Appendix D: Safety Management

Safety is considered the foremost element of a project's importance in the SMMPO region. SRPEDD considers safety problems to be pre-existing conditions that merit maximum consideration for corrective measures. Unfortunately, the majority of traffic crashes are caused by driver error. Driver error can be influenced by inadequate road design or ineffective traffic controls. One of the tasks of transportation officials is to identify locations where crashes occur in excessive numbers and investigate their causes. Further study can give us a clearer understanding of the reasons for frequent crashes. With sufficient data it is possible to determine if the transportation network, its design, condition, traffic controls, etc. are contributing factors. Remedial steps can then be taken to correct the problem. Physical improvements to a roadway, traffic control devices or increased police enforcement can improve the safety of our region's roads.

Too often, modifications made to local roads and intersections are based on public pressure as motorists involved in crashes demand that local officials implement modifications such as multi-way stop control, speed limit changes, crosswalks, pavement markings, etc. to address a perceived problem. In some instances, the suggested modification does not address the problem and can actually worsen it. Sometimes those suggestions are implemented without regard to appropriate engineering standards. Local and state officials must listen to the general public's opinion on traffic safety issues, but ultimately, decisions on improvements must be made with sound engineering judgment. This will ensure that recommended improvements will be successful to improve a problem, instead of worsening it.

Massachusetts Strategic Highway Safety Plan (SHSP)

Also known as the Commonwealth's roadway action plan the Strategic Highway Safety Plan (SHSP) is a policy document required by the Federal Highway Administration to unlock federal funds for safety improvements. It is required under the Highway Safety Improvement Program and must be updated at a minimum every 5 years. The latest update was completed in 2018.

The 2018 SHSP proposes both interim goals and aggressive policy and legislative interventions to assist in the Commonwealth's long range goal of zero deaths. Interim goals for 2022 include reducing the 5- year average fatalities by 12% and the 5-year average serious injury crashes by 21%.

Under the plan proposed legislative measures / high leverage policies include:

● Hands Free: Would allow police to stop and issue citations to motorists using mobile electronic devices.

● Primary Seat Belt: Would enable law enforcement to stop motorists who appear to not be wearing seatbelts.

● Work Zone Safety: Would enable variable speed limits in work zones and increase penalties for motorists who strike roadway workers.

● Ignition Interlock for All Offenders: Would statutorily allow judges to order ignition interlock devices for first time Operating Under the Influence offenders.

● Truck Side Guards: Would require that trucks registered in Massachusetts, meeting certain criteria, have side guards.

● Automated Enforcement: Would give municipalities "opt in" authority to issue citations through the use of cameras and radar technology.

These specific measures / policies were selected to address the high occurrence of interconnected crashes such as speeding, driver distraction, and impaired driving. SRPEDD staff continues to be an active participant in this process by identifying hazardous locations and pursuing corrective measures to address safety problems throughout southeastern Massachusetts.

Previous Experience

Since 1988 SRPEDD has been identifying the most dangerous intersections in Southeastern Massachusetts. We regularly publish a listing of the 100 most dangerous intersections in our region. Our latest list covers 2014-2016 (see Table D-1).

