

## VI. CONGESTION MANAGEMENT

One of the most visible and most noticed characteristics of any region's transportation system is traffic congestion. Congestion creates air pollution, decreases gasoline mileage (thereby increasing the cost of driving), increases the costs of shipping goods and providing services, and often results in the diversion of traffic from arterial roadways to neighborhood streets. These local roadways were not intended to serve in such a capacity and the traffic using them often reduces the quality of life of residents living along the m.

The importance of identifying and reducing or eliminating congestion was emphasized in ISTEA. That legislation called for MPOs around the country to implement a Congestion Management System. In 1995, the MVPC began a comprehensive effort to fully identify congested highway conditions as part of its CMS. Although the requirement to implement all these systems was subsequently amended, the Merrimack Valley MPO, as a Transportation Management Area (TMA), is still mandated under SAFETEA-LU to maintain a regional CMS.

This system has become the primary tool used by the Merrimack Valley MPO to identify congested highway facilities in the Valley. The CMS is intended to continually monitor and evaluate the existing transportation system, and recommend potential strategies for alleviating present and future congestion. Working cooperatively with the members of the Merrimack Valley MPO and the neighboring of Massachusetts and other MPOs, the goal of the Merrimack Valley Congestion Management System (MVCMS) is to improve mobility for all the region's residents and visitors.

The MVCMS includes all roadways in the region that are functionally classified as collectors, arterials and interstates. These roads carry virtually all bus routes, all roadways that connect to interchanges on the interstates, and roads with heavy volumes of truck traffic. In certain locations, local roads that are used as alternatives to already congested collectors and arterials are included as well.

The MVPC Regional Traffic Model Network contains the complete set of all of these types of roads, and as such was originally used as the base for the MVCMS. Many of the findings in this chapter are based on the research activities of the MVCMS.

### **Roadway Segment Congestion**

Congestion on roadways is a function of traffic volume, plus the *capacity* of the roadways to handle that volume. The capacity of a given section of roadway is influenced by a number of factors, including: number of lanes, design speed, shoulder width, presence of on-street parking, and the directional distribution of traffic.

In the Merrimack Valley CMS, screening to identify congested roadways involves using calculated volume-to-capacity (V/C) ratios from the output of the Regional Traffic Model. When the V/C ratio for a section of roadway equals one, that roadway is said to be at capacity. It should be noted that when V/C ratios approach a value of one, severe roadway congestion is often present. V/C ratios provide an *approximation* of actual congestion, due to the wide variety of factors that affect roadway capacity. Nevertheless, they are a very useful

measure in screening for congested roadway facilities. Over the years, the Merrimack Valley CMS has used a V/C ratio of .65 in identifying roadways experiencing congestion.

Changes from the V/C ratios shown in the 1997 CMS and included in the 2003 Plan may be explained by differences in the way that the current model defines roadway capacity and changes in traffic volumes. For this analysis, it is assumed that each lane on an interstate roadway can carry 2,200 vehicles per lane per hour. Local roadways are assumed to have a capacity of 1,600 vehicles/lane. V/C ratios were calculated based on assumed loadings

Again, it should be kept in mind that this is a screening tool to help us identify congested roadway segments in the region. It should also be noted that the model is being used to identify congested roadway links on the regional transportation network. A discussion of the congested intersections in the region is included later in this section.

In addition to using the Regional Traffic Model, other factors were used to identify and rank congested facilities such as the importance of the facility to the regional economy, type of traffic, observations and professional judgment of the MVPC Transportation Staff, along with public input.

Table VI-1 on the following page lists sections of roadways in the MVPC region that have existing congestion problems based on the above screening criteria. Thirty-seven roadway segments were identified as having V/C ratios of .65 or greater during one of the peak travel hours of the day. Fifteen of these roadway sections are on I-495, while five are found on Route I-93 in Andover. The roadway with the highest V/C ratio is Route 125 in Haverhill south of Rosemont Street. Sections of Route 97 in Georgetown and Haverhill also appear on this list. A description of many of these congested facilities is provided below.

