EMO

TO: Stephen O'Connell, PE

FROM: Phillip Cherry, PE, PTOE

SUBJECT: **Seekonk Street Proposed Development Traffic Study**

DATE: **July 30, 2019**

INTRODUCTION

WSP assessed the traffic impacts associated with the development of the 96-unit residential development project proposed at 144 Seekonk Street in Norfolk, Massachusetts. The development will be accessed via a new driveway that will intersect Seekonk Street and form an unsignalized intersection.

The following traffic analysis concentrates on the weekday AM (7:00 to 9:00 AM) and weekday PM (4:00 to 6:00 PM) peak periods, the critical time periods for a residential development. WSP analyzed the existing and build transportation conditions, calculated the number of trips associated with the proposed development, distributed generated vehicles trips to Seekonk Street, determined the traffic impact of the proposed development, and visited the site to determine stopping and intersection sight distances.

EXISTING CONDITIONS

ROADWAY GEOMETRY

Seekonk Street primarily runs north and south near the project and curves horizontally at approximately 185 feet south of the proposed driveway. Seekonk Street intersects Cleveland Street in the north from the proposed driveway and Fruit Street in the south from the proposed driveway at unsignalized intersections less than half a mile away. The posted speed limit on Seekonk Street is 35 miles per hour (mph) in both directions.

The proposed driveway is approximately 1,115 feet long and 47 feet wide, including the median. Each travel lane is 18 feet wide lane with an 11-foot center median. A mini roundabout is proposed at the end of the driveway; the diameter of the proposed mini roundabout is approximately 30 feet with an approximately 6 foot truck apron

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TRAFFIC VOLUME DATA

The traffic counts were collected as part of the originally performed traffic impact study in January 2017. The volumes were grown at 1% annually to determine the 2019 existing conditions volumes.

An automatic traffic recorder (ATR) collected traffic volumes and speed data on Seekonk Street on Wednesday, November 30, 2016 and Thursday, December 1, 2016. Approximately, 3,100 vehicles (1,700 northbound and 1,400 southbound) passed the locations of the proposed site driveways. The weekday AM peak hour occurred from 7:00 to 8:00 AM when approximately 420 vehicles (340 northbound and 80 southbound) passed the proposed site driveways. The weekday PM peak hour occurred from 4:30 to 5:30 PM when approximately 300 vehicles (210 southbound and 90 northbound) passed the proposed site driveways. During the morning, the majority of traffic (80 percent) on Seekonk Street proceeded northbound. During the evening, following commuting traffic patterns, the traffic reversed direction and the majority of traffic (70 percent proceeded southbound). WSP averaged these values and arrived at a distribution of 75% to and from the north and 25% to and from the south during the AM and PM peak periods.

During the data collection, vehicle speeds were captured. The 85th percentile speeds were consistent during the AM and PM peak hours for vehicles approaching from north at 41 mph. The 85th percentile speeds during the AM and PM peak hour were consistent for vehicles approaching from the south at 40 mph.

As part of the original study, WSP researched traffic volume data from MassDOT permanent count stations within the area to determine an appropriate seasonal traffic volume adjustment. Continuous count data was taken from the closest permanent count stations; 6126, located on Interstate 495 in Franklin just south of Route 140 and 6127, located on Interstate 495 in Wrentham just north of Route 1A. Based on 6127, November traffic volumes are historically 3 percent lower than average month volumes and December volumes are historically 7 percent lower than average month. Traffic volumes were increased by 5 percent to represent average monthly conditions. The monthly traffic factors from the permanent counts stations mentioned above are attached in Appendix.

The 2016 ATR counts and calculated 2019 weekday AM and weekday PM peak hour traffic volumes can be found in the Appendix.

SITE RELATED TRAFFIC

WSP calculated the net increase in traffic expected as a result of the proposed development. The trips associated with the 96-units were calculated using the Institute of Transportation Engineer's (ITE) Trip Generation Manual, 10th Edition. The appropriate Land Use Code (LUC) for the residential units is LUC 210, Single Family – Detached Housing.

Table 1: ITE Trip Generation

Project Trip Generation			
	In	Out	Total
Weekday Daily	453	453	906
AM Peak Hour (Adjacent Street)	18	55	73
PM Peak Hour (Adjacent Street)	62	36	98

Trip generation based on Trip Generation, 10th Edition, published by Institute of Transportation Engineers in 2017. Assumes 96 units of LUC 210, Single-Family Detached Housing.

As shown in Table 1, the proposed development is expected to generate 906 vehicle trips over the course of a weekday. The proposed development is anticipated to generate 73 vehicle trips during the weekday AM peak hour (18 in and 55 out) and 98 vehicle trips during the weekday PM peak hour (62 in and 36 out).

The trip generation of the proposed development was distributed at the proposed driveway intersection based on existing traffic patterns and engineering judgment. Approximately, 75 percent of the site traffic is expected to travel to and from north of the site along Seekonk Street and the remaining 25 percent of the site traffic is expected to travel to and from south of the site. The trip generation associated with the proposed development was added to the 2019 Existing condition peak hour traffic volumes to determine the 2019 Build condition peak hour traffic volumes. The 2019 Build weekday AM and weekday PM peak hours can be found in the Appendix.

INTERSECTION OPERATIONS

The traffic operations at the proposed driveway intersection with Seekonk Street were determined. Analysis was based on methodologies outlined in the Highway Capacity Manual (HCM). Level of Service (LOS) and delays were calculated and are summarized below.

LOS is a calculation of control delay for an intersection. LOS is an indication of driver discomfort, frustration, fuel consumption, and lost time. LOS is defined by an index from A (free flow) to F (long delays). Control delay and LOS values are listed in Table 2.

For unsignalized intersection, delay values apply only to the controlled movements, since the main street movements are not restricted. Control delay is the elapsed time for deceleration, queue time, stopped delay, and final acceleration. Average control delay for unsignalized intersections is a function of capacity of the approach and the degree of saturation. Synchro 9 software was used as the analysis tool for determining the unsignalized LOS at the proposed driveway intersection. Synchro implements the methods of the Highway Capacity Manual (HCM) to analyze intersection capacity and determine LOS.

Table 2: Level of Service Criteria

Average Delay (seconds)	
Level of Service	Unsignalized Intersections
A	≤ 10
B	> 10 and ≤ 15
C	> 15 and < 25
D	> 25 and ≤ 35
E	> 35 and ≤ 50
F	> 50

Source: 2010 HCM

The LOS procedures described above were used to determine peak operating LOS at the study area intersections for the 2019 Existing, 2019 Build, and 2026 Build conditions. All backup calculations are provided in the Appendix. The 2026 volumes assume a 1% average annual growth rate.

The operations of the study area intersections were determined. Table 3 summarizes the LOS and average delay per vehicle at the stop controlled site driveway approach at unsignalized intersection.

The site driveway approach (westbound) at unsignalized intersection is expected to operate at LOS B during AM peak hour and at LOS A during PM peak hour with low delays for the Build conditions in 2019 and 2026.

