



December 3, 2020

Mr. Ryan Schoen  
Morgan Schoen Hospitality  
12 Grand Street  
Stonington, Connecticut 06378

Re: Proposed Land Redevelopment Project  
*Shepherd's Run*  
4780A Tower Hill Road (US Route 1)  
South Kingstown, Rhode Island 02879

Dear Mr. Schoen:

BETA Group, Inc., in accordance with our scope of services, has completed a planning level traffic assessment of existing and future safety and operational conditions of the immediate servicing roadways to a proposed hotel and event venue, *Shepherd's Run*, on Tower Hill Road (Route 1) in the Town of South Kingstown, Rhode Island. The subject parcel is situated at the rear of *The Prout School* campus along the easterly side of Route 1. Refer to Figure 1, Project Vicinity Map, for the project location within the community. This study was completed for submission to the town as part of the local approval process and provides a summary of existing roadway conditions and an estimate of future traffic conditions if the project was to be approved and the new business was operating at this location.

Based upon our discussions and a review of the site plan provided, it is our understanding that the current proposal includes a re-use of the 30+ acre property. The site was most recently utilized as a religious institution that included an all-girls, high school level boarding school that closed in 2012. The former school property has been vacant and underutilized since that time. An historic manor house, built in 1933 as a summer residence on a 212 acre property at the time, is the primary structure on the site. The building was expanded in 1960 and land subdivided after the property was sold to the Sisters of the Cross and Passion. The expansion included a church and other facilities for the occupying nuns who subsequently started the *Prout School* in 1966 that was constructed on the abutting parcel to the west.

These buildings will be retained and renovated to accommodate a boutique hotel containing thirty-three rooms with an associated restaurant, spa and fitness center as guest amenities to promote their health and wellness during their stay at the facility. Also, as part of the hotel function, event/meeting space will be provided primarily to accommodate weddings, which will be a major element of the *Shepherd's Run* business during the year. Both the hotel and wedding experience proposed for the facility will be augmented by a vineyard that will be established on the grounds, along with a small winery. Future expansion of the site to include new construction is proposed and may include the potential for up to twelve small, individual extended stay bungalows in the northeast corner of the property, secluded from the main hotel area. Access to the property will be provided from an existing driveway off of Route 1 just north of the Stedman Government Center. This stone wall lined driveway will be restricted to an entrance only, with egress provided through a common driveway to the Government Center signalized access road.

*The following is a summary of our investigation of the potential impacts and recommendations to provide safe and efficient access to the subject property; .*



## PROJECT APPROACH

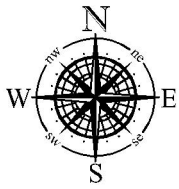
The objective of the following study is to determine if any operational and/or traffic safety concerns presently exist along the local servicing roadways, specifically Tower Hill Road (Route 1), in the immediate site vicinity. A review of the existing roadway features was completed to determine if any potential deficiencies presently warrant mitigation. In addition to existing conditions, the analysis also included the assessment of potential impacts resulting from the traffic generated by the proposed hotel and event venue. The study focused on these issues and made recommendations for improvements if determined necessary, based upon the findings of the data collection and analysis phases of the study. In order to complete our analysis, the following scope of work was conducted for the project:

- An inventory of the physical roadway characteristics of Tower Hill Road (Route 1) and its intersections in the immediate site vicinity to determine the adequacy of the existing roadway geometric features in reference to safety and operations.
- Review of available traffic data to define the existing traffic patterns and operation characteristics along the servicing roadways. Due to the current state of emergency in place in Rhode Island and resultant traffic patterns not being consistent with typical daily traffic conditions, the most recent record data was obtained from the Rhode Island Department of Transportation (RIDOT) and from previous studies completed in the immediate area in accordance with current guidelines.
- Analysis of crash data obtained from the South Kingstown Police Department to determine if there are any safety concerns relative to the frequency, severity, or pattern of crashes in the immediate site vicinity.
- A site plan for the proposed redevelopment project was reviewed to define future site and roadway conditions at the access drive intersection to the new business.
- An analysis of the data collected and evaluation of the proposed design and development of recommendations if determined necessary to provide a safe and adequate access to the site.

## PROJECT AREA

As noted in the previous section, the subject parcel is located at the rear of *The Prout School* campus along the easterly side of Tower Hill Road (Route 1) and is defined by Assessor's Plat 50-4, Lot 12, which contains approximately 30.44 acres of partially developed land. The property currently has several buildings that are interconnected with enclosed hallways including the original stone manor house that was built in 1933 on the property as a single family summer residence. Several newer structures containing the church, classrooms and cafeteria are more modern with a light brick facade were added in 1960 to accommodate the religious institutional use. The buildings and site have remained vacant since 2012. Figure 2 on the following page depicts the general project area, and the boundary lines of the subject property.

Land use in the immediate area can be defined as a mixture of commercial, residential, and institutional uses including undeveloped wooded land along Route 1. Immediately abutting the property to the east and south is wooded conservation land along the waterfront of the Narrow River. To the immediate west and south are *The Prout School*, a private Catholic High School, and the *Stedman Government Center* containing state offices, and a judicial complex. To the north is an active farm for agricultural use. Other properties



# Shepherd's Run

SOUTH KINGSTOWN, RHODE ISLAND

## Figure 2 - Project Area Map



in the immediate project area on the westerly of Route 1 include the *Bradley School*, Hampton Meadows mixed use site including several small businesses, *South County Commons*, low density single-family residential homes and large wooded parcels. *South County Commons* is a large mixed-use development that has been built out over the last 20 years and contains a diverse mix of land uses including offices, retail shops, a cinema, restaurants, hotels, apartments, condominiums, and an assisted living facility.

Tower Hill Road (Route 1) will serve as the primary access route to the new business. Based upon the operating characteristics along the roadway adjacent to the site, and the low estimated volume and type of traffic associated with the new commercial business, a study impact area was defined for the project. The limits of the analysis focused on Route 1 between South County Commons to the north and Hampton Way/*Stedman Government Center Complex* to the south, with a primary focus on the intersections of Route 1 with Hampton Way/*Stedman Government Center driveway* and with the site access road.

## EXISTING CONDITIONS

### ROADWAYS

#### Tower Hill Road (Route 1)

Route 1 is a major north/south arterial extending through South County, providing access from the interstate highway system to more densely populated areas in the southern half of Rhode Island including Washington and Newport Counties. Route 1, south of Route 4, is a divided roadway separated by median guardrail, concrete barrier or a raised grassed median. Due to the divided nature and adjacent low density development, it is generally posted at 50 mph.

The limited access (right in/out) section of Route 1 through South Kingstown extends from south of Route 138 through Hampton Way/*Stedman Government Center*, where all left or U-turns are made at signalized jug-handle type intersections. South of Wakefield in the lightly populated areas and less traffic, properties are still restricted to right in/outs, but left turns are completed at regularly spaced median U-turn locations.

Route 1 within the defined project area is a four lane roadway with access limited to right turns in and out of adjacent properties as described above. Two 12 foot travel lanes, a 2 foot left shoulder, and 10 foot right shoulder are provided in each direction. These lanes are separated by a 14-foot wide grassed median with



a cable system guardrail as depicted on the adjacent photograph looking north along Route 1, with the subject site access driveway on the right. The roadway surface condition can be classified as being in fair condition with visible crack sealing north of Hampton Way. South of Hampton Way, the roadway surface condition can be classified as being in good condition, as it was resurfaced within the past 5 years. No curbing or sidewalks are available along the roadway, which was recently classified in 2018 as a Scenic

Highway in Rhode Island due to its rural character and abutting properties consisting of large tracts of undeveloped land, open fields, farmland, and horse farms.

#### Site Access Road

The site access road is a private road that generally runs in an east/west direction between Route 1 to the west and the parking areas adjacent to the existing buildings to the east. The site access road provides connection to both *The Prout School* on the northerly side and the Government Center Complex on the southerly side creating two "T" type unsignalized junctions along its length. The roadway is approximately 16 feet wide and will be upgraded due to its present poor condition of rutting and pot holes. It will be maintained at 16 feet and restricted to a one-way entrance from Route 1 for approximately 750 feet to its driveway intersection with the Government Center. At this point it will be widened to allow two-way travel between the Government Center and the on-site parking areas. The two-way travel section will allow egress from the site to the Government Center signalized intersection with Route 1 for safe and efficient access to the major route.



As seen in the adjacent photo the roadway is scenic in nature and is tree lined with stone walls along both sides. This inviting character will be enhanced and maintained as a signature entry way to the vineyard portion of the property. There was no observed posted speed limit and was assumed to be 15 MPH due to the short length of the roadway coupled with being private. With the introduction of guest and additional traffic on the property, appropriate control signage will be added where necessary.