#### *Route I-495 in Andover, Lawrence, Haverhill and Methuen*

This interstate runs generally east to west through the Valley, largely paralleling the Merrimack River. Eight of the Valley's 15 communities have at least one interchange on the highway, which also connects the two other interstates in the Valley, I-95 and I-93. Given the number of communities that are directly served, it is arguably the most important roadway in the regional highway network. It also serves as a critical route in the nation's freight network as a great deal of truck traffic generated in or destined to Maine and eastern Canada uses facility to access western New England and the rest of the country.

Traffic volumes in excess of 115,000 vehicles per day have been counted along the sections of I-495 in the four communities noted. I-495 is a six-lane roadway (i.e. three lanes in each direction) for virtually all its length in the region and the combination of the high traffic volumes in the western Merrimack Valley and the limited number of travel lanes cause it to appear in the screening analysis.

**Table VI-1  
Existing Roadway Congestion**

<b>TOWN</b>	<b>STREET</b>	<b>COUNT LOCATION</b>	<b>Highest V/C for segment</b>
Haverhill	MAIN STREET	S of Rosemont St	<b>1.16</b>
Andover	INTERSTATE 495	NB north of I-93	<b>0.91</b>
Lawrence	SOUTH BROADWAY	SB at Andover TL	<b>0.90</b>
Haverhill	INTERSTATE 495	SB North of Rt 125 C	<b>0.89</b>
Lawrence	SOUTH UNION STREET	NB at Andover TL	<b>0.84</b>
Haverhill	INTERSTATE 495	NB North of Rt 125 C	<b>0.82</b>
Methuen	INTERSTATE 495	SB North of Rt 213	<b>0.81</b>
Methuen	INTERSTATE 495	NB North of Rt 213	<b>0.80</b>
Andover	INTERSTATE 93	NB North of Rt 125	<b>0.80</b>
Lawrence	CANAL STREET	W of Prospect St	<b>0.78</b>
Haverhill	BRIDGE STREET	S of Water St	<b>0.78</b>
Andover	INTERSTATE 495	SB north of I-93	<b>0.76</b>
Methuen	HAVERTHILL STREET	E of Lowell St	<b>0.75</b>
Methuen	ALBERT SLACK HWY	EB E of Rt 28	<b>0.74</b>
Haverhill	WINTER STREET	W of Hale St	<b>0.73</b>
Lawrence	INTERSTATE 495	SB North of Marston	<b>0.72</b>
Haverhill	GROVELAND STREET	E of Lincoln Ave	<b>0.71</b>
Andover	INTERSTATE 93	SB North of Rt 125	<b>0.71</b>
Salisbury	MAIN STREET	W of Willow Ave	<b>0.71</b>
Amesbury	MACY STREET	E of I-495	<b>0.70</b>
Andover	INTERSTATE 93	NB north of Dascomb	<b>0.70</b>
Lawrence	INTERSTATE 495	NB North of Marston	<b>0.70</b>
Haverhill	INTERSTATE 495	SB North of Rt 125 C	<b>0.69</b>
Methuen	ALBERT SLACK HWY	EB W of Rt 28	<b>0.68</b>
Andover	SOUTH MAIN STREET	S of Ballardvale Rd	<b>0.68</b>
Lawrence	INTERSTATE 495	SB North of Marston	<b>0.68</b>
North Andover	TURNPIKE STREET	SE of Hillside	<b>0.67</b>
Andover	INTERSTATE 495	SB North of Rt 28	<b>0.66</b>
Andover	INTERSTATE 93	NB north of Rt 133	<b>0.66</b>
Lawrence	INTERSTATE 495	NB N of Rt 114	<b>0.66</b>
Andover	INTERSTATE 93	NB North of I-495	<b>0.66</b>
Lawrence	INTERSTATE 495	NB North of Marston	<b>0.66</b>
Andover	INTERSTATE 495	SB North of Rt 28	<b>0.65</b>
Georgetown	CENTRAL STREET	S of Library St	<b>0.65</b>
Haverhill	BROADWAY	E of Lowell Ave	<b>0.65</b>
Haverhill	INTERSTATE 495	SB North of Rt 97	<b>0.65</b>
Andover	INTERSTATE 495	NB North of Rt 28	<b>0.65</b>