Table 3: Intersection Operations Summary

Seekonk Street at Driveway	2019 Existing		2019 Build		2026 Build	
	Delay	LOS	Delay	LOS	Delay	LOS
AM Peak Hour	NA	NA	11.6	B	12.0	B
PM Peak Hour	NA	NA	9.8	A	10.0	A

2019 Existing (NA): No existing intersection at site
2019 Build: Delays if project were completed in 2019
2026 Build: Existing plus 7 years per the MassDOT TIA guidance

SIGHT DISTANCES

WSP has reviewed the available sight lines approaching the proposed driveway to access the proposed development and compared them to industry standards. WSP measured the available sight lines approaching and from the proposed site driveway in July, 2019.

The American Association of State Highway and Transportation Officials (AASHTO) calculates the requirements for Stopping Sight Distance (SSD). SSD is the critical measurement of sight lines as the distance a vehicle needs to come to a complete stop to avoid a collision when traveling at a certain speed. For a 35-mph zone, the minimum required SSD is 250 feet based on AASHTO guidelines.

Based on ATR speed data, the 85th percentile speeds for vehicles approaching the site driveway were 40 mph from the north and 41 mph from the south along Seekonk Street. The minimum required SSD for 40-mph speeds is 305 feet based on AASHTO guidelines. Approaching the driveway from the north along Seekonk Street, a motorist can see an object at the site driveway from approximately 400+ feet away. Approaching the site driveway from the south along Seekonk Street, SSD is clear at 305 feet, beyond 305 feet the sight distance is blocked by the tree branches as shown in Figure 1. If the tree branches are trimmed, a motorist can see an object at the site driveway from approximately 325 feet away. The available SSD meets the requirements in both directions for a 40-mph speed zone.

Figure 1: SSD from South Blocked by Tree Branches

Intersection sight distance (ISD), the sight distance needed to allow drivers turning onto or crossing a road, is desirable, but not required. On Seekonk Street, the required ISD to the north for vehicles traveling 40 mph is 445 feet.

Measuring from the driveway centerline and 15 feet behind the proposed stop bar, the ISD to the north is clear for 270 feet; however, beyond 270 feet, it is blocked by trees and shrubs located 60 feet to 150 feet from the driveway centerline. If the trees to the north are cleared for a distance of 150 feet from the proposed driveway, the ISD is will be clear for more than 450 feet.

ISD to the south is available for 40 feet but is then blocked by trees adjacent to Seekonk Street that parallel the street from the driveway to 60 feet to the south. If these trees are removed, then 450 feet of intersection sight distance would be available, after which it is limited by roadway curvature.

DRIVEWAY AND ROUNDABOUT DESIGN ASSESSMENT

The proposed development features a 1,115 foot long driveway that provides access to all 96 units in the development to Seekonk Street. This driveway features 18 foot lanes with a median and also provides access to community mailboxes. The proposed driveway ends with a traffic circle (mini-roundabout) that provides access to the driveway as well as two connecting access roads within the development. Implemented in the correct context, roundabouts can provide a number of benefits, including:

1. Improved safety for motor vehicles versus other potential traffic control methods (signal and stop control) due to designs forcing vehicles to reduce their speed and fewer conflict points.[1]
2. Unlike signals, roundabouts are not subject to power failures or other interruptions in operations.
3. Roundabouts offer easy-accessible U-turns.

In a residential community like the one proposed where prevailing vehicle speeds are lower (30 mph or less), mini roundabouts can provide lower operations and maintenance costs. Roundabouts also can provide other benefits, such as the opportunity to provide attractive entries or centerpieces to communities through their center islands and splitter islands. In addition, textured or colored concrete brick pavers can be easy for snow removal.

The central island can also be designed to be mountable, to accommodate larger vehicles passing over (but not to the left of) it. The centerpiece if limited smaller elevation can provide required sight lines per AASHTO guidelines.

The proposed driveway design width meets section 18.2.3.4.1.1 of the Massachusetts Fire Code which states that "Fire department access roads constructed in the boulevard-style shall be allowed where each lane is less than 20' but not less than 10' when they do not provide access to a building or structure."[2]

Due to the length of the driveway, it is recommended that median breaks be provided to allow vehicles and emergency vehicles to turn around. The median break should provide sufficient space and turning radius for the vehicle to turn-around, which may necessitate the need for a pull-out or "loon" on the opposite curb to facilitate larger vehicles, such as delivery trucks and fire or emergency vehicles, the space needed to turn around.

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[1] https://www.fhwa.dot.gov/publications/research/safety/00067/00067.pdf

[2] https://www.mass.gov/files/documents/2018/02/02/FEA_527%20CMR._2015_%20unofficial%20Effective%20January%201%2C%202018%20_1.pdf

CONCLUSIONS

The proposed development is anticipated to generate 906 vehicle trips over the course of a weekday, 73 vehicle trips during the AM peak hour, and 98 vehicle trips during the PM peak hour. The unsignalized intersection at the proposed driveway is expected to operate with minimal delays during both AM peak and PM peak hours at LOS A or LOS B for build condition in 2019 and 2026.

The proposed driveway location meets the required SSD lengths in both directions for a 40-mph speed zone. Meeting intersection sight distance is desirable, but not required for a site, and the ISD from the proposed driveway can be met in both directions by trimming the tree branches or removing trees as recommended.

Designed correctly, the proposed mini-roundabout can provide a number of safety, operational, and aesthetic benefits. If median breaks are provided with accommodations for vehicles to turn around, the driveway design was found to meet standards.

Location Map: 165400 Norfolk, MA

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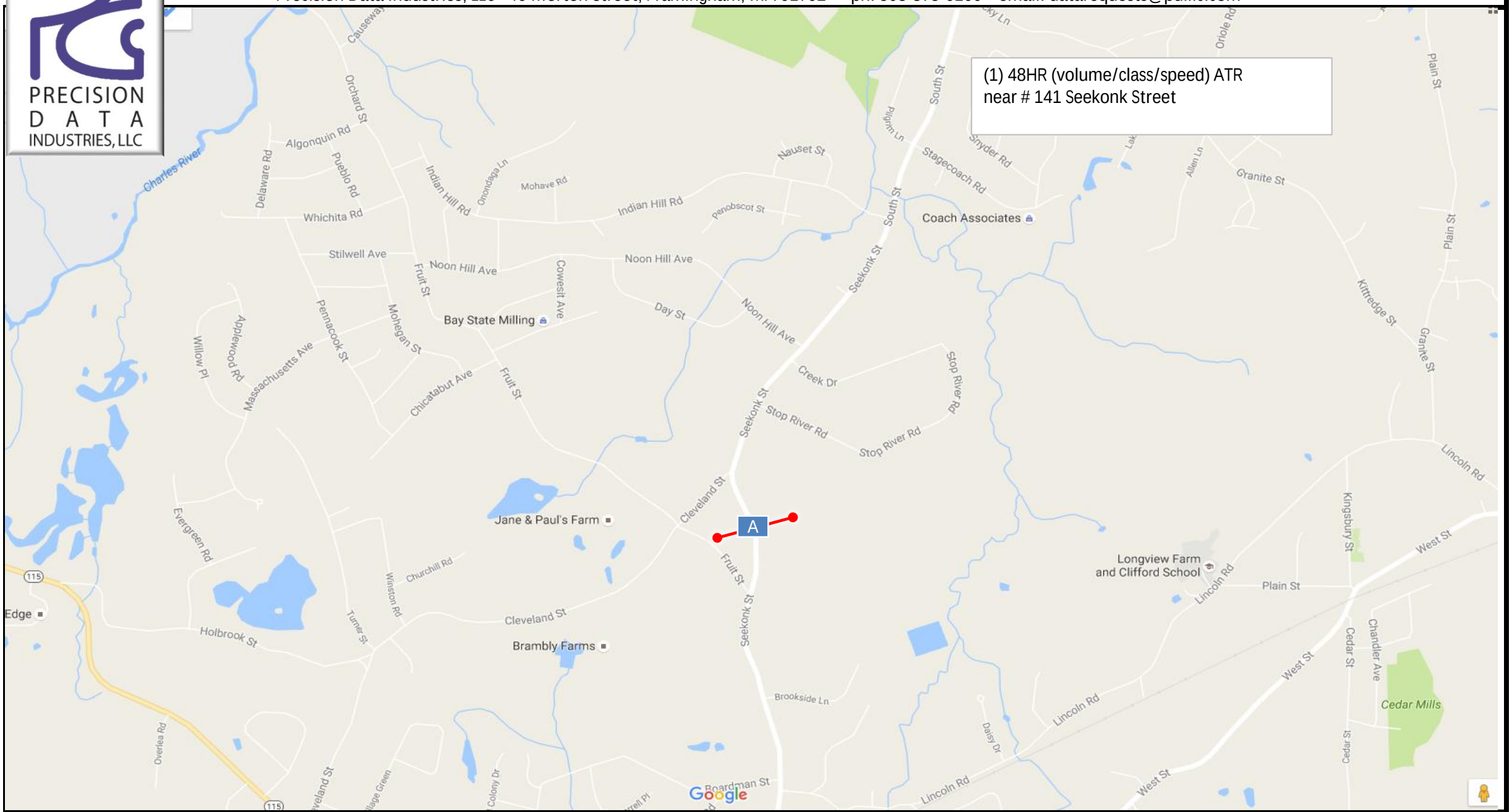

