



# Old Colony Planning Council

## Major Bottleneck Identification Study and Action Plan

January 2011



*Prepared by Old Colony Planning Council  
70 School Street Brockton MA 02301  
under MassDOT Contract # 0052455*



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The views and opinions of the Old Colony Planning Council expressed herein do not necessarily state or reflect those of the U. S. Department of Transportation.

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## Table of Contents

<b>1.0</b>	<b>Study Purpose and Scope .....</b>	<b>1</b>
<b>2.0</b>	<b>Bottlenecks and Congestion .....</b>	<b>1</b>
<b>3.0</b>	<b>Congestion in the OCPC Region .....</b>	<b>3</b>
<b>4.0</b>	<b>Bottleneck Identification .....</b>	<b>4</b>
<b>5.0</b>	<b>Next Steps and Recommendations .....</b>	<b>Error! Bookmark not defined.</b>
<b>6.0</b>	<b>Appendix .....</b>	<b>20</b>
6.1	2011 Old Colony Regional Transportation Survey .....	20

## Figures

<b>Figure 1 - Regional Highway System.....</b>	<b>2</b>
<b>Figure 2 - Traffic Congestion in the Region.....</b>	<b>5</b>
<b>Figure 3 - Locations Advanced to Phase II.....</b>	<b>18</b>



## 1.0 Study Purpose and Scope

This study was undertaken as part of the Old Colony Unified Planning Work Program Task 3600 (UPWP Fiscal Year 2010). The purpose of this study is to identify three major bottleneck locations within the Old Colony Region and develop short term and long term actions to enhance circulation and efficiency of traffic flow. In depth analysis for the three locations will be completed in Phase II of the study, which will be completed in FFY 2011. Phase I of the study includes the identification of the three major bottleneck locations, which will include a limited access highway, an arterial, and a town center.

The geographic scope of this study includes the highway and road network within the fifteen OCPC region communities. Figure 1 shows the OCPC region and the regional highway network.

## 2.0 Bottlenecks and Congestion

A bottleneck is a condition that restricts the free movement of traffic creating a point of congestion during specific periods, usually the peak commuter periods. Bottlenecks have a number of different causes including operational influences (traffic signals and the physical design and alignment of intersections); the narrowing of a highway corridor and lane drops, weaving conditions, sun glare, steep grades, or crashes and incidents on a roadway. The FHWA defines bottlenecks as “Localized sections of highway where traffic experiences reduced speeds and delays due to recurring operational conditions or non-recurring traffic influencing events”.<sup>1</sup>

The FHWA defines congestion as an excess of vehicles on a roadway at a particular time resulting in speeds that are much slower than normal or free flow speeds. Congestion can be described in terms of capacity. The capacity of a facility refers to the ability of a facility to process traffic during times of peak demand. Congestion occurs when the facility’s capacity is insufficient to meet the traffic demand. Although bottlenecks cause congestion, the terms are not interchangeable. A bottleneck occurs at a specific location on a facility. Congestion can be pervasive on a facility where too many vehicles compete along segments of a facility.

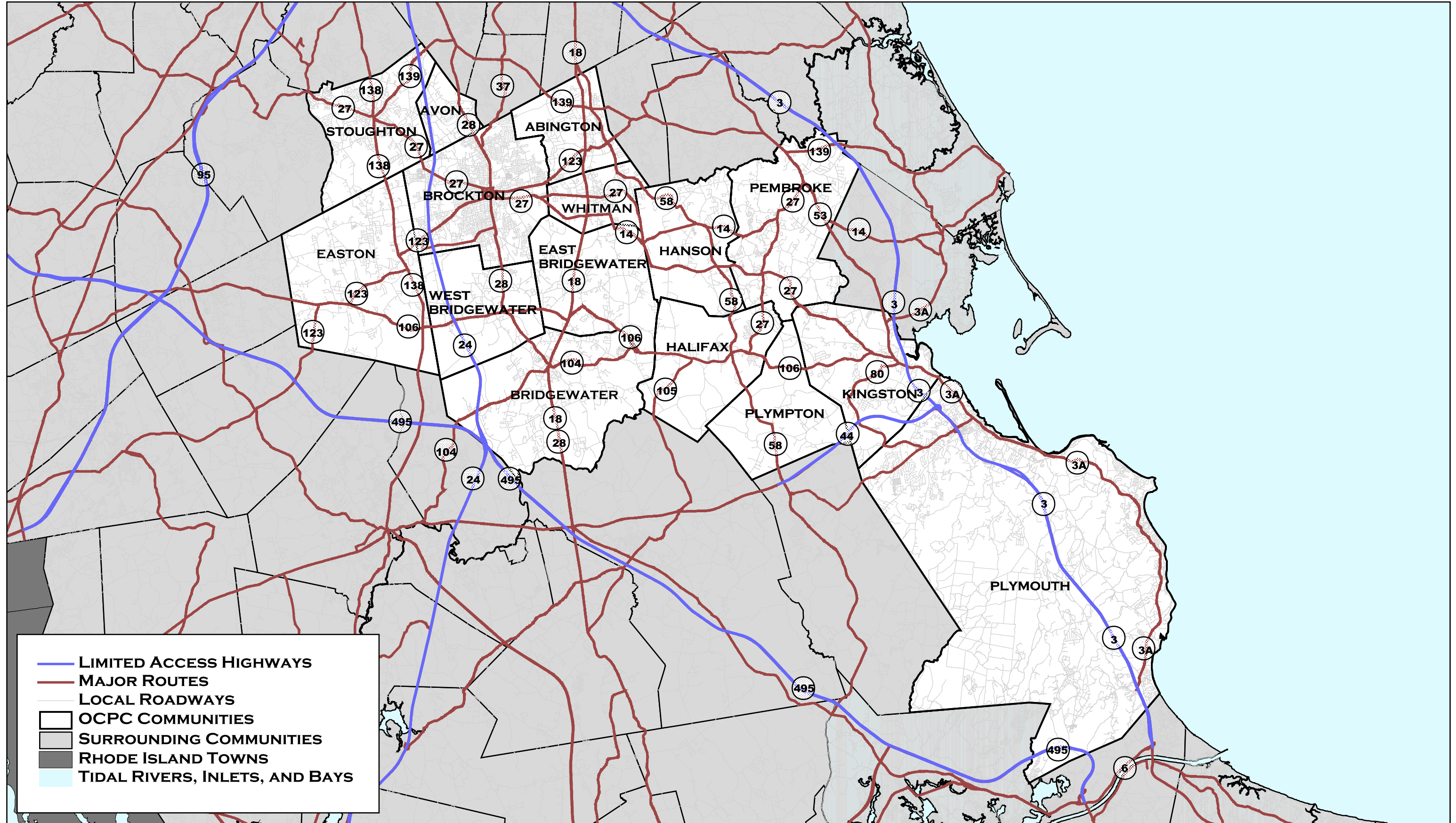
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<sup>1</sup> Recurring Traffic Bottlenecks: A Primer, USDOT, FHWA, June 2009, Page 50.

# OCPC REGIONAL HIGHWAY NETWORK



FIGURE 1



- LIMITED ACCESS HIGHWAYS
- MAJOR ROUTES
- LOCAL ROADWAYS
- OCPC COMMUNITIES
- SURROUNDING COMMUNITIES
- RHODE ISLAND TOWNS
- TIDAL RIVERS, INLETS, AND BAYS





Bottlenecks have been categorized by traffic engineers based upon their causes and unique characteristics. Bottlenecks are divided into two main types; those that create recurring congestion and those that create nonrecurring congestion. Recurring bottlenecks can be caused by inadequate capacity and poor signal timing. Nonrecurring bottlenecks are due mainly to random factors such as bad weather, and traffic incidents, and can vary widely in location and severity. This study addresses recurring bottlenecks, which are more predictable in cause, location, time of day, and duration.<sup>2</sup>

Table 1 summarizes various types of bottlenecks.

