

ROUTE 58 CORRIDOR STUDY

INCLUDING THE COMMUNITIES OF: ABINGTON, WHITMAN,
HANSON, HALIFAX, AND PLYMPTON



ROUTE 58, HEADING NORTH, THROUGH EAST AND WEST MONPONSETT PONDS



OLD COLONY PLANNING COUNCIL

70 SCHOOL STREET, BROCKTON, MA 02301

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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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1.0 EXECUTIVE SUMMARY

STUDY PURPOSE AND SCOPE

The purpose of the Route 58 Corridor Study, which was initiated as part of the Old Colony Unified Planning Work Program (UPWP FFY 2009 and 2010), is to identify specific and general transportation problems, including issues involving land use and transportation, and to derive feasible solutions to enhance circulation, safety, and traffic flow efficiency for Route 58 in the communities of Abington, Whitman, Hanson, Halifax, and Plympton.

The geographic scope of this study includes 18.5 miles of the Route 58 corridor from the Abington/Weymouth Town Line south to the Plympton/Carver Town Line. In the OCPC region, the corridor is under town jurisdiction. It is classified as an urban minor arterial in Abington, Whitman, Hanson, and Halifax and a rural major collector in Plympton. This study focuses on key intersections, as well as on the road corridor itself, and includes data and analysis for non-motorized and motorized travel. Route 58 provides access between Route 18, in Weymouth (connecting to Route 93 and Boston) and Route 44, providing access to Plymouth to the east and Middleborough and Interstate 495 to the west. The Southfield Development (South Weymouth Naval Air Station re-use) in Weymouth, Rockland, and Abington and the previously proposed casino complex in Middleborough to the southwest of Plympton, both represent potential for traffic growth in the Route 58 corridor through direct or indirect impacts. The corridor is currently a two-lane rural-suburban facility with commercial and industrial nodes in Abington, Halifax, and Hanson. The corridor was recently reconstructed and repaved in Plympton from the Plympton/Carver Town Line to the Plympton/Halifax Town Line. This included improvements at key intersections for improving safety and traffic flow funded by the Old Colony Transportation Improvement Program (TIP).

As part of a public outreach program for this corridor study, stakeholder meetings were held in Abington, Whitman, Hanson, and Plympton (with Halifax participating in the Plympton meeting). The purpose of these meetings was to solicit local input and provide a more comprehensive approach to the planning process. The meetings included representation from the study area towns' Boards of Selectmen, Planning Boards, Department of Public Works, Planning Departments, Fire Departments, and Police Departments. In addition, a meeting was held with MassDOT Office of Transportation Planning and MassDOT District Five. Recommended improvements were developed based on the review of the data and analyses and on discussions and input at the stakeholder meetings. Recommended improvements in the corridor were made in concert with existing TIP improvement projects and other planned mitigation for developments. A variety of funding sources is described at the end of this report for funding recommended improvements.



RECOMMENDED IMPROVEMENTS

Abington – Adams Street Route 58 at North Avenue Route 139

The Town of Abington has begun improvements at this intersection as part of a Public Works Economic Development Grant (PWED). The project includes Route 58, between Birch Street and Wales Street (repaving only), and Route 139 from the Route 58/Route 139 intersection to the Rockland Town Line. Improvements to the Route 58/Route 139 intersection include replacing signal equipment, installing countdown pedestrian signals with audio for the visually impaired, and reconstructing pedestrian crossings for ADA compliancy. Improvements to Route 58 as part of this project include cold planing and resurfacing Route 58 from Wales Street south through the Route 139 intersection to Birch Street.

The Southfield Development Final Environmental Impact Report (FEIR) proposed off-site mitigation for the Route 58/Route 139 intersection in Abington. This mitigation includes adding an exclusive northbound left turn lane on Route 58, and adding an eastbound right turn lane on Route 139. Analysis of future peak hour operating conditions in this corridor study assumes these proposed improvements. The analysis estimates that future peak hour operating conditions with these improvements are expected to be at Level-of-Service (LOS) “B” during the future morning peak hour and at LOS “C” during the afternoon peak hour. These improvements are planned for the completion of Phase 1B of the Southfield project, which is expected to occur between 2013 and 2014.

Abington – Plymouth Street Route 58 at Birch Street and Brighton Street

The problems at this unsignalized intersection, poor morning and afternoon peak hour levels-of-service (“E” and “F”) and higher than average crash rates, are exacerbated because this is a five-legged intersection. One of the suggestions at the Abington stakeholders meeting was to make Brighton Street one-way northbound away from Route 58 to the parking lot at New England Art in order to reduce the vehicle conflicts entering the intersection from Brighton Street. If this change is implemented by the town, the Old Colony Planning Council will follow up this improvement by monitoring the peak hour levels-of-service and crash rates to determine its effectiveness.

Hanson – Route 58 at Spring Street and Route 58 at Whitman Street

The problems at these two intersections stem from the poor alignment of Spring Street at Route 58 and Whitman Street at Route 58, both of these intersections are skewed, and they are located approximately 125 feet apart. In addition, these roads intersect Route 58 at a curve, and a restaurant parking lot is located directly opposite the Spring Street intersection with no access control. Vehicles entering and exiting the restaurant lot add to the turning movement confusion at these intersections.

The Transportation Research Board published a series of reports (The National Highway Cooperative Research Program Report (NHCRP) 500) for the implementation of the American Association of State Highway and Transportation Officials’ Strategic Highway Safety Plan. Volume 7 of these reports: *NHCRP 500 A Guide for Reducing Collisions on Horizontal Curves* offers strategies to reduce the likelihood of a vehicle leaving its lane



and either crossing the centerline or leaving the roadway at a horizontal curve. These include providing advance warning of unexpected changes in horizontal alignment, enhancing delineation of the curve, providing adequate lighting at the curve, providing adequate sight distance, and widening the roadway.

Some of these improvements can be done at relatively low cost in the near term, while others, such as realigning and reconstructing the road and intersection to improve sight distance, require larger investments of time and money.

Reconstructing and relocating the Spring Street intersection further from the Whitman Street intersection, and adding a curb and access control at the restaurant opposite Spring Street, would help reduce conflicts at these locations. Other less expensive, short-term improvements include adding advanced warning signs for turns and 25 miles per hour advisory speeds (MUTCD W1-1R and W13-1P, Section 2C.07, page 111) on the northbound and southbound approaches on Route 58 to these intersections.

Hanson - Route 58 at West Washington Street

This intersection lacks sufficient sight distance for vehicles entering Route 58 from West Washington due to the curvature on Route 58. Advanced warning signs and 25 miles per hour advisory speeds are recommended for this intersection.

Hanson – Liberty Street Route 58 at County Road Route 14 and the Dunkin Donuts Drive and the County Road Route 14 at High Street

The peak hour analyses for this signalized intersection show that the lack of storage for vehicles on the northbound County Road approach along with the heavy peak hour northbound volumes creates back-ups into the stop-sign controlled County Road Route 14/High Street intersection. High Street intersects County Road just 50 feet south of Liberty Street. Both County Road and High Street are stop-signed controlled. There is a heavy demand for vehicles coming from County Road turning right to Liberty Street during both the morning and afternoon peak hours. A Dunkin Donuts exit is located opposite County Road, making up the fourth leg of a four-way intersection, although the pavement markings at this exit allow only right turns and left turns out, with no through movements allowed to County Road. The entrance to the Dunkin Donuts is separate from the exit, and is located 100 feet to the southeast off of Route 58. The back-ups from this entrance (due to left turning vehicles) interfere with traffic operations at the intersection especially during the morning and afternoon peak hours. A right turn in and right turn out policy on Route 58 for the Dunkin Donuts would eliminate back-ups from the Dunkin Donuts and improve traffic operations at this intersection. The town should work with the owner of the Dunkin Donuts and adjacent properties toward sharing access off of Route 58, thereby eliminating those driveways that interfere with traffic operations at this intersection.

Hanson – Liberty Street Route 58 at Maquan Street Route 14

This three-way intersection is currently under stop sign control on the Maquan Street approach and the Route 58 northbound approach. This is unconventional when compared to the standard three-way intersection that has a stop sign on just one approach (usually the minor street approach). The stop sign on Route 58 northbound compensates for the



poor northbound sight distance, as this faces heavy left turn volumes from Route 58 southbound to Maquan Street. The grade is ascending on the northbound approach which restricts sight distance. This intersection operates under LOS “E” conditions during the afternoon peak hour.

The installation of a traffic signal is recommended for this location along with the addition of an exclusive left turn lane on the Route 58 southbound approach. This intersection satisfies the signal warrants for the peak hour warrant and four hour warrant as prescribed in the *Manual on Uniform Traffic Control Devices*. In addition to the installation of signals, it is recommended that sidewalks be installed along both sides of Maquan Street back to School Street to accommodate and facilitate pedestrian activity to and from the elementary schools on School Street.

Hanson - Indian Head Street Route 58 at Main Street Route 27 and Monponsett Street Route 58

Although the peak hour levels-of-service are within the acceptable range, this intersection has an elevated crash rate (1.27 crashes per million entering vehicles), and a fatality occurred here in 2006. The intersection is poorly aligned and there are curb cuts and driveways to adjacent parking lots in close proximity to the intersection on the southeast, southwest, and northeast corners. These driveways create confusion for vehicles making turning movements at the intersection. The town should work with the owners of the adjacent businesses and properties to manage the access close to the intersection, especially on the southwest corner where there should be a right turn in, right turn out policy. In addition, the signal timing and phasing should be adjusted to allow protected phasing for left turns on the northbound and southbound approaches. Long-term improvements should include widening Route 27 and adding an additional left turn lanes on the eastbound and westbound approaches, as well as consolidating driveway access in close proximity to the intersection.

Route 58 in Halifax

The pavement condition on Route 58 Halifax is in the “Poor” category from the Hanson Town Line to the Plympton Town Line. The recommendations from the Pavement Management software for Route 58 in Halifax include reconstructing and repaving the entire length of Route 58 in Halifax from the Hanson Town Line south to the Plympton Town Line.

Halifax – Monponsett Street Route 58 at Plymouth Street Route 106

This intersection operates within acceptable LOS ranges during the morning and afternoon peak hours, although its crash rate (0.89 per million entering vehicles) exceeds the MassDOT District 5 average of 0.77. Route 58 lacks sufficient sidewalks south of Route 106, although a sidewalk on the west side does exist. There is an existing residential development on Route 58 south of Route 106 and a proposed residential development that will likely increase the demand for walkers to and from the retail establishments along Route 106. It is recommended that sidewalks be added on the east side of Route 58 from Route 106 south to accommodate pedestrian movement to and from these residential areas.

***Plympton- Palmer Road Route 58 at Center Street***

Funded through the Old Colony Transportation Improvement Program (TIP), improvements to Route 58 completed in 2009 include the reconstruction of the entire length of Route 58 in Plympton (approximately 3 miles). Traffic signals were installed at the Main Street Route 58/Parsonage Road/Mayflower Road intersection and flashing signal beacons were installed at the Palmer Road Route 58/Center Street intersection. The Palmer Road Route 58/Center Street intersection has a higher than average crash rate of 1.17 crashes per million entering vehicles; however, this crash rate is based on 2006, 2007, 2008 data, which is from a time period before the intersection was reconstructed and the flashing beacons installed. It is recommended that OCPC monitor the crash experience to determine the effectiveness of the 2009 improvements.



2.0 INTRODUCTION

2.1 *Study Purpose and Scope*

This corridor study was undertaken as part of the Old Colony Metropolitan Planning Organization (MPO) *Unified Planning Work Program* (UPWP). The UPWP describes and lists the planning tasks and activities provided under the provisions of the Safe, Accountable, and Efficiency Transportation Act: A Legacy for Users (SAFETEA-LU).

The purpose of this traffic study is to assist Abington, Whitman, Hanson, Halifax, and Plympton in developing appropriate strategies for improving traffic safety and enhancing traffic circulation patterns within the regional system and surrounding communities. The findings and recommendations in this study include short and long term solutions for identified deficiencies that are in keeping with the visions for the future development, character, and land use patterns of the communities. It is expected that these recommendations will serve as the basis for including projects in the region's Transportation Improvement Program (TIP) and Regional Transportation Plan (RTP).

The main tasks for this study include:

- Developing and maintaining a comprehensive public participation component, including holding a series of stakeholder meetings in the communities, and other various meetings, to garner input from local officials, businesses, institutions, and interested parties and individuals.
- Documenting existing traffic and transportation conditions and identifying problems.
- Forecasting future conditions and identifying potential improvement projects, short term and long term, for the study area.

2.2 *Methodology and Process*

This study includes a review of existing traffic conditions (traffic volumes, intersection peak hour levels-of-service, speeds, and heavy vehicles), physical conditions (such as traffic control, lane use, signage, pavement conditions, intersection alignment), crash analyses, traffic signal warrant analyses, land use conditions, community goals and plans, zoning, and previous studies and proposed improvements pertinent to the Route 58 corridor. In addition, non-motorized data and analyses (pedestrian and bicycle travel) are included in the study and recommendations for improvements have been developed based on the analyses and stakeholder input. Traffic data collection and safety analyses were completed based on the standard practices published in the *Manual of Transportation Engineering Studies*, by the Institute of Transportation Engineers (ITE). Signal Warrant analyses were performed in accordance with national standards in the *Manual on Uniform Traffic Control Devices 2009 (MUTCD)* by the Federal Highway Administration (FHWA).

Traffic forecasts and level-of-service analyses for future (five-year horizon) peak hour conditions were performed for this study. Traffic analyses were completed utilizing



standard practices published in the ITE *Highway Capacity Manual*. The traffic analyses were completed for the intersection peak hour operations using SYNCHRO software (with SimTraffic). There are a number of key intersections within the corridor that are near to one other. SYNCHRO conforms to the *Highway Capacity Manual* practices, and along with SimTraffic, takes into account traffic back-ups, delays, and queues from an intersection that interfere with operations at other nearby intersections.

Information on intersection crashes, highway width, functional classification, and jurisdiction were obtained from the Massachusetts Registry of Motor Vehicles, the Massachusetts Department of Transportation (MassDOT), the Federal Highway Administration (FHWA), and the Massachusetts Geographic Information System (MassGIS).

The study area stakeholders in the communities of Abington, Whitman, Hanson, Halifax, and Plympton were contacted by direct mail and the general public was notified of the study through local newspaper articles.

The public outreach effort included stakeholder meetings that enabled an organic approach to the planning process. Minutes of the meetings are included in the report appendix. Periodic updates of the study's progress were provided to the Old Colony Joint Transportation Committee (JTC) and the Old Colony Metropolitan Planning Organization (MPO) over the course of the study.



3.0 EXISTING CONDITIONS

3.1 *Jurisdiction and Road Classification*

Route 58 in the OCPC region extends south (approximately 18.5 miles) from Abington, through Whitman, Hanson, Halifax, and Plympton. Route 58 connects to Route 18 in South Weymouth in the north and to Route 495 in Wareham in the south, and intersects a number of key routes including Route 123 in Abington, Route 14 and Route 27 in Hanson, Route 106 in Halifax, and Route 44 in Carver just south of the Plympton Town Line. Route 58 parallels both Route 24 and Route 18, located to the west, and Route 3, in the east, although Route 58 is a two-lane state numbered route under local jurisdiction.

Route 58 is classified as an urban minor arterial in Abington, Whitman, Hanson, and Halifax, and as a rural major collector in Plympton. It is under local town jurisdiction and is eligible for federal-aid funding. Figure 1 shows the geographic scope of the study area and the road classifications.

3.2 *Land Use*

The land use along the Route 58 corridor is mainly residential; however, land use varies and includes commercial, industrial, educational, and agricultural areas interspersed with residential areas. There are some areas of Route 58, especially in Abington and Hanson where commercial use has evolved and has been encouraged through zoning. This type of use has transitioned into commercial development whereby businesses line a busy highway. This has a significant impact on the safety and capacity of a highway due to every shopping plaza or new store having at least one driveway or access point. Despite this tendency toward extensive, auto dependent land use patterns, specific focal points or “nodes” of development have evolved within the corridor. Figure 2 shows the land use within the Route 58 corridor. Figure 3 shows the nodal development that has evolved within the corridor.

Figure 3 shows two village nodes in Abington; one encompassing the Route 58/Route 139 intersection, and the other around the Route 58/Route 123 intersection. Industrial nodes are located in Abington, at the Weymouth Town Line and in Whitman to the west of the Route 58 corridor. Figure 3 shows two commercial nodes along Route 58 in Hanson; one in the area of the Route 58/Route 14 intersection and the other at the Route 58/Route 27 intersection. Hanson also has two school nodes adjacent to the Route 58 corridor. Halifax has a commercial node at the Route 58/Route 106 intersection, a residential/commercial node at the Hanson Town Line, and an agricultural node at the Plympton Town Line.