MassHighway is now undertaking a corridor study of the roadway from Westford in the Northern Middlesex region to its intersection with I-95 in Salisbury. This study has already determined that much of the existing congestion on the roadway is a result of deficiencies at many of the interchanges including insufficient weaving distances between ramps and substandard merge/acceleration lanes. It is anticipated that the study will recommend a series

of short-term and long-term roadway and transit improvements that will address these and other problems with the existing congestion and allow the facility to accommodate projected traffic volumes.

### *Interstate 93 in Andover*

Interstate 93 is a north/south, limited access freeway that traverses the western part of the MVPC region. To the north, it provides access for a large number of commuters traveling from New Hampshire to Massachusetts. It also provides Massachusetts residents with access to recreational destinations in New Hampshire and Vermont. To the south, I-93 accesses the Boston metropolitan area, with its abundance of employment, educational, and cultural opportunities. Within the MVPC region, I-93 intersects Interstate 495, a circumferential freeway that crosses every major highway in eastern Massachusetts. I-93 is of vital importance to the economy of the Merrimack Valley, as it provides access to some of the region's largest employers.

This roadway was identified in the region's 1997 CMS as a severely congested roadway. At about the same time, MassHighway undertook a project to facilitate the use of the breakdown lane in Andover and Methuen as a travel lane during peak travel periods in the peak direction of travel (i.e., northbound in the afternoon, southbound in the morning). This project expanded the capacity of the roadway during these periods and has served to lower the V/C ratios on the roadway and improve travel times through the corridor.

In 2001, the Merrimack Valley MPO undertook a study of the I-93 corridor in Andover and Methuen. This analysis revealed numerous problems such as insufficient weave areas on Route I-93 at certain interchanges, insufficient roadway capacity at key ramps and along the mainline, parking capacity issues at commuter rail stations along the Haverhill Main Line, and safety problems at the Route 110/113 Rotary and the I-495/Route I-93 interchange.

This study recommended numerous roadway and transit improvements, many of which are listed below:

- Modifications to and Elimination of Route 110/Route 113 Rotary
- Removal of Route I-93 SB/Route 213 EB at-grade weave section
- Modification to the Route I-495/Route I-93 Interchange
- Elimination of ramps at the Route 133 interchange to eliminate a weave area
- Construction of additional sections of track on the Haverhill Main Line and the purchase of additional train sets to improve the level of commuter rail service
- Completion of an Interchange Justification Report for I-93 in the Lowell Junction area.
- Construction of additional travel lane on Route I-93

The recommendations above as well as others contained in the study were endorsed by the Merrimack Valley MPO and since the completion of the I-93 Study in 2003, some of these recommendations have been undertaken. In 2005, MassHighway undertook a study of the Route 110/113 Rotary in Methuen. The purpose of this study, now under way, is to identify a preferred improvement alternative for the rotary and adjacent roadways. In 2006, the

Merrimack Valley MPO completed the I-93: Lowell Junction Interchange Justification Study. This study analyzed the possible traffic, land-use, environmental, economic and other impacts of nine possible interchange alternatives. It found that that an interchange at this location was feasible and recommended that three interchange alternatives be considered for further analysis. This study was forwarded to the Executive Office of Transportation, which subsequently submitted an Interchange Justification Report to the Federal Highway Administration for review and approval.

#### *Route 213 in Methuen*

This two lane, limited access roadway connects Routes I-495 and I-93 in Methuen. It also serves as a primary means of access to the Loop, a major retail development located on Pleasant Valley Street between Exits 3 and 4. Traffic volumes along this roadway have increased over the years as development has taken place at the Loop and elsewhere on Pleasant Valley Street, such as the large multifamily residential development located east of the Loop. Congestion also occurs at the Route 28 interchange (Exit 2) as traffic is generated by the commercial development along that roadway in northern Methuen and in southern New Hampshire.

