay (s/veh)                  |  |  |  |  | 67.8 |      |  |  |  |  |  |  | 2.1 |      |  |  |
| Approach LOS                            |  |  |  |  | F    |      |  |  |  |  |  |  |     |      |  |  |



ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

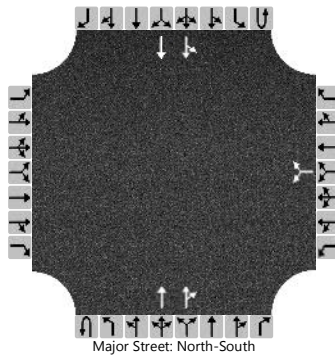
|                       |                          |                      |                    |
|-----------------------|--------------------------|----------------------|--------------------|
| <b>Major Street:</b>  | East Main Road (Rte 138) | <b>Minor Street:</b> | Mitchells Lane     |
| <b>City/Town:</b>     | Middletown, RI           | <b>Day of Week:</b>  | Saturday           |
| <b>Reference No.:</b> | 6414                     | <b>Peak Period:</b>  | 12:00 PM - 1:00 PM |
| <b>Existing:</b>      | MD Peak Hour             | <b>Future:</b>       | n/a                |



# HCS7 Two-Way Stop-Control Report

| General Information      |                              |  |  | Site Information           |                           |  |  |
|--------------------------|------------------------------|--|--|----------------------------|---------------------------|--|--|
| Analyst                  | Traffic Dept.                |  |  | Intersection               | Route 138 at Mitchells Ln |  |  |
| Agency/Co.               | BETA Group, Inc.             |  |  | Jurisdiction               | Middletown, RI            |  |  |
| Date Performed           | 4/17/2019                    |  |  | East/West Street           | Mitchells Lane            |  |  |
| Analysis Year            | 2019                         |  |  | North/South Street         | E. Main Road (Route 138)  |  |  |
| Time Analyzed            | Existing Sat MD Peak Hour    |  |  | Peak Hour Factor           | 0.96                      |  |  |
| Intersection Orientation | North-South                  |  |  | Analysis Time Period (hrs) | 0.25                      |  |  |
| Project Description      | Newport National West Course |  |  |                            |                           |  |  |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |    |    |    | Northbound |   |     |    | Southbound |    |     |   |
|----------------------------|-----------|----|----|----|-----------|----|----|----|------------|---|-----|----|------------|----|-----|---|
|                            | U         | L  | T  | R  | U         | L  | T  | R  | U          | L | T   | R  | U          | L  | T   | R |
| Priority                   |           | 10 | 11 | 12 |           | 7  | 8  | 9  | 1U         | 1 | 2   | 3  | 4U         | 4  | 5   | 6 |
| Number of Lanes            |           | 0  | 0  | 0  |           | 0  | 1  | 0  | 0          | 0 | 2   | 0  | 0          | 0  | 2   | 0 |
| Configuration              |           |    |    |    |           |    | LR |    |            |   | T   | TR |            | LT | T   |   |
| Volume (veh/h)             |           |    |    |    |           | 23 |    | 50 |            |   | 828 | 38 |            | 35 | 800 |   |
| Percent Heavy Vehicles (%) |           |    |    |    |           | 0  |    | 0  |            |   |     |    |            | 0  |     |   |
| Proportion Time Blocked    |           |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |
| Percent Grade (%)          |           |    |    |    | 0         |    |    |    |            |   |     |    |            |    |     |   |
| Right Turn Channelized     |           |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |
| Median Type   Storage      | Undivided |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |

## Critical and Follow-up Headways

|                              |  |  |  |  |  |      |  |      |  |  |  |  |  |  |      |  |  |
|------------------------------|--|--|--|--|--|------|--|------|--|--|--|--|--|--|------|--|--|
| Base Critical Headway (sec)  |  |  |  |  |  | 7.5  |  | 6.9  |  |  |  |  |  |  | 4.1  |  |  |
| Critical Headway (sec)       |  |  |  |  |  | 6.80 |  | 6.90 |  |  |  |  |  |  | 4.10 |  |  |
| Base Follow-Up Headway (sec) |  |  |  |  |  | 3.5  |  | 3.3  |  |  |  |  |  |  | 2.2  |  |  |
| Follow-Up Headway (sec)      |  |  |  |  |  | 3.50 |  | 3.30 |  |  |  |  |  |  | 2.20 |  |  |

## Delay, Queue Length, and Level of Service

|   |  |  |  |  |      |      |  |  |  |  |  |  |     |  |      |  |  |
|---|--|--|--|--|------|------|--|--|--|--|--|--|-----|--|------|--|--|
| Flow Rate, v (veh/h)                    |  |  |  |  |      | 76   |  |  |  |  |  |  |     |  | 36   |  |  |
| Capacity, c (veh/h)                     |  |  |  |  |      | 278  |  |  |  |  |  |  |     |  | 762  |  |  |
| v/c Ratio                               |  |  |  |  |      | 0.27 |  |  |  |  |  |  |     |  | 0.05 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |  |  |  |  |      | 1.1  |  |  |  |  |  |  |     |  | 0.2  |  |  |
| Control Delay (s/veh)                   |  |  |  |  |      | 22.7 |  |  |  |  |  |  |     |  | 10.0 |  |  |
| Level of Service (LOS)                  |  |  |  |  |      | C    |  |  |  |  |  |  |     |  | A    |  |  |
| Approach Delay (s/veh)                  |  |  |  |  | 22.7 |      |  |  |  |  |  |  | 0.8 |  |      |  |  |
| Approach LOS                            |  |  |  |  | C    |      |  |  |  |  |  |  |     |  |      |  |  |

Mitchells Lane at Wyatt Road

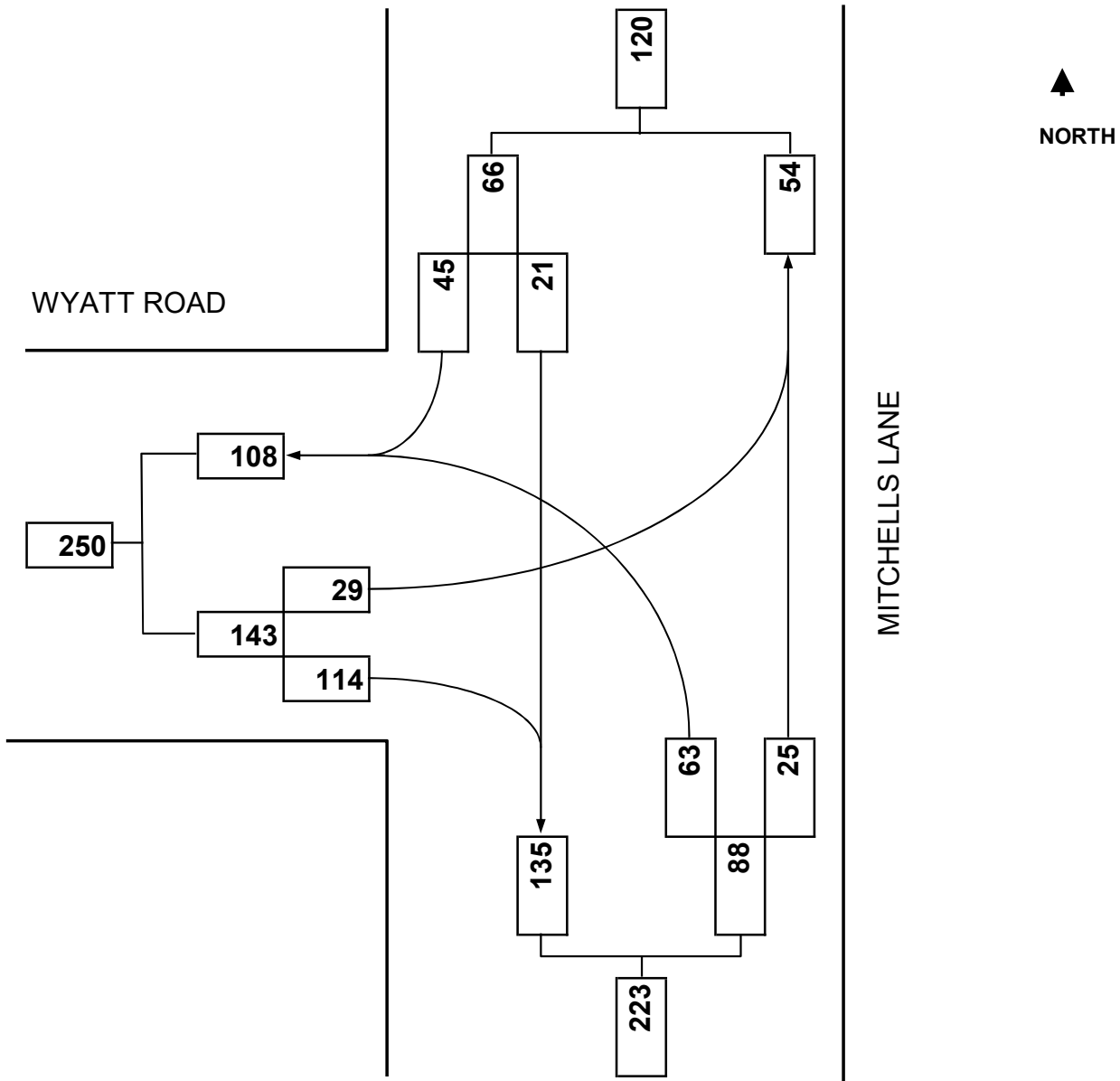


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

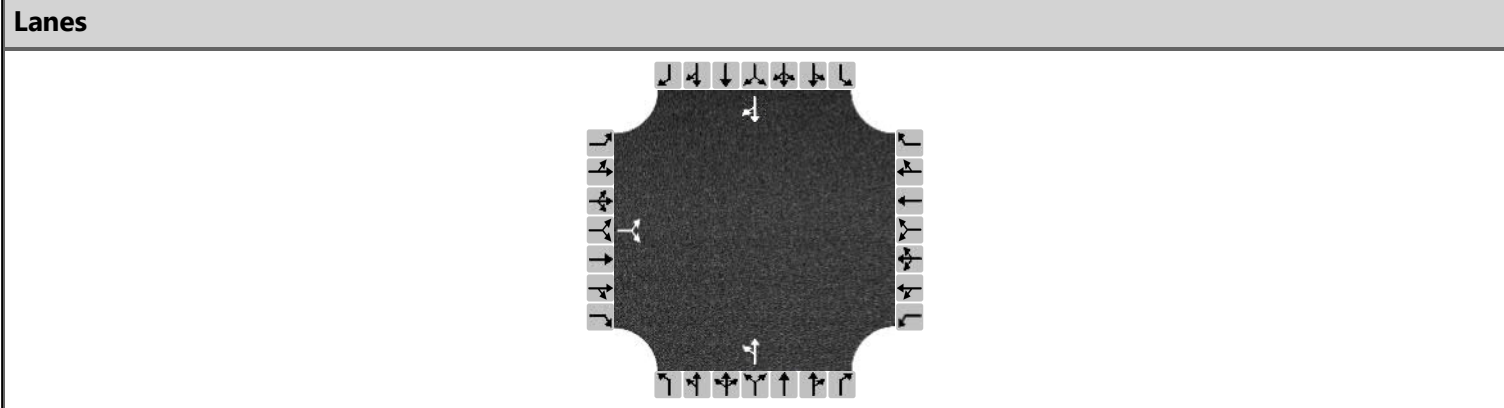
**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** PM Peak Hour