**Table 1- Traffic Bottlenecks**

<b>Occurrences</b>	<b>Recurring</b> – “Predictable” in cause, location, time of day, and approximate duration. <b>Nonrecurring</b> – “Random” (in the colloquial sense) as to location and severity. Even if planned in some cases, like work zones or special events, these occurrences are irregular and are not predictably habitual or recurring in location.
<b>Causes</b>	<b>Recurring: Operational Causes</b> – A “facility determinate” condition wherein a fixed condition (the design or function of the facility at that point) allows surging traffic confluence to periodically overwhelm the roadway’s physical ability (i.e., capacity) to handle the traffic, resulting in predictable periods of delay. <b>Nonrecurring: Dynamic Occurrences</b> – An “event determinate” occurrence, wherein a dynamic situation either reduces available capacity (e.g., loss of lanes due to incident or work zone) or increases demand (e.g., special event).
<b>Examples</b>	<b>Recurring:</b> Ramps, lane drops, weaves, merges, grades, underpasses, tunnels, narrow lanes, lack of shoulders, bridge lane reduction, curves, poorly operating traffic signals. <b>Nonrecurring:</b> Work zones, crashes, incidents, special events, weather.
<b>Supplementary Terms (Applies to both types)</b>	<b>“Active” bottlenecks</b> – When traffic “released” past the bottleneck is not affected by a downstream restriction (i.e., queue spillback) from another bottleneck. <b>“Hidden” bottlenecks</b> – When traffic demand is metered by another upstream bottleneck(s); i.e., either a lesser or nonexistent bottleneck that would increase or appear, respectively, if only unfettered traffic could reach it.
<b>Identification of (Applies to either type)</b>	Motorists typically refer to bottlenecks in terms of added time delay when compared to the same non-delayed trip, but engineers and agencies also measure performance data: average speed (travel time), lane densities, queue lengths, queue discharge rates, vehicle miles of travel (VMT), and vehicle hours of travel (VHT).
<b>Measurement of: (applies to either type)</b>	Data is collected using manual techniques (e.g., floating cars, aerial photography, or manual counts from video recordings) or from dynamic surveillance (e.g., detectors, radar, video, etc.) collected in real time. Modeling, especially micro-simulation, can be used to study the impacts of bottleneck remediation on upstream and downstream conditions.
<b>Classification</b>	<b>Recurring: Type I</b> – Demand surge, no capacity reduction (typically at freeway on-ramp merges). <b>Type II</b> – Capacity reduction, no demand surge (typically changes in freeway geometry; lane drop, grade, curve). <b>Type III</b> – Combined demand surge and capacity reduction (typically in weaving sections). <b>Nonrecurring:</b> Usually classified by the type of event (e.g., incident, work zone) and severity of impact (e.g., duration of the number of lanes lost, closed, or impassable).
<b>Signature Trigger</b>	<b>Recurring:</b> Bottleneck is due to over-demand of volume (i.e., peak-hour conditions). The bottleneck clears from the rear of the queue as volume declines. <b>Nonrecurring:</b> Bottleneck is due to loss of capacity due to an incident, or short-term over-demand due to a spot event. The bottleneck clears from the front or rear of the queue, depending on whether the cause is incident-related (former) or volume-related (latter), respectively.
<b>Disappears</b>	<b>Recurring:</b> When volume over-demand drops back to manageable levels for available capacity (i.e., when off-peak conditions return). <b>Nonrecurring:</b> When dynamic event is removed; queue should dissipate, thereafter.

Source: FHWA

### 3.0 Congestion in the OCPC Region

OCPC has consistently developed a Congestion Management Process (CMP), as an integral part of the metropolitan planning process, in accordance with the guidelines in the Safe Accountable Flexible Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU). The CMP monitors and manages congestion, provides information on transportation system performance, and develops alternative strategies for alleviating

<sup>2</sup> Traffic Analysis Toolbox Volume X; Localized Bottleneck Congestion Analysis, Publication No. FHWA HOP 09 042 March 2010, Page 2.



congestion and enhancing the mobility of persons and goods. The Congestion Management Process establishes performance methods as well as routines to monitor and evaluate the performance of the transportation system and to identify the causes of congestion in the region.

Congestion within the region was identified through a number of means. The OCPC CMP identified congested facilities, including intersections and highway segments, through corridor studies and Local Highway Planning Technical Assistance studies completed by OCPC (and studies from other agencies and organizations). In addition, congestion on OCPC's highway network was identified based on the volume to capacity (V/C) ratios from the Travel Demand Model developed by the MassDOT Office of Transportation Planning, and the OCPC Traffic Count Management System. The V/C ratio expresses congestion in terms based on the demand or volume in comparison to capacity (capacity can be described as the ability of a facility to process the demand). A facility is generally considered to be at capacity at a V/C ratio greater than 80 percent. At 80 percent, reduced speeds, very long delays, long queues, and forced flow become pervasive. The congested areas within the OCPC region based on the V/C ratio are shown in Figure 2.

#### **4.0 Bottleneck Identification**

Recurring bottlenecks occur when the rate of approaching traffic is greater than the rate of departing traffic.<sup>3</sup> OCPC has developed a screening process to identify bottleneck locations within the region, utilizing the OCPC CMP, Regional Transportation Plan, corridor studies, and other studies. These locations were compiled initially based on their V/C ratio, as shown in Figure 2. In addition, bottleneck locations were identified through public outreach during the corridor study process and the Regional Transportation Plan process. The results of the public outreach process are included in the appendix to this report.

In order to better identify and screen locations, a matrix was developed that includes the facility, the bottleneck type, previous studies, and improvement to the facility (recently implemented or planned). Table 2 summarizes the locations where congestion is pervasive due to bottlenecks within the OCPC Region. The congested locations in Table 2 contain one or more bottlenecks.

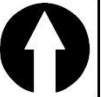
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<sup>3</sup> Traffic Analysis Toolbox Volume X; Localized Bottleneck Congestion Analysis, Publication No. FHWA HOP 09 042 March 2010, Page 2.



