

Traffic Impact Study

Cumberland Farms Development

2880 Acushnet Avenue, New Bedford, MA



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INTRODUCTION

McMahon Associates has completed a review of the existing traffic operations and potential traffic impacts associated with the proposed Cumberland Farms and car wash development project in New Bedford, MA. The purpose of this traffic impact study is to evaluate existing and projected traffic operations and safety conditions associated with the proposed development project within the study area.

The assessment documented in this traffic impact study is based on a review of existing traffic volumes, recent crash data, and the anticipated traffic generating characteristics of the proposed project. The study examines existing and projected traffic operations (both with and without the proposed development) at key intersections in the vicinity of the project site. The study area was selected based on a review of the surrounding roadway network and expected trip generating characteristics of the proposed project. This study provides a detailed analysis of traffic operations during the weekday morning and weekday afternoon peak hours, when the adjacent roadway volumes are greatest.

Based on the analysis presented in this study, the project-related traffic estimated to be generated by the proposed development are shown to have a minimal effect on the area roadways and intersections. The following report documents these findings.

Project Description

The proposed Cumberland Farms and car wash development would be located on at 2880 Acushnet Avenue in New Bedford, MA, as shown in Figure 1. The site is currently occupied by three residential buildings with two driveways which provide access Acushnet Avenue (Route 18) and undeveloped land. The site is bounded by commercial land uses to the north and south, undeveloped land to the east, and Acushnet Avenue to the west. The proposed project would include a 5,275 square foot Cumberland Farms convenience market, five gasoline pumps (10 fueling positions) and a 2,640 square foot car wash. Access to the proposed site would be provided via two full-access driveways located on Acushnet Avenue, one north and one south at the signalized intersection of Acushnet Avenue and Ashley Boulevard (Route 18).



Figure 1
Site Location Map
Cumberland Farms Development
New Bedford, Massachusetts

Study Methodology

This traffic impact study evaluates existing and projected traffic operations within the project study area during the weekday morning and weekday afternoon peak hour traffic conditions when the adjacent roadway volumes are greatest.

The study was conducted in three steps. The first step consisted of an inventory of existing traffic conditions within the project study area. As part of this inventory, manual turning movement counts were collected at key intersections during the weekday morning and weekday afternoon peak hours. A field visit was also completed to document intersection and roadway geometries and available sight distances at the proposed site driveways. Crash data for the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) to determine if the study area has any existing traffic safety deficiencies.

The second step of the study builds upon the data collected in the first step to establish the basis for evaluating potential transportation impacts associated with the projected future conditions. During this second step, the projected traffic demands associated with any planned future developments that could influence traffic volumes at the study area intersections were assessed. Consistent with MassDOT traffic study guidelines, the 2018 Existing traffic volumes were forecasted to the future year 2025 to determine 2025 No Build (without project) conditions and 2025 Build (with project) conditions.

The third step of this study determined if measures were necessary to improve existing or future traffic operations and safety, minimize potential traffic impacts, and provide safe and efficient access to the proposed project site.

Study Area Intersections

Based on a review of the anticipated traffic generating characteristics of the proposed convenience store with gas station and car wash and a review of the adjacent roadways serving the project site, the following study area intersections were selected for detailed analysis:

- Acushnet Avenue at Ashley Boulevard (Route 18)
- Acushnet Avenue (Route 18) at North Site Driveway
- Acushnet Avenue at South Site Driveway

The traffic impact study presented in the report documents existing and future traffic conditions for the study area intersections noted above.

EXISTING CONDITIONS

An accurate assessment of the potential traffic impacts associated with the proposed Cumberland Farms development requires a comprehensive understanding of the existing traffic conditions within the project study area. The existing conditions assessment included in this study consists of an inventory of intersection and roadway geometries, an inventory of traffic control devices, the collection of peak period traffic volumes, and a review of recent crash data, summarized below.

Roadway Network and Intersections

The project site benefits from excellent access via the local and regional roadway system. A brief description of the principal roadways providing access to the project site is presented below.

Acushnet Avenue (Route 18)

Acushnet Avenue generally travels in a north to southeast direction (designated as north to south for the purposes of this report) through the City of New Bedford within the vicinity of the site. The roadway is classified as an urban minor arterial under the City of New Bedford jurisdiction. Acushnet Avenue becomes Route 18 north of its intersection with Ashley Boulevard (Route 18). Acushnet Avenue generally provides two lanes of travel in each direction. At its signalized intersection with Ashley Boulevard (Route 18), Acushnet Avenue provides two exclusive right-turn lanes in the northbound direction to continue onto Acushnet Avenue and provides an exclusive left-turn lane and an exclusive through lane on the southbound approach. Sidewalks are provided on both sides of Acushnet Avenue measuring approximately 5.5 feet in width at the intersection. The posted speed limit along Acushnet Avenue is 30 miles per hour within the study area.

Ashley Boulevard (Route 18)

Ashley Boulevard (Route 18) generally travels in a north to south direction through the City of New Bedford. The roadway is classified as an urban principal arterial under the City of New Bedford jurisdiction. Ashley Boulevard (Route 18) generally provides two lanes of travel in each direction. Sidewalks are provided on both sides of Ashley Boulevard (Route 18) measuring between 5 feet and 7 feet in width. Bike lanes are not currently provided on Ashley Boulevard (Route 18). Ashley Boulevard (Route 18) generally provides access to commercial and residential land uses within the vicinity of the project site.

Multi-Modal Accommodations

Bike lanes are not currently provided on Acushnet Avenue or Ashley Boulevard (Route 18). The Southeastern Regional Transit Authority Routes NB4 Bus (Ashley Boulevard) and NB21 Bus (North End Shuttle) provides service along Acushnet Avenue and Ashley Boulevard, with a stop provided at Acushnet Avenue and Victoria Street.

Existing Traffic Volumes

Existing Peak Hour Traffic Volumes

To assess peak hour traffic conditions, manual turning movement counts were conducted at the intersection of Acushnet Avenue at Ashley Boulevard (Route 18) during the weekday morning and weekday afternoon peak periods. Counts were conducted on Tuesday, April 10, 2018 from 7:00 AM to 9:00 AM and from 2:00 PM to 6:00 PM. The results of the turning movement counts are tabulated by 15-minute periods and are provided in Appendix A of this report. The four highest consecutive 15-minute intervals during each of these count periods constitute the peak hours that are the basis of the traffic analysis provided in this report. Based on a review of the peak period traffic data, the weekday morning peak hour occurs between 7:15 AM and 8:15 AM and the weekday afternoon peak hour occurs from 4:45 PM to 5:45 PM.

Automatic traffic recorder (ATR) data was collected along Acushnet Avenue, north of Belair Street and north of Victoria Street for a 24-hour period on Tuesday, April 10, 2018 which has been included in Appendix A. The ATR collected traffic volume, vehicle speed and vehicle classification data. The speed data collected as part of this ATR has been utilized as part of the sight distance analysis documented subsequently in this report. A summary of the ATR data is provided in Table 1 below.

Table 1: Acushnet Avenue Automatic Traffic Recorder Data

<u>Location</u>	<u>Direction</u>	<u>ADT⁽¹⁾</u>	<u>85th Percentile Speed</u>
North of Belair Street	NB	8,640	30
	SB	<u>8,520</u>	<u>38</u>
	Overall	17,160	n/a
North of Victoria Street	NB	5,770	35
	SB	<u>5,040</u>	<u>34</u>
	Overall	10,810	n/a

(1) Average daily traffic volume in vehicles per day.

Based on the ATR data, the average daily traffic volume on Acushnet Avenue north of the signalized intersection is approximately 17,160 vehicles and south of the intersection on Acushnet Avenue the average daily traffic volume is approximately 10,810 vehicles.

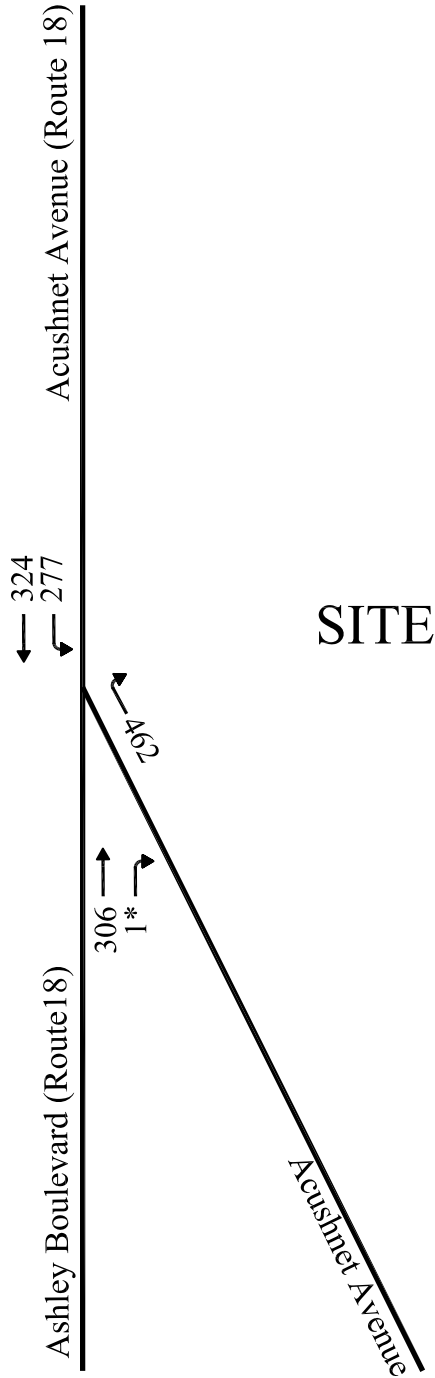
Seasonal Variation

In order to account for seasonal variation in traffic volumes, continuous count data from a nearby count station on Interstate 195 in Dartmouth, MA was reviewed. Based on the seasonal adjustment trends of the data, traffic counts collected during the month of April are shown to be representative of an average month. Therefore, the existing peak hour traffic volumes were not adjusted. The seasonal adjustment data from the continuous count station is provided in Appendix B of this report. The resulting peak hourly traffic flows for the 2018

Existing conditions are depicted in Figure 2 for the weekday morning peak hour and Figure 3 for the weekday afternoon peak hour.



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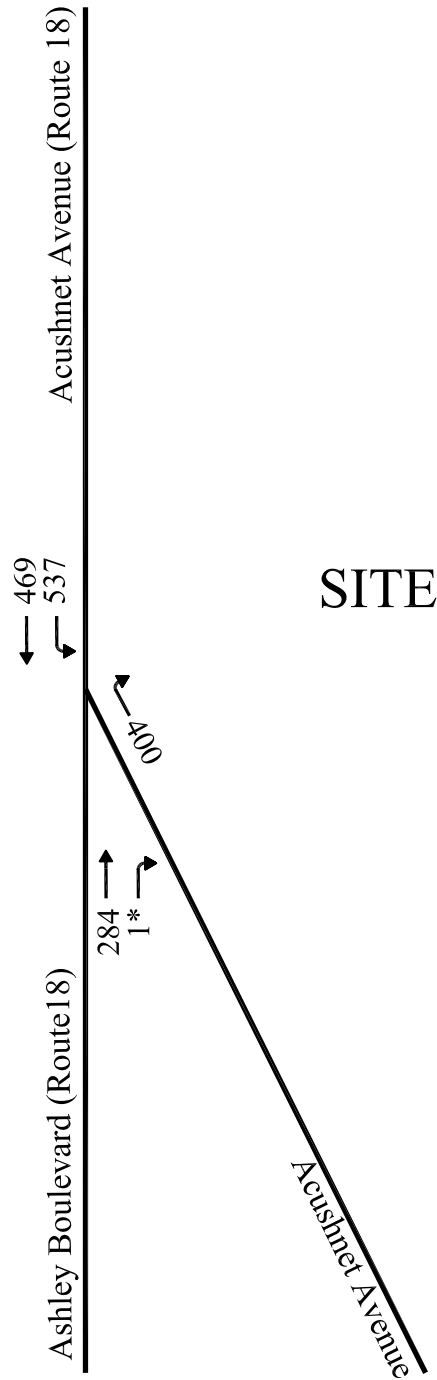
Legend

X* Illegal Movement

Figure 2
2018 Existing Weekday Morning
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts



SCHEMATIC-
NOT TO SCALE



SITE

Legend

X* Illegal Movement

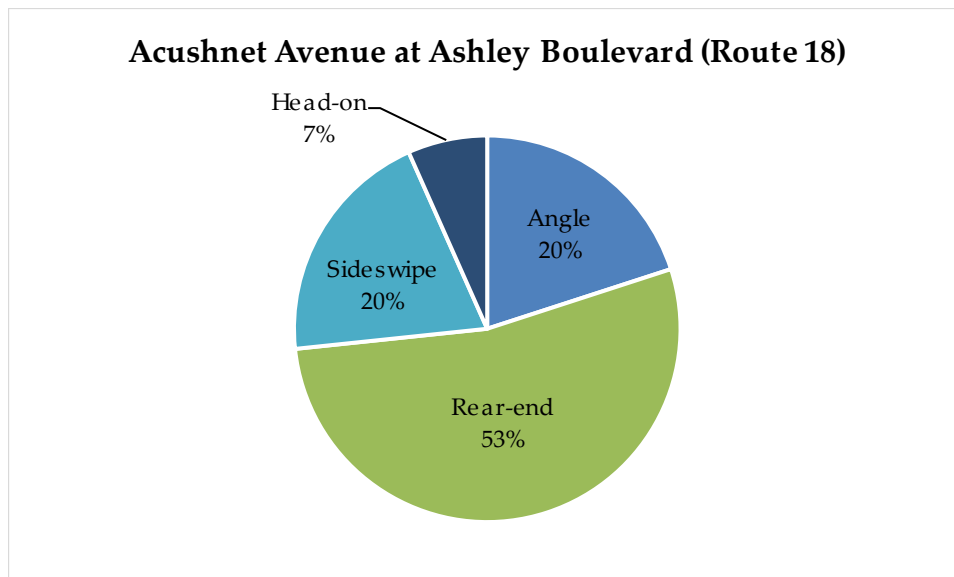
Figure 3
2018 Existing Weekday Afternoon
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts

Crash Summary

Crash data for the study area intersection was obtained from MassDOT for the most recent five-year period available. This data includes complete yearly crash summaries for 2012, 2013, 2014, 2015, and 2016. A summary of the crash data is presented in Appendix C.

The MassDOT Crash Rate Worksheet was used to determine whether the crash frequencies at the study area intersections were unusually high given the travel demands at each location. The MassDOT Crash Rate Worksheet calculates a crash rate expressed in crashes per million entering vehicles. The calculated rate was then compared to the average rate for signalized and unsignalized intersections statewide and within MassDOT District 5. For signalized intersections, the statewide average crash rate is 0.77 crashes per million entering vehicles and the MassDOT District 5 crash rate is 0.76 crashes per million entering vehicles. A summary of crash types at the intersection of Acushnet Avenue at Ashley Boulevard (Route 18) is depicted in Figure 4.

Figure 4: Intersection Crash Summary



The intersection of Acushnet Avenue at Ashley Boulevard (Route 18) is shown to have experienced 15 crashes over the five-year period between 2012 and 2016. The resulting crash rate of 0.38 crashes per million entering vehicles is well below both the statewide and District 5 averages for signalized intersections. Of the reported crashes at this intersection, three were angle crashes, eight were rear-end collisions, three were sideswipes, and one was head-on. Of the 15 reported crashes, ten resulted in property damage only and five resulted in personal injury. No fatal crashes were reported at this intersection through the MassDOT data.

Additional Field Review

Observations were conducted to understand the critical gap acceptance behavior of vehicles at unsignalized intersections within the study area. Observations were performed during the weekday afternoon peak hour on Tuesday, May 15, 2018 at the intersection of Acushnet Avenue at Belair Street. The purpose of the supplemental review was to determine the minimum gap drivers are willing to accept when making a left or right turn onto Acushnet Avenue. When a vehicle exited Belair Street, the accepted gap was recorded in half second intervals.

A review of the critical gap acceptance data determined that the gap acceptance time provided in the HCM (6.9 seconds for a right-turn and 7.5 seconds for a left-turn onto a four-lane roadway) is overly conservative compared to what drivers are accepting along Acushnet Avenue. Gaps as short as 3.0 to 3.5 seconds were shown to be accepted by both left and right turning vehicles. Based on a review of the field measured accepted gaps, the critical gap acceptance within the capacity analysis for this project was adjusted to 6.5 seconds for a turning movement exiting a stop-controlled roadway within the study area.

FUTURE CONDITIONS

To determine future traffic demands on the study area roadways and intersections, the 2018 Existing traffic volumes were projected to the future-year 2025, by which time the proposed project would be expected to be built and occupied. Traffic volumes on the study area roadways in 2025 are assumed to include all existing traffic, as well as new traffic resulting from general growth in the study area and from other planned development projects, independent of the proposed convenience store with gas station and car wash. The potential background traffic growth, unrelated to the proposed project, was considered in the development of the 2025 No Build (without project) peak hour traffic volumes. The estimated traffic increases associated with the proposed project were then added to the 2025 No Build volumes to reflect the 2025 Build (with project) traffic conditions. A more detailed description of the development of the 2025 No Build and 2025 Build traffic volume networks is presented below.

Future Roadway Improvements

Planned roadway improvement projects can impact travel patterns and future traffic operations. MassDOT project information was consulted to develop and understanding of future area roadway improvement projects. According to MassDOT project information, there are no planned roadway improvements within the vicinity of the project site that are expected to significantly alter traffic flow or operations within the study area.

Background Traffic Growth

Traffic growth is generally a function of changes in motor vehicle use and expected land development within the area. In order to predict the rate at which traffic on the study area roadways can be expected to grow during the seven-year forecast period (2018 to 2025), both planned area developments and historic traffic growth were reviewed.