#### *Route 125 in Haverhill South of Rosemont Street*

Route 125 is one of the major north/south arterial roads in the MVPC region, and is the most heavily traveled arterial roadway in the City of Haverhill. The road is primarily one lane in each direction and serves as the main travel route between Haverhill and Plaistow, New Hampshire. Traffic volumes are greatest on Route 125 between Rosemont Street and I-495, with congestion greatest during the morning peak hour.

This section of roadway has previously appeared in the region's CMS and over the years, both the Merrimack Valley Planning Commission and the Massachusetts Highway Department have completed important traffic studies in this corridor. An MVPC study in 1989 recommended a series of improvements including:

- ❖ Signalize the intersection of Route 125, Route 121A, and Cushing Avenue.
- Add striping at the intersection of Route 125 and Marsh Avenue, creating two lanes for vehicles at each approach (partially implemented, it has been striped for two lanes southbound on Route 125)
- Add a stop sign to the Merrill Street approach to the intersection of Route 121, Merrill Street, and Cushing Avenue (Merrill Street has since been made one-way southbound therefore there are no longer any vehicles approaching Route 121 from Merrill Street northbound).
- Change the isolated signal timing at each signalized intersection to allow more green time to the Route 125 approaches. (Signal improvements have been made at Route 125/Main Street intersection)
- Coordination of traffic signals along Route 125 (progressive signal timing).
- Restripe Route 125 to three total lanes, providing two lanes northbound, or two lanes southbound

- Minor reconstruction of Route 125 to 4 total lanes (2 lanes in each direction).

Another recommendation of the MVPC analysis was that a bypass roadway would be needed to relieve the congestion in the corridor on a long-term basis. In 2002, MassHighway conducted the Route 125 Location Study, which examined seven possible interchange concepts. The study final report identified a preferred alternative to be considered for implementation. This preferred alternative (Bypass Alternative 3) calls for the creation of a new point of access to Route I-495 just west of the existing interchange with Route 125 and the creation of a roadway that would connect to Rosemont Street.

#### *Route 114 Southeast of Hillside Road in Lawrence*

Route 114 from I-495 in Lawrence to Willow Street in North Andover is a very congested corridor with several different individual problem areas. The problem close to I-495 is that the roadway narrows from two lanes in each direction to one lane in each direction because of a narrow bridge over the Shawsheen River.

Further south on Route 114, traffic congestion during peak travel periods occurs between the entrance to the North Andover Mall and the Route 125 Bypass due to heavy conflicting traffic volumes in the corridor and especially at the Route 125/Route 114 and Route 114/Peters Street intersections. Development of commercial and industrial land along Route 114 south of the Route 125 Bypass to Willow Street has also created pockets of congestion. Southeast of the Route 125 Bypass on the section of roadway identified in the CMS, the roadway narrows again to one travel lane in each direction, thereby creating another choke point

The Merrimack Valley Planning Commission is now conducting a study of the corridor between the roadway's intersection with South Union Street in Lawrence to the Middleton town line. This study has already identified the existing level of service for intersections and roadway segments. MVPC has also completed a similar analysis of how the roadway will function with the completion of planned and proposed development projects (i.e., projects that could be built over the next five years). The final step will be to identify a program of transit and roadway improvements that will address the long-term demand for travel in the corridor.

#### *Route 97 in Haverhill West of Hale Street*

The 2003 Merrimack Valley Regional Transportation Plan noted that some of the congestion along this section of roadway was due to congestion in Lafayette Square. Since then, the Square has been reconstructed, with signals added at two locations, the elimination of the roundabout, and the addition of travel and turning lanes. These improvements have reduced congestion in the Square, but it remains a problem from Route 110 to the Square with vehicles turning to and from Locust Street, Primrose Street, Hale Street and Locke Street adding to the traffic congestion.

