Appendix C: Congestion Management Plan

Congestion Management is a systematic process for managing congestion on all aspects of the transportation system with the principal goal of alleviating existing or preventing future congestion, thereby enhancing the mobility of people and goods. It includes procedures to monitor the transportation system's performance, identify causes of congestion, evaluate alternative actions, implement cost-effective strategies, and determine the effectiveness of those strategies.

Traffic congestion adversely impacts the movement of people and goods. Motor vehicles excessively delayed in traffic operate less efficiently, wasting fuel and expelling greenhouse gases into the air we breathe. The region's carbon footprint greatly increases when congestion is regularly present. Correcting congestion is important in providing an effective highway system. It is vital in reducing our reliance on fossil fuels and achieving the state and national goal of meeting clean air quality standards.

Normally, people associate congestion with heavy traffic volumes. Traffic congestion causes delays in travel, motorist frustration, and increased levels of air pollution. Congestion, however, is not confined exclusively to roadways. Overcrowded buses, trains, and commuter parking lots are other examples of congestion.

Performance-based planning and programming (PBPP) refers to the application of performance management principles within the planning and programming processes of transportation agencies to achieve desired performance outcomes for the multimodal transportation system. PBPP attempts to ensure that transportation investment decisions are made, both in long-term planning and short-term programming of projects, based on their ability to meet established goals for improving the overall transportation system. Furthermore, it involves measuring progress toward meeting goals, and using information on past and anticipated future performance trends to inform investment decisions. (Source: FHWA)

Traffic congestion is caused by recurring congestion or non-recurring congestion. In southeastern Massachusetts, the recurring congestion is attributed to work trip traffic during the morning and afternoon commute, and retail traffic, primarily along densely developed commercial corridors. Non recurring congestion is attributed to incidents, adverse weather conditions, work zones and other special events.

Congestion Management in southeastern Massachusetts is a basic three-step process:

- Identification of mobility problems;
- Development of measures to address those problems; and
- Implementation of corrective measures.

Identification of Congestion

The SMMPO utilizes three methods to identify congestion in the region; 1) assessment of existing data, 2) collective knowledge of the region and 3) the Travel Demand Forecasting Model.

The assessment of existing data uses regional databases such as the traffic count file, road inventory file, traffic studies (conducted by SRPEDD or others), and the region's Signalized Intersection Inventory database. The Signalized Intersection Inventory consists of signal timing information, intersection geometry, traffic volume data, and a capacity analysis that defines the existing operational characteristics and average delay at each of the region's 361 signalized intersections. This database also allows for the inclusion of realistic delay and turning penalties into the regional Travel Demand Model.

Collective knowledge of the region originates through the public participation process, which encompasses input from staff, local officials and the general public through the Joint Transportation Planning Group (JTPG). Staff verification is an important component of this effort.

Finally, the Travel Demand Forecasting Model provides a means of predicting future traffic conditions. The model calculates traffic flow to the year 2040, giving us an understanding of future traffic conditions based on current growth trends and land use policies.

Once identified, further study is initiated to identify the cause and extent of the problem. Alternative measures are examined to determine their impact on reducing congestion. Ultimately, recommendations are offered to decision-makers for implementation.

Analyses

Corridors and Road Segments - Along road segments, congestion is expressed as a Volume to Capacity Ratio (v/c). The v/c ratio is a measure of a road's traffic volume versus it's vehicle carrying capacity represented by a numerical scale where a zero ratio equals no traffic congestion and a ratio above 1.0 exceeds the road's capacity. A v/c ratio above 0.8 is considered congested in the SMMPO region.

Every intersection or corridor possesses its own ability to effectively accommodate traffic. A capacity analysis measures that ability and determines the quality of traffic flow, referred to as Level of Service (LOS). There are six levels of service that are assigned the letters A through F. LOS A represents the best conditions while LOS F represents the worst. Figure C-1 displays the various states of congestion for roadways.

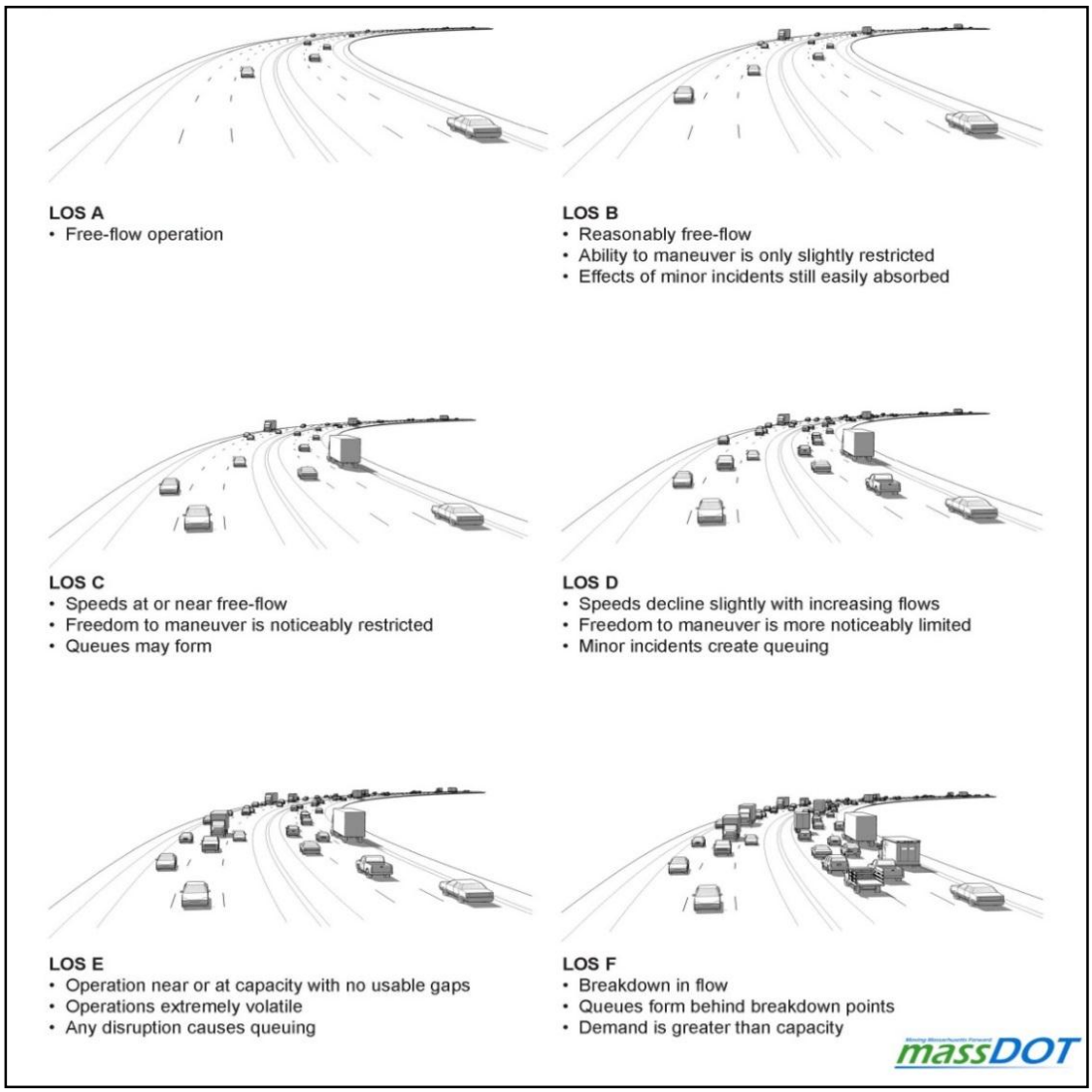

Figure C-1: Levels of Service Illustrated

Intersections - In recent years, staff has compiled a comprehensive database consisting of all 361 signalized intersections in the region. For each intersection, the database provides the current LOS from a capacity analysis based on recent traffic volumes (turning movement counts), the existing lane configuration, and operational characteristics including signal timing

and phasing. Each of the levels of service (A through F) represents an average delay for all vehicles traveling through the intersection during a peak travel period of the day. It is calculated by a capacity analysis using techniques defined in the Highway Capacity Manual (HCM). Table C-1 defines the level of service for signalized and unsignalized intersections based on the calculated average delay in seconds per vehicle while Table C-2 lists and ranks the intersections within the SMMPO that are consider congested based on average delay.