Site-Specific Growth

One site-specific development was identified for inclusion in the background growth of this study based on its proximity to the project site and trip generation characteristics. The development is proposed to include 15-single family homes to be located off of Philips Road, north of the Cumberland Farms project site. New trip volumes associated with the development were identified based on the traffic impact study completed by Vanasse & Associates, Inc. (VAI) in August 2017. The traffic volumes associated with the residential development are provided in Appendix E and are documented in the traffic projection model located in Appendix F.

Historic Traffic Growth

The Southern Regional Planning and Economic Development District (SRPEDD) was contacted to determine an annual growth rate for the study area. SRPEDD recommended an annual growth rate of one percent. The one percent growth rate, compounded annually, was

utilized to capture traffic growth associated with general changes in population, other smaller developments and developments that may not be known at this time to forecast increases in traffic volumes on the study area roadways and intersections.

2025 No Build Traffic Volumes

The 2018 Existing peak hour traffic volumes were grown by one percent per year (compounded annually) over the seven-year study horizon (2018 to 2025) to establish the 2025 base traffic volumes. Trips expected to be generated by the additional developments were then added to the 2025 base future volumes utilizing the methodologies described above. The resulting 2025 No Build weekday morning and weekday afternoon peak hour traffic volumes are illustrated in Figure 5 and Figure 6, and are documented in the traffic projection model presented in Appendix E of this report.



SCHEMATIC-
NOT TO SCALE

Acushnet Avenue (Route 18)

349
299

SITE

496

Ashley Boulevard (Route 18)

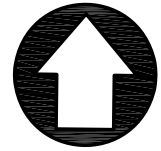
328
1*

Acushnet Avenue

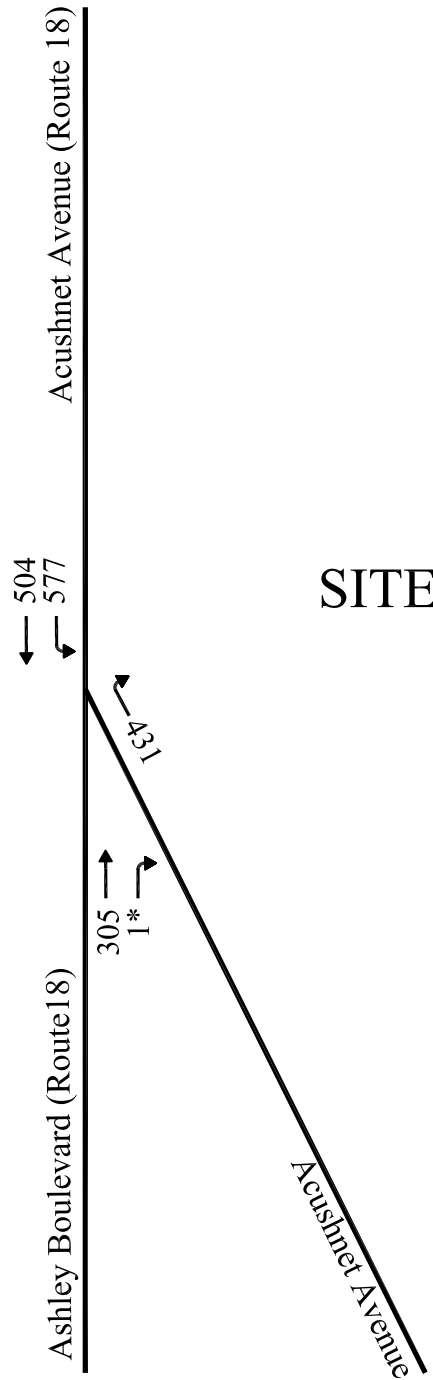
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X* Illegal Movement

Figure 5
2025 No Build Weekday Morning
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts



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SITE

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X* Illegal Movement

Figure 6
2025 No Build Weekday Afternoon
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts

Site-Generated Traffic

In order to estimate the number of vehicle trips associated with the proposed Cumberland Farms development, the Institute of Transportation Engineers’ (ITE) publication, *Trip Generation Manual, 10th Edition*, was referenced. ITE is a national research organization of transportation professionals, and *The Trip Generation Manual, 10th Edition* provides traffic generation information for various land uses compiled from studies conducted by members nationwide. Vehicle trip estimates for the proposed Cumberland Farms development project were developed based on data presented in this publication for Land Use Code 960 (Super Convenience Market/Gas Station) and Land Use Code 948 (Automated Car Wash). Based on LUC 960 trip generation, vehicle trips to the car wash component of a gasoline station have been estimated to be approximately 20% higher during the weekday morning peak than the weekday afternoon peak. These references establish vehicle trips rates (in this case expressed in trips per square foot) based on actual traffic counts conducted at similar existing land uses.

Not all (driveway) trips to convenience markets with gasoline pumps are “new” trips. In fact, a significant portion of the total trips attracted to such retail uses are “pass-by” trips. The ITE publication does not currently provide pass-by rates for Land Use Code 960 and therefore, the land use category “Convenience Market with Gasoline Pumps” was utilized. Based on this land use, approximately 63 percent of the total weekday morning trips and 66 percent of the total weekday afternoon trips attracted to this type of retail use are attributed to pass-by trips. The vehicle trips expected to be generated by the proposed convenience market and gasoline station development are separated into pass-by vehicle trips and new vehicle trips which were then added to the vehicle trips expected to be generated by the proposed car wash, as shown in Table 2.

Table 2: Summary of New and Pass-by Trips

Description	Weekday AM			Weekday PM		
	Peak Hour			Peak Hour		
	In	Out	Total	In	Out	Total
Total Convenience/Gas Trips ⁽¹⁾	140	140	280	115	115	230
- Pass-By Trips ⁽²⁾	<u>88</u>	<u>88</u>	<u>176</u>	<u>76</u>	<u>76</u>	<u>152</u>
- New Convenience/Gas Trips	52	52	104	39	39	78
Car Wash Trips ⁽³⁾	<u>23</u>	<u>23</u>	<u>46</u>	<u>19</u>	<u>19</u>	<u>38</u>
Total New Trips⁽⁴⁾	75	75	150	58	58	116

(1) ITE Land Use Code 960 (Super Convenience Market/Gas Station), based on 10 vehicle fueling positions.

(2) Based on LUC 853 63% of AM and 66% of PM peak hour trips are attributed to “pass-by” trips.

(3) ITE Land Use Code 948 (Automated Car Wash), based on 2,640 s.f. building for weekday afternoon trip generation.

(4) Summation of new project trips from convenience market, gasoline station, and car wash.

Since pass-by traffic is already on the adjacent roadways, this portion of the total development traffic is reflected in the existing traffic volumes and does not represent additional traffic on the roadway network. Therefore, the total proposed development traffic volume is reduced by the pass-by trips to estimate the new traffic generated by the proposed development. As shown in Table 2, the peak hour trip generation of the proposed Cumberland Farms is estimated to result in an increase of approximately 150 new vehicle trips (75 entering vehicles and 75 exiting vehicles) during the weekday morning peak hour and an increase of approximately 116 new vehicle trips (58 entering vehicles and 58 exiting vehicles) during the weekday afternoon peak hour.

The total new proposed development traffic volumes did not account for pass-by volumes for the proposed car wash component or internal capture between the convenience store and gas station uses and the car wash use. Since pass-by trips and internal capture trips associated with the car wash would reduce the overall traffic volume to and from the project site, the trip generation and associated analysis presented in this report is considered to be conservative.

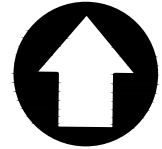
Project Site Distribution and Assignment

The additional traffic projected to be generated by the proposed development was distributed onto the study area roadways and intersections based on the existing travel patterns of the adjacent roadways. Vehicle trips accessing the project site were assigned to the site driveways based on location of proposed parking spaces and ease of access to Acushnet Avenue and Ashley Boulevard. The resulting arrival and departure patterns are presented in Figure 7 and are documented in the traffic projection model found in Appendix E.

The project-related traffic was assigned to the surrounding roadway network based on the project trip distribution patterns presented in Figure 7. The resulting distributed new project trips are shown in Figure 8 and Figure 9 for the weekday morning and weekday afternoon peak hours, respectively.

2025 Build Traffic Volumes

To establish the 2025 Build peak hour traffic volumes, the distributed new project trips and diverted pass-by trips were then added to the 2025 No Build peak hour traffic volumes to reflect the 2025 Build peak hour traffic volumes. The resulting 2025 Build weekday morning and weekday afternoon peak hour traffic volumes are presented in Figure 10 and Figure 11, respectively, and are documented in the traffic projection model presented in Appendix E of this report.



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50% 

Acushnet Avenue (Route 18)

North Site Driveway

SITE

Ashley Boulevard (Route 18)

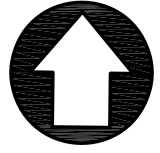
South Site Driveway

Acushnet Avenue

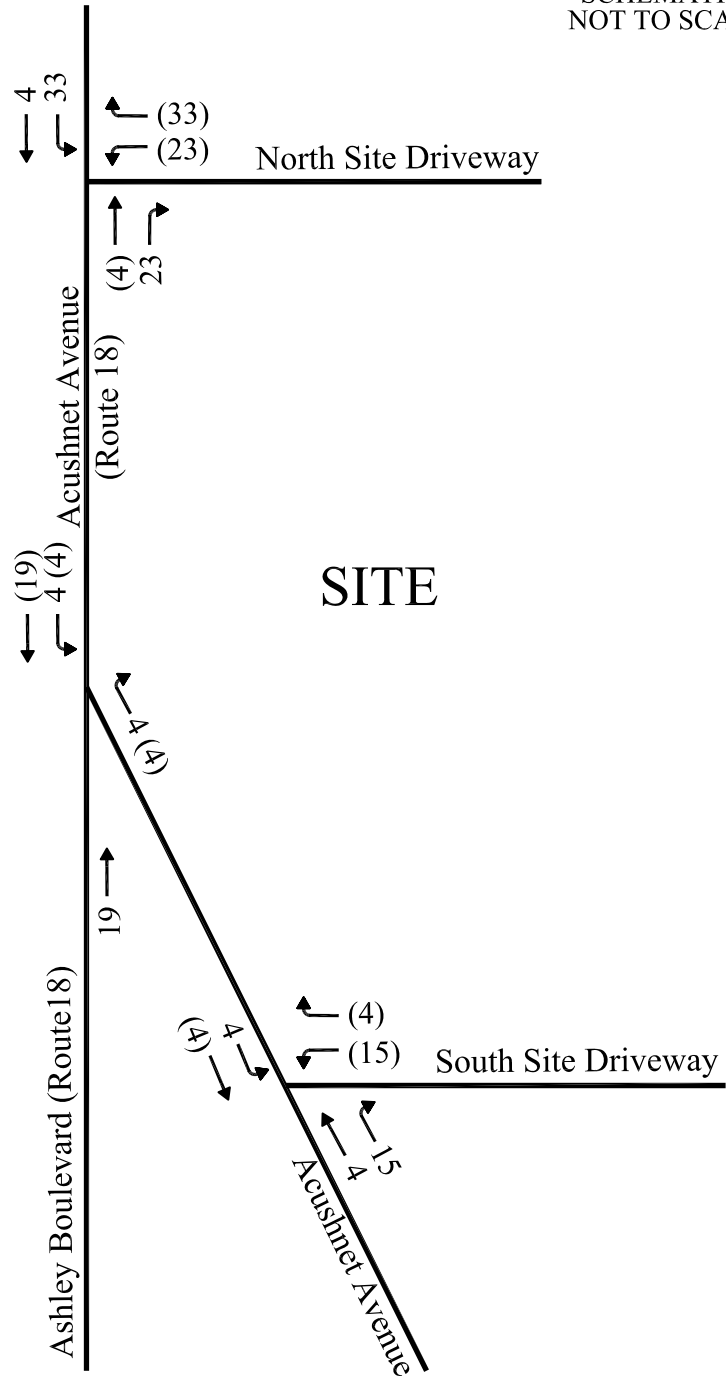
25% 

 25%

Figure 7
Directions of Arrival and Departure
Cumberland Farms
New Bedford, Massachusetts



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NOT TO SCALE

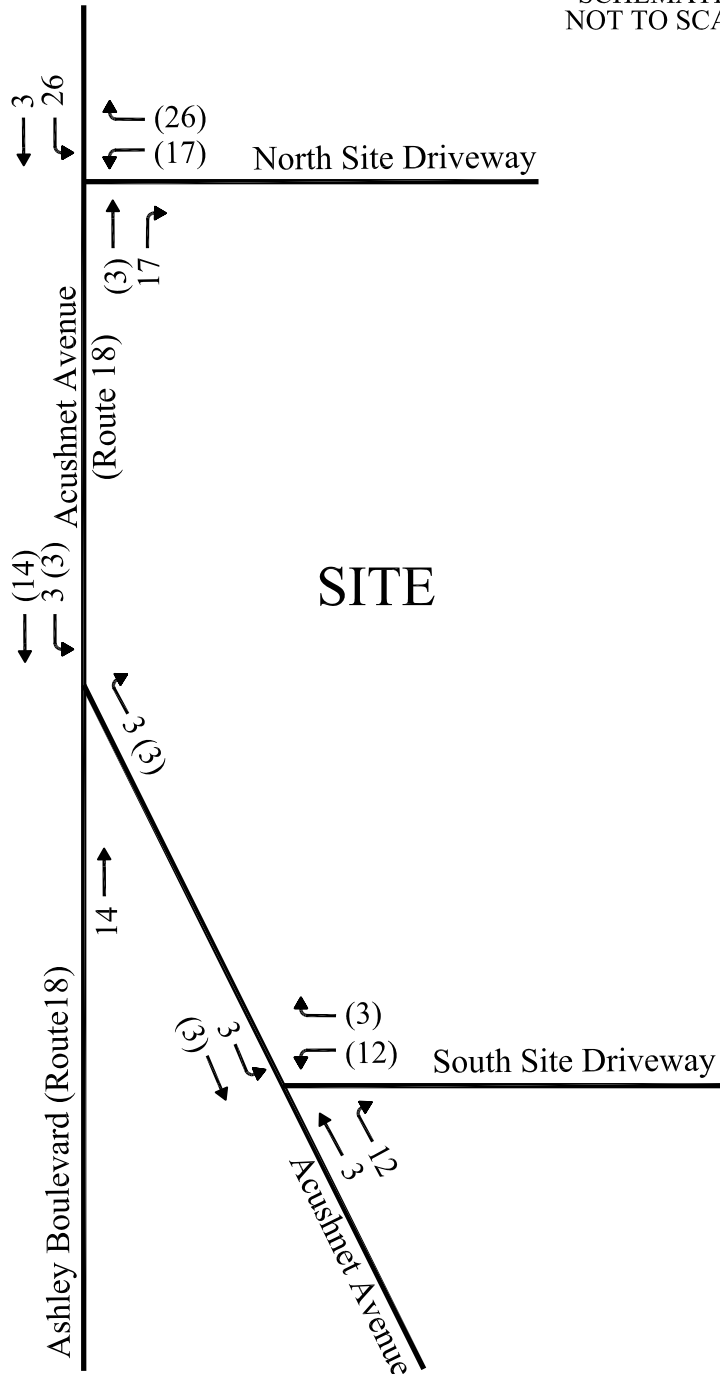


Legend
Entering (Exiting)

Figure 8
Weekday Morning Peak Hour
New Project Trips
Cumberland Farms
New Bedford, Massachusetts

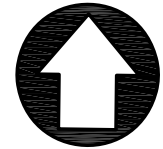


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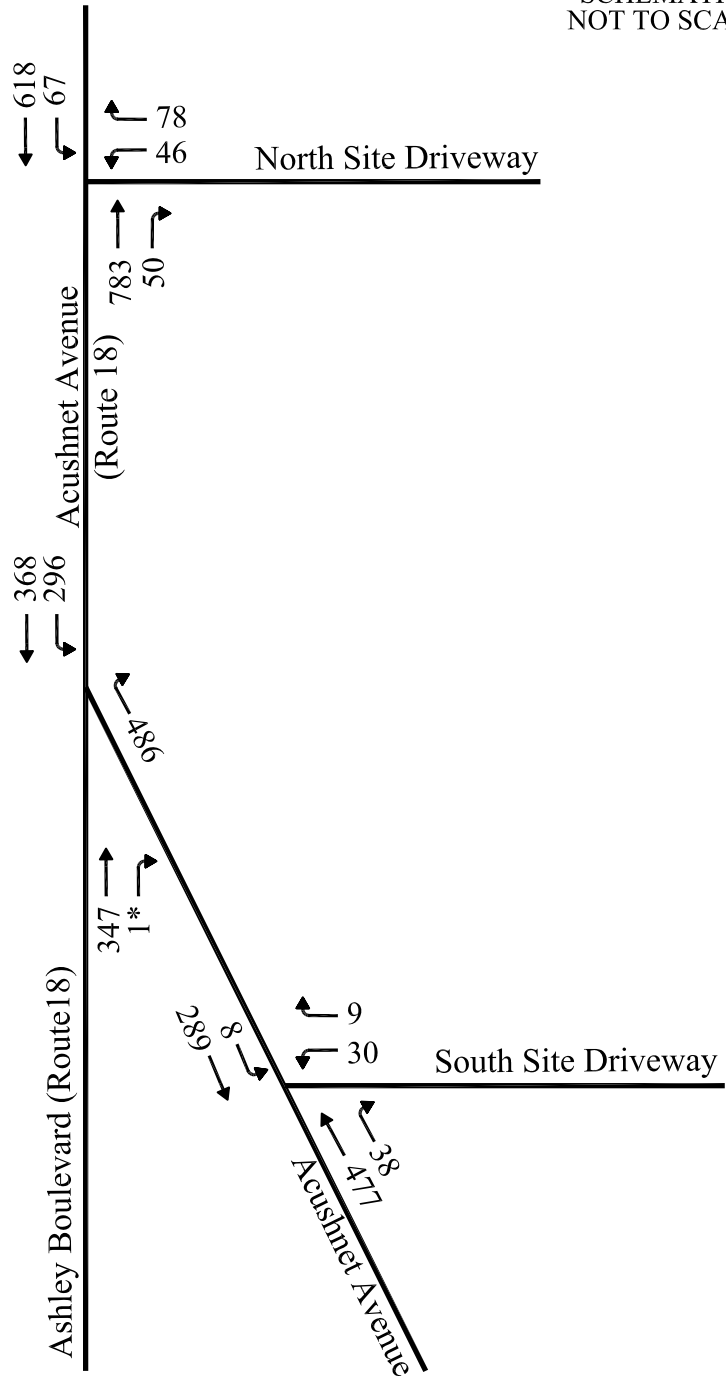