#### Stedman Government Center Access Road

The Stedman Government Center access road is a short 750-foot long local roadway running generally in east/west direction from Tower Hill Road (Route 1) to the west providing access to parking lots and terminating at a dead end to the east. The roadway services the Rhode Island Department of Motor Vehicles Wakefield branch, the Coastal Resource Management Council, and the McGrath Judicial Complex. It links to a secondary road extending in front of the McGrath Judicial building to a driveway to the subject property access road as previously noted. The roadway is approximately 24 feet wide consisting of a 12-foot travel lane in each direction with no delineation. Cement concrete curbing with sidewalks are only provided on the northerly side along the courthouse site at the easterly end of the roadway. The pavement surface can be classified as being in fair condition with block cracking, small patching, and longitudinal cracking. Cobra-head light fixtures on utility poles are located along the northerly side for nighttime illumination. There was no observed posted speed limit along the roadway and was assumed to be 15 MPH due to the commercial nature of the area, coupled with the short length of the roadway.

## INTERSECTIONS

### Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center

The Government Center access road and Hampton Way intersect Route 1 to form a signalized, four-way junction. The Route 1 northbound and southbound approaches provide two thru lanes in each direction. The Hampton Way eastbound approach provides a left turn lane and a shared thru and right turn lane. The Stedman Government Center access road westbound approach provides a single multiuse lane. Jug-handle turnarounds are available at this intersection with a northbound right turn exit that provides a single lane into the Stedman Government Center complex and a southbound right turn exit that provides two lanes intersecting with Hampton Way at a two-way stop condition as depicted in the adjacent photo looking north. All left turns along this section of Route 1 are made as U-turns through the jug-handles.



The intersection was determined to operate in a fully actuated mode consisting of three phases. Route 1 movements are serviced under Phase 1. The Hampton Way eastbound and the Stedman Government Center westbound approaches are served separately (split) under the remaining two phases, respectively. In addition, pedestrian accommodations are provided at the intersection including curb ramps, pedestrian signal heads and push buttons with a crosswalk extending east/west across the northbound Route 1 approach. The pedestrian activity requiring accommodations at this location are specific to the RIPTA bus route along Route 1 and the Bus Stop available at this location for the demand created by the adjacent state office complex.

## TRAFFIC FLOW DATA

Existing traffic flow characteristics for this area were determined from record data obtained from the RIDOT and from previous traffic studies completed in the immediate area by our office. Record data from the RIDOT found that Route 1, which is influenced by South County Hospital, the University of Rhode Island during the school year, and recreational beach areas during the summer months, services in an average month, 35,000 vehicles per day (vpd). During the summer months, this can increase by 20% to approximately 42,000 vpd.

Project specific intersection turning movement traffic counts cannot be collected at this time in 2020 as a result of traffic patterns not being consistent with typical daily traffic conditions due to the current state of emergency in place in Rhode Island. Manual turning movement count data from a previous study completed in 2015 was available and has been compared to more current 2018 data obtained from the RIDOT for this section of Route 1, which is in accordance with current guidelines in establishing base traffic conditions. This information has been utilized as basis for this study and has been adjusted accordingly to estimate 2020 traffic conditions using a conservative annual growth rate of 1%, although Route 1 has seen little growth in the past 5 years as documented in available RIDOT data. In addition, the adjusted 2020 traffic volumes include known developments that have been approved and recently constructed in the project area.

The 2020 adjusted turning movement data found that Route 1 services approximately 3,275 vehicles during the weekday afternoon peak hour with approximately 1,600 vehicles northbound and 1,675 vehicles southbound. During the same time period, the Stedman Government Center access road serviced approximately 170 vehicles with approximately 40 vehicles eastbound and 130 vehicles westbound as can be expected at the end of the workday for the office complex.

## SAFETY ANALYSIS

To determine if there are any limiting factors affecting safety relating to access to the proposed commercial project, the physical characteristics of Route 1 and the Stedman Government Center access road, and specifically at the existing site access driveway, were 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 driveway.

The driveway on Route 1 will be restricted to a right turn entrance only, resulting in no concern for sight distance as there will be no conflicting turning traffic. Right turning traffic entering the driveway will slow then enter the shoulder area before turning into the driveway. The sight distance for northbound Route 1 in this area is well over 2,000 feet for cars following and reacting to slowing and turning vehicles into the driveway.

The primary egress to the property as noted will be via the Government Center access road to the traffic signal. This access road intersects internally with a secondary road in front of the courthouse that links to the subject property. A review of this section of road and intersection found that the vertical and horizontal alignment of the Stedman Government Center access road can be described as generally level and relatively straight. Based upon the existing roadway geometry as described, the available sight distance at the existing internal intersection on the Stedman Government Center access road, is greater than 500 feet to the west. This value is in excess of AASHTO's recommended minimum stopping sight distance of 80 feet based on the assumed speed limit of 15 mph and 155 feet based on observed travel speeds of between 20-25 mph.

As a result of the preliminary evaluation of the existing roadway geometry and physical features, it does not appear that any substantive physical roadway safety deficiencies exist within the defined study area. Also, as part of our analysis, crash data was obtained from the South Kingstown Police Department for the latest three-year period from January 2017 to December 2019 to determine if Route 1 in the immediate area experienced a high frequency or pattern of crashes requiring mitigation.

A total of 17 crashes (avg. 6 per year) occurred in the project area over the three-year study period, with two involving injuries. Summarizing the data, six crashes with none involving an injury, occurred at the signalized intersection of Route 1 with South County Commons commercial plaza access road; there were no recorded crashes at the signalized intersection of Route 1 with Hampton Way/Stedman Government Center access road; and eleven crashes with two involving an injury occurred along Route 1 between South County Commons and the Hampton Way/Stedman Government Center access road.

The majority (5) of the six crashes at the signalized intersection of Route 1 with the South County Commons commercial plaza access road were rear-end collisions, which is typical of signalized junctions due to the numerous starting and stopping movements required for the signal change intervals. The other crash at this intersection was a side-swipe collision (same direction) that involved a vehicle attempting to change

lanes. The mid-block section of Route 1 between South County Commons and the Hampton Way/Stedman Government Center access road found that ten of the crashes that occurred were single vehicle crashes and one was a rear end collision. Five of the single vehicle crashes were attributed to weather conditions (wet and snow covered roadways), one can be attributed to a distracted driver, one to driving under the influence, one fell asleep behind the wheel, one struck a deer, and one was an unknown cause.

Based upon the historical accident data obtained, and a review of existing roadway geometry and operations, roadway or traffic related safety improvements are currently not warranted to improve safety or operations within the immediate project area. A summary of the accident data depicting the number, type, and severity is provided in the Appendix.

## TRIP GENERATION

To understand the potential traffic impact of the new business, an estimate of anticipated traffic to be generated by the proposed land use has been calculated. The proposal consists of the renovation and re-use of existing buildings on the property situated to the rear of *The Prout School* along the easterly side of Route 1. As previously noted, an historic stone summer residence built in 1933 will be repurposed to provide a small boutique hotel along with other buildings built later in 1960 for the private school use to include a restaurant, spa, fitness center. A wedding event venue, which is a major component of the *Shepherd's Run* operation will be provided to accommodate typically 125-150 guests, and will be incorporated as a primary use of the site during the peak season, as the existing historic building and proposed vineyard are available amenities to attract this type of business.

It is anticipated that this wedding use of the property will generally be limited to a 20 week period between May and September, the typical wedding season. The wedding events would ideally result in one per weekend to accommodate a full buyout of the property between Friday night and Sunday. This would allow for a two night stay for a Friday wedding rehearsal with dinner, and Saturday wedding with the wedding party and quest staying overnight. This use will generate minor traffic (50-75 vehicles) during peak traffic periods along the Route 1 corridor and would be limited to the start of the event and sporadic traffic leaving the event in the evening and not staying on site. For overflow of out-of-town guest, the hotels across Route 1 would be utilized and guest bussed as needed between sites, further reducing traffic demands of this use of the property.