### *Route 97 in Haverhill East of Lowell Avenue*

This section of Route 97 connects with the western end of Lafayette Square. Volumes are higher here because of southbound traffic entering the roadway from Lowell Avenue. This section of roadway often experiences congestion during the AM peak period as school buses and parents drop off children at the St. Joseph's School. Delays on this section of the highway have also increased with the installation of traffic signals at the nearby Hilldale Avenue/Route 97 intersection.

### *Route 97 South of Library Street in Georgetown*

This section of Route 97 is a north-south roadway that links Georgetown Square with I-95 at Exit 52 in Boxford. It is a heavily traveled commuter route for traffic destined for Boston and I-95 from the central Merrimack Valley region. The approach to the Library Street intersection is most congested during the PM peak period. It should be noted that there is also congestion north of this intersection in nearby Georgetown Square.

### *Route 110 in Amesbury and Salisbury*

Traffic volumes along this section of Route 110 increase markedly during the summer as people access Salisbury Beach from Route I-495. Much of the congestion noted in this area is the result of roadway capacity limitations that exist in and around Salisbury Square. However, limited roadway capacity along Route 110 just east of its intersection with Route I-495 contributes to this congestion problem. A project to widen Route 110 as needed between the two interstates appears in the region's TIP. Completion of the project should help relieve some of the congestion issues in this area.

### Other Congested Roadways

The following roadways, while not appearing in Table M-1, have also been determined by staff to be congested. These facilities have been identified based on input received from local citizens and officials and corroborated by MVPC transportation staff, staff knowledge of the transportation network, and findings contained in traffic studies completed throughout the Valley:

- Route 28 in Methuen north of Route 213
- Route 286 in Salisbury east of Route 1 (seasonal)

Route 28 near the New Hampshire state line experiences severe congestion during peak travel periods and on weekends as traffic from Methuen and Route 213 use the roadway to access businesses located in southern New Hampshire. Heavy traffic volumes combined with the lack of turning lanes create back ups that often impact the Route 213/Route 28 interchange.

Congestion along Route 286 in Salisbury is almost entirely a seasonal problem as this roadway serves as a major access point to the beaches in Salisbury, MA and those in Seabrook and Hampton Beach in New Hampshire. PM peak congestion is especially problematic during weekends as traffic leaves the beach areas and attempts to access I-95. MVPC is now concluding a study of the signalized intersections along Route 286 in Seabrook

and Salisbury to determine if changes in their phasing and timing might improve traffic flow during these afternoon peak periods during summer weekends.

### Intersections

While the identification of congested roadway facilities is largely accomplished through the regional traffic model, identification of congested intersections is based on a number of sources including traffic studies, input from local officials and residents combined with the MVPC transportation staff knowledge of area. Table VI-2 on the following page lists the intersections in the region have been identified as being congested. A brief summary of the traffic congestion issues at these locations is also provided.

#### *Route 28 at Elm Street (Elm Square) in Andover*

Elm Square in Andover is at the intersection of Route 28 (Main Street), Elm Street, and Central Street in the center of Andover. Congestion on Route 28 just south of this intersection is dictated by the signals at the intersection. The initial screening of congestion areas shows only a small section of roadway being congested. The intersection signal timing could control this congestion. A project to improve Route 28 between Wheeler Street and the Shawsheen River, which includes this section of roadway, is now under construction. Among the many improvements contained in this project is the provision of additional approach lanes from Elm Street.