Table D-1: Intersections 2014-2016

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
1	New Bedford	Kempton St. (Rte. 6)	Route 140/Brownell Ave.	78	78.0
2	Raynham	New State Hwy. (Rte. 44)	Orchard St.	80	57.3
3	Middleborough	Route 44	Plympton St. (Rte. 105)	63	49.0
4	Swansea	GAR Highway (Rte. 6)	J. Reynolds Rd./Market St.(Rte. 136)	60	45.3
5	Fall River	Plymouth Ave.	Rodman St.	53	40.3
6	Somerset	GAR Highway (Rte. 6)	Brayton Ave.	43	39.7
7	Taunton	County St. (Rte. 140)	Hart St.	55	38.3
8	Swansea	GAR Highway (Rte. 6)	Swansea Mall Dr. (Rte. 118)	54	38.0
9	Fall River	Bedford St.	Troy/High St.	42	36.7
10	Seekonk	Fall River Ave. (Rte. 114A)	Taunton Ave. (Rte. 44)	53	36.3
11	Attleboro	Washington St. (Rte. 1)	Highland Ave. (Rte. 123)	59	35.7
12	Mansfield	Route 140	School St.	59	35.7
13	Somerset	GAR Highway (Rte. 6)	Lees River Ave.	40	34.7
14	Taunton	Williams St.	Gordon Owen Riverway	35	34.3
15	Middleborough	East/West Grove St. (Rte. 28)	South Main St. (Rte. 105)	48	33.3
16	Mansfield	Chauncy St. (Rte. 106)	N. Main St.	45	32.3
17	Mansfield	Chauncy St. (Rte. 106)	Copeland Dr.	42	31.3
18	Raynham	New State Hwy. (Rte. 44)	Shaw's Plaza (#270-350)	40	30.7

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
19	Fall River	President Ave. (Rte. 6)	Highland Ave.	43	30.3
20	Mansfield	Chauncy St. (Rte. 106)	Rte. 140	43	29.0
21	Swansea	GAR Highway (Rte. 6)	Maple Ave.	31	29.0
22	N. Attleborough	E. Washington St. (Rte. 1)	Chestnut St.	40	28.0
23	New Bedford	Mount Pleasant St.	Nash Rd.	28	28.0
24	New Bedford	JFK Highway (Rte. 18)	Elm St.	34	27.7
25	New Bedford	Acushnet Av/JFK Hwy NB (Rte. 18)	Coggeshall St.	26	27.3
26	New Bedford	Kempton St. (Rte. 6)	Rockdale Ave.	35	26.3
27	Raynham	Broadway (Rte. 138)	Carver St.	27	26.3
28	Seekonk	Fall River Ave. (Rte. 114A)	Arcade Ave. / Mill (Grist Mill)	43	26.3
29	Taunton	Broadway (Rte 138)	East Britannia St.	34	26.0
30	Taunton	Washington St.	East Britannia St.	37	25.7
31	New Bedford	JFK Highway (Rte. 18)	Potomska St.	32	25.3
32	Taunton	Broadway (Rte. 138)	Washington St.	27	25.3
33	Middleborough	Route 44	Plymouth St.	39	25.0
34	Somerset	GAR Highway (Rte. 6)	Brayton Point Rd.	34	24.7
35	Swansea	GAR Highway (Rte. 6)	Gardners Neck Rd.	38	24.7
36	Fall River	President Ave. (Rte. 6)	Davol St. (NB & SB)	29	24.3

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
37	Fairhaven	Bridge St.	Alden Rd.	39	23.7
38	Rehoboth	Winthrop St. (Rte. 44)	Anawan/Bay State (Rte. 118)	38	23.3
39	Seekonk	Fall River Ave. (Rte. 6)	Mink St. (Rte. 114A)/Sam's Club	44	22.7
40	Seekonk	Taunton Ave. (Rte. 44)	Lincoln Ave.	28	22.7
41	Taunton	Dean St. (Rte. 44)	Longmeadow/Gordon Owen Riverway	28	22.7
42	Attleboro	Pleasant St. (Rte. 123)	Emory St.	27	22.3
43	Fairhaven	Bridge St.	Route 240	39	22.3
44	Fall River	Bedford St.	Rock/Third St.	27	22.3
45	New Bedford	Brock Ave./Cove Rd.	Rodney French Blvd.	31	22.3
46	Raynham	New State Hwy. (Rte. 44)	South St. West	39	22.3
47	Seekonk	Taunton Ave. (Rte. 44)	Arcade Ave.	43	22.3
48	Fall River	Davol St.	Central St.	24	21.3
49	N. Attleborough	S. Washington St. (Rte. 1)	Allen Ave/Emerald Sq. Mall	36	21.3
50	Seekonk	Fall River Ave. (Rte. 114A)	County St.	43	21.0
51	N. Attleborough	S.& E. Washington St. (Rte. 1/1A)	Hoppin Hill Rd. (Rte. 120)	33	20.3
52	New Bedford	Hathaway Rd.	Shawmut Ave.	25	20.3
53	Taunton	Washington St. / Oak St.	Tremont St. (Rte. 140)	21	20.3
54	Wareham	Cranberry Hwy. WB (Rte. 6 & 28)	Glen Charlie Rd./Depot St.	29	20.3
55	Attleboro	N. Main St. (Rte. 152)	Toner Blvd.	28	20.0