Client:	Engineer:	Site Code:	Date:	PDI Job #	City, State:
WSP-Parson Brinckerhoff	J. Conley	TBA		165400	Norfolk, MA

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City, State: Norfolk, MA
Client:WSP/ J. Conley
SB

165400 A Class
Site Code:

Start Time	Bikes	Cars & Trailers	2 Axle Long	Buses	2 Axle 6 Tire	3 Axle Single	4 Axle Single	<5 Axl Double	5 Axle Double	>6 Axl Double	<6 Axl Multi	6 Axle Multi	>6 Axl Multi	Total
11/30/1														
6	0	3	1	0	0	0	0	0	0	0	0	0	0	4
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	1	1	0	0	0	0	0	0	0	0	0	0	2
05:00	0	3	0	0	1	0	0	0	0	0	0	0	0	4
06:00	1	20	12	1	1	0	0	0	0	0	0	0	0	35
07:00	0	57	18	0	0	0	0	0	0	0	0	0	0	75
08:00	0	47	15	2	1	0	0	0	0	0	0	0	0	65
09:00	0	43	20	0	6	0	0	0	0	0	0	0	0	69
10:00	1	34	15	1	2	0	0	0	1	0	0	0	0	54
11:00	1	33	12	0	3	0	0	0	0	0	0	0	0	49
12 PM	2	35	16	0	8	1	0	0	0	0	0	0	0	62
13:00	0	56	21	1	9	0	0	0	0	0	0	0	0	87
14:00	0	54	28	1	3	0	0	1	0	0	0	0	0	87
15:00	0	86	42	0	11	0	0	0	0	0	0	0	0	139
16:00	0	155	42	1	3	0	0	0	0	0	0	0	0	201
17:00	2	142	34	0	6	1	0	0	0	0	0	0	0	185
18:00	0	98	22	0	3	0	0	0	0	0	0	0	0	123
19:00	1	51	11	0	1	0	0	0	0	0	0	0	0	64
20:00	0	24	5	0	0	0	0	0	0	0	0	0	0	29
21:00	0	18	1	0	4	0	0	0	0	0	0	0	0	23
22:00	0	9	1	0	1	0	0	0	0	0	0	0	0	11
23:00	0	8	2	0	0	0	0	0	0	0	0	0	0	10
Percent	0.6%	70.9%	23.1%	0.5%	4.6%	0.1%	0.0%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	06:00	07:00	09:00	08:00	09:00				10:00					07:00
Vol.	1	57	20	2	6				1					75
PM Peak	12:00	16:00	15:00	13:00	15:00	12:00		14:00						16:00
Vol.	2	155	42	1	11	1		1						201

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12/01/1														
6	0	5	1	0	0	0	0	0	0	0	0	0	0	6
01:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
05:00	0	2	0	0	2	0	0	0	0	0	0	0	0	4
06:00	0	19	9	1	1	0	0	0	0	0	0	0	0	30
07:00	0	56	20	0	2	0	0	0	0	0	0	0	0	78
08:00	0	56	16	1	1	1	0	0	0	0	0	0	0	75
09:00	0	32	12	0	5	0	0	0	0	0	0	0	0	49
10:00	0	35	16	1	2	1	0	0	0	0	0	0	0	55
11:00	0	42	20	0	6	0	0	0	0	0	0	0	0	68
12 PM	0	34	9	0	2	0	0	0	0	0	0	0	0	45
13:00	0	32	10	0	9	0	0	0	0	0	0	0	0	51
14:00	3	72	30	0	4	0	0	0	0	0	0	0	0	109
15:00	2	83	54	1	8	0	0	1	0	0	0	0	0	149
16:00	0	112	47	0	5	0	0	1	0	0	0	0	0	165
17:00	1	147	45	0	7	0	0	0	0	0	0	0	0	200
18:00	0	109	17	0	3	1	0	0	0	0	0	0	0	130
19:00	0	63	18	0	2	0	0	0	0	0	0	0	0	83
20:00	0	37	6	0	1	0	0	0	0	0	0	0	0	44
21:00	0	27	2	0	0	0	0	0	0	0	0	0	0	29
22:00	0	9	1	0	1	0	0	0	0	0	0	0	0	11
23:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
Percent	0.4%	70.7%	23.8%	0.3%	4.4%	0.2%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak		07:00	07:00	06:00	11:00	08:00								07:00
Vol.		56	20	1	6	1								78
PM Peak	14:00	17:00	15:00	15:00	13:00	18:00		15:00						17:00
Vol.	3	147	54	1	9	1		1						200