**Table VI-2  
Congested Intersections in the Merrimack Valley**

Community	Intersection
Andover	Route 28 at High Street (Elm Square)
Andover	Route 28 at Route 133 (Shawsheen Square)
Georgetown	Route 97 at Route 133 (Georgetown Square)
Haverhill	Main Street (4 locations)
Lawrence	Route 28 at Route 110
Lawrence	Route 28 at Andover Street
Methuen	Howe Street at Jackson St (Marston Corners)
Methuen	Howe Street at Route 213 Ramps
Newburyport	Route 113 at Low Street
Rowley	Route 1 at Route 133
Salisbury	Route 1 at Route 110 and Beach Road (Salisbury Square)

#### *Route 28 at Elm Street (Elm Square) in Andover*

Elm Square in Andover is at the intersection of Route 28 (Main Street), Elm Street, and Central Street in the center of Andover. Congestion on Route 28 just south of this intersection is dictated by the signals at the intersection. The initial screening of congestion areas shows only a small section of roadway being congested. The intersection signal timing could control

this congestion. A project to improve Route 28 between Wheeler Street and the Shawsheen River, which includes this section of roadway, is now under construction. Among the many improvements contained in this project is the provision of additional approach lanes from Elm Street at the Square as well as the creation of another shared travel lane on Route 28.

#### *Route 133 and Route 97 in Georgetown (Georgetown Square)*

Drivers experience long delays on virtually all approaches to this intersection during AM and PM peak periods. AM Peak congestion is severe on the Route 97 eastbound approach to the Square, while northbound (Route 97) and westbound approaches (Route 133) back up during the evenings. Much of the traffic traveling through this intersection is commuter traffic from Haverhill, Groveland and even southern New Hampshire that is headed for Route I-95. The MVPC has previously assisted the town on this issue by suggesting changes to the timing in the Square and reviewing the synchronization of that signal with the Library Street/Central Street signal located near Town Hall. Earlier in 2007, the town implement changes to the signal timing at this location to improve traffic flow. However, the magnitude of travel demand through this location and the limited number of approach lanes on the major approaches to this intersection make it difficult to develop effective solutions to this problem.

#### *Main Street (Route 125) in Haverhill: Three Locations*

While it could be considered a traffic corridor, congestion on this section of Route 125, located on the eastern end of the downtown area, is governed by three signalized intersections:

- Route 125 at Summer/Winter streets
- Route 125 at Bailey/Ginty boulevards
- Route 125 at Merrimack/Water streets

Congestion is primarily caused by capacity constraints at the Route 125 and Water Street intersection and the heavy volume of pedestrian traffic that travels through the area. The signals at the three intersections are interconnected and maintaining coordination becomes problematic when pedestrian call buttons are pushed during peak travel periods.

MVPC has agreed to conduct a study of the corridor to determine what changes can be made to roadway geometry, signal timing and pedestrian control to reduce congestion in this area. It should be noted that some of this congestion is the result of the additional traffic diverted to Main Street through the closure of the Comeau Bridge at the western end of the downtown area. This bridge is expected to open later this year, thereby reducing traffic volumes on Bridge Street and Main Street.

#### *Route 110 and Route 28 in Lawrence*

High traffic volumes exist on all approaches to the intersection. Route 28 is the major north/south arterial in the city while Route 110 (Haverhill Street) is one of the busiest east/west thoroughfares. In recent years, MHD has improved the section of Route 28 that includes this intersection. Elimination of a limited amount parking on Route 28 northbound approach to the intersection has provided room for an additional travel lane but this loss of

parking has met with resistance from local business owners and local officials. Tight turning radii on all corners of the intersection create lane crossover problems for larger trucks as they make turns. Frequent parking maneuvers near the intersection, limited sight distance on the Route 110 westbound approach and heavy pedestrian activity in and around the intersection all contribute to the congestion at this intersection.

#### *Route 28 and Andover Street in Lawrence*

Route 28 serves a densely developed retail area in South Lawrence and provides a connection to Route I-495 and Andover to the south. Andover street is an east-west roadway that serves the residential areas in Lawrence as well employment centers located in the Lawrence Industrial Park and the River Road section of Andover, where there is access to Route I-93. A study of this intersection by MVPC found that it was difficult for trucks to make turns from all approaches to the intersection. This is a problem given the nature of the development along Route 28 and in the surrounding areas. Congestion problems at this location are made worse when freight and passenger trains cross Andover Street just a few hundred feet east of the intersection. This causes traffic to back up into the intersection, often resulting in severe congestion and even temporary “gridlock” conditions.