Table C-1: Level of Service Expressed as Delay per Vehicle

LOS	Signalized Intersection Delay per Vehicle (Seconds)	Unsignalized Intersection Delay per Vehicle (Seconds)
A	=<10	=<10
B	> 10 to 20	> 10 to 15
C	> 20 to 35	> 15 to 25
D	> 35 to 55	> 25 to 35
E	> 55 to 80	> 35 to 50
F	> 80	> 50

Table C-2: Most Congested Signalized Intersections

Location	Intersection	Year	Delay (Seconds)	LOS
Attleboro	Washington St. (Rte. 1) at Highland Ave. (Rte. 123)	2015	57	E
Dartmouth	GAR Hwy. (Rte. 6) at Slocum Rd.	2016	422	F
Dartmouth	GAR Hwy. (Rte. 6) at Tucker Rd. and Champion Terrace	2007	82	F
Dartmouth	GAR Hwy. (Rte. 6) at Faunce Corner Rd. and Old Westport Rd.	2006	58	E
Fairhaven	Huttleston Ave. (Rte. 6) at Route 240 and Sconticut Neck Rd.	2015	55	E
Fall River	South Main St. at Globe St. and Broadway (Globe 4 Corners)	2010	144	F
Fall River	Durfee St. and Milliken Blvd. at Central St. and Bedford St.	2014	90	F

Location	Intersection	Year	Delay (Seconds)	LOS
Fall River	William S. Canning Blvd. at Newton St. and South Coast Market Place	2018	83	F
Middleborough	Route 44 at Plympton St. (Rte. 105)	2015	111	F
New Bedford	Mt. Pleasant St. at Nash Rd.	2011	70	E
New Bedford	Kempton St., Mill St., Pleasant St., Purchase St. and Sixth St.	2009	57	E
Seekonk	Fall River Ave. (Rte. 6) at Mink St. (Rte. 114A)	2017	148	F

Past Experience

The SMMPO has regularly identified congestion issues in the region. In 1995, the first Congestion Management System report was published, which listed 26 congestion issues ranging from corridor-wide traffic flow problems to overcrowded commuter rail parking facilities. Six (6) locations were added to the list in 1996 and 1997. Subsequent Regional Transportation Plans for the region, published in 2000, 2003 and 2007 listed an additional 43 locations (14 in the 2000 Transportation Plan, 9 in the 2003 Transportation Plan and 20 in the 2007 Transportation Plan). Corridors are identified primarily through the Travel Demand Model; intersections are identified through the region's updated Signalized Intersection Database.

The region’s travel demand forecasting model is used to evaluate the volume to capacity ratios for all road segments in the network in future years. The results of the effort identify roads within the region that are currently or expected to be congested through the year 2040. Overall, 63 congestion issues have been identified by this process: 35 at intersections or interchanges and 28 along corridors. Table C-3 summarizes congested intersections and corridors in the SRPEDD region and provides status of the improvements by communities. It should be noted that a total of 28 congestion improvement projects identified in previous RTPs have been completed for the region since 2000.

Table C-3: Congestion Locations in the SMMPO

Community	Location	Status
Attleboro, Mansfield, N. Attleborough	I-95 from Attleboro/Rhode Island line to I-93 Interchange	Intermittent Improvements scheduled as needed at interchanges
Attleboro	N. Main St. (Rte. 152) at Holden St.	Studied (No commitment by the city)
Attleboro	Rte. 1/Rte. 123/Rte. 1A	TIP project in design, 2020-2024 TIP project
Attleboro	South Ave. (Rte. 123) from I-95 to Tiffany St.	Improvements Completed
Attleboro/North Attleborough	Route 1	Under study from Rte. 123 to Rte. 120, In design for resurfacing and complete streets improvements
Dartmouth	Faunce Corner Rd. from I-195 to Old Fall River Rd.	In design
Dartmouth	I-195 and Faunce Corner Rd. Interchange	Improvements Completed
Dartmouth	GAR Hwy. (Rte. 6) at Faunce Corner Rd. and Old Westport Rd.	Under Construction
Dartmouth	GAR Hwy. (Rte. 6) at Tucker Rd. and Champion Terrace	In design to realign Tucker Rd. to meet Hathaway Rd. with signals
Dartmouth	GAR Hwy. (Rte. 6) at Slocum Rd.	Needs Study
Fairhaven	Huttleston Ave. (Rte. 6) at Route 240 and Sconticut Neck Rd.	Needs Study
Fall River	Brayton Ave. at Eastern Ave./Martine St. (Rte. 6)	Improvements Completed
Fall River	Broadway from I-195 Ramps to William St.	Needs Study
Fall River	Mariano Bishop Blvd. at Newton St.	Studied (Improvements planned by City)
Fall River	Plymouth Ave. from Pleasant St. to Second St.	Improvements Completed
Fall River	Plymouth Ave. from Rodman to 2nd St.	Improvements Completed
Fall River	President Ave. at N. Main St.	Studied (To be addressed with Route 79 project)

Community	Location	Status
Fall River	President Ave. at Robeson St.	Studied (Improvements planned by city)
Fall River	Relocation of Route 79	In Design, 2020-2024 TIP project
Fall River	Route 24 from Rhode Island Line to I-195	Needs Study
Fall River	Intersection of Bedford St., Central St., Durfee St. and Milliken Blvd.	Needs Study
Fall River	Intersection of Broadway, Globe St., and South Main St. (Globe 4 Corners)	Studied (Awaiting action by the city)
Fall River	Intersection of William S. Canning Blvd., Newton St. and South Coast Market Place Driveway	Needs Study
Lakeville, Middleborough	S. Main St. (Rte. 105) at I-495	Under Construction, signals operational
Mansfield	Chauncy St. (Rte. 106) Corridor	TIP 2020-2024
Mansfield	Chauncy St. at Route 140	TIP 2020-2024
Middleborough	I-495 from Route 24 to I-195	Studied (No commitment)
Middleborough	Route 44 Rotary	Interim improvements complete
Middleborough	Route 44 at Plympton St. (Rte. 105)	Need Study
North Attleborough	E. Washington St. (Rte. 1) at Elm St.	Studied (Further evaluation needed)
North Attleborough	E. Washington St. (Rte. 1) at Elmwood St.	Studied (No commitment)
North Attleborough	E. Washington St. (Rte. 1) at Walmart Entrance	Studied (Further evaluation needed)
New Bedford	I-195 from Acushnet River to Route 140	Studied (No commitment)
New Bedford	Mt. Pleasant St. at Nash Rd.	Needs Study
New Bedford	Rockdale Ave. at Allen St.	Needs Study
New Bedford	Ashley Blvd. at Sawyer St.	Improvements underway
New Bedford	Brownell Ave. at Kempton St. (Rte. 6/Rte. 140)	Studied, Improvements Completed

Community	Location	Status
New Bedford	Coggeshall St. from Purchase St. to Acushnet Ave.	Under construction
New Bedford	JFK Highway (Rte. 18)	Improvements (Phase 1 Complete, Phase 2 under construction)
New Bedford	Kings Highway Corridor	Project in TIP 2019
New Bedford	Route 140 from I-195 to Kings HWY	Needs Study
New Bedford	Intersection of Kempton St., Mill St., Pleasant St., Purchase St. and Sixth St. (The Octopus)	Studied by SRPEDD 2012, Improvements Completed
New Bedford/Fairhaven	Route 6 Bridge Replacement	Studied by MassDOT (No funding commitment)
Norton	Route 123 at Route 140	Studied by SRPEDD (Rte. 140 Corridor) Under study
Raynham	Broadway (Rte. 138) from Taunton to I-495 ramps	TIP 2020-2024
Raynham	Route 24 Corridor South of I-495	SRPEDD Study in 1990s, needs Further Study
Raynham	Interchange of Route 44 at Route 24	Under construction
Raynham	Route 44 from Route 24 to I-495	Studied (No commitment, Route 24 and Orchard St. Improvements completed)
Seekonk	Central St. at Newman Ave./Pine St. (Baker's Corner)	Improvements underway
Seekonk	Fall River Ave. (Rte. 6) at Mink St. (Rte. 114A)	Safety and Signal Improvements Complete, Needs Further Study
Seekonk	I-195	Needs Study
Seekonk	Route 44	Intersection Improvements Complete and resurfacing in design
Swansea	Route 6 at Route 136	Studied (No commitment)
Swansea	Route 6 at I-195 interchange	Studied (No commitment)
Taunton	County St. (Rte. 140) at Hart St.	Improvements Completed
Taunton	Dean St. from Arlington St. to S. Main St.	TIP 2020-2024