# TRAFFIC CONGESTION IN THE REGION BASED ON VOLUME TO CAPACITY (V/C) RATIO

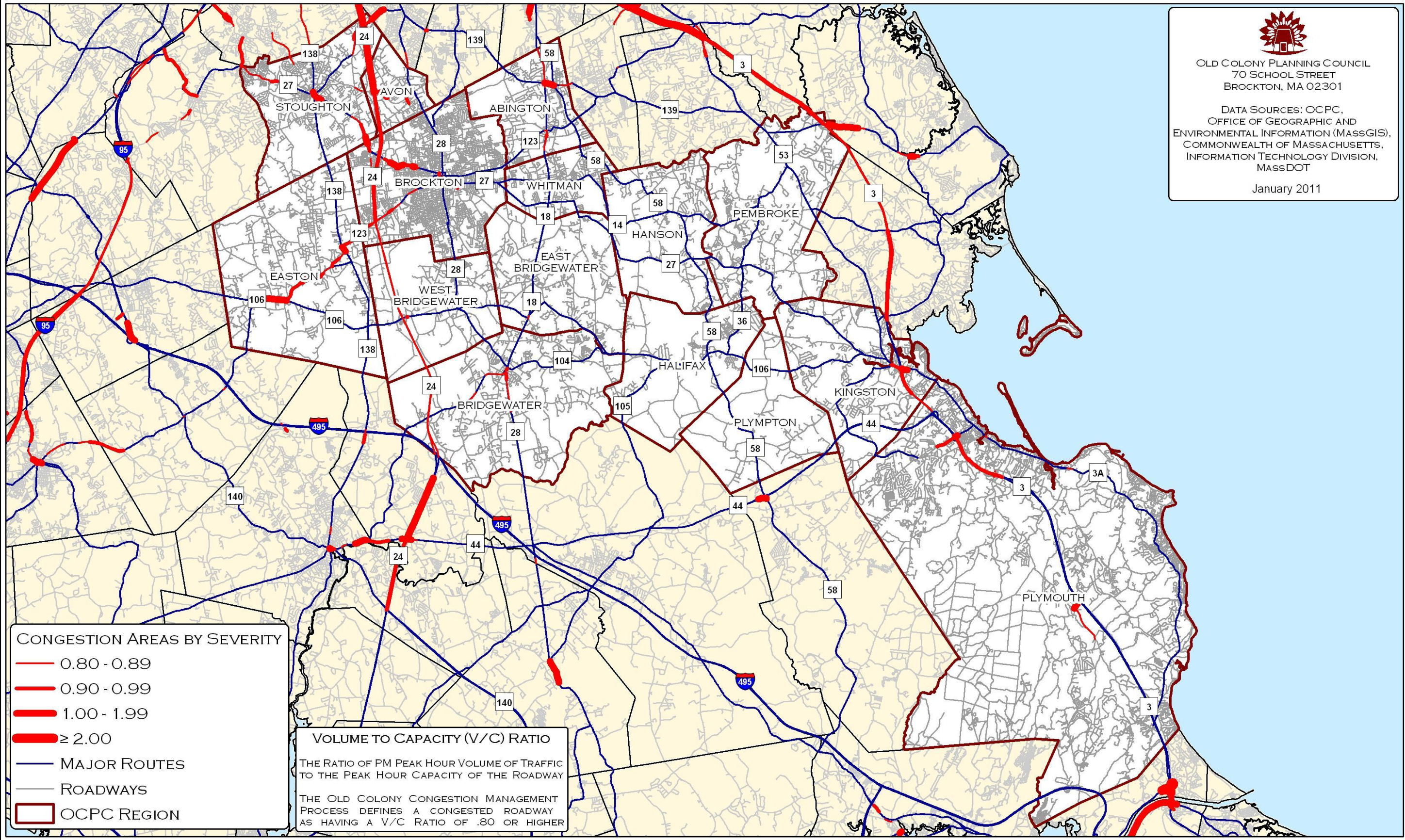
Figure 2



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DATA SOURCES: OCPC,  
OFFICE OF GEOGRAPHIC AND  
ENVIRONMENTAL INFORMATION (MASSGIS),  
COMMONWEALTH OF MASSACHUSETTS,  
INFORMATION TECHNOLOGY DIVISION,  
MASSDOT

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**Table 2 - Bottleneck Locations in the OCPC Region**

<b>Bottleneck Facility</b>	<b>Bottleneck Types (Cause)</b>
<b>Limited Access Highway Interchanges</b>	
AmVets Memorial Highway (Route 24) & Interstate 495 - Exit 14	Demand surge/ merges/weaves/narrow lanes
AmVets Memorial Highway (Route 24) & Pleasant Street (Route 104) - Exit 15	Demand surge/ merges
AmVets Memorial Highway (Route 24) & West Center Street (Route 106) - Exit 16	Demand surge/ merges
AmVets Memorial Highway (Route 24) & Belmont Street (Route 123) - Exit 17	Demand surge/ merges
AmVets Memorial Highway (Route 24) & Reynolds Memorial Highway (Route 27) - Exit 18	Demand surge/ merges
AmVets Memorial Highway (Route 24) & Harrison Boulevard/Central Street - Exit 19	Demand surge/ merges
AmVets Memorial Highway (Route 24) & Lindelof Avenue (Route 139) - Exit 20	Demand surge/ merges
Pilgrim Highway (Route 3) & Long Pond Road - Exit 5	Demand Surge
Pilgrim Highway (Route 3) & Samoset Street (Route 44) SB - Exit 6A	Demand Surge
Pilgrim Highway (Route 3) & Samoset Street SB - Exit 6B	Demand Surge – Lane drop
Pilgrim Highway (Route 3) & Smiths Lane - Exit 8	Demand Surge
Pilgrim Highway (Route 3) & Main Street (Route 3A) - Exit 9	Demand surge
Pilgrim Highway (Route 3) & Church Street (Route 139) – Exit 12	Demand surge
<b>Arterials</b>	
Route 3A Kingston – Railroad Tracks to Route 3	Demand Surge
Route 3A Plymouth – Cherry Street to South Street	Demand Surge
Route 18 - Abington from Weymouth Town Line to Whitman Town Line	Lane drop
Route 27 Brockton from West Street to Route 14	
Route 27 Stoughton from Town Center to Brockton City Line	
Route 44/Samoset Street from Pilgrim Hill Road to Court Street (Route 3A)	
Route 104 Bridgewater from Route 24 to Bridgewater Center	Lane drop Demand Surge
Route 106 Halifax from Indian Pond Road to Route 58	
Route 106 West Bridgewater from Route 24 to Route 28 (West Bridgewater Center)	Demand Surge
Route 123 Easton and Brockton from Route 138 to Route 28	
Route 138 Stoughton from Canton Town Line to Route 27	
Central Street Stoughton Route 27 to Avon Town Line	
Main Street Brockton – Howard Street to Plain Street	
<b>Town Centers</b>	
Bridgewater Center	Signal/Traffic Control (Systematic)
East Bridgewater Center	Signal/ Systematic
Stoughton Square	Signal/ Systematic
West Bridgewater Center	Signal
Whitman Center	Intersection



#### **4.1 Limited Access Highways and Interchanges**

##### **AmVets Memorial Highway (Route 24)**

Route 24 is a six-lane (three in each direction), principal limited access highway within the Old Colony Region that provides north south access between I-495, and points south, and Route 128 (I-93). Route 24, within the OCPC region, is over capacity during the morning and afternoon peak hours due to extremely heavy volume surges and a lack of weaving areas and acceleration and deceleration lanes. Lane widths, bridge heights, shoulder widths, and weaving and merging lanes do not conform to interstate standards. The congestion and back-ups on Route 128 (I-93) create congestion at the Route 24/Route 128 merge in Randolph, and back onto Route 24 into Stoughton, Avon, Brockton, and West Bridgewater.

The V/C ratio for Route 24 exceeds 0.80 from the I-495 to Route 104 interchanges in Bridgewater and from the Route 106 interchange in West Bridgewater north through Brockton, Avon, and Stoughton to the Route 128 merge in Randolph. In addition, the peak hour demand surges create bottlenecks at the Route 24 interchanges including Route 24 at Lindelof Avenue (Route 139) in Exit 20 in Stoughton, Route 24 at Harrison Boulevard/Central Street Exit 19 in Avon, Route 24 at Belmont Street (Route 123) Exit 17 in Brockton, Route 24 at West Center Street Route 106 Exit 16 in West Bridgewater, and Route 24 at Pleasant Street (Route 104) Exit 15 in Bridgewater.

The junction of Lindelof Avenue (Route 139) and Route 24 Exit 20 in Stoughton is a full cloverleaf design with a designated ramp for each entering and exiting movement. Volumes and speeds on Route 139 make merging from Route 24 off-ramp challenging. The curvature and wooded landscape on Route 24 off-ramp creates limited sightlines. Each off-ramp is controlled by a yield sign as they merge with Lindelof Avenue. The bridge deck on the Route 139 over Route 24 overpass was recently replaced. Included in this project was resurfacing of the ramp entrances and exits, and striping enhancements. The project was completed in 2010.

Route 24 at Harrison Boulevard Exit 19 in Avon is also full cloverleaf design and serves the Avon Industrial Park to the east (via Harrison Boulevard to Pond Street to Bodwell Street), and a major retail area on Stockwell Drive. Typically, during the weekday morning and afternoon peak hour, traffic is backed up at the intersection of Harrison Boulevard and Pond Street, with a heavy left turn demand on the Harrison Boulevard eastbound approach. On the weekends, during the Saturday and Sunday retail peak hours, because of the IKEA Home Furnishings on Stockwell Drive, traffic is backed up from Stockwell Drive along Harrison Boulevard, onto the Route 24 ramps and southbound travel lane.

Route 24 at Reynolds Memorial Highway (Route 27) Exit 18 in Brockton serves retail plazas along Route 27 to the west and the Westgate Mall and Brockton Downtown to the east. A lack of acceleration lanes for vehicles exiting Route 24, along with high





speeds along Reynolds Highway, creates merging and weaving problems on Reynolds Highway. Heavy left turns on Reynolds Highway at the Westgate Mall intersection create backups along Reynolds Highway. A reconstruction project is currently underway to align Reynolds Highway and West Street, which includes the reconstruction of the Westgate Drive/Reynolds intersection to facilitate movement into the mall that is currently inhibited by poor merging and intersection alignment within the mall at the Westgate Drive. This in turn will facilitate traffic flow at the Westgate Mall/Reynolds Highway intersection.