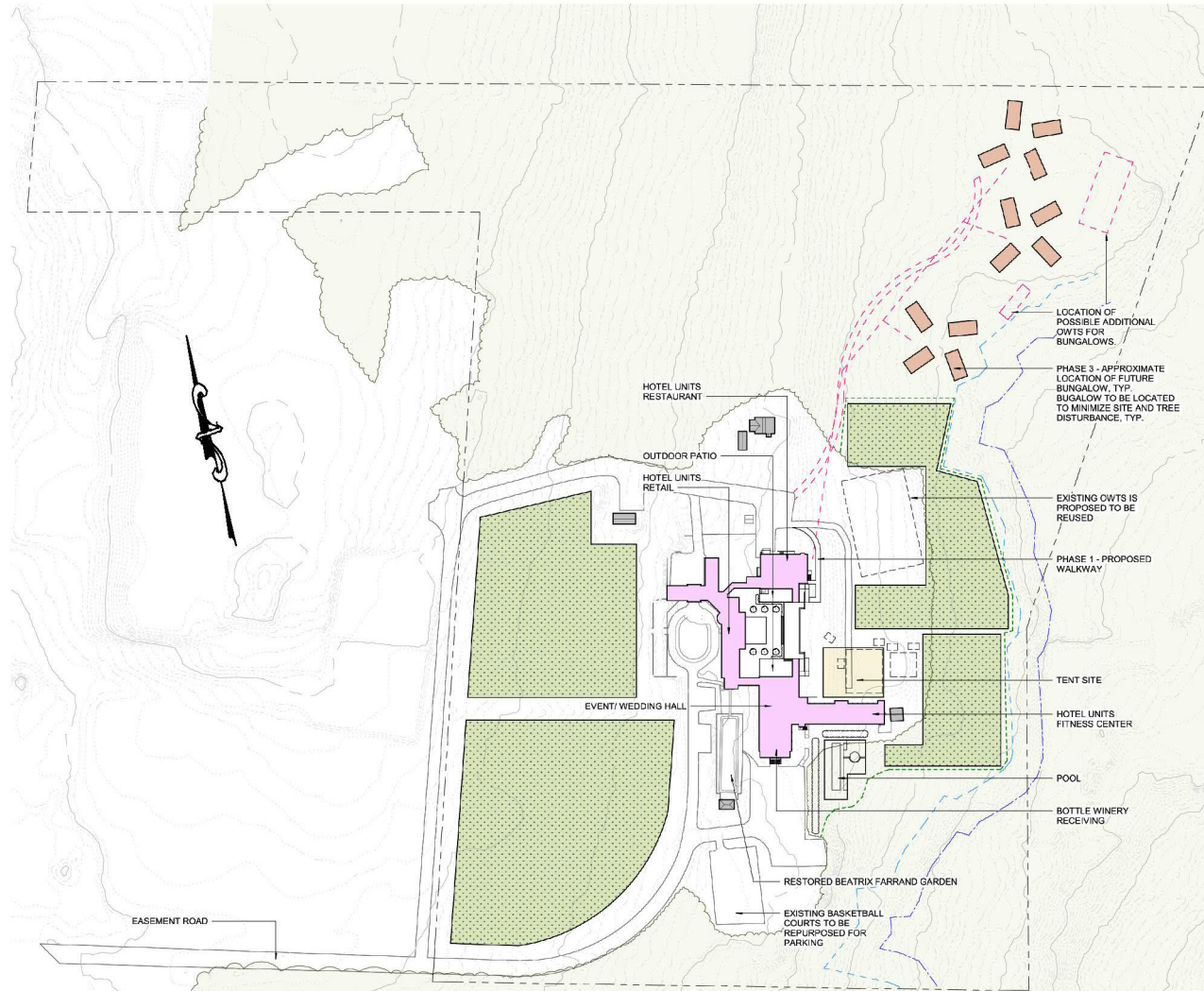
For this project we focused on the weekday use of the hotel and vineyard/winery to assess traffic impacts on the adjacent roadways as this would typically occur during the daily late afternoon peak traffic condition on Route 1 at the site driveway and adjacent signalized intersection over the full year. Access and egress to the proposed site will be provided at the existing driveway on Route 1 as noted and will be restricted to enter only, while egress will be provided via the access driveway through the McGrath Judicial Complex driveway and the Stedman Government Center access road. Figure 3 on the following page depicts the site layout and access plan submitted to the Town as part of the local review process.

The projected traffic volumes for the proposed *Shepherd's Run* development were based on operational data provided by the owner 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 vehicle trips for new development projects.

# Shepherd's Run

SOUTH KINGSTOWN, RHODE ISLAND

## Figure 3 - Site Layout



The focus of *Shepherd's Run* as discussed previously is the boutique hotel and vineyard/winery during the weekday and offseason allowing for a short getaway experience for couples and small groups to relax and enjoy the property and its amenities, while also being in close proximity to miles of Rhode Island beaches and other attractions. During the weekends the business will focus on wedding events that will also use the vineyard and winery as an amenity to the wedding experience. The hotel and vineyard/winery are anticipated initially to be open five (5) days a week from Wednesday through Sunday and closed Monday and Tuesday with the hotel and winery open to the public. The boutique hotel and vineyard/winery components of the business typically generate low activity during the morning hours. It is anticipated that the winery would be open between 12:30 PM and 6:30 PM and would be a major element of the hotel guest stay on the property.

For the proposed commercial redevelopment project, Land Use Code 310 Hotel and Land Use Code 970 Winery were reviewed for applicability in developing an estimate of site related vehicle trips. The appropriate worksheets from the manual are included in the Appendix along with the trip estimate calculations. Table 1 summarizes the estimate trip volumes calculated for this project.

TABLE 1 - Trip Generation Estimate

	Description	Enter	Exit	Total
<i>PM Peak Hour</i>				
Land Use Code 310	Hotel	16	17	33
Land Use Code 970	Winery	4	4	8
	TOTAL	20	21	41

## TRAFFIC CAPACITY 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. Based on the operational characteristics of the business and review of the traffic data, it was determined that the weekday afternoon peak hour would represent this worst-case combination of site-generated traffic with the servicing roadway peak traffic period.

The Highway Capacity Manual 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.

The Tower Hill Road (Route 1) intersection with Hampton Way/Stedman Government Center access road was analyzed for the weekday PM peak hour, which would represent the period of the greatest impact of site related traffic on the servicing roadways under existing and future build conditions. It is anticipated that the small commercial project is to be fully operational for the 2021 season where traffic volumes will

be substantially the same. Therefore, for this project, base traffic was not expanded further for the build condition other than site related traffic in order to assess existing versus proposed conditions.

TABLE 2: Highway Capacity Manual Criteria

Level of Service	Unsignalized Delay Per Vehicle (sec)	Signalized Delay Per Vehicle (sec)
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 capacity analysis worksheets are included in the Appendix and Table 3 summarizes the results of the analyses. The table depicts both the current and future build operating conditions at the study intersection of Tower Hill Road (Route 1) with Hampton Way/Stedman Government Center access road. As can be seen in the table, the signalized junction currently operates overall at an acceptable Level of Service (LOS) B with the critical movements experiencing LOS C or better during the daily PM peak period.

TABLE 3: Level of Service Summary

Location / Movement	PM PEAK HOUR							
	Existing				Future Build			
	LOS	Delay	95 <sup>th</sup> % Queue Length (veh.)	v/c	LOS	Delay	95 <sup>th</sup> % Queue Length (veh.)	v/c
<i>Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road (S)</i>								
Route 1 NB	B	17.5	20	0.76	B	18.7	20	0.77
Route 1 SB	C	20.1	22	0.82	C	21.3	23	0.83
Hampton Way EB Left	C	26.9	2	0.22	C	27.5	3	0.27
Hampton Way EB Thru/Right	B	12.0	1	0.15	B	11.8	1	0.15
Government Center WB	C	23.5	4	0.42	C	23.9	4	0.48
OVERALL	B	19.1	-	-	C	20.2	-	-

(S) – Signalized

(U) – Unsignalized

Under the future build conditions, the analysis found that the estimated increase in traffic during the afternoon peak period resulting from the proposed small scale reuse of the property will have no discernable impact on overall traffic operations at the intersection reviewed for this project and the adjacent servicing roadways. The signalized intersection of Tower Hill Road (Route 1) with Hampton

Way/Stedman Government Center access road will continue to operate at an acceptable LOS C with critical movements experiencing LOS C or better during the daily peak period of traffic

Specifically relating to vehicles entering the subject site on Route 1, the right turn entering movement at the unsignalized intersection of the site driveway with Route 1 will operate efficiently with minimal delays during the afternoon peak conditions due to the low volumes for this movement, coupled with the restricted right turn enter-only movement, which does not result in a delay analysis. In addition, the existing unsignalized intersection of the Stedman Government Center access road intersection with the site access driveway (McGrath Judicial Complex driveway) for site exiting traffic will operate efficiently with minimal delays during the afternoon peak conditions due to the low volumes experienced at this intersection. It should also be noted that during the busiest periods of the subject site including the late afternoon peak and weekend events, the Government Center is closed, generating little to no traffic during these periods.

## CONCLUSIONS AND RECOMMENDATIONS

In summary, the study has shown that the proposed site access and circulation plan has been designed to maintain a desirable level of safety and efficiency on the servicing roadway system. The safety of the intersection of the Stedman Government Center access road intersection with the site access driveway (McGrath Judicial Complex driveway) was reviewed for geometry and sight distances. The study intersection was 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 and/or driveway.

The results of the operational analysis determined that the estimated minor increase in traffic during the daily peak period resulting from the proposed hotel and vineyard/winery business, *Shepherd's Run*, will have a negligible effect on overall traffic operations along the servicing roadways, particularly during the daily afternoon peak hour when the site was estimated to generate its highest daily traffic volumes.

Therefore, based upon the data collected on the servicing roadways and the analysis completed as part of this study, it can be concluded that the future traffic conditions resulting from the proposed redevelopment project 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.

We trust this letter sufficiently addresses the requirements of the Town of South Kingstown to obtain your local approvals. If you should have any questions or require any additional information, please do not hesitate to contact our office.

Very truly yours,  
BETA Group, Inc.