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
56	New Bedford	Union St.	Pleasant St.	19	19.7
57	Lakeville	Bedford St. (Rte. 18)	Rhode Island Rd. (Rte. 79)	30	19.3
58	New Bedford	Ashley Blvd.	Wood St.	18	19.3
59	Attleboro	N. Main St. (Rte. 152)	Holden St.	24	19.0
60	New Bedford	Ashley Blvd./JFK Hwy SB (Rte. 18)	Coggeshall St.	24	19.0
61	Taunton	Summer St. (Rte. 140)	Spring/Church Green	21	19.0
62	Dartmouth	State Rd. (Rte. 6)	Slocum Rd.	24	18.7
63	Fall River	Pleasant St.	Quarry/County St.	35	18.3
64	Lakeville	Bedford St. (Rte. 18)	Main/Precinct (Rte. 105)	31	18.3
65	New Bedford	Church St.	Park Ave.	27	18.3
66	New Bedford	Church St.	Nash Rd.	19	18.3
67	New Bedford	JFK Highway (Rte. 18)	Union St./MacArthur Dr.	31	18.3
68	Attleboro	County St. (Rte. 123)	Thacher St.	34	18.0
69	Fairhaven	Main St.	Howland Rd.	30	18.0
70	Fall River	President Ave. (Rte. 6)	Robeson St.	18	18.0
71	New Bedford	Rockdale Ave.	Hawthorn St.	22	18.0
72	Taunton	School St.	Purchase/Arlington St.	22	18.0
73	Attleboro	Washington St. (Rte. 1)	May St.	29	17.7
74	Plainville	Washington St. (Rte. 1)	Taunton St. (Rte. 152)	33	17.7
75	Swansea	Bark St.	Stevens St./Buffington St.	17	17.7

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
76	Attleboro	Pleasant St. (Rte. 123)	Peck St.	32	17.3
77	New Bedford	Belleville Ave.	Coggeshall St.	24	17.3
78	Plainville	Taunton St. (Rte. 152)	Messenger St. (Rte. 106)	40	17.3
79	Fall River	Broadway	Bradford Ave.	23	17.0
80	New Bedford	County St.	Mill St.	27	17.0
81	Raynham	Broadway (Rte. 138)	King Phillip St.	19	17.0
82	Seekonk	Fall River Ave. (Rte. 6)	Commerce Way/Seekonk Sq.	31	17.0
83	Attleboro	O'Neil Blvd.	Dunham St.	18	16.7
84	Somerset	GAR Highway (Rte. 6)	Stop & Shop (#815-887)	26	16.7
85	Taunton	Longmeadow / Winter	School St. / Floral St.	18	16.7
86	Fall River	Eastern Ave. (Rte. 6)	County St.	17	16.3
87	Fall River	Eastern Ave./Brayton Ave.	Martine/DeValle	17	16.3
88	Plainville	South St. (Rte. 1A)	E.& W. Bacon St. (Rte. 106)	13	16.3
89	Fall River	Rodman St.	Second St.	24	16.0
90	Somerset	County/Riverside (Rte. 138)	Read/Riverside	24	16.0
91	Taunton	Washington St.	Jackson St.	20	16.0
92	Fairhaven	Huttleston Ave. (Rte. 6)	Alden Rd.	23	15.7
93	Fairhaven	Huttleston Ave. (Rte. 6)	Sconticut Neck/Rte. 240	23	15.7
94	Attleboro	Newport Ave. (Rte. 1A)	Carelton/Pitas	21	15.0
95	Dartmouth	State Rd. (Rte. 6)	Hathaway Rd.	21	15.0