Community	Location	Status
Taunton	Route 24 at Route 140 interchange	TIP 2020-2024
Taunton	Washington St. from Broadway to Oak St.	Improvements Completed
Taunton	Winthrop St. (Rte. 44) at Highland St.	Needs Study
Taunton	Taunton Green	Studied (Recent updates)
Taunton/Raynham	Broadway (Rte. 138) from Taunton Center to Easton Town Line	Studied (2 projects pursued by city/town)
Taunton/Raynham	Route 44 from Route 104 to Church St.	TIP 2020-2024
Wareham	Cranberry Highway (Route 28) at Toby Rd.	Improvements Completed (Improvements made by developers)
Wareham	I-195 from I-495 to Route 28	Studied (No further actions)

Planned Congestion Improvement Projects

The following projects are currently in the various stages of implementation:

Chauncy Street (Route 106), Mansfield - Several traffic studies along Chauncy Street were conducted over the years to address existing and future congestion. The Chauncy Street (Route 106) at Copeland Drive intersection suffers from both congestion and safety issues. The project provides a signal upgrade and adds a northbound left-turn lane. These are considered short-term improvements. The project was listed in the TIP for FFY2008 at an estimated cost of $500,000.

In the long term, a widening of Chauncy Street to provide three approach lanes (a separate left turn lane, a thru lane, and a thru/right turn lane) to the intersection will be necessary. This measure would provide acceptable levels of service at the intersection and improved safety by protecting left-turning vehicles on Chauncy Street. Any widening of the corridor is likely to require land-takings, although impacts to buildings are not anticipated.

The Chauncy Street Underpass is located beneath the AMTRAK/MBTA rail line. It was

severely deteriorated due to water infiltration because the road is ten feet below the water table. Major reconstruction was necessary to correct the problem. The project was listed in the FFY2006 TIP at an estimated cost of $3,900,000 but was not advertised until FFY2008. Congressional Earmarks totaling $2,865,643 were appropriated for this project, which was recently completed in 2010.

Others portions of Chauncy Street are in need of improvements but as yet have no active projects in the works. These locations are discussed below:

Chauncy Street at Route 140: This project is currently in the TIP. The intersection operates at level of service (LOS) E. The crash rate at the intersection also exceeds acceptable thresholds. Measures to improve the intersection include the addition of a second exclusive southbound left turn lane or the addition of another westbound thru lane. These measures may need to be implemented sooner depending on the time frame at which development in the area occurs. The additional southbound left turn lane may be feasible within the existing right-of-way, but an additional westbound thru lane is likely to require land-takings. Developer involvement in a project of this magnitude has been suggested. Safety issues also exist at this intersection and are discussed further in Appendix D - Safety in this plan.

Chauncy Street at North Main Street: This intersection currently operates at LOS E and will deteriorate into the future with projected traffic growth in the area. Separate left-turn lanes with protected phases were designated on Chauncy Street a few years ago to improve safety issues, however, the intersection was not widened at all and consequently, a thru lane in each direction was lost. Re-striping the left-turn lanes in each direction on Chauncy Street as shared thru/left-turn lanes and re-phasing the signal so the eastbound direction has a leading protected left-turn phase and the westbound direction has a lagging protected left-turn phase would improve existing LOS to a D. These improvements would be short-term but relatively inexpensive. Safety issues at this intersection are present as well and are discussed further in Appendix D - Safety in this plan.

Chauncy Street (Route 106) at Central Street: Motorists attempting to access or cross Chauncy Street from Central Street regularly experience long delays. Previous studies have suggested signalization of this intersection to be coordinated with adjacent signalized intersections. Additional improvements call for a widening of Chauncy Street to provide a second (eastbound and westbound) approach lane. A coordinated signal system would also prevent westbound traffic queued at the Copeland Drive intersection

from backing up to the Central Street intersection, which is a short distance from Copeland Drive. The additional lanes on Chauncy Street would make access/egress at the medical building driveway (on Chauncy Street) difficult, if not impossible, during peak periods. Consideration should be given to closing the driveway and redirecting traffic to the access point on Central Street. This would provide safer and more efficient traffic flow along the Route 106 corridor.

Chauncy Street at Highland Avenue/Winthrop Street: Town is pursuing this project in the TIP. Motorists attempting to access or cross Chauncy Street from Highland Avenue or Winthrop Street regularly experience long delays. The problems are directly related to the operation of commuter rail since this intersection is the primary access-egress point for most of the parking for the train station. Previous studies have recommended the signalization of this intersection, provided that it remains the primary access-egress point to commuter rail parking. Geometric improvements have been suggested including a widening of Chauncy Street to provide an additional approach lane (separate left-turn lane) and a realignment of Highland Avenue and Winthrop Street, with each road providing two approach lanes at the intersection. Additional realignment of Chauncy Street is necessary to improve inadequate sight distance for motorists looking left (the westbound Chauncy Street approach) when exiting Highland Avenue.

In 2015, the town unveiled several plans developed by BETA Group for land use redevelopment west of the MBTA station, redevelopment of North Main Street for a potential MassWorks grant using recommendations by STC (Northeast University), and improvements to the Route 106 corridor and signalized intersections as recommended by a separate proposal by STC. Mansfield officials requested the assistance of SRPEDD to examine all of the proposals collectively using TransModeler, a traffic simulation program to collectively evaluate the corridor.

Although much of the improvements proposed offer solutions at the traffic signals, curb cut management and access might continue to add congestion to the commercial corridor between Route 140 and Copeland Drive. North Main Street and Route 106 was also modified to include turning lanes that were not originally proposed by STC, but was evaluated by the town engineering department which indicated noticeable improvement potential. Based on the simulation analysis, the town has begun efforts to pursue a phased corridor improvement plan to be implemented over several years using the TIP. This project is in the preliminary stage for development and a Project Needs Form has yet to be filed with MassDOT.

Route 18 (JFK Highway), New Bedford - Route 18 and the JFK Highway is a principal routing to Downtown New Bedford, the Port of New Bedford, ferry service to Martha's Vineyard, and the Whaling National Historical Park. It is a principal location for economic activity in the City. Congested conditions occur at the intersection of the JFK Highway at Union Street. Traffic problems are expected to worsen as residential and economic development projects begin to mature and tourist attractions develop in the immediate area. The highway bisects the working waterfront from the waterfront historic district and downtown, making traffic and pedestrian movements between the two congested and unsafe. A redesign and reconstruction of the corridor is currently underway that will involve traffic calming measures in conjunction with more efficient traffic flow. Phase 1 of the project is completed and Phase 2 is under construction and nearly complete. Additional information regarding safety issues along the corridor, particularly at Union Street, Cove Street and Coggeshall Street can be found in Appendix D - Safety in this plan.

Central Avenue @ Newman Avenue / Pine Street (Bakers Corner), Seekonk - A functional design report, prepared in 2002, found inefficient signal operations and geometry resulting in capacity and safety issues at the intersection. The project includes an upgraded signal system at Bakers Corner and at the Central Avenue @ Oak Street intersections, as well as geometric modifications. It is programmed in the FFY2010 TIP at an estimated cost of $2 million.