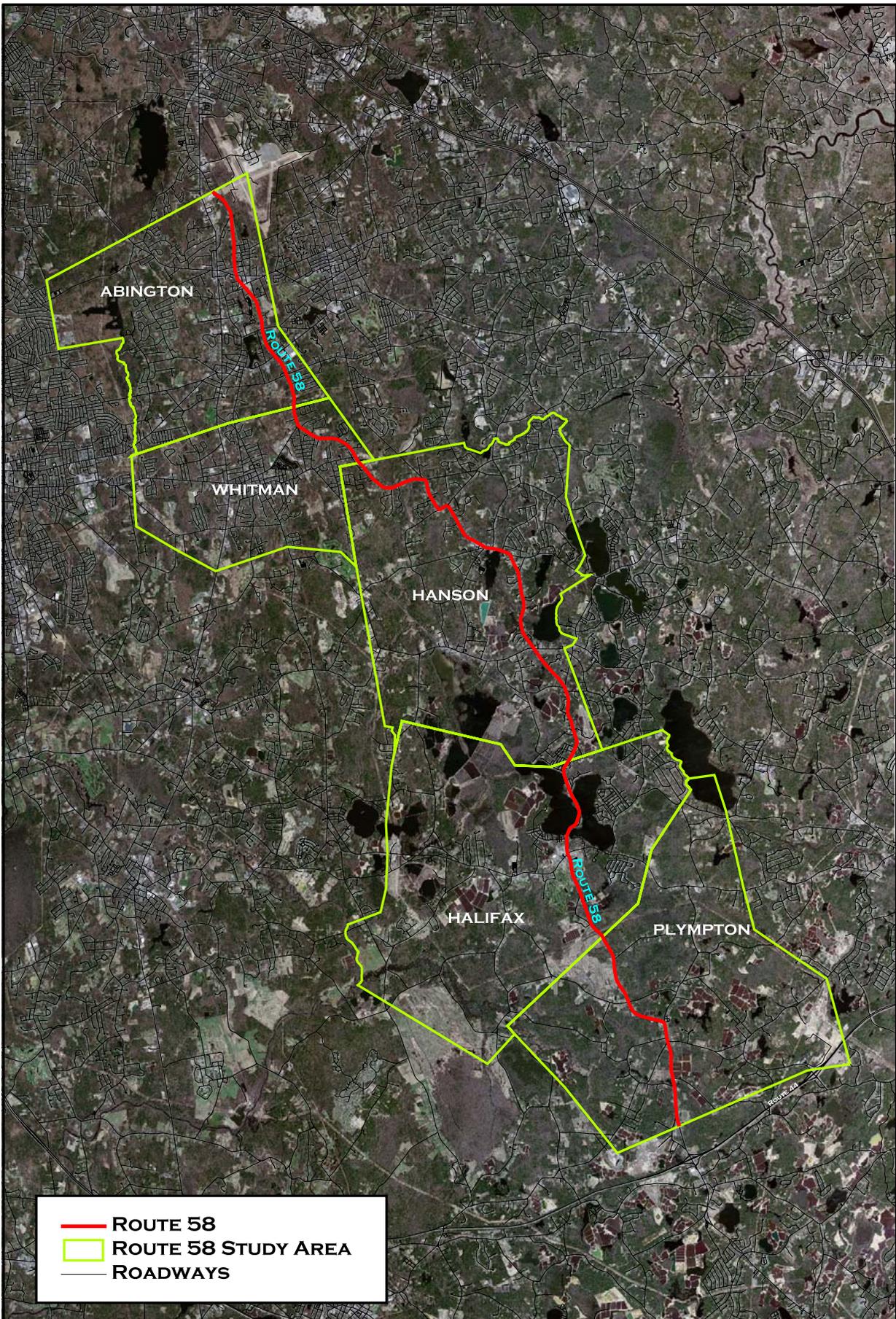
Southfield Development (the redevelopment of the former South Weymouth Naval Air Station) in Abington, Rockland, and Weymouth is expected to be an important trip generator in the region. The FEIR for Southfield expects traffic from this development to impact Route 58 in Abington, with traffic dispersing so that the impact is expected to be minimal to the towns south of Abington. The Southfield FEIR offers mitigation for

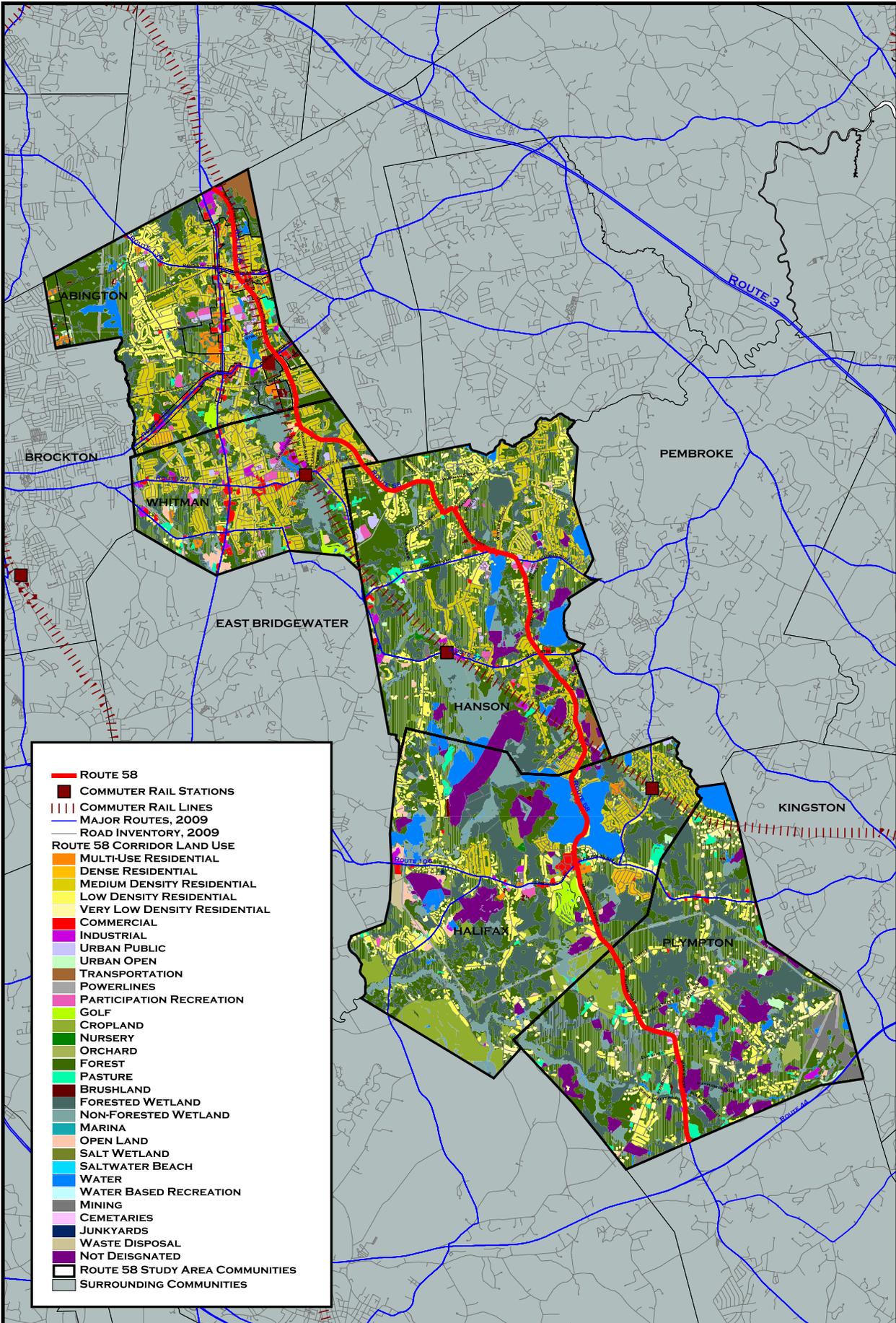


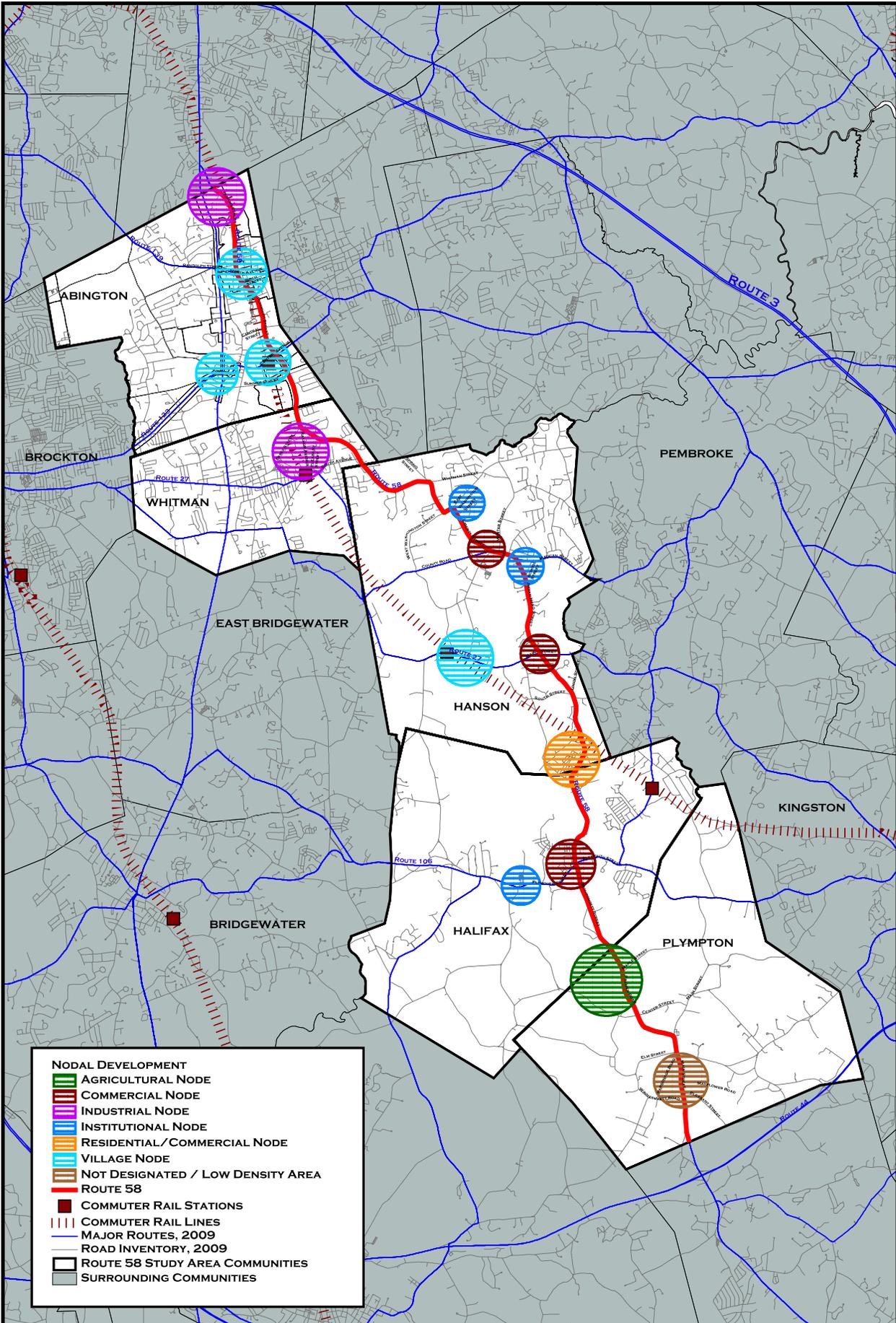
traffic impacts at the Route 58/Route 139 intersection within the Route 58 corridor (and also at the Route 18/Route 58 intersection in Weymouth; however, this intersection is not within the scope of this study). The Wampanoag casino proposal in Middleborough is the only other large development with the potential for significant impact to the Route 58 corridor; however, the Wampanoag Tribe has subsequently written the Town of Middleborough stating that it is no longer is interested in pursuing that development as of May 14, 2010.

ROUTE 58 ORTHO PHOTO, 2008

FIGURE 1









3.3 Existing Traffic Volumes

3.3.1 Average Daily Traffic (ADT)

OCPC utilized automatic traffic recorders to determine the average daily traffic (ADT) at specific locations on Route 58. The automatic recorders were installed for a minimum 48-hour period and recorded traffic in both directions in one-hour intervals. The recorders also recorded vehicle speeds and the number of heavy vehicles in the traffic stream. Figures 4 and 5 show the resulting average daily traffic (24-hour traffic total for both directions of travel) for the Route 58 corridor, along with the morning and afternoon peak hours. The counts are included in the appendix to this study.

The ADT in Abington, as shown in Figure 4, ranges from 10,198 at the Weymouth Town Line to 14,146 vehicles per day at the Whitman Town Line. The ADT on Route 58 south of Route 139 in Abington is 12,893. Figure 4 shows that in Whitman, much of the Route 58 traffic is siphoned off to Essex Street and Raynor Avenue, which provide access to Route 27 and Whitman center. The ADT on Route 58 in Whitman south of Essex Street and Raynor Avenue is 7,567 vehicles per day, and 8,108 vehicles per day at the Hanson Town Line. The ADT in Hanson remains in the 8,000 range as in Whitman, with 8,515 vehicles per day south of Spring Street and Whitman Street; however, the ADT is 15,000 west of Maquan Street, as Route 58 merges with Route 14 in this section between Liberty Street and Maquan Street. South of Maquan Street, the ADT is lower with 9,446 vehicles per day (just north of Route 27) and 9,098 at the Halifax Town Line.

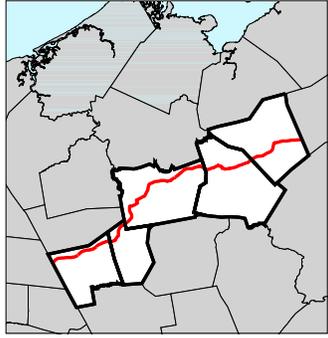
Figure 5 shows that the ADT on Route 58 in Halifax north of Route 106 is 10,744 vehicles per day, and 6,834 vehicles per day south of Route 106. In Plympton, the ADT is 6,760 vehicles per day between Center Street and Main Street, 8,767 vehicles per day south of Main Street, and 7,974 vehicles per day at the Carver Town Line.

FIGURE 4

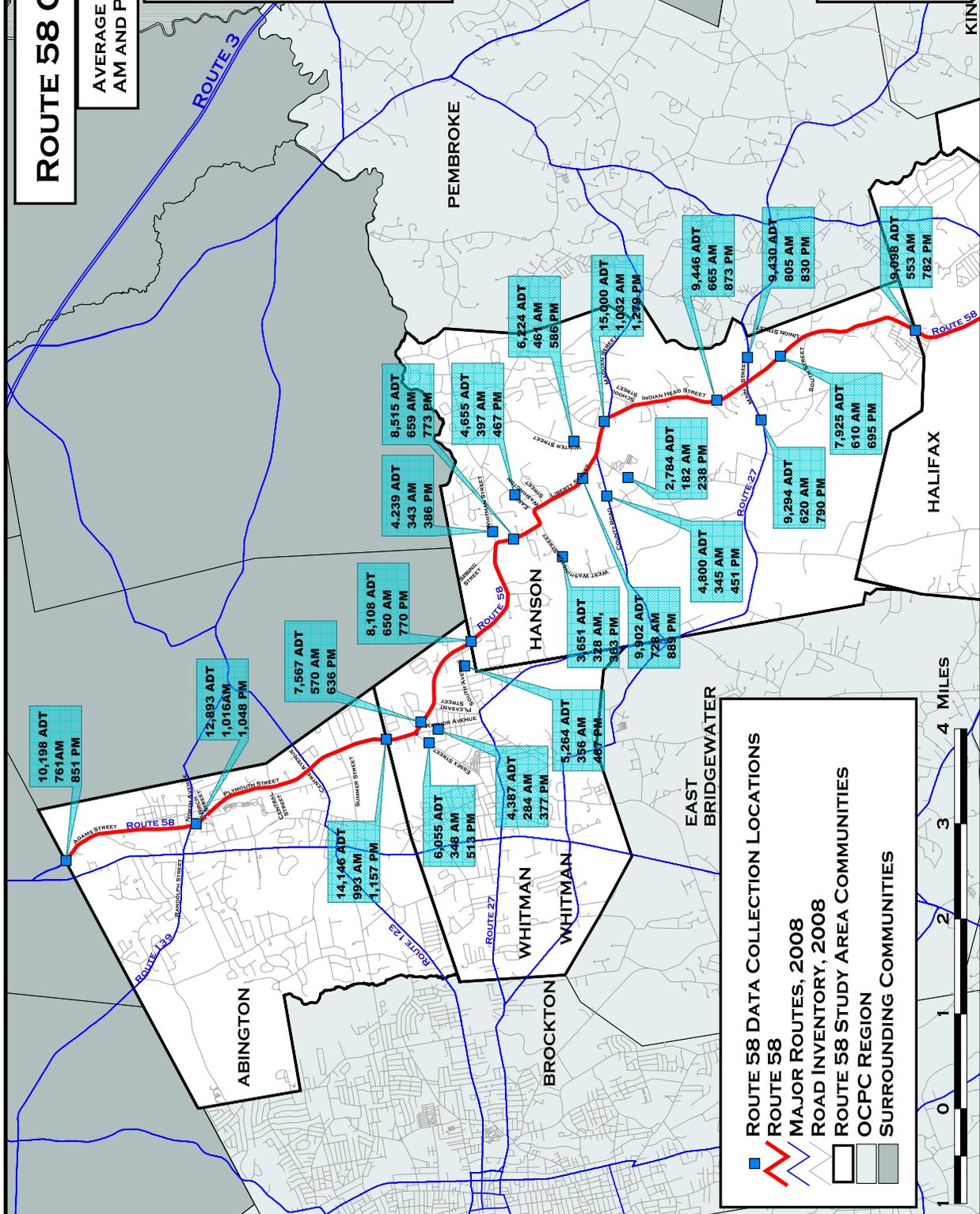
ROUTE 58 CORRIDOR STUDY

AVERAGE DAILY TRAFFIC (ADT) & AM AND PM PEAK

ROUTE 58 STUDY AREA



OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
GIS DATA SOURCES:
MASSGIS, MASSDOT, OCPC



- ROUTE 58 DATA COLLECTION LOCATIONS
- ROUTE 58
- MAJOR ROUTES, 2008
- ROAD INVENTORY, 2008
- ROUTE 58 STUDY AREA COMMUNITIES
- OCPC REGION
- SURROUNDING COMMUNITIES



KINGSTON

PEMBROKE

HANSON

HALIFAX

ABINGTON

BROCKTON

WHITMAN

WHITMAN

EAST BRIDGEWATER

ROUTE 3

ROUTE 129

ROUTE 27

ROUTE 27

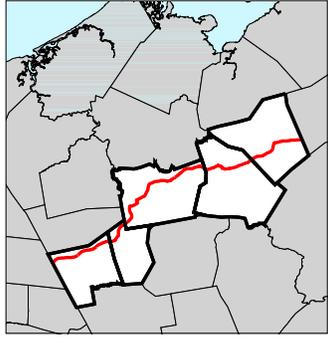
ROUTE 58

FIGURE 5

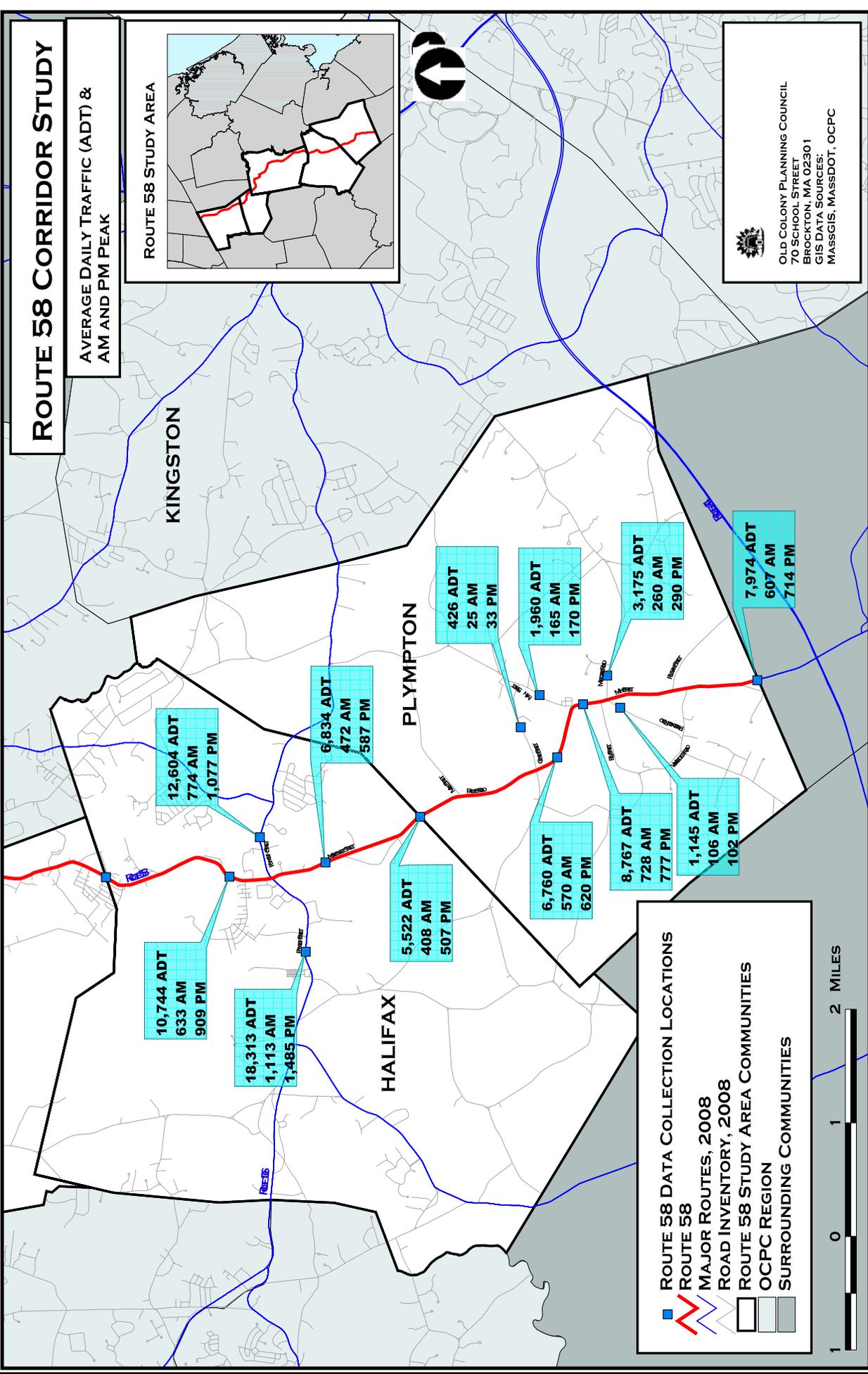
ROUTE 58 CORRIDOR STUDY

AVERAGE DAILY TRAFFIC (ADT) & AM AND PM PEAK

ROUTE 58 STUDY AREA




 OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
 GIS DATA SOURCES:
 MASSGIS, MASSDOT, OCPC



ROUTE 58 DATA COLLECTION LOCATIONS

- ROUTE 58
- ▬ MAJOR ROUTES, 2008
- ▬ ROAD INVENTORY, 2008
- ▬ ROUTE 58 STUDY AREA COMMUNITIES
- ▬ OCPC REGION
- ▬ SURROUNDING COMMUNITIES





3.3.2 Peak Hour Intersection Turning Movement Counts (TMCs)

Manual turning movement counts were conducted at key intersections (signalized and unsignalized) within the corridor during the morning and afternoon (7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM) to determine the AM and PM peak hours of operation. The turning movement counts include a count of pedestrians and heavy vehicles entering intersections as well as passenger cars. The turning movement counts are included in the appendix to this study.