#### *Route 110 Traffic Circle in Methuen*

This location is The Route 110/113 Rotary at I-93 is a traffic circle that joins three major roadways just north of the Merrimack River in Methuen. This traffic circle forms part of the Exit 46 interchange of I-93. Routes 110 and 113 combine to form a single approach (Lowell Street) from the east with one lane in each direction. On the west side, Route 113 branches off as North Lowell Street (one lane each direction), while Route 110 continues as Lowell Street with two lanes in each direction. Four ramps to and from I-93 also feed into this rotary, creating substantial weaving movements throughout it. During evening peak hours, this one-lane traffic circle experiences substantial congestion to the point of the I-93 northbound off-ramp backing up onto I-93.

This traffic circle was studied in great detail in the MVPC’s I-93 Corridor Study. Seven alternative improvements to this interchange were developed and evaluated in that analysis. MassHighway is now conducting a more detailed study of this area to identify a preferred improvement alternative. Both short-term and long-term improvements will be recommended in the final study report. It is anticipated that both the short and long-term improvements will also address capacity issues at the intersections adjacent to the rotary.

#### *Low Street at Route 113 (Storey Avenue) in Newburyport*

Severe capacity restrictions on the Low Street approach to its intersection with Storey Avenue, coupled with heavy traffic created by workers traveling home from the industrial parks in the area have helped to create this primarily PM Peak Hour congestion problem.

### *Route 133 and Route 1 Intersection in Rowley*

MVPC transportation staff examined this intersection as part of its work on the transportation element of the town's Master Plan. MVPC staff noted some delays on the eastbound approach to the intersection, but found that the intersection functions at an acceptable overall level of service, but that some movements are experiencing delays.

### *Howe Street at Jackson Street and Pleasant Valley Street (Marston Corner) in Methuen*

Howe Street is a north-south running arterial that provides access to the residential areas in northern Methuen. The roadway also provides access to the Loop development off Route 113 and connects to Route 213 just north of the Marston Corner intersection. Improvements to the Marston Corner intersection that were implemented as part of the Loop development have helped the traffic situation, but congestion remains due to the heavy traffic volumes and the high number of left turns from Pleasant Street eastbound to Howe Street northbound during the PM peak period.

### *Howe Street at the Route 213 Ramps in Methuen*

Howe Street is a heavily traveled commuter route during peak travel periods with queues of traffic being observed stretching north from the Route 213 ramps with Howe Street as far back as Hampstead Street.

### *Route 1 at Route 110 and Beach Road in Salisbury (Salisbury Square)*

This intersection serves as a primary means of access to the Salisbury Beach area, located approximately miles west to the east along Route 1A. As with Route 286, traffic congestion at this location is largely seasonal. However, some congestion occurs during traditional weekday peak hour periods. This situation would worsen as the beach area gets redeveloped to include more residential uses.

In 2000, MassHighway completed a study of access to the beach area that included an analysis of this intersection and which identified four possible improvement options. Two of these alternatives; Alternative 2, which would construct a bypass roadway along the old railroad right of way, and Alternative 3, which would involve widening the existing roadways leading to the Square, were deemed to be the most feasible. The report noted, however, that Alternative 3 would have limited impact in relieving congestion due to the capacity limits created by the Square. Local officials have as yet not made a decision to implement either of these alternatives.

***Recommendations:***

- ❖ Implement Improvements identified in the Route I-93 Corridor Study
- ❖ Monitor status the following ongoing traffic studies and implement their recommendations:
  - Route I-93 Corridor Transit Study
  - Route 110/113 Rotary Study
  - Route I-495 Corridor Study
  - Route 114 Corridor Study
  - Main Street Intersection Analysis
  - Route 286 Corridor Study
- ❖ Imitate studies of the following intersections and roadways:
  - Low Street and Storey Avenue in Newburyport
  - Route 213 in Methuen