Route 6 from Hathaway Road to Faunce Corner Road, Dartmouth –This segment of Route 6 was studied in 1995 and again in 2007. The 1995 study recommended modifications to the Hathaway Road intersection to add capacity as a short-term improvement. An eastbound separate left-turn storage lane was subsequently added, based on that study.

Both studies also recommended the relocation of a segment of Tucker Road from its current intersection with Route 6 @ Champion Terrace, to a direct alignment at the Hathaway Road intersection. The intent of the recommendation is to eliminate severe queues that exist between the Tucker Road and Faunce Corner Road intersections, which are located too closely to operate efficiently. Queues between the two intersections regularly extend into the adjacent intersection, causing severe delays along Route 6 and on Faunce Corner Road and Hathaway Road. The proposed Tucker Road relocation would provide a fully signalized intersection at Hathaway Road and eliminate the signal and median crossing at the existing Tucker Road intersection. This project is currently under design. Please see Figure C-2.

Although partial short-term improvements have been made, congested conditions along with major safety issues (discussed further in Appendix D -Safety) remain. The town recently submitted a Project Needs Form to MassDOT District 5 for this project, and two public meetings were held in the spring of 2010 regarding the relocation.

Figure C-2: Route 6 Corridor, Faunce Corner Road to Hathaway Road, Dartmouth

Faunce Corner Road (Route 6 to Old Fall River Road) and the I-195 Interchange, Dartmouth - The I-195 partial cloverleaf interchange was originally constructed in the late 1960's to accommodate trips from the New Bedford area heading toward commercial development south along Faunce Corner Road to Route 6. In recent years, development has spread northward along Faunce Corner Road. This corridor has also become an important center of medical facilities serving a wider geographic area extending to the west.

These circumstances have increased the amount of traffic using Faunce Corner Road. Severe congestion occurs daily at the interchange and is especially a problem during peak shopping seasons. A traffic signal on the ramp that serves the eastbound I-195 turning movement to northbound Faunce Corner Road was constructed in 2007, along with a minor widening on the bridge to provide two southbound lanes on Faunce Corner Road. The signal improved the intersection's operation but did not solve the congestion problem at the interchange.

The Town of Dartmouth prepared an Engineering Justification Design Study for

improvements to the interchange in the 1980's. The study found a need to widen the Faunce Corner Road overpass at I-195 to four lanes and construct a loop ramp in the northeast quadrant. Additional geometric improvements for the terminus of each ramp, consistent with current design standards, were also found to be necessary. In 1999, MassHighway purchased land in the northeast quadrant for the loop ramp.

SRPEDD conducted a full corridor study in 2007 to determine future growth affecting Faunce Corner Road. The study evaluated congestion and safety issues, identified and evaluated alternative measures to address those issues, and offered recommendations for consideration. The overall conclusion was that a five-lane bridge over I-195 would be necessary with a new signal at the westbound on-ramp and capacity improvements at the Cross Road intersection with Faunce Corner Road. The westbound loop on-ramp idea was deemed no longer necessary. The project is under construction.

Main and Dean Streets (Route 44) from Route 104 to Church Green, Taunton – Congestion is occurring with regularity along this segment of Route 44. The corridor directly serves the Taunton Central Business District to the west, and the Raynham Route 44 commercial strip to the east. A major bottleneck exists between Longmeadow Street and Route 104 where Route 44 narrows from four to two lanes. The corridor needs a consistent four lane layout. Recent closures due to significant flooding have added to the problem. The intersection of Dean Street with Longmeadow Road is also listed as one of the Top 100 Most Dangerous Locations in Southeastern Massachusetts.

A commuter rail station, expected to be placed adjacent to the Dean Street and Arlington Street intersection, will dramatically add to the congestion once rail service returns to southeastern Massachusetts. The MBTA must be prepared to make appropriate improvements to the intersection to address the problem.

In 2015, SRPEDD completed a study with MassDOT District 5 office that evaluated the corridor with short-term and long-term solutions for improvement. The short-term improvements included adjusting the signal operations at 3 intersections for improved traffic flow while long term improvements recommended a widening for increased capacity. The widening is currently in design with the MassDOT District 5 office.

Dean Street between Arlington Street and South Main Street is current programmed for the FFY2020–2024 TIP.

Congestion Projects Awaiting Action

The following projects have been studied and are awaiting actions leading to implementation of corrective measures:

North Main Street (Route 152) @ Holden Street Intersection, Attleboro - This intersection has previously been identified as a congestion problem. A 1985 study considered various alternatives, including construction of a new connector road between Routes 123 and 152 and modifications to the existing road network. Improvements to the North Main @ Holden Street intersection were considered the most cost effective and least disruptive measure. Minor widening of the approaches to the intersection and signalization were recommended.

A reconstruction project was planned by the City of Attleboro on North Main Street from Holden Street to Holcott Drive as Phase 2 of the Reconstruction of Route 152. Due to strong opposition to the project by residents of this neighborhood, the plan to signalize Holden Street was abandoned. Instead, the reconstruction project was shortened to end just north of Holden Street. Without improved traffic controls at Holden Street, left turns will continue to cause delays. Many years ago, the city attempted to pursue a project at this location, but opposition by residents surrounding the intersection has halted those efforts.

William S. Canning Boulevard/Rhode Island Avenue/Tucker Street, Fall River - This intersection is currently operating at LOS F during the PM peak period. A 1999 study by SRPEDD recommended a consolidation of curb-cuts adjacent to the intersection. A signal upgrade and optimized signal timings could greatly improve level of service. This project has no official status at this point. The City of Fall River should consult with MassDOT District 5 to consider appropriate means to design and implement the recommended improvements.

William S. Canning Boulevard/Newton Street/Harbor Mall, Fall River - PM peak period traffic operations are expected to be at a poor level of service by 2020. A 1999 study by SRPEDD recommended a minor widening of the eastbound and westbound approaches to provide separate left turn lanes. This project has no official status at this point. The City of Fall River should consult with MassDOT District 5 to consider appropriate means to design and implement the recommended improvements. Although the signal is designed to be semi-actuated, it is currently operating under a pre-timed setting with a resulting LOS D.

Broadway at Globe Street, Fall River - In 2001, a study was conducted of the Broadway, Globe Street, and South Main Street intersection in Fall River. The analysis determined that congestion problems exist during the AM and PM peak hours and will deteriorate in the future. A crash analysis also revealed a growing safety problem, ranking this intersection as the 14th most dangerous location in the region.

The study recommended that the outdated pre-timed traffic signal system be replaced with a fully-actuated traffic signal. A separate (lead) phase should be included for the Broadway and Globe Street eastbound approaches to reduce the congestion and improve safety at this intersection. This project has no official status at this point. The City of Fall River should consult with MassDOT District 5 to consider appropriate means to design and implement the recommended improvements.

King's Highway/Tarkiln Hill Road (Church to Mount Pleasant Street), New Bedford – This corridor was studied in 2005. The principal issue is traffic queues that extend from one intersection into adjacent intersections (at Fieldstone Marketplace, the Route 140 northbound interchange, and the Stop & Shop/King's Highway Plaza intersection) and active railroad tracks. The primary conclusion of the study is to widen the corridor from Fieldstone Marketplace to Tarkiln Hill Road to add a fifth lane, which will provide an exclusive left turn lane for each of the signalized intersections. This measure eliminates the traffic back-ups into adjacent intersections. Other improvements include formalizing the two-lane layout for the eastbound flow for Tarkiln Hill Road from King's Highway to Church Street and a traffic signal upgrade at the Church Street and Ashley Boulevard intersections. Ideally, a grade separation of the railroad tracks is preferred, but at the very least, a signal system with railroad preemption that allows for a clearance of the Stop & Shop westbound and Church Street eastbound approaches to both intersections is necessary. The City of New Bedford has initiated design and public outreach to pursue this project through the TIP. Figure C-3 depicts proposed lane configurations taken from SRPEDD's study.