**Minor Street:** Wyatt Road  
**Day of Week:** Weekday  
**Peak Period:** 4:30 PM - 5:30 PM  
**Future:** n/a



# HCS7 All-Way Stop Control Report

| General Information        |                              | Site Information   |                          |
|----------------------------|------------------------------|--------------------|--------------------------|
| Analyst                    | Traffic Dept.                | Intersection       | Mitchells Ln at Wyatt Rd |
| Agency/Co.                 | BETA Group, Inc.             | Jurisdiction       | Middletown, RI           |
| Date Performed             | 4/17/2019                    | East/West Street   | Wyatt Road               |
| Analysis Year              | 2019                         | North/South Street | Mitchells Lane           |
| Analysis Time Period (hrs) | 0.25                         | Peak Hour Factor   | 0.94                     |
| Time Analyzed              | Existing PM Peak Hour        |                    |                          |
| Project Description        | Newport National West Course |                    |                          |



| Approach               | Eastbound |    |    | Westbound |    |    | Northbound |    |    | Southbound |    |    |
|------------------------|-----------|----|----|-----------|----|----|------------|----|----|------------|----|----|
|                        | L         | T  | R  | L         | T  | R  | L          | T  | R  | L          | T  | R  |
| Movement               |           |    |    |           |    |    |            |    |    |            |    |    |
| Volume                 | 29        |    | 14 |           |    |    | 63         | 25 |    |            | 21 | 45 |
| % Thrus in Shared Lane |           |    |    |           |    |    |            |    |    |            |    |    |
| Lane                   | L1        | L2 | L3 | L1        | L2 | L3 | L1         | L2 | L3 | L1         | L2 | L3 |
| Configuration          | LR        |    |    |           |    |    | LT         |    |    | TR         |    |    |
| Flow Rate, v (veh/h)   | 46        |    |    |           |    |    | 94         |    |    | 70         |    |    |
| Percent Heavy Vehicles | 0         |    |    |           |    |    | 0          |    |    | 0          |    |    |

| Departure Headway and Service Time |       |  |  |  |  |  |       |  |  |       |  |  |
|------------------------------------|-------|--|--|--|--|--|-------|--|--|-------|--|--|
| Initial Departure Headway, hd (s)  | 3.20  |  |  |  |  |  | 3.20  |  |  | 3.20  |  |  |
| Initial Degree of Utilization, x   | 0.041 |  |  |  |  |  | 0.083 |  |  | 0.062 |  |  |
| Final Departure Headway, hd (s)    | 4.18  |  |  |  |  |  | 4.21  |  |  | 3.68  |  |  |
| Final Degree of Utilization, x     | 0.053 |  |  |  |  |  | 0.109 |  |  | 0.072 |  |  |
| Move-Up Time, m (s)                | 2.0   |  |  |  |  |  | 2.0   |  |  | 2.0   |  |  |
| Service Time, ts (s)               | 2.18  |  |  |  |  |  | 2.21  |  |  | 1.68  |  |  |

| Capacity, Delay and Level of Service    |     |  |  |  |  |  |     |  |  |     |  |  |
|---|-----|--|--|--|--|--|-----|--|--|-----|--|--|
| Flow Rate, v (veh/h)                    | 46  |  |  |  |  |  | 94  |  |  | 70  |  |  |
| Capacity                                | 861 |  |  |  |  |  | 856 |  |  | 977 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) | 0.2 |  |  |  |  |  | 0.4 |  |  | 0.2 |  |  |
| Control Delay (s/veh)                   | 7.4 |  |  |  |  |  | 7.7 |  |  | 7.0 |  |  |
| Level of Service, LOS                   | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Approach Delay (s/veh)                  | 7.4 |  |  |  |  |  | 7.7 |  |  | 7.0 |  |  |
| Approach LOS                            | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Intersection Delay, s/veh   LOS         | 7.4 |  |  |  |  |  | A   |  |  |     |  |  |

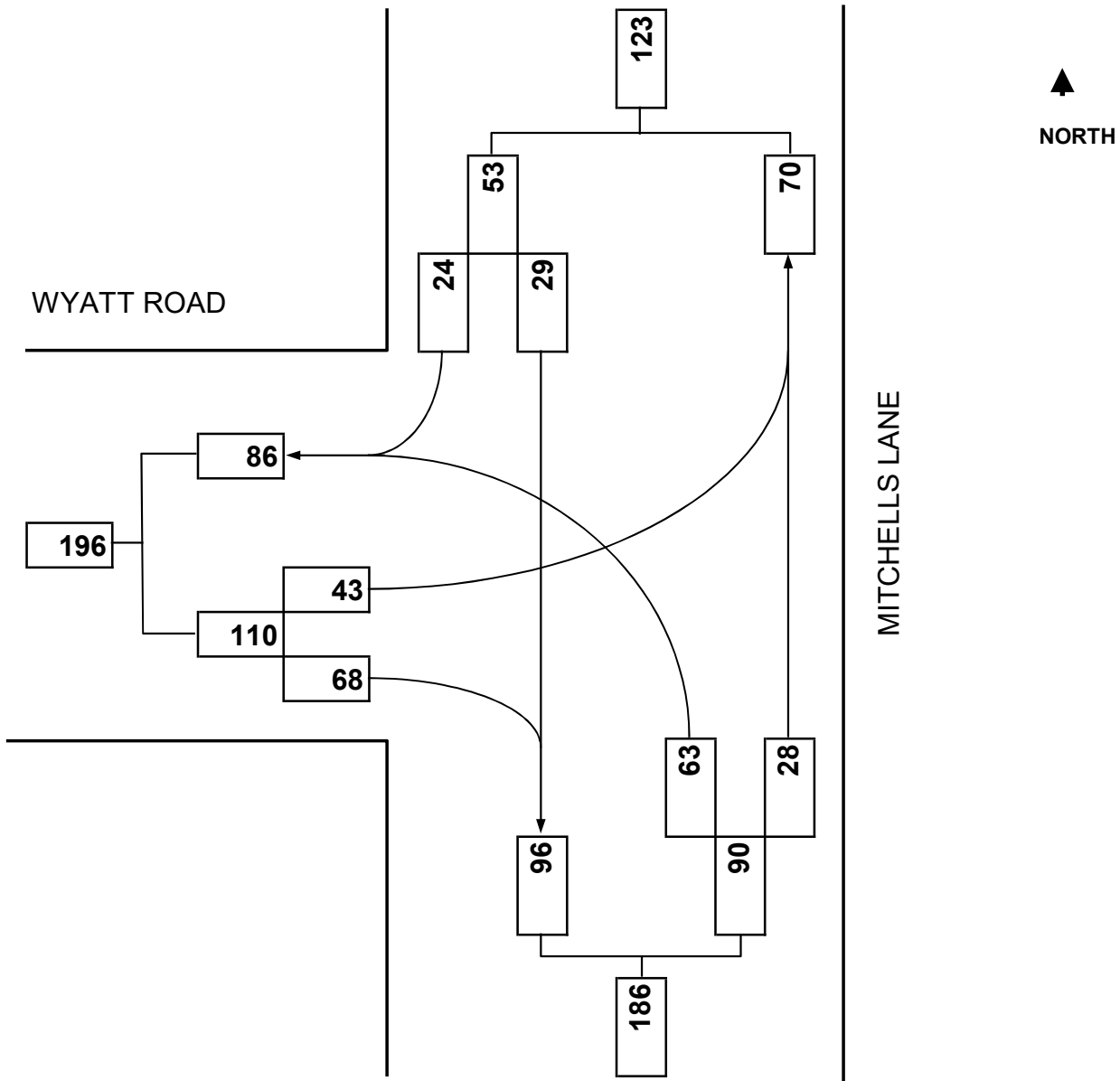


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

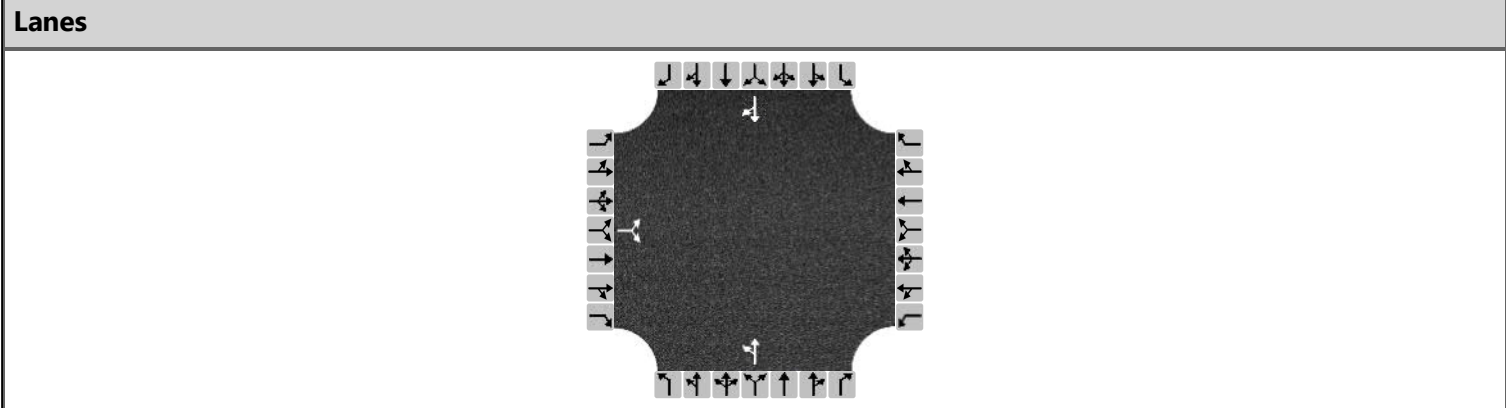
**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** MD Peak Hour

**Minor Street:** Wyatt Road  
**Day of Week:** Saturday  
**Peak Period:** 12:00 PM - 1:00 PM  
**Future:** n/a



# HCS7 All-Way Stop Control Report

| General Information        |                              | Site Information   |                          |
|----------------------------|------------------------------|--------------------|--------------------------|
| Analyst                    | Traffic Dept.                | Intersection       | Mitchells Ln at Wyatt Rd |
| Agency/Co.                 | BETA Group, Inc.             | Jurisdiction       | Middletown, RI           |
| Date Performed             | 4/17/2019                    | East/West Street   | Wyatt Road               |
| Analysis Year              | 2019                         | North/South Street | Mitchells Lane           |
| Analysis Time Period (hrs) | 0.25                         | Peak Hour Factor   | 0.83                     |
| Time Analyzed              | Existing Sat MD Peak Hour    |                    |                          |
| Project Description        | Newport National West Course |                    |                          |