3.4 Existing Traffic Operations

Level-of-service analyses (LOS) were completed for the study area intersections to determine the operating conditions during the morning and afternoon peak hours. Level-of-service analysis is a qualitative and quantitative measure based on the analysis techniques published in the *Highway Capacity Manual* by the Transportation Research Board. Level-of-service is a general measure that summarizes the overall operation of an intersection or transportation facility. It is based upon the operational conditions of a facility including lane use, traffic control, and lane width, and takes into account such factors as operating speeds, traffic interruptions, and freedom to maneuver. Level-of-service represents a range of operating conditions and is summarized with letter grades from “A” to “F”, with “A” being the most desirable. Level-of-service “E” represents the maximum flow rate or the capacity of a facility. The following describes the characteristics of each level-of-service:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.
- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is still relatively unaffected.
- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream. Occasional backups occur behind turning vehicles.
- LOS "D" represents high-density, but stable, flow. Speed and freedom to maneuver are restricted, and the driver experiences a below average level of comfort and convenience. Small increases in traffic flow will generally cause operational problems at this level.
- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform level. Freedom to maneuver within the traffic stream is extremely limited, and generally requires forcing other vehicles to give way. Congestion levels and delay are very high.
- LOS "F" is representative of forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount that can traverse the point, resulting in lengthy queues and delay.



The LOS definitions describe conditions based on a number of operational parameters. There are certain parameters utilized as measures of effectiveness for specific facilities. In the case of the intersections, two-lane highways, and arterials, which represent the physical conditions that typify the study area corridor, time delay, average stop delay, and average travel speed are used as measures of operational effectiveness to which levels-of-service are assigned. Table 1 shows the delay criteria for each level-of-service for both unsignalized and signalized intersections.

Table 1 Level-of-Service Criteria Average Delay in Seconds

Level-of-Service	Stop Sign	Traffic Signal
A	0 to 10	0 to 10
B	>10 to 15	>10 to 20
C	>15 to 25	>20 to 35
D	>25 to 35	>35 to 55
E	>35 to 50	>55 to 80
F	>50	>80

Table 2 shows the signalized and unsignalized levels-of-service for the Route 58 study area intersections under existing peak hour conditions. Congestion at intersections in Table 2 (LOS “E” and “F”) is shown in shaded blocks.

Table 2 shows that 22 of the 30 study area intersections are stop sign controlled, and six of these stop sign intersections experience LOS “E” or “F” conditions during the morning peak hour, afternoon peak hour, or during both peak hours. Table 2, shows that seven of the study area intersections are signal controlled. Only one of these signalized intersections, Plymouth Street Route 58 at Centre Avenue Route 123 in Abington, experiences a poor LOS. This intersection experiences LOS “E” conditions during the afternoon peak hour.

Figures 6 and 7 show the peak hour levels-of-service for the Route 58 corridor. Levels-of-service “E” and “F” are shown in red in Figures 6 and 7. The Route 58 intersections with the poorest levels-of-service (LOS “E” and “F”) are located in Abington and Hanson. There were no Route 58 corridor intersections in Whitman, Halifax, or Plympton with peak hour levels-of-service below LOS “C”.

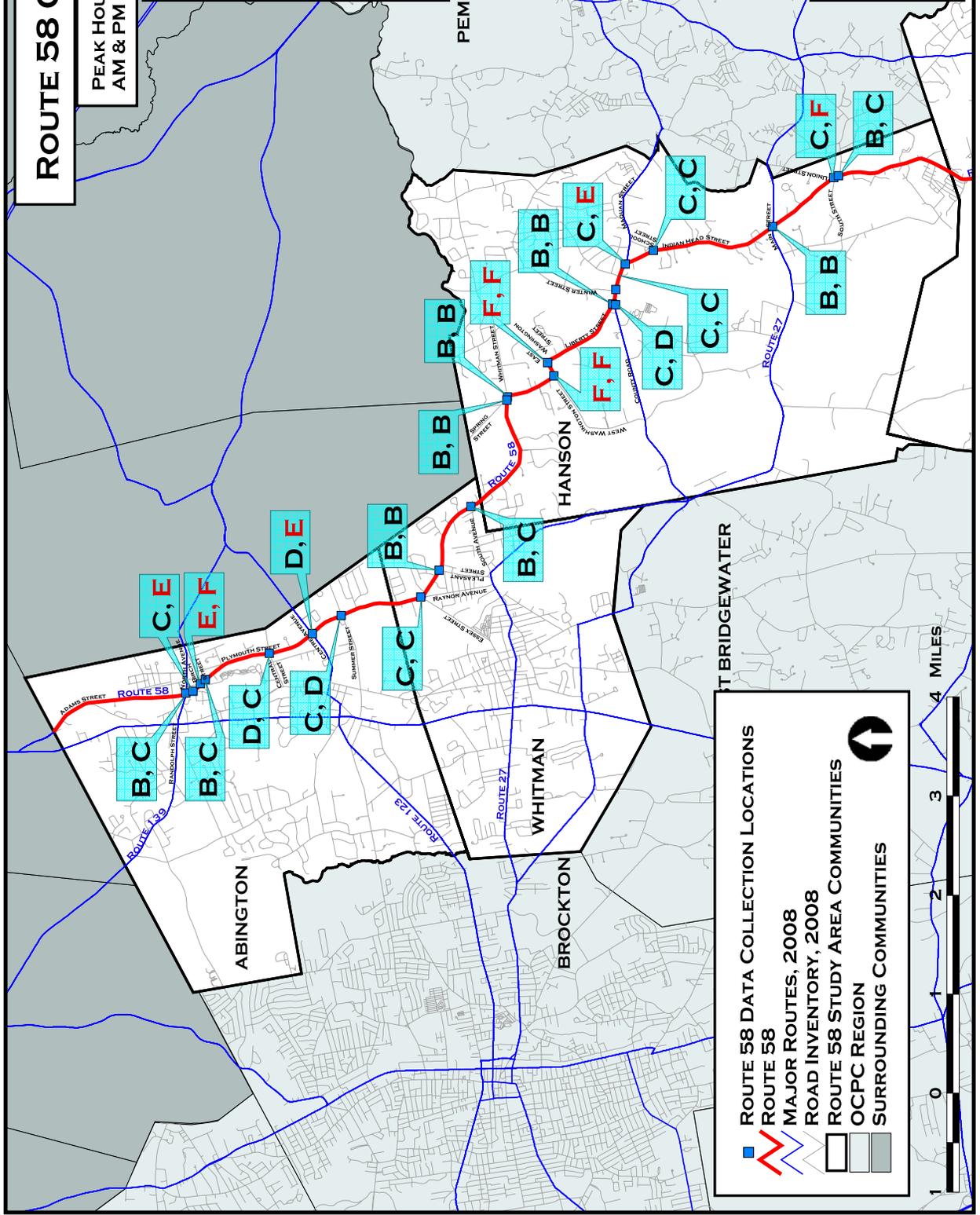
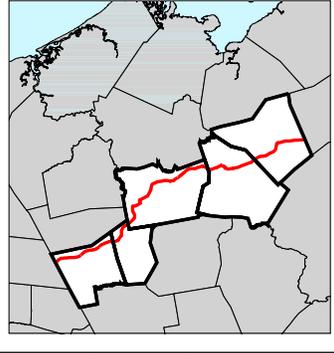
The poor levels-of-service at the unsignalized intersections in the Route 58 corridor in Abington and Hanson are due to the heavy traffic flow on Route 58 during the peak hours. This traffic is so heavy on Route 58 in both directions that there are very few gaps sufficient for the side street left turns to enter the main stream traffic safely or without very long delays. Subsequently, side street traffic often forces its way into the main flow on Route 58, forcing Route 58 traffic to slow down, or worse, causing crashes. The critical movement from Route 58, vehicles turning left into the side streets, also lacks sufficient gaps in the Route 58 through traffic. These left turns block traffic behind them on Route 58 because there is no room for vehicles behind them to perform a bypass maneuver.

FIGURE 6

ROUTE 58 CORRIDOR STUDY

PEAK HOUR LEVELS OF SERVICE
AM & PM

ROUTE 58 STUDY AREA



OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
GIS DATA SOURCES:
MASSGIS, MASSDOT, OCPC
MARCH, 2010

ROUTE 58 DATA COLLECTION LOCATIONS

- ROUTE 58
- MAJOR ROUTES, 2008
- ROAD INVENTORY, 2008
- ROUTE 58 STUDY AREA COMMUNITIES
- OCPC REGION
- SURROUNDING COMMUNITIES

Scale: 0 1 2 3 4 MILES

North Arrow



Table 2 Existing 2010 Intersection Levels-of-Service

ID	Community	Intersection	Traffic Control	AM LOS	PM LOS
1	Abington	Adams Street Route 58 at North Avenue Route 139	Signal	B	C
2	Abington	Plymouth Street Route 58 at Adams Street	Stop Sign	C	E
3	Abington	Plymouth Street Route 58 at Birch Street/Brighton Street	Stop Sign	E	F
4	Abington	Plymouth Street Route 58 at Pearl Street	Stop Sign	B	C
5	Abington	Plymouth Street Route 58 at Central Street	Signal	D	C
6	Abington	Plymouth Street Route 58 at Centre Avenue Route 123	Signal	D	E
7	Abington	Plymouth Street Route 58 at Summer Street	Signal	C	D
8	Whitman	Plymouth Street Route 58 at Essex Street/Raynor Avenue	Roundabout	D*	D*
9	Whitman	Plymouth Street Route 58 at Pleasant Street	Stop Sign	B	B
10	Whitman	Plymouth Street Route 58 at South Avenue	Stop Sign	B	C
11	Hanson	Whitman Street Route 58 at Spring Street	Stop Sign	B	B
12	Hanson	Spring Street Route 58 at Whitman Street	Stop Sign	B	B
13	Hanson	Whitman Street Route 58 at West Washington Street	Stop Sign	F	F
14	Hanson	West Washington Route 58 Street/Liberty Street at East Washington Street	Stop Sign	F	F
15	Hanson	Liberty Street Route 58 at County Road Route 14	Signal	B	B
16	Hanson	Route 14 County Road at High Street	Stop Sign	B	D
17	Hanson	Liberty Street Route 58 at Winter Street	Signal	C	C
18	Hanson	Liberty Street Route 58/Indian Head Street at Maquan Street Route 14	Stop Sign	C	E
19	Hanson	Indian Head Street Route 58 at School Street	Stop Sign	C	C
20	Hanson	Indian Head Street Route 58/Monponsett Street at Main Street Route 27	Signal	B	B
21	Hanson	Monponsett Street Route 58 at Union Street	Stop Sign	C	F
22	Hanson	Monponsett Street Route 58 at South Street	Stop Sign	B	C
23	Halifax	Monponsett Street Route 58 at Plymouth Street Route 106	Signal	B	C
24	Plympton	Palmer Road Route 58 at Maple Street	Stop Sign	B	B
25	Plympton	Palmer Road Route 58 at Center Street	Stop Sign	B	B
26	Plympton	Palmer Road Route 58 at Main Street	Stop Sign	B	C
27	Plympton	Main Street Route 58 at Elm Street	Stop Sign	B	C
28	Plympton	Main Street Route 58 at Parsonage Road/Mayflower Road	Signal	A	A
29	Plympton	Main Street Route 58 at Pleasant Street	Stop Sign	B	C
30	Plympton	Main Street Route 58 at Winnetuxet Road	Stop Sign	B	B

* Estimated LOS based on *Roundabouts; An Informational Guide*, by the FHWA.



In the Abington, the unsignalized intersection of Plymouth Street Route 58 at Adams Street experiences LOS “E” during the afternoon peak hour. This intersection is stop-signed controlled on the eastbound Adams Street approach. The poor level-of-service during the afternoon peak hour is due to the long delays for vehicles on this eastbound approach attempting to turn left to Route 58 northbound. These delays are due mainly to the lack of gaps in the Route 58 traffic with sufficient time for vehicles to make the left turn out of Adams Street.

Just south of this intersection, the unsignalized Plymouth Street Route 58/Birch Street/Brighton Street intersection experiences LOS “E” during the morning peak hour and LOS “F” during the afternoon peak hour. This is a five-way intersection. Traffic operations are negatively impacted by the heavy minor street volumes on Birch Street and the additional conflicts from a fifth approach, Brighton Street, which increases motorist confusion and delay. This intersection, much like the Route 58/Adams Street intersection, experiences long delays on the Birch Street and Brighton Street minor street approaches due to insufficient gap time in the Route 58 mainstream traffic.

Key unsignalized intersections in the Route 58 corridor in Hanson that experience long delays and/or forced flow (LOS “E” and “F”) conditions during the morning and afternoon peak hours include the intersection of Route 58 at West Washington Street, the intersection of Route 58 at East Washington Street, and the intersection of Route 58 at Union Street. These intersections experience LOS “F” in the morning and afternoon peak hours, (except for the Union Street intersection, which experiences LOS “C” during the morning peak hour). These poor levels-of-service at these intersections are due to heavy traffic volumes and the lack of sufficient gaps in the Route 58 peak hour flow in Hanson that would allow traffic from the minor streets to enter Route 58 safely.

3.5 Crash Analysis

Information on crashes at the study area intersections was obtained from the Massachusetts Department of Transportation (MassDOT) for the latest available three-year period (2006, 2007, and 2008). This data, which is made available to MassDOT by the Massachusetts Registry of Motor Vehicles (RMV), was compiled and analyzed in accordance with the standard practices published by the Institute of Transportation Engineers (ITE) in the *Manual of Traffic Engineering Studies*. Crash rates were calculated based on the procedures in the *Manual of Traffic Engineering Studies* and compared with the average crash rates for the State and for MassDOT District 5.

Crash rates are used, according to the *Manual of Traffic Engineering Studies*, to characterize the crash exposure of a facility. Crash rates for intersections are calculated based on the average number of crashes per million entering vehicles (MEV). Crash rates can also be calculated to measure the exposure of a highway segment, which is based on average crashes per million vehicle miles traveled. Both of these methods were used in this study to determine crash exposure at Route 58 intersections and along segments within the Route 58 corridor.



The purpose for analyzing crash data includes:

- To define and identify high crash locations;
- To justify actions for the installation of traffic control devices;
- To evaluate the geometric design (including lane use) and proposed changes in traffic regulations;
- To justify expenditures for improvements that offer crash reduction or prevention;
- To identify a need for traffic enforcement; and,
- To identify needs in pedestrian and bicycle safety and certain actions causing crashes that can be prevented through driver and/or public education.

The number of crashes often increases as traffic volumes increase. Traffic growth creates more opportunities for crashes and therefore increases vehicle exposure to crashes. A particular condition that causes crashes at an intersection can become exacerbated with increased traffic, and frequency will therefore rise. The crash rate equations are included in the appendices to this report. The crash rate utilized for intersection analysis is the crash rate per million entering vehicles, which is the average number of accidents per year (over three years) times one million, divided by the number of vehicles entering the intersection in a year. Table 3 shows the number of crashes and crash rates for the study area intersections. Those intersections in Table 3 with a crash rate higher than the State Average are shown in shaded blocks.

Table 3 also shows the ranking for the intersections in the OCPC Region's Top 100 Hazardous Intersection List. The Top 100 list is based upon a weighted average where, for every intersection, 10 points is given for every fatal crash, 5 points for every crash resulting in personal injury, and one point given for every crash that resulted in property damage only. The study area intersections weighted average was also compared to MassDOT's Top 200 Hazardous intersections. There were no Route 58 intersections on MassDOT's Top 200 List.

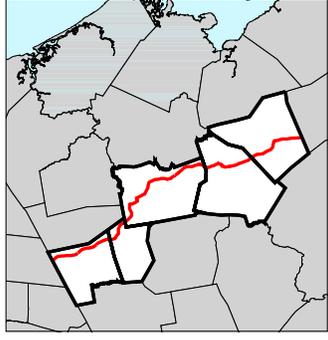
Crash rates for the study area intersections are also shown in Figures 8 and 9, with those rates higher than the State's Average shown in red.