At Route 24 at Belmont Street (Route 123) Exit 17 in Brockton, traffic exiting Route 24 and traveling eastbound on Belmont Street (Route 123) during the morning peak period backs up on the highway because of the traffic signal at the intersection of Belmont Street (Route 123) and Manley Street (approximately 400 feet to the east). This bottleneck and the volume of traffic attempting to traverse the facility create a congestion and safety problem. The FFY 2011-2014 Old Colony TIP contains a project to improve the intersections of Belmont Street (Route 123) at Manley Street, and Belmont Street (Route 123) at the VA Hospital. These improvements include upgrading the signals, signal timing, and lane use. In addition, widening of the cross-section is included as part of the project.

At Route 24 at West Center Street (Route 106) Exit 16 in West Bridgewater, northbound and southbound traffic attempting to exit Route 24 and travel eastbound on West Center Street (Route 106) during the morning and afternoon peak periods backs up on both roadways because of a lane drop on the east side of the interchange. In addition, land uses on either side of West Center Street (Route 106) create numerous turning movements, which increase the congestion at this location.

Similarly to the Route 106 exit in West Bridgewater, northbound and southbound traffic attempting to exit Route 24 and travel eastbound on Pleasant Street (Route 104) at the Route 24/Pleasant Street (Route 104) Exit 15 in Bridgewater during the morning and afternoon peak periods backs up on both roadways because of a lane drop on the east side of the interchange. In addition, land uses, including a new home improvement store, on both sides of Pleasant Street create numerous turning movements, exacerbating congestion at this location. Route 104 in this segment was recently widened as mitigation for the opening of the home improvement store, and traffic signals were added to the northbound and southbound ramps at the Route 104 intersections.

### Pilgrim Highway (Route 3)

Route 3 contains three lanes in the northbound and southbound direction north of Exit 16 in Weymouth. The southbound lane drops from three lanes to two lanes south of Exit 16. The northbound side contains two lanes to Exit 16 where it widens to three lanes. The Old Colony 2007 Regional Transportation Plan includes a long standing



recommended project that would widen Route 3 from Exit 16 in Weymouth to Exit 14 in Duxbury. Route 3 is four-lane highway south of Exit 16 except for the segment between Exit 6 and Exit 7 in Plymouth, where Route 3 is a six lane cross section. This situation creates a lane drop for northbound traffic after Exit 7, while the southbound contains two lane drops, one just south of Exit 16 in Weymouth and one at Exit 6 in Plymouth.

The northbound and southbound ramps at Route 3/Church Street (Route 139) Exit 12 in Pembroke make up two signalized intersections, with the northbound on-off ramps intersecting Route 139 to the east of Route 3 and the southbound ramps intersecting Route 139 to the west of Route 3. These intersections have multiple lane approaches on Route 139 as well as on the off ramps. Both signals are coordinated and have high peak hour travel demands resulting in long delays, especially at the southbound ramp intersection during the PM peak hour. Left turn storage is limited at both the southbound and northbound ramp systems and physical constraints on Route 139, due to the Route 3 overpass, embankments, and commercial development, present obstacles to potential roadway widening. The queue for left turn from Church Street (Route 139) onto Route 3 southbound occasionally exceeds available storage during peak hours. The queue for left turn from Church Street (Route 139) onto Route 3 northbound frequently exceeds the available storage during peak hours. There are also conflicts on the on-ramp between heavy streams of vehicles coming from both approaches of Church Street that add to the delays.

In Kingston, traffic along Route 3A is hindered at the Pilgrim Highway (Route 3)/Main Street (Route 3A) Exit 9 due to heavy peak hour demands at the northbound and southbound on-off ramp intersections. This segment of Route 3A is often congested, especially during the morning and afternoon peak hours, and traffic backups from Route 3A through the Hilltop Avenue/Route 3A signalized intersection, which is in close proximity to the southbound ramps. Coordination between the Hilltop Avenue and Route 3 SB Ramp signal systems is poor and does not efficiently process queued vehicles from Route 3A southbound into and through the Route 3 ramps. The intersection of Route 3A at Route 3 NB ramp system is currently un-signalized. The potential for increasing capacity through this area is limited with right of way issues and other issues such as the Route 3A Bridge over Route 3.

Smiths Lane at the Route 3 Exit 8 interchange in Kingston is a heavily travelled two-lane corridor that provides connection between Route 3A and the Independence Mall. Both the northbound and southbound Route 3 on-off ramps are signalized at Smiths Lane, with the Independence Mall Entrance located opposite the Route 3 southbound ramps creating a four-way intersection with Smiths Lane.

At Pilgrim Highway (Route 3) and Samoset Street Exit 6B, southbound traffic attempting to exit Pilgrim Highway (Route 3) and travel eastbound on Samoset Street is routinely backed up onto the highway during the afternoon peak period because of a bottleneck



at the end of the exit ramp. This bottleneck is caused by a stop control at the end of the exit ramp as well as a signal approximately 300 feet east which controls the access and egress to a large shopping plaza.

At Pilgrim Highway (Route 3) at Long Pond Road Exit 5, southbound traffic attempting to exit Pilgrim Highway (Route 3) and travel southbound on Long Pond Road during the weekend peak periods experience a backup due to a traffic signal and yield at the end of the ramp. Heavy volumes of Long Pond Road southbound traffic prevent the exiting traffic from merging with traffic. In addition, a traffic signal at the Home Depot Plaza (approximately 500 feet south of the exit ramp signal) contributes to the congestion at this junction point.

#### **4.2 Arterials**

##### Route 3A from the Railroad Tracks to Route 3 - Kingston

The Route 3A corridor in Kingston and Plymouth is a two lane highway providing multiple functions as an inter-regional highway. It is an important regional connection between communities and it provides connections for collector and local roads to Route 3 and the interstate highway network. In addition, Route 3A functions as a downtown main street through Plymouth center and Kingston center. The Route 3A corridor also functions, in certain sections, as a retail corridor with retail and commercial land uses serving the needs of local residents and tourists. The segment of Route 3A from the railroad tracks to Route 3 begins at the town center and ends at the ramps to Route 3. This corridor experiences a surge of traffic during morning and afternoon peak hours with few sufficient gaps in the mainline traffic available for turning vehicles to utilize to turn to and from side roads and driveways. The poor alignment of side streets, such as Landing Road and Route 106, along with the heavy peak hour demands for turning movements creates congested peak conditions through this segment of Route 3A.

##### Route 3A Cherry Street to South Street – Plymouth

This section of Route 3A extends from Cherry Street, which connects to the retail development, through Plymouth Center to South Street. In addition to providing regional connection between communities as well as for collector and local roads, Route 3A is also vital to the region's tourism industry, providing access to historic Plymouth and Cape Cod. This section of Route 3A is not only congested during the morning and afternoon peak hours, but because of the tourism trade, the periods of congestion extend beyond the morning peak hour into midday.

##### Route 18

Route 18 is two-lane highway in Abington, except for the section from Lincoln Boulevard to Thayer Street, which has a four lane cross section. It provides connections for regional access to Route 128/I-93 to Boston in the north. Key signalized and un-signalized intersections in Abington along Route 18 experience long delays and/or forced flow (LOS "E" and "F") conditions during the morning and afternoon peak hours



due to the lack of sufficient gaps in the Route 18 peak hour flow. The Route 18 corridor provides alternative north south travel to Route 3 and Route 24. The design is currently underway for the reconstruction and widening of Route 18 in Weymouth to Route 139 in Abington in anticipation of the redevelopment of the South Weymouth Naval Air Station. This project; however, does not address the bottlenecks caused by demand surges and lane drops on Route 18 south of the Route 139 intersection.