**Vehicle Volume and Adjustments**

| Approach               | Eastbound |    |    | Westbound |    |    | Northbound |    |    | Southbound |    |    |
|------------------------|-----------|----|----|-----------|----|----|------------|----|----|------------|----|----|
|                        | L         | T  | R  | L         | T  | R  | L          | T  | R  | L          | T  | R  |
| Movement               |           |    |    |           |    |    |            |    |    |            |    |    |
| Volume                 | 43        |    | 68 |           |    |    | 63         | 28 |    |            | 29 | 24 |
| % Thrus in Shared Lane |           |    |    |           |    |    |            |    |    |            |    |    |
| Lane                   | L1        | L2 | L3 | L1        | L2 | L3 | L1         | L2 | L3 | L1         | L2 | L3 |
| Configuration          | LR        |    |    |           |    |    | LT         |    |    | TR         |    |    |
| Flow Rate, v (veh/h)   | 134       |    |    |           |    |    | 110        |    |    | 64         |    |    |
| Percent Heavy Vehicles | 0         |    |    |           |    |    | 0          |    |    | 0          |    |    |

**Departure Headway and Service Time**

|                                   |       |  |  |  |  |  |       |  |  |       |  |  |
|-----------------------------------|-------|--|--|--|--|--|-------|--|--|-------|--|--|
| Initial Departure Headway, hd (s) | 3.20  |  |  |  |  |  | 3.20  |  |  | 3.20  |  |  |
| Initial Degree of Utilization, x  | 0.119 |  |  |  |  |  | 0.097 |  |  | 0.057 |  |  |
| Final Departure Headway, hd (s)   | 3.99  |  |  |  |  |  | 4.39  |  |  | 4.03  |  |  |
| Final Degree of Utilization, x    | 0.148 |  |  |  |  |  | 0.134 |  |  | 0.071 |  |  |
| Move-Up Time, m (s)               | 2.0   |  |  |  |  |  | 2.0   |  |  | 2.0   |  |  |
| Service Time, ts (s)              | 1.99  |  |  |  |  |  | 2.39  |  |  | 2.03  |  |  |

**Capacity, Delay and Level of Service**

|   |     |  |  |  |  |  |     |  |  |     |  |  |
|---|-----|--|--|--|--|--|-----|--|--|-----|--|--|
| Flow Rate, v (veh/h)                    | 134 |  |  |  |  |  | 110 |  |  | 64  |  |  |
| Capacity                                | 902 |  |  |  |  |  | 821 |  |  | 893 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) | 0.5 |  |  |  |  |  | 0.5 |  |  | 0.2 |  |  |
| Control Delay (s/veh)                   | 7.7 |  |  |  |  |  | 8.1 |  |  | 7.3 |  |  |
| Level of Service, LOS                   | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Approach Delay (s/veh)                  | 7.7 |  |  |  |  |  | 8.1 |  |  | 7.3 |  |  |
| Approach LOS                            | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Intersection Delay, s/veh   LOS         | 7.7 |  |  |  |  |  | A   |  |  |     |  |  |

D

---

**Future Weekday PM / Saturday MD Peak Hour**

East Main Road (Route 138) at Mitchells Lane

Mitchells Lane at Site Driveway

Mitchells Lane at Wyatt Road

East Main Road (Route 138) at Mitchells Lane

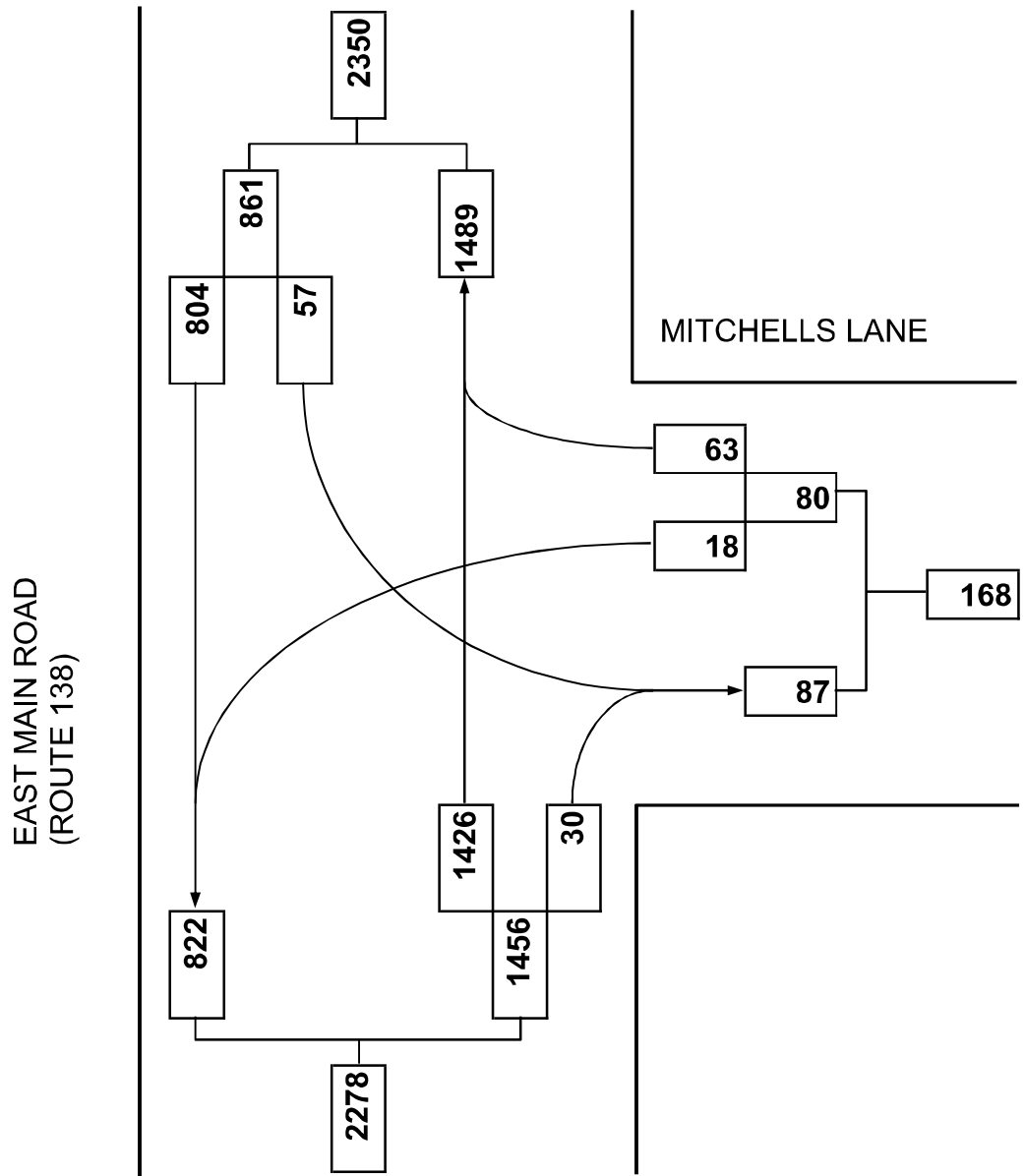


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

|                       |                          |                      |                |
|-----------------------|--------------------------|----------------------|----------------|
| <b>Major Street:</b>  | East Main Road (Rte 138) | <b>Minor Street:</b> | Mitchells Lane |
| <b>City/Town:</b>     | Middletown, RI           | <b>Day of Week:</b>  | Weekday        |
| <b>Reference No.:</b> | 6414                     | <b>Peak Period:</b>  | PM Peak Hour   |
| <b>Existing:</b>      | n/a                      | <b>Future:</b>       | Build          |

NORTH  
▲



# HCS7 Two-Way Stop-Control Report

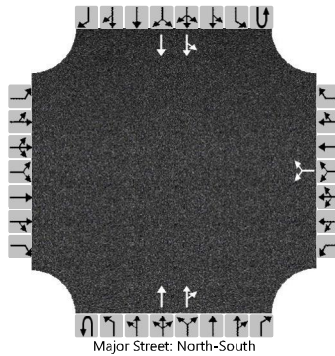
## General Information

|                          |                              |
|--------------------------|------------------------------|
| Analyst                  | Traffic Dept.                |
| Agency/Co.               | BETA Group, Inc.             |
| Date Performed           | 4/17/2019                    |
| Analysis Year            | 2019                         |
| Time Analyzed            | Build PM Peak Hour           |
| Intersection Orientation | North-South                  |
| Project Description      | Newport National West Course |

## Site Information

|                            |                           |
|----------------------------|---------------------------|
| Intersection               | Route 138 at Mitchells Ln |
| Jurisdiction               | Middletown, RI            |
| East/West Street           | Mitchells Lane            |
| North/South Street         | E. Main Road (Route 138)  |
| Peak Hour Factor           | 0.90                      |
| Analysis Time Period (hrs) | 0.25                      |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |    |    |    | Northbound |   |      |    | Southbound |    |     |   |
|----------------------------|-----------|----|----|----|-----------|----|----|----|------------|---|------|----|------------|----|-----|---|
|                            | U         | L  | T  | R  | U         | L  | T  | R  | U          | L | T    | R  | U          | L  | T   | R |
| Movement                   |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Priority                   |           | 10 | 11 | 12 |           | 7  | 8  | 9  | 1U         | 1 | 2    | 3  | 4U         | 4  | 5   | 6 |
| Number of Lanes            |           | 0  | 0  | 0  |           | 0  | 1  | 0  |            | 0 | 2    | 0  |            | 0  | 2   | 0 |
| Configuration              |           |    |    |    |           |    | LR |    |            |   | T    | TR |            | LT | T   |   |
| Volume (veh/h)             |           |    |    |    |           | 18 |    | 63 |            |   | 1426 | 30 |            | 57 | 804 |   |
| Percent Heavy Vehicles (%) |           |    |    |    |           | 0  |    | 0  |            |   |      |    |            | 0  |     |   |
| Proportion Time Blocked    |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Percent Grade (%)          |           |    |    |    | 0         |    |    |    |            |   |      |    |            |    |     |   |
| Right Turn Channelized     |           |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |
| Median Type   Storage      | Undivided |    |    |    |           |    |    |    |            |   |      |    |            |    |     |   |