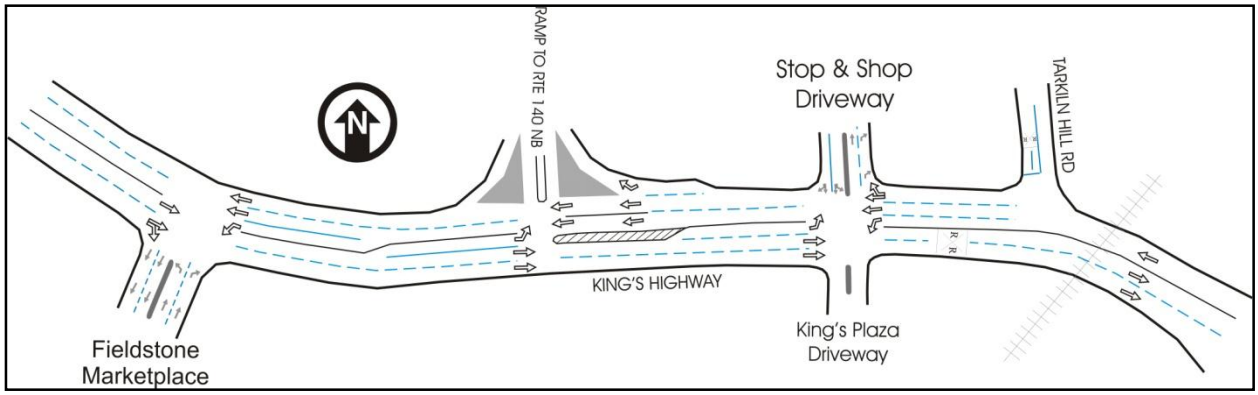

Figure C-3: King's Highway Proposed Lane Configurations, New Bedford

Recently with the funding commitment to the Phase I project for the extension of commuter rail service through the South Coast Rail Project, improvements to King's Highway will be considered as a result from technical assistance grants issues through MassDOT for the study of the proposed station on Church Street.

Route 6 at Route 136, Swansea - Two studies were conducted along the Route 136 corridor in Swansea, each identifying measures to address congestion and safety issues at this intersection. The first involved improvements to the intersection. A 2002 study of the Route 136 corridor found traffic congestion during peak periods, including excessive queuing from the Route 6 intersection to the I-195 eastbound off-ramp. The site is also one of the most dangerous intersections in the region. Recommendations include the installation of a fully-protected left turning phase in the Route 6 / Route 136 signal, extension of the left-turn storage lanes at the eastbound and northbound approaches, curb cut closings, and additional pavement markings in the vicinity of the I-195 eastbound ramp. Improvements were made several years ago that addressed issues with the signal system. Due to local opposition, adjustments to the left-turn storage lanes and driveway closing were not implemented. The following alternatives to the latter two recommendations were offered: textured pavement instead of a raised median along the extended storage lanes on Route 136; and modifications to the existing curb cuts instead of full closure. These alternatives address both congestion and safety issues at the intersection. The issue regarding curb cut access, specifically on the southwest quadrant of the intersection needs to be resolved with the town and adjacent businesses to adequately improve this location.

A second measure would provide a commuter parking facility along the Route 136

corridor, which would reduce peak period traffic volume through the intersection. Two locations have been considered. The first is land adjacent to the I-195 interchange, north of the intersection. This site would provide maximum benefit to more commuters, especially serving the Fall River to Providence commute. The second is south of the intersection in the vicinity of the Rhode Island line. A commuter lot in this area would serve fewer commuters but would remove more vehicles from the Route 6/Route 136 intersection.

A third option considers the use of existing parking lots at businesses along Route 6 or Route 136 in the vicinity of the intersection or interchange with I-195. Cardi's Furniture Store, which has more than ample parking, has verbally expressed interest with this idea which is also supported by the town's planning board. In return, the furniture store would enter into a three-year lease with MassDOT who would provide compensation for the use of a minimum of 50 parking spaces for ride-share purposes. Although this idea is preferred by all parties involved, legal details as well as a competitive bid process must be negotiated between the business and MassDOT before this proposal is finalized.

Route 6 / I-195 / Swansea Mall Drive (Route 118), Swansea - This highway interchange serves as a primary access to the Swansea Mall and other retail and commercial development. It is currently operating at level of service F and is expected to worsen due to continued commercial activity along the Route 6 corridor. A 1998 study recommended the reconstruction of the Route 6 / I-195 interchange to include a new westbound off-ramp at Route 118 plus a widening of the Route 6 Bridge over I-195. MassDOT recently completed a minor widening of the bridge, however, the new off-ramp proposal has not been addressed. Further planning and engineering studies are needed for the new ramp proposal. As yet, MassDOT has not attempted to move this project forward. The interchange is also listed as a high crash location based on recent crash experience and has documented drainage issues. More information regarding this intersection can be found in Appendix D -Safety and Appendix N-Environmental Coordination and Climate Change.

Taunton Green, Taunton - Traffic flow through the Taunton Central Business District was studied in 2002. The study focused on the so-called "Taunton Green," an historical park operating as a (square) rotary. The Green has a long history of traffic congestion and safety issues. (Discussed further in Appendix D - Safety of this plan). The study recommended several immediate measures to improve traffic flow. The measures involved: improved pavement markings to better inform motorists of the proper use of each travel lane; and improved corner radii to assist trucking movements. Pavement

marking improvements have been made, and corner improvements are planned.

The more permanent solution involves closing the segment of the Green from Court Street to Winthrop Street (in front of the Post Office) and rerouting traffic around the rear of the post office. This would require improvements to accommodate the turning radius for heavy truck traffic, changing Cohannet Street from two-way to one-way eastbound from Post Office Square to the Winthrop Street intersection, and channelization of the Cohannet Street/Post Office Square intersection. It would also require the re-designation of Cohannet Street (from Post Office Square to High Street) and High Street (from Cohannet Street to Winthrop Street) as Route 44 westbound. The Court Street, Winthrop Street, and Cohannet Street approaches to the Green would operate more safely and efficiently due to the removal of conflicting movements that contribute to excessive delay and unsafe traffic flow. The revised Cohannet Street approach would provide a better alignment that would more evenly distribute eastbound thru traffic into the double eastbound thru lanes between Winthrop and Weir Street. An important added benefit to closing this segment of road is that it would increase the overall size of the Taunton Green and improve access to the Post Office building.

City officials have not expressed a desire to pursue these long-term recommendations. Although the recommendations remain viable, the Regional Transportation Plan cannot recommend this project until the City of Taunton fully supports the solution. No other action has been pursued by the City.

Route 24 at Route 140 Interchange, Taunton - The Route 24/140 interchange is the common routing for most trips from the greater New Bedford and Fall River areas to the Boston area. Heavy traffic volumes combined with inadequate acceleration/deceleration lanes at the interchange frequently result in crashes, mainly during commuting periods that result in lengthy traffic queues. The evening commute is regularly delayed by traffic control signals, necessary to stop southbound motorists, resulting in extensive backups onto Route 24 south. The morning commute is frequently affected by upstream crashes due to the sub-standard design of interchanges along the corridor. Traffic queues have been recorded in excess of 130 vehicles extending from Route 24 northbound back onto Route 140.

The interchange is currently operating at level of service F during the morning and evening peak traffic periods. A 1998 study recommended adding a Route 24 southbound off-ramp, extending Route 24 acceleration/deceleration lanes, widening Route 140

under Route 24, and widening Route 24 over Route 140.These measures would improve access and egress onto Route 24, and would simplify movements at the Route 140 intersections.

Congress provided the following earmarks for this project: in 2003, $993,500 for interchange improvements; in 2004, $940,419 for design and engineering; and in 2005, $17 million for reconstruction. The first two earmarks were used for interim improvements to the interchange, which include a widening of Route 24 to extend the deceleration lanes for the southbound off-ramp, and a longer acceleration lane for the Route 140 northbound on-ramp onto Route 24. This project was advertised for construction bids in September of 2005 and finished construction in 2009.