#### Route 27 from West Street to Route 14 – Brockton

Route 27 east from West Street to its intersection with Main Street in the Brockton Downtown provides two lanes of travel with sidewalks on both sides of the road. Utility poles are located close to the travel way, due to a lack of shoulders, creating potential hazards for lane departure crashes. Route 27 is in a densely settled residential area with numerous driveways and side streets. Some of the side streets contain heavy traffic that turns onto Route 27 or crosses through traffic. In addition, pedestrian traffic is significant in this densely settled area. Route 27 continues east from Main Street passing under the Railroad viaduct in downtown Brockton. This viaduct was built in the late 1800s before bridge height was an issue for moving freight via truck, and the viaduct is currently 13 feet and 6 inches high at its highest point, which is insufficient for many of today's heavy vehicles. Route 27 intersects both Main Street and Route 28 (Montello Street), two heavily traveled corridors in the Brockton area. Route 27 turns right along Commercial Street, adjacent to the Brockton Area Transit (BAT) Intermodal Centre and the Brockton MBTA Commuter Rail Station. Route 27 then intersects Route 123 (Centre Street) an important east-west corridor in the Brockton region. Sidewalks are provided on Route 27 throughout the Brockton downtown with textured crosswalks provided across Route 27 between the BAT Intermodal Centre and the Brockton MBTA Commuter Rail Station. Route 27 turns left along Crescent Street where it provides a four-lane cross section to the Route 27/Lyman Street intersection. Route 27 narrows to two lanes with no shoulders east of the Lyman Street intersection. The land use along Route 27 in this area east of Brockton Downtown is commercial in nature with strip malls and a Home Depot home improvement store. Route 27 forms a four-way intersection with the Massasoit Community College entrance and Quincy Street. Quincy Street is a heavily traveled north south road between Route 123 and Route 27 in Brockton, and Massasoit Community College is a commuter college that currently serves 7,500 full and part-time students. Congestion at this intersection is prevalent during the morning and afternoon peak hours and into the mid day due to heavy demand at the Massasoit Community College entrance.

#### Route 27 Stoughton from Stoughton Town Center to Brockton

Route 27 provides access to Stoughton Center and Route 138, as well as the MBTA Stoughton Commuter Rail Station, which is located on Railroad Avenue just off of Stoughton Center. Route 27, east from Stoughton Center is a heavily traveled two lane highway with mostly residential land use. The land use transitions to commercial use just north of the Brockton City Line where the road widens to four lanes of travel. The



longest delays occur in this section of Route 27 and into Brockton, although heavy peak hour volumes make it difficult for vehicles to enter and enter side streets along this corridor due to a lack of sufficient gaps in the mainstream traffic.

#### Route 44/Samoset Street from Pilgrim Hill Road to Court Street (Route 3A)

In addition to providing a connection between Route 3 Interchange 6 and Route 3A to Plymouth Downtown, Samoset Street provides access to commercial areas (strip development, auto dealers, and commercial plazas) west of Route 3. Although Samoset Street is a four lane highway west Route 3, traffic exiting the southbound Route 3 ramps backs up along Samoset Street and backs up the ramp onto Route 3 due to the close proximity of the traffic signal at the intersection of the Standish Plaza and Route 3 southbound onramp intersection. East of Route 3, Samoset Street provides two lanes through a mostly residential area to Route 3A and Plymouth Center.

#### Route 104 Bridgewater from Route 24 to Bridgewater Center

Route 104 connects Route 24 to Bridgewater Center. Route 104 is mostly a two lane highway except for the section between Route 24 and Old Pleasant Street, which was recently widened to four lanes to mitigate impacts from a home improvement store located on the north side of Route 104 just east of Route 24 Interchange 15. The heavy vehicle volumes on Route 104 extend beyond the morning peak hour due to travel demands of Bridgewater State University located adjacent to Bridgewater Central Square.

#### Route 106 Halifax from Indian Pond Road to Route 58

Route 106 is a two lane highway from Indian Pond Road to Route 58. Improvements at the Route 106 and Route 58 intersection, which include adding turning lanes, have recently been implemented as mitigation for a Wal-Mart and supermarket opening just east of Route 58. These improvements include adding signals to Route 106/Wal-Mart drive intersection and the Route 106/supermarket drive intersection. This section of Route 106 in Halifax includes an elementary school as well as the Police Department and Post Office. Morning and afternoon peak traffic on Route 106 is heavy with few sufficient gaps in the traffic flow for vehicles entering and exiting side streets.

#### Route 106 West Bridgewater from Route 24 to Route 28 (West Bridgewater Center)

Route 106 over Route 24 provides four lanes of travel; however, east of the Route 24 Interchange 16, the highway drops to two lanes. This area of Route 106 in West Bridgewater between Route 24 and Crescent Street is highly congested with multiple factors contributing to the traffic problems including: the Combined Route 24 northbound off-ramp and lane merge eastbound due to the lane drop on Route 106, high volume pass-by generators due to service stations, convenience stores and coffee shops, and the high volume of turning movements around the Crescent Street/Lincoln Street intersection. The merging of both through lanes on Route 106 combined with traffic entering and merging from the Route 24 northbound ramp creates a very tight



bottleneck. During peak hours, especially in the afternoon, eastbound traffic backs up considerably through this stretch and occasionally backs up onto the exit ramp and Route 24.

Route 106 intersects Route 28 at West Bridgewater Central Square, and is a highly developed area, with municipal buildings and offices for the town located on Route 28 just north of Route 106. West Bridgewater High School, the Spring Street School, the Howard School, and the West Bridgewater Public Library are all located on Howard Street, which connects between West Center Street (Route 106) and North Main Street (Route 28) in the northwest quadrant of Central Square. These schools include playgrounds and recreational facilities. The headquarters for the West Bridgewater Police and Fire Departments are located on the corner of Howard Street and West Center Street. Elm Square at the intersection of West Center Street (Route 106) and North and South Elm Streets hosts commercial development with a small strip mall on the northeast corner and a gas station on the southwest corner. There is a large volume of motorists attempting to avoid traffic congestion at Central Square by turning from West Center Street onto either leg of Howard Street. The northern leg of Howard Street creates a direct connection between West Center Street (Route 106) and North Main Street (Route 28) while the southern leg connects to River Street, which provides access to South Main Street (Route 28). Likewise, drivers from North Main Street (Route 28) avoid Central Square by using Howard Street to connect to Route 106 westbound. Few vehicles use the northbound approach of Howard Street, as access to Route 106 from this direction is very difficult due to heavy traffic and a lack of sufficient gaps in the Route 106 traffic flow.

#### Route 123 Easton and Brockton from Route 138 to Route 28

Route 123 is a major east-west connector between the Brockton Downtown and Route 24 Interchange 17, and Easton to the west. This segment of Route 123 includes major trip generators such as Brockton High School, Campanelli Stadium, and the Veterans Administration Hospital. In addition, the land use along this section is densely residential with an elementary school just west of the downtown, which transitions into commercial/strip plaza use with a high number of driveways west of Torrey Street. Route 123 is two lanes from Brockton Downtown west to Torrey Street where it transitions to a four lane cross-section. Route 123 is four lanes from Torrey Street west to Pearl Street where it becomes a two lane highway again into Easton to Route 138. The FFY 2011-2014 Old Colony TIP includes a project for improving the Route 123/V.A. Hospital intersection and the Route 123/ Manley Street intersection, which includes upgrading traffic signals, and Roadway widening.

#### Route 138 Stoughton from Canton Town Line to Route 27 (Stoughton Center)

This section of Route 138 is located just north of Stoughton Center. Route 138 provides an alternative north south route connection to Route 95/128 as it runs parallel to Route 24, which is consistently congested during the morning and afternoon peak hours. The



land use along this section of Route 138 is mostly commercial with a large number of driveways providing direct access to adjacent parcels. This segment of Route 138 provides a three lane cross section from Stoughton Town Center to Lincoln Street; however, except for another section from Central Street to Charles Avenue, Route 138 is mostly a two lane highway.

#### Central Street Stoughton Route 27 to Avon Town Line

Central Street is a two lane road that intersects Route 27 in the western part of Stoughton, siphoning off heavy traffic volumes to the north and around Stoughton Center, and provides access east to Route 24 Interchange 19 and Harrison Boulevard in Avon. Central Street also intersects Route 138 about three-fourths of a mile north of Stoughton Center. The land use along Central Street is mainly residential except for the eastern end, which provides access to warehouse and industrial uses via Evans Drive and Tosca Drive.