## Critical and Follow-up Headways

|                              |  |  |  |  |  |      |  |      |  |  |  |  |  |  |      |  |
|------------------------------|--|--|--|--|--|------|--|------|--|--|--|--|--|--|------|--|
| Base Critical Headway (sec)  |  |  |  |  |  | 7.5  |  | 6.9  |  |  |  |  |  |  | 4.1  |  |
| Critical Headway (sec)       |  |  |  |  |  | 6.80 |  | 6.90 |  |  |  |  |  |  | 4.10 |  |
| Base Follow-Up Headway (sec) |  |  |  |  |  | 3.5  |  | 3.3  |  |  |  |  |  |  | 2.2  |  |
| Follow-Up Headway (sec)      |  |  |  |  |  | 3.50 |  | 3.30 |  |  |  |  |  |  | 2.20 |  |

## Delay, Queue Length, and Level of Service

|   |  |  |  |  |       |       |  |  |  |  |  |  |     |  |      |  |
|---|--|--|--|--|-------|-------|--|--|--|--|--|--|-----|--|------|--|
| Flow Rate, v (veh/h)                    |  |  |  |  |       | 90    |  |  |  |  |  |  |     |  | 63   |  |
| Capacity, c (veh/h)                     |  |  |  |  |       | 113   |  |  |  |  |  |  |     |  | 408  |  |
| v/c Ratio                               |  |  |  |  |       | 0.80  |  |  |  |  |  |  |     |  | 0.16 |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |  |  |  |  |       | 4.5   |  |  |  |  |  |  |     |  | 0.5  |  |
| Control Delay (s/veh)                   |  |  |  |  |       | 107.0 |  |  |  |  |  |  |     |  | 15.4 |  |
| Level of Service (LOS)                  |  |  |  |  |       | F     |  |  |  |  |  |  |     |  | C    |  |
| Approach Delay (s/veh)                  |  |  |  |  | 107.0 |       |  |  |  |  |  |  | 3.0 |  |      |  |
| Approach LOS                            |  |  |  |  | F     |       |  |  |  |  |  |  |     |  |      |  |

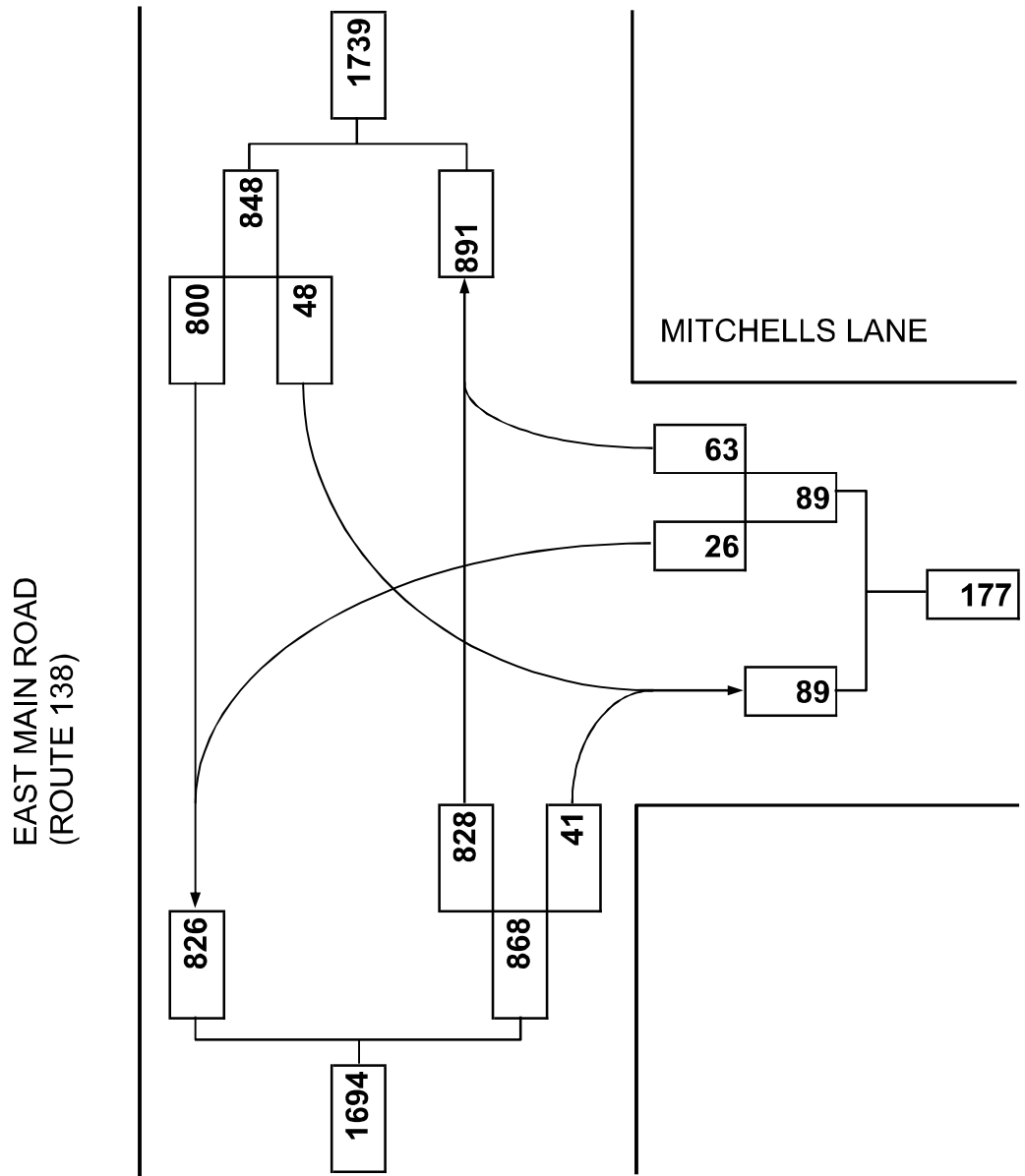


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

|                       |                          |                      |                |
|-----------------------|--------------------------|----------------------|----------------|
| <b>Major Street:</b>  | East Main Road (Rte 138) | <b>Minor Street:</b> | Mitchells Lane |
| <b>City/Town:</b>     | Middletown, RI           | <b>Day of Week:</b>  | Saturday       |
| <b>Reference No.:</b> | 6414                     | <b>Peak Period:</b>  | MD Peak Hour   |
| <b>Existing:</b>      | n/a                      | <b>Future:</b>       | Build          |

NORTH  
▲



# HCS7 Two-Way Stop-Control Report

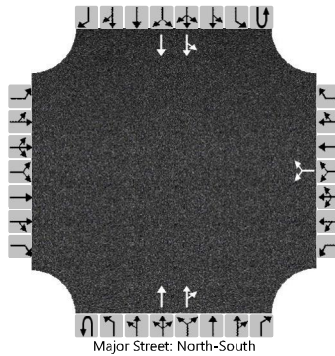
## General Information

|                          |                              |
|--------------------------|------------------------------|
| Analyst                  | Traffic Dept.                |
| Agency/Co.               | BETA Group, Inc.             |
| Date Performed           | 4/17/2019                    |
| Analysis Year            | 2019                         |
| Time Analyzed            | Build Sat MD Peak Hour       |
| Intersection Orientation | North-South                  |
| Project Description      | Newport National West Course |

## Site Information

|                            |                           |
|----------------------------|---------------------------|
| Intersection               | Route 138 at Mitchells Ln |
| Jurisdiction               | Middletown, RI            |
| East/West Street           | Mitchells Lane            |
| North/South Street         | E. Main Road (Route 138)  |
| Peak Hour Factor           | 0.96                      |
| Analysis Time Period (hrs) | 0.25                      |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |    |    |    | Northbound |   |     |    | Southbound |    |     |   |
|----------------------------|-----------|----|----|----|-----------|----|----|----|------------|---|-----|----|------------|----|-----|---|
|                            | U         | L  | T  | R  | U         | L  | T  | R  | U          | L | T   | R  | U          | L  | T   | R |
| Priority                   |           | 10 | 11 | 12 |           | 7  | 8  | 9  | 1U         | 1 | 2   | 3  | 4U         | 4  | 5   | 6 |
| Number of Lanes            |           | 0  | 0  | 0  |           | 0  | 1  | 0  | 0          | 0 | 2   | 0  | 0          | 0  | 2   | 0 |
| Configuration              |           |    |    |    |           |    | LR |    |            |   | T   | TR |            | LT | T   |   |
| Volume (veh/h)             |           |    |    |    |           | 26 |    | 63 |            |   | 828 | 41 |            | 48 | 800 |   |
| Percent Heavy Vehicles (%) |           |    |    |    |           | 0  |    | 0  |            |   |     |    |            | 0  |     |   |
| Proportion Time Blocked    |           |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |
| Percent Grade (%)          |           |    |    |    | 0         |    |    |    |            |   |     |    |            |    |     |   |
| Right Turn Channelized     |           |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |
| Median Type   Storage      | Undivided |    |    |    |           |    |    |    |            |   |     |    |            |    |     |   |

## Critical and Follow-up Headways

|                              |  |  |  |  |  |      |  |      |  |  |  |  |  |  |  |      |  |
|------------------------------|--|--|--|--|--|------|--|------|--|--|--|--|--|--|--|------|--|
| Base Critical Headway (sec)  |  |  |  |  |  | 7.5  |  | 6.9  |  |  |  |  |  |  |  | 4.1  |  |
| Critical Headway (sec)       |  |  |  |  |  | 6.80 |  | 6.90 |  |  |  |  |  |  |  | 4.10 |  |
| Base Follow-Up Headway (sec) |  |  |  |  |  | 3.5  |  | 3.3  |  |  |  |  |  |  |  | 2.2  |  |
| Follow-Up Headway (sec)      |  |  |  |  |  | 3.50 |  | 3.30 |  |  |  |  |  |  |  | 2.20 |  |

## Delay, Queue Length, and Level of Service

|   |  |  |  |  |      |      |  |  |  |  |  |  |     |  |  |      |  |
|---|--|--|--|--|------|------|--|--|--|--|--|--|-----|--|--|------|--|
| Flow Rate, v (veh/h)                    |  |  |  |  |      | 93   |  |  |  |  |  |  |     |  |  | 50   |  |
| Capacity, c (veh/h)                     |  |  |  |  |      | 277  |  |  |  |  |  |  |     |  |  | 760  |  |
| v/c Ratio                               |  |  |  |  |      | 0.33 |  |  |  |  |  |  |     |  |  | 0.07 |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |  |  |  |  |      | 1.4  |  |  |  |  |  |  |     |  |  | 0.2  |  |
| Control Delay (s/veh)                   |  |  |  |  |      | 24.4 |  |  |  |  |  |  |     |  |  | 10.1 |  |
| Level of Service (LOS)                  |  |  |  |  |      | C    |  |  |  |  |  |  |     |  |  | B    |  |
| Approach Delay (s/veh)                  |  |  |  |  | 24.4 |      |  |  |  |  |  |  | 1.1 |  |  |      |  |
| Approach LOS                            |  |  |  |  | C    |      |  |  |  |  |  |  |     |  |  |      |  |