FIGURE 8

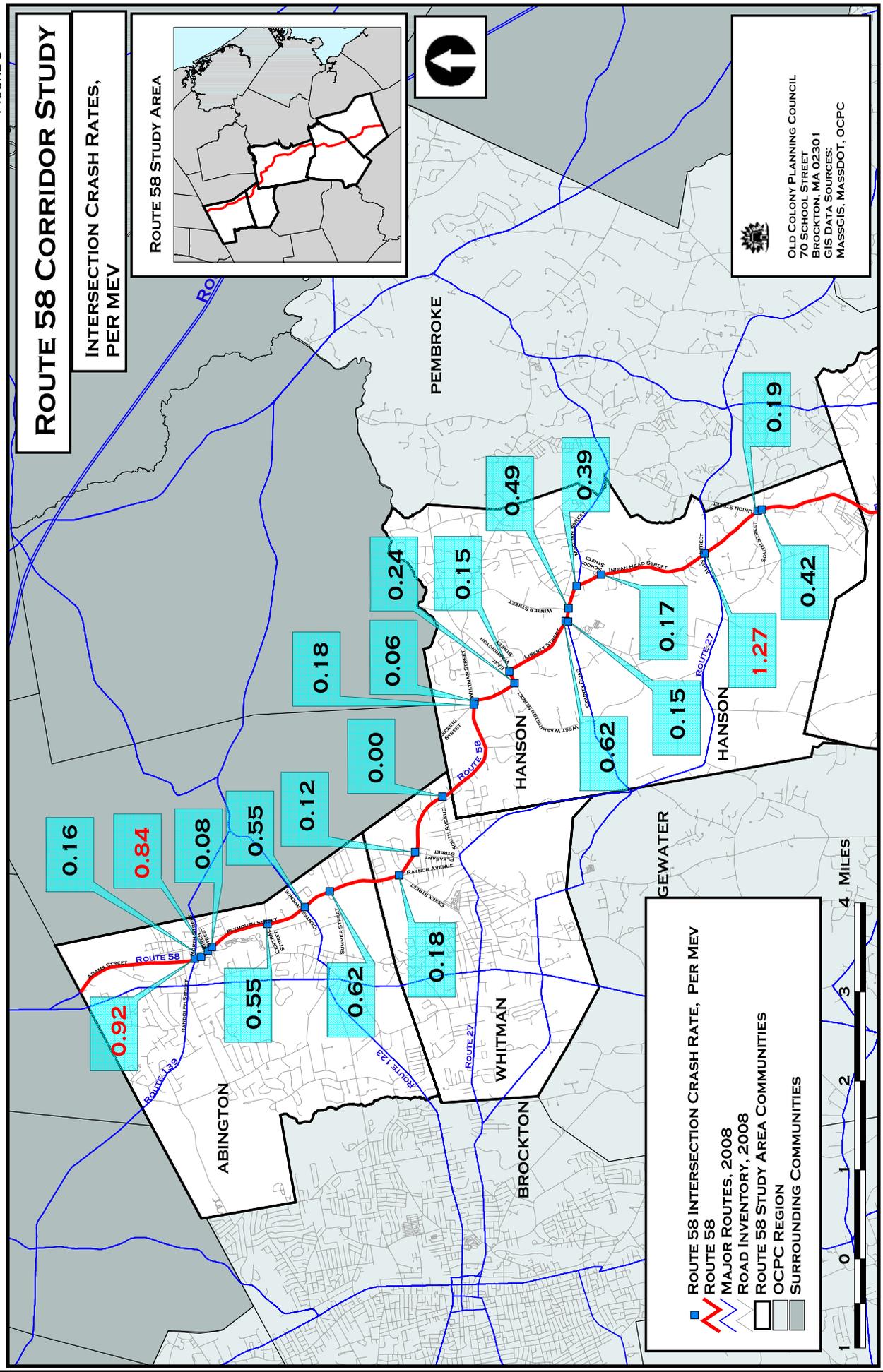
ROUTE 58 CORRIDOR STUDY

INTERSECTION CRASH RATES,
PER MEV

ROUTE 58 STUDY AREA



OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
GIS DATA SOURCES:
MASSGIS, MASSDOT, OCPC



- ROUTE 58 INTERSECTION CRASH RATE, PER MEV
- ROUTE 58
- MAJOR ROUTES, 2008
- ROAD INVENTORY, 2008
- ROUTE 58 STUDY AREA COMMUNITIES
- OCPC REGION
- SURROUNDING COMMUNITIES

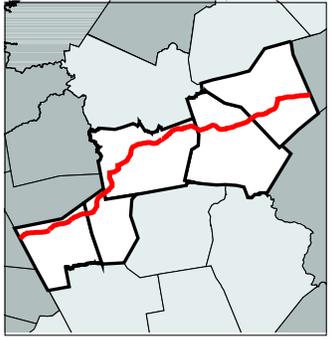


FIGURE 9

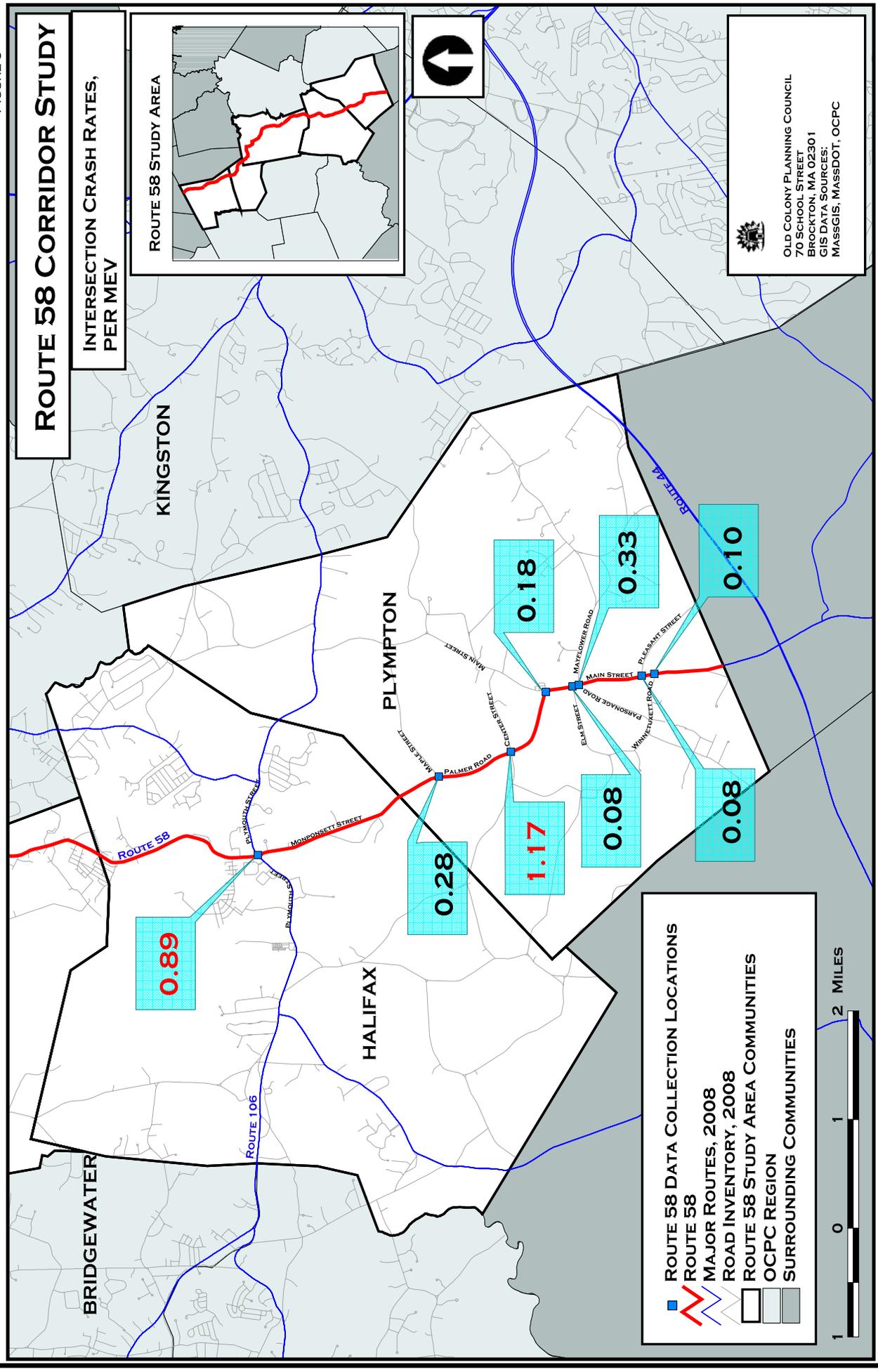
ROUTE 58 CORRIDOR STUDY

INTERSECTION CRASH RATES,
PER MEV

ROUTE 58 STUDY AREA




OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
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GIS DATA SOURCES:
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- ROUTE 58 DATA COLLECTION LOCATIONS
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- ROAD INVENTORY, 2008
- ROUTE 58 STUDY AREA COMMUNITIES
- OCPC REGION
- SURROUNDING COMMUNITIES





Table 3 – Crashes and Intersection Crash Rates

	Community	Intersection	Traffic Control	Number of Crashes	Crash Rate (Per MEV)	Fatal	OCPC Top 100?
1	Abington	Adams Street Route 58 at North Avenue Route 139	Signal	23	0.92	0	--
2	Abington	Plymouth Street Route 58 at Adams Street	Stop Sign	2	0.16	0	--
3	Abington	Plymouth Street Route 58 at Birch Street/Brighton Street	Stop Sign	13	0.84	0	--
4	Abington	Plymouth Street Route 58 at Pearl Street	Stop Sign	1	0.08	0	--
5	Abington	Plymouth Street Route 58 at Central Street	Signal	12	0.55	0	--
6	Abington	Plymouth Street Route 58 at Centre Avenue Route 123	Signal	15	0.55	0	Rank 92
7	Abington	Plymouth Street Route 58 at Summer Street	Signal	14	0.62	0	--
8	Whitman	Plymouth Street Route 58 at Essex Street/Raynor Avenue	Roundabout	3	0.18	0	--
9	Whitman	Plymouth Street Route 58 at Pleasant Street	Stop Sign	1	0.12	0	--
10	Whitman	Plymouth Street Route 58 at South Avenue	Stop Sign	0	0.00	0	--
11	Hanson	Whitman Street Route 58 at Spring Street	Stop Sign	2	0.18	0	--
12	Hanson	Spring Street Route 58 at Whitman Street	Stop Sign	1	0.06	0	--
13	Hanson	Whitman Street Route 58 at West Washington Street	Stop Sign	5	0.24	0	--
14	Hanson	West Washington Route 58 Street/Liberty Street at East Washington Street	Stop Sign	3	0.15	0	--
15	Hanson	Liberty Street Route 58 at County Road Route 14	Signal	12	0.62	0	--
16	Hanson	Route 14 County Road at High Street	Stop Sign	2	0.15	0	--
17	Hanson	Liberty Street Route 58 at Winter Street	Signal	11	0.49	0	--
18	Hanson	Liberty Street Route 58/Indian Head Street at Maquan Street Route 14	Stop Sign	9	0.39	0	--
19	Hanson	Indian Head Street Route 58 at School Street	Stop Sign	2	0.17	0	--
20	Hanson	Indian Head Street Route 58/Monponsett Street at Main Street Route 27	Signal	25	1.27	1	--
21	Hanson	Monponsett Street Route 58 at Union Street	Stop Sign	2	0.19	0	--
22	Hanson	Monponsett Street Route 58 at South Street	Stop Sign	5	0.42	0	--
23	Halifax	Monponsett Street Route 58 at Plymouth Street Route 106	Signal	21	0.89	0	Rank 78

MassDOT District 5 Average Crash Rate for signalized intersections is 0.77. MassDOT District 5 Average Crash Rate for unsignalized intersections is 0.62. Massachusetts Statewide Average Crash Rate for signalized intersections is 0.82, and Massachusetts Statewide Average for unsignalized intersections is 0.62.



Table 3 Crashes and Intersection Crash Rates (continued)

	Community	Intersection	Control	Number of Crashes	Crash Rate (Per MEV)	Fatal	OCPC Top 100?
24	Plympton	Palmer Road Route 58 at Maple Street	Stop Sign	2	0.28	0	--
25	Plympton	Palmer Road Route 58 at Center Street	Stop Sign	9	1.17	0	--
26	Plympton	Palmer Road Route 58 at Main Street	Stop Sign	2	0.18	0	--
27	Plympton	Main Street Route 58 at Elm Street	Stop Sign	1	0.08	0	--
28	Plympton	Main Street Route 58 at Parsonage Road/Mayflower Road	Signal	5	0.33	0	--
29	Plympton	Main Street Route 58 at Pleasant Street	Stop Sign	1	0.08	0	--
30	Plympton	Main Street Route 58 at Winnetuxet Road	Stop Sign	1	0.10	0	--

MassDOT District 5 Average crash rate for signalized intersections is 0.77. MassDOT District 5 Average Crash Rate for unsignalized intersections is 0.62. Massachusetts Statewide Average Crash Rate for signalized intersections is 0.82, and Massachusetts statewide average for unsignalized intersections is 0.62.

The average crash rate for MassDOT District 5 is 0.77 per MEV for signalized intersections and 0.62 per MEV for unsignalized intersections. The Massachusetts Statewide Average is 0.82 per MEV for signalized intersections and 0.62 per MEV for unsignalized intersections. A rate higher than the District 5 Average is used as an indicator that safety improvements should be considered to reduce crashes at an intersection location. Other criteria used as indications that improvements are necessary include inclusion on MassDOT’s Top 200 Hazardous Intersection List and the OCPC Region’s Top 100 Hazardous Intersection List, as well as the percentage of injury crashes and the overall number of crashes. There were no study area intersections that made it on the state’s Top 200 Hazardous Intersection List; however, there were two intersections that are included on the OCPC Region’s Top 100 Hazardous Intersection List. These include the Monponsett Street Route 58 at Plymouth Street Route 106 intersection in Halifax (rank 78), and the Plymouth Street Route 58 at Centre Avenue Route 123 intersection in Abington (rank 92).

In Abington, there were two intersections that experienced higher than average crash rates, including the Adams Street Route 58 at North Avenue Route 139 intersection, and the Plymouth Street Route 58 at Birch Street/Brighton Street intersection. Other study area intersections with higher than average crash rates include: the Monponsett Street Route 58 at Main Street Route 27 intersection in Hanson, the Monponsett Street Route 58 at Plymouth Street Route 106 intersection in Halifax, and the Palmer Street Route 58 at Center Street intersection in Plympton. It should be noted that the data for the crash rates preceded the recently completed reconstruction improvements to the Palmer Street Route 58 at Center Street intersection in Plympton, which included a flashing beacon signal at the intersection to improve visibility.

Table 4 summarizes the crashes per million vehicle miles travelled (MVMT) as calculated for specific segments of Route 58. Route 58 was divided into eleven segments for analysis purposes as described in Table 4.



Table 4 Route 58 Section Crash Rates

Community	Route 58 Section	Road Classification	Number of Crashes	Number of Fatalities	Crash Rate (Per Million Vehicle Miles Traveled)
Abington	From the Weymouth Line to Route 139	Urban Minor Arterial	7	0	0.44
Abington	From Route 139 to Route 123 Centre Avenue	Urban Minor Arterial	10	0	0.40
Abington	From Route 123 to the Whitman Line	Urban Minor Arterial	12	0	0.86
Whitman	From the Abington Line to the Hanson Line	Urban Minor Arterial	10	0	0.75
Hanson	From the Whitman Line to Country Road	Urban Minor Arterial	39	0	1.36
Hanson	From County Road to Route 27	Urban Minor Arterial	22	0	1.06
Hanson	From Route 27 to Halifax Line	Urban Minor Arterial	23	0	1.11
Halifax	From Hanson Line to Route 106	Urban Minor Arterial	17	1	0.90
Halifax	From Route 106 to Plympton Line	Urban Minor Arterial	5	1	0.48
Plympton	From Halifax Line to Main Street	Rural Major Collector	8	0	0.59
Plympton	From Main Street to Carver Line	Rural Major Collector	8	0	0.56

MassDOT Statewide Average Crash Rate for urban areas is 2.31 crashes per million vehicle miles traveled. MassDOT Average Crash Rate for Urban Minor Arterials is 4.07. MassDOT Average Crash Rate for Rural Major Collectors is 1.51.

Table 4 shows that the crash rates per million vehicle miles traveled on Route 58 are well under the Massachusetts statewide average of 2.31. The average for an Urban Minor Arterial highway is 4.07 crashes per MVMT in Massachusetts. Table 4 shows that the crash rates on Route 58 are under the average for this road class. In Plympton, Route 58 is classified as a Rural Major Collector road. The average crash rate for a Rural Major Collector in Massachusetts is 1.51 crashes per MVMT. As shown in Table 4, the crash rate for Route 58 in Plympton, where Route 58 is classified as a Rural Major Collector, is at 0.59 and 0.56, which is below the average crash rate for this highway class. Although Table 4 shows that Route 58 is below the state average for its road classification, there are some segments of Route 58 where the number of crashes is elevated. These sections include Route 58 in Hanson, especially between the Whitman Line and County Road where there were 39 crashes in the three year period, and in Halifax between the Hanson Line and Route 106. There were two fatalities on Route 58 in Halifax, one located just south of the Hanson Line, and the other near the Plympton Line. Both of these crashes involved a vehicle leaving the travel lane and hitting a fixed object (a tree and utility pole).



3.6 Speed Studies

OCPC staff measured vehicle speeds under prevailing conditions at specific locations within the Route 58 corridor. These speed studies were conducted using automatic traffic recorders, which also recorded vehicle classification to identify the percentage of heavy vehicles in the traffic flow. Spot speed data collection occurs over a 24 to 48 hour period during a weekday. The use of automatic recorders allows for non-peak as well as peak hour data collection. Figures 10 and 11 summarize the speed data collected for the Route 58 corridor, as well as the percentage of heavy vehicles in the traffic flow. The 85th percentile speed is the speed at or below in which 85 percent of all vehicles were traveling at the time of the study. It is used in the MassDOT's guidelines as one of the criteria to determine the posted speed limit on a road.

As shown in Figures 10 and 11, the 85th percentile speed on Route 58 in Abington at the Weymouth Town Line is 49 miles per hour while just south of Route 139 it was recorded at 43 miles per hour. The prevailing speeds on Route 58 in Abington are lower at the Whitman Town Line where the 85th percentile is 40 miles per hour. The 85th percentile remains steady at 40 miles per hour in Whitman south of the roundabout and also at the Whitman/Hanson Town Line. In Hanson, the 85th percentile speed is 44 miles per hour just north of West Washington Street and 43 miles per hour north of County Road. South of Maquan Street, the 85th percentile speed is 45 miles per hour and 47 miles per hour at the Hanson/Halifax Town Line.

In Halifax, the 85th percentile speed on Route 58 is 39 miles per hour north of Route 106, 43 miles per hour in the more rural area south of Route 106 and even higher at 50 miles per hour at the Halifax/Plympton Town Line. In Plympton, the 85th percentile speed remains at 50 miles per hour north of Main Street, drops to 40 miles per hour just south of Main Street in the vicinity of the town center, and goes up to 50 miles per hour at the Plympton/Carver Town Line.

3.7 Heavy Vehicle Traffic

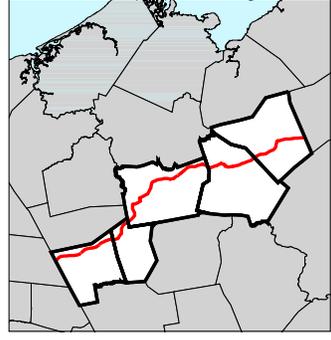
The percentages of heavy vehicles within the Route 58 traffic stream were measured with automatic traffic recorders and are shown in Figures 10 and 11. In Abington, heavy vehicles are 5.5 percent of the traffic at the Weymouth Town Line, 5.7 percent just south of Route 139, and 5.2 percent at the Whitman Town Line. In Whitman, the percentages are within a similar range; 5.5 percent just south of the Plymouth Street Route 58/Essex Street/Raynor Street roundabout, and 5.9 percent at the Hanson Town Line. In Hanson, the percentages of heavy vehicles are higher than in Abington and Whitman, with 6.9 percent heavy vehicles on Route 58 between Whitman Street and West Washington Street, 7.1 percent between County Road and Maquan Street, and 8.3 percent north of Route 27. Although the percent of heavy vehicles on Route 58 is 5.7 percent south of Route 27, it is 12.1 percent at the Halifax Town Line, and is 8.2 percent on Route 58 south of Route 106. Heavy vehicles are 10.4 percent on Route 58 at the Halifax Plympton Town Line, and remain at this level in Plympton, with 10.2 percent south of Center Street, 9.4 percent south of Main Street, and 10.1 percent at the Carver Town Line.