Legend
Entering (Exiting)

Figure 9
Weekday Afternoon Peak Hour
New Project Trips
Cumberland Farms
New Bedford, Massachusetts



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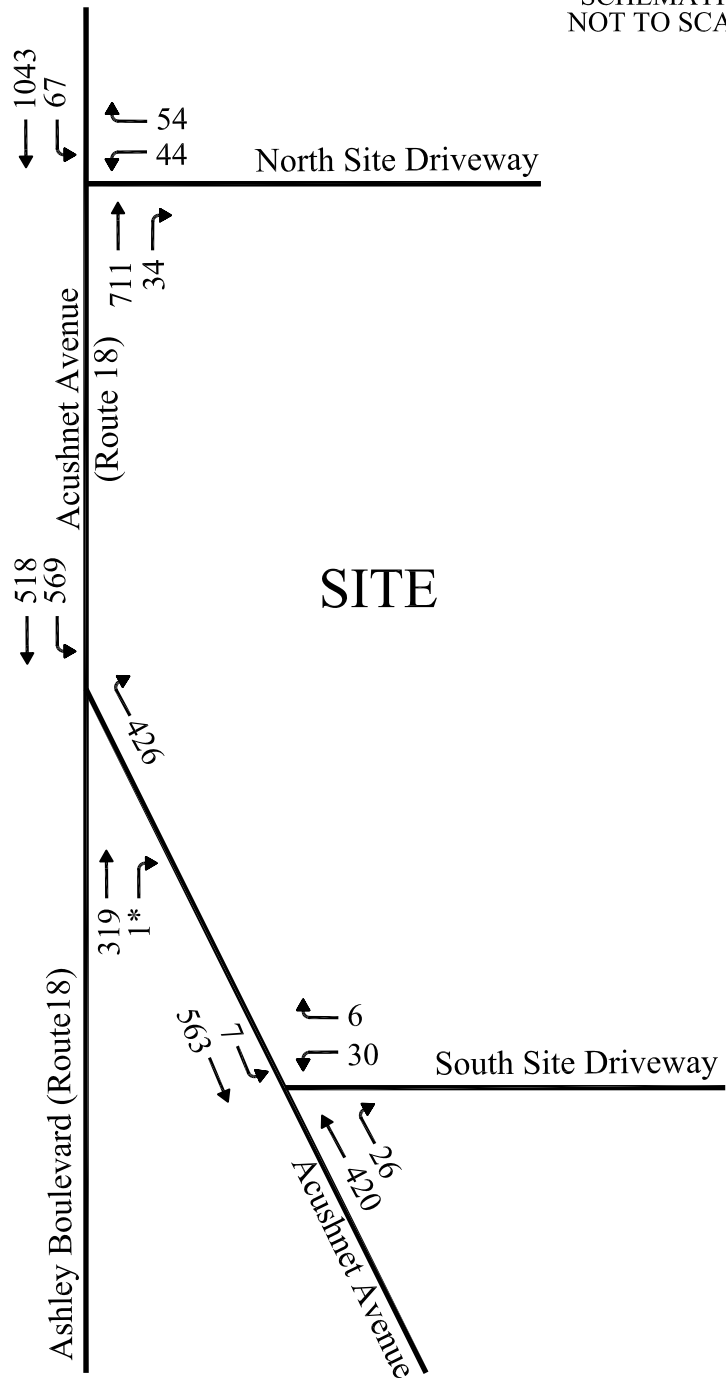
Legend

X* Illegal Movement

Figure 10
2025 Build Weekday Morning
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts



SCHEMATIC-
NOT TO SCALE



SITE

Legend

X* Illegal Movement

Figure 11
2025 Build Weekday Afternoon
Peak Hour Traffic Volumes
Cumberland Farms
New Bedford, Massachusetts

TRAFFIC OPERATIONS ANALYSIS

In previous sections of this report, the quantity of traffic at the study area intersections has been discussed. This section describes the overall quality of the traffic flow at the study area intersections during the weekday morning and weekday afternoon peak hours. As a basis for this assessment, intersection capacity analyses were conducted using the Synchro capacity analysis software at the study area intersections under the 2018 Existing, 2025 No Build and 2025 Build peak hour traffic conditions. The analysis is based on Synchro capacity analysis methodologies and procedures contained in the *Highway Capacity Manual, 6th Edition* (HCM), which is summarized in Appendix G. A discussion of the evaluation criteria and a summary of the results of the capacity analyses are presented below.

Level-of-Service Criteria

Average total vehicle delay is reported as level-of-service (LOS) on a scale of A to F. LOS A represents delays of 10 seconds or less and LOS F represents delays in excess of 50 seconds for unsignalized movements and greater than 80 seconds for movements at signalized intersections. A more detailed description of the LOS criteria is provided in Appendix F.

Capacity Analysis Results

Intersection capacity analyses were conducted using Synchro capacity analysis software for the study area intersections to evaluate the 2018 Existing, 2025 No Build and 2025 Build traffic conditions. As mentioned previously, the peak hour traffic volumes utilized as part of this analysis are provided in the traffic projection model, attached in Appendix E of this report.

The Synchro capacity analysis results for the 2018 Existing, 2025 No Build and 2025 Build traffic conditions are presented in Appendix G, Appendix H, and Appendix I, respectively. The overall results of the intersection capacity analysis for the signalized study area intersection of Acushnet Avenue at Ashley Boulevard (Route 18) is presented in Table 3 below. Table 4 summarizes the level-of-service results for the critical movements at the unsignalized site driveways during the weekday morning and weekday afternoon peak hours. A more detailed summary of the capacity analysis for the study area intersections is provided in Appendix J. The results of the specific capacity analysis at the study area intersections is discussed below.

Table 3: Signalized Peak Hour Intersection Capacity Analysis Results

Intersection	2018 Existing				2025 No Build			2025 Build		
	LOS ⁽¹⁾	Delay ⁽²⁾	V/C ⁽³⁾	LOS	Delay	V/C	LOS	Delay	V/C	
Acushnet Avenue at	AM	B	12.4	0.56	B	12.9	0.59	B	12.9	0.59
Ashley Boulevard (Route 18)	PM	B	13.2	0.61	B	13.9	0.65	B	13.9	0.65

(1) Level-of-Service

(2) Average vehicle delay, in seconds

(3) Volume to capacity ratio

Acushnet Avenue at Ashley Boulevard (Route 18)

Based on a review of the capacity analysis, the signalized intersection of Acushnet Avenue at Ashley Boulevard (Route 18) is shown to currently operate at overall LOS B during the weekday morning and weekday afternoon peak hours. Under the 2025 No Build conditions, the intersection is projected to continue to operate at overall LOS B during the weekday morning and weekday afternoon peak hours. With the proposed project in place, the signalized intersection is projected to continue to operate at overall LOS B during the weekday morning and weekday afternoon peak hours, with no increase in delay from the 2025 No Build condition. With the proposed project in place, the intersection is projected to continue to operate under capacity during the weekday morning and weekday afternoon peak hours.

Table 4: Unsignalized Peak Hour Intersection Capacity Analysis Results

Intersection	Movement	2025 Build			
		LOS ⁽¹⁾	Delay ⁽²⁾	V/C ⁽³⁾	
Acushnet Avenue (Route 18) at	WB LR	AM	D	34.6	0.54
North Site Driveway		PM	E	42.9	0.54
Acushnet Avenue at	WB LR	AM	C	16.2	0.12
South Site Driveway		PM	C	21.7	0.15

(1) Level-of-Service

(2) Average vehicle delay, in seconds

(3) Volume to capacity ratio

Acushnet Avenue (Route 18) at North Site Driveway

The capacity analysis indicates that under the 2025 Build conditions, the westbound movement exiting the proposed full-access driveway from the North Site Driveway on Acushnet Avenue (Route 18) is projected to operate at LOS D during the weekday morning peak hour and operate at LOS E during the weekday afternoon peak hour. The site driveway is projected to operate under capacity during the weekday morning and weekday afternoon peak hours. The proposed site driveway is projected to have little impact on Acushnet Avenue (Route 18) operations.

Acushnet Avenue at South Site Driveway

Under the 2025 Build condition, the westbound movement exiting the South Site Driveway onto Acushnet Avenue is projected to operate at LOS C during the weekday morning and weekday afternoon peak hours. The South Site Driveway is projected to operate well under capacity during the weekday morning and weekday afternoon peak hours. The proposed site driveway is projected to have little impact on Acushnet Avenue operations.

Site Access and Circulation

Access to the proposed Cumberland Farms development is proposed to be provided via two full-access, unsignalized driveways on Acushnet Avenue; one to be located north of Belair Street and one located south of the signalized intersection with Ashley Boulevard.

Each of the site driveways has been located as far from the signalized intersection of Acushnet Avenue and Ashley Boulevard (Route 18) as the site allows in order to minimize interaction with the adjacent intersection and provide sufficient sight distance for vehicles exiting from the driveway, as described below.

The Cumberland Farms convenience store with gasoline station and car wash development has been designed to provide safe and efficient movement throughout the site. Fuel tanker trucks are expected to enter the site via the North Site Driveway to access the underground storage tankers and exit via the South Site Driveway. The project site driveways are shown to operate with minimal vehicle queues and are not anticipated to impact site operations or the operations on the adjacent roadways.

Sight Distance

A field review of the available sight distance was conducted at the location of the two proposed full-access site driveways on Acushnet Avenue. Vehicle speeds collected through the ATR counts indicate that the 85th percentile speed on Acushnet Avenue (Route 18) located north of Belair Street is approximately 30 miles per hour for vehicles traveling in the northbound direction and approximately 38 miles per hour for vehicles traveling southbound. Therefore, a speed of 40 miles per hour was utilized in the sight distance review for the North Site Driveway. Vehicle speeds collected through the ATR counts indicate that the 85th percentile speed on Acushnet Avenue located south of the signalized intersection is approximately 35 miles per hour for vehicles traveling in the northbound direction and approximately 34 miles per hour for vehicles traveling southbound. Therefore, a speed of 35 miles per hour was utilized in the sight distance review for the South Site Driveway.

The American Association of State Highway and Transportation Officials (AASHTO) publication, *A Policy on Geometric Design, 2011 Edition*, defines minimum and desirable sight distances at intersections. The minimum sight distance is based on the required stopping sight distance (SSD) for vehicles traveling along the main road. According to AASHTO, "If the available sight distance for an entering or crossing vehicle is at least equal to the

appropriate stopping sight distance for the major road, then drivers have sufficient time to anticipate and avoid collisions.”

Table 5 summarizes the AASHTO sight distance standards for a speed of 40 miles per hour at the North Site Driveway and 35 miles per hour at the South Site Driveway, and the available sight distance at the proposed site driveways.

Table 5: Sight Distance Requirements

Vehicle Location	Direction	SSD	ISD	Available Sight	Meets SSD/ISD
		Required (ft) ⁽¹⁾	Recommended (ft) ⁽²⁾	Distance Measured (ft)	
North Site Driveway	Looking Left (South)	305	415	>500 ⁽³⁾	Yes
	Looking Right (North)	305	470	>500	Yes
South Site Driveway	Looking Left (South)	250	365	>500	Yes
	Looking Right (North)	250	415	>500 ⁽³⁾	Yes

(1) AASHTO stopping sight distance (see AASHTO Table 3-1) for operating speeds of 40 miles per hour for the North Site Driveway and 35 miles per hour for the South Site Driveway.

(2) AASHTO intersection sight distance (see AASHTO Table 9-6 for Case B1, Left Turn from Stop and Table 9-8 for Case B2, Right Turn from Stop).

(3) Sight lines limited by existing vegetation on the site. With proposed clearing >500' of sight lines would be available if vegetation removed.

As shown in Table 5, the available sight distance for a vehicle exiting the proposed North Site Driveway looking to the left (south) and to the right (north) onto Acushnet Avenue (Route 18) is greater than 500 feet, which exceeds the SSD and ISD requirements for 40 miles per hour. The available sight distance looking left (south) and right (north) from the proposed South Site Driveway is greater than 500 feet, which exceeds the SSD and ISD requirements for 35 miles per hour. As part of the proposed project, existing vegetation in front of the site would be removed eliminating any existing obstructions to sight distance and providing for safe operations.

CONCLUSION

The proposed Cumberland Farms development includes the construction of a 5,275 square foot convenience store with five gasoline pumps (10 fueling positions) and a 2,640 square foot car wash located at 2880 Acushnet Avenue in New Bedford, MA. Access to the site is to be provided via two full-access, unsignalized driveways on Acushnet Avenue, one located north and one south of the signalized intersection of Acushnet Avenue and Ashley Boulevard (Route 18).

Based on the analysis presented in this assessment, the Cumberland Farms project is estimated to generate approximately 150 new vehicle trips (75 entering vehicles and 75 exiting vehicles) during the weekday morning peak hour and approximately 116 new vehicle trips (58 entering vehicles and 58 exiting vehicles) during the weekday afternoon peak hour. Pass-by trips and internal capture trips associated with the car wash would not be accounted for as part of this study which would reduce the overall traffic volume to and from the project site. Therefore, the trip generation and associated capacity analysis presented in this report is considered to be conservative.

The capacity analysis indicates that the proposed project would have a negligible impact on the operations of the study area intersections and roadways. Under the 2025 Build condition, the intersection of Acushnet Avenue at Ashley Boulevard (Route 18) is projected to experience minimal increases in delay during the weekday morning and weekday afternoon peak hours from the 2025 No Build condition. The exiting movements at the North Site Driveway are projected to operate at LOS D during the weekday morning peak hour and at LOS E during the weekday afternoon peak hour. The exiting movements at the South Site Driveway are projected to operate at LOS C during the weekday morning and weekday afternoon peak hour. Operations along Acushnet Avenue (Route 18) and Ashley Boulevard (Route 18) are not shown to be significantly impacted by the project. The site driveways have been designed to provide as much distance as possible from the adjacent signal and sufficient sight distance to allow vehicles to enter and exit the site safely.

Based on a review of the analysis contained within this traffic impact study, the proposed Cumberland Farms development is not shown to have an appreciable impact on the traffic operations of the study area roadways and intersections.

Appendix for Traffic Impact Study

Cumberland Farms Development

2880 Acushnet Avenue, New Bedford, MA



Prepared by
McMahon Associates, Inc.
120 Water Street, 4th Floor
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Prepared for
TM Crowley & Associates

November 2018

APPENDIX A

Traffic Volume Data

Transportation Data Corporation

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N/S: Acushnet Avenue/Ashley Boulevard
 E: Acushnet Avenue
 City, State: New Bedford, MA
 Client: McM/R. Hansen

File Name : 05028A
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Groups Printed- Cars & Peds

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	98	65	0	84	0	0	0	43	0	290
07:15 AM	114	60	0	107	0	1	1	73	0	356
07:30 AM	66	65	0	113	0	3	0	82	2	331
07:45 AM	65	69	0	117	0	0	0	60	0	311
Total	343	259	0	421	0	4	1	258	2	1288
08:00 AM	68	68	0	108	0	0	0	81	0	325
08:15 AM	75	71	0	120	0	1	0	58	1	326
08:30 AM	75	60	0	96	0	0	0	39	0	270
08:45 AM	70	65	0	68	0	1	3	32	0	239
Total	288	264	0	392	0	2	3	210	1	1160
Grand Total	631	523	0	813	0	6	4	468	3	2448
Apprch %	54.7	45.3	0	99.3	0	0.7	0.8	98.5	0.6	
Total %	25.8	21.4	0	33.2	0	0.2	0.2	19.1	0.1	

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	114	60	0	174	107	0	1	108	1	73	0	74	356
07:30 AM	66	65	0	131	113	0	3	116	0	82	2	84	331
07:45 AM	65	69	0	134	117	0	0	117	0	60	0	60	311
08:00 AM	68	68	0	136	108	0	0	108	0	81	0	81	325
Total Volume	313	262	0	575	445	0	4	449	1	296	2	299	1323
% App. Total	54.4	45.6	0		99.1	0	0.9		0.3	99	0.7		
PHF	.686	.949	.000	.826	.951	.000	.333	.959	.250	.902	.250	.890	.929

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 Client: McM/R. Hansen

File Name : 05028A
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Groups Printed- Trucks & Buses

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	3	1	0	2	0	0	0	2	0	8
07:15 AM	4	4	0	2	0	0	0	5	0	15
07:30 AM	3	4	0	5	0	0	0	1	0	13
07:45 AM	2	4	0	5	0	0	0	2	0	13
Total	12	13	0	14	0	0	0	10	0	49
08:00 AM	2	3	0	5	0	0	0	2	0	12
08:15 AM	4	4	0	5	0	0	0	1	0	14
08:30 AM	2	2	0	2	0	0	0	1	0	7
08:45 AM	1	4	0	3	0	0	0	3	0	11
Total	9	13	0	15	0	0	0	7	0	44
Grand Total	21	26	0	29	0	0	0	17	0	93
Apprch %	44.7	55.3	0	100	0	0	0	100	0	
Total %	22.6	28	0	31.2	0	0	0	18.3	0	

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
07:15 AM	4	4	0	8	2	0	0	2	0	5	0	5	15
07:30 AM	3	4	0	7	5	0	0	5	0	1	0	1	13
07:45 AM	2	4	0	6	5	0	0	5	0	2	0	2	13
08:00 AM	2	3	0	5	5	0	0	5	0	2	0	2	12
Total Volume	11	15	0	26	17	0	0	17	0	10	0	10	53
% App. Total	42.3	57.7	0		100	0	0		0	100	0		
PHF	.688	.938	.000	.813	.850	.000	.000	.850	.000	.500	.000	.500	.883