Mitchells Lane at Site Driveway

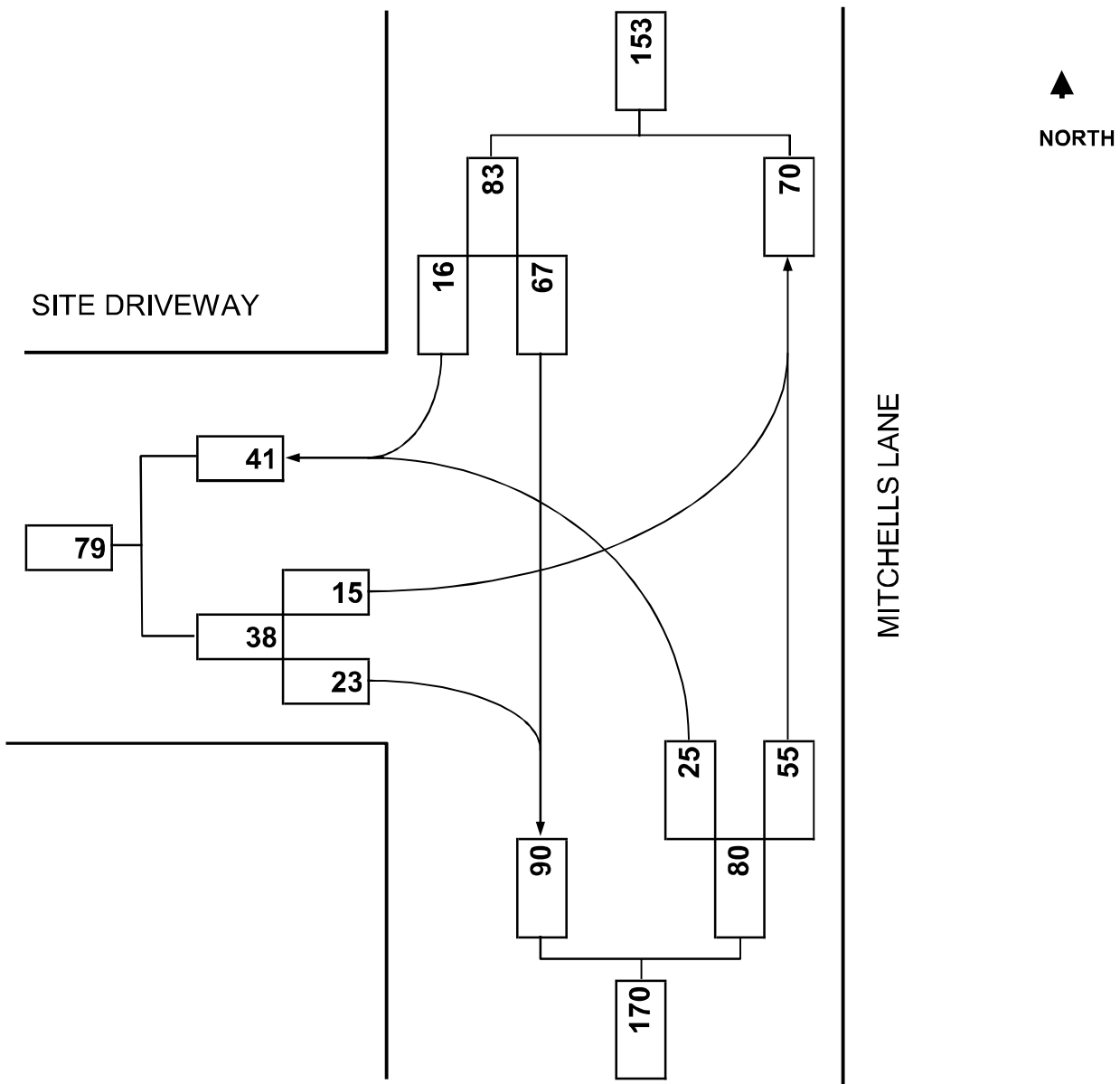


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** n/a

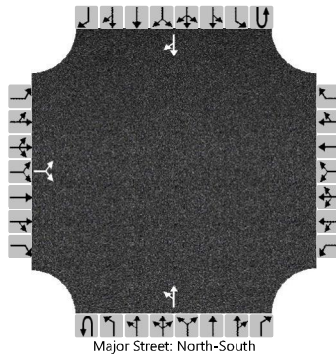
**Minor Street:** Site Driveway  
**Day of Week:** Weekday  
**Peak Period:** PM Peak Hour  
**Future:** Build



# HCS7 Two-Way Stop-Control Report

| General Information      |                              |  |  | Site Information           |                          |  |  |
|--------------------------|------------------------------|--|--|----------------------------|--------------------------|--|--|
| Analyst                  | Traffic Dept.                |  |  | Intersection               | Mitchells Ln at Site Dwy |  |  |
| Agency/Co.               | BETA Group, Inc.             |  |  | Jurisdiction               | Middletown, RI           |  |  |
| Date Performed           | 4/17/2019                    |  |  | East/West Street           | Site Driveway            |  |  |
| Analysis Year            | 2019                         |  |  | North/South Street         | Mitchells Lane           |  |  |
| Time Analyzed            | Build PM Peak Hour           |  |  | Peak Hour Factor           | 0.92                     |  |  |
| Intersection Orientation | North-South                  |  |  | Analysis Time Period (hrs) | 0.25                     |  |  |
| Project Description      | Newport National West Course |  |  |                            |                          |  |  |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |   |   |   | Northbound |    |    |   | Southbound |   |    |    |
|----------------------------|-----------|----|----|----|-----------|---|---|---|------------|----|----|---|------------|---|----|----|
|                            | U         | L  | T  | R  | U         | L | T | R | U          | L  | T  | R | U          | L | T  | R  |
| Movement                   |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Priority                   |           | 10 | 11 | 12 |           | 7 | 8 | 9 | 1U         | 1  | 2  | 3 | 4U         | 4 | 5  | 6  |
| Number of Lanes            |           | 0  | 1  | 0  |           | 0 | 0 | 0 |            | 0  | 1  | 0 |            | 0 | 1  | 0  |
| Configuration              |           |    | LR |    |           |   |   |   |            | LT |    |   |            |   |    | TR |
| Volume (veh/h)             |           | 15 |    | 23 |           |   |   |   |            | 25 | 55 |   |            |   | 67 | 16 |
| Percent Heavy Vehicles (%) |           | 0  |    | 0  |           |   |   |   |            | 0  |    |   |            |   |    |    |
| Proportion Time Blocked    |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Percent Grade (%)          | 0         |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Right Turn Channelized     |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Median Type   Storage      | Undivided |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |

## Critical and Follow-up Headways

|                              |  |      |  |      |  |  |  |  |  |      |  |  |  |  |  |  |
|------------------------------|--|------|--|------|--|--|--|--|--|------|--|--|--|--|--|--|
| Base Critical Headway (sec)  |  | 7.1  |  | 6.2  |  |  |  |  |  | 4.1  |  |  |  |  |  |  |
| Critical Headway (sec)       |  | 6.40 |  | 6.20 |  |  |  |  |  | 4.10 |  |  |  |  |  |  |
| Base Follow-Up Headway (sec) |  | 3.5  |  | 3.3  |  |  |  |  |  | 2.2  |  |  |  |  |  |  |
| Follow-Up Headway (sec)      |  | 3.50 |  | 3.30 |  |  |  |  |  | 2.20 |  |  |  |  |  |  |

## Delay, Queue Length, and Level of Service

|   |     |  |      |  |  |  |  |  |     |      |  |  |  |  |  |  |
|---|-----|--|------|--|--|--|--|--|-----|------|--|--|--|--|--|--|
| Flow Rate, v (veh/h)                    |     |  | 41   |  |  |  |  |  |     | 27   |  |  |  |  |  |  |
| Capacity, c (veh/h)                     |     |  | 894  |  |  |  |  |  |     | 1518 |  |  |  |  |  |  |
| v/c Ratio                               |     |  | 0.05 |  |  |  |  |  |     | 0.02 |  |  |  |  |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |     |  | 0.1  |  |  |  |  |  |     | 0.1  |  |  |  |  |  |  |
| Control Delay (s/veh)                   |     |  | 9.2  |  |  |  |  |  |     | 7.4  |  |  |  |  |  |  |
| Level of Service (LOS)                  |     |  | A    |  |  |  |  |  |     | A    |  |  |  |  |  |  |
| Approach Delay (s/veh)                  | 9.2 |  |      |  |  |  |  |  | 2.4 |      |  |  |  |  |  |  |
| Approach LOS                            | A   |  |      |  |  |  |  |  |     |      |  |  |  |  |  |  |