The proposed project consists of improvements along 1.2 miles of Route 24 and 0.8 miles of Route 140 including modifications to the interchange system. Route 24 within the project limits will be reconstructed to provide improved shoulders, accommodate a future third travel lane and upgrade acceleration/deceleration lanes. Existing Route 24 bridges over Route 140 and the Middleborough Secondary rail line will be replaced to accommodate the proposed roadway section and provide increased vertical clearance. Modifications to the interchange include construction of a new off-ramp from Route 24 Southbound to Route 140 Northbound and providing two lane entrance ramps from Route 140. Route 140 will be widened to provide a new southbound bypass lane between the intersections of the Route 24 Southbound and Northbound ramps and additional turning lanes. Traffic signals along Route 140 will be upgraded/replaced. Minor improvements are also proposed at the Stevens Street interchange to accommodate the widening along Route 140. The work will be completed using staged construction that maintains two lanes of traffic in each direction on Route 24 and 140. (Source: MassDOT website)

Cranberry Highway (Route 28) / Toby Road Area, Wareham - In 2002, a study was conducted along the Cranberry Highway in Wareham in the vicinity of the Route 28 Industrial Park. The area had 158 acres of land available for development. The operation of four unsignalized intersections with the Cranberry Highway was analyzed, including Toby Road, Kendrick Road, the I-195 WB Ramps and the I-195 EB Ramps.

The study found excessive traffic delay at all four intersections during AM and PM peak hours with additional delay expected as development in the area increases. All of the intersections also met signal warrants with the exception of Kendrick Road. In 2008, the developers of the Wareham Crossing Shopping Center (opposite Kendrick Road) made

major improvements along the corridor including the signalization of all four intersections listed above as well as corridor widening for turning lanes. All of the intersections now operate at acceptable levels of service.

Recently, a Walmart Supercenter and adjacent shopping plaza have been constructed west of Toby Road. The developer implemented plans to widen the Toby Road/Cranberry Highway intersection and installed signals at the site's driveway on Toby Road. The A.D. Makepeace Company also has developed plans further east along the Cranberry Highway to signalize the intersection with Lou Avenue. This will be the primary access point to the "Rosebrook Business Park" (currently under construction) and "Rosebrook Place", two major mixed-use developments. Widening of the Cranberry Highway at this location is also planned by Makepeace to accommodate additional capacity. This corridor will require close scrutiny in coming years as development proposals continue to emerge.

I-95 Corridor from the Attleboro/Rhode Island line to I-93 Interchange - In 2012, MassDOT completed a study of the transportation issues along the I-95 Corridor between Canton and the Rhode Island state line, the I-495 Corridor from Route 140 in Mansfield to the Route 1A interchange in Wrentham and the Route 1 Corridor from Canton to the Rhode Island state line. The study examined safety conditions, congestion within the interchanges, and growth projections that will influence traffic volumes. A full range of alternatives, including interchange, highway and non-highway improvements, as well as multimodal options were developed and analyzed. Short term, medium term and long term recommendations were included. The corridor was also listed as having a large number of lane departure crashes and crashes at interchanges. This is discussed further in Appendix D - Safety in this plan.

Short-term recommendations in MassDOT's study include the extension of acceleration and deceleration lanes on I-95 at exits 2, 3, 4, 5, 6 and at exit 14 on I-495. A park and ride lot at exit 5 and better access management on Route 1A at exit 2 and on Route 123 at exit 3 are also mentioned.

Medium-term recommendations include further ramp modifications, particularly the flattening of curves at exits 4 and 6 (I-295 and I-495, respectively). The signalization of Route 1A at Elmwood Street (in coordination with the signal at Route 1 and Elmwood Street) is also included as a medium term recommendation. Figure C-4 illustrates these recommendations.

Long-term recommendations include a widening of the I-95 mainline between I-295 and I-495 to four lanes in each direction, the elimination of exit 1, a partial cloverleaf at exit 2, modifications and an additional southbound ramp at exit 3 and high-speed "flyover" ramps at I-295 and I-495.

The improvements to the interchange including the realignment of I-95 southbound to I-295 southbound are in currently in the TIP. Improvements for I-95 northbound to I-295 southbound are currently awaiting funding.

Figure C-4: I-95 @ I-295 Medium-Term Improvements

I-495 Corridor (Route 24 to Interstate 195), Middleborough to Wareham - A corridor study of I-495 from Route 24 to Route 25 was conducted in 2008 by SRPEDD. A full land-use analysis was completed and population/employment projections were developed to the year 2030. Congestion was projected from where I-495 narrows to two lanes, south of Route 24, to Route 105. Future traffic was anticipated from commercial, residential and industrial development not only around the Lakeville Commuter Rail Station along Route 105, but also in south Middleborough and in the vicinity of the Middleborough Circle.

The current Travel Demand Model does not anticipate congestion on I-495 south of Route 18. Congestion is predicted by 2020 from Route 44 to Route 18 and by 2030

between Route 44 and the lane-drop south of Route 24. This could change, however, with major development of land in Wareham, Carver and Plymouth, mainly in the vicinity of the I-495/I-195 interchange. Such development could add significant traffic to I-495 as well as to the Cranberry Highway. Developers must be prepared to study the impacts of any development proposal and include mitigation as part of their project. At this time, no improvements are being considered.

I-195 Corridor (Route 140 to the Acushnet River), New Bedford - The 2003 T-Plan identified this segment of I-195 as a future congestion problem. A 2005 corridor study by SRPEDD concluded that projected future congestion was likely based on potential economic development activities currently being pursued by the City of New Bedford for the harbor area. The study also identified an existing problematic weaving issue on the segment between the Route 18 on- and off-ramps to I-195 westbound that worsens traffic flow and creates unsafe movements. Simple solutions to these issues are not readily apparent. The City has and continues to redevelop the downtown and waterfront area as well as enhancing development in nearby blighted areas. The potential Commuter Rail station and a warehousing district in the Whale's Tooth area are considered as future traffic generators.

The study recommended improvements to the Coggeshall Street corridor, and the I-195 interchanges at the JFK Highway (Route 18) and Coggeshall and Washburn Streets. The I-195 westbound ramp with Coggeshall Street was recently reconstructed and signalized with the development of a Market Basket grocery store. Although no other plans for the interchange have been pursued, MassDOT District 5 Office has listed bridges as part of I-195 and accompanying ramps as structurally deficient and required action for improvement.

Washington Street from Broadway to Oak Street, Taunton - SRPEDD completed a corridor study of Washington Street and Oak Street in late 2009. The study looked at both signalized and unsignalized intersections along the corridor and found numerous congestion and safety issues at each. The corridor has special needs as it is the primary route to Morton Hospital and is a high pedestrian traffic corridor.

Recommendations for the corridor included signal upgrades at Broadway (St. Mary's Square) and Court Street, new signals at Pleasant Street and Frederick Martin Parkway and a four-lane bridge over the Mill River. The Washington Street Bridge was reconstructed and widened for increased capacity. Further study of the entire Downtown Taunton area is necessary, including a comprehensive look at by-pass routes

and the possibility of re-routing Frederick Martin Parkway to meet directly with Tremont Street.

The Middleborough Circle Rotary (Routes 44, 18 and 28) – Significant traffic congestion occurs at the Middleborough Rotary. Anticipated economic development activities in the vicinity of the area will add to this congestion. Since major improvements to the Route 44 corridor have already been implemented, the emphasis now is on the rotary improvements. The relocation of Route 44 from Route 58 in Carver to Plymouth was completed in 2005 and MassDOT reconstructed the four signalized intersections along the corridor in Middleborough in 2010. A widening of each approach was included at each intersection to allow for separate left-turn, thru and right-turn lanes. See Figure C-5.

Figure C-5: Middleborough Rotary (with Interim Improvements 2019)

For many years Route 44 has been considered for major improvements due to both congestion and safety issues at the Rotary and along the corridor to Route 24 in Raynham. Improvements must address existing problems and take into account the tremendous development potential of land in the vicinity of the Rotary and I-495 interchange. MassDOT completed a study of the rotary in 2013 and began preliminary engineering to construct a flyover for the Route 44 segment with access to a modified rotary for access to Route 18 and 28 while maintaining connection to I-495. This long term solution to eliminate the rotary will be an expensive project, estimated at $83 million.