FIGURE 10

ROUTE 58 CORRIDOR STUDY

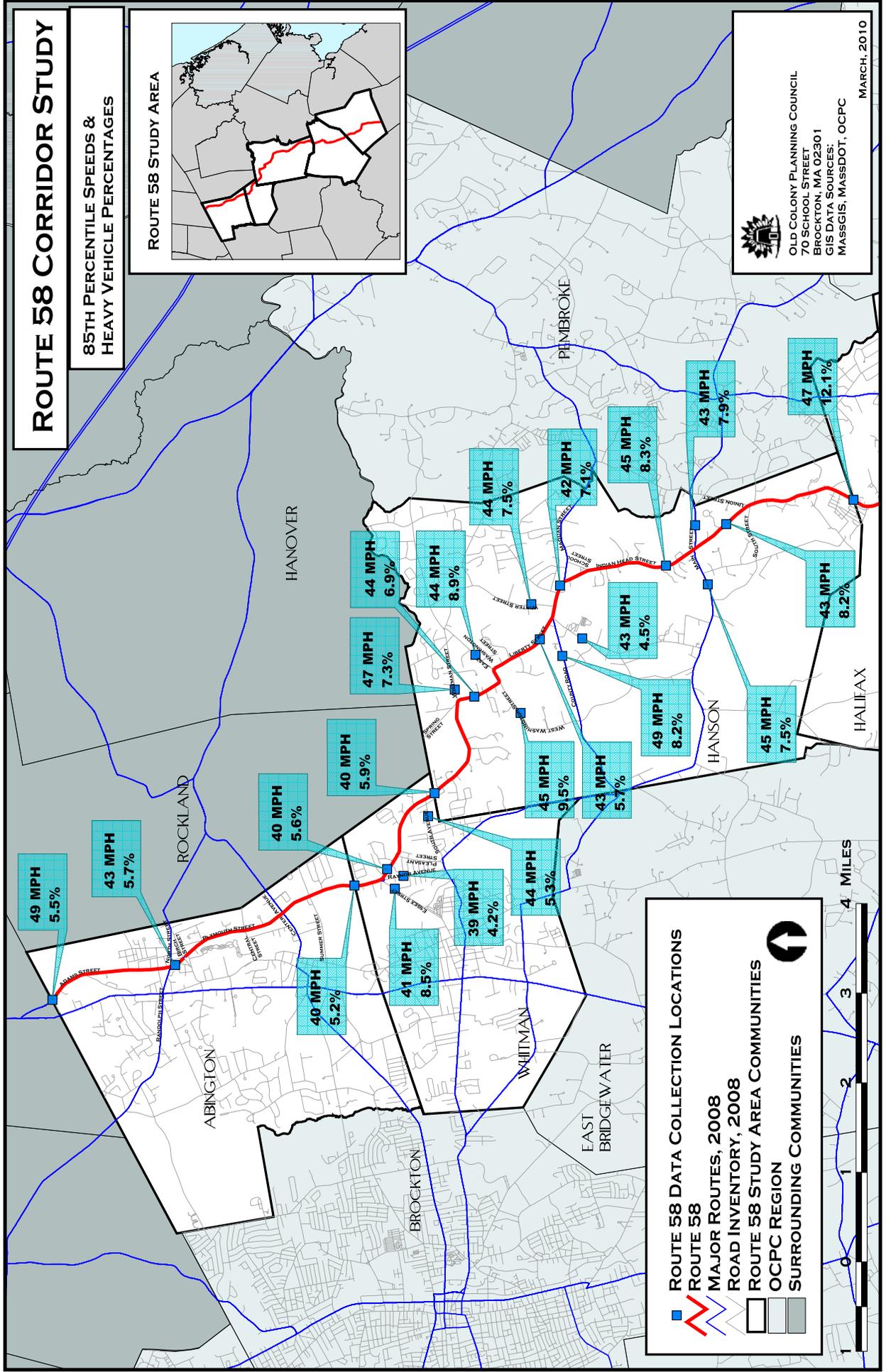
85TH PERCENTILE SPEEDS &
HEAVY VEHICLE PERCENTAGES

ROUTE 58 STUDY AREA



OLD COLONY PLANNING COUNCIL
70 SCHOOL STREET
BROCKTON, MA 02301
GIS DATA SOURCES:
MASSGIS, MASSDOT, OCPC

MARCH, 2010



- ROUTE 58 DATA COLLECTION LOCATIONS
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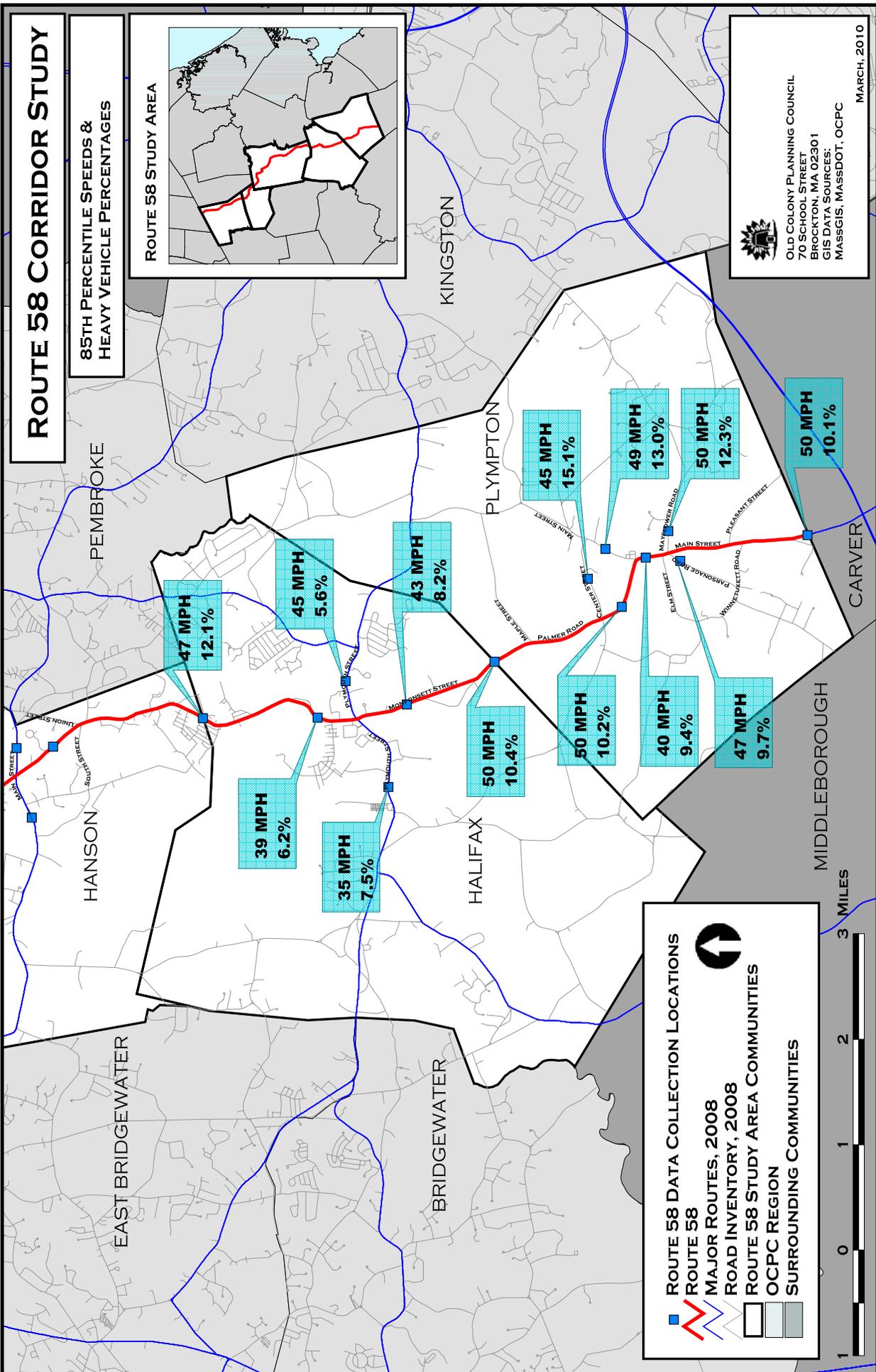
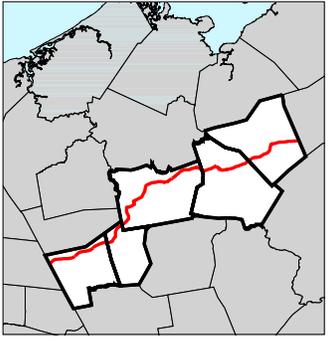


FIGURE 11

ROUTE 58 CORRIDOR STUDY

85TH PERCENTILE SPEEDS & HEAVY VEHICLE PERCENTAGES

ROUTE 58 STUDY AREA




 OLD COLONY PLANNING COUNCIL
 70 SCHOOL STREET
 BROCKTON, MA 02301
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MARCH, 2010

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 SURROUNDING COMMUNITIES





3.8 *Pavement Conditions*

OCPC utilizes pavement management software and maintains a region-wide Pavement Management System (PMS) for roads that are eligible for federal aid (including road classifications arterial, urban collector, and major rural collector). The system includes a pavement deterioration curve that demonstrates the rate of deterioration of pavement and the implications for the cost of maintenance. The system calculates Pavement Condition Index (PCI) scores for surveyed road segments. The PCI is derived from an evaluation of pavement distress factors (such as longitudinal and transverse cracking, pot holes, block cracking, alligator cracking, rutting, etc.), average daily traffic, and roadway classification.

The pavement management software detracts points for the severity and extent of the various distresses assigned to a road segment. The PCI is based on a scale of 1 to 100, with 100 indicating a flawless road surface. PCI scores of 95 or higher indicate that the road surface is in excellent condition. PCI scores between 85 and 94 normally indicate that the road has some distresses but is in good condition. Roads with scores between 65 and 84 are in fair condition and are in need of maintenance or mill and overlay repairs. Roads with scores below 65 are in poor condition and need base rehabilitation or reconstruction and overlay.

OCPC conducted a windshield survey of the Route 58 corridor to determine the condition of the surface pavement. Figure 12 shows the results of the survey and the road conditions of Route 58 as determined by the software. As shown in Figure 12, the Route 58 corridor in Abington is in “Fair” condition from the Abington/Weymouth Town Line south to Birch Street, and in “Good” condition from Birch Street to the Abington/Whitman Town Line. Route 58 in Whitman is in “Excellent” condition. In Hanson, Route 58 is in “Good” condition from the Whitman Town Line to East Washington Street, in “Fair” condition from East Washington Street to Maquan Street, in “Excellent” condition from Maquan Street to Route 27, and in “Good” condition from Route 27 to the Halifax Town Line.

Figure 12 shows that the pavement on Route 58 in Halifax is in “Poor” condition from the Hanson Town Line to the Plympton Town Line. In Plympton, the Route 58 pavement is in “Excellent” condition as this section of Route 58 has been reconstructed and resurfaced over the past year.



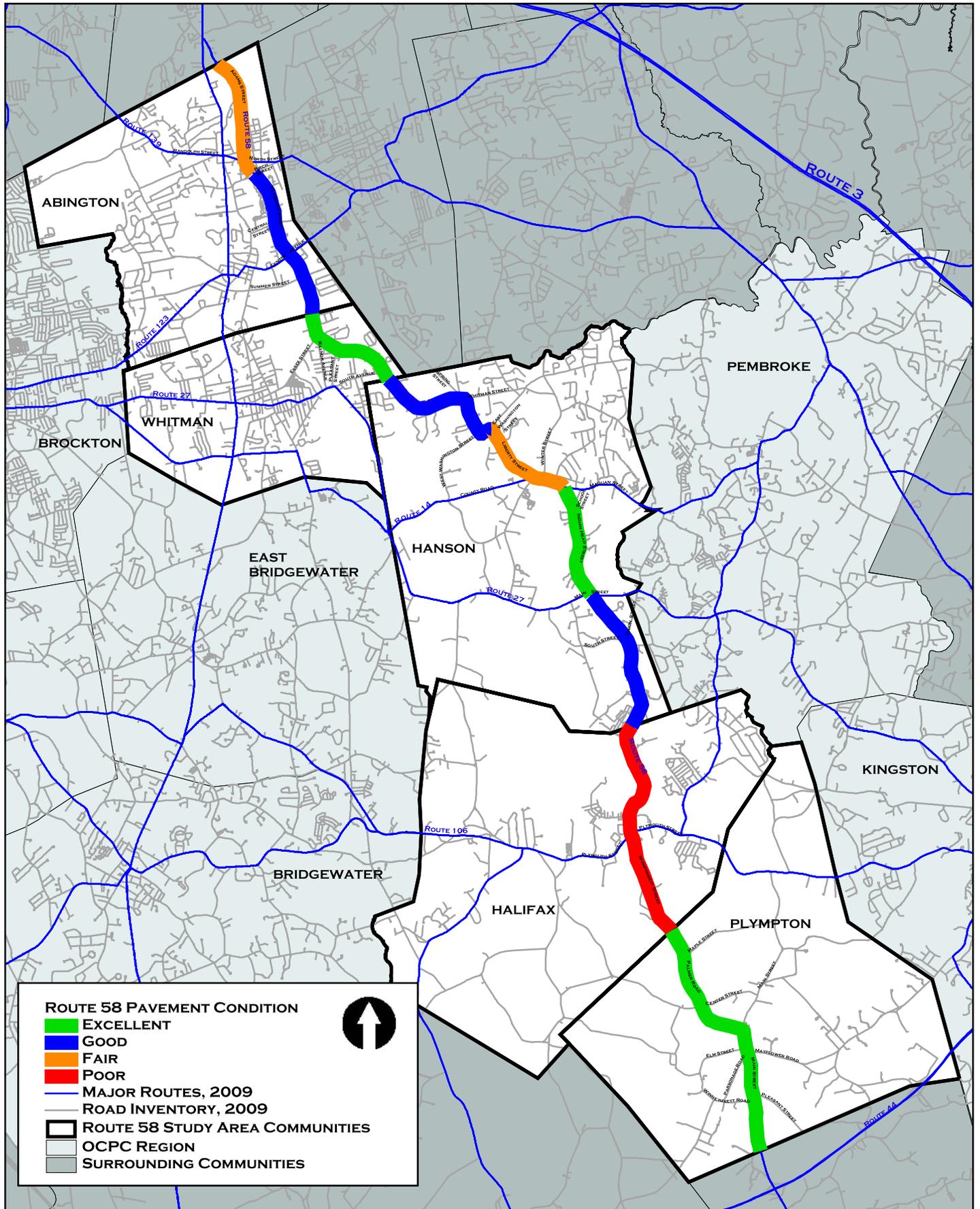
Route 58 pavement conditions in Halifax at West Monponsett Pond and East Monponsett Pond looking north (Poor conditions).



Route 58 Pavement Conditions in Halifax near Palmer Mill Road (Poor conditions).

ROUTE 58 CORRIDOR STUDY PAVEMENT CONDITIONS

FIGURE 12



ROUTE 58 PAVEMENT CONDITION

- █ EXCELLENT
- █ GOOD
- █ FAIR
- █ POOR

MAJOR ROUTES, 2009
— ROAD INVENTORY, 2009

ROUTE 58 STUDY AREA COMMUNITIES
 OCPC REGION
 SURROUNDING COMMUNITIES

↑





3.9 *Pedestrian and Bicycle Accommodations*

Pedestrian and bicycle amenities can generally improve travel choices and the overall quality of life in communities. The presence of sidewalks is an important feature within a road corridor and at key intersections, especially within village nodes. Adequate sidewalks can link residential areas to commercial areas and transit stops to surrounding areas, and can provide an alternative mode to the motor vehicle.

Some portions of Route 58 have adequate sidewalk infrastructure, while other areas require improvement. Sidewalks are provided discontinuously along the corridor. The Towns of Abington and Hanson contain sidewalks within the Route 58 corridor more consistently than the communities of Whitman, Halifax, and Plympton.

Route 58 in Abington has a sidewalk on the northbound side of the highway from Hemlock Lane southward to Route 139. In Abington, Route 58 has sidewalks and raised curbs on both the northbound and southbound side from Jefferson Street south through Route 139, to a terminus just south of Birch Street. South of Birch Street, Route 58 has a sidewalk on the southbound side only to the Whitman Town Line.



Route 58 in Abington looking south toward Birch Street with sidewalks on both sides of the highway with raised curbs.



Route 58 in Abington looking south toward the Railroad tracks showing typical sidewalk on the southbound side with a grass buffer but no raised curbs.

Sidewalks in Hanson on Route 58 are consistent between East Washington Street and Maquan Street, through the Town Center. The sidewalks are mainly on the southbound side from East Washington Street to Winter Street. In addition, Route 58 has sidewalks on the northbound side from Winter Street south to the Route 58/Route 27 intersection. Sidewalks are missing on Route 58 in Hanson south of Route 27 except for a short section on the northbound side from the Halifax Town Line to Briggs Street in the Monponsett section of the Town.



Sidewalks at the Route 58/Winter Street intersection in Hanson looking south.



Sidewalks on Route 58 in Halifax are limited to two short segments; on the southbound side, just south of the Hanson Town Line, and on the northbound side, just south of Route 106.



Sidewalks with raised curbs on the southbound side of Route 58 in Halifax at the Hanson Town Line (photo looking north).

Sidewalks on Route 58 in Plympton run on the southbound side from the Palmer Road/Main Street intersection to the Main Street/Mayflower Road intersection, and on the north side in the vicinity of the Main Street/Palmer Road intersection.



Route 58 sidewalks in Plympton near Elm Street and Parsonage/Mayflower Road



3.9.1 *Pedestrian and Bicycle Levels-of-Service*

A Level-of-Service (LOS) methodology was developed by the FHWA to qualitatively and quantitatively identify sidewalk gaps along a highway corridor, and to determine the compatibility of bicycle use. The input criteria used to calculate both the pedestrian and bicycle LOS for a highway segment include; the number of lanes per direction of travel, lane width, width of sidewalk (if present) or paved shoulder, traffic volumes, posted speed limits, the composition of traffic (percent heavy vehicles), pavement conditions, the presence of parking, the percent of sidewalks present, the presence of a sidewalk buffer, and the average tree spacing within the buffer. The LOS ranges from “A” to “F” with LOS “A” representing the highest level of pedestrian accommodation and LOS “F” representing the lowest level of accommodation. A LOS of “C” or better indicates higher levels of compatibility, and LOS “D” or below indicates lower levels of compatibility.

The data input for determining the pedestrian and bicycle LOS for the Route 58 corridor was collected by OCPC and evaluated according to the pedestrian LOS model procedures. A summary of the bicycle and pedestrian LOS criteria and evaluations for Route 58 are included in the appendix to this report.

In addition to the pedestrian LOS for highway segments, the FHWA has developed a methodology utilizing a Pedestrian Infrastructure Index to determine the pedestrian levels-of-service at a signalized intersection. The input criteria for the Pedestrian Infrastructure Index include: the number of lanes at an intersection (and the type of lanes), presence of crosswalks, presence of pedestrian signal actuation, presence of sidewalks, the approach grade, ADA compliance, turn radii and skewing of the intersection, and lighting. The data input for determining the pedestrian LOS for the Route 58 corridor signalized intersections was collected by OCPC and evaluated according to the pedestrian LOS model procedures. A summary of the criteria and evaluations for these signalized intersections is included in the appendix to this report.