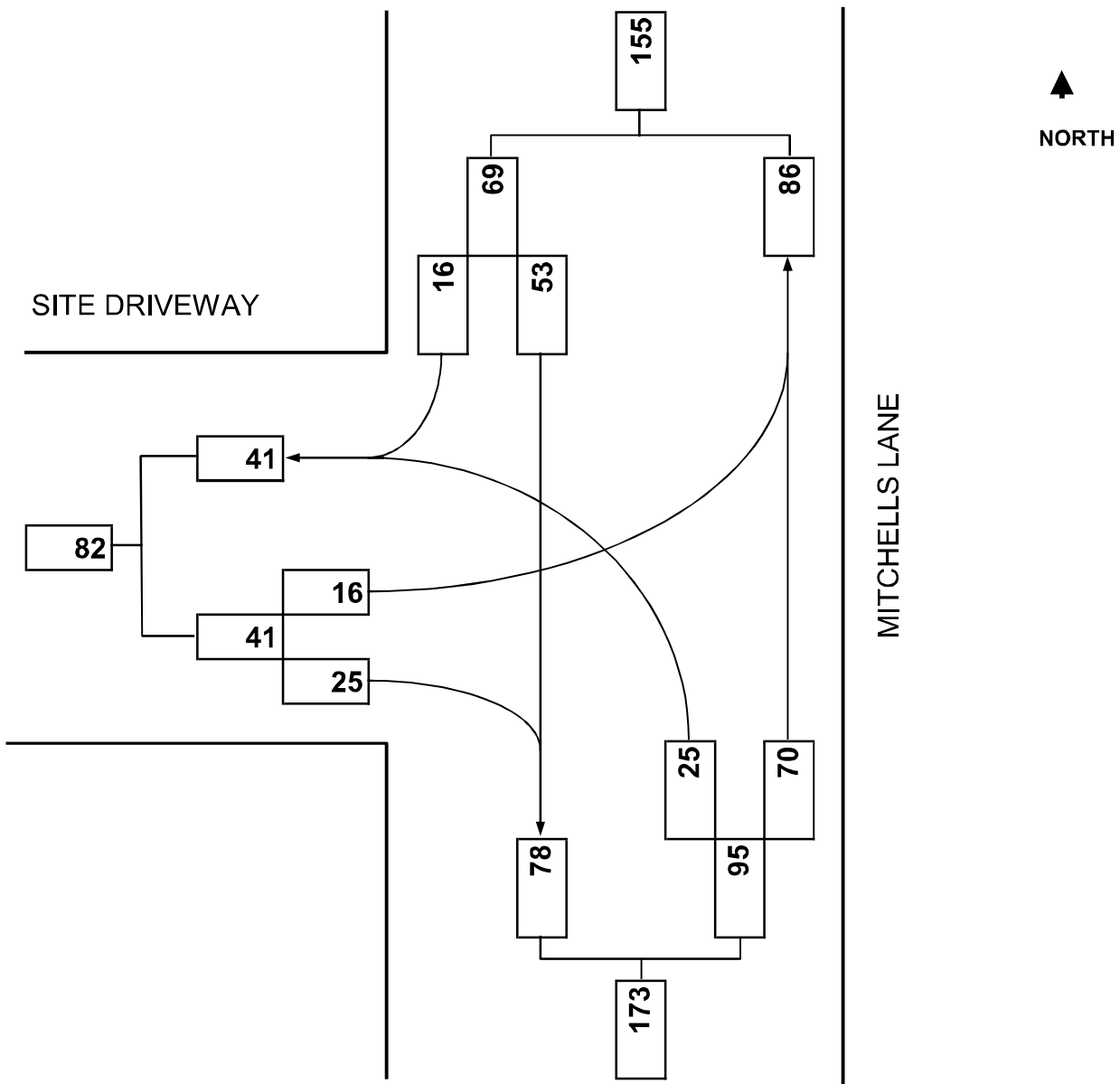


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** n/a

**Minor Street:** Site Driveway  
**Day of Week:** Saturday  
**Peak Period:** MD Peak Hour  
**Future:** Build



# HCS7 Two-Way Stop-Control Report

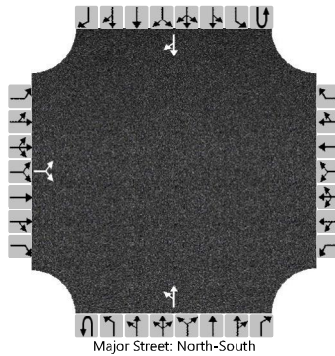
## General Information

|                          |                              |
|--------------------------|------------------------------|
| Analyst                  | Traffic Dept.                |
| Agency/Co.               | BETA Group, Inc.             |
| Date Performed           | 4/17/2019                    |
| Analysis Year            | 2019                         |
| Time Analyzed            | Build Sat MD Peak Hour       |
| Intersection Orientation | North-South                  |
| Project Description      | Newport National West Course |

## Site Information

|                            |                          |
|----------------------------|--------------------------|
| Intersection               | Mitchells Ln at Site Dwy |
| Jurisdiction               | Middletown, RI           |
| East/West Street           | Site Driveway            |
| North/South Street         | Mitchells Lane           |
| Peak Hour Factor           | 0.92                     |
| Analysis Time Period (hrs) | 0.25                     |

## Lanes



## Vehicle Volumes and Adjustments

| Approach                   | Eastbound |    |    |    | Westbound |   |   |   | Northbound |    |    |   | Southbound |   |    |    |
|----------------------------|-----------|----|----|----|-----------|---|---|---|------------|----|----|---|------------|---|----|----|
|                            | U         | L  | T  | R  | U         | L | T | R | U          | L  | T  | R | U          | L | T  | R  |
| Movement                   |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Priority                   |           | 10 | 11 | 12 |           | 7 | 8 | 9 | 1U         | 1  | 2  | 3 | 4U         | 4 | 5  | 6  |
| Number of Lanes            |           | 0  | 1  | 0  |           | 0 | 0 | 0 |            | 0  | 1  | 0 |            | 0 | 1  | 0  |
| Configuration              |           |    | LR |    |           |   |   |   |            | LT |    |   |            |   |    | TR |
| Volume (veh/h)             |           | 16 |    | 25 |           |   |   |   |            | 25 | 70 |   |            |   | 53 | 16 |
| Percent Heavy Vehicles (%) |           | 0  |    | 0  |           |   |   |   |            | 0  |    |   |            |   |    |    |
| Proportion Time Blocked    |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Percent Grade (%)          | 0         |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Right Turn Channelized     |           |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |
| Median Type   Storage      | Undivided |    |    |    |           |   |   |   |            |    |    |   |            |   |    |    |

## Critical and Follow-up Headways

|                              |  |      |  |      |  |  |  |  |  |      |  |  |  |  |  |  |
|------------------------------|--|------|--|------|--|--|--|--|--|------|--|--|--|--|--|--|
| Base Critical Headway (sec)  |  | 7.1  |  | 6.2  |  |  |  |  |  | 4.1  |  |  |  |  |  |  |
| Critical Headway (sec)       |  | 6.40 |  | 6.20 |  |  |  |  |  | 4.10 |  |  |  |  |  |  |
| Base Follow-Up Headway (sec) |  | 3.5  |  | 3.3  |  |  |  |  |  | 2.2  |  |  |  |  |  |  |
| Follow-Up Headway (sec)      |  | 3.50 |  | 3.30 |  |  |  |  |  | 2.20 |  |  |  |  |  |  |

## Delay, Queue Length, and Level of Service

|   |     |  |      |  |  |  |  |  |     |      |  |  |  |  |  |  |
|---|-----|--|------|--|--|--|--|--|-----|------|--|--|--|--|--|--|
| Flow Rate, v (veh/h)                    |     |  | 45   |  |  |  |  |  |     | 27   |  |  |  |  |  |  |
| Capacity, c (veh/h)                     |     |  | 904  |  |  |  |  |  |     | 1537 |  |  |  |  |  |  |
| v/c Ratio                               |     |  | 0.05 |  |  |  |  |  |     | 0.02 |  |  |  |  |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) |     |  | 0.2  |  |  |  |  |  |     | 0.1  |  |  |  |  |  |  |
| Control Delay (s/veh)                   |     |  | 9.2  |  |  |  |  |  |     | 7.4  |  |  |  |  |  |  |
| Level of Service (LOS)                  |     |  | A    |  |  |  |  |  |     | A    |  |  |  |  |  |  |
| Approach Delay (s/veh)                  | 9.2 |  |      |  |  |  |  |  | 2.0 |      |  |  |  |  |  |  |
| Approach LOS                            | A   |  |      |  |  |  |  |  |     |      |  |  |  |  |  |  |

Mitchells Lane at Wyatt Road

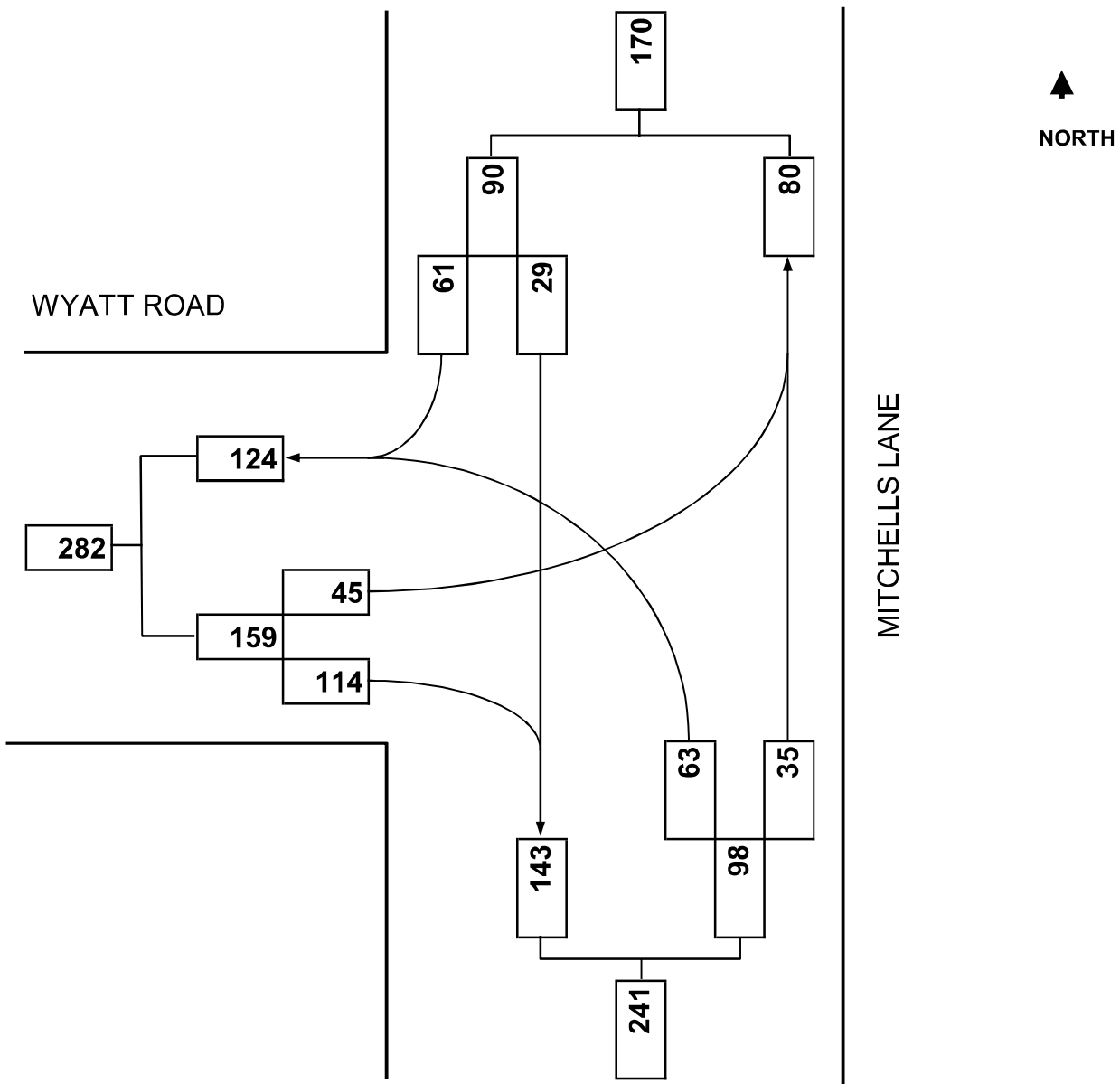


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

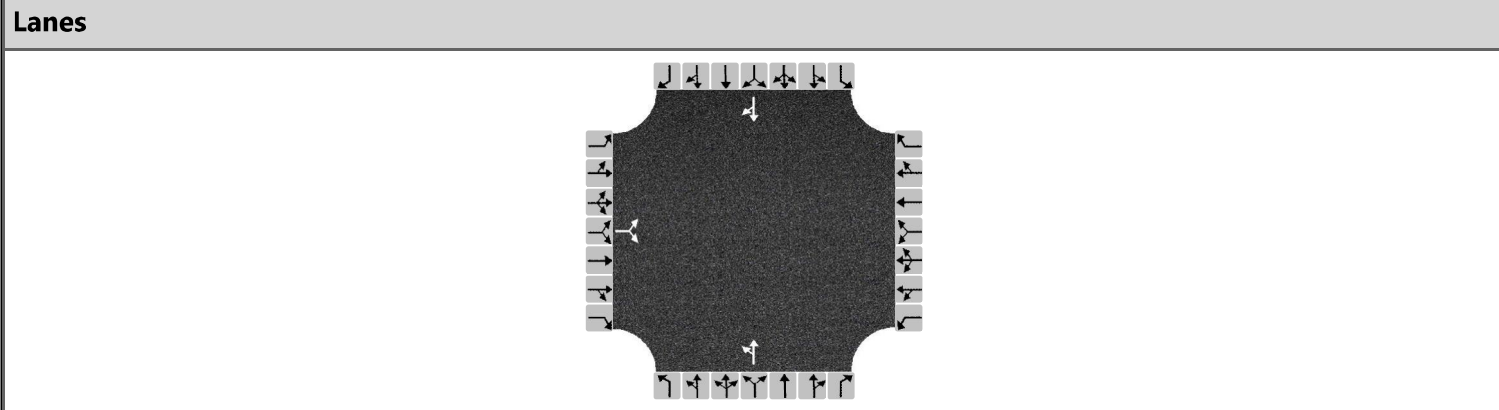
**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** n/a