Rank	City/Town	Intersection		2014-2016 Total Crashes	2014-2016 EPDO
96	Somerset	Brayton Ave.	Read St.	17	15.0
97	Attleboro	Newport Ave. (Rte. 1A)	Highland Ave. (Rte. 123)	20	14.7
98	Fairhaven	Huttleston Ave. (Rte. 6)	Bridge St.	16	14.7
99	Mansfield	Chauncy St. (Rte. 106)	Forbes Blvd.	20	14.7
100	Somerset	Wilbur Ave.	Brayton Point Rd.	24	14.7

Our efforts in identifying the most dangerous crash locations in our region has led to an ongoing cooperative relationship between SRPEDD and state and local officials, including local police. This has led to our involvement in conducting detailed studies to determine specific causes and potential solutions to the many of the safety problems in the region.

Since 2007, FHWA has encouraged Road Safety Audits (RSA's) for reviewing safety problems leading to and implementation of corrective measures. A road safety audit the identification is a formal evaluation of a roadway or intersection by an independent, multidisciplinary team, to determine specific causes and identify possible solutions to safety problems. SRPEDD has participated in audits conducted by MassDOT, as well as conducting our own audits with MassDOT participation. In addition, SRPEDD considers safety in other types of studies (signal warrants analyses, congestion studies, corridor studies, etc.). Since our last Transportation Plan, SRPEDD has participated in the following road safety audits / safety studies listed in Table D-2 below:

Table D-2: Safety Audits Performed in the SMMPO region 2016 – 2018

Town	Location	Date
Attleboro	Washington Street (Rte. 1) at Mendon Road	June 11, 2018
Attleboro	Washington Street (Rte. 1) at Scott Street	June 11, 2018
Attleboro	Washington Street (Rte. 1) at Como Drive	March 7, 2016
Carver	Route 58 at Plymouth Street	April 23, 2018
Dartmouth	Route 6 Corridor	September 20, 2016

Town	Location	Date
Fall River	President Ave (Rte. 6) at North Davol St & North Main Street at Pearce Street	April 9, 2018
Fall River	South Main Street (Dwelly Street to Slade Street)	February 14, 2017
Lakeville	Rhode Island Road (Rte. 79) at Bedford Street (Rte. 18)	December 1, 2016
Mansfield	Chauncy Street (Rte. 140) & School Street	March 6, 2017
Marion	Wareham Road (Rte. 6) at Spring Street/Wells Road, and Front Street	January 3, 2018
Middleborough	Route 44 at Plympton Street (Rte. 105)	April 17, 2018
Middleborough	South Main Street (Rte. 105) at W. Grove Street/E. Grove Street (Rte. 28) and Prospect Street	April 4, 2018
New Bedford	County Street	January 4, 2017
New Bedford	Rockdale Avenue at Allen Street	January 4, 2017
North Attleborough	South Washington Street (Rte. 1) at Old Post Road	June 22, 2018
North Attleborough	South Washington Street (Rte. 1) at I-295 Interchange	June 22, 2018
North Attleborough	East Washington Street (Rte. 1) at Royal Park Apartment North Entrance	June 20, 2018
North Attleborough	East Washington Street (Rte. 1) at Elm Street	June 20, 2018
North Attleborough	Route 1 at Route 1A and Elmwood Street	June 20, 2018
North Attleborough	North Attleborough (Rte. 1) at 3 locations	August 2, 2017
Norton	East Main Street (Rte. 123) at Route I-495 Northbound & Southbound Ramps	March 31, 2016
Plainville	South Street (Rte. 1A) at East Bacon Street (Rte. 106) and West Bacon Street	February 12, 2018
Raynham	Route 138 at Carver Street & Elm Street	October 27, 2017
Rehoboth	Route 44 at Route 118	April 25, 2018
Seekonk	Taunton Avenue (Rte. 44) at Lincoln Street	December 11, 2017
Seekonk	Taunton Avenue (Rte. 44) at Arcade Avenue	December 11, 2017