Richard A. Bernardo, PE  
Senior Vice President



# APPENDIX

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

# APPENDIX A – Traffic Volume Data

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## **Automatic Traffic Recorder Count**

Tower Hill Road (Route 1)

## **Intersection Turning Movement Count**

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

A

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**Automatic Traffic Recorder Count**

Tower Hill Road (Route 1)

Tower Hill Road (Route 1)

(Source; Rhode Island Department of Transportation, February and August 2018)

## Rhode Island Dept. of Transportation

### 320056 Weekly Volume Report - Sun 02/04/2018 - Fri 02/09/2018

<b>Location ID:</b>	320056
<b>Located On:</b>	US-1 Tower Hill Road
<b>Direction</b>	2-WAY
<b>Community:</b>	South Kingstown
<b>AADT:</b>	

<b>Type:</b>	SPOT
<b>:</b>	
<b>Period:</b>	Sun 02/04/2018 - Fri 02/09/2018

Start Time	Sun	Mon	Tue	Wed	Thu	Fri	Avg
12:00 AM	293	188	131	148	137	193	182
1:00 AM	227	68	61	72	62	113	101
2:00 AM	104	47	27	32	38	49	50
3:00 AM	68	50	59	49	53	74	59
4:00 AM	68	116	130	122	138	133	118
5:00 AM	89	400	424	374	445	408	357
6:00 AM	272	1296	1391	1267	1277	1251	1126
7:00 AM	428	2412	2501	2467	2589	2096	2082
8:00 AM	722	2509	2666	2551	2574	2402	2237
9:00 AM	988	1962	2015	1900	2106	2037	1835
10:00 AM	1304	1731	1912	1667	1812	1968	1732
11:00 AM	1543	1778	1882	1624	1839	2025	1782
12:00 PM	1686	1874	1855	1570	1884	2068	1823
1:00 PM	1657	1940	1769	1639	1985	2083	1846
2:00 PM	1554	2310	2290	2062	2432	2511	2193
3:00 PM	1591	2458	2647	2288	2738	2847	2428
4:00 PM	1531	2623	2699	2450	2759	2924	2498
5:00 PM	1413	2460	2571	2267	2735	2733	2363
6:00 PM	703	1634	1740	1635	1980	2035	1621
7:00 PM	360	1101	1162	1062	1253	1343	1047
8:00 PM	403	839	800	859	1155	1017	846
9:00 PM	266	579	679	681	814	1059	680
10:00 PM	913	360	404	423	463	724	548
11:00 PM	639	222	300	252	347	542	384
<b>24HrTotal</b>	<b>18822</b>	<b>30957</b>	<b>32115</b>	<b>29461</b>	<b>33615</b>	<b>34635</b>	<b>29934</b>
<b>AM Pk Hr</b>	11:00	8:00	8:00	8:00	7:00	8:00	
<b>AM Peak</b>	1543	2509	2666	2551	2589	2402	2377
<b>PM Pk Hr</b>	12:00	4:00	4:00	4:00	4:00	4:00	
<b>PM Peak</b>	1686	2623	2699	2450	2759	2924	2524
<b>% Peak Hr</b>	8.96%	8.47%	8.40%	8.66%	8.21%	8.44%	8.43%

## Rhode Island Dept. of Transportation

### 320056 Weekly Volume Report - Mon 08/20/2018 - Sun 08/26/2018

<b>Location ID:</b>	320056
<b>Located On:</b>	US-1 Tower Hill Road
<b>Direction:</b>	2-WAY
<b>Community:</b>	South Kingstown
<b>AADT:</b>	35849

<b>Type:</b>	SPOT
<b>Period:</b>	Mon 08/20/2018 - Sun 08/26/2018

Start Time	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Avg
12:00 AM	203	226	264	221	294	458	467	305
1:00 AM	104	127	146	122	156	315	248	174
2:00 AM	73	75	57	86	71	138	171	96
3:00 AM	89	83	65	84	75	113	97	87
4:00 AM	197	170	137	169	200	172	137	169
5:00 AM	484	497	487	514	520	330	295	447
6:00 AM	1395	1445	1423	1468	1397	796	581	1215
7:00 AM	2443	2525	2281	2509	2314	1533	1093	2100
8:00 AM	2928	2913	2632	3032	2609	2384	1881	2626
9:00 AM	2630	2709	2462	3075	2890	2987	2621	2768
10:00 AM	2683	2731	2566	3040	3161	3122	2741	2863
11:00 AM	2702	2845	2659	3043	3177	3113	2870	2916
12:00 PM	2652	2749	2613	2955	2941	2752	3036	2814
1:00 PM	2520	2701	2584	3030	3263	3177	3163	2920
2:00 PM	2918	2805	2674	3196	3433	3247	3154	3061
3:00 PM	3103	2965	2987	3196	3476	3278	3092	3157
4:00 PM	3327	3331	3021	3501	3585	3414	3046	3318
5:00 PM	3000	3089	2814	3422	3460	2880	2792	3065
6:00 PM	2357	2557	2509	2940	3141	2926	2661	2727
7:00 PM	1767	1808	1663	2176	2428	2340	2394	2082
8:00 PM	1443	1473	1534	1993	2141	2114	1891	1798
9:00 PM	1072	1153	1200	1487	1630	1681	1217	1349
10:00 PM	625	752	796	1011	1132	1346	705	910
11:00 PM	377	444	402	498	757	786	405	524
<b>Total</b>	<b>41092</b>	<b>42173</b>	<b>39976</b>	<b>46768</b>	<b>48251</b>	<b>45402</b>	<b>40758</b>	
<b>24HrTotal</b>	41092	42173	39976	46768	48251	45402		43489
<b>AM Pk Hr</b>	8:00	8:00	11:00	9:00	11:00	10:00	11:00	
<b>AM Peak</b>	2928	2913	2659	3075	3177	3122	2870	2963
<b>PM Pk Hr</b>	4:00	4:00	4:00	4:00	4:00	4:00	1:00	
<b>PM Peak</b>	3327	3331	3021	3501	3585	3414	3163	3335
<b>% Peak Hr</b>	8.10%	7.90%	7.56%	7.49%	7.43%	7.52%	7.76%	7.71%
<b>% Peak Hr</b>	8.10%	7.90%	7.56%	7.49%	7.43%	7.52%		7.68%

A

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**Intersection Turning Movement Count**

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road



Project Name: Castle Farm  
 Town/City: South Kingstown, RI  
 Location: Rte 1 @ Hampton W./Govt. Cent  
 Weather: Sunny/60's

File Name : 506703 Route 1 at Hampton Way-Govt. Center  
 Site Code : 506703  
 Start Date : 5/20/2015  
 Page No : 1