**Minor Street:** Wyatt Road  
**Day of Week:** Weekday  
**Peak Period:** PM Peak Hour  
**Future:** Build



# HCS7 All-Way Stop Control Report

| General Information        |                              | Site Information   |                          |
|----------------------------|------------------------------|--------------------|--------------------------|
| Analyst                    | Traffic Dept.                | Intersection       | Mitchells Ln at Wyatt Rd |
| Agency/Co.                 | BETA Group, Inc.             | Jurisdiction       | Middletown, RI           |
| Date Performed             | 4/17/2019                    | East/West Street   | Wyatt Road               |
| Analysis Year              | 2019                         | North/South Street | Mitchells Lane           |
| Analysis Time Period (hrs) | 0.25                         | Peak Hour Factor   | 0.94                     |
| Time Analyzed              | Build PM Peak Hour           |                    |                          |
| Project Description        | Newport National West Course |                    |                          |



| Approach               | Eastbound |    |     | Westbound |    |    | Northbound |    |    | Southbound |    |    |
|------------------------|-----------|----|-----|-----------|----|----|------------|----|----|------------|----|----|
|                        | L         | T  | R   | L         | T  | R  | L          | T  | R  | L          | T  | R  |
| Movement               |           |    |     |           |    |    |            |    |    |            |    |    |
| Volume                 | 45        |    | 114 |           |    |    | 63         | 35 |    |            | 29 | 61 |
| % Thrus in Shared Lane |           |    |     |           |    |    |            |    |    |            |    |    |
| Lane                   | L1        | L2 | L3  | L1        | L2 | L3 | L1         | L2 | L3 | L1         | L2 | L3 |
| Configuration          | LR        |    |     |           |    |    | LT         |    |    | TR         |    |    |
| Flow Rate, v (veh/h)   | 169       |    |     |           |    |    | 104        |    |    | 96         |    |    |
| Percent Heavy Vehicles | 0         |    |     |           |    |    | 0          |    |    | 0          |    |    |

| Departure Headway and Service Time |       |  |  |  |  |  |       |  |  |       |  |  |
|------------------------------------|-------|--|--|--|--|--|-------|--|--|-------|--|--|
| Initial Departure Headway, hd (s)  | 3.20  |  |  |  |  |  | 3.20  |  |  | 3.20  |  |  |
| Initial Degree of Utilization, x   | 0.150 |  |  |  |  |  | 0.093 |  |  | 0.085 |  |  |
| Final Departure Headway, hd (s)    | 3.96  |  |  |  |  |  | 4.48  |  |  | 3.96  |  |  |
| Final Degree of Utilization, x     | 0.186 |  |  |  |  |  | 0.130 |  |  | 0.105 |  |  |
| Move-Up Time, m (s)                | 2.0   |  |  |  |  |  | 2.0   |  |  | 2.0   |  |  |
| Service Time, ts (s)               | 1.96  |  |  |  |  |  | 2.48  |  |  | 1.96  |  |  |

| Capacity, Delay and Level of Service    |     |  |  |  |  |  |     |  |  |     |  |  |
|---|-----|--|--|--|--|--|-----|--|--|-----|--|--|
| Flow Rate, v (veh/h)                    | 169 |  |  |  |  |  | 104 |  |  | 96  |  |  |
| Capacity                                | 909 |  |  |  |  |  | 804 |  |  | 908 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) | 0.7 |  |  |  |  |  | 0.4 |  |  | 0.4 |  |  |
| Control Delay (s/veh)                   | 7.9 |  |  |  |  |  | 8.1 |  |  | 7.4 |  |  |
| Level of Service, LOS                   | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Approach Delay (s/veh)                  | 7.9 |  |  |  |  |  | 8.1 |  |  | 7.4 |  |  |
| Approach LOS                            | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Intersection Delay, s/veh   LOS         | 7.8 |  |  |  |  |  | A   |  |  |     |  |  |

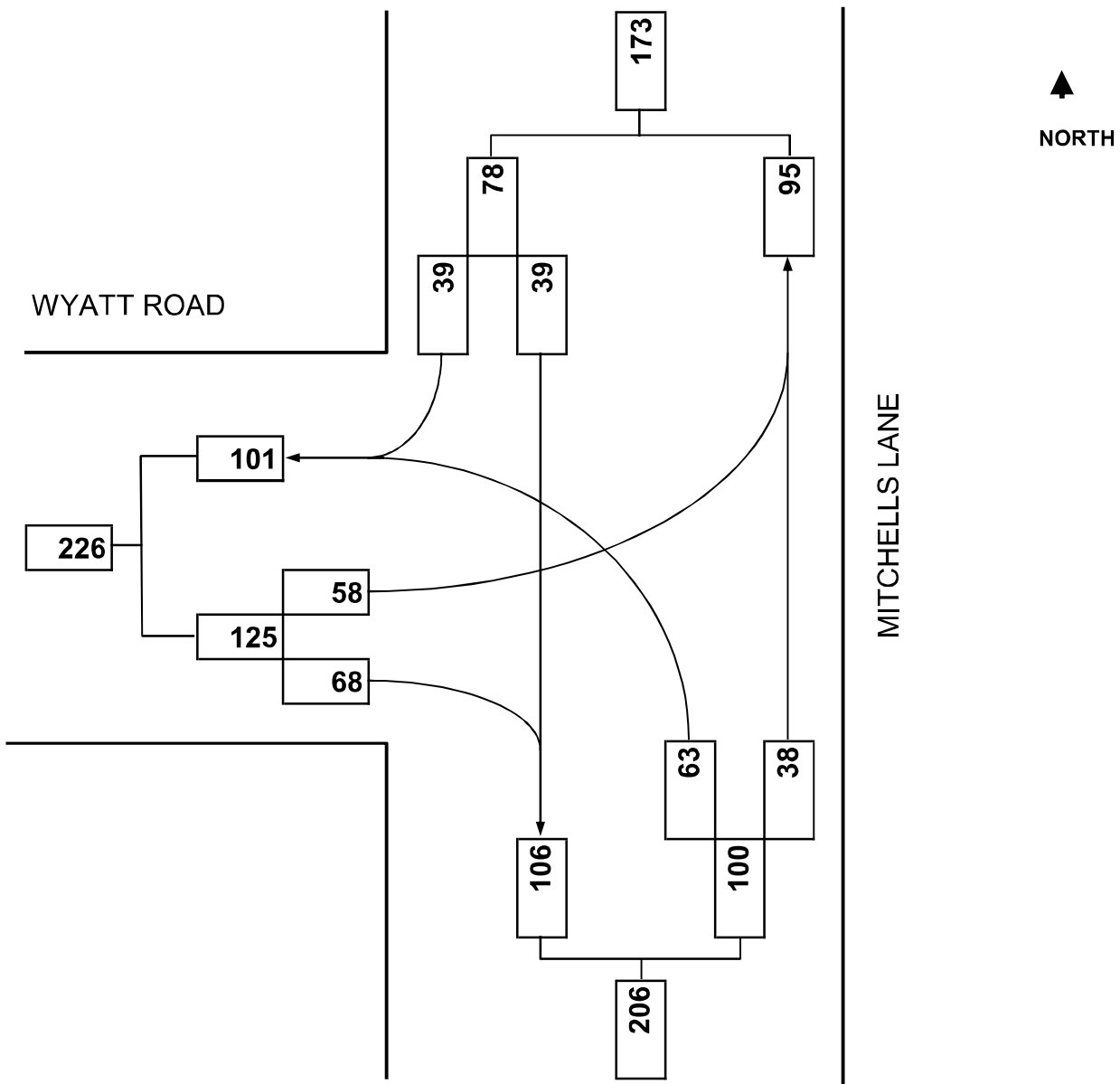


ENGINEERING SUCCESS TOGETHER

### Turning Movement Diagram

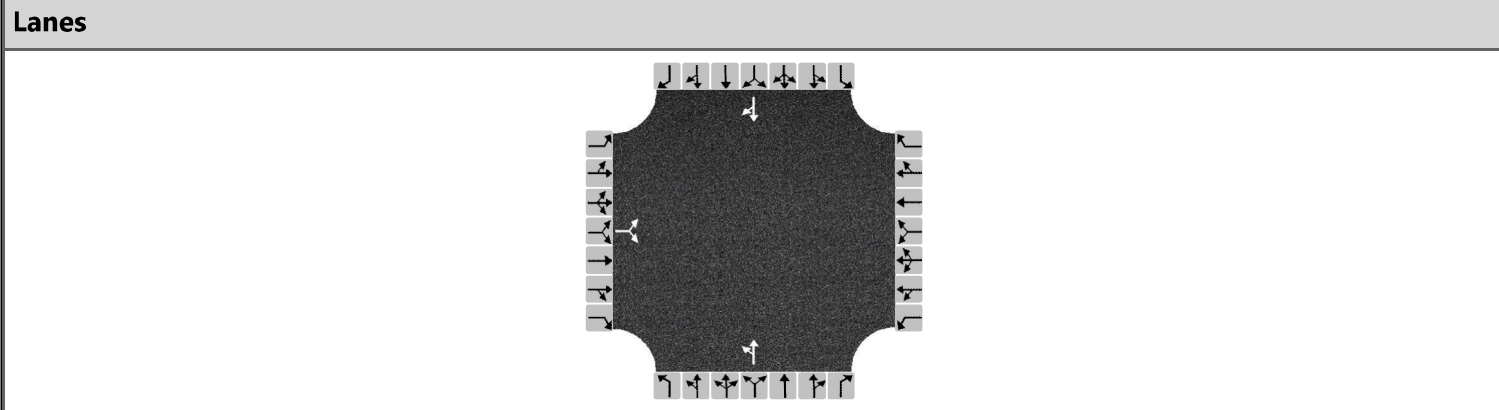
**Major Street:** Mitchells Lane  
**City/Town:** Middletown, RI  
**Reference No.:** 6414  
**Existing:** n/a