#### Main Street Brockton – Howard Street to Plain Street

Main Street, running north-south between Howard Street and Plain Street, runs through Brockton Downtown and densely settled areas of Brockton. It is a two lane road with parking and sidewalks along both sides of the road. Main Street intersects Howard Street (Route 37) in the north of Brockton, providing access to Holbrook and Randolph. It intersects with major east–west routes in the downtown including Route 27, providing access to Route 24 and points west and Whitman to the east, and Route 123 providing access to Route 24 and Easton to the west and Abington to the east. Main Street is currently one way for one-third of a mile from its intersection with Belmont Street north to its intersection with Pleasant Street and Court Street. A comprehensive traffic study was completed by a consultant for the city in 1999 that recommended reverting Main Street and other one-way streets in the downtown back to two way travel, and a project was included on the FFY 2011-2014 Old Colony TIP to implement this recommendation; however, this recommendation has been scaled down to upgrade signals and improve the streetscape, but no longer includes the two-way conversion. The FFY 2011-2014 Old Colony TIP also includes a project for improving the Main Street/Keith Street/Plain Street intersection, including realigning the intersection and upgrading traffic signals.

### **4.3 Town Centers**

#### Bridgewater Central Square

Bridgewater's Central Square represents a major bottleneck for traffic flow in the Route 18 corridor. Central Square forms an oval with Route 18 Broad Street, Route 28 Main Street, and Route 104 Summer Street intersecting at a signalized intersection in the northern end. At the southern end of Central Square, there are two yield control access points with Route 104 South Street entering the oval with a yield control, and Route 18/28 Bedford Street at another yield controlled access. Bedford Street continues south of Central Square and is designated as both Route 18 and Route 28, while Route 104 continues along South Street connecting with Route 24. In addition, there is head-in



parking inside Central Square, with parking maneuvers interfering with overall traffic operations. During the morning and afternoon peak hours, delays at the signalized intersection of Route 18 Broad Street/Route 28 Main Street/Route 104 Summer Street cause back-ups for vehicles in the oval (northbound), which in turn causes back-ups at the two yield controlled south end intersections; Route 104 South Street at Central Square and Route 18/28 Bedford Street at Central Square. Traffic also queues southbound on Route 18 Broad Street at this intersection during the AM and PM peak hour so that the queues back up past the commuter rail grade crossing, with vehicles stopped on the tracks for the signal.

#### East Bridgewater Center

The intersection at the East Bridgewater Center is a major bottleneck along Route 18, and along with congestion and delay, the intersection has a higher than average crash rate. These problems are due to heavy peak hour volumes entering the intersection, and to the unusual alignment of the intersection, which has six approaches. This intersection had been the subject of a traffic study conducted by OCPC in November of 1988, in which reconstruction and traffic flow reorganization was recommended. The recommendations included making Spring Street a one-way westbound away from the intersection and Maple Street one-way eastbound away from the intersection. The other important recommendation from that study included the construction of a new road between Spring Street and the southern leg of Route 18 to re-route eastbound Spring Street traffic. It was also recommended in this study that Route 18 northbound be widened to two lanes. Within the East Bridgewater Center intersection, there is a lot of area within the intersection where vehicles waiting to turn left get hung up at the end of a green phase.

#### Stoughton Square

The Town of Stoughton participated in the *Route 138 Corridor Study*, conducted by the Central Transportation Planning Staff in 2002. The study recommended a series of improvements to enhance safety and traffic flow in the Route 138 corridor in Stoughton, Canton, and Milton, including Stoughton Square. The study concluded that the town should work to implement traffic and pedestrian improvements in Stoughton Square. Stoughton received a Public Works and Economic Development (PWED) grant to implement traffic and pedestrian improvements in Stoughton Square. The purpose of the improvements was to provide public incentives for private redevelopment of Stoughton Square. Although the improvements have been implemented to date, the town has currently contracted a consultant to maximize signal coordination and the channeling of downtown traffic. The town developed the *Stoughton Community Development Plan* (CDP) to enable Stoughton to address future growth and development by creating visions, goals, and strategies. In 2006, the Town of Stoughton amended its zoning laws to include the Stoughton Center Mixed-Use Overlay District (SCMUOD). This district applies to the town center and includes the Central Business





District zone and portions of Residential zones, Industrial zones and General Business zones.

#### West Bridgewater Center

The town's business and civic center is located at the intersection of Route 28 and Route 106. Both intersecting roads are major regional highways serving southeastern Massachusetts. The most significant factor contributing to the traffic problems at this location is the large amount of traffic traveling through the intersection daily, and especially during the morning and afternoon peak hours. The limited number of approach lanes, signal timing and phasing, and lane use at this intersection simply does not provide enough capacity for the volume of traffic. In addition, the intersection alignment, which is a modified five-way, creates confusion for motorists executing turning movements at the intersection.

Route 106 provides access to Route 24 to the west and carries large volumes of commuter traffic during the peak hours. Route 28 provides direct connections to Brockton to the north and Bridgewater to the south. Businesses located within the town center include a shopping plaza on the southeast corner, an automobile service shop on the southwest corner, and a new Dunkin Donuts on the northeast corner. Other businesses, including a gasoline station are located on the northwest corner. In addition, the alignment of the intersection creates a problem for large trucks attempting to turn right from Route 28 onto Route 106. Currently, the southern leg of Route 28 enters the intersection at a 45 - degree angle to Route 106. River Street intersects the intersection from the south at 90 degrees to form a five-way intersection (along with the Route 28 southbound approach and the Route 106 eastbound and westbound approaches). River street is one-way southbound with traffic traveling away from the intersection, which limits the number of turning movements. An improvement project that includes the reconstruction and reconfiguration of the intersection is currently under design, which is included in the FFY 2011-2014 Old Colony TIP.

#### Whitman Center

The Town of Whitman amended its zoning to include a Mixed-Use Overlay District in 2005. This district is in effect within the General Business zone, which includes Route 27 in the center of the town and Route 27 eastward to Franklin Street. This overlay district allows residential uses in developments within the business zone and it also allows the conversion of upper floors in existing commercial buildings to residential units. Although a number of previous studies that focused on traffic operations in the center recommended installing traffic signals at the Route 27 (Temple Street)/South Avenue/Washington Street intersection, the overwhelming consensus among Whitman stakeholders was that the small town character and pedestrian traffic were the priorities in which the town should focus their efforts. Whitman residents and stakeholders emphasized the fact that at this four-way stop, although at congested LOS "F" levels during the morning and afternoon peak hours, the queues move sufficiently as



most motorists are familiar with the intersection, and signalization was not required. In addition, there are alternative routes around the center, such as Route 14. The stakeholders in Whitman were in consensus for the need to enhance alternative modes by encouraging Transit Oriented Development (TOD) to support the economic viability of the town center, maintain the small town character, and reduce traffic congestion within the center.