Groups Printed- Vehicles

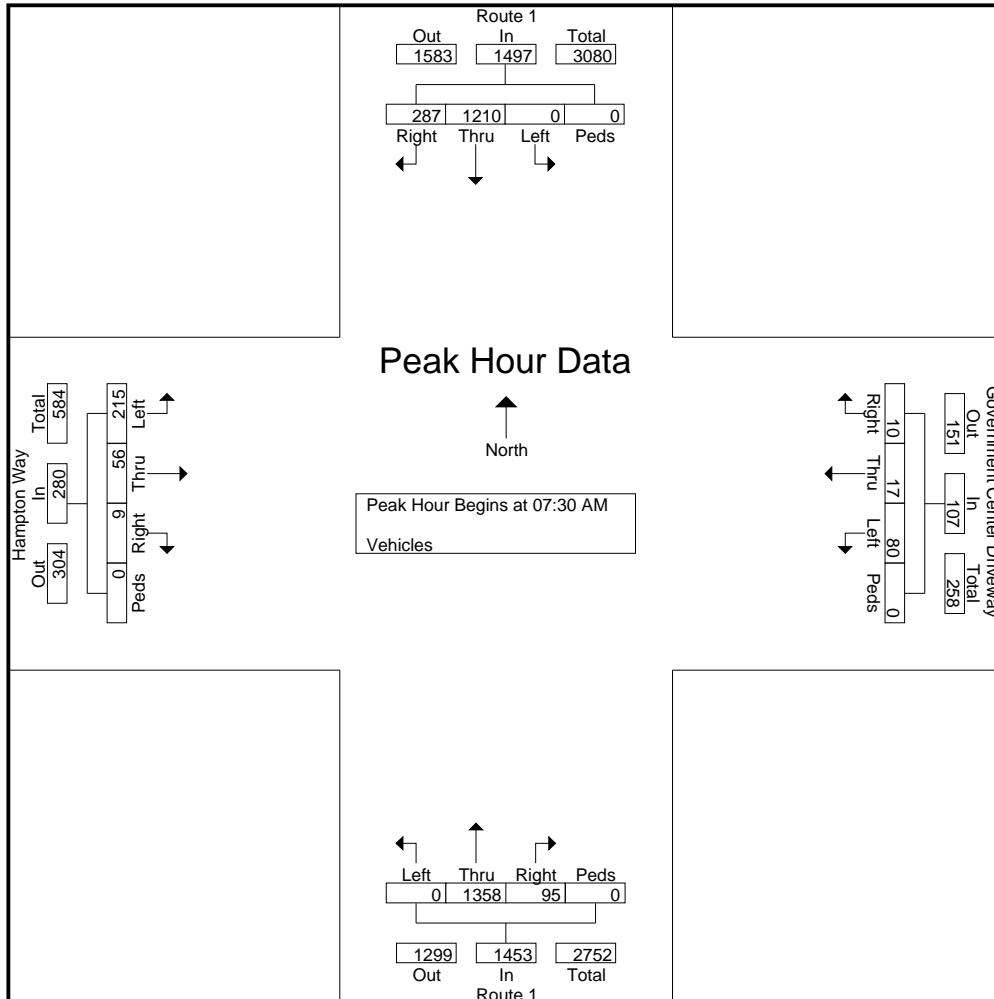
Start Time	Route 1 Southbound					Government Center Driveway Westbound					Route 1 Northbound					Hampton Way Eastbound					Int. Total
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	
07:00 AM	0	241	11	0	252	3	0	0	0	3	0	291	2	0	293	4	2	1	0	7	555
07:15 AM	0	247	32	0	279	5	1	0	0	6	0	302	7	0	309	32	3	2	0	37	631
07:30 AM	0	276	68	0	344	18	3	1	0	22	0	338	19	0	357	56	2	1	0	59	782
07:45 AM	0	276	93	0	369	22	5	3	0	30	0	323	19	0	342	79	12	0	0	91	832
Total	0	1040	204	0	1244	48	9	4	0	61	0	1254	47	0	1301	171	19	4	0	194	2800
08:00 AM	0	330	80	0	410	26	6	3	0	35	0	338	15	0	353	67	18	7	0	92	890
08:15 AM	0	328	46	0	374	14	3	3	0	20	0	359	42	0	401	13	24	1	0	38	833
08:30 AM	0	318	36	0	354	11	1	1	0	13	0	296	37	0	333	7	31	3	0	41	741
08:45 AM	0	328	48	0	376	10	3	4	0	17	0	259	32	0	291	10	44	0	0	54	738
Total	0	1304	210	0	1514	61	13	11	0	85	0	1252	126	0	1378	97	117	11	0	225	3202
*** BREAK ***																					
04:00 PM	0	323	13	0	336	18	0	22	0	40	0	362	9	0	371	10	3	1	0	14	761
04:15 PM	0	332	16	0	348	25	0	8	0	33	0	368	5	0	373	11	4	1	0	16	770
04:30 PM	0	377	10	0	387	18	0	25	0	43	0	355	0	0	355	13	1	5	0	19	804
04:45 PM	0	359	8	0	367	11	0	8	0	19	0	365	4	0	369	6	0	4	0	10	765
Total	0	1391	47	0	1438	72	0	63	0	135	0	1450	18	0	1468	40	8	11	0	59	3100
05:00 PM	0	396	11	0	407	7	0	4	0	11	0	325	5	0	330	9	2	3	0	14	762
05:15 PM	0	397	5	0	402	14	0	2	0	16	0	361	6	0	367	4	0	1	0	5	790
05:30 PM	0	365	10	0	375	11	0	2	0	13	0	327	5	0	332	6	0	1	0	7	727
05:45 PM	0	338	7	0	345	12	0	2	0	14	0	291	6	0	297	3	4	0	0	7	663
Total	0	1496	33	0	1529	44	0	10	0	54	0	1304	22	0	1326	22	6	5	0	33	2942
Grand Total	0	5231	494	0	5725	225	22	88	0	335	0	5260	213	0	5473	330	150	31	0	511	12044
Apprch %	0	91.4	8.6	0		67.2	6.6	26.3	0		0	96.1	3.9	0		64.6	29.4	6.1	0		
Total %	0	43.4	4.1	0	47.5	1.9	0.2	0.7	0	2.8	0	43.7	1.8	0	45.4	2.7	1.2	0.3	0	4.2	



Project Name: Castle Farm  
 Town/City: South Kingstown, RI  
 Location: Rte 1 @ Hampton W./Govt. Cent  
 Weather: Sunny/60's

File Name : 506703 Route 1 at Hampton Way-Govt. Center  
 Site Code : 506703  
 Start Date : 5/20/2015  
 Page No : 2

Start Time	Route 1 Southbound					Government Center Driveway Westbound					Route 1 Northbound					Hampton Way 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 07:00 AM to 11:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	0	276	68	0	344	18	3	1	0	22	0	338	19	0	357	56	2	1	0	59	782
07:45 AM	0	276	93	0	369	22	5	3	0	30	0	323	19	0	342	79	12	0	0	91	832
08:00 AM	0	330	80	0	410	26	6	3	0	35	0	338	15	0	353	67	18	7	0	92	890
08:15 AM	0	328	46	0	374	14	3	3	0	20	0	359	42	0	401	13	24	1	0	38	833
Total Volume	0	1210	287	0	1497	80	17	10	0	107	0	1358	95	0	1453	215	56	9	0	280	3337
% App. Total	0	80.8	19.2	0		74.8	15.9	9.3	0		0	93.5	6.5	0		76.8	20	3.2	0		
PHF	.000	.917	.772	.000	.913	.769	.708	.833	.000	.764	.000	.946	.565	.000	.906	.680	.583	.321	.000	.761	.937

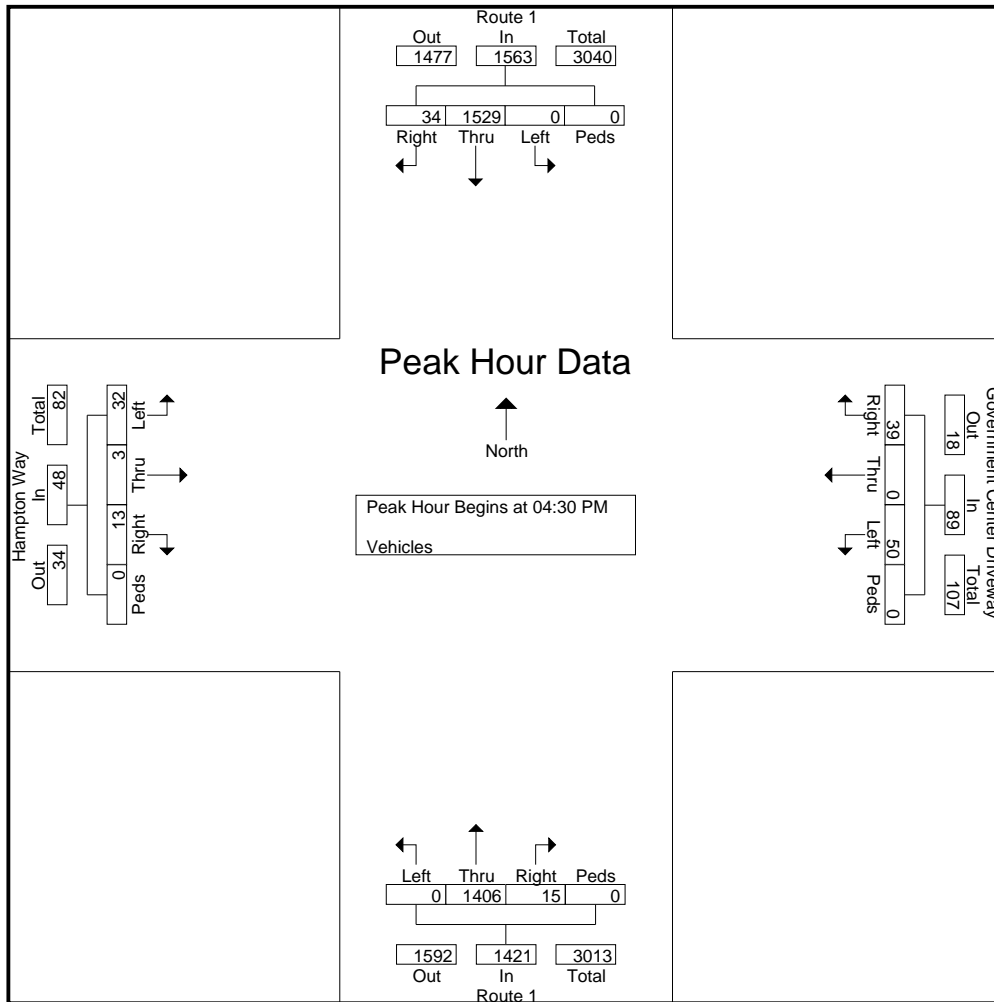




Project Name: Castle Farm  
 Town/City: South Kingstown, RI  
 Location: Rte 1 @ Hampton W./Govt. Cent  
 Weather: Sunny/60's

File Name : 506703 Route 1 at Hampton Way-Govt. Center  
 Site Code : 506703  
 Start Date : 5/20/2015  
 Page No : 3