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:15 AM

Transportation Data Corporation

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 Client: McM/R. Hansen

File Name : 05028A
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Groups Printed- Bikes by Direction

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
07:00 AM	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
08:00 AM	0	0	0	0	0	0	0	0	0	0
08:15 AM	0	0	0	0	0	0	0	0	0	0
08:30 AM	0	0	0	0	0	0	0	0	0	0
08:45 AM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	0	0	0	0
Apprch %	0	0	0	0	0	0	0	0	0	0
Total %										

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
07:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
07:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 07:00 AM

Transportation Data Corporation

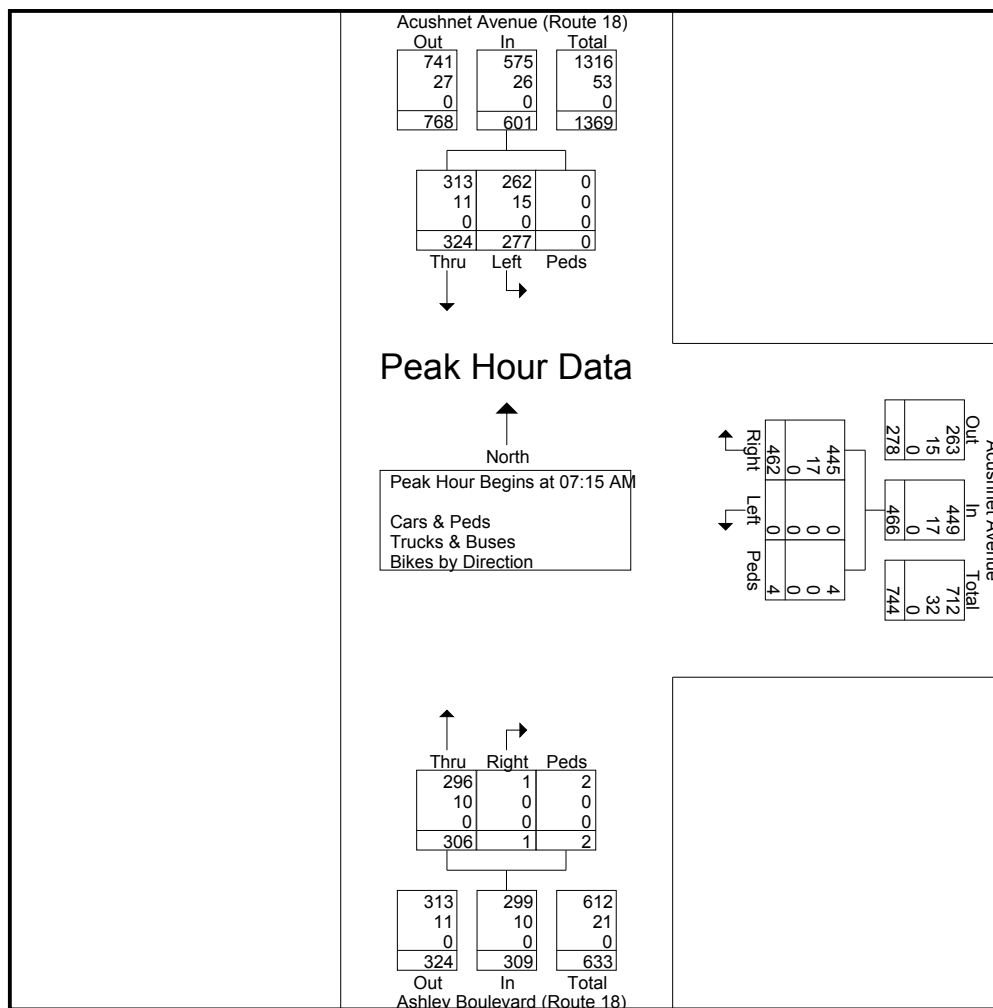
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Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 07:15 AM													
07:15 AM	118	64	0	182	109	0	1	110	1	78	0	79	371
07:30 AM	69	69	0	138	118	0	3	121	0	83	2	85	344
07:45 AM	67	73	0	140	122	0	0	122	0	62	0	62	324
08:00 AM	70	71	0	141	113	0	0	113	0	83	0	83	337
Total Volume	324	277	0	601	462	0	4	466	1	306	2	309	1376
% App. Total	53.9	46.1	0		99.1	0	0.9		0.3	99	0.6		
PHF	.686	.949	.000	.826	.947	.000	.333	.955	.250	.922	.250	.909	.927
Cars & Peds	313	262	0	575	445	0	4	449	1	296	2	299	1323
% Cars & Peds	96.6	94.6	0	95.7	96.3	0	100	96.4	100	96.7	100	96.8	96.1
Trucks & Buses	11	15	0	26	17	0	0	17	0	10	0	10	53
% Trucks & Buses	3.4	5.4	0	4.3	3.7	0	0	3.6	0	3.3	0	3.2	3.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



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File Name : 05028AA
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Groups Printed- Cars & Peds

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
02:00 PM	89	82	0	92	0	0	0	59	1	323
02:15 PM	83	88	0	108	0	0	0	51	0	330
02:30 PM	86	94	0	94	0	0	0	67	0	341
02:45 PM	82	109	0	108	0	1	0	70	1	371
Total	340	373	0	402	0	1	0	247	2	1365
03:00 PM	111	143	0	82	0	0	0	72	2	410
03:15 PM	110	126	0	107	0	0	0	96	0	439
03:30 PM	109	136	0	112	0	0	0	75	1	433
03:45 PM	122	128	0	84	0	0	0	79	0	413
Total	452	533	0	385	0	0	0	322	3	1695
04:00 PM	111	109	0	110	0	0	0	72	0	402
04:15 PM	116	131	0	95	1	0	0	61	0	404
04:30 PM	107	128	0	94	0	0	0	65	0	394
04:45 PM	126	125	0	98	0	0	0	63	0	412
Total	460	493	0	397	1	0	0	261	0	1612
05:00 PM	131	128	0	95	0	0	0	86	0	440
05:15 PM	112	138	0	118	0	0	1	56	0	425
05:30 PM	97	142	0	84	0	0	0	76	0	399
05:45 PM	93	125	0	86	0	0	0	65	0	369
Total	433	533	0	383	0	0	1	283	0	1633
Grand Total	1685	1932	0	1567	1	1	1	1113	5	6305
Apprch %	46.6	53.4	0	99.9	0.1	0.1	0.1	99.5	0.4	
Total %	26.7	30.6	0	24.9	0	0	0	17.7	0.1	

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	111	143	0	254	82	0	0	82	0	72	2	74	410
03:15 PM	110	126	0	236	107	0	0	107	0	96	0	96	439
03:30 PM	109	136	0	245	112	0	0	112	0	75	1	76	433
03:45 PM	122	128	0	250	84	0	0	84	0	79	0	79	413
Total Volume	452	533	0	985	385	0	0	385	0	322	3	325	1695
% App. Total	45.9	54.1	0		100	0	0		0	99.1	0.9		
PHF	.926	.932	.000	.969	.859	.000	.000	.859	.000	.839	.375	.846	.965

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	126	125	0	251	98	0	0	98	0	63	0	63	412
05:00 PM	131	128	0	259	95	0	0	95	0	86	0	86	440
05:15 PM	112	138	0	250	118	0	0	118	1	56	0	57	425
05:30 PM	97	142	0	239	84	0	0	84	0	76	0	76	399
Total Volume	466	533	0	999	395	0	0	395	1	281	0	282	1676
% App. Total	46.6	53.4	0		100	0	0		0.4	99.6	0		
PHF	.889	.938	.000	.964	.837	.000	.000	.837	.250	.817	.000	.820	.952

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Groups Printed- Trucks & Buses

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
02:00 PM	4	2	0	3	0	0	0	0	0	9
02:15 PM	0	0	0	5	0	0	0	3	0	8
02:30 PM	3	2	0	5	0	0	0	1	0	11
02:45 PM	3	1	0	1	0	0	0	3	0	8
Total	10	5	0	14	0	0	0	7	0	36
03:00 PM	5	4	0	2	0	0	0	1	0	12
03:15 PM	1	3	0	3	0	0	0	1	0	8
03:30 PM	2	2	0	1	0	0	0	1	0	6
03:45 PM	3	2	0	3	0	0	0	1	0	9
Total	11	11	0	9	0	0	0	4	0	35
04:00 PM	3	5	0	3	0	0	0	0	0	11
04:15 PM	1	4	0	2	0	0	0	0	0	7
04:30 PM	2	0	0	2	0	0	0	1	0	5
04:45 PM	0	2	0	2	0	0	0	2	0	6
Total	6	11	0	9	0	0	0	3	0	29
05:00 PM	1	1	0	2	0	0	0	1	0	5
05:15 PM	1	0	0	1	0	0	0	0	0	2
05:30 PM	1	1	0	0	0	0	0	0	0	2
05:45 PM	2	1	0	0	0	0	0	0	0	3
Total	5	3	0	3	0	0	0	1	0	12
Grand Total	32	30	0	35	0	0	0	15	0	112
Apprch %	51.6	48.4	0	100	0	0	0	100	0	
Total %	28.6	26.8	0	31.2	0	0	0	13.4	0	

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 02:15 PM													
02:15 PM	0	0	0	0	5	0	0	5	0	3	0	3	8
02:30 PM	3	2	0	5	5	0	0	5	0	1	0	1	11
02:45 PM	3	1	0	4	1	0	0	1	0	3	0	3	8
03:00 PM	5	4	0	9	2	0	0	2	0	1	0	1	12
Total Volume	11	7	0	18	13	0	0	13	0	8	0	8	39
% App. Total	61.1	38.9	0		100	0	0		0	100	0		
PHF	.550	.438	.000	.500	.650	.000	.000	.650	.000	.667	.000	.667	.813

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:00 PM													
04:00 PM	3	5	0	8	3	0	0	3	0	0	0	0	11
04:15 PM	1	4	0	5	2	0	0	2	0	0	0	0	7
04:30 PM	2	0	0	2	2	0	0	2	0	1	0	1	5
04:45 PM	0	2	0	2	2	0	0	2	0	2	0	2	6
Total Volume	6	11	0	17	9	0	0	9	0	3	0	3	29
% App. Total	35.3	64.7	0		100	0	0		0	100	0		
PHF	.500	.550	.000	.531	.750	.000	.000	.750	.000	.375	.000	.375	.659

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 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Groups Printed- Bikes by Direction

Start Time	Acushnet Avenue (Route 18) From North			Acushnet Avenue From East			Ashley Boulevard (Route 18) From South			Int. Total
	Thru	Left	Peds	Right	Left	Peds	Right	Thru	Peds	
02:00 PM	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
03:00 PM	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	0	0	0	0
04:15 PM	0	0	0	0	0	0	0	0	0	0
04:30 PM	0	0	0	0	0	0	0	0	0	0
04:45 PM	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0
05:00 PM	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	1	0	1
Total	0	0	0	0	0	0	0	1	0	1
Grand Total	0	0	0	0	0	0	0	1	0	1
Apprch %	0	0	0	0	0	0	0	100	0	0
Total %	0	0	0	0	0	0	0	100	0	0

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
02:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
02:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Volume	0	0	0	0	0	0	0	0	0	0	0	0	0
% App. Total	0	0	0	0	0	0	0	0	0	0	0	0	0
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Entire Intersection Begins at 05:00 PM

05:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
05:45 PM	0	0	0	0	0	0	0	0	0	1	0	1	1
Total Volume	0	0	0	0	0	0	0	0	0	1	0	1	1
% App. Total	0	0	0	0	0	0	0	0	0	100	0	.250	.250
PHF	.000	.000	.000	.000	.000	.000	.000	.000	.000	.250	.000	.250	.250

Transportation Data Corporation

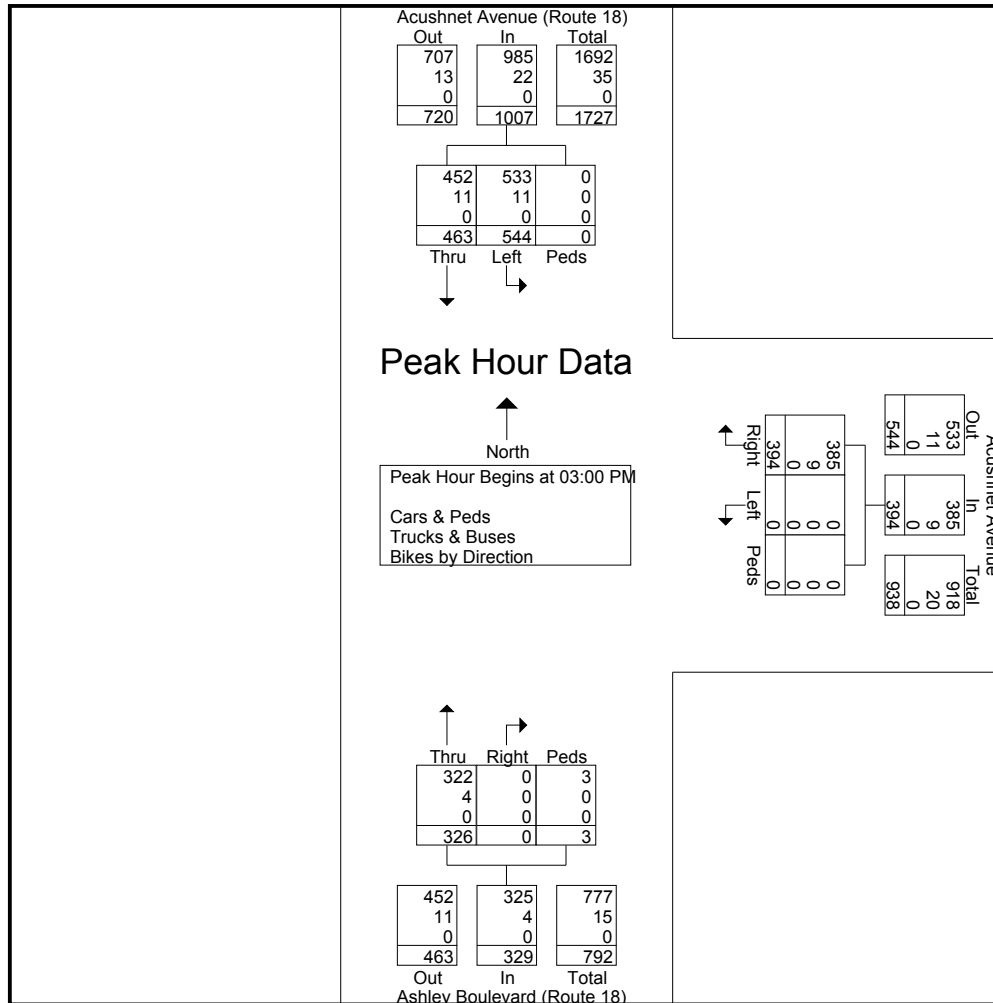
Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N/S: Acushnet Avenue/Ashley Boulevard
 E: Acushnet Avenue
 City, State: New Bedford, MA
 Client: McM/R. Hansen

File Name : 05028AA
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 1

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 02:00 PM to 03:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 03:00 PM													
03:00 PM	116	147	0	263	84	0	0	84	0	73	2	75	422
03:15 PM	111	129	0	240	110	0	0	110	0	97	0	97	447
03:30 PM	111	138	0	249	113	0	0	113	0	76	1	77	439
03:45 PM	125	130	0	255	87	0	0	87	0	80	0	80	422
Total Volume	463	544	0	1007	394	0	0	394	0	326	3	329	1730
% App. Total	46	54	0		100	0	0		0	99.1	0.9		
PHF	.926	.925	.000	.957	.872	.000	.000	.872	.000	.840	.375	.848	.968
Cars & Peds	452	533	0	985	385	0	0	385	0	322	3	325	1695
% Cars & Peds	97.6	98.0	0	97.8	97.7	0	0	97.7	0	98.8	100	98.8	98.0
Trucks & Buses	11	11	0	22	9	0	0	9	0	4	0	4	35
% Trucks & Buses	2.4	2.0	0	2.2	2.3	0	0	2.3	0	1.2	0	1.2	2.0
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation

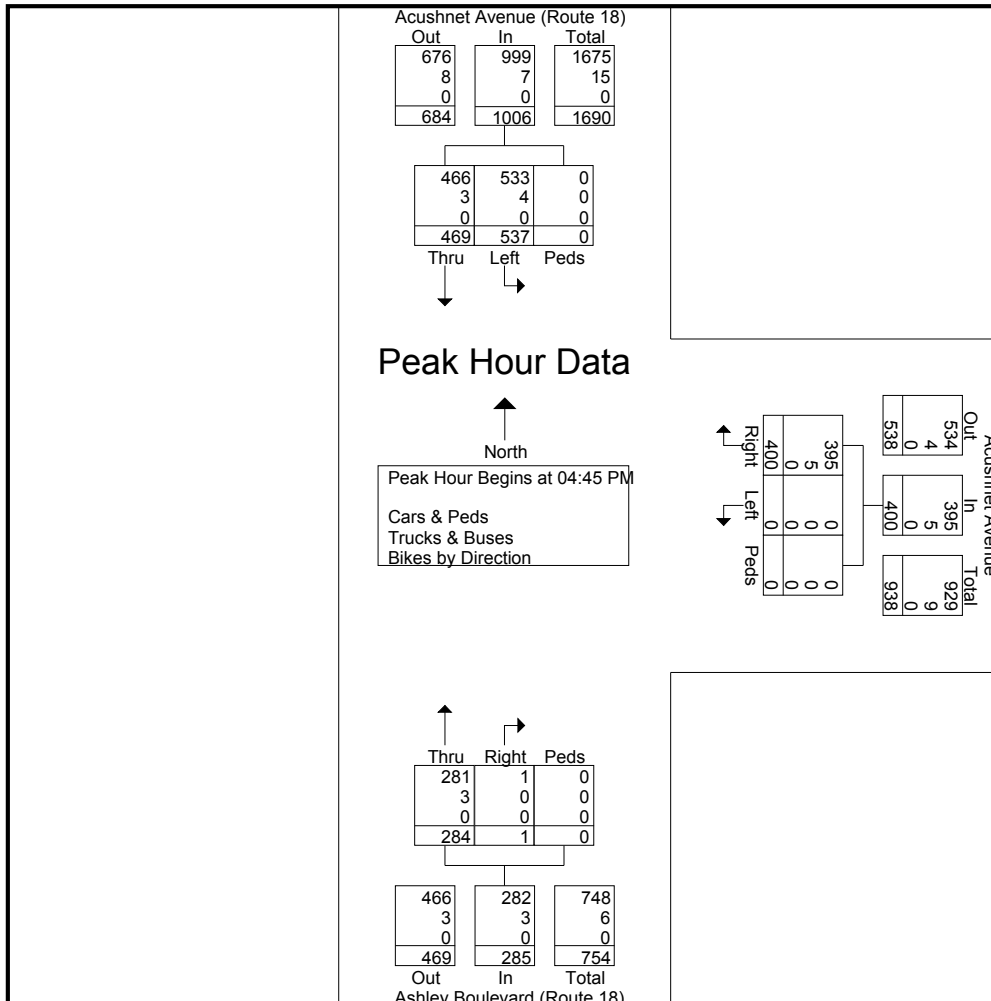
Mario Perone, mperone1@verizon.net

tel (781) 587-0086 cell (781) 439-4999

N/S: Acushnet Avenue/Ashley Boulevard
 E: Acushnet Avenue
 City, State: New Bedford, MA
 Client: McM/R. Hansen