Town	Location	Date
Seekonk	Taunton Avenue (Rte. 44) at Fall River Avenue (Route 114A)	December 11, 2017
Seekonk	Fall River Avenue (Rte. 114A / Rte. 6) from I-195 EB Ramps to Commerce Way	November 3, 2016
Somerset	Grand Army of the Republic Highway (Rte. 6) at Brayton Point Road	September 11, 2018
Swansea	Grand Army of the Republic Highway (Rte. 6) at Swansea Mall Drive and Maple Avenue	March 15, 2017
Swansea	Grand Army of the Republic Highway (Rte. 6) at Gardners Neck Road	December 5, 2016
Swansea	Grand Army of the Republic Highway (Rte. 6) at Market Street (Rte. 136) & James Reynolds Road (Rte. 136) at I-195 EB Off ramp	October 31, 2016
Taunton	County Street (Rte. 140) between Mozzone Blvd and the BPRT School Driveway	August 20, 2018
Taunton	Dean Street (Rte. 44) at Longmeadow Road / Honorable Gordon M. Owen Riverway	February 22, 2018

High Crash Locations

SRPEDD regularly compiles crash data to determine the most dangerous intersections, corridors, highway interchanges, etc. in southeastern Massachusetts. This is accomplished using the statewide database provided by MassDOT. A separate publication of the most dangerous locations in the region is prepared to inform federal, state, and local officials, as well as the general public. This information is the basis for our safety planning efforts between Transportation Plan updates and is an important tool in initiating and prioritizing projects for inclusion in the Transportation Improvement Program (TIP).

Intersections

Intersection data is used to calculate two separate crash rates: the Equivalent Property Damage Only index (EPDO) and the Accidents per Million Entering Vehicles rate (ACC/MEV).

The EPDO index allows intersections to be ranked based on the severity of collisions. Greater importance is given to crashes in which injuries or fatalities have occurred. A point system is applied to each crash: one point for a crash involving vehicular property

damage only; five points for a crash that involved one or more personal injuries; and ten points for a crash in which a fatality occurred. The resulting EPDO index is a ranking of crashes based on severity in terms of human suffering and personal cost. In southeastern Massachusetts, an intersection whose EPDO is at or exceeds 14.7 is considered a priority.

ACC/MEV rate is based on traffic volume. It allows us to compare intersections with different traffic characteristics, ultimately providing a probability of being in a collision at a given intersection; the higher the rate, the greater the danger. MassDOT annually publishes the average ACC/MEV rates for each district throughout the state. The average ACC/MEV rates for southeastern Massachusetts are currently 0.75 for signalized intersections and 0.57 for unsignalized intersections. An intersection whose ACC/MEV rate is at or exceeds the regional average is considered a problem in the SMMPO region.

Identified problematic intersections require a thorough analysis / safety audit that, leading to the identification and implementation of corrective measures to address deficiencies, for those intersections that have not been previously studied. Safety audits should include a thorough examination of crash data as well as the operational characteristics of each intersection to identify short and long term measures leading to implementation.

Such measures could include:

Signal Systems Modifications – such as: signal phasing/timing modifications; add protected left-turn phase; improve visibility of signal heads, etc.

Geometric Improvements – such as: install/extend exclusive left-turn or right-turn lanes; install raised median or refuge islands; convert intersection to a roundabout, etc.

Sign & Pavement Marking Improvements – such as: install advance warning signs; install and maintain appropriate lane markings (including center and edge lines); add supplementary warning messages marked on the pavement, etc.