#### **4.4 Screening Process**

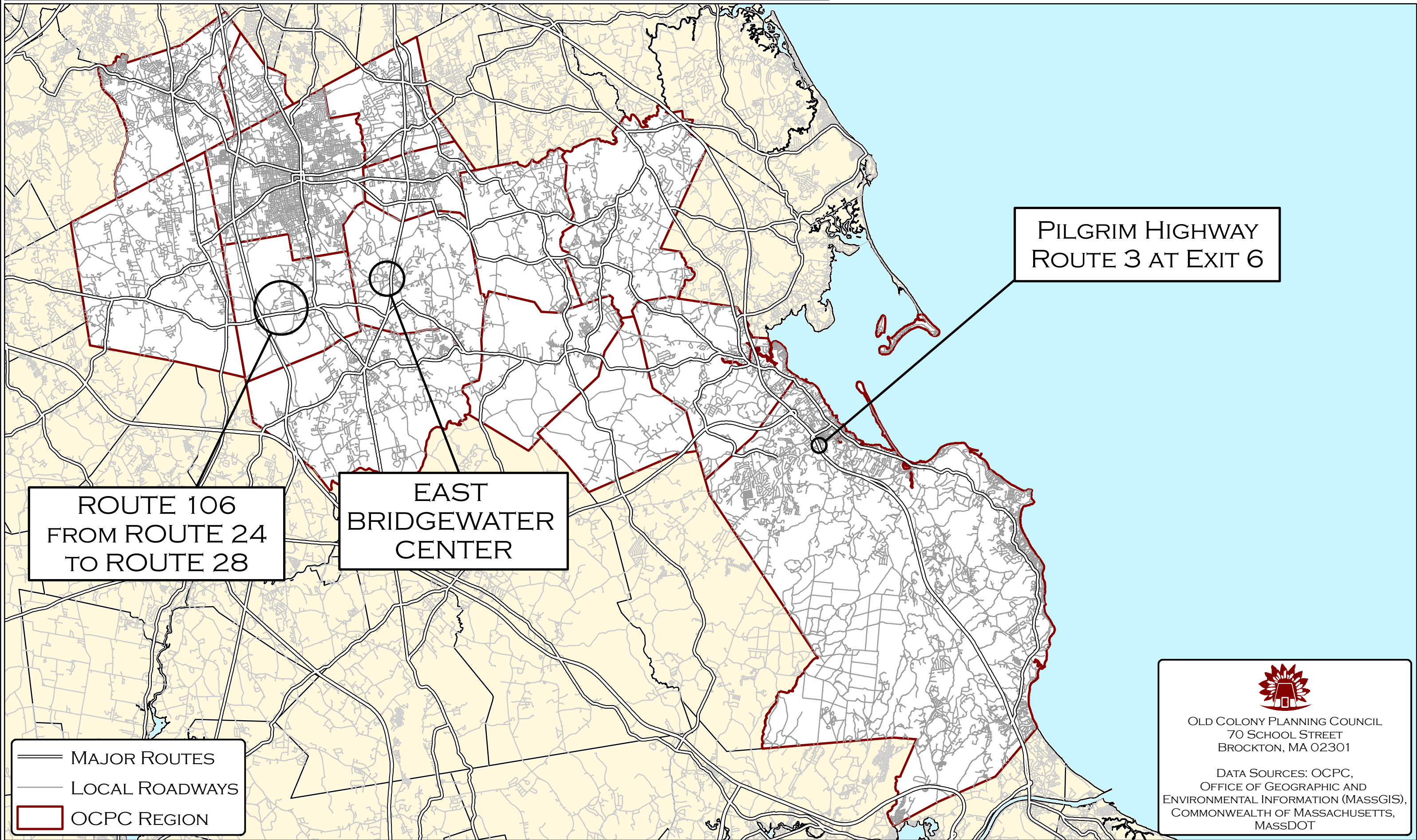
Within the screening process, consideration was weighed heavily toward those locations that lacked past study, or lacked improvement plans or programming for improvements. The purpose of the screening process; however, was to advance three locations for further study in Phase II of the Major Bottleneck Identification Study and Action Plan, and does not preclude any of the other locations listed in this study from inclusion in the Old Colony Unified Planning Work Program (UPWP) for further study under a separate task. The following three locations met the criteria in this study for advancement in Phase II of the Major Bottleneck Identification Study and Action Plan:

1. Route 106 in West Bridgewater, from Route 24 to Route 28
2. East Bridgewater Center
3. Pilgrim Highway (Route 3) at Exit 6 in Plymouth

Qualitative as well as quantitative factors were included in the screening process for advancing a location to Phase II of the Major Bottleneck Identification Study and Action Plan. Quantitative factors included Levels-of-Service, volume to capacity ratio, and number of access points per mile. Performance measures such as level-of-service and volume to capacity are essential in assessing traffic operations; however, the purpose of this Phase I study is to identify locations for advancement to Phase II. As all the locations in the studies have failed levels-of-service and high volume to capacity ratios, qualitative factors were included in the decision making process. These included whether or not the location had been previously studied, as well as how long ago that study took place, whether improvements had been previously made to the facility, or how long ago the improvements were made, and the context in which the facility plays a role within the local and regional road and highway network. Figure 3 shows the locations to be advanced to Phase II of the study.

# STUDY LOCATIONS TO BE ADVANCED TO PHASE II

FIGURE 3





## 5.0 Next Steps and Recommendations

Phase I of this study identified the congested components of the region's highway and road network and screened out three locations for further in depth study. The identification and screening process utilized OCPC's Congestion Management Process (CMP), Regional Transportation Plan (RTP), and corridor studies. The three locations identified for further in depth study include:

1. Route 106 in West Bridgewater, from Route 24 to Route 28
2. East Bridgewater Center
3. Pilgrim Highway (Route 3) at Exit 6 in Plymouth

Phase II of the Major Bottleneck Identification Study and Action Plan will involve an extensive public outreach program that will include meetings with local and MassDOT officials and stakeholders to discern root causes, and develop alternatives for mitigating and alleviating bottlenecks. The alternatives will include cost effective measures that have been tried and proven to ameliorate specific types and causes of bottlenecks. A short-range plan will be developed for implementation that will include the identification of potential funding sources, and a long-range plan will be developed with specific projects for inclusion in the Old Colony Transportation Improvement Program and 2011 Regional Transportation Plan.



## 6.0 Appendix

### 6.1 2011 Old Colony Regional Transportation Survey

2011 Old Colony Regional Transportation Plan Survey		
List of the top three areas or intersections within your community or during your commute to work that have the worst congestion problems.		
Top 1	Top 2	Top 3
West Bridgewater, backup on Route 106 after exiting highway (At Route 24 interchange)	West Bridgewater intersection of Route 28 and Route 106	Bridgewater Center at South Street and Bedford Street (Route 18/28)
Bridgewater Route 18 and High Street	Bridgewater Route 104 by BSC through Bridgewater Center	East Bridgewater-Intersection of Route 106 and Route 18
Five Corners in Easton	East Bridgewater-Route 106 at town common	Five Corners, Easton
East Bridgewater-Route 18 at Center of Town (five way intersection)	Center Street Brockton	Main Street/Centre and Main Street /Montello Street -- Brockton
Belmont Street - Brockton	Route 93 and Route 24 to Storrow Dr Boston	Main Street
Route 24 through Brockton	Belmont Street, Brockton	North Pearl Street - Brockton
Pembroke Center	Main Street at Oak Street - Brockton	Downtown Stoughton
Main Street, Brockton	South Street at Obery Street, Plymouth	Route 58 and Route 106 Halifax
Route 27/Pleasant Street at West Street - Brockton	Centre Street - Brockton	Route 3, From Exit 15 all the way to Boston
South Street at Sandwich Street (Route 3A), Plymouth	Montello Street & Centre Street	Brockton - The area around Brockton Hospital (Route 123)
Belmont Street - Brockton	Central Street Stoughton	Stoughton Square - Stoughton
Route 28 at Route 37, Brockton	Carver Street and Route 106 -Halifax	Routes 44/28/18 rotary in Middleborough
Canton Street and School Street intersection, Stoughton	Route 53 Hanover, south of Hanover Mall	Downtown Brockton
Route 105 & Route 106 intersection - Halifax	Route 106 and East Street - West Bridgewater	Court Street and Samoset Street in Plymouth
Route 106 at Route 58 - Halifax	Route 28 at High Street - Bridgewater	Oak Street and DW Field Park entrance, Brockton
Route 28 at Matfield Street - West Bridgewater	Taunton center rotary	South and Sandwich Streets Plymouth
Route 53 near Target Hanover	Central Square - Bridgewater	South Street and Sandwich Streets - Plymouth
Brockton downtown	Route 106 at Route 28 - West Bridgewater	Lincoln Street/Crescent Street/West Center Street - West Bridgewater
Route 24 from Route 27 to Main Street in Brockton.	Intersection of Wareham Street by Dunkin' Donuts	Warren Avenue