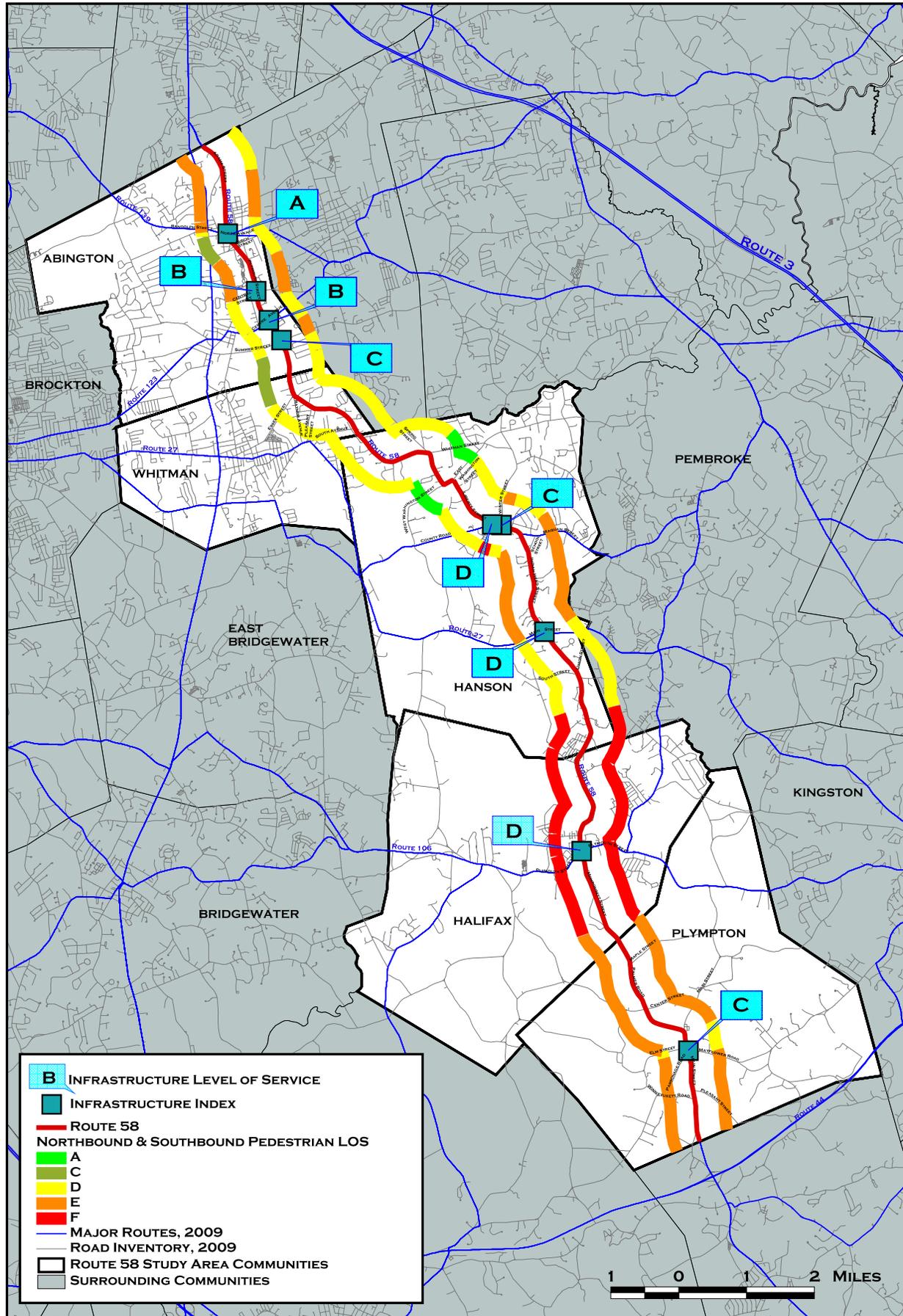
The pedestrian levels-of-service for Route 58 (including pedestrian LOS at signalized intersections) are shown in Figure 13. In order to identify sidewalk gaps along the corridor, Figure 13 shows the northbound and southbound pedestrian levels-or-service in colored bands parallel to the Route 58 corridor (to the east of Route 58 for the northbound and to the west of Route 58 for southbound). The pedestrian levels-of-service at signalized intersections are also shown in Figure 13 (in callouts blocks). The bicycle levels-of-service for the Route 58 corridor are shown in Figure 14. In Figure 14, the bicycle levels-of-service for northbound are indicated along the east side of Route 58 and the southbound levels-of-service are indicated on the west side of Route 58.

As shown in Figure 13, the pedestrian levels-of-service for most of the Route 58 corridor fall below LOS “C”. In Abington, the portion of Route 58 just north and south of Route 139 provides the highest pedestrian accommodations in the corridor (LOS “B” and “C”). Other portions of Route 58 in Abington that contain LOS “C” accommodations (moderately high pedestrian compatibility) include the portion from Central Street to Centre Avenue (southbound side only). In Whitman, the LOS for pedestrian compatibility is at LOS “D” or below (moderately low to very low compatibility).



Hanson has mostly low levels of pedestrian compatibility, LOS “D” or below, except for two portions on the northbound side; from Route 27 to Maquan Street and from the Halifax Town Line to Briggs Street. Halifax has low levels of pedestrian accommodation, LOS “D” or below, except for the northbound side of Route 58 from East and West Monponsett Ponds to the Hanson Town Line, which is at LOS “C”. In Plympton, the pedestrian LOS is at LOS “D” or below, except for the section of Route 58 from Main Street to Mayflower Road, which is at LOS “C”.

In Abington, as shown in Figure 13, the Route 58/Route 139 intersection has the highest level-of-service (LOS “A” Extremely High Compatibility) compared to the other signalized intersections in the Route 58 corridor. The other signalized intersections in Abington, Route 58 at Central Street, Route 58 at Centre Avenue, and Route 58 at Summer Street, have LOS “C” conditions (Moderately High Compatibility). The Hanson signalized intersections within the Route 58 corridor experience LOS “D” conditions for pedestrian compatibility (Moderately Low Compatibility). The Route 58/Route 106 intersection in Halifax and the Route 58/Mayflower Street/Parsonage intersection in Plympton experience LOS “C” conditions (Moderately High Compatibility) for pedestrian accommodations.



B INFRASTRUCTURE LEVEL OF SERVICE

■ INFRASTRUCTURE INDEX

— ROUTE 58
NORTHBOUND & SOUTHBOUND PEDESTRIAN LOS

■ A
■ C
■ D
■ E
■ F

— MAJOR ROUTES, 2009
— ROAD INVENTORY, 2009

□ ROUTE 58 STUDY AREA COMMUNITIES
■ SURROUNDING COMMUNITIES





Figure 14 shows that most of the Route 58 corridor experiences LOS “D” and “E” (Moderately Low and Very Low) conditions for bicycle compatibility. In Abington and Whitman, the bicycle compatibility is at LOS “D” and “E” for northbound and southbound except for a short section in Abington (from Route 139 to the railroad tracks) and a short section in Whitman and Abington (at the Abington/Whitman Town Line) where the southbound side experiences LOS “C” conditions (Moderately High Compatibility). In Hanson, Figure 14 shows that the bicycle LOS is mostly LOS “D” and “E”, except for a short section from Spring Street to East Washington Street on both the northbound and southbound side where the LOS is at LOS “A” (Extremely High Compatibility). There are also some short sections of Route 58 in Hanson that are at LOS “F” (Extremely Low Compatibility) including southbound from County Road to Winter Street and from Briggs Street to the Halifax Town Line (on both the northbound and southbound sides). In Halifax, the bicycle LOS is at LOS “F” (Extremely Low Compatibility) for most of northbound and southbound Route 58 except for a short section south of Palmer Mill Road to the Plympton Town Line. In Plympton, the bicycle LOS is at LOS “D” and “E” for the northbound and southbound sides (Moderately Low to Very Low Compatibility).

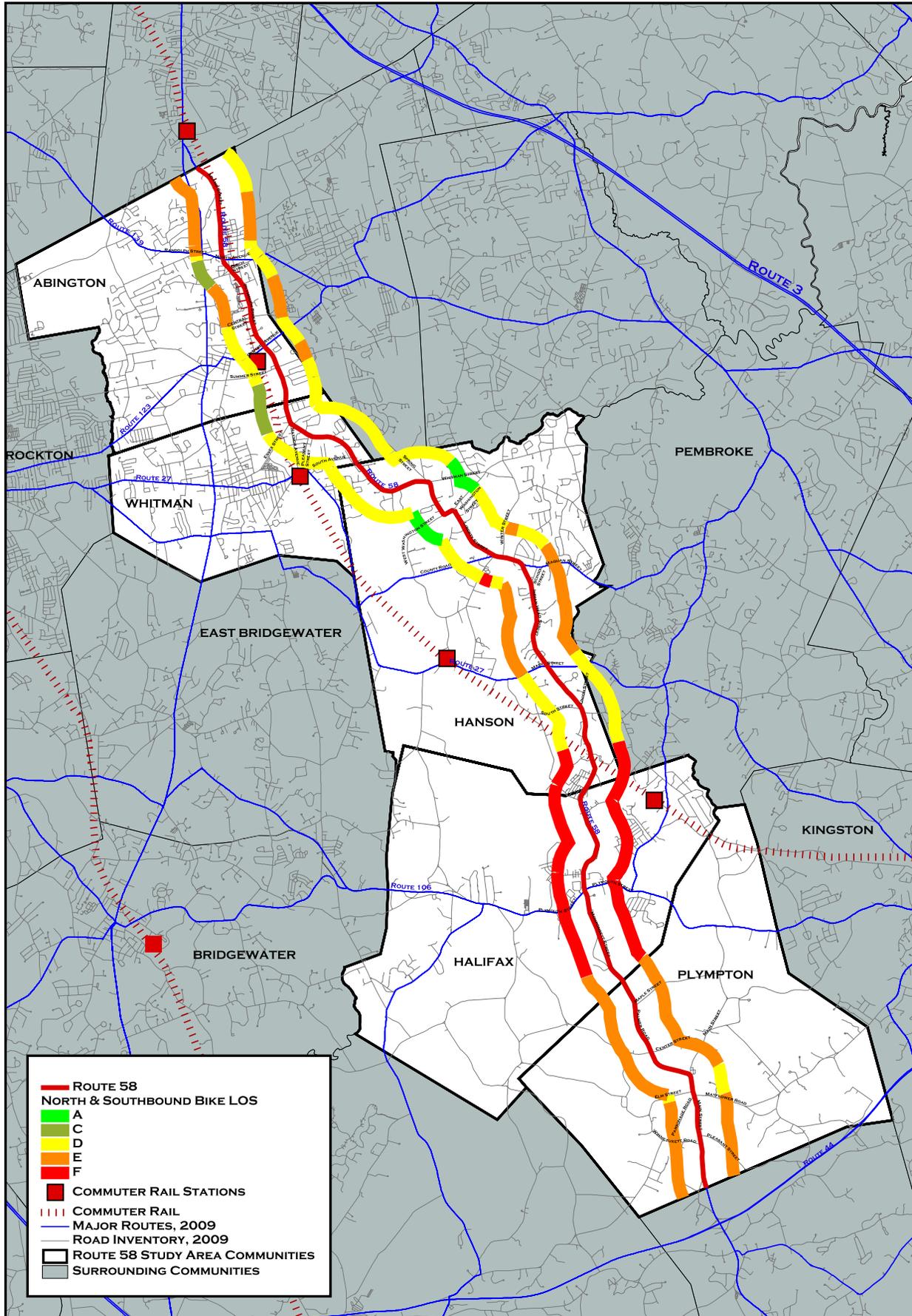


Route 58 in Whitman south of Pleasant Street (LOS “E” bicycle conditions, Very Low Compatibility).

ROUTE 58, BICYCLE LEVEL OF SERVICE



FIGURE 14



- ROUTE 58
- NORTH & SOUTHBOUND BIKE LOS**
- A
- C
- D
- E
- F
- COMMUTER RAIL STATIONS
- - - COMMUTER RAIL
- MAJOR ROUTES, 2009
- ROAD INVENTORY, 2009
- ROUTE 58 STUDY AREA COMMUNITIES
- SURROUNDING COMMUNITIES





3.10 Land Use and Zoning

Land use and zoning are key components in defining the character of a community and determining the development patterns along a highway corridor. These are areas in which a community has important influences; through zoning regulations and the local review process. As previously stated, Route 58 is classified as both an urban minor arterial (in Abington, Whitman, Hanson, and Halifax) and a rural major collector (in Plympton). The publication, *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO), describes the function of an urban minor arterial, such as Route 58, as augmenting the principal arterial system, accommodating vehicle trips of moderate length, on a somewhat lower level than principal arterials, and distributing travel on a regional basis (serving major centers of activity of urbanized areas). The function of a rural major collector is described as linking larger towns and traffic generators, such as consolidated schools, shipping points, and important agricultural areas, with routes of higher classifications. According to AASHTO's publication, local roads emphasize the land access function, while roads of higher tiers, such as arterials, specialize in travel mobility (main movement or distribution). Collector roads offer balanced service for both mobility and movement. Despite its minor arterial and rural major collector classifications, Route 58 provides property access to many businesses and residents along the corridor. Under traditional zoning, commercial zones are placed along the busiest roadways regardless of functional class (except for limited access facilities), and as such promote strip commercial development where businesses line busy arterials.

Zoning maps, zoning ordinances, and land use and master plans from the Route 58 communities were compiled in order to discern the vision that each of the communities has had for the corridor and has for future development patterns. A review of these documents helps also to discern consistency in zoning and land use as Route 58 transitions from one town to the next.

3.10.1 Abington Zoning and Land Use

Approximately 75 percent of the land adjacent to Route 58 in Abington falls into either of two residential zones, High Density Residential or Medium Density Residential. In addition to these residential zones, land adjacent to Route 58 in Abington has an Industrial zone, from the Weymouth Town Line south to Pine Street, a Central Business District zone surrounding the Route 58/Route 139 intersection and along Route 139 to the Rockland Town Line, and a Highway Commercial District surrounding the Route 58/Centre Avenue intersection. Other types of zoning, although not located directly along Route 58, are located close to the corridor including, a Multi-Use Planned Development District (which covers the Southfield parcels in Abington), a Technology Business zone adjacent to the industrial zone in the north, and a Transit Oriented Development district in the south that extends from Centre Avenue to Summer Street. The land use along Route 58 is primarily residential interspersed with commercial areas at Oak Street, Route 139, and Centre Avenue. There is also a warehouse operation in the industrial district adjacent to the Weymouth Town Line.



3.10.2 Whitman Zoning and Land Use

The land adjacent to the Route 58 corridor in Whitman is zoned residential from the Abington Town Line south to the Hanson Town Line. There is a General Industrial district to the west of Route 58, which is accessible via Essex Street from the Route 58/Essex Street/Raynor Avenue roundabout, and a General Business district and Limited Industrial district at the Route 27/Pleasant Street/South Avenue intersection, accessible from Route 58 via Pleasant Street and/or South Avenue. The land use along Route 58 in Whitman is residential interspersed with a couple of isolated commercial establishments

3.10.3 Hanson Zoning and Land Use

The zoning along the Route 58 corridor in Hanson is residential except for specific portions of the corridor that are zoned commercial. These commercial portions include Route 58 from West Washington Street south to Winter Street, the area surrounding the Route 58/Route 27 intersection, and a section of Route 58 beginning south from the railroad tracks to the Halifax Town Line. The land use along Route 58 in Hanson is mainly residential with two commercial nodes. These commercial nodes are located in the center of Town from West Washington Street south to Winter Street, and surrounding the Route 58/Route 27 intersection. Other significant land use types include the Maquan and Indian Head Schools located off of School Street, adjacent to the Route 58 corridor, and the Cranland Airport, which is located in the south of the Town, just north of the railroad grade crossing.

3.10.4 Halifax Zoning and Land Use

Halifax has three types of zoning along the Route 58 corridor. Much as in the other Route 58 communities, the majority of the adjacent land is zoned for residential use. There are two portions zoned for commercial and business use. The Commercial/Business districts are from Wamsutta Avenue (near West and East Monponsett Ponds) north to the Hanson Town Line, and south from Lingam Street, through the Route 106 intersection, to Parsons Lane. In addition, there is an Industrial district adjacent to the Route 58 corridor from Palmer Mill Road south to the Plympton Town Line. The land use in Halifax is primarily residential with a commercial-retail node at the Route 106 intersection, and commercial areas interspersed along the corridor north of Wamsutta Avenue to the Hanson Town Line.

3.10.5 Plympton Zoning and Land Use

There are three zoning districts within the Route 38 corridor in Plympton including Light Industrial, General Business, and a Residential/Agricultural zone. A Light Industrial district extends from the Hanson Town Line south to Maple Street. There are three General Business districts; one district surrounding the Route 58/Center Street intersection, the largest General Business district extending from Elm Street south Winnetuxett Road, and a third General Business district extending south from Montello Street to the Carver Town Line. The remaining land adjacent to the Route 58 corridor in Plympton that is not Light Industrial or General Business is zoned Residential/Agricultural. The land use along Route 58 in Plympton is mainly forested and agricultural interspersed with isolated commercial parcels. The residential uses are



also isolated along the corridor with a cluster around the Elm Street and Parsonage Road intersections.

4.0 FUTURE ROUTE 58 CONDITIONS

4.1 Planned Improvements

Information on planned infrastructure improvements was compiled from MassDOT, the Old Colony Transportation Improvement Program (TIP), and from the four study area towns. These include improvements planned or proposed prior to the initiation of this study. Some of these projects have recently been completed. Table 5 summarizes these improvements.

Table 5 Route 58 Improvements

Community	Project	Status
Abington	Public Works Economic Development (PWED) Grant Route 58 at Route 139 – Replace signal equipment, install countdown pedestrian signal with audio for visually impaired, reconstruct crossings for ADA compliancy. Cold plane and resurface Route 58 from Wales Street south to Birch Street. Cold plane and resurface Route 139 from Route 58 to the Rockland Town Line.	Currently underway.
Hanson	Mill and overlay Route 58 south of Maquan Street to Main Street	Completed 2006.
Plympton	Reconstruct and pave Route 58 in Plympton (approximately 3 miles). Install traffic signals and reconstruct the Main Street (Route 58)/ Parsonage/Mayflower Road intersection.	Completed 2009.

Table 5 shows three Route 58 improvement projects located in Abington, Hanson, and Plympton. Two of these projects have already been completed (Hanson and Plympton) and the Abington project is currently under construction.



Route 58, Plympton at Center Street showing completed improvements that include re-striping, pavement resurfacing, and installation of a flashing beacon.



Route 58, Plympton at showing completed improvements for Route 58 that include re-striping, pavement resurfacing, and installation of a traffic signal at the Route 58 Parsonage Road/Mayflower Road intersection.



4.2 Traffic Forecasts

A five-year time horizon has been chosen for analysis of future conditions, which is consistent with state guidelines for traffic studies. Traffic growth within the Route 58 corridor in the study area towns of Abington, Whitman, Hanson, Halifax, and Plympton, was reviewed, based on the Old Colony Planning Council's archived volume reports published in *The Old Colony Planning Council Traffic Volumes Report, 2009*. Table 6 summarizes the growth in traffic along Route 58 from the volumes report along with updated traffic counts completed for this study.