In 2013, the JTPG elected to devote one year's target to this project as incentive for its design and implementation. However, the future long-tern improvements may remain necessary with increased development to open space available in the vicinity of the rotary as well as at several locations along Route 44 between the rotary and the town of Plymouth. The interim improvements to the Rotary, included striping of lanes, new signage, geometric improvements at the access and exit points, re-grading the road surface and lane widening. Since completion of the improvements there has been positive feedback identifying a decrease in delays/congestion. However, there are still safety concerns with navigation through the rotary. A thorough analysis should be conducted in the near future to determine the effectiveness of the capacity and safety improvements.

East & West Main Street (Route 123) at Taunton Avenue / Mansfield Avenue (Route 140), Norton – This intersection was reconstructed several years ago to address safety and congestion concerns, but it continues to be a congestion issue with a current operation of LOS E. Signalization added a measure of safety here, but the intersection's offset alignment complicates the efficiency of traffic flow through the intersection, especially during the peak hours and with Wheaton College in session. Ultimately, land takings and re-alignment of the intersection needs to be considered before additional improvements can be implemented.

SRPEDD evaluated this intersection as part of their 2017 Route 140 Corridor Study and proposed alternatives for improvement. However, these improvements, which call for the realignment of the intersection, will require significant land takings that were opposed by residents of the town. Negotiation and resolution of these land takings are necessary before any project can proceed.

Broadway (Route 138) from Taunton to I-495 Ramps, Raynham – This corridor is projected to become congested by 2030. Improvements to this corridor have been implemented in the vicinity of a new Walmart with the added travel lanes to increase capacity and traffic signal improvements to the signal at the Market Basket Plaza and King Phillip Road. An additional traffic signal is proposed for Route 138 and Center Street as part of the required mitigation from Walmart.

In 2010, traffic signals were added to the Interchange of Route 138 and I-495 to manage turning movements to and from the ramps. Additional signals were installed as part of the new Walmart located south of King Phillips Street. In addition to the signal at

Walmart, King Phillips Street was also signalized. MassDOT has a project in design and implementation through the TIP in FFY 2020–2040. This will resurface the road as well as include bicycle and pedestrian accommodations with a new traffic signal installed at Route 138 and Center Street.

Relocation/Reconstruction of Route 79, Fall River - A proposal initiated by the City was studied by MassDOT to reconstruct Route 79 between I-195 and the Brightman Street Bridge transforming the limited-access corridor into a waterfront boulevard. The intent is to improve access between the waterfront and downtown Fall River with the added benefit of creating additional waterfront land for development. Route 79 as it exists today is a major barrier between Fall River's residential neighborhoods and the waterfront. The feasibility study determined the boulevard concept would improve safety and proved access to the waterfront from the neighborhood area as well as to the commuter rail station proposed with South Coast Rail. However, the added delay associated with the conversion of the elevated divided highway to a concept of a boulevard might also contribute to an increase in GHG emissions. This project is programmed under the TIP for FFY2022, FFY2023 and FFY2024 for $87.8 million.

The Route 79 interchange with I-195 completed construction of a number of structurally deficient bridges which frequently experienced congestion due to substandard design. The new interchange was developed as an at-grade boulevard and eliminates a significant portion of ramps and bridges that opens up the waterfront to the downtown area. The project was completed through the MassDOT Accelerated Bridge Program.

Projects Needing Further Study

The following locations have been identified as existing or future congestion issues needing further study:

President Avenue at North Main Street, Fall River - A review of the operation of this intersection after the completion of the new Brightman Street Bridge is necessary to determine the reasons for peak period congestion. Improvements are expected by the MBTA in relation to a planned commuter rail station in the vicinity of the intersection. The intersection is also listed as the 33rd most dangerous intersection in the region. More information regarding this can be found in the Appendix D-Safety of this document.

South Washington Street (Route 1) at Walmart, North Attleborough - This intersection

operated at LOS E in 2003. The signal timings were recently updated following an expansion of Walmart into a supercenter in 2009. An evaluation of these timing updates should be undertaken to see if they have helped to alleviate any congestion at the intersection. No action has been taken for this location although the former Mayor of Attleboro has suggested an evaluation of the Route 1 corridor that includes this location. SRPEDD initiated a study of the Route 1 Corridor in 2018. Due to the number of land takings and right of way issues, additional capacity to resolve congestion along this stretch of Route 1 is unlikely.

Winthrop Street (Route 44) at Highland Street, Taunton - A review of the operation of this intersection is necessary to determine the reasons for peak period congestion and identify measures to address the problem.

Route 24 Corridor (Route 140 to Interstate 495), Taunton and Raynham – As a major arterial for commuters to the greater Boston area, this corridor currently experiences peak hour congestion and is expected to deteriorate based on the Regional Travel Demand Forecasting Model's projections. These projections, based on a variety of factors including land use changes and normal traffic growth, reveal the need for added capacity immediately.

Existing congestion along the corridor are a culmination of various factors including insufficient capacity to handle the existing demand, inadequate design of several interchanges specifically with substandard acceleration and deceleration lanes, coupled with the lane drop from three lanes to two between I-495 and Route 44. Several interchanges have a high rate of motor vehicle crashes that may be attributed to interchange design. Congestion is frequently the result of crashes along the corridor due to the restricted capacity of 2 travel lanes in either direction

The traffic projections clearly demonstrate the need for construction of an additional northbound and southbound thru lane from the I-495 Interchange in Raynham south to Route 140 in Taunton. The cost of adding lanes has been estimated at between $40 and $50 million, based on the cost per mile of widening Route 3. There is an immediate need for an engineering study of the future operation of Route 24 to verify the need and begin the process of adding the lanes.

For many years, SRPEDD and several versions of the Regional Transportation Plan supported the designation of Route 24 as an Interstate Highway, that necessitates the need to upgrade the corridor to interstate highway design standards. A joint meeting

took place in December of 2010 between SRPEDD, the Boston Metropolitan Planning Organization and the Old Colony Planning Council to discuss the issues regarding Route 24. Although there was consensus that increased capacity and interchange upgrades are necessary, the designation of Route 24 as an interstate highway was not supported by these 3 regions. Recent consultation meetings between these agencies continues to support that decision.

SRPEDD continues to stress the need to commence a study to address the capacity and safety improvements to Route 24. The 2012 RTP (that examined 2015 to 2040) was based on the traditional growth scenario and the smart growth scenario which includes the development of South Coast Rail. Under the Smart Growth Scenario, the need to widen Route 24 south of Route 140 is not warranted with an acceptable operation. However, the need to widen Route 24 between Route 140 and I-495 remains a consideration. In 2019, the corridor remains congested during the morning and afternoon peak periods.

The Southcoast Rail phase 1 project is scheduled to be completed in 2023 using a route through Middleboro along the Old Colony line before turning west towards Taunton and then south to Fall River and New Bedford. Phase 2 will extend the Stoughton Line south to Taunton and is anticipated to be constructed later in the decade after the phase 1 project is complete. Although projected, it is difficult to determine if the Southcoast Rail service will reduce the current state of traffic congestion along Route 24 once Phase 1 and 2 become operational.

I-195/Route 24 Interchange, Fall River- The Regional Travel Demand Model shows congestion along I-195 in Fall River, beginning in the base year of 2010 between the Route 24 exits. This is primarily due to increased commercial development along Route 24 in both Fall River and Freetown. Currently, no improvements have been considered for this location.

I-195 from Route 28 to I-495, Wareham- Significant development has occurred and is projected to occur along Route 28 adjacent to the highway. A large shopping center opened there in 2008 and a medical facility, a Super Walmart and a mixed-use plaza opened in 2015. The I-195/I-495 interchange and the I-195/Route 28 interchange were both studied by MassDOT in 2007, however, this was before much of the future development was planned.

Brayton Ave at Eastern Ave/Martine St, Fall River- This intersection currently operates

at LOS E, and will continue to deteriorate with new development along both Martine Street and Brayton Avenue. Currently, no improvements have been considered for this location.