File Name : 05028AA
 Site Code : Y1828511
 Start Date : 4/10/2018
 Page No : 2

Start Time	Acushnet Avenue (Route 18) From North				Acushnet Avenue From East				Ashley Boulevard (Route 18) From South				Int. Total
	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Right	Thru	Peds	App. Total	
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 04:45 PM													
04:45 PM	126	127	0	253	100	0	0	100	0	65	0	65	418
05:00 PM	132	129	0	261	97	0	0	97	0	87	0	87	445
05:15 PM	113	138	0	251	119	0	0	119	1	56	0	57	427
05:30 PM	98	143	0	241	84	0	0	84	0	76	0	76	401
Total Volume	469	537	0	1006	400	0	0	400	1	284	0	285	1691
% App. Total	46.6	53.4	0		100	0	0		0.4	99.6	0		
PHF	.888	.939	.000	.964	.840	.000	.000	.840	.250	.816	.000	.819	.950
Cars & Peds	466	533	0	999	395	0	0	395	1	281	0	282	1676
% Cars & Peds	99.4	99.3	0	99.3	98.8	0	0	98.8	100	98.9	0	98.9	99.1
Trucks & Buses	3	4	0	7	5	0	0	5	0	3	0	3	15
% Trucks & Buses	0.6	0.7	0	0.7	1.3	0	0	1.3	0	1.1	0	1.1	0.9
Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0
% Bikes by Direction	0	0	0	0	0	0	0	0	0	0	0	0	0



Transportation Data Corporation

Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

05028Aclass
Site Code: Y-18285.11

Northbound

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
04/10/18	0	20	2	0	0	0	0	0	0	0	0	0	0	22
01:00	0	12	3	0	1	0	0	0	1	0	0	0	0	17
02:00	0	28	5	0	0	2	0	0	0	0	0	0	0	35
03:00	0	34	6	0	3	0	0	0	0	0	0	0	0	43
04:00	0	187	69	3	33	0	0	0	1	0	0	0	0	293
05:00	3	283	122	1	34	4	0	1	0	0	0	0	0	448
06:00	5	415	103	3	24	5	0	2	1	0	0	0	0	558
07:00	3	503	77	9	13	7	2	2	0	0	0	0	0	616
08:00	4	457	63	8	14	6	1	0	2	0	0	0	0	555
09:00	6	331	73	2	17	4	2	1	3	0	0	0	0	439
10:00	5	339	68	2	22	3	1	1	1	0	0	0	0	442
11:00	1	370	63	2	20	4	0	0	1	1	0	0	0	462
12 PM	3	424	58	2	17	6	0	1	1	0	0	0	0	512
13:00	5	428	62	3	9	5	0	4	1	0	0	0	0	517
14:00	8	468	65	7	11	8	0	2	2	0	0	0	0	571
15:00	6	420	50	3	8	4	0	1	0	0	0	0	0	492
16:00	5	440	67	4	20	7	0	1	1	0	0	0	0	545
17:00	8	462	53	3	15	4	0	0	1	0	0	0	0	546
18:00	4	369	49	0	10	1	0	2	1	0	0	0	0	436
19:00	2	332	40	1	9	3	0	0	0	0	0	0	0	387
20:00	1	236	33	2	9	1	0	0	1	0	0	0	0	283
21:00	0	176	23	1	6	0	0	0	0	0	0	0	0	206
22:00	2	118	18	1	2	0	0	0	0	0	0	0	0	141
23:00	1	55	11	2	1	0	0	0	0	0	0	0	0	70
Total	72	6907	1183	59	298	74	6	18	18	1	0	0	0	8636
Percent	0.8%	80.0%	13.7%	0.7%	3.5%	0.9%	0.1%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	05:00	07:00	05:00	07:00	07:00	06:00	09:00	11:00				07:00
Vol.	6	503	122	9	34	7	2	2	3	1				616
PM Peak	14:00	14:00	16:00	14:00	16:00	14:00		13:00	14:00					14:00
Vol.	8	468	67	7	20	8		4	2					571
Grand Total	72	6907	1183	59	298	74	6	18	18	1	0	0	0	8636
Percent	0.8%	80.0%	13.7%	0.7%	3.5%	0.9%	0.1%	0.2%	0.2%	0.0%	0.0%	0.0%	0.0%	

Transportation Data Corporation

Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

05028Aclass
Site Code: Y-18285.11

Southbound

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
04/10/18	0	33	28	0	5	0	0	0	0	0	0	0	0	66
01:00	0	8	11	1	3	0	0	0	0	0	0	0	0	23
02:00	0	9	6	1	1	0	0	0	0	0	0	0	0	17
03:00	0	4	11	0	4	0	0	0	0	0	0	0	0	19
04:00	1	14	23	0	16	0	0	0	0	0	0	0	0	54
05:00	0	29	47	1	21	2	0	2	0	0	0	0	0	102
06:00	3	72	92	8	43	0	0	1	1	0	0	0	0	220
07:00	7	234	198	13	58	3	1	10	1	0	0	0	0	525
08:00	5	228	177	9	60	2	0	10	2	0	0	0	0	493
09:00	3	162	200	9	69	1	0	5	3	0	0	0	0	452
10:00	3	154	195	9	43	2	0	7	0	0	0	0	1	414
11:00	4	228	150	5	63	2	1	1	1	0	0	0	0	455
12 PM	6	271	160	6	48	1	0	4	2	0	0	0	0	498
13:00	5	277	147	6	55	3	0	4	3	0	0	0	0	500
14:00	4	303	206	5	72	4	0	7	1	0	0	0	1	603
15:00	8	446	175	6	76	2	0	15	0	1	0	0	0	729
16:00	7	431	213	3	104	10	1	10	0	0	0	0	0	779
17:00	5	449	220	5	89	1	2	14	0	0	0	0	0	785
18:00	2	305	234	2	74	5	0	6	0	0	0	0	0	628
19:00	2	200	147	3	47	0	0	3	0	0	0	0	0	402
20:00	1	155	113	2	24	0	0	2	0	0	0	0	0	297
21:00	0	96	77	1	15	0	0	0	0	0	0	0	0	189
22:00	1	47	87	1	10	0	0	0	0	0	0	0	0	146
23:00	0	63	54	0	6	0	0	1	0	0	0	0	0	124
Total	67	4218	2971	96	1006	38	5	102	14	1	0	0	2	8520
Percent	0.8%	49.5%	34.9%	1.1%	11.8%	0.4%	0.1%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	09:00	07:00	09:00	07:00	07:00	07:00	09:00				10:00	07:00
Vol.	7	234	200	13	69	3	1	10	3				1	525
PM Peak	15:00	17:00	18:00	12:00	16:00	16:00	17:00	15:00	13:00	15:00			14:00	17:00
Vol.	8	449	234	6	104	10	2	15	3	1			1	785
Grand Total	67	4218	2971	96	1006	38	5	102	14	1	0	0	2	8520
Percent	0.8%	49.5%	34.9%	1.1%	11.8%	0.4%	0.1%	1.2%	0.2%	0.0%	0.0%	0.0%	0.0%	

Transportation Data Corporation

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tel (781) 587-0086 cell (781) 439-4999

Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Aspeed
Site Code: Y-18285.11

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
04/10/18	0	1	1	6	6	5	3	0	0	0	0	0	0	22
01:00	0	0	1	5	5	4	2	0	0	0	0	0	0	17
02:00	1	0	3	7	12	8	4	0	0	0	0	0	0	35
03:00	0	0	5	11	16	10	1	0	0	0	0	0	0	43
04:00	2	4	43	93	101	34	13	3	0	0	0	0	0	293
05:00	16	17	56	163	139	45	10	1	1	0	0	0	0	448
06:00	37	32	115	216	134	21	2	1	0	0	0	0	0	558
07:00	76	104	206	163	56	8	0	1	2	0	0	0	0	616
08:00	102	75	168	166	40	2	1	1	0	0	0	0	0	555
09:00	31	41	139	171	48	8	1	0	0	0	0	0	0	439
10:00	35	49	145	159	40	10	2	0	1	1	0	0	0	442
11:00	71	62	143	147	36	3	0	0	0	0	0	0	0	462
12 PM	67	91	163	150	36	4	0	0	1	0	0	0	0	512
13:00	63	53	172	175	49	4	1	0	0	0	0	0	0	517
14:00	128	87	195	130	22	8	1	0	0	0	0	0	0	571
15:00	194	99	122	65	11	0	1	0	0	0	0	0	0	492
16:00	140	84	185	115	19	1	1	0	0	0	0	0	0	545
17:00	111	92	185	126	30	2	0	0	0	0	0	0	0	546
18:00	37	29	159	157	47	7	0	0	0	0	0	0	0	436
19:00	20	24	128	155	50	9	0	0	0	0	0	1	0	387
20:00	14	17	80	111	51	9	1	0	0	0	0	0	0	283
21:00	4	4	39	107	47	5	0	0	0	0	0	0	0	206
22:00	3	1	31	47	46	11	2	0	0	0	0	0	0	141
23:00	0	1	4	38	21	6	0	0	0	0	0	0	0	70
Total	1152	967	2488	2683	1062	224	46	7	5	1	0	1	0	8636
Percent	13.3%	11.2%	28.8%	31.1%	12.3%	2.6%	0.5%	0.1%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 15 MPH
50th Percentile : 24 MPH
85th Percentile : 30 MPH
95th Percentile : 34 MPH

Mean Speed(Average) : 24 MPH
10 MPH Pace Speed : 21-30 MPH
Number in Pace : 5171
Percent in Pace : 59.9%
Number of Vehicles > 30 MPH : 1346
Percent of Vehicles > 30 MPH : 15.6%

Grand Total	1152	967	2488	2683	1062	224	46	7	5	1	0	1	0	8636
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Overall

15th Percentile : 15 MPH
50th Percentile : 24 MPH
85th Percentile : 30 MPH
95th Percentile : 34 MPH

Mean Speed(Average) : 24 MPH
10 MPH Pace Speed : 21-30 MPH
Number in Pace : 5171
Percent in Pace : 59.9%
Number of Vehicles > 30 MPH : 1346
Percent of Vehicles > 30 MPH : 15.6%

Transportation Data Corporation

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Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen
Southbound

05028Aspeed
Site Code: Y-18285.11

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
04/10/18	0	0	4	6	6	17	20	6	6	1	0	0	0	66
01:00	0	0	0	1	3	8	7	3	1	0	0	0	0	23
02:00	0	0	0	2	1	5	5	3	1	0	0	0	0	17
03:00	0	0	0	0	5	5	4	4	0	0	1	0	0	19
04:00	2	0	2	6	11	17	11	5	0	0	0	0	0	54
05:00	3	0	3	12	31	24	16	8	2	1	1	0	1	102
06:00	22	2	4	25	60	66	25	14	2	0	0	0	0	220
07:00	57	3	25	107	175	121	24	10	3	0	0	0	0	525
08:00	49	10	45	96	169	92	27	3	2	0	0	0	0	493
09:00	27	15	35	97	138	104	28	6	1	0	0	1	0	452
10:00	28	9	43	93	127	88	21	5	0	0	0	0	0	414
11:00	46	17	55	126	132	62	15	1	0	1	0	0	0	455
12 PM	42	16	58	118	154	82	22	4	2	0	0	0	0	498
13:00	48	16	67	123	148	78	16	4	0	0	0	0	0	500
14:00	61	14	66	176	178	77	25	6	0	0	0	0	0	603
15:00	138	34	126	204	167	52	5	2	0	0	1	0	0	729
16:00	95	29	114	227	209	93	11	1	0	0	0	0	0	779
17:00	79	26	80	209	273	94	18	5	0	0	0	1	0	785
18:00	50	10	59	149	167	140	40	10	3	0	0	0	0	628
19:00	14	2	40	86	125	84	44	4	2	0	1	0	0	402
20:00	4	4	15	48	99	76	39	7	3	2	0	0	0	297
21:00	4	3	10	17	51	61	35	5	3	0	0	0	0	189
22:00	2	0	1	17	43	46	24	8	4	0	1	0	0	146
23:00	4	1	7	9	15	43	26	14	5	0	0	0	0	124
Total	775	211	859	1954	2487	1535	508	138	40	5	5	2	1	8520
Percent	9.1%	2.5%	10.1%	22.9%	29.2%	18.0%	6.0%	1.6%	0.5%	0.1%	0.1%	0.0%	0.0%	

Daily
 15th Percentile : 21 MPH
 50th Percentile : 30 MPH
 85th Percentile : 38 MPH
 95th Percentile : 42 MPH

 Mean Speed(Average) : 30 MPH
 10 MPH Pace Speed : 26-35 MPH
 Number in Pace : 4441
 Percent in Pace : 52.1%
 Number of Vehicles > 30 MPH : 4721
 Percent of Vehicles > 30 MPH : 55.4%

Grand Total	775	211	859	1954	2487	1535	508	138	40	5	5	2	1	8520
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Overall
 15th Percentile : 21 MPH
 50th Percentile : 30 MPH
 85th Percentile : 38 MPH
 95th Percentile : 42 MPH

 Mean Speed(Average) : 30 MPH
 10 MPH Pace Speed : 26-35 MPH
 Number in Pace : 4441
 Percent in Pace : 52.1%
 Number of Vehicles > 30 MPH : 4721
 Percent of Vehicles > 30 MPH : 55.4%

Transportation Data Corporation

Mario Perone, mperone1@verizon.net
tel (781) 587-0086 cell (781) 439-4999

Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Avolume
Site Code: Y-18285.11

Start Time	10-Apr-18 Tue		NB		SB		Combined		11-Apr Wed	NB		SB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	8	139	26	144	34	283	*	*	*	*	*	*	*	*	
12:15	6	125	21	122	27	247	*	*	*	*	*	*	*	*	
12:30	6	121	9	114	15	235	*	*	*	*	*	*	*	*	
12:45	2	127	10	118	12	245	*	*	*	*	*	*	*	*	
01:00	4	126	8	125	12	251	*	*	*	*	*	*	*	*	
01:15	2	114	6	114	8	228	*	*	*	*	*	*	*	*	
01:30	6	157	5	132	11	289	*	*	*	*	*	*	*	*	
01:45	5	120	4	129	9	249	*	*	*	*	*	*	*	*	
02:00	11	136	5	157	16	293	*	*	*	*	*	*	*	*	
02:15	5	135	3	142	8	277	*	*	*	*	*	*	*	*	
02:30	8	152	6	150	14	302	*	*	*	*	*	*	*	*	
02:45	11	148	3	154	14	302	*	*	*	*	*	*	*	*	
03:00	3	115	4	222	7	337	*	*	*	*	*	*	*	*	
03:15	8	124	5	158	13	282	*	*	*	*	*	*	*	*	
03:30	5	122	5	157	10	279	*	*	*	*	*	*	*	*	
03:45	27	131	5	192	32	323	*	*	*	*	*	*	*	*	
04:00	38	139	11	200	49	339	*	*	*	*	*	*	*	*	
04:15	69	131	7	193	76	324	*	*	*	*	*	*	*	*	
04:30	86	133	15	194	101	327	*	*	*	*	*	*	*	*	
04:45	100	142	21	192	121	334	*	*	*	*	*	*	*	*	
05:00	113	137	17	211	130	348	*	*	*	*	*	*	*	*	
05:15	113	147	18	194	131	341	*	*	*	*	*	*	*	*	
05:30	117	132	38	189	155	321	*	*	*	*	*	*	*	*	
05:45	105	130	29	191	134	321	*	*	*	*	*	*	*	*	
06:00	105	111	29	183	134	294	*	*	*	*	*	*	*	*	
06:15	141	135	49	160	190	295	*	*	*	*	*	*	*	*	
06:30	145	113	60	156	205	269	*	*	*	*	*	*	*	*	
06:45	167	77	82	129	249	206	*	*	*	*	*	*	*	*	
07:00	133	112	153	108	286	220	*	*	*	*	*	*	*	*	
07:15	167	98	143	124	310	222	*	*	*	*	*	*	*	*	
07:30	169	99	111	89	280	188	*	*	*	*	*	*	*	*	
07:45	147	78	118	81	265	159	*	*	*	*	*	*	*	*	
08:00	173	93	122	90	295	183	*	*	*	*	*	*	*	*	
08:15	156	73	120	80	276	153	*	*	*	*	*	*	*	*	
08:30	127	49	131	66	258	115	*	*	*	*	*	*	*	*	
08:45	99	68	120	61	219	129	*	*	*	*	*	*	*	*	
09:00	111	55	107	53	218	108	*	*	*	*	*	*	*	*	
09:15	111	57	108	47	219	104	*	*	*	*	*	*	*	*	
09:30	115	50	126	47	241	97	*	*	*	*	*	*	*	*	
09:45	102	44	111	42	213	86	*	*	*	*	*	*	*	*	
10:00	111	38	87	37	198	75	*	*	*	*	*	*	*	*	
10:15	97	35	102	40	199	75	*	*	*	*	*	*	*	*	
10:30	124	38	102	40	226	78	*	*	*	*	*	*	*	*	
10:45	110	30	123	29	233	59	*	*	*	*	*	*	*	*	
11:00	119	18	105	47	224	65	*	*	*	*	*	*	*	*	
11:15	108	18	94	34	202	52	*	*	*	*	*	*	*	*	
11:30	142	17	114	22	256	39	*	*	*	*	*	*	*	*	
11:45	93	17	142	21	235	38	*	*	*	*	*	*	*	*	
Total	3930	4706	2840	5680	6770	10386	0	0	0	0	0	0	0	0	
Day Total	8636		8520		17156		0	0	0	0	0	0	0	0	
% Total	22.9%	27.4%	16.6%	33.1%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Peak	-	07:15	02:00	07:00	04:30	07:15	04:30	-	-	-	-	-	-	-	
Vol.	-	656	571	525	791	1150	1350	-	-	-	-	-	-	-	
P.H.F.	-	0.948	0.939	0.858	0.937	0.927	0.970	-	-	-	-	-	-	-	
ADT	ADT 17,156		AADT 17,156												