Start Time	Route 1 Southbound					Government Center Driveway Westbound					Route 1 Northbound					Hampton Way 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 12:00 PM to 05:45 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 04:30 PM																					
04:30 PM	0	377	10	0	387	18	0	25	0	43	0	355	0	0	355	13	1	5	0	19	804
04:45 PM	0	359	8	0	367	11	0	8	0	19	0	365	4	0	369	6	0	4	0	10	765
05:00 PM	0	396	11	0	407	7	0	4	0	11	0	325	5	0	330	9	2	3	0	14	762
05:15 PM	0	397	5	0	402	14	0	2	0	16	0	361	6	0	367	4	0	1	0	5	790
Total Volume	0	1529	34	0	1563	50	0	39	0	89	0	1406	15	0	1421	32	3	13	0	48	3121
% App. Total	0	97.8	2.2	0		56.2	0	43.8	0		0	98.9	1.1	0		66.7	6.2	27.1	0		
PHF	.000	.963	.773	.000	.960	.694	.000	.390	.000	.517	.000	.963	.625	.000	.963	.615	.375	.650	.000	.632	.970



## APPENDIX B – Traffic Crash Data

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### January 2017 through December 2019

Tower Hill Road (Route 1) – South County Commons to  
Hampton Way/Stedman Government Center Access Road

**Crash Data Summary**

	Year			Total	Average per Year
	2017	2018	2019		
<b>Intersections</b>					
Tower Hill Road (Route 1) at Hampton Way/Government Center Access Road	0	0	0	0	0
Tower Hill Road (Route 1) at South County Commons	3	2	1	6	2
<b>Corridor</b>					
Tower Hill Road (Route 1) from South County Commons to Hampton Way	4	5	2	11	4
<b>Total</b>	<b>7</b>	<b>7</b>	<b>3</b>	<b>17</b>	<b>6</b>

**Tower Hill Road (Route 1) at South County Commons**

	2017	2018	2019	Total	Percent
<b>Collision Type</b>					
Rear End	2	2	1	5	83%
Angle	0	0	0	0	0%
Head-On	0	0	0	0	0%
Pedestrian	0	0	0	0	0%
Sideswipe, Same Direction	1	0	0	1	17%
Sideswipe, Opposite Direction	0	0	0	0	0%
Collision with Object	0	0	0	0	0%
Collision with Deer	0	0	0	0	0%
Other	0	0	0	0	0%
Unknown	0	0	0	0	0%
<b>Crash Severity</b>					
Property	3	2	1	6	100%
Injury	0	0	0	0	0%
<b>Light Condition</b>					
Daylight	2	2	1	5	83%
Dawn	0	0	0	0	0%
Dusk	0	0	0	0	0%
Dark - Lighted	1	0	0	1	17%
Dark - Not Lighted	0	0	0	0	0%
Dark - Unknown Lighting	0	0	0	0	0%
<b>Road Condition</b>					
Dry	3	1	1	5	83%
Wet	0	1	0	1	17%
Snow	0	0	0	0	0%
Slush	0	0	0	0	0%
Ice/Frost	0	0	0	0	0%
Other	0	0	0	0	0%
Unknown	0	0	0	0	0%
<b>Hour of Day</b>					
6:00 AM - 9:00 AM	0	0	0	0	0%
9:00 AM - 3:00 PM	2	1	0	3	50%
3:00 PM - 6:00 PM	0	1	0	1	17%
6:00 PM - 6:00 AM	1	0	1	2	33%
<b>Total Crashes:</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>6</b>	

**Tower Hill Road (Route 1) from South County Commons to Hampton Way**

	2017	2018	2019	Total	Percent
<b>Collision Type</b>					
Rear End	0	1	0	1	9%
Angle	0	0	0	0	0%
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	4	4	2	10	91%
Collision with Deer	0	0	0	0	0%
Other	0	0	0	0	0%
Unknown	0	0	0	0	0%
<b>Crash Severity</b>					
Property	4	3	2	9	82%
Injury	0	2	0	2	18%
<b>Light Condition</b>					
Daylight	2	2	0	4	36%
Dawn	0	0	0	0	0%
Dusk	0	0	0	0	0%
Dark - Lighted	1	2	2	5	45%
Dark - Not Lighted	0	0	0	0	0%
Dark - Unknown Lighting	1	1	0	2	18%
<b>Road Condition</b>					
Dry	0	4	1	5	45%
Wet	1	1	1	3	27%
Snow	1	0	0	1	9%
Slush	1	0	0	1	9%
Ice/Frost	1	0	0	1	9%
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	9%
9:00 AM - 3:00 PM	2	1	0	3	27%
3:00 PM - 6:00 PM	1	0	0	1	9%
6:00 PM - 6:00 AM	1	3	2	6	55%
<b>Total Crashes:</b>	<b>4</b>	<b>5</b>	<b>2</b>	<b>11</b>	

# APPENDIX C – Trip Generation

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## **ITE Trip Generation Summary**

## **Site Trip Distribution**

## **ITE Land Use Code**

ITE Land Use Code 310 – Hotel

ITE Land Use Code 970 – Winery

C

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**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 310	Hotel	16	17	33
ITE Land Use Code 970	Winery	4	4	8
	<b>TOTAL</b>	<b>20</b>	<b>21</b>	<b>41</b>

### Calculations;

#### ITE Land Use Code 310      Hotel      (45 Occupied Rooms)

Independent Variable (X) = Number of Occupied Rooms      X = 45

<u>PM Peak</u>	<i>Directional Distribution:</i>	<i>49% Entering</i>	<i>51% Exiting</i>
T =	0.73 x (X)	Enter:	16
T =	0.73 x 45	Exit:	17
T =	33	Total:	33

#### ITE Land Use Code 970      Winery      (1000 SF)

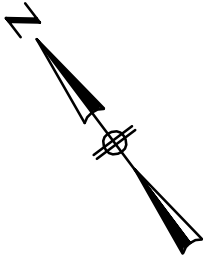
Independent Variable (X) = Thousand Gross Floor Area (GFA)      X = 1

<u>PM Peak</u>	<i>Directional Distribution:</i>	<i>50% Entering</i>	<i>50% Exiting</i>
T =	7.31 x (X)	Enter:	4
T =	7.31 x 1	Exit:	4
T =	8	Total:	8

C

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**Site Trip Distribution**



Route 1

**SITE**

Site Trips:

Enter:	20
Exit:	<u>21</u>
Total:	41

ONE-WAY →

Site Access Road

21 ↙

↑ 15  
↗ 20

20 →

Site Access Driveway

**McGrath  
Judicial  
Complex**

15 ↙

↙ 15  
↘ 6

21 ↙

Hampton Way

Oliver Stedman Government  
Center Access Road

15 →

↑ 5

Tower Hill Road



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WEEKDAY TRAFFIC DISTRIBUTION  
PM PEAK HOUR BUILD

SHEPHERD'S RUN  
SOUTH KINGSTOWN, RHODE ISLAND

**C**

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**ITE Land Use Code**

ITE Land Use Code 310 – Hotel  
ITE Land Use Code 970 – Winery

ITE Land Use Code 310 – Hotel

# Land Use: 310 Hotel

## Description

A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. All suites hotel (Land Use 311), business hotel (Land Use 312), motel (Land Use 320), and resort hotel (Land Use 330) are related uses.

## Additional Data

Studies of hotel employment density indicate that, on the average, a hotel will employ 0.9 employees per room.<sup>1</sup>

Twenty-five studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 82 percent.

Some properties contained in this land use provide guest transportation services such as airport shuttles, limousine service, or golf course shuttle service, which may have an impact on the overall trip generation rates.

Time-of-day distribution data for this land use are presented in Appendix A. For the one center city core site with data, the overall highest vehicle volumes during the AM and PM on a weekday were counted between 8:30 and 9:30 a.m. and 3:15 and 4:15 p.m., respectively. On Saturday and Sunday, the peak hours were between 5:00 and 6:00 p.m. and 10:15 and 11:15 a.m., respectively.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in California, District of Columbia, Florida, Georgia, Indiana, Minnesota, New York, Pennsylvania, South Dakota, Texas, Vermont, Virginia, and Washington.

***For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.***

**Trip generation at a hotel may be related to the presence of supporting facilities such as convention facilities, restaurants, meeting/banquet space, and retail facilities. Future data submissions should specify the presence of these amenities. Reporting the level of activity at the supporting facilities such as full, empty, partially active, number of people attending a meeting/banquet during observation may also be useful in further analysis of this land use.**

## Source Numbers

170, 260, 262, 277, 280, 301, 306, 357, 422, 507, 577, 728, 867, 872, 925, 951

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<sup>1</sup> Buttk, Carl H. Unpublished studies of building employment densities, Portland, Oregon.