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165400 A Class
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11/30/1														
6	0	3	0	0	0	0	0	0	0	0	0	0	0	3
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
03:00	0	5	0	0	0	0	0	0	0	0	0	0	0	5
04:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
05:00	0	35	7	0	3	0	0	0	0	0	0	0	0	45
06:00	0	143	43	1	3	1	0	2	0	0	0	0	0	193
07:00	1	265	58	3	7	0	0	0	0	0	0	0	0	334
08:00	1	145	33	1	5	1	1	0	0	0	0	0	0	187
09:00	0	65	19	1	6	0	0	0	1	0	0	0	0	92
10:00	1	48	22	1	2	0	0	1	0	0	0	0	0	75
11:00	0	44	6	0	6	0	0	0	0	0	0	0	0	56
12 PM	1	50	17	0	2	2	0	0	0	0	0	0	0	72
13:00	1	43	16	0	5	0	0	0	0	0	0	0	0	65
14:00	0	47	15	1	3	1	0	0	0	0	0	0	0	67
15:00	0	52	15	2	0	0	0	0	0	0	0	0	0	69
16:00	1	58	14	0	2	0	0	0	0	0	0	0	0	75
17:00	0	71	19	0	1	0	1	0	0	0	0	0	0	92
18:00	0	59	9	0	1	0	0	0	0	0	0	0	0	69
19:00	0	22	5	0	0	0	0	0	0	0	0	0	0	27
20:00	0	35	6	0	0	0	0	0	0	0	0	0	0	41
21:00	0	19	3	0	0	0	0	0	0	0	0	0	0	22
22:00	0	11	2	0	1	0	0	0	0	0	0	0	0	14
23:00	0	3	1	0	0	0	0	0	0	0	0	0	0	4
Percent	0.4%	76.1%	19.3%	0.6%	2.9%	0.3%	0.1%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	07:00	07:00	07:00	06:00	08:00	06:00	09:00					07:00
Vol.	1	265	58	3	7	1	1	2	1					334
PM Peak	12:00	17:00	17:00	15:00	13:00	12:00	17:00							17:00
Vol.	1	71	19	2	5	2	1							92

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12/01/1														
6	0	0	0	0	1	0	0	0	0	0	0	0	0	1
01:00	0	4	0	0	0	0	0	0	0	0	0	0	0	4
02:00	0	1	0	0	0	0	0	0	0	0	0	0	0	1
03:00	0	2	0	0	0	0	0	0	0	0	0	0	0	2
04:00	0	7	0	0	0	0	0	0	0	0	0	0	0	7
05:00	0	24	8	0	5	0	0	0	0	0	0	0	0	37
06:00	0	139	48	1	7	0	0	0	0	0	0	0	0	195
07:00	0	265	65	1	13	0	1	0	0	0	0	0	0	345
08:00	1	193	35	2	8	0	0	0	0	0	0	0	0	239
09:00	0	65	20	1	5	3	0	0	0	0	0	0	0	94
10:00	1	35	18	0	4	0	0	0	0	0	0	0	0	58
11:00	0	45	7	1	3	0	0	0	0	0	0	0	0	56
12 PM	0	53	17	0	4	0	0	0	0	0	0	0	0	74
13:00	0	53	13	0	5	0	0	0	0	0	0	0	0	71
14:00	1	61	17	1	3	0	0	0	0	0	0	0	0	83
15:00	1	64	13	3	1	0	0	0	0	0	0	0	0	82
16:00	0	43	14	0	1	0	0	0	0	0	0	0	0	58
17:00	0	69	16	0	2	0	0	0	0	0	0	0	0	87
18:00	0	57	10	0	1	0	0	0	0	0	0	0	0	68
19:00	0	56	14	0	0	0	0	0	0	0	0	0	0	70
20:00	0	42	10	0	0	0	0	0	0	0	0	0	0	52
21:00	0	26	4	0	1	0	0	0	0	0	0	0	0	31
22:00	0	10	0	0	0	0	0	0	0	0	0	0	0	10
23:00	0	2	2	0	0	0	0	0	0	0	0	0	0	4
Percent	0.2%	76.1%	19.1%	0.6%	3.7%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
AM Peak	08:00	07:00	07:00	08:00	07:00	09:00	07:00							07:00
Vol.	1	265	65	2	13	3	1							345
PM Peak	14:00	17:00	12:00	15:00	13:00									17:00
Vol.	1	69	17	3	5									87

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165400 A Speed
Site Code:

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/30/ 16	0	0	0	0	1	3	0	0	0	0	0	0	0	4	38	36
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	0	2	0	0	0	0	0	0	0	2	38	37
05:00	0	0	**1**	0	1	1	1	0	0	0	0	0	0	4	41	33
06:00	**1**	1	0	1	9	16	6	1	0	0	0	0	0	35	40	35
07:00	0	**2**	0	0	12	**39**	**22**	0	0	0	0	0	0	**75**	41	37
08:00	0	0	1	3	**18**	28	12	**2**	0	**1**	0	0	0	65	41	36
09:00	0	0	0	**6**	14	34	14	1	0	0	0	0	0	69	40	36
10:00	0	0	0	3	11	30	9	1	0	0	0	0	0	54	40	36
11:00	1	0	0	0	12	25	10	1	0	0	0	0	0	49	40	36
12 PM	0	0	0	1	11	39	10	**1**	0	0	0	0	0	62	39	37
13:00	0	0	0	0	19	53	15	0	0	0	0	0	0	87	39	37
14:00	0	0	0	1	20	53	13	0	0	0	0	0	0	87	38	36
15:00	0	0	1	10	28	72	**28**	0	0	0	0	0	0	139	40	36
16:00	0	**3**	**3**	**11**	**91**	81	12	0	0	0	0	0	0	**201**	37	34
17:00	0	0	0	9	79	**84**	13	0	0	0	0	0	0	185	38	35
18:00	**1**	0	0	9	49	57	7	0	0	0	0	0	0	123	37	34
19:00	0	0	0	1	12	42	8	1	0	0	0	0	0	64	38	37
20:00	0	0	0	0	7	17	5	0	0	0	0	0	0	29	39	37
21:00	0	1	1	2	5	11	3	0	0	0	0	0	0	23	38	34
22:00	0	0	0	1	5	4	1	0	0	0	0	0	0	11	38	34
23:00	0	0	0	0	2	6	2	0	0	0	0	0	0	10	40	37
Total	3	7	7	58	406	697	191	8	0	1	0	0	0	1378		
%	0.2%	0.5%	0.5%	4.2%	29.5%	50.6%	13.9%	0.6%	0.0%	0.1%	0.0%	0.0%	0.0%			
AM Peak	06:00	07:00	05:00	09:00	08:00	07:00	07:00	08:00		08:00				07:00		
Vol.	1	2	1	6	18	39	22	2		1				75		
PM Peak	18:00	16:00	16:00	16:00	16:00	17:00	15:00	12:00						16:00		
Vol.	1	3	3	11	91	84	28	1						201		

Stats

15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	38 MPH
95th Percentile :	42 MPH
Mean Speed(Average) :	36 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1103
Percent in Pace :	80.0%
Number of Vehicles > 35 MPH :	758
Percent of Vehicles > 35 MPH :	55.0%

PRECISION DATA INDUSTRIES, LLC
46 Morton Street, Framingham, MA
Office: 5088750100 Fax: 508-875-0118
Email: datarequests@pdillc.com

Seekonk Street
@ #141 Seekonk Street
City, State: Norfolk, MA
Client:WSP/ J. Conley
SB