Transportation Data Corporation

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Acushnet Avenue (Route 18)
north of Belair Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Avolume
Site Code: Y-18285.11

Start Time	10-Apr-18 Tue	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		8	139			26	144				
12:15		6	125			21	122				
12:30		6	121			9	114				
12:45		2	127	22	512	10	118	66	498	88	1010
01:00		4	126			8	125				
01:15		2	114			6	114				
01:30		6	157			5	132				
01:45		5	120	17	517	4	129	23	500	40	1017
02:00		11	136			5	157				
02:15		5	135			3	142				
02:30		8	152			6	150				
02:45		11	148	35	571	3	154	17	603	52	1174
03:00		3	115			4	222				
03:15		8	124			5	158				
03:30		5	122			5	157				
03:45		27	131	43	492	5	192	19	729	62	1221
04:00		38	139			11	200				
04:15		69	131			7	193				
04:30		86	133			15	194				
04:45		100	142	293	545	21	192	54	779	347	1324
05:00		113	137			17	211				
05:15		113	147			18	194				
05:30		117	132			38	189				
05:45		105	130	448	546	29	191	102	785	550	1331
06:00		105	111			29	183				
06:15		141	135			49	160				
06:30		145	113			60	156				
06:45		167	77	558	436	82	129	220	628	778	1064
07:00		133	112			153	108				
07:15		167	98			143	124				
07:30		169	99			111	89				
07:45		147	78	616	387	118	81	525	402	1141	789
08:00		173	93			122	90				
08:15		156	73			120	80				
08:30		127	49			131	66				
08:45		99	68	555	283	120	61	493	297	1048	580
09:00		111	55			107	53				
09:15		111	57			108	47				
09:30		115	50			126	47				
09:45		102	44	439	206	111	42	452	189	891	395
10:00		111	38			87	37				
10:15		97	35			102	40				
10:30		124	38			102	40				
10:45		110	30	442	141	123	29	414	146	856	287
11:00		119	18			105	47				
11:15		108	18			94	34				
11:30		142	17			114	22				
11:45		93	17	462	70	142	21	455	124	917	194
Total		3930	4706			2840	5680			6770	10386
Combined Total		8636				8520				17156	
Percentage	0.0%										
Total Percent		3930	4706			2840	5680			6770	10386
		45.5%	54.5%			33.3%	66.7%			39.5%	60.5%
ADT		ADT 17,156		AADT 17,156							

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Acushnet Avenue
north of Victoria Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Bclass
Site Code: Y-18285.11

Northbound

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
04/10/18	0	14	0	0	1	0	0	0	0	0	0	0	0	15
01:00	0	8	4	0	0	0	0	0	1	0	0	0	0	13
02:00	0	16	8	0	1	2	0	0	0	0	0	0	0	27
03:00	0	16	3	0	3	0	0	0	0	0	0	0	0	22
04:00	0	109	31	0	38	0	0	0	1	0	0	0	0	179
05:00	2	119	53	1	66	0	0	0	0	0	0	0	0	241
06:00	1	219	96	2	57	1	0	3	1	0	0	0	0	380
07:00	3	328	74	4	19	1	2	0	1	0	0	0	0	432
08:00	2	305	69	2	24	1	4	1	2	0	0	0	0	410
09:00	4	198	66	1	24	2	1	0	2	0	0	0	0	298
10:00	2	200	49	0	27	1	1	1	2	0	0	0	0	283
11:00	1	226	65	5	22	1	0	2	1	0	0	0	0	323
12 PM	3	254	54	2	26	1	0	1	1	0	0	0	0	342
13:00	4	237	54	1	22	3	0	2	2	0	0	0	0	325
14:00	6	315	75	1	20	4	0	2	4	0	0	0	0	427
15:00	5	267	71	7	20	4	0	2	0	0	1	0	0	377
16:00	3	280	69	2	27	0	0	1	3	0	0	0	0	385
17:00	2	275	51	2	21	1	0	1	0	0	0	0	0	353
18:00	5	208	48	1	18	0	0	2	0	0	0	0	0	282
19:00	2	187	31	1	12	1	0	0	0	0	0	0	0	234
20:00	3	134	19	1	10	1	0	0	1	0	0	0	0	169
21:00	0	97	11	0	8	0	0	0	0	0	0	0	0	116
22:00	0	65	18	0	5	0	0	0	0	0	0	0	0	88
23:00	0	36	7	0	3	0	0	0	0	0	0	0	0	46
Total	48	4113	1026	33	474	24	8	18	22	0	1	0	0	5767
Percent	0.8%	71.3%	17.8%	0.6%	8.2%	0.4%	0.1%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	
AM Peak	09:00	07:00	06:00	11:00	05:00	02:00	08:00	06:00	08:00					07:00
Vol.	4	328	96	5	66	2	4	3	2					432
PM Peak	14:00	14:00	14:00	15:00	16:00	14:00		13:00	14:00		15:00			14:00
Vol.	6	315	75	7	27	4		2	4		1			427
Grand Total	48	4113	1026	33	474	24	8	18	22	0	1	0	0	5767
Percent	0.8%	71.3%	17.8%	0.6%	8.2%	0.4%	0.1%	0.3%	0.4%	0.0%	0.0%	0.0%	0.0%	

Transportation Data Corporation

Acushnet Avenue
north of Victoria Street
City, State: New Bedford, MA
Client: McM/R. Hansen

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05028Bclass
Site Code: Y-18285.11

Southbound

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
04/10/18	0	30	3	0	1	0	0	0	0	0	0	0	0	34
01:00	0	11	0	1	2	0	0	0	0	0	0	0	0	14
02:00	0	9	1	0	0	0	0	0	0	0	0	0	0	10
03:00	0	10	1	0	1	0	0	0	0	0	0	0	0	12
04:00	0	22	8	0	3	0	0	0	0	0	0	0	0	33
05:00	0	42	16	0	8	1	0	1	0	0	0	0	0	68
06:00	1	87	25	3	7	1	0	0	1	0	0	0	0	125
07:00	3	199	47	5	10	3	1	1	0	0	0	0	0	269
08:00	3	192	56	3	10	2	0	2	3	0	0	0	0	271
09:00	3	170	42	3	12	2	0	1	3	0	0	0	0	236
10:00	2	151	30	3	10	3	0	3	3	0	0	0	0	205
11:00	2	194	48	3	13	4	1	0	0	0	0	0	0	265
12 PM	5	183	59	2	8	2	0	0	0	0	0	0	0	259
13:00	3	209	54	2	15	2	0	4	4	0	0	0	0	293
14:00	6	283	70	1	12	2	0	1	0	0	0	0	0	375
15:00	3	380	108	5	28	2	0	2	1	0	0	0	0	529
16:00	5	353	99	3	27	2	1	0	0	0	0	0	0	490
17:00	5	413	78	0	19	1	0	1	0	0	0	0	0	517
18:00	4	274	55	2	12	1	0	0	0	0	0	0	0	348
19:00	0	194	35	0	1	1	0	0	0	0	0	0	0	231
20:00	1	147	23	0	5	1	0	0	0	0	0	0	0	177
21:00	0	90	12	1	3	0	0	0	0	0	0	0	0	106
22:00	0	75	13	1	2	0	0	0	0	0	0	0	0	91
23:00	0	70	6	0	2	0	0	0	0	0	0	0	0	78
Total	46	3788	889	38	211	30	3	16	15	0	0	0	0	5036
Percent	0.9%	75.2%	17.7%	0.8%	4.2%	0.6%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	
AM Peak	07:00	07:00	08:00	07:00	11:00	11:00	07:00	10:00	08:00					08:00
Vol.	3	199	56	5	13	4	1	3	3					271
PM Peak	14:00	17:00	15:00	15:00	15:00	12:00	16:00	13:00	13:00					15:00
Vol.	6	413	108	5	28	2	1	4	4					529
Grand Total	46	3788	889	38	211	30	3	16	15	0	0	0	0	5036
Percent	0.9%	75.2%	17.7%	0.8%	4.2%	0.6%	0.1%	0.3%	0.3%	0.0%	0.0%	0.0%	0.0%	

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Acushnet Avenue
north of Victoria Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Bspeed
Site Code: Y-18285.11

Northbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
04/10/18	0	0	0	1	3	4	6	1	0	0	0	0	0	15
01:00	0	0	0	4	3	3	2	1	0	0	0	0	0	13
02:00	0	0	0	2	9	7	5	2	2	0	0	0	0	27
03:00	0	0	0	1	7	5	4	5	0	0	0	0	0	22
04:00	2	0	1	17	53	75	25	5	1	0	0	0	0	179
05:00	17	0	6	30	72	77	31	6	2	0	0	0	0	241
06:00	12	1	12	83	144	101	22	3	1	1	0	0	0	380
07:00	11	4	47	164	166	37	3	0	0	0	0	0	0	432
08:00	15	8	77	136	133	38	1	1	0	0	0	1	0	410
09:00	10	4	29	96	119	38	2	0	0	0	0	0	0	298
10:00	4	8	20	118	106	24	3	0	0	0	0	0	0	283
11:00	18	17	43	132	91	22	0	0	0	0	0	0	0	323
12 PM	15	12	47	111	117	39	1	0	0	0	0	0	0	342
13:00	8	5	45	122	109	33	3	0	0	0	0	0	0	325
14:00	14	9	69	179	129	26	1	0	0	0	0	0	0	427
15:00	19	7	51	144	132	21	3	0	0	0	0	0	0	377
16:00	24	6	65	144	125	20	1	0	0	0	0	0	0	385
17:00	25	18	42	127	112	27	2	0	0	0	0	0	0	353
18:00	15	7	40	108	85	21	6	0	0	0	0	0	0	282
19:00	8	2	26	79	90	23	6	0	0	0	0	0	0	234
20:00	10	0	19	50	67	22	1	0	0	0	0	0	0	169
21:00	1	1	7	33	55	16	3	0	0	0	0	0	0	116
22:00	0	0	1	22	33	21	9	1	1	0	0	0	0	88
23:00	0	0	0	3	24	13	5	1	0	0	0	0	0	46
Total	228	109	647	1906	1984	713	145	26	7	1	0	1	0	5767
Percent	4.0%	1.9%	11.2%	33.1%	34.4%	12.4%	2.5%	0.5%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily

15th Percentile : 24 MPH
50th Percentile : 29 MPH
85th Percentile : 35 MPH
95th Percentile : 39 MPH

Mean Speed(Average) : 30 MPH
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 3890
Percent in Pace : 67.5%
Number of Vehicles > 30 MPH : 2877
Percent of Vehicles > 30 MPH : 49.9%

Grand Total	228	109	647	1906	1984	713	145	26	7	1	0	1	0	5767
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Overall

15th Percentile : 24 MPH
50th Percentile : 29 MPH
85th Percentile : 35 MPH
95th Percentile : 39 MPH

Mean Speed(Average) : 30 MPH
10 MPH Pace Speed : 26-35 MPH
Number in Pace : 3890
Percent in Pace : 67.5%
Number of Vehicles > 30 MPH : 2877
Percent of Vehicles > 30 MPH : 49.9%

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north of Victoria Street
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Client: McM/R. Hansen

05028Bspeed
Site Code: Y-18285.11

Southbound

Start Time	1 15	16 20	21 25	26 30	31 35	36 40	41 45	46 50	51 55	56 60	61 65	66 70	71 75	Total
04/10/18	0	0	1	4	7	13	6	3	0	0	0	0	0	34
01:00	1	0	0	0	5	3	4	1	0	0	0	0	0	14
02:00	0	0	0	1	2	4	2	1	0	0	0	0	0	10
03:00	0	0	0	0	5	4	2	1	0	0	0	0	0	12
04:00	0	0	0	4	14	11	4	0	0	0	0	0	0	33
05:00	6	1	2	10	28	15	4	1	1	0	0	0	0	68
06:00	8	10	2	25	35	38	5	2	0	0	0	0	0	125
07:00	15	4	12	73	111	42	11	1	0	0	0	0	0	269
08:00	18	4	22	68	112	40	4	2	1	0	0	0	0	271
09:00	12	6	22	70	91	31	4	0	0	0	0	0	0	236
10:00	11	2	22	67	79	23	1	0	0	0	0	0	0	205
11:00	15	12	41	87	83	23	4	0	0	0	0	0	0	265
12 PM	17	5	29	86	93	26	3	0	0	0	0	0	0	259
13:00	23	19	43	94	82	28	4	0	0	0	0	0	0	293
14:00	21	29	48	108	121	38	7	2	1	0	0	0	0	375
15:00	42	48	98	169	140	29	2	0	0	0	0	1	0	529
16:00	21	17	71	187	167	25	2	0	0	0	0	0	0	490
17:00	39	16	71	202	151	35	2	0	0	1	0	0	0	517
18:00	25	20	34	133	102	31	3	0	0	0	0	0	0	348
19:00	9	13	30	75	70	32	1	1	0	0	0	0	0	231
20:00	12	1	11	44	76	27	5	0	1	0	0	0	0	177
21:00	3	6	8	20	44	21	4	0	0	0	0	0	0	106
22:00	4	1	1	22	34	20	6	2	1	0	0	0	0	91
23:00	1	0	1	11	27	26	8	4	0	0	0	0	0	78
Total	303	214	569	1560	1679	585	98	21	5	1	0	1	0	5036
Percent	6.0%	4.2%	11.3%	31.0%	33.3%	11.6%	1.9%	0.4%	0.1%	0.0%	0.0%	0.0%	0.0%	

Daily
 15th Percentile : 22 MPH
 50th Percentile : 29 MPH
 85th Percentile : 34 MPH
 95th Percentile : 38 MPH

 Mean Speed(Average) : 29 MPH
 10 MPH Pace Speed : 26-35 MPH
 Number in Pace : 3239
 Percent in Pace : 64.3%
 Number of Vehicles > 30 MPH : 2390
 Percent of Vehicles > 30 MPH : 47.5%

Grand Total	303	214	569	1560	1679	585	98	21	5	1	0	1	0	5036
-------------	-----	-----	-----	------	------	-----	----	----	---	---	---	---	---	------

Overall
 15th Percentile : 22 MPH
 50th Percentile : 29 MPH
 85th Percentile : 34 MPH
 95th Percentile : 38 MPH

 Mean Speed(Average) : 29 MPH
 10 MPH Pace Speed : 26-35 MPH
 Number in Pace : 3239
 Percent in Pace : 64.3%
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Transportation Data Corporation

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Acushnet Avenue
north of Victoria Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Bvolume
Site Code: Y-18285.11