# Hotel (310)

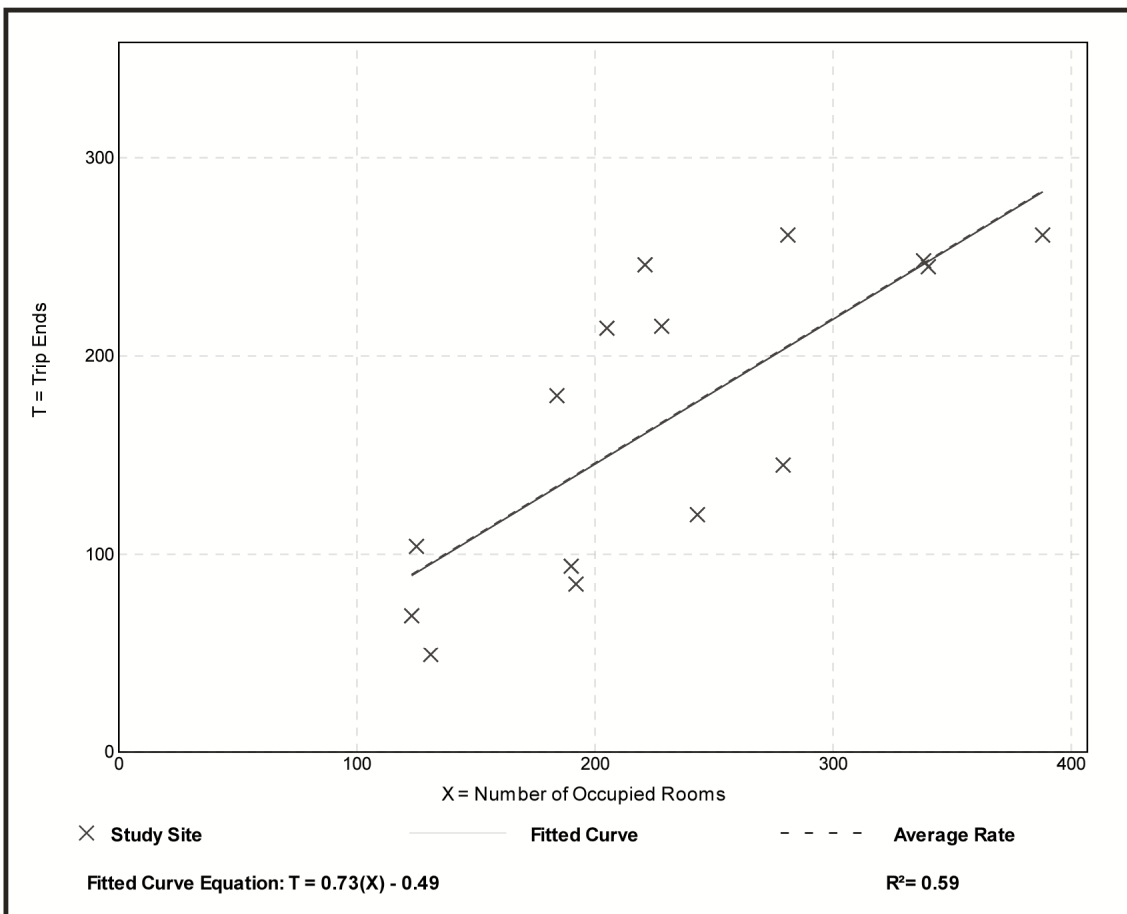
**Vehicle Trip Ends vs: Occupied Rooms**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**

**Setting/Location: General Urban/Suburban**  
 Number of Studies: 15  
 Avg. Num. of Occupied Rooms: 231  
 Directional Distribution: 49% entering, 51% exiting

## Vehicle Trip Generation per Occupied Room

Average Rate	Range of Rates	Standard Deviation
0.73	0.37 - 1.11	0.22

## Data Plot and Equation



ITE Land Use Code 970 – Winery

## Land Use: 970 Winery

### Description

A winery is a property used primarily for the production of wine. Wineries typically include tasting room facilities and may offer special events such as weddings or parties. Wineries often offer complimentary tours and wine tasting. Visitors also may purchase wine or wine-related products.

### Additional Data

For the purposes of this land use, the independent variable “1,000 sq. foot gross floor area” refers to the square footage of the building that houses the tasting room.

Time-of-day distribution data for this land use for a weekday, Friday, Saturday, and Sunday are presented in Appendix A. For the sites with weekday, Saturday, and Sunday data, the overall highest vehicle volumes during the PM were counted between 1:45 and 2:45 p.m. For the sites with Friday data, the PM peak hour was between 4:00 and 5:00 p.m. For all four days, the AM peak hour was between 11:45 a.m. and 12:45 p.m.

The sites were surveyed in the 2010s in California, Illinois, and Virginia.

### Source Numbers

807, 851, 894



# APPENDIX D – Operational Analysis

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## Existing Conditions

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

## Future Build Conditions

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

D

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**Existing Weekday PM Peak Hour**

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

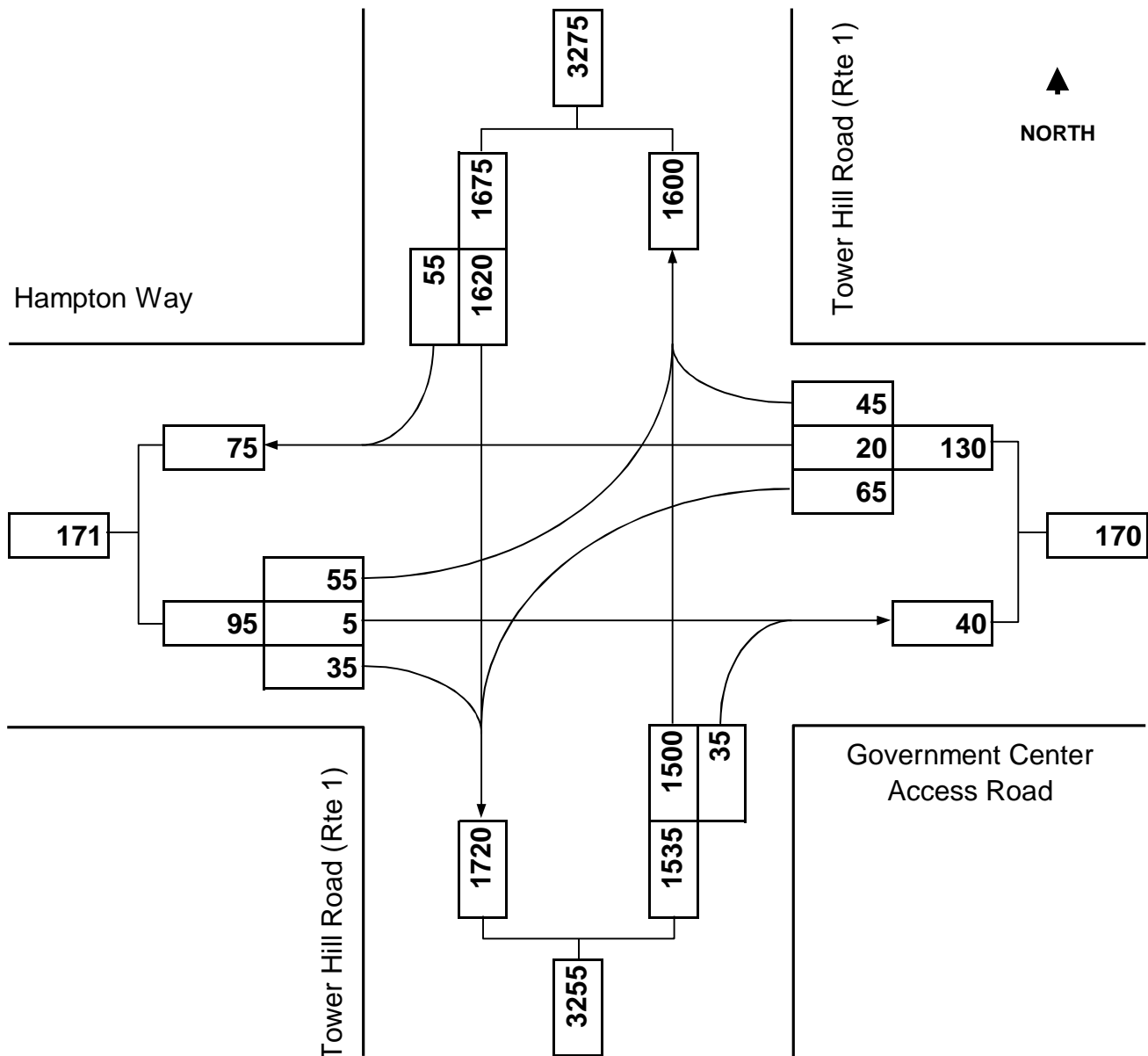
Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

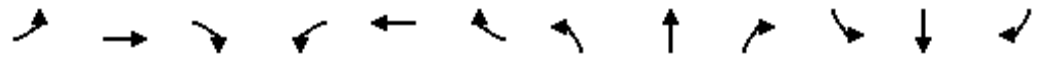


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### Turning Movement Diagram

<b>Major Street:</b>	Tower Hill Road (Rte 1)	<b>Minor Street:</b>	Hampton Way/Access Road
<b>City/Town:</b>	South Kingstown, RI	<b>Day of Week:</b>	Weekday
<b>Reference No.:</b>	7357	<b>Peak Period:</b>	4:30 PM - 5:30 PM
<b>Existing:</b>	PM Peak Hour	<b>Future:</b>	n/a