165400 A Speed
Site Code:

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/01/ 16	**1**	0	0	0	0	5	0	0	0	0	0	0	0	6	38	32
01:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
02:00	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
04:00	0	0	0	0	2	0	2	0	0	0	0	0	0	4	42	37
05:00	0	0	0	0	0	3	1	0	0	0	0	0	0	4	41	38
06:00	1	0	**1**	0	6	16	5	1	0	0	0	0	0	30	40	36
07:00	0	0	0	1	17	**43**	14	2	**1**	0	0	0	0	**78**	40	37
08:00	0	0	0	1	10	43	18	**3**	0	0	0	0	0	75	41	38
09:00	0	0	0	**3**	8	26	12	0	0	0	0	0	0	49	40	37
10:00	0	**1**	0	2	**19**	24	9	0	0	0	0	0	0	55	39	35
11:00	0	0	1	1	7	33	**25**	1	0	0	0	0	0	68	42	38
12 PM	0	0	0	2	10	25	7	1	0	0	0	0	0	45	39	36
13:00	0	0	0	**3**	10	28	10	0	0	0	0	0	0	51	40	36
14:00	**2**	0	0	1	20	66	17	3	0	0	0	0	0	109	40	37
15:00	0	0	0	3	28	87	28	3	0	0	0	0	0	149	40	37
16:00	0	0	0	0	24	**116**	24	1	0	0	0	0	0	165	39	37
17:00	0	0	**1**	0	**38**	108	**51**	2	0	0	0	0	0	**200**	41	37
18:00	0	0	0	0	13	77	36	**4**	0	0	0	0	0	130	41	38
19:00	0	0	0	2	16	41	23	1	0	0	0	0	0	83	41	37
20:00	0	0	0	0	10	21	11	2	0	0	0	0	0	44	41	38
21:00	0	0	1	3	1	10	12	1	**1**	0	0	0	0	29	43	38
22:00	0	0	0	0	0	6	5	0	0	0	0	0	0	11	42	39
23:00	0	0	1	0	0	4	3	2	0	0	0	0	0	10	45	39
Total	4	1	5	22	240	783	313	27	2	0	0	0	0	1397		
%	0.3%	0.1%	0.4%	1.6%	17.2%	56.0%	22.4%	1.9%	0.1%	0.0%	0.0%	0.0%	0.0%			
AM Peak	00:00	10:00	06:00	09:00	10:00	07:00	11:00	08:00	07:00					07:00		
Vol.	1	1	1	3	19	43	25	3	1					78		
PM Peak	14:00		17:00	13:00	17:00	16:00	17:00	18:00	21:00					17:00		
Vol.	2		1	3	38	116	51	4	1					200		

Stats

15th Percentile :	32 MPH
50th Percentile :	36 MPH
85th Percentile :	41 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	37 MPH
10 MPH Pace Speed :	35-44 MPH
Number in Pace :	1096
Percent in Pace :	78.5%
Number of Vehicles > 35 MPH :	968
Percent of Vehicles > 35 MPH :	69.3%

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City, State: Norfolk, MA
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NB

165400 A Speed
Site Code:

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
11/30/ 16	0	1	1	0	1	0	0	0	0	0	0	0	0	3	31	24
01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	*
02:00	0	0	0	0	2	0	0	0	0	0	0	0	0	2	33	32
03:00	0	0	0	0	1	4	0	0	0	0	0	0	0	5	38	36
04:00	0	0	0	0	0	1	2	1	0	0	0	0	0	4	46	42
05:00	0	0	0	0	5	15	18	**6**	**1**	0	0	0	0	45	44	40
06:00	0	1	0	0	44	112	34	2	0	0	0	0	0	193	40	37
07:00	0	0	1	3	**66**	**188**	**71**	4	1	0	0	0	0	**334**	40	37
08:00	**5**	**6**	**6**	2	33	88	44	2	1	0	0	0	0	187	41	35
09:00	0	0	3	4	29	32	21	2	1	0	0	0	0	92	41	36
10:00	0	1	0	**6**	15	34	18	1	0	0	0	0	0	75	41	36
11:00	0	0	1	1	20	21	12	0	1	0	0	0	0	56	40	36
12 PM	0	0	0	4	14	**42**	**11**	1	0	0	0	0	0	72	39	36
13:00	0	**2**	0	0	16	37	10	0	0	0	0	0	0	65	39	36
14:00	0	0	0	2	19	33	11	**2**	0	0	0	0	0	67	40	36
15:00	1	0	0	0	22	40	6	0	0	0	0	0	0	69	38	35
16:00	0	1	**2**	10	31	25	5	1	0	0	0	0	0	75	37	33
17:00	1	1	1	**11**	**40**	34	4	0	0	0	0	0	0	**92**	37	33
18:00	**2**	0	0	9	29	22	7	0	0	0	0	0	0	69	38	33
19:00	0	0	0	3	12	10	2	0	0	0	0	0	0	27	37	34
20:00	0	0	0	1	22	15	3	0	0	0	0	0	0	41	37	34
21:00	0	0	0	0	7	13	2	0	0	0	0	0	0	22	38	36
22:00	0	0	0	1	3	8	1	1	0	0	0	0	0	14	38	36
23:00	0	0	0	1	0	3	0	0	0	0	0	0	0	4	38	34
Total	9	13	15	58	431	777	282	23	5	0	0	0	0	1613		
%	0.6%	0.8%	0.9%	3.6%	26.7%	48.2%	17.5%	1.4%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak	08:00	08:00	08:00	10:00	07:00	07:00	07:00	05:00	05:00					07:00		
Vol.	5	6	6	6	66	188	71	6	1					334		
PM Peak	18:00	13:00	16:00	17:00	17:00	12:00	12:00	14:00						17:00		
Vol.	2	2	2	11	40	42	11	2						92		

Stats

15th Percentile :	30 MPH
50th Percentile :	35 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	36 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1208
Percent in Pace :	74.9%
Number of Vehicles > 35 MPH :	932
Percent of Vehicles > 35 MPH :	57.8%

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NB

165400 A Speed
Site Code:

Start Time	1 14	15 19	20 24	25 29	30 34	35 39	40 44	45 49	50 54	55 59	60 64	65 69	70 9999	Total	85th % ile	Ave Speed
12/01/ 16	0	0	0	0	1	0	0	0	0	0	0	0	0	1	33	32
01:00	0	0	**2**	0	0	1	1	0	0	0	0	0	0	4	41	31
02:00	0	0	0	0	0	1	0	0	0	0	0	0	0	1	38	37
03:00	0	0	0	0	1	0	1	0	0	0	0	0	0	2	42	37
04:00	0	0	0	0	0	3	4	0	0	0	0	0	0	7	42	40
05:00	0	0	0	0	3	14	18	1	**1**	0	0	0	0	37	43	40
06:00	0	**1**	0	1	31	130	29	3	0	0	0	0	0	195	39	37
07:00	0	0	1	0	**71**	**208**	**57**	**7**	1	0	0	0	0	**345**	40	37
08:00	0	0	1	**5**	44	150	37	2	0	0	0	0	0	239	39	37
09:00	0	0	0	5	38	42	9	0	0	0	0	0	0	94	38	35
10:00	0	0	0	1	19	29	8	1	0	0	0	0	0	58	39	36
11:00	0	0	0	0	12	32	11	1	0	0	0	0	0	56	40	37
12 PM	0	1	0	3	10	42	18	0	0	0	0	0	0	74	40	37
13:00	0	**2**	0	2	13	39	13	2	0	0	0	0	0	71	40	36
14:00	0	0	0	3	**24**	41	15	0	0	0	0	0	0	83	39	36
15:00	0	0	**1**	1	16	**49**	14	0	1	0	0	0	0	82	39	37
16:00	0	1	1	1	13	29	8	2	**3**	0	0	0	0	58	41	37
17:00	0	0	1	**7**	16	45	17	1	0	0	0	0	0	**87**	40	36
18:00	**1**	1	1	0	11	33	**20**	1	0	0	0	0	0	68	41	37
19:00	0	1	0	0	13	38	15	**3**	0	0	0	0	0	70	41	37
20:00	1	0	0	0	13	26	10	2	0	0	0	0	0	52	41	37
21:00	0	0	1	1	5	17	6	1	0	0	0	0	0	31	40	37
22:00	0	0	0	0	3	4	3	0	0	0	0	0	0	10	41	37
23:00	0	0	1	0	0	1	2	0	0	0	0	0	0	4	42	36
Total	2	7	10	30	357	974	316	27	6	0	0	0	0	1729		
%	0.1%	0.4%	0.6%	1.7%	20.6%	56.3%	18.3%	1.6%	0.3%	0.0%	0.0%	0.0%	0.0%			
AM Peak		06:00	01:00	08:00	07:00	07:00	07:00	07:00	05:00					07:00		
Vol.		1	2	5	71	208	57	7	1					345		
PM Peak	18:00	13:00	15:00	17:00	14:00	15:00	18:00	19:00	16:00					17:00		
Vol.	1	2	1	7	24	49	20	3	3					87		