Start Time	10-Apr-18 Tue		NB		SB		Combined		11-Apr Wed	NB		SB		Combined	
	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.	A.M.	P.M.		A.M.	P.M.	A.M.	P.M.	A.M.	P.M.
12:00	5	88	17	74	22	162	*	*	*	*	*	*	*	*	
12:15	5	78	10	56	15	134	*	*	*	*	*	*	*	*	
12:30	5	86	5	69	10	155	*	*	*	*	*	*	*	*	
12:45	0	90	2	60	2	150	*	*	*	*	*	*	*	*	
01:00	2	74	4	78	6	152	*	*	*	*	*	*	*	*	
01:15	3	78	5	66	8	144	*	*	*	*	*	*	*	*	
01:30	4	93	2	69	6	162	*	*	*	*	*	*	*	*	
01:45	4	80	3	80	7	160	*	*	*	*	*	*	*	*	
02:00	9	114	4	89	13	203	*	*	*	*	*	*	*	*	
02:15	5	97	1	94	6	191	*	*	*	*	*	*	*	*	
02:30	4	117	3	91	7	208	*	*	*	*	*	*	*	*	
02:45	9	99	2	101	11	200	*	*	*	*	*	*	*	*	
03:00	1	84	1	145	2	229	*	*	*	*	*	*	*	*	
03:15	5	104	4	116	9	220	*	*	*	*	*	*	*	*	
03:30	1	99	2	143	3	242	*	*	*	*	*	*	*	*	
03:45	15	90	5	125	20	215	*	*	*	*	*	*	*	*	
04:00	27	100	10	116	37	216	*	*	*	*	*	*	*	*	
04:15	50	101	2	127	52	228	*	*	*	*	*	*	*	*	
04:30	48	91	8	121	56	212	*	*	*	*	*	*	*	*	
04:45	54	93	13	126	67	219	*	*	*	*	*	*	*	*	
05:00	60	89	12	138	72	227	*	*	*	*	*	*	*	*	
05:15	63	109	14	123	77	232	*	*	*	*	*	*	*	*	
05:30	63	76	25	146	88	222	*	*	*	*	*	*	*	*	
05:45	55	79	17	110	72	189	*	*	*	*	*	*	*	*	
06:00	67	76	18	91	85	167	*	*	*	*	*	*	*	*	
06:15	88	85	24	88	112	173	*	*	*	*	*	*	*	*	
06:30	109	72	34	90	143	162	*	*	*	*	*	*	*	*	
06:45	116	49	49	79	165	128	*	*	*	*	*	*	*	*	
07:00	84	68	62	65	146	133	*	*	*	*	*	*	*	*	
07:15	112	56	66	68	178	124	*	*	*	*	*	*	*	*	
07:30	114	66	69	53	183	119	*	*	*	*	*	*	*	*	
07:45	122	44	72	45	194	89	*	*	*	*	*	*	*	*	
08:00	120	59	66	52	186	111	*	*	*	*	*	*	*	*	
08:15	113	52	70	58	183	110	*	*	*	*	*	*	*	*	
08:30	103	29	66	31	169	60	*	*	*	*	*	*	*	*	
08:45	74	29	69	36	143	65	*	*	*	*	*	*	*	*	
09:00	79	27	51	23	130	50	*	*	*	*	*	*	*	*	
09:15	72	37	65	30	137	67	*	*	*	*	*	*	*	*	
09:30	73	25	64	32	137	57	*	*	*	*	*	*	*	*	
09:45	74	27	56	21	130	48	*	*	*	*	*	*	*	*	
10:00	71	24	48	27	119	51	*	*	*	*	*	*	*	*	
10:15	66	27	60	17	126	44	*	*	*	*	*	*	*	*	
10:30	71	18	40	28	111	46	*	*	*	*	*	*	*	*	
10:45	75	19	57	19	132	38	*	*	*	*	*	*	*	*	
11:00	69	16	58	31	127	47	*	*	*	*	*	*	*	*	
11:15	65	7	55	24	120	31	*	*	*	*	*	*	*	*	
11:30	119	13	76	12	195	25	*	*	*	*	*	*	*	*	
11:45	70	10	76	11	146	21	*	*	*	*	*	*	*	*	
Total	2623	3144	1542	3494	4165	6638	0	0	0	0	0	0	0	0	
Day Total	5767		5036		10803		0	0	0	0	0	0	0	0	
% Total	24.3%	29.1%	14.3%	32.3%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	
Peak	-	07:30	02:00	07:30	04:45	07:30	03:00	-	-	-	-	-	-	-	
Vol.	-	469	427	277	533	746	906	-	-	-	-	-	-	-	
P.H.F.	0.961	0.912	0.962	0.913	0.961	0.936									
ADT	ADT 10,803		AADT 10,803												

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Acushnet Avenue
north of Victoria Street
City, State: New Bedford, MA
Client: McM/R. Hansen

05028Bvolume
Site Code: Y-18285.11

Start Time	10-Apr-18 Tue	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		5	88			17	74				
12:15		5	78			10	56				
12:30		5	86			5	69				
12:45		0	90	15	342	2	60	34	259	49	601
01:00		2	74			4	78				
01:15		3	78			5	66				
01:30		4	93			2	69				
01:45		4	80	13	325	3	80	14	293	27	618
02:00		9	114			4	89				
02:15		5	97			1	94				
02:30		4	117			3	91				
02:45		9	99	27	427	2	101	10	375	37	802
03:00		1	84			1	145				
03:15		5	104			4	116				
03:30		1	99			2	143				
03:45		15	90	22	377	5	125	12	529	34	906
04:00		27	100			10	116				
04:15		50	101			2	127				
04:30		48	91			8	121				
04:45		54	93	179	385	13	126	33	490	212	875
05:00		60	89			12	138				
05:15		63	109			14	123				
05:30		63	76			25	146				
05:45		55	79	241	353	17	110	68	517	309	870
06:00		67	76			18	91				
06:15		88	85			24	88				
06:30		109	72			34	90				
06:45		116	49	380	282	49	79	125	348	505	630
07:00		84	68			62	65				
07:15		112	56			66	68				
07:30		114	66			69	53				
07:45		122	44	432	234	72	45	269	231	701	465
08:00		120	59			66	52				
08:15		113	52			70	58				
08:30		103	29			66	31				
08:45		74	29	410	169	69	36	271	177	681	346
09:00		79	27			51	23				
09:15		72	37			65	30				
09:30		73	25			64	32				
09:45		74	27	298	116	56	21	236	106	534	222
10:00		71	24			48	27				
10:15		66	27			60	17				
10:30		71	18			40	28				
10:45		75	19	283	88	57	19	205	91	488	179
11:00		69	16			58	31				
11:15		65	7			55	24				
11:30		119	13			76	12				
11:45		70	10	323	46	76	11	265	78	588	124
Total		2623	3144			1542	3494			4165	6638
Combined Total		5767				5036				10803	
Percentage	0.0%										
Total Percent		2623	3144			1542	3494			4165	6638
		45.5%	54.5%			30.6%	69.4%			38.6%	61.4%
ADT		ADT 10,803		AADT 10,803							

APPENDIX B

Seasonal Variation Data

Seasonal Adjustment

Local ID: 6629 Interstate 195, Dartmouth, MA

Year	AADT	APRIL ADT	% Above ADT
2016	80,055	78,504	-2%
2015	79,023	78,986	0%
2014	77,220	78,104	1%
2013	74,526	75,531	1%
Average	77,706	77,781	0%

APPENDIX C

Crash Data

Table 1
Crash Summary

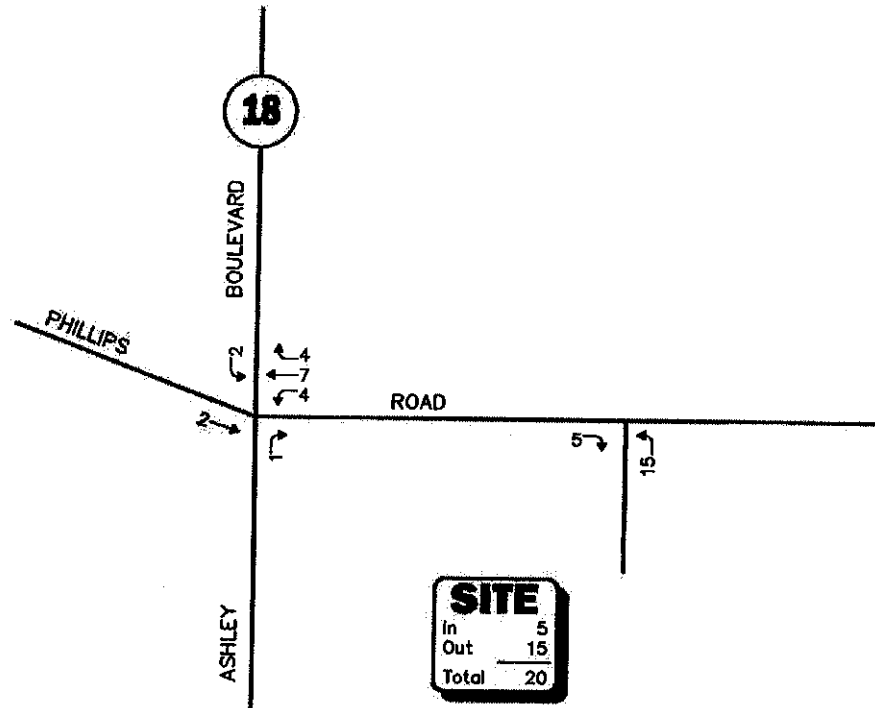
Acushnet Avenue at Ashley Boulevard (Route 18)	
2012	3
2013	4
2014	5
2015	2
2016	<u>1</u>
Total	15
Type	
Angle	3
Rear-end	8
Sideswipe	3
Head-on	1
Single Vehicle Crash	<u>0</u>
Total	15
Severity	
Property Damage	10
Personal Injury	5
Fatality	0
Other	<u>0</u>
Total	15
Weather	
Clear	12
Cloudy	0
Rain	2
Snow	0
Ice	0
Sleet	1
Fog	0
Unknown	<u>0</u>
Total	15
Time	
7:00 AM to 9:00 AM	0
9:00 AM to 4:00 PM	5
4:00 PM to 6:00 PM	5
6:00 PM to 7:00 AM	<u>5</u>
Total	15
Crash Rate	0.38
Statewide Average	0.77
District 5 Average	0.76

Source: MassDOT

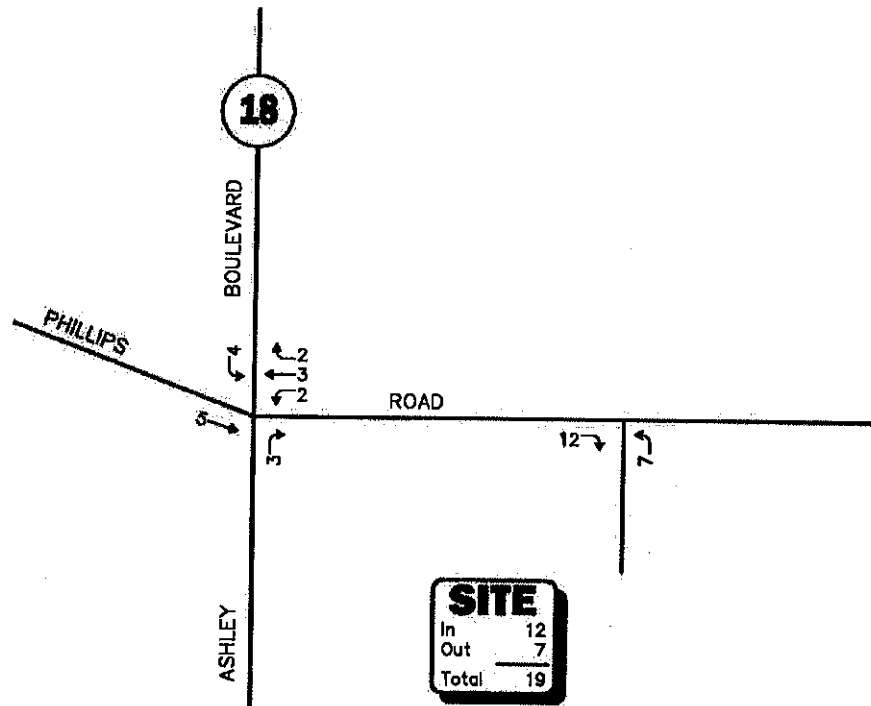
APPENDIX D

Additional Development Traffic Volumes

WEEKDAY MORNING PEAK HOUR



WEEKDAY EVENING PEAK HOUR



Not To Scale



Figure 5

Site Generated Peak Hour Traffic Volume

APPENDIX E

Traffic Projection Model

TRAFFIC PROJECTION MODEL

**Cumberland Farms
Weekday Morning Peak Hour
New Bedford, MA**

Intersection	Dir.	Turn	2018 Existing Volumes Counted	Background Growth 7 yrs (at 1.0 % per year)	Additional Development (15 Single-Family Homes)	2025 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	Pass-By Trips	Total Project Trips	2025 Build Volumes
Acushnet Avenue at Ashley Boulevard (Route 18)	NB	T	306	22	0	328	25%	19		0	19		19	347
		R*	1	0		1		0		0	0		0	1
	SB	L	277	20	2	299	5%	4	5%	4	8	-11	-3	296
		T	324	23	2	349		0	25%	19	19		19	368
	NWB	R	462	33	1	496	5%	4	5%	4	8	-18	-10	486
Acushnet Avenue (Route 18) at North Site Driveway	WB	L				0		0	30%	23	23	23	46	46
		R				0		0	45%	33	33	45	78	78
	NB	T	768	55	1	824		0	5%	4	4	-45	-41	783
		R				0	30%	23		0	23	27	50	50
	SB	L				0	45%	33		0	33	34	67	67
	T	601	43	4	648	5%	4		0	4	-34	-30	618	
Acushnet Avenue at South Site Driveway	WB	L				0		0	20%	15	15	15	30	30
		R				0		0	5%	4	4	5	9	9
	NB	T	462	33	1	496	5%	4		0	4	-23	-19	477
		R				0	20%	15		0	15	23	38	38
	SB	L				0	5%	4		0	4	4	8	8
	T	278	20	2	300		0	5%	4	4	-15	-11	289	

Peak Hour: 7:15 AM - 8:15 AM

TRAFFIC PROJECTION MODEL

**Cumberland Farms
Weekday Afternoon Peak Hour
New Bedford, MA**

Intersection	Dir.	Turn	2018 Existing Volumes Counted	Background Growth 7 yrs (at 1.0 % per year)	Additional Development (15 Single-Family Homes)	2025 No-Build Volumes	New Project PERCENT ENTER	New Project Trips ENTER	New Project PERCENT EXIT	New Project Trips EXIT	New Project Trips TOTAL	Pass-By Trips	Total Project Trips	2025 Build Volumes
Acushnet Avenue at Ashley Boulevard (Route 18)	NB	T	284	20	1	305	25%	14		0	14		14	319
		R*	1	0		1		0		0	0		0	1
	SB	L	537	39	1	577	5%	3	5%	3	6	-14	-8	569
		T	469	34	1	504		0	25%	14	14		14	518
	NWB	R	400	29	2	431	5%	3	5%	3	6	-11	-5	426
Acushnet Avenue (Route 18) at North Site Driveway	WB	L				0		0	30%	17	17	27	44	44
		R				0		0	45%	26	26	28	54	54
	NB	T	684	49	3	736		0	5%	3	3	-28	-25	711
		R				0	30%	17		0	17	17	34	34
	SB	L				0	45%	26		0	26	41	67	67
	T	1006	73	2	1081	5%	3		0	3	-41	-38	1043	
Acushnet Avenue at South Site Driveway	WB	L				0		0	20%	12	12	18	30	30
		R				0		0	5%	3	3	3	6	6
	NB	T	400	29	2	431	5%	3		0	3	-14	-11	420
		R				0	20%	12		0	12	14	26	26
	SB	L				0	5%	3		0	3	4	7	7
	T	538	39	1	578		0	5%	3	3	-18	-15	563	

Peak Hour: 4:45 PM - 5:45 PM

APPENDIX F

Highway Capacity Manual Methodologies

CAPACITY/LEVEL-OF-SERVICE ANALYSES METHODOLOGY

The detailed capacity/level-of-service analysis contained in this traffic impact study was performed in accordance with the standard techniques contained in the *Highway Capacity Manual*.⁽¹⁾ By definition, capacity represents “the maximum rate of flow that can reasonably be expected to pass a point on a uniform section of a lane or roadway under prevailing roadway, traffic, and control conditions.” The level of functioning of an intersection or a uniform section of a lane or roadway can be expressed in terms of levels of service. Level of service (LOS) is defined as “a qualitative measure describing operational conditions within a traffic stream, and their perception by motorists and/or passengers”. Such measures include “speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety.”

At unsignalized intersections, a methodology for evaluating the relative functioning of intersections controlled by stop or yield signs has been developed, and is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.

The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections as follows:

(1) *Transportation Research Board, Highway Capacity Manual, 6th Edition, published by the Transportation Research Board, Washington, DC, 2016.*

Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	0 – 10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	> 50

At signalized intersections, an additional element must be considered: time allocation. Level of service is based on the average control delay per vehicle for various movements within the intersection. Volume/capacity relationships also affect the operations of signalized intersections. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections as follows:

Signalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	≤ 10
B	>10 – 20
C	>20 – 35
D	>35 – 55
E	>55 – 80
F	> 80

APPENDIX G

2018 Existing Capacity/Level-of-Service Analysis

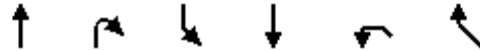
Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2018 Existing
 Weekday AM

	↑	↖	↙	↓	↘	↗	
Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↖	↑		↗	
Traffic Volume (vph)	306	1	277	324	0	462	
Future Volume (vph)	306	1	277	324	0	462	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3388	0	1719	1845	0	1791	
Flt Permitted			0.950				
Satd. Flow (perm)	3388	0	1714	1845	0	1791	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			272	496		
Travel Time (s)	12.2			6.2	11.3		
Confl. Peds. (#/hr)		4	4				
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.83	0.83	0.95	0.95	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	0%	5%	3%	2%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	334	0	334	390	0	486	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	15.7		27.0	53.3		27.0	
Actuated g/C Ratio	0.28		0.48	0.95		0.48	
v/c Ratio	0.35		0.40	0.22		0.56	
Control Delay	19.6		13.2	1.6		15.6	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	19.6		13.2	1.6		15.6	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2018 Existing
 Weekday AM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	B		B	A		B	
Approach Delay	19.6			7.0	15.6		
Approach LOS	B			A	B		
Queue Length 50th (ft)	43		54	0		86	
Queue Length 95th (ft)	114		191	80		330	
Internal Link Dist (ft)	457			192	416		
Turn Bay Length (ft)							
Base Capacity (vph)	1674		1175	1748		1225	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.20		0.28	0.22		0.40	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 56.2
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 12.4
 Intersection LOS: B
 Intersection Capacity Utilization 45.4%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue



Cumberland Farms New Bedford
3: Ashley Boulevard (Route 18) & Acushnet Avenue

2018 Existing
Weekday PM

	↑	↖	↙	↓	↘	↗	
Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↖	↑		↗	
Traffic Volume (vph)	284	1	537	469	0	400	
Future Volume (vph)	284	1	537	469	0	400	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3455	0	1787	1881	0	1844	
Flt Permitted			0.950				
Satd. Flow (perm)	3455	0	1787	1881	0	1844	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			199	496		
Travel Time (s)	12.2			4.5	11.3		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.82	0.82	0.96	0.96	0.84	0.84	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	0%	1%	1%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	347	0	559	489	0	476	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	16.8		31.5	58.3		31.5	
Actuated g/C Ratio	0.27		0.51	0.95		0.51	
v/c Ratio	0.37		0.61	0.27		0.50	
Control Delay	20.9		17.1	1.7		14.7	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	20.9		17.1	1.7		14.7	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2018 Existing
 Weekday PM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	C		B	A		B	
Approach Delay	20.9			9.9	14.7		
Approach LOS	C			A	B		
Queue Length 50th (ft)	55		117	0		93	
Queue Length 95th (ft)	106		#416	118		286	
Internal Link Dist (ft)	457			119	416		
Turn Bay Length (ft)							
Base Capacity (vph)	1504		1089	1780		1124	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.23		0.51	0.27		0.42	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 61.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.61
 Intersection Signal Delay: 13.2
 Intersection LOS: B
 Intersection Capacity Utilization 46.0%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue

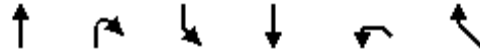


APPENDIX H

2025 No Build Capacity/Level-of-Service Analysis

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 No Build
 Weekday AM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↘	↑		↗	
Traffic Volume (vph)	328	1	299	349	0	496	
Future Volume (vph)	328	1	299	349	0	496	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3388	0	1719	1845	0	1791	
Flt Permitted			0.950				
Satd. Flow (perm)	3388	0	1714	1845	0	1791	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			208	496		
Travel Time (s)	12.2			4.7	11.3		
Confl. Peds. (#/hr)		4	4				
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.83	0.83	0.95	0.95	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	0%	5%	3%	2%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	358	0	360	420	0	522	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	16.7		28.9	55.8		28.9	
Actuated g/C Ratio	0.28		0.49	0.95		0.49	
v/c Ratio	0.37		0.43	0.24		0.59	
Control Delay	20.2		13.8	1.6		16.5	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	20.2		13.8	1.6		16.5	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 No Build
 Weekday AM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	C		B	A		B	
Approach Delay	20.2			7.2	16.5		
Approach LOS	C			A	B		
Queue Length 50th (ft)	52		64	0		103	
Queue Length 95th (ft)	122		208	88		363	
Internal Link Dist (ft)	457			128	416		
Turn Bay Length (ft)							
Base Capacity (vph)	1570		1115	1735		1162	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.23		0.32	0.24		0.45	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 58.9
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 48.1%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue



Cumberland Farms New Bedford
3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 No Build
Weekday PM

	↑	↖	↙	↓	↘	↗	
Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↖	↑		↗	
Traffic Volume (vph)	305	1	577	504	0	431	
Future Volume (vph)	305	1	577	504	0	431	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3455	0	1787	1881	0	1844	
Flt Permitted			0.950				
Satd. Flow (perm)	3455	0	1787	1881	0	1844	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			278	496		
Travel Time (s)	12.2			6.3	11.3		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.82	0.82	0.96	0.96	0.84	0.84	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	0%	1%	1%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	373	0	601	525	0	513	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	17.8		33.3	60.8		33.3	
Actuated g/C Ratio	0.28		0.52	0.95		0.52	
v/c Ratio	0.39		0.65	0.29		0.54	
Control Delay	21.3		18.5	1.8		15.5	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	21.3		18.5	1.8		15.5	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 No Build
 Weekday PM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	C		B	A		B	
Approach Delay	21.3			10.7	15.5		
Approach LOS	C			B	B		
Queue Length 50th (ft)	59		133	0		105	
Queue Length 95th (ft)	114		#488	128		313	
Internal Link Dist (ft)	457			198	416		
Turn Bay Length (ft)							
Base Capacity (vph)	1409		1020	1775		1053	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.26		0.59	0.30		0.49	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 64.2
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 13.9
 Intersection LOS: B
 Intersection Capacity Utilization 48.8%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue

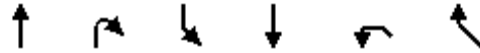


APPENDIX I

2025 Build Capacity/Level-of-Service Analysis

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 Build
 Weekday AM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↘	↑		↗	
Traffic Volume (vph)	347	1	296	368	0	486	
Future Volume (vph)	347	1	296	368	0	486	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3388	0	1719	1845	0	1791	
Flt Permitted			0.950				
Satd. Flow (perm)	3388	0	1714	1845	0	1791	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			180	322		
Travel Time (s)	12.2			4.1	7.3		
Confl. Peds. (#/hr)		4	4				
Confl. Bikes (#/hr)							
Peak Hour Factor	0.92	0.92	0.83	0.83	0.95	0.95	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	3%	0%	5%	3%	2%	4%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	378	0	357	443	0	512	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	17.0		29.0	56.2		29.0	
Actuated g/C Ratio	0.29		0.49	0.95		0.49	
v/c Ratio	0.39		0.42	0.25		0.59	
Control Delay	20.3		13.8	1.7		16.4	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	20.3		13.8	1.7		16.4	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 Build
 Weekday AM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	C		B	A		B	
Approach Delay	20.3			7.1	16.4		
Approach LOS	C			A	B		
Queue Length 50th (ft)	57		64	0		102	
Queue Length 95th (ft)	129		206	93		354	
Internal Link Dist (ft)	457			100	242		
Turn Bay Length (ft)							
Base Capacity (vph)	1560		1108	1730		1155	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.24		0.32	0.26		0.44	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 59.3
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.59
 Intersection Signal Delay: 12.9
 Intersection LOS: B
 Intersection Capacity Utilization 48.1%
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue



Intersection						
Int Delay, s/veh	3.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	46	78	783	50	67	618
Future Vol, veh/h	46	78	783	50	67	618
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	96	96	83	83
Heavy Vehicles, %	2	2	4	2	2	4
Mvmt Flow	50	85	816	52	81	745

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1377	434	0	0	868	0
Stage 1	842	-	-	-	-	-
Stage 2	535	-	-	-	-	-
Critical Hdwy	6.5	6.5	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	155	601	-	-	772	-
Stage 1	383	-	-	-	-	-
Stage 2	551	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	127	601	-	-	772	-
Mov Cap-2 Maneuver	127	-	-	-	-	-
Stage 1	383	-	-	-	-	-
Stage 2	452	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	34.6	0	1.7
HCM LOS	D		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	252	772
HCM Lane V/C Ratio	-	-	0.535	0.105
HCM Control Delay (s)	-	-	34.6	10.2
HCM Lane LOS	-	-	D	B
HCM 95th %tile Q(veh)	-	-	2.9	0.3

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	30	9	477	38	8	289
Future Vol, veh/h	30	9	477	38	8	289
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	95	95	95	95
Heavy Vehicles, %	2	2	4	2	2	5
Mvmt Flow	33	10	502	40	8	304

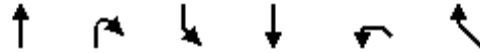
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	842	522	0	0	542	0
Stage 1	522	-	-	-	-	-
Stage 2	320	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	334	555	-	-	1027	-
Stage 1	595	-	-	-	-	-
Stage 2	736	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	331	555	-	-	1027	-
Mov Cap-2 Maneuver	331	-	-	-	-	-
Stage 1	595	-	-	-	-	-
Stage 2	729	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	16.2	0	0.2
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	365	1027
HCM Lane V/C Ratio	-	-	0.116	0.008
HCM Control Delay (s)	-	-	16.2	8.5
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.4	0

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

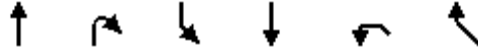
2025 Build
 Weekday PM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
Lane Configurations	↑↑		↘	↑		↗	
Traffic Volume (vph)	319	1	569	518	0	426	
Future Volume (vph)	319	1	569	518	0	426	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Width (ft)	11	11	12	12	16	16	
Grade (%)	0%			0%	0%		
Storage Length (ft)		0	0		0	0	
Storage Lanes		0	1		0	1	
Taper Length (ft)			25		25		
Satd. Flow (prot)	3455	0	1787	1881	0	1844	
Flt Permitted			0.950				
Satd. Flow (perm)	3455	0	1787	1881	0	1844	
Right Turn on Red		No				No	
Satd. Flow (RTOR)							
Link Speed (mph)	30			30	30		
Link Distance (ft)	537			101	330		
Travel Time (s)	12.2			2.3	7.5		
Confl. Peds. (#/hr)							
Confl. Bikes (#/hr)							
Peak Hour Factor	0.82	0.82	0.96	0.96	0.84	0.84	
Growth Factor	100%	100%	100%	100%	100%	100%	
Heavy Vehicles (%)	1%	0%	1%	1%	2%	1%	
Bus Blockages (#/hr)	0	0	0	0	0	0	
Parking (#/hr)							
Mid-Block Traffic (%)	0%			0%	0%		
Shared Lane Traffic (%)							
Lane Group Flow (vph)	390	0	593	540	0	507	
Turn Type	NA		Prot	NA		Over	
Protected Phases	1		3	1 3		3	2
Permitted Phases							
Detector Phase	1		3	1 3		3	
Switch Phase							
Minimum Initial (s)	4.0		4.0			4.0	5.0
Minimum Split (s)	9.0		18.0			18.0	18.0
Total Split (s)	30.0		40.0			40.0	18.0
Total Split (%)	34.1%		45.5%			45.5%	20%
Yellow Time (s)	4.0		4.0			4.0	2.0
All-Red Time (s)	1.0		1.0			1.0	3.0
Lost Time Adjust (s)	0.0		0.0			0.0	
Total Lost Time (s)	5.0		5.0			5.0	
Lead/Lag	Lead						Lag
Lead-Lag Optimize?	Yes						Yes
Recall Mode	Min		None			None	None
Act Effect Green (s)	18.3		33.2	61.2		33.2	
Actuated g/C Ratio	0.28		0.51	0.95		0.51	
v/c Ratio	0.40		0.65	0.30		0.54	
Control Delay	21.3		18.6	1.8		15.6	
Queue Delay	0.0		0.0	0.0		0.0	
Total Delay	21.3		18.6	1.8		15.6	

Cumberland Farms New Bedford
 3: Ashley Boulevard (Route 18) & Acushnet Avenue

2025 Build
 Weekday PM



Lane Group	NBT	NBR	SBL	SBT	NWL	NWR	Ø2
LOS	C		B	A		B	
Approach Delay	21.3			10.6	15.6		
Approach LOS	C			B	B		
Queue Length 50th (ft)	62		139	0		110	
Queue Length 95th (ft)	118		#477	134		309	
Internal Link Dist (ft)	457			21	250		
Turn Bay Length (ft)							
Base Capacity (vph)	1400		1014	1773		1046	
Starvation Cap Reductn	0		0	0		0	
Spillback Cap Reductn	0		0	0		0	
Storage Cap Reductn	0		0	0		0	
Reduced v/c Ratio	0.28		0.58	0.30		0.48	

Intersection Summary

Area Type: Other
 Cycle Length: 88
 Actuated Cycle Length: 64.6
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.65
 Intersection Signal Delay: 13.9
 Intersection LOS: B
 Intersection Capacity Utilization 48.7%
 ICU Level of Service A
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 3: Ashley Boulevard (Route 18) & Acushnet Avenue



Intersection						
Int Delay, s/veh	3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑↓			↑↓
Traffic Vol, veh/h	44	54	711	34	67	1043
Future Vol, veh/h	44	54	711	34	67	1043
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	93	93	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	48	59	765	37	70	1086

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1467	401	0	0	802	0
Stage 1	784	-	-	-	-	-
Stage 2	683	-	-	-	-	-
Critical Hdwy	6.5	6.5	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	136	629	-	-	817	-
Stage 1	410	-	-	-	-	-
Stage 2	463	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	107	629	-	-	817	-
Mov Cap-2 Maneuver	107	-	-	-	-	-
Stage 1	410	-	-	-	-	-
Stage 2	363	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	42.9	0	1.4
HCM LOS	E		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	197	817
HCM Lane V/C Ratio	-	-	0.541	0.085
HCM Control Delay (s)	-	-	42.9	9.8
HCM Lane LOS	-	-	E	A
HCM 95th %tile Q(veh)	-	-	2.8	0.3

Intersection						
Int Delay, s/veh	0.8					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		B			A
Traffic Vol, veh/h	30	6	420	26	7	563
Future Vol, veh/h	30	6	420	26	7	563
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	87	87	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	33	7	483	30	7	599

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	1111	498	0	0	513	0
Stage 1	498	-	-	-	-	-
Stage 2	613	-	-	-	-	-
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	231	572	-	-	1052	-
Stage 1	611	-	-	-	-	-
Stage 2	541	-	-	-	-	-
Platoon blocked, %			-	-	-	-
Mov Cap-1 Maneuver	229	572	-	-	1052	-
Mov Cap-2 Maneuver	229	-	-	-	-	-
Stage 1	611	-	-	-	-	-
Stage 2	536	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	21.7	0	0.1
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	254	1052
HCM Lane V/C Ratio	-	-	0.154	0.007
HCM Control Delay (s)	-	-	21.7	8.4
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	0.5	0

APPENDIX J

Capacity/Level-of-Service Analysis Summary

Capacity Analysis Summary
 Cumberland Farms
 New Bedford, Massachusetts

Weekday Morning Peak Hour											
Intersection	Movement	2018 Existing			2025 No Build			2025 Build			
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C	
Acushnet Avenue at	NB T	B	19.6	0.35	C	20.2	0.37	C	20.3	0.39	
Ashley Boulevard (Route 18)	SB L	B	13.2	0.40	B	13.8	0.43	B	13.8	0.42	
	T	A	1.6	0.22	A	1.6	0.24	A	1.7	0.25	
	NWB R	B	15.6	0.56	B	16.5	0.59	B	16.4	0.59	
	<i>Overall</i>	<i>B</i>	<i>12.4</i>	<i>0.56</i>	<i>B</i>	<i>12.9</i>	<i>0.59</i>	<i>B</i>	<i>12.9</i>	<i>0.59</i>	
Acushnet Avenue (Route 18) at	WB LR	n/a	n/a	n/a	n/a	n/a	n/a	D	34.6	0.54	
North Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	
	SB LT	n/a	n/a	n/a	n/a	n/a	n/a	A	1.7	0.11	
	<i>Overall</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>A</i>	<i>3.3</i>	<i>0.54</i>	
Acushnet Avenue at	WB LR	n/a	n/a	n/a	n/a	n/a	n/a	C	16.2	0.12	
South Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	
	SB LT	n/a	n/a	n/a	n/a	n/a	n/a	A	0.2	0.01	
	<i>Overall</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>A</i>	<i>0.8</i>	<i>0.12</i>	

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

n/a Not Applicable

Queue Summary
Cumberland Farms
New Bedford, Massachusetts

Weekday Morning Peak Hour								
Intersection	Movement	2018 Existing		2025 No Build		2025 Build		
		50th Queue ¹	95th Queue ²	50th Queue	95th Queue	50th Queue	95th Queue	
Acushnet Avenue at	NB T	43	114	52	122	57	129	
Ashley Boulevard (Route 18)	SB L	54	191	64	208	64	206	
	T	0	80	0	88	0	93	
	NWB R	86	330	103	363	102	354	
Acushnet Avenue (Route 18) at	WB LR	n/a	n/a	n/a	n/a	n/a	73	
North Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	0	
	SB LT	n/a	n/a	n/a	n/a	n/a	8	
Acushnet Avenue at	WB LR	n/a	n/a	n/a	n/a	n/a	10	
South Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	0	
	SB LT	n/a	n/a	n/a	n/a	n/a	0	

¹ 50th Percentile Queue Length, in feet

² 95th Percentile Queue Length, in feet

n/a Not Applicable

Capacity Analysis Summary
 Cumberland Farms
 New Bedford, Massachusetts

Weekday Afternoon Peak Hour											
Intersection	Movement	2018 Existing			2025 No Build			2025 Build			
		LOS ¹	Delay ²	V/C ³	LOS	Delay	V/C	LOS	Delay	V/C	
Acushnet Avenue at	NB T	C	20.9	0.37	C	21.3	0.39	C	21.3	0.40	
Ashley Boulevard (Route 18)	SB L	B	17.1	0.61	B	18.5	0.65	B	18.6	0.65	
	T	A	1.7	0.27	A	1.8	0.29	A	1.8	0.30	
	NWB R	B	14.7	0.50	B	15.5	0.54	B	15.6	0.54	
	<i>Overall</i>	<i>B</i>	<i>13.2</i>	<i>0.61</i>	<i>B</i>	<i>13.9</i>	<i>0.65</i>	<i>B</i>	<i>13.9</i>	<i>0.65</i>	
Acushnet Avenue (Route 18) at	WB LR	n/a	n/a	n/a	n/a	n/a	n/a	E	42.9	0.54	
North Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	
	SB LT	n/a	n/a	n/a	n/a	n/a	n/a	A	1.4	0.09	
	<i>Overall</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>A</i>	<i>3.0</i>	<i>0.54</i>	
Acushnet Avenue at	WB LR	n/a	n/a	n/a	n/a	n/a	n/a	C	21.7	0.15	
South Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	n/a	A	0.0	0.00	
	SB LT	n/a	n/a	n/a	n/a	n/a	n/a	A	0.1	0.01	
	<i>Overall</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>A</i>	<i>0.8</i>	<i>0.15</i>	

1 Level-of-Service

2 Average vehicle delay in seconds

3 Volume to capacity ratio

n/a Not Applicable

Queue Summary
Cumberland Farms
New Bedford, Massachusetts

Weekday Afternoon Peak Hour								
Intersection	Movement	2018 Existing		2025 No Build		2025 Build		
		50th Queue ¹	95th Queue ²	50th Queue	95th Queue	50th Queue	95th Queue	
Acushnet Avenue at	NB T	55	106	59	114	62	118	
Ashley Boulevard (Route 18)	SB L	117	416	133	488	139	477	
	T	0	118	0	128	0	134	
	NWB R	93	286	105	313	110	309	
Acushnet Avenue (Route 18) at	WB LR	n/a	n/a	n/a	n/a	n/a	70	
North Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	0	
	SB LT	n/a	n/a	n/a	n/a	n/a	8	
Acushnet Avenue at	WB LR	n/a	n/a	n/a	n/a	n/a	13	
South Site Driveway	NB TR	n/a	n/a	n/a	n/a	n/a	0	
	SB LT	n/a	n/a	n/a	n/a	n/a	0	

¹ 50th Percentile Queue Length, in feet

² 95th Percentile Queue Length, in feet

n/a Not Applicable