Table 6 Route 58 Traffic Growth

COMMUNITY	LOCATION	HISTORIC YEAR	ADT	LATEST YEAR	ADT	TOTAL GROWTH	ANNUAL GROWTH
ABINGTON	ADAMS ST (RT 58) AT WEYMOUTH LINE	2000	9,455	2010	10,198	7.9%	0.8%
ABINGTON	ADAMS ST (RT 58) SOUTH OF Route 139	2000	10,388	2010	12,893	24.1%	2.2%
ABINGTON	PLYMOUTH ST (RT 58) AT WHITMAN LINE	2005	12,347	2010	14,146	14.6%	2.8%
HALIFAX	MONPONSETT ST (RT 58) AT PLYMPTON LINE	2002	5,529	2010	5,522	-0.1%	0.0%
HANSON	INDIAN HEAD ST (RT 58) NORTH OF MAIN STREET	2002	10,170	2010	9,446	-7.1%	-0.9%
HANSON	MONPONSETT ST (RT 58) AT HALIFAX LINE	2003	8,995	2010	9,098	1.1%	0.2%
PLYMPTON	MAIN ST (RT 58) AT CARVER LINE	2004	8,422	2010	7,974	-5.3%	-0.9%
PLYMPTON	MAIN ST (RT 58) NORTH OF ELM STREET	2004	8,951	2010	8,767	-2.1%	-0.3%
WHITMAN	PLYMOUTH ST (RT 58) AT HANSON LINE	2001	7,607	2010	8,108	6.6%	0.7%
		2002	9,096	2010	9,572	5.2%	0.67%

As shown in Table 6, Abington showed the highest rates in traffic growth, and Whitman has seen an average of 0.7 percent increase over 2001. Hanson and Halifax have experienced a drop in traffic except at the Hanson/Halifax Town Line, which has experienced a small 0.2 percent average growth since 2003. Plympton has experienced a drop in the average rate of traffic since 2004. The table shows an average traffic growth rate of 0.67 percent overall in the corridor. In order to reflect potential development and traffic growth in the corridor, an annual growth rate of one percent projected over five years has been applied to the existing turning movement volumes in order to estimate the future peak hour turning movements at study area intersections.

4.3 Southfield Development (The Redevelopment of the former South Weymouth Naval Air Station)

The redevelopment of the former South Weymouth Naval Air Station, known as Southfield, is expected to have a significant impact on the region. The site is located in the Towns of Weymouth, Rockland, and Abington. The project is described by the proponent as a mix of retail, residential, and office uses oriented around a series of public squares. The project's Village Center is proposed to be within walking distance of the



MBTA's Old Colony commuter rail station in South Weymouth. In addition, several residential/mixed-use development clusters, many of the recreational fields and amenities, and significant portions of the Shea Science Park are proposed to be within walking distance of the Village Center.

The project's Master Plan includes a public school facility that will accommodate Kindergarten through Eighth Grade (elementary and middle school) as well as a civic or community center. The Master Plan calls for buildings along the main street in the Village Center to accommodate residential and commercial, with shops on the ground floor and residential units above. The residential mix will consist of a neighborhood of townhouses and garden homes oriented to a series of small parks and squares in the Northern Village Center; a neighborhood of townhouses and single-family homes next to the planned public golf course in the Golf Village; and a neighborhood primarily of townhouses and single-family homes next to public squares, small parks and recreation fields in the East Village.

The project is expected to be built in three major phases, and include 2,855 housing units (single-family, townhouse condominiums, apartments), 900,000 to 2,000,000 commercial square feet, a golf course, public playgrounds and recreation fields, and an east-west parkway connecting Route 18 in Weymouth to Route 228 Hingham Street in Rockland.

The proponent's Final Environmental Impact Statement (FEIR) concluded that most of the project's traffic impact to OCPC communities will be on the Route 18 corridor; however, the FEIR does show impact on the Route 58 corridor, specifically at the Route 58/Route 139 intersection. The FEIR included mitigation recommendations for this intersection including adding an exclusive left turn lane on the Route 58 northbound approach and adding an exclusive right lane on the Route 139 eastbound approach. These improvements will be implemented under Phase I of the construction of the development; therefore, they have been included in the future conditions analysis. This is because implementation of the improvements is expected within the five year horizon for future conditions in this study.

4.4 Future Traffic Operations

Level-of-service analyses (LOS) for the study area intersections were completed to determine the future operating conditions that are expected to occur during the morning and afternoon peak hours. Table 7 shows the signalized and unsignalized LOS for the Route 58 study area intersections for future 2015 peak hour conditions. The morning and afternoon peak hour levels-of-service for current 2010 conditions are also included in Table 7 to compare changes in future LOS to current LOS. Congestion at intersections in Table 7 (LOS "E" and "F") is shown in shaded blocks.



Table 7 Future 2015 Intersection Levels-of-Service

ID	Community	Intersection	Traffic Control	2010 AM LOS	2010 PM LOS	2015 AM LOS	2015 PM LOS
1	Abington	Adams Street Route 58 at North Avenue Route 139*	Signal	B	C	B*	C*
2	Abington	Plymouth Street Route 58 at Adams Street	Stop Sign	C	E	C	E
3	Abington	Plymouth Street Route 58 at Birch Street/Brighton Street	Stop Sign	E	F	E	F
4	Abington	Plymouth Street Route 58 at Pearl Street	Stop Sign	B	C	B	C
5	Abington	Plymouth Street Route 58 at Central Street	Signal	D	C	D	D
6	Abington	Plymouth Street Route 58 at Centre Avenue Route 123	Signal	D	E	D	E
7	Abington	Plymouth Street Route 58 at Summer Street	Signal	C	D	D	E
8	Whitman	Plymouth Street Route 58 at Essex Street/Raynor Avenue**	Roundabout	D**	D**	D**	D**
9	Whitman	Plymouth Street Route 58 at Pleasant Street	Stop Sign	B	B	B	C
10	Whitman	Plymouth Street Route 58 at South Avenue	Stop Sign	B	C	B	C
11	Hanson	Whitman Street Route 58 at Spring Street	Stop Sign	B	B	C	C
12	Hanson	Spring Street Route 58 at Whitman Street	Stop Sign	B	B	B	B
13	Hanson	Whitman Street Route 58 at West Washington Street	Stop Sign	F	F	F	F
14	Hanson	West Washington Route 58 Street/Liberty Street at East Washington Street	Stop Sign	F	F	F	F
15	Hanson	Liberty Street Route 58 at County Road Route 14	Signal	B	B	B	B
16	Hanson	Route 14 County Road at High Street	Stop Sign	B	D	B	D
17	Hanson	Liberty Street Route 58 at Winter Street	Signal	C	C	C	D
18	Hanson	Liberty Street Route 58/Indian Head Street at Maquan Street Route 14	Stop Sign	C	E	C	E
19	Hanson	Indian Head Street Route 58 at School Street	Stop Sign	C	C	C	C
20	Hanson	Indian Head Street Route 58/Monponsett Street at Main Street Route 27	Signal	B	B	B	B
21	Hanson	Monponsett Street Route 58 at Union Street	Stop Sign	C	F	C	F
22	Hanson	Monponsett Street Route 58 at South Street	Stop Sign	B	C	B	C
23	Halifax	Monponsett Street Route 58 at Plymouth Street Route 106	Signal	B	C	C	C
24	Plympton	Palmer Road Route 58 at Maple Street	Stop Sign	B	B	B	B
25	Plympton	Palmer Road Route 58 at Center Street	Stop Sign	B	B	B	C
26	Plympton	Palmer Road Route 58 at Main Street	Stop Sign	B	C	B	C
27	Plympton	Main Street Route 58 at Elm Street	Stop Sign	B	C	B	C
28	Plympton	Main Street Route 58 at Parsonage Road/Mayflower Road	Signal	A	A	A	A
29	Plympton	Main Street Route 58 at Pleasant Street	Stop Sign	B	C	B	C
30	Plympton	Main Street Route 58 at Winnetuxet Road	Stop Sign	B	B	B	B

* Assumes Southfield mitigation is in place (the addition of an exclusive northbound left lane and an exclusive westbound right lane).

** Estimated LOS based on *Roundabouts; An Informational Guide*, by the FHWA.

Table 7 compared with Table 2 shows that in Abington, the changes in peak hour levels-of-service can be expected at two intersections, the signalized Plymouth Street Route 58/Central Street intersection, which will go from LOS “C” in the existing PM peak to LOS “D” under future conditions, and the signalized Plymouth Street/Summer Street intersection, which will go from LOS “C” and “D” in the existing AM and PM peak



hours to LOS “D” and “E” under future AM and PM peak hours. In Whitman, the three Route 58 study area intersections are expected to operate under acceptable levels-of-service under future conditions, although the PM LOS is expected to go from a present LOS “B” to a LOS “C” at the Plymouth Street Route 58 Pleasant Street intersection.

Hanson is expected to experience reduced peak hour levels-of-service at two intersections. The unsignalized Route 58/Spring Street intersection is expected to drop in AM and PM LOS from LOS “B” to LOS “C”. The Liberty Street Route 58/Route 14/Winter Street intersection is expected to experience a drop in LOS during the PM peak from LOS “C” to LOS “D”. The intersection of Monponsett Street Route 58 at Plymouth Street Route 106 in Halifax is expected to experience a drop in LOS for the AM peak hour from LOS “B” to LOS “C” under future conditions.

The future peak hour levels-of-service at the study area intersections in Plympton are expected to remain the same as they are under existing conditions except for the PM peak hour at the Palmer Road Route 58/Center Street intersection, which will experience a drop in LOS from “B” to “C”. All of the study area intersections in Plympton are expected to continue to have acceptable peak hour levels-of service under future operations as they experience under existing conditions.



5.0 RECOMMENDATIONS

The recommendations in this section were developed based on improvement strategies and best practices outlined in the National Cooperative Research Program (NCHRP) Report 500 series. These reports are a series of implementation guides that address the emphasis areas of the American Association of Safety Highway and Transportation Officials' (AASHTO) Strategic Highway Safety Plan. The reports describe the resources and expertise of professionals compiled from around the country through research, workshops, and actual demonstrations. The reports documented best practices in different areas of emphasis (safety at signalized intersections, unsignalized intersections, pedestrian and bicycle safety, etc.)

Recommendations in this study were also developed based upon the Route 58 stakeholder meetings held with the study area towns and MassDOT. OCPC held five stakeholder meetings in the Route 58 communities to solicit input from local residents and officials regarding their visions and desires for improvements in the Route 58 corridor. Issues that were discussed at these meetings include; land use, traffic volumes, intersection levels-of-service, traffic speeds and percentage of heavy vehicles in the traffic flow, crash rates and crash severity, pavement conditions, and non-motorized modes (pedestrian and bicycle travel). The agenda and sign-in attendance sheets for the meetings are included in the appendix to this report.

5.1 Overall Corridor Improvements

In addition to specific road improvements, a plan to improve the overall safety, physical conditions, and traffic operations for the entire corridor for motor vehicle traffic and other users is warranted. The study area communities should work together with state agencies and private developers to implement-short term and long-term improvements that address the cumulative impacts of growth in the Route 58 corridor.

The following overall improvements regarding traffic, pedestrian, and bicyclist safety and operation in the Route 58 corridor were identified:

Short term improvements:

- Re-stripe and improve signage at crosswalks throughout the corridor (except Plympton),
- Provide pavement marking revision and re-striping along the corridor (centerlines, fog lines, side street stop lines).
- Install new and revised signing upgraded to meet MUTCD reflectivity standards.
- Replace missing speed limit signs.
- Conduct regular roadway sweeping.
- Improve lighting along the road and at intersections.
- Clear vegetation to improve sight distances at intersections and driveways, and to provide recovery areas for lane departures.



- Relocate and or remove fixed objects (utility poles, trees, etc.) that are too close to travel lanes and present lane departure hazards.
- Install post mounted curve delineators and chevrons.
- Enhance speed management by providing immediate and strict speed enforcement.
- Implement traffic signal updates and modifications (improvements to equipment, coordination, and timing and phasing).
- Consider lane use revisions.

Long term improvements:

- Participate in the Safe Routes to School Program (currently, schools in Abington, Hanson, and Halifax participate in this program).
- Implement construction and/or operational improvements, such as adding or expanding shoulders, straightening dangerous curves, and realigning and improving hazardous intersections.
- Realign intersections and remove obstacles to improve sight distances at intersections, especially in the vicinity of the Route 58/Spring Street intersection, the Route 58/Whitman Street intersection, and the Route 58/West Washington Street intersection in Hanson.
- Request that OCPC routinely monitor traffic conditions on Route 58 as part of its regional growth monitoring efforts.
- Study area communities should continue to participate in the Joint Transportation Committee and Metropolitan Planning Organization.
- Continue to utilize pavement management systems.
- Construct, reconstruct, and replace sidewalks in conformance with the Americans with Disabilities Act, and provide overall sidewalk continuity and connectivity.
- Communities should review zoning ordinances and site plan review procedures to incorporate Access Management techniques that encourage driveway sharing, reducing curb cuts, linking existing parking lots, and avoiding curb cuts too close to intersections.
- The Route 58 study area communities should coordinate long term goals for the corridor with OCPC's Regional Transportation Plan and OCPC's Regional Policy Plan.

5.1.1 Recommended Improvements – Access Management

As noted in Section 3.2, the land use along the Route 58 corridor is mainly residential; however, land use varies and there are commercial and industrial nodes within the corridor, specifically in Abington and Hanson. A common problem within these nodes of development is the lack of control, placement, spacing, and width of curb cuts that provide access to adjacent properties. These conditions have led to situations in which safety and traffic flow have been compromised. This is notable at a number of locations including Route 58 at Spring Street and Route 58 at Whitman Street in Hanson where a lack of access control at a restaurant lot on Route 58 adds cross movement conflicts to intersection operations. The lack of access control on Route 58 between Shaw's Plaza to Maquan Street in Hanson creates situations where traffic entering driveways backs up



traffic on Route 58 that interferes with intersection operations (especially at the Route 58/County Road intersection). Also in Hanson, the businesses surrounding the Route 58 Monponsett Street at Route 27 Main Street intersection have numerous driveways within the intersection and within 150 feet from the intersection that create hazardous turning movement conditions.

Access Management is defined as the planning of the design, location, and operation of driveways, median openings, interchanges, and street connections. Access management provides two important advantages when applied to a roadway corridor:

1. Improved Safety
2. Improved Capacity

These advantages are achieved through techniques that seek the following results:

- Limit the number of conflict points in turning movements
- Separate conflict areas
- Remove turning vehicles from through traffic lanes
- Reduce conflicting volumes
- Improve roadway operations
- Improve driveway operations

Commercial and retail activities are important within certain nodes in the Route 58 corridor. Although some access management techniques include limiting the number of curb cuts, adding medians, and reducing turning movements, studies show that well planned access management design and modifications do not negatively impact businesses. Access Management applications result in reduced blocking of driveways by queues, better access between neighborhoods and businesses, and safer overall driving conditions. All of these attributes are important to both retailers and the customers they serve.

The prevailing conditions along the Route 58 corridor are such that some areas adjacent to the road have already been developed, especially in the more urbanized nodes in Abington. Development along the corridor sometimes results in the redevelopment of parcels that were abandoned or are in transition in regards to use. The techniques applied to these segments will involve retrofitting access management to existing curb cut access, which sometimes requires consolidating access points.

The areas within the Route 58 corridor in which access management techniques should be a prime focus include:

- Route 58 in Abington from the Weymouth Town Line to Summer Street.
- Route 58 in Hanson from West Washington Street to Maquan Street.



5.1.2 Recommendations – Land Use

As previously stated, the land use within the Route 58 corridor can be characterized as mainly residential and/or agricultural in nature with specific areas, especially in Abington and Hanson where commercial use has evolved and encouraged through zoning. This type of use has evolved into “strip” commercial development that impacts the safety and capacity of a highway due to numerous driveways and access points. Communities try to ameliorate this situation by widening the highway and adding a median or by building bypass roads. An alternative preferable strategy is to encourage nodal development where commercial and mixed use development can be concentrated in development nodes. The PWED improvements in Abington designed to encourage economic activity in the Central Business District on Route 139 from the Route 58/Route 139 intersection to Rockland follow the nodal development model. This type of dense development allows driveways and access points to be shared and provides opportunities for walking between establishments. It also creates densities that could support mass transit bus services, thereby creating more modal choices for the traveling public.

Mixed use zoning in concert with the dense development (encouraging nodal development) can improve livability and reduce the negative effects of sprawl (traffic congestion, air pollution, and wasted time and resources). There are three characteristics of sprawl; auto dependency, single use zoning, and extensive versus intensive (dense) development. Mixed use zoning encourages and allows more than a single category of use to be developed on a single parcel or within an area of a community. Many New England towns have historically contained a mix of uses in the town center. A mix of uses creates an environment whereby vehicle trips are reduced by allowing residents to bicycle or walk to their destinations. Mixed use zoning encourages the vertical mixing of uses (within the same structure), and the horizontal mixing of uses throughout an area. Communities need to be careful that the allowed uses within a mixed-use area are compatible. Many communities offer incentives to developers to encourage mixed use development including density bonuses and decreased requirements for off-street parking. Allowing multi-family housing within commercial areas provides pedestrian oriented traffic for nearby businesses, amenities, and transit services.

5.2 Recommended Improvements - Abington

Adams Street Route 58 at North Avenue Route 139

Improvements to this intersection are currently underway by the town under a Public Works Economic Development (PWED) grant, as described in Section 4.0. These improvements include: replacing signal equipment, installing countdown pedestrian signals with audio for visually impaired, reconstructing crossings for ADA compliancy, and resurfacing Route 58 from Wales Street south to Birch Street.

Further improvements for this intersection, recommended as mitigation for the Southfield development, include adding an exclusive northbound left turn lane on Route 58, and adding an eastbound right turn lane on Route 139. Table 7 in Section 4.3 shows the results of the future peak hour operating conditions with the proposed Southfield mitigation. As shown in Table 7, these proposed improvements will result in LOS “B” for the AM peak and LOS “C” for the PM peak hour.



Plymouth Street Route 58 at Birch Street and Brighton Street

This five-legged intersection operates under failed AM and PM peak hour levels-of-service (LOS “E” and “F”) and has a higher than average crash rate. A “Dangerous Intersection” warning sign is posted on the Route 58 southbound approach to this intersection. It was discussed and recommended at the May 2010 Route 58 Abington stakeholders meeting that Brighton Street be made into a one way northbound away from the intersection up to the New England Art driveway in order to cut down on the demand at the intersection and to remove conflicts from vehicles turning at the intersection from Brighton Street. Access to and from Route 139 can remain as it is for New England Art employees and customers if the one-way restriction is limited from Route 58 to the New England Art driveway.

Bicycle and Pedestrian Improvements in Abington

Issues regarding non-motorized transportation within the corridor were discussed at the May 2010 Route 58 Abington stakeholders meeting. It was recommended that the town take advantage of any opportunities for linking bicycle paths from the Southfield development to nearby streets in Abington. These streets are located east of the Route 58 corridor in the northeast portion of the town next to the Town of Rockland. It is also recommended that raised curbs be added to the sidewalk in the south side of Route 58 in Abington beginning at Birch Street south to the Hanson Town Line.

5.3 Recommended Improvements - Hanson

Hanson – Route 58 at Spring Street and Route 58 at Whitman Street

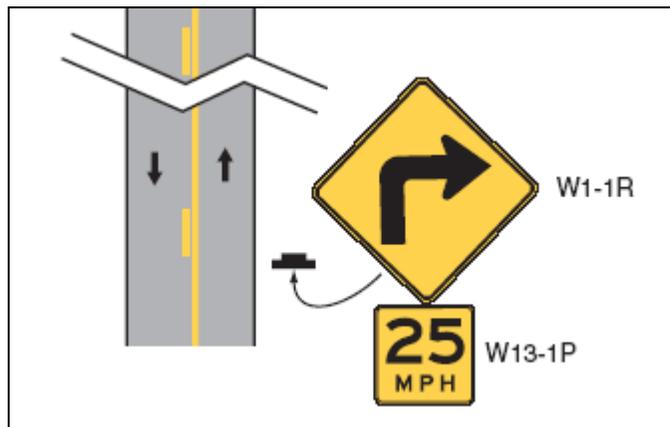
Problems at these two intersections were cited by participants of the stakeholder meetings in Hanson and Whitman (Hanson, March 30, 2010 and Whitman, March 31, 2010). These problems stem from the poor alignment of Spring Street at Route 58 and Whitman Street at Route 58. Both of these intersections are skewed, and they are located approximately 125 feet apart. Participants at the stakeholders meetings noted that these roads intersect Route 58 at a curve, and a restaurant parking lot is located directly opposite the Spring Street intersection with no access control. Traffic entering and exiting the restaurant lot adds conflicting vehicles to traffic entering and exiting Route 58 at these two intersections.