Stats

15th Percentile :	31 MPH
50th Percentile :	36 MPH
85th Percentile :	40 MPH
95th Percentile :	43 MPH
Mean Speed(Average) :	37 MPH
10 MPH Pace Speed :	30-39 MPH
Number in Pace :	1331
Percent in Pace :	77.0%
Number of Vehicles > 35 MPH :	1128
Percent of Vehicles > 35 MPH :	65.3%

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Seekonk Street
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City, State: Norfolk, MA
Client:WSP/ J. Conley

165400 A Volume
Site Code:

Start	SB				NB				Combined				11/30/2016 Wed		
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.				
12:00	3		15		0		15		3		30				
12:15	0		11		0		27		0		38				
12:30	0		21		2		15		2		36				
12:45	1	4	15	62	1	3	15	72	2	7	30	134			
01:00	0		17		0		20		0		37				
01:15	0		24		0		14		0		38				
01:30	0		16		0		19		0		35				
01:45	0	0	30	87	0	0	12	65	0	0	42	152			
02:00	0		23		2		17		2		40				
02:15	0		17		0		15		0		32				
02:30	0		24		0		18		0		42				
02:45	0	0	23	87	0	2	17	67	0	2	40	154			
03:00	0		26		1		17		1		43				
03:15	0		39		4		20		4		59				
03:30	0		43		0		15		0		58				
03:45	0	0	31	139	0	5	17	69	0	5	48	208			
04:00	0		47		1		17		1		64				
04:15	0		34		1		19		1		53				
04:30	0		60		1		18		1		78				
04:45	2	2	60	201	1	4	21	75	3	6	81	276			
05:00	1		49		5		24		6		73				
05:15	1		40		10		29		11		69				
05:30	1		45		11		26		12		71				
05:45	1	4	51	185	19	45	13	92	20	49	64	277			
06:00	4		33		26		21		30		54				
06:15	6		37		41		17		47		54				
06:30	12		31		61		18		73		49				
06:45	13	35	22	123	65	193	13	69	78	228	35	192			
07:00	19		24		66		5		85		29				
07:15	16		21		102		8		118		29				
07:30	18		15		84		8		102		23				
07:45	22	75	4	64	82	334	6	27	104	409	10	91			
08:00	19		9		49		18		68		27				
08:15	15		5		65		9		80		14				
08:30	18		5		33		10		51		15				
08:45	13	65	10	29	40	187	4	41	53	252	14	70			
09:00	17		7		25		7		42		14				
09:15	19		5		27		3		46		8				
09:30	15		6		24		8		39		14				
09:45	18	69	5	23	16	92	4	22	34	161	9	45			
10:00	11		1		22		6		33		7				
10:15	12		5		19		2		31		7				
10:30	11		2		15		2		26		4				
10:45	20	54	3	11	19	75	4	14	39	129	7	25			
11:00	10		3		15		3		25		6				
11:15	13		2		13		1		26		3				
11:30	11		3		17		0		28		3				
11:45	15	49	2	10	11	56	0	4	26	105	2	14			
Total	357		1021		996		617		1353		1638				
Percent	26.4%		62.3%		73.6%		37.7%								
Day Total		1378				1613				2991					
Peak	07:00	-	04:30	-	07:00	-	04:45	-	07:00	-	04:30	-	-	-	
Vol.	75	-	209	-	334	-	100	-	409	-	301	-	-	-	
P.H.F.	0.852		0.871		0.819		0.862		0.867		0.929				

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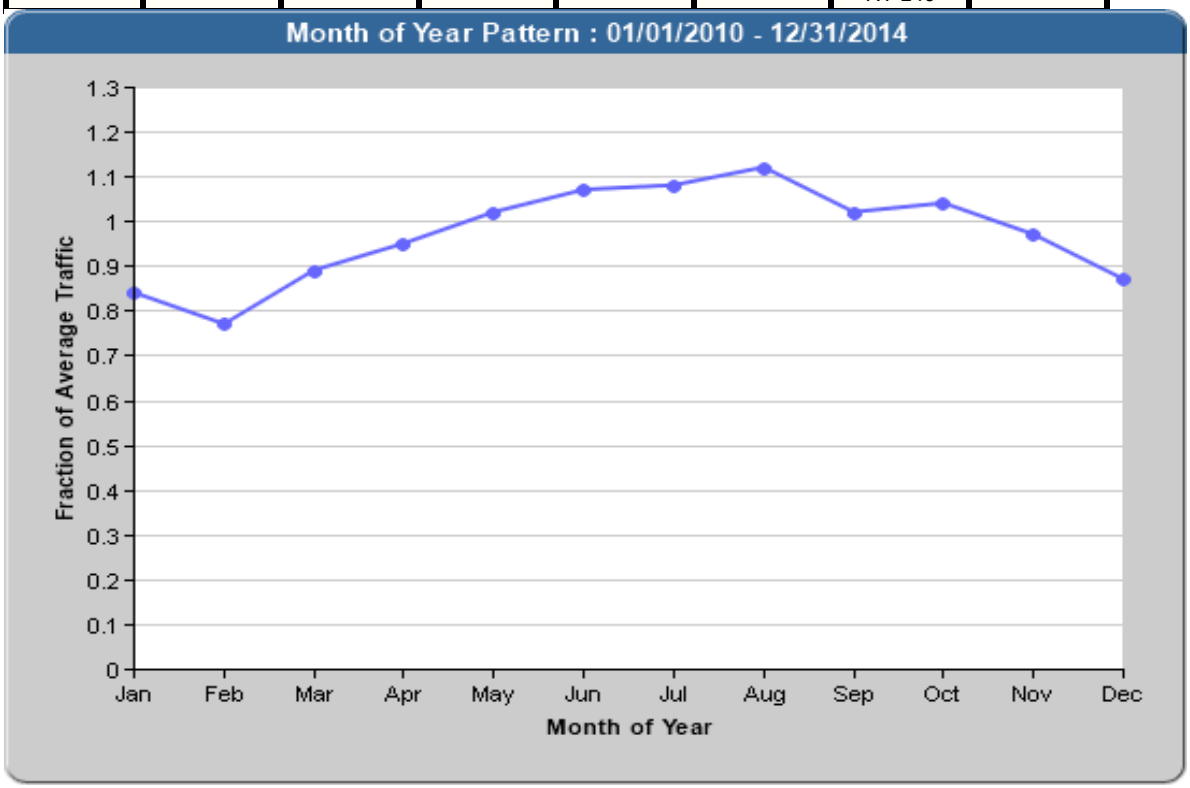
Client:WSP/ J. Conley