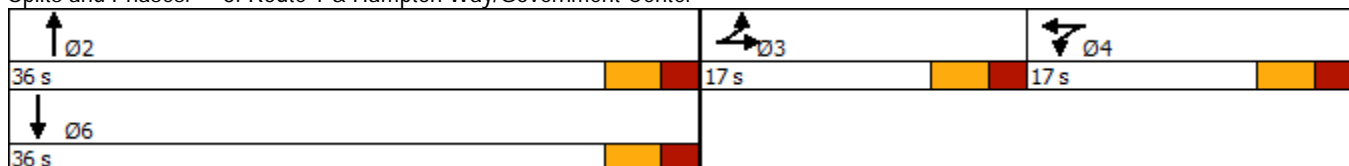


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↗			↔			↑↑			↑↑	
Traffic Volume (vph)	55	5	35	65	20	45	0	1500	0	0	1620	0
Future Volume (vph)	55	5	35	65	20	45	0	1500	0	0	1620	0
Satd. Flow (prot)	1805	1647	0	0	1769	0	0	3539	0	0	3539	0
Flt Permitted	0.950				0.976							
Satd. Flow (perm)	1805	1647	0	0	1769	0	0	3539	0	0	3539	0
Satd. Flow (RTOR)		38			33							
Lane Group Flow (vph)	59	43	0	0	140	0	0	1613	0	0	1742	0
Turn Type	Split	NA		Split	NA			NA			NA	
Protected Phases	3	3		4	4			2			6	
Permitted Phases												
Total Split (s)	17.0	17.0		17.0	17.0			36.0			36.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Act Effct Green (s)	8.7	8.7			10.0			35.1			35.1	
Actuated g/C Ratio	0.15	0.15			0.17			0.60			0.60	
v/c Ratio	0.22	0.15			0.42			0.76			0.82	
Control Delay	26.9	12.0			23.5			17.5			20.1	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	26.9	12.0			23.5			17.5			20.1	
LOS	C	B			C			B			C	
Approach Delay		20.6			23.5			17.5			20.1	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	20	2			37			265			307	
Queue Length 95th (ft)	52	26			86			#493			#555	
Internal Link Dist (ft)		388			723			755			685	
Turn Bay Length (ft)												
Base Capacity (vph)	424	416			441			2127			2127	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.14	0.10			0.32			0.76			0.82	

**Intersection Summary**

Cycle Length: 70  
 Actuated Cycle Length: 58.4  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.82  
 Intersection Signal Delay: 19.1  
 Intersection LOS: B  
 Intersection Capacity Utilization 65.5%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Route 1 & Hampton Way/Government Center



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**Future Build Weekday PM Peak Hour**

Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

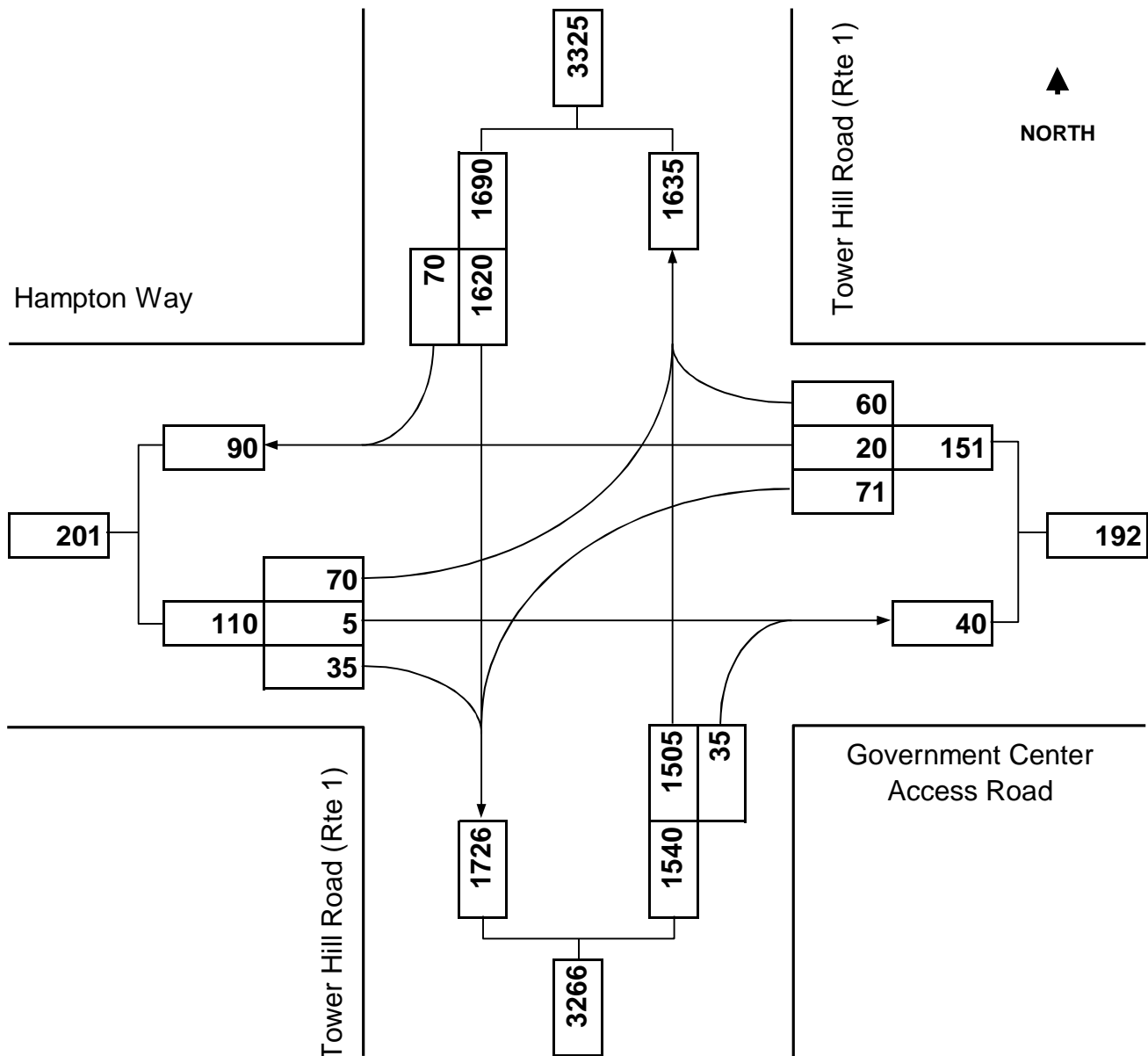
Tower Hill Road (Route 1) at Hampton Way/Stedman Government Center Access Road

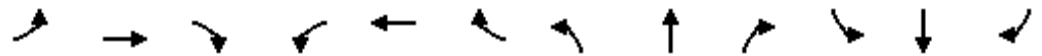


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### Turning Movement Diagram

<b>Major Street:</b>	Tower Hill Road (Rte 1)	<b>Minor Street:</b>	Hampton Way/Access Road
<b>City/Town:</b>	South Kingstown, RI	<b>Day of Week:</b>	Weekday
<b>Reference No.:</b>	7357	<b>Peak Period:</b>	PM Peak Hour
<b>Existing:</b>	n/a	<b>Future:</b>	Build





Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	5	35	71	20	60	0	1505	0	0	1620	0
Future Volume (vph)	70	5	35	71	20	60	0	1505	0	0	1620	0
Satd. Flow (prot)	1805	1647	0	0	1756	0	0	3539	0	0	3539	0
Flt Permitted	0.950				0.977							
Satd. Flow (perm)	1805	1647	0	0	1756	0	0	3539	0	0	3539	0
Satd. Flow (RTOR)		38			42							
Lane Group Flow (vph)	75	43	0	0	163	0	0	1618	0	0	1742	0
Turn Type	Split	NA		Split	NA			NA			NA	
Protected Phases	3	3		4	4			2			6	
Permitted Phases												
Total Split (s)	17.0	17.0		17.0	17.0			36.0			36.0	
Total Lost Time (s)	4.0	4.0			4.0			4.0			4.0	
Act Effct Green (s)	9.2	9.2			10.4			35.2			35.2	
Actuated g/C Ratio	0.16	0.16			0.18			0.59			0.59	
v/c Ratio	0.27	0.15			0.48			0.77			0.83	
Control Delay	27.5	11.8			23.9			18.7			21.3	
Queue Delay	0.0	0.0			0.0			0.0			0.0	
Total Delay	27.5	11.8			23.9			18.7			21.3	
LOS	C	B			C			B			C	
Approach Delay		21.8			23.9			18.7			21.3	
Approach LOS		C			C			B			C	
Queue Length 50th (ft)	26	2			43			280			322	
Queue Length 95th (ft)	62	26			99			#507			#568	
Internal Link Dist (ft)		388			723			755			685	
Turn Bay Length (ft)												
Base Capacity (vph)	419	411			440			2101			2101	
Starvation Cap Reductn	0	0			0			0			0	
Spillback Cap Reductn	0	0			0			0			0	
Storage Cap Reductn	0	0			0			0			0	
Reduced v/c Ratio	0.18	0.10			0.37			0.77			0.83	

**Intersection Summary**

Cycle Length: 70  
 Actuated Cycle Length: 59.3  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.83  
 Intersection Signal Delay: 20.2  
 Intersection LOS: C  
 Intersection Capacity Utilization 66.8%  
 ICU Level of Service C  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Route 1 & Hampton Way/Government Center