Intersection of Route 80 to Route 3A in Kingston	Franklin Street and South Avenue - Whitman	Route 18 and Route 14
Belmont Street - Brockton	In and around Exit 19 on Route 24 Stoughton	Downtown Bridgewater
Route 104/28/18 intersection in Bridgewater/Bridgewater State (Bridgewater Center)	Route 3 and Samoset Street in Plymouth	Elm Street at Route 138, Raynham
The rotary in Middleboro at 18/28	Route 44 rotary, Middleboro	Main Street, Brockton
Route 123 and Crescent Street Brockton	Legion Parkway	East Bridgewater Center: Route 18/Central Street
Route 27 in Brockton	South and Obery Streets Plymouth	Whitman Commuter Rail Station, Whitman
Long Pond Road and Clark Road in Plymouth	South Street and Obery Streets Plymouth	Bedford Street and Auburn Street, Whitman
East Bridgewater Town Center	Plain Street and Main Street Brockton	Brockton Intersection of Massasoit Boulevard/Route 27
Center Street/Commercial Street/Montello Street	intersection of Center Street and Depot Street	Chestnut Street and North Quincy Street - Abington
Samoset Street Plymouth	Pearl Street (serving as a bypass) during a Route 24 incident	Belmont Street and Warren Avenue - Brockton
Samoset Street Plymouth	East Street at East Center Street-West Bridgewater	All of Route 18 through Weymouth, MA
Plain Street and Main Street intersection in Brockton	Belmont Street - Brockton	Main Street Downtown Brockton
Pearl Street and Belmont Street - Brockton	Route 123 and Route 18	Route 27 at Route 18
Intersection of Elm Street & Washington Street	Bridgewater Center at Traffic Signal	Easton, Intersection of Prospect Street and Foundry Street
Any east-west crossing of Brockton during peak hours	Entry to Massasoit at Route 27	Massasoit/Crescent St Brockton
Matfield Street at North Main Street (Route 28) - West Bridgewater	All the one way streets in Brockton	Brockton - intersection of Elm & West Streets
Crescent Street at Massasoit Boulevard	Route 28 (Bridgewater Center) near Bridgewater State University	East Bridgewater Route 18 multi-street intersection at Town Center
Intersection at entrance to Massasoit Community College, Crescent St. Brockton	Route 28 at Matfield Street, West Bridgewater	The Pinehills Route 3A Manomet
Main and Montello Streets	Route 123 & Route 24, Brockton	Queen Anne's Corner in Hingham
Route 27 at Route 18 - Whitman	Route 24 at Route 106 - West Bridgewater	Morton Street and Washington Street, Stoughton
East Bridgewater Center (Five-way Intersection)	Route 27 at Massasoit Boulevard - Brockton	Route 106 and East Street - Bridgewater
Crescent Street - Brockton	Centre Street at North Quincy Street, Brockton	Route 128 @ Reed Street Randolph
Rotary @ Route 123 and Route 3A	North Quincy Street at Centre Street intersection - Brockton	Route 27, Massasoit Community College, Brockton
Stoughton Center - intersection of Route 138, Route 139 & Route 27	East Bridgewater intersection of Route 106 and Route 18	Randolph Street and York Street, Canton



Route 18 & High Street, Bridgewater	Hancock Street at Chestnut Street - Abington	Route 18 at Route 27 intersection - Whitman
Route 18 and Central Street in East Bridgewater (Town Center)	Forest Avenue at Warren Avenue - Brockton	Braintree I-93N Exit 6 on-ramp getting over three lanes left toward Boston I-93N is short and dangerous
Route 106 & Route 138, West Bridgewater	Route 24 south near I-495, going from 3 lanes to 2	Route 18 through Town Center town common - Bridgewater
Crescent Street & Massasoit Boulevard, Brockton	Route 128 from Milton to Canton	Route 18 at Route 139 intersection - Abington
Route 24/104 Bridgewater	Route 139 & Route 37 Holbrook, MA	Route 106 in Halifax
South Avenue & Washington Street - Whitman Center	Crescent Street (going into and away from Whitman)	School zones--poorly managed and dangerous for children
Middleboro Rotary	Crescent Street Brockton and Route 27	Route 127 @ Evergreen Street, Kingston
Crescent St and North Quincy St., Brockton	The intersection of Route 27 and Massasoit Boulevard in Brockton	North Quincy Street at Centre Street - Brockton
Route 123 & Route 18 intersection - Abington	Easton, Five Corners intersection	Entrance to Massasoit at Crescent Street - Brockton
Intersections with lights - Brockton	West Bridgewater Center	Commercial Street and Center Street - Brockton
Highway 3 heading into Boston from South Shore	Brockton - intersection of Pearl Street & Torrey Street	Widening of 18 from Route 3 to Route 123 (Weymouth and Abington)
Bridgewater Intersection of Route 18/Route 28 Center of Town	Bridgewater Center	York Street and Randolph Street intersection (Canton)
Route 18 at Route 139 - Abington	Massasoit Community College out to Crescent Street Brockton	Brockton - Massasoit Boulevard and Crescent Street
Torrey Street and West Street - Brockton	Massasoit Boulevard at Route 27 in Brockton	Crescent Street at Quincy Street Brockton
Route 44/Route 18 rotary	Torrey and West Street Brockton	
Massasoit entrance at Crescent Street/Quincy Street/Massasoit Boulevard	End of summer street onto Route 18, Abington	
Getting on route 3 Weymouth	End of summer street onto Route 18 - Abington	
Massasoit Boulevard at Crescent Street - Brockton	Turning left into Massasoit Community College from Route 27 - Brockton	
Pleasant Street (near the mall)	Central Street and Pearl Street - Stoughton	
Route 18 and Route 14	Four corners in Easton	
Route 3 in Kingston/Plymouth	Rte 139 @ Centre Street - Randolph	
Route 123 and Route 18 in Abington	Junction Route 106 & Route 58 - Halifax	
East Bridgewater Center	Crescent Street at Massasoit Boulevard - Brockton	
Intersection between Ash Street and Forest Avenue - Brockton	Route 106 in between Route 24 and Route 28 - West Bridgewater	



East Bridgewater Center	Route 18, Five-way intersection, East Bridgewater Center	
Route 24 Bridgewater to Avon	Five corners in East Bridgewater (at Route 18 and Route 106)	
Stop light at Christo's entrance, both ways	Route 138 and Randolph Street, Canton	
Intersection of Main Street and Route 138 - Easton	Route 18 and Route 14 intersection	
Middleborough Rotary	Route 3 northbound onramp at Union Street Braintree is always congested.	
Crescent street into Massasoit College - Brockton	Bridgewater--Route 18 & Winter Street	
Quincy Avenue and Route 123 in Brockton	Bridgewater Route 18, Intersection, near Pier 18 restaurant	
Pleasant Street and West Street - Brockton	Downtown Brockton	
Corner of Route 123 and Quincy Avenue with the newest bank the traffic is often back to Route 27	Crossing Brockton--near courthouse	
Whitman Center, four way stop - Whitman	Route 18 at Central Street - East Bridgewater	
Cross roads of Route 18 and Route 27 (Whitman)	Entering Pembroke Center coming from Barker Street, Pembroke	
Washington Street and Central Street - Stoughton	Intersection of Routes 18 and 28 - Bridgewater Center	
Five Corners in Easton	Downtown - Main Street - One Way	
Pearl Street and Belmont Street	Randolph Street and Washington Street - Canton	
Route 139 at Lafayette Street - Randolph	High Street and Court Street	
Rte 44 around the Middleboro Rotary	Route 18 and Route 139 (Abington)	
Pearl Street and Belmont Street - Brockton	Routes 58 and 106 in Halifax	
Matfield Street and Route 28 in West Bridgewater (left onto Route 28)	Route 24 between Brockton and Route 128	
Downtown, on the green, Bridgewater, Mass	Brockton - Belmont St between Route 24 and West Street	
Crescent Street/Massasoit boulevard	Route 24	
Washington Street and Chapman Streets, Canton	Belmont Street and Manley Street, Brockton	
Whitman town center		
Route I-93S between Exit 6 and Exit 3 Braintree to Canton.		
Bridgewater - Route 18 & High Street - needs a light and crossing		
Abington Route 18 at Route 123		
East Bridgewater Center		





Route I-95		
Route 123 at Route 138, Brockton		
Route 139, Pembroke		
West Street and Belmont Street		
Bridgewater Center		
East Bridgewater Center - Intersection of Bedford, Central, North Central, and Spring Streets Central		
Westgate Mall Area - Route 27		
Centre Street and Montello Street - Brockton		
Route 27 and Quincy Street		
VFW Parkway and Bridge Street		
Entrance and exit from Massasoit campus (Brockton)		
Route 106 and Route 18 in East Bridgewater (by E.B. High School)		
Route 106 and Route 24 (W. Bridgewater)		
Easton - W. Bridgewater : Route 24 / Route 106 to Bridgewater Center		
Route 106 exit 16A		
School Street at Main Street - Brockton		