165400 A Volume
Site Code:

Start		SB				NB				Combined			12/1/2016
Time	A.M.		P.M.		A.M.		P.M.		A.M.		P.M.		Thu
12:00	3		9		0		26		3		35		
12:15	1		13		0		17		1		30		
12:30	1		11		0		17		1		28		
12:45	1	6	12	45	1	1	14	74	2	7	26	119	
01:00	1		17		0		13		1		30		
01:15	0		9		2		18		2		27		
01:30	0		11		2		22		2		33		
01:45	0	1	14	51	0	4	18	71	0	5	32	122	
02:00	0		19		0		12		0		31		
02:15	1		28		1		24		2		52		
02:30	0		27		0		23		0		50		
02:45	0	1	35	109	0	1	24	83	0	2	59	192	
03:00	0		28		0		20		0		48		
03:15	0		28		0		28		0		56		
03:30	0		44		0		14		0		58		
03:45	0	0	49	149	2	2	20	82	2	2	69	231	
04:00	1		42		4		18		5		60		
04:15	0		37		0		11		0		48		
04:30	1		39		2		20		3		59		
04:45	2	4	47	165	1	7	9	58	3	11	56	223	
05:00	1		51		4		30		5		81		
05:15	0		55		13		26		13		81		
05:30	1		58		9		17		10		75		
05:45	2	4	36	200	11	37	14	87	13	41	50	287	
06:00	1		40		27		18		28		58		
06:15	8		23		53		19		61		42		
06:30	8		33		50		14		58		47		
06:45	13	30	34	130	65	195	17	68	78	225	51	198	
07:00	22		26		80		21		102		47		
07:15	18		15		104		16		122		31		
07:30	17		23		90		19		107		42		
07:45	21	78	19	83	71	345	14	70	92	423	33	153	
08:00	13		10		73		21		86		31		
08:15	18		9		69		17		87		26		
08:30	18		12		54		9		72		21		
08:45	26	75	13	44	43	239	5	52	69	314	18	96	
09:00	7		11		33		16		40		27		
09:15	16		6		23		10		39		16		
09:30	11		7		25		3		36		10		
09:45	15	49	5	29	13	94	2	31	28	143	7	60	
10:00	10		3		14		3		24		6		
10:15	12		3		14		1		26		4		
10:30	14		2		17		5		31		7		
10:45	19	55	3	11	13	58	1	10	32	113	4	21	
11:00	10		2		9		2		19		4		
11:15	19		3		20		1		39		4		
11:30	16		2		11		0		27		2		
11:45	23	68	3	10	16	56	1	4	39	124	4	14	
Total	371		1026		1039		690		1410		1716		
Percent	26.3%		59.8%		73.7%		40.2%						
Day Total		1397				1729				3126			
Peak	07:00	-	04:45	-	07:00	-	02:30	-	07:00	-	04:45	-	- -
Vol.	78	-	211	-	345	-	95	-	423	-	293	-	- -
P.H.F.	0.886		0.909		0.829		0.848		0.867		0.904		

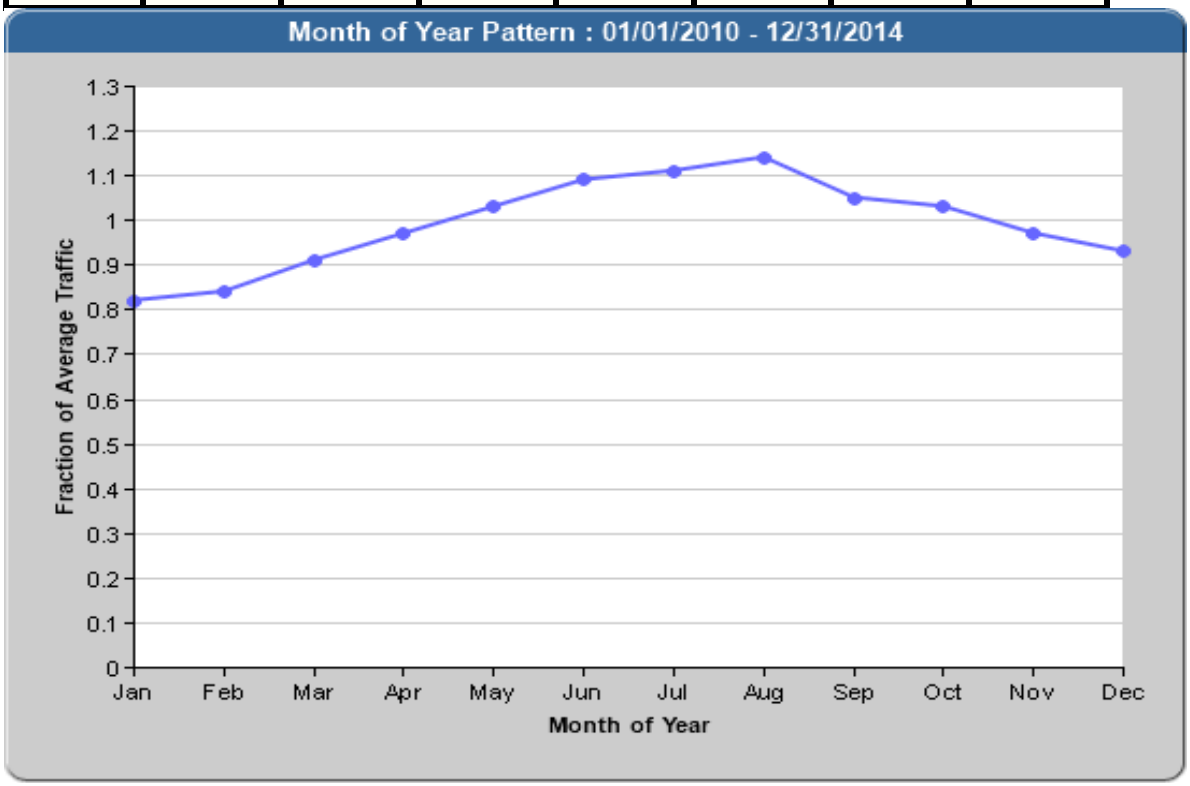
Loc ID	County	Community	On	From	To	At	Dir
6126	NORFOLK	FRANKLIN	INTERSTATE 495			RAMP-RT 495 NB TO RT 140	2-WAY



Month of Year	Average	Fraction
January	66,944	0.84
February	62,034	0.77
March	71,102	0.89
April	76,171	0.95
May	81,624	1.02
June	85,948	1.07
July	86,427	1.08
August	89,730	1.12
September	81,563	1.02
October	82,934	1.04
November	77,765	0.97
December	69,368	0.87

WSP | PARSONS BRINCKERHOFF

Loc ID	County	Community	On	From	To	At	Dir
6127	NORFOLK	WRENTHAM	INTERSTATE 495			RTE.1A	2-WAY