The Transportation Research Board published a series of reports (The National Highway Cooperative Research Program Report (NHCRP) 500) for the implementation of the American Association of State Highway and Transportation Officials’ Strategic Highway Safety Plan. Volume 7 of these reports: *NHCRP 500 A Guide for Reducing Collisions on Horizontal Curves* offers a number of strategies to achieve the objective of reducing the likelihood of a vehicle leaving its lane and either crossing the roadway centerline or leaving the roadway at a horizontal curve. These include; provide advance warning of unexpected changes in horizontal alignment, enhancing delineation along the curve, providing adequate lighting at the curve, providing adequate sight distance, and widening the roadway.



Some of these improvements can be implemented with relatively low cost in the near term, while others, such as realigning and reconstructing the road and intersection to improve sight distance, require larger investments in time and money.

The reconstruction and relocation of the Spring Street intersection further from the Whitman Street intersection, along with adding a curb and access control at the restaurant opposite Spring Street, were discussed at the stakeholder meetings. Other improvements that are less expensive and short-term should be implemented to improve safety. These include adding advanced warning signs for turns and 25 miles per hour advisory speeds (MUTCD W1-1R and W13-1P, Section 2C.07, page 111) on the northbound and southbound approaches on Route 58 to these intersections.



W1-1R and W13-1P, Page 111 of the MUTCD

Hanson - Route 58 at West Washington Street

This intersection has failing AM and PM peak hour levels-of-service (LOS “F”) due to heavy peak hour volumes on the West Washington Street approach being unable to enter Route 58 due to a lack of sufficient gaps in the Route 58 traffic flow. This intersection also lacks sufficient sight distance for vehicles entering Route 58 from West Washington due to the curvature on Route 58. The installation of advanced warning signs and 25 miles per hour advisory speeds are recommended here to enhance safety.



W1-1a, Page 109 of the MUTCD



Hanson – Liberty Street Route 58 at County Road Route 14 and the Dunkin Donuts Drive and the County Road Route 14 at High Street intersection

These two intersections are in close proximity, approximately 50 feet apart. The unsignalized County Road Route 14/High Street intersection is just south of the signalized Liberty Street Route 58/County Road Route 14/Dunkin Donuts intersection. The County Road Route 14/High Street intersection is unconventional in that it is stop sign controlled on two of three approaches. There are stop signs on the County Road Route 14 approach (northeast) and the High Street approach (north), and a free movement on the County Road Route 14 southwest approach.

The signalized Liberty Street Route 58/County Road Route 14/Dunkin Donuts intersection has a heavy demand for vehicles coming from County Road turning right to Liberty Street during both the morning and afternoon peak hours. The peak hour analyses for this signalized intersection showed that the lack of storage for vehicles on this northbound County Road approach along with the heavy peak hour northbound volumes creates back-ups into the stop-sign controlled County Road Route 14/High Street intersection.

There is a Dunkin Donuts exit located opposite County Road, making up the fourth leg of the Liberty Street Route 58/County Road Route 14 intersection making it a four-way intersection, although the pavement markings at this exit allow only right turns and left turns out, with no through movements allowed to County Road. The entrance to the Dunkin Donuts is separate from the exit, and is located 100 feet to the southeast off of Route 58. Although the entrance is not part of this intersection, the back-ups from the entrance interfere with traffic operations at the intersection especially during the morning and afternoon peak hours. A right turn in and right turn out policy on Route 58 for the Dunkin Donuts would eliminate back-ups from the Dunkin Donuts and improve traffic operations at this intersection. The town should work with the owner of the Dunkin Donuts and adjacent properties toward sharing access with adjacent lots off of Route 58, thereby eliminating driveways that interfere with traffic operations at this intersection.

Hanson – Liberty Street Route 58 at Maquan Street Route 14

This intersection is a three-way stop controlled intersection; however, it is unconventional in that there are two approaches that are stop controlled. One stop sign is on the Maquan Street Route 14 side street approach, and the other stop sign is on the northbound major street Indian Head Street Route 58 approach. The stop sign on Route 58 northbound compensates for the poor sight distance in the northbound direction. Northbound Route 58 traffic is in conflict with heavy left turn volumes on Route 58 southbound to Maquan Street. This intersection operates under LOS “C” conditions during the morning peak hour, which is characterized by average delays (15 to 25 seconds); however, it operates under failed LOS “E” conditions during the afternoon peak hour, which is characterized by long delays (35 to 50 seconds).

The installation of a traffic signal is recommended here along with the addition of an exclusive left turn lane on the Route 58 southbound approach. This intersection satisfies the signal warrants for the peak hour warrant and four hour warrant as prescribed in the



Manual on Uniform Traffic Control Devices. The signal warrant analyses are included in the appendix to this report.

The need for pedestrian safety and access was discussed at the Hanson stakeholders meeting due to the close proximity of the Indian Head and Maquan School facilities. The 2008 Hanson Master Plan noted that the pedestrian route to and from the schools from the north via School Street and Maquan Street contains gaps in the sidewalk system. Although Maquan Street has a sidewalk on the south side, there are no sidewalks on the north side of the street that can accommodate walkers from residential streets to the north. In addition to the installation of signals, it is recommended that sidewalks be installed along both sides of Maquan Street back to School Street to accommodate and facilitate pedestrian activity at the elementary schools on School Street.

Hanson - Indian Head Street Route 58 at Main Street Route 27 and Monponsett Street Route 58

The existing AM and PM peak hour levels-of-service for this intersection are within the acceptable levels (LOS “B”, 10 to 20 seconds); however, this intersection has a higher than average crash rate (1.27 per million entering vehicles), and a fatality occurred at this intersection in 2006. The intersection is poorly aligned and there are curb cuts and driveways to adjacent parking lots in close proximity to the intersection on the southeast, southwest, and north east corners. These driveways create confusion for vehicles making turning movements at the intersection. It is recommended that the town work with the owners of the adjacent businesses and properties to manage the access close to the intersection, especially on the southwest corner where left turns to Route 27 west are difficult. There should be a right turn in, right turn out policy to the lot on the southwest corner of this intersection.

It is also recommended that the signal timing and phasing be adjusted to allow protected phasing for left turns on the northbound and southbound approaches. Long-term improvements should include widening Route 27 eastbound and westbound and adding additional left turn lanes, as well as consolidating driveways near the intersection. Table 8 compares the LOS of the intersection with these recommendations in place over the existing conditions.

Table 8 LOS Monponsett Street Route 58 at Main Street Route 27

Operating Conditions	LOS	LOS
	AM Peak	PM Peak
Existing geometric conditions and timing and phasing	B	B
Existing geometric conditions with lead lag phasing	B	B
Lead lag phasing with additional exclusive left lanes on the EB and WB approaches	B	B



5.4 Recommended Improvements – Halifax

Halifax – Monponsett Street Route 58 at Plymouth Street Route 106

Under existing AM and PM peak hour conditions, this intersection operates at LOS “B” and “C” respectively, within acceptable levels of delay; however, its crash rate (0.89 per MEV) exceeds the MassDOT District 5 average of 0.77. Route 58 lacks sufficient sidewalks south of Route 106. There is a residential development on Route 58 south of Route 106 and a proposed residential development that will increase the demand for walkers to and from the retail establishments along Route 106. It is recommended that sidewalks be added on both sides of Route 58 from Route 106 south to accommodate pedestrian movement to and from these residential areas.

Pavement Improvements to Route 58 in Halifax

According to OCPC’s pavement management software system, the pavement on Route 58 in Halifax is in “Poor” condition from the Hanson Town Line to the Plympton Town Line. The recommendations from the Pavement Management software for Route 58 in Halifax include reconstructing and repaving the entire length of Route 58 in Halifax from the Hanson Town Line south to the Plympton Town Line.

5.5 Recommended Improvements – Plympton

Palmer Road Route 58 at Center Street

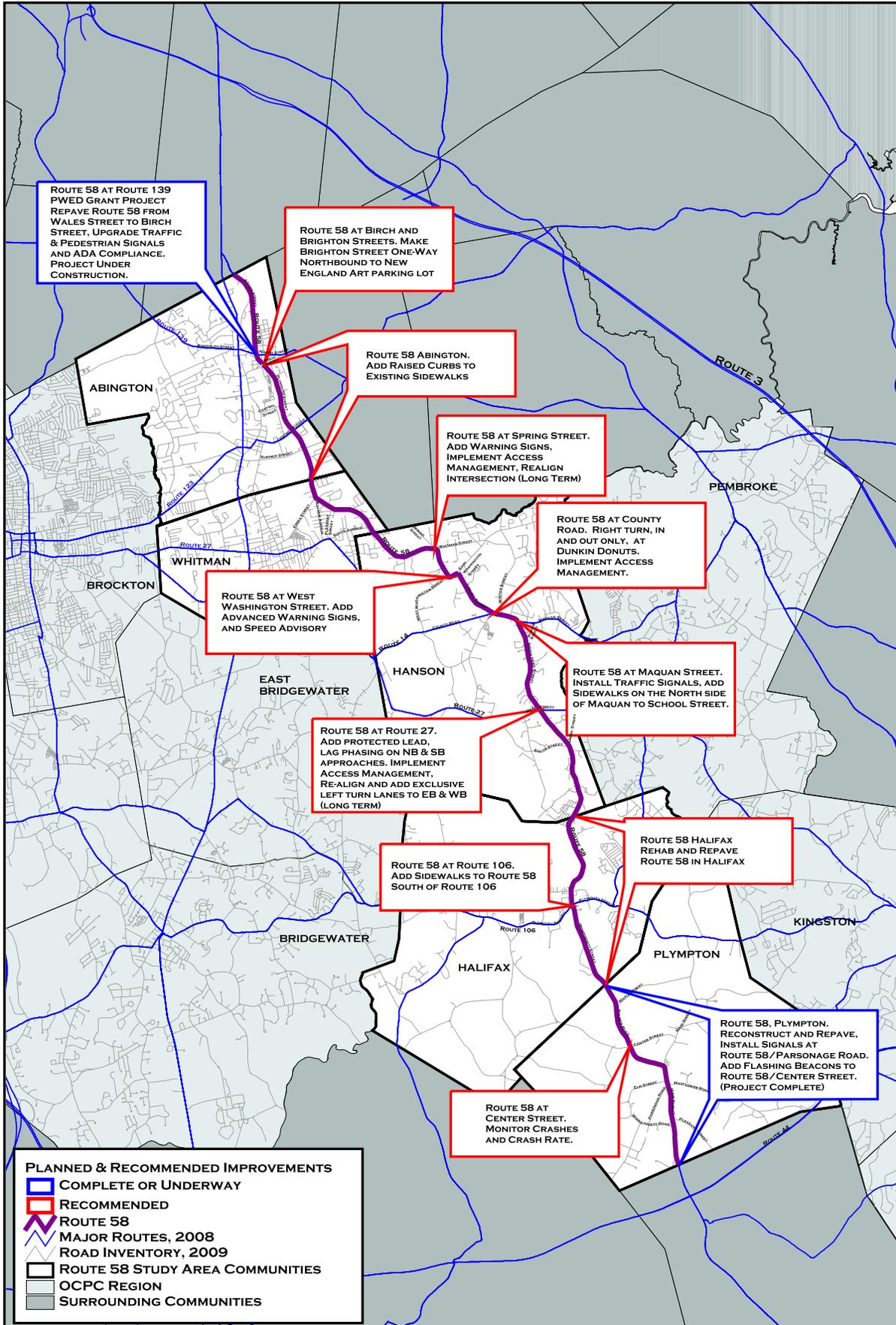
Route 58 in Plympton was repaved and reconstructed in 2009. The improvements, funded through the Old Colony Transportation Improvement Program (TIP), included the reconstruction and re-paving of the entire length of Route 58 in Plympton (approximately 3 miles). In addition, traffic signals were installed at the Main Street Route 58/Parsonage/Mayflower Road intersection. Flashing signal beacons were installed at the Palmer Road Route 58/Center Street intersection. The Route 58 study area intersections in Plympton experience acceptable peak hour levels-of-service and are expected to continue to do so under future peak hour conditions. All of the study area intersections experience lower than average crash rates except for the Palmer Road Route 58/Center Street intersection, which has a crash rate of 1.17 crashes per million entering vehicles. The crash experience at this intersection was discussed at the April 2010 Plympton/Halifax stakeholders meeting. It was agreed that since this crash rate is based on 2006, 2007, 2008 data, which is from a time period before the intersection was reconstructed and the flashing beacons installed, that OCPC will monitor the crash experience to determine the effectiveness of the 2009 improvements. It was the opinion of the stakeholder meeting participants that since the flashing beacon was installed and the visibility of the stop control on the Central Street approaches improved, there have been fewer crashes. Nevertheless, it was agreed that the intersection crash experience should be monitored to evaluate the effectiveness of the improvements.

ROUTE 58 CORRIDOR STUDY

PLANNED & RECOMMENDED IMPROVEMENTS



FIGURE 15



PLANNED & RECOMMENDED IMPROVEMENTS

- ▭ COMPLETE OR UNDERWAY
- ▭ RECOMMENDED
- ▬ ROUTE 58
- ▬ MAJOR ROUTES, 2008
- ▬ ROAD INVENTORY, 2009
- ROUTE 58 STUDY AREA COMMUNITIES
- OCPG REGION
- SURROUNDING COMMUNITIES





6.0 PROJECT DEVELOPMENT AND FUNDING

The implementation of projects includes taking transportation improvements from the concept stage through to design and construction. Funding is an essential element in ensuring the implementation of recommended improvements. The *MassDOT Project Development and Design Guide* explains the project development process in Massachusetts and design standards for transportation projects. The MassDOT project development process consists of eight steps:

- I. Problem/Need/Opportunity Identification (A Project Need Form, PNF, is submitted to MassDOT)
- II. Planning (A project planning report is completed)
- III. Project Initiation (A Project Initiation Form, PIF, is submitted to MassDOT)
 - Identification of Appropriate Funding
 - Definition of Appropriate Next Steps
 - Project Review Committee Action
- VI. Environmental Design and ROW Process (Includes Plans, Specifications, and Estimates, P, S, & E)
 - Environmental Studies and Permits
 - Right-of-Way Plans
 - Permits
- V. Programming (Old Colony TIP and State Transportation Improvement Program, STIP)
 - Programming of Funds
- VI. Procurement (Construction bids and contractor selection)
- VII. Construction
- VIII. Project Assessment

On sections of roadway owned and maintained by the municipality, the municipality typically initiates a project by completing and submitting the Project Need Form (available in the Appendix), as well as providing for project planning, design, and right-of-way (if necessary). Similarly, for state owned facilities, the MassDOT initiates projects and provides planning and design on their section of roads.

Many funding options are available for project construction, and are outlined below. Note that some funding programs, such as the Congestion Mitigation and Air Quality (CMAQ) Program, are for specific types of projects that meet specific criteria, while other programs such as Chapter 90 can be utilized on a much broader range of projects. Federal aid eligible regional transportation needs have outpaced available funding in the Transportation Improvement Program (TIP) for the past several years. All projects on the TIP go through a comprehensive evaluation process to determine priority for funding; therefore, the programming of the TIP is a competitive process. In general, the process to fund a project through the TIP may take up to five years. Therefore, due to this limitation of TIP funding, communities are encouraged to seek alternate funding avenues for their



high priority projects. Examples of such options include using Chapter 90 funds, developer mitigation, or public/private partnerships with local stakeholders.

Funding Programs

- **Capital Improvement Program (CIP) and Local Funding** have historically been utilized to help provide the design and engineering of highway projects.
- **Exactions (Developer Mitigation Agreements)** Communities have increasingly turned to exactions as a means to meet new infrastructure and public service needs. Cities and towns use developer exactions as a strategy to offset the burdens of new development on the community. Exactions contribute to regional equity by ensuring that a new development pays a fair share of the public costs that they generate. Exactions consist of a developer's payment of funds to offset the cost of necessary construction, design, or maintenance of public infrastructure directly connected to the new development. Developers commit to an agreement for funding or constructing off-site improvements in exchange for the approvals to proceed with a development project.
- **Bridge Replacement and Rehabilitation Program** provides funds for rehabilitation and replacement of any bridge on a public road. Bridges on the federal aid system or off the federal aid system are eligible for these funds.
- **Chapter 90** provides funding for highway construction, preservation, and improvement projects that create or extend the life of capital facilities. The level of funding is determined by a formula that is based upon public way mileage, population and level of employment in each community. The Chapter 90 Program is a reimbursement program, as the community must initially pay the cost of a particular project.
- **Small Town Road Assistance Program (STRAP)** provides funds grants to municipalities with a population of not more than 7,000 persons for new road projects. Priority will be given to those projects which promote public safety, which encourage the retention of the applicant's economic base and where the urgency of the project can be demonstrated.
- **Community Development Block Grant (CDBG) Program** provides for the development or expansion of economic opportunities and the provision of decent housing and public facilities. Eligible use of funds includes community development (construction or reconstruction of streets, water and sewer facilities, neighborhood centers, recreation facilities, and other public works).
- **Congestion Mitigation and Air Quality Improvement Program (CMAQ)** directs funds toward transportation projects in Clean Air Act non-attainment areas for ozone and carbon monoxide. OCPC is located in the Boston non-attainment area for ozone.
- **National Highway System (NHS)** consists primarily of existing Interstate Highway routes and portions of the Primary System. This program was established to focus federal resources on roads that are the most important to interstate travel, national defense, inter-modal connections, and international commerce.
- **Non-Federal Aid (NFA)** provides state funds for projects that due to federal fiscal constraints would not be able to receive federal funding. Projects under this category are listed for informational purposes only.



- **Public Works Economic Development (PWED)** grants are designed to assist municipalities seeking infrastructure improvements that support economic development goals.
- **Surface Transportation Program (STP)** is a block grant type program that may be used for any roads (including NHS) that are not functionally classified as local or rural minor collectors. These roads are collectively referred to as federal-aid eligible roads.
- **Transportation Bond Bill (TBB)** authorizes and directs the MassDot to expend monies for transportation projects such as reconstruction, resurfacing, rehabilitation or improvements of highways, bridges, and parking facilities. From this, the State will issue either general obligation or special obligation bonds.
- **Federal appropriations** allocate Federal funding for Federal Aid eligible projects.



7.0 APPENDICES (see enclosed CD)

7.1 Appendix A - Route 58 Meeting Minutes

7.2 Appendix B - Crash Rate Equations

7.3 Appendix C - Automatic Traffic Recorder Counts

7.4 Appendix D - Intersection Turning Movement Counts

7.5 Appendix E - Bicycle and Pedestrian Analyses

7.6 Appendix F - Safe Routes to School Information

7.7 Appendix G - Route 58 Community Zoning Maps

7.8 Appendix H - Project Need Form (PNF)

7.9 Appendix I – Project Initiation Form (PIF)