**Minor Street:** Wyatt Road  
**Day of Week:** Saturday  
**Peak Period:** MD Peak Hour  
**Future:** Build



# HCS7 All-Way Stop Control Report

| General Information        |                              | Site Information   |                          |
|----------------------------|------------------------------|--------------------|--------------------------|
| Analyst                    | Traffic Dept.                | Intersection       | Mitchells Ln at Wyatt Rd |
| Agency/Co.                 | BETA Group, Inc.             | Jurisdiction       | Middletown, RI           |
| Date Performed             | 4/17/2019                    | East/West Street   | Wyatt Road               |
| Analysis Year              | 2019                         | North/South Street | Mitchells Lane           |
| Analysis Time Period (hrs) | 0.25                         | Peak Hour Factor   | 0.83                     |
| Time Analyzed              | Build Sat MD Peak Hour       |                    |                          |
| Project Description        | Newport National West Course |                    |                          |



**Vehicle Volume and Adjustments**

| Approach               | Eastbound |    |    | Westbound |    |    | Northbound |    |    | Southbound |    |    |
|------------------------|-----------|----|----|-----------|----|----|------------|----|----|------------|----|----|
|                        | L         | T  | R  | L         | T  | R  | L          | T  | R  | L          | T  | R  |
| Movement               |           |    |    |           |    |    |            |    |    |            |    |    |
| Volume                 | 58        |    | 68 |           |    |    | 63         | 38 |    |            | 39 | 39 |
| % Thrus in Shared Lane |           |    |    |           |    |    |            |    |    |            |    |    |
| Lane                   | L1        | L2 | L3 | L1        | L2 | L3 | L1         | L2 | L3 | L1         | L2 | L3 |
| Configuration          | LR        |    |    |           |    |    | LT         |    |    | TR         |    |    |
| Flow Rate, v (veh/h)   | 152       |    |    |           |    |    | 122        |    |    | 94         |    |    |
| Percent Heavy Vehicles | 0         |    |    |           |    |    | 0          |    |    | 0          |    |    |

**Departure Headway and Service Time**

|                                   |       |  |  |  |  |  |       |  |  |       |  |  |
|-----------------------------------|-------|--|--|--|--|--|-------|--|--|-------|--|--|
| Initial Departure Headway, hd (s) | 3.20  |  |  |  |  |  | 3.20  |  |  | 3.20  |  |  |
| Initial Degree of Utilization, x  | 0.135 |  |  |  |  |  | 0.108 |  |  | 0.084 |  |  |
| Final Departure Headway, hd (s)   | 4.14  |  |  |  |  |  | 4.45  |  |  | 4.07  |  |  |
| Final Degree of Utilization, x    | 0.175 |  |  |  |  |  | 0.150 |  |  | 0.106 |  |  |
| Move-Up Time, m (s)               | 2.0   |  |  |  |  |  | 2.0   |  |  | 2.0   |  |  |
| Service Time, ts (s)              | 2.14  |  |  |  |  |  | 2.45  |  |  | 2.07  |  |  |

**Capacity, Delay and Level of Service**

|   |     |  |  |  |  |  |     |  |  |     |  |  |
|---|-----|--|--|--|--|--|-----|--|--|-----|--|--|
| Flow Rate, v (veh/h)                    | 152 |  |  |  |  |  | 122 |  |  | 94  |  |  |
| Capacity                                | 870 |  |  |  |  |  | 809 |  |  | 886 |  |  |
| 95% Queue Length, Q <sub>95</sub> (veh) | 0.6 |  |  |  |  |  | 0.5 |  |  | 0.4 |  |  |
| Control Delay (s/veh)                   | 8.0 |  |  |  |  |  | 8.2 |  |  | 7.5 |  |  |
| Level of Service, LOS                   | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Approach Delay (s/veh)                  | 8.0 |  |  |  |  |  | 8.2 |  |  | 7.5 |  |  |
| Approach LOS                            | A   |  |  |  |  |  | A   |  |  | A   |  |  |
| Intersection Delay, s/veh   LOS         | 8.0 |  |  |  |  |  | A   |  |  |     |  |  |

# APPENDIX E – Conceptual Figures

---

**Sakonnet Greenway Trail Crossing Conceptual Figure**

**Newport National West Course Golf Cart Crossing Conceptual Figure**

**E**

---

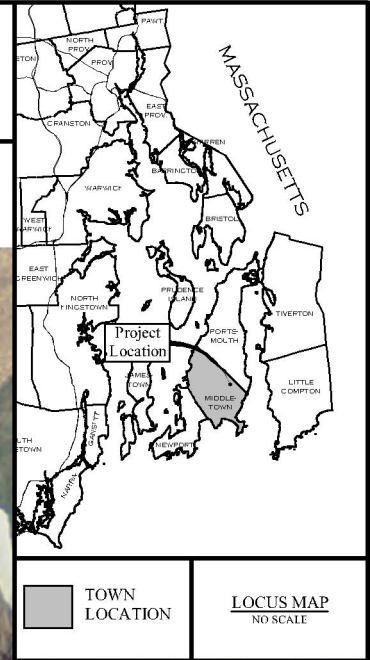
**Sakonnet Greenway Trail Crossing**



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

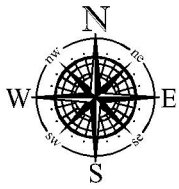
## Sakonnet Greenway Trail Crossing Concept



**E**

---

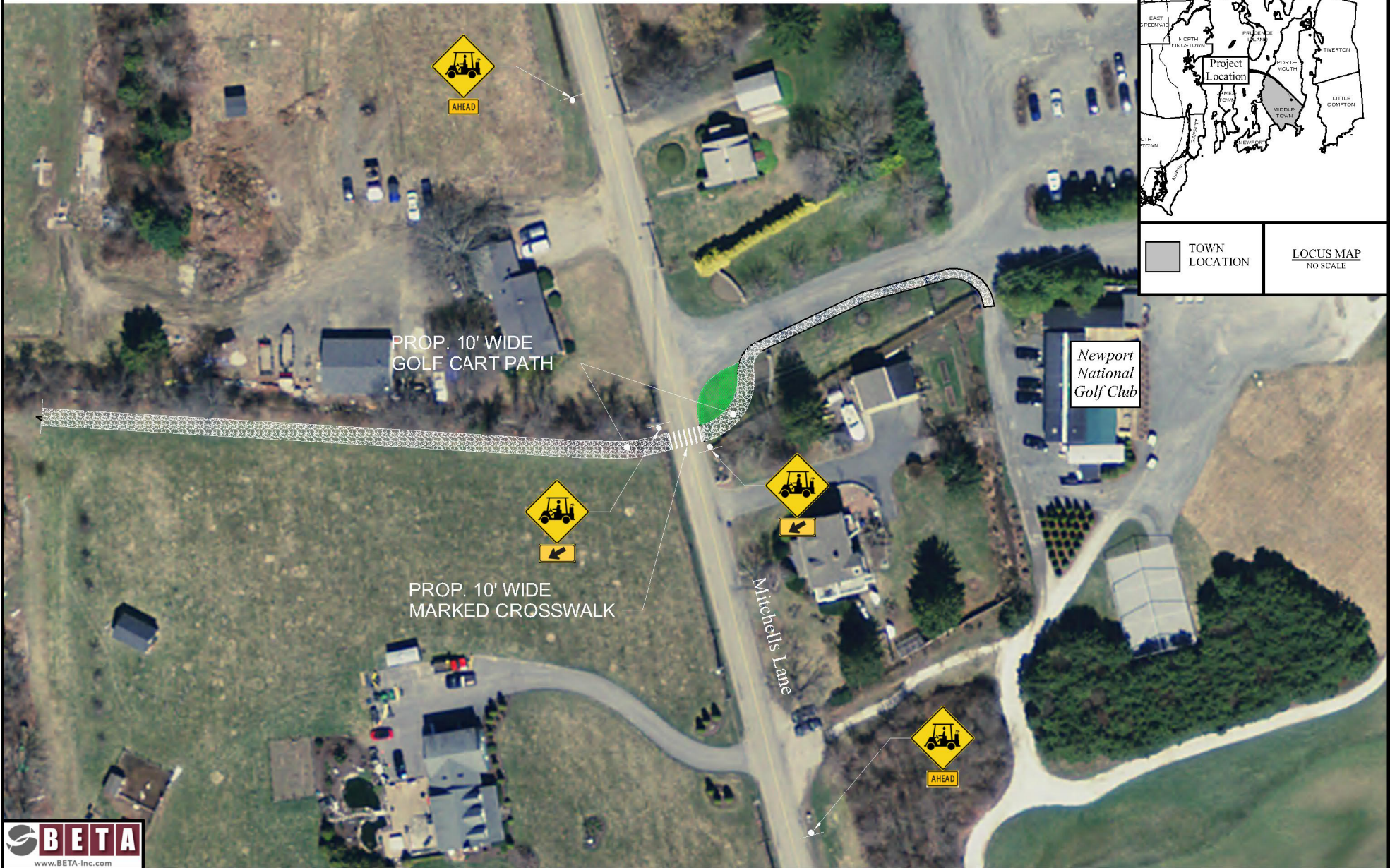
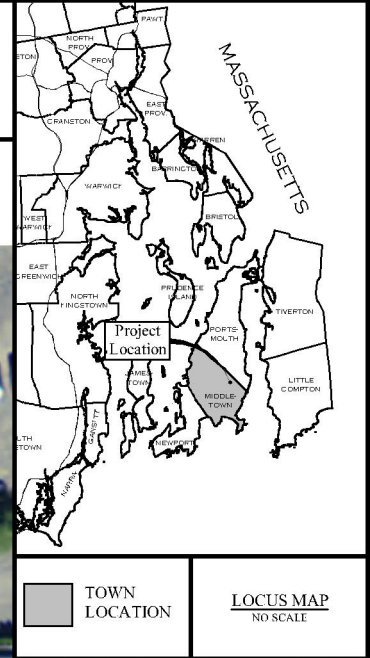
**Newport National West Course Golf Cart Crossing**



# Newport National West Course

MIDDLETOWN, RHODE ISLAND

## Newport National Golf Cart Crossing Concept



PROP. 10' WIDE  
GOLF CART PATH

Newport  
National  
Golf Club

PROP. 10' WIDE  
MARKED CROSSWALK

Michels Lane