Month of Year	Average	Fraction
January	65,654	0.82
February	67,784	0.84
March	73,111	0.91
April	78,198	0.97
May	82,664	1.03
June	87,447	1.09
July	88,897	1.11
August	91,492	1.14
September	84,454	1.05
October	82,731	1.03
November	78,000	0.97
December	74,274	0.93

WSP | PARSONS BRINCKERHOFF

Weekday AM Peak Hour

Nov/Dec Seasonal Adjustment	3 to7 percent lower				
December Seasonal Adjustment	avg. 5%	1.05			
Growth Factor	1.01				
Total Growth	1.03	1.07	In	18	
	(2016-2019)	(2019-2026)	Out	55	
			Total	73	

Seekonk Street @ Driveway	Raw Counts	2016 Historic	2019 Existing	Trips	2019 Build	2026 Build
EB L		0	0		0	0
EB T		0	0		0	0
EB R		0	0		0	0
WB L		0	0	14	14	15
WB T		0	0		0	0
WB R		0	0	41	41	44
NB L		0	0		0	0
NB T	340	357	368		368	394
NB R		0	0	5	5	5
SB L		0	0	13	13	14
SB T	80	84	87		87	93
SB R		0	0		0	0

Weekday PM Peak Hour

Nov/Dec Seasonal Adjustment	3 to7 percent lower			
December Seasonal Adjustment	avg. 5%	1.05		
Growth Factor	1.01			
Total Growth	1.03	1.07	In	62
	(2016-2019)	(2019-2026)	Out	36
			Total	98

Seekonk Street @ Driveway	Raw Counts	2016 Historic	2019 Existing	Trips	2019 Build	2026 Build
EB L		0	0		0	0
EB T		0	0		0	0
EB R		0	0		0	0
WB L		0	0	9	9	10
WB T		0	0		0	0
WB R		0	0	27	27	29
NB L		0	0		0	0
NB T	90	95	98		98	105
NB R		0	0	16	16	17
SB L		0	0	46	46	49
SB T	210	221	228		228	244
SB R		0	0		0	0

TRIP GENERATION WORKSHEET

x= 96 Dwelling Units LUC: Single-Family Detached Housing (210)

WEEKDAY

Average Rate =	9.44	Fitted Curve Equation =	Ln (T) = 0.92* Ln(X) +2.71
Total Trips =	906.24	Total Trips =	1001.45

AM PEAK HOUR of ADJACENT STREET

Average Rate =	0.74	Fitted Curve Equation =	T = 0.71*X + 4.80
Total Trips =	71.04	Total Trips =	72.96
25% of Trips In =	18	25% of Trips In =	18
75% of Trips Out =	53	75% of Trips Out =	55

PM PEAK HOUR of ADJACENT STREET

Average Rate =	0.99	Fitted Curve Equation =	Ln (T) = 0.96* Ln(X) + 0.20
Total Trips =	95.04	Total Trips =	97.69
63% of Trips In =	60	63% of Trips In =	62
37% of Trips Out =	35	37% of Trips Out =	36

AM PEAK HOUR of GENERATOR

Average Rate =	0.76	Fitted Curve Equation =	Ln (T) =0.91* Ln(X) + 0.20
Total Trips =	72.96	Total Trips =	77.75
26% of Trips In =	19	26% of Trips In =	20
74% of Trips Out =	54	74% of Trips Out =	58

PM PEAK HOUR of GENERATOR

Average Rate =	1.00	Fitted Curve Equation =	Ln (T) = 0.94* Ln(X) + 0.34
Total Trips =	96.00	Total Trips =	102.56
64% of Trips In =	61	64% of Trips In =	66
36% of Trips Out =	35	36% of Trips Out =	37

SATURDAY

Average Rate =	9.54	Fitted Curve Equation =	Ln (T) = 0.94* Ln(X) +2.56
Total Trips =	915.84	Total Trips =	944.34

PEAK HOUR of GENERATOR

Average Rate =	0.93	Fitted Curve Equation =	T = 0.84 (X) + 17.99
Total Trips =	89.28	Total Trips =	98.63
54% of Trips In =	48	54% of Trips In =	53
46% of Trips Out =	41	46% of Trips Out =	45

SUNDAY

Average Rate =	8.55	Fitted Curve Equation =	T = 8.87 (X) -65.12
Total Trips =	820.8	Total Trips =	786.40

PEAK HOUR of GENERATOR

Average Rate =	0.85	Fitted Curve Equation =	T =0.79 (X) + 11.02
Total Trips =	81.6	Total Trips =	86.86
53% of Trips In =	43	53% of Trips In =	46
47% of Trips Out =	38	47% of Trips Out =	41

ITE TRIP GENERATION

10TH EDITION

Intersection	
Int Delay, s/veh	1.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	41	368	5	13	87
Future Vol, veh/h	14	41	368	5	13	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	15	45	400	5	14	95

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	526	403	0	0	405	0
Stage 1	403	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	512	647	-	-	1154	-
Stage 1	675	-	-	-	-	-
Stage 2	902	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	505	647	-	-	1154	-
Mov Cap-2 Maneuver	505	-	-	-	-	-
Stage 1	675	-	-	-	-	-
Stage 2	890	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.6	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	604	1154	-
HCM Lane V/C Ratio	-	-	0.099	0.012	-
HCM Control Delay (s)	-	-	11.6	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.3	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	27	98	16	46	228
Future Vol, veh/h	9	27	98	16	46	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	29	107	17	50	248

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	464	116	0	0	124	0
Stage 1	116	-	-	-	-	-
Stage 2	348	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	556	936	-	-	1463	-
Stage 1	909	-	-	-	-	-
Stage 2	715	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	534	936	-	-	1463	-
Mov Cap-2 Maneuver	534	-	-	-	-	-
Stage 1	909	-	-	-	-	-
Stage 2	686	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.8	0	1.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	788	1463	-
HCM Lane V/C Ratio	-	-	0.05	0.034	-
HCM Control Delay (s)	-	-	9.8	7.5	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-

Intersection	
Int Delay, s/veh	1.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	14	41	368	5	13	87
Future Vol, veh/h	14	41	368	5	13	87
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	16	48	428	6	15	101

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	562	431	0	0	434	0
Stage 1	431	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	488	624	-	-	1126	-
Stage 1	655	-	-	-	-	-
Stage 2	895	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	481	624	-	-	1126	-
Mov Cap-2 Maneuver	481	-	-	-	-	-
Stage 1	655	-	-	-	-	-
Stage 2	882	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	1.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	580	1126	-
HCM Lane V/C Ratio	-	-	0.11	0.013	-
HCM Control Delay (s)	-	-	12	8.2	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.4	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	27	98	16	46	228
Future Vol, veh/h	9	27	98	16	46	228
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	31	114	19	54	265

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	497	124	0	0	133	0
Stage 1	124	-	-	-	-	-
Stage 2	373	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	532	927	-	-	1452	-
Stage 1	902	-	-	-	-	-
Stage 2	696	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	509	927	-	-	1452	-
Mov Cap-2 Maneuver	509	-	-	-	-	-
Stage 1	902	-	-	-	-	-
Stage 2	665	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10	0	1.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	769	1452	-
HCM Lane V/C Ratio	-	-	0.054	0.037	-
HCM Control Delay (s)	-	-	10	7.6	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.1	-