Route 6 Bridge Replacement, New Bedford/Fairhaven - MassDOT completed a feasibility study to replace the Route 6 Bridge over the Acushnet River as known as the Fairhaven/New Bedford Bridge. The bridge has long been a site of traffic flow problems due to the slow operation of the bridge opening and closing to maritime traffic and the resulting congestion on surrounding roadways as motorists use alternate routes in an attempt to bypass the bridge. The study examined the replacement of the existing swing span bridge with a Lift Bridge, Single-leaf bascule or a double-leaf bascule bridge with a wider channel to accommodate larger freight vessels accessing the North Terminal and encourage more economic development with the north harbor. Although the time necessary to open and close a new bridge will essentially equal the current time for the existing swing span, the difference with a new facility is increased reliability in the bridge operation, as well as opening up the north harbor. The bridge was recently rehabilitated; however, no additional plans or funding have been identified for the replacement of this existing swing span bridge.

Operational and Management Strategies

MAP-21 and FAST ACT requires transportation planning to include strategies that improve performance of existing facilities to reduce congestion, improve safety, and enhance mobility. Initiatives through MassDOT, include the Commonwealth's Global Warming Solutions Act, aimed to reduce GHG emission by 25% by 2020 at measurable levels from 1990. This is included with the statewide performance measure efforts and the evaluation criteria for TIP projects. A collective effort by all agencies to track and measure the reduction of GHG emissions will ultimately help achieve this goal.

SRPEDD staff continues to track these measures through efforts with the Signalized Intersection Database. Previous RTPs included the identification and evaluation of antiquated traffic signal systems throughout the region that operate under a pre-timed setting. This measure identifies and recommends new, more sophisticated signal equipment with actuation, preemptive capabilities for emergency vehicles and generally capable of moving traffic efficiently while reducing vehicle delay.

The 28 intersections summarized in Table C-4 are located primarily in the urban communities where signal updates may be appropriate. A pre-timed signal is different from an actuated

signal where the pre-timed signal has a fixed sequence and time allocated to each phase with no detectors and gap counters. No phases are skipped, regardless of the vehicles or pedestrians present at the intersection approaches. Pre-timed signals are common in downtown areas and in certain cases, have existed for long periods of time. The pre-timed signal does not adjust to the demand of traffic and does not effectively accommodate varying traffic patterns. During off peak hours when traffic volumes are typically low, pre-timed signals add unnecessary delay and can encourage red light running. Furthermore, these added delays also generate unnecessary GHG emissions that are better managed by actuated or adaptive signal controls. SRPEDD intends to examine and analyze these types of signal system with consideration and recommendations for improvement. Funding for this undertaking is currently programmed in the SMMPO's FFY2020 UPWP in the Management Systems task.

Table C-4: Pre-timed Traffic Signals

Municipality	Intersection
Fall River	Broadway / Middle St.
Fall River	Eastern Ave. / Pleasant St.
Fall River	Globe St. / South Main St. / Broadway
Fall River	Mariano Bishop Blvd. / Newton St.
Fall River	Mariano Bishop Blvd. / William S. Canning Blvd.
Fall River	Pleasant St. / Seneca Dr. / Troy St.
Fall River	President Ave. / Davol St. North (2 intersections)
Fall River	President Ave. / Davol St. South (2 intersections)
Fall River	President Ave. / North Main St.
Fall River	President Ave. / Robeson St.
Fall River	South Main St. / Dwelly St.
Fall River	South Main St. / King Philip St.
Fall River	South Main St. / Middle St.
Fall River	South Main St. / Pocasset St. / Sullivan
Fall River	Sullivan St. / 3rd St.
New Bedford	Acushnet Ave. / Nash Rd.
New Bedford	Acushnet Ave. / Sawyer St.
New Bedford	Acushnet Ave. / Tarkiln Hill Rd.
New Bedford	Ashley Blvd. / Deane St.
New Bedford	Ashley Blvd. / Nash Rd.
New Bedford	Ashley Blvd. / Tarkiln Hill Rd.
New Bedford	Belleville Ave. / Coggeshall St.
New Bedford	County St. / Union St.

Municipality	Intersection
New Bedford	Dartmouth St. / Rockdale Ave.
New Bedford	Union St. / Pleasant St.
New Bedford	Union St. / Sixth St.
Taunton	Winthrop St. (Route 44) / High St.
Taunton	Winthrop St. (Route 44) / Highland St.

This Regional Transportation Plan recommends the following in order to reduce congestion and improve air quality in the region:

C-1: Continue to develop planning and operational traffic database, using the evaluation criteria process to prioritize and support the design and construction of all planned congestion mitigation projects in the region.

C-2: Encourage MassDOT and local communities to begin the design of those congestion mitigation projects currently awaiting action.

C-3: Continue to offer assistance to communities with access management issues. Access management issues exist along several corridors in the SMMPO region. Commercial corridors with multiple retail driveways are especially problematic. These corridors could greatly benefit from driveway consolidation and new frontage roads linking adjacent developments. The Route 1 corridor in Attleboro/North Attleborough, Route 6 in Swansea and Seekonk, and Route 44 in Raynham are examples of corridors with poor access management. Multiple curb cuts and driveways with unprotected left-turning movements are all issues along these corridors.

C-4: Continue to support development of real-time driver information through traffic cameras, congestion mapping and Variable Message Boards (VMB) accessible by the general public. Innovative techniques for congestion mapping include on-road radars that measure average vehicle speed, copper loops that measure percentage of time cars are over each loop, and tracking of cell phone location data through various smart phone applications. Overall, this continued development of technology will assist in congestion relief by providing motorists advanced warning of congestion or emergency situations, enabling them to choose alternate routes.

C-5: The SMMPO should consider study of ITS Technologies for the development, promotion and implementation of Electric Vehicle charging stations at parking facilities to help in addressing air quality issues associated with traffic congestion. Funding for this undertaking will be considered in the future through the SMMPO's UPWP in the Intermodal Project Coordination, Freight Movement & Intelligent Transportation Systems (ITS) task. Current charging stations are listed in Table C-5.

Table C-5: Southeastern Massachusetts electric fueling stations

Name	Address	Community
Colonial Honda of Dartmouth	225 State Rd.	Dartmouth
Brazilian Grill	464 State Rd.	Dartmouth
DCM Complex	107-199 Third St.	Fall River
DCM Complex	10 Lewiston St.	Fall River
Massachusetts DEP-SE Region Main Office	20 Riverside Dr.	Lakeville
Monogram Res	792 West St.	Mansfield
Mansfield Crossing-Tesla Supercharger	280 School St.	Mansfield
Mastria Nissan	1305 New State HWY	Raynham
Mastria VW	1619 New State HWY	Raynham
Depuy Synthes	325 Paramount Dr.	Raynham
Chili's	107 Taunton St.	Plainville
Station 1	111 South St.	Plainville
Nissan Village of North Attleboro	685 S Washington St.	North Attleborough
Emerald Square Mall	999 S Washington St.	North Attleborough
Public Infrastructure Lot	1105 Shawmut Ave.	New Bedford
New Bedford Neighborhoods Center	360 Coggeshall St.	New Bedford
Parker Street Lot	256 Parker St.	New Bedford
Black Whale Seafood	106 Co Op Wharf	New Bedford
Elm Street Parking Garage	51 Elm St.	New Bedford
Zeiterion Garage	684 Purchase St.	New Bedford
Plainridge Park Casino	301 Washington St .	Plainville
National Grid	107 Taunton St.	Plainville
Westport Town Hall	816 Main Rd.	Westport

C-6: Implementation of GPS/AVL systems within the region's transit authorities will help track vehicles and provide for opportunities to track congestion in addition to

providing an important service during evacuations during emergencies.

C-7: Identify commonly congested corridors that inhibit fixed route transit services from meeting their on-time performance. Encourage the implementation and use of new technologies that extend the green time of signals to allow public transit buses and help maintain their scheduled stops.

C-8: Encourage local communities to concentrate development in Priority Development Areas as identified in SRPEDD's Smart Growth Scenario, while protecting open space in identified in Priority Protection Areas. This concentration of development will help to reduce vehicle miles traveled and support Commuter Rail extensions into the region.