Operational Improvements – such as: convert a 2-way stop control intersection to an all-way or signal control (based on stop warrants analysis); install cameras to detect red-light running (pending legislative approval); and install pedestrian crossings, etc.

Regulatory Improvements – such as: permit/prohibit right-turn-on-red; prohibit and install no left-turn and no U-turn signs; restrict parking near intersections, etc.

Rotaries - There are four rotaries in the SMMPO region; the Eastern Avenue Rotary and Airport Road Rotaries, (Fall River); the Middleborough Rotary (Routes 44/18/28, Middleborough), and the Taunton Green, a square configuration operating as a rotary (Taunton).

Rotaries were popular many years ago to accommodate large volumes of traffic. Unfortunately, traffic growth has made many of them ineffective, especially where heavy traffic volumes conflict with a design intended to accommodate speed. Most rotaries in the SMMPO region have a large layout, accommodating two lanes of travel side-by-side resulting in numerous conflict points due to the large number of merging/diverging vehicles. The Middleborough Rotary is a prime example. This large rotary has five state highway access/egress roads. During off peak periods, motorists enter, circulate and leave the rotary at speeds much too fast for safe operations. This rotary had 197 reported crashes during 2014-16, an increase of 13% (23) from the previous 20010-2012 crash analysis period.

Each Rotary listed in table D-3, shows the number of connecting roadways and the total number of crashes from 2014-2016.

Table D-3: Rotary Crashes 2014 – 2016

City / Town	Location	# Connecting Roadways	Total Crashes 2014-2016
Fall River	Eastern Avenue and President Avenue Rotary	3	26
Fall River	Airport Rotary @ North Main Street / Route 24 SB On-Off Ramps	4	11
Middleborough	Middleborough Rotary	5	197
Taunton	Taunton Green	7	71

Prior to consideration of improvements an examination of each rotary is needed to identify measures to improve safety and efficiency. Such measures could include:
Conversion to a modern roundabout - Unlike the traditional rotary, the modern roundabout is intended to slow traffic flow to a safer speed for entering, circulating and exiting motorists.

Eliminate or replace rotary - A redesign to either replace the existing rotary with safer intersecting roadways (through signalized and un-signalized intersections) or with by-pass roads and/or fly-overs to remove conflicting movements.

The following rotaries have improvement projects recommended in various stages of development:

Middleborough Circle, Middleborough - Over the years, the Middleborough rotary has been the focus of many discussions in reference to its congestion and safety issues. In 2014, the Massachusetts Department of Transportation (MassDOT) and the town of Middleborough came to a consensus on the best alternative. The proposed project will replace the existing rotary with a modern roundabout, including a flyover for Route 44. Route 44 will bridge the new roundabout with improved ramp access to Interstate 495 northbound. Local traffic on Routes 18 and 28 will pass through the new roundabout and have access to Route 44. The project is estimated at $55 million. The project will assist in generating economic development in the surrounding area. It is considered a project of regional significance and therefore has a commitment from the SRPEDD Joint Transportation Planning Group (JTPG) of one full year of Transportation Improvement Program (TIP) target funding.

Since the long term solution is years away MassDOT recently completed interim improvements at the rotary in 2018. Interim improvements included: striping of the rotary to a 2-lane facility; new signage; and geometric improvements at the access/egress points to/from the rotary. Since completion of the improvements there has positive feedback identifying a decrease in congestion. A thorough crash analysis should be conducted post improvements to determine effectiveness on safety issues.

Taunton Green, Taunton - Traffic flow through the Taunton Central Business District was studied in 2002. The study focused on the Taunton Green (square) rotary. The Green has a long history of traffic congestion and safety issues. The study suggested consideration for expanding the one-way loop around the back of Post Office Square. The expanded loop could improve traffic flow around the CBD by preventing queues from blocking other movements, extending the length of roadway to accommodate lane changes, reduce congestion at the intersections, and provide a more orderly flow of traffic through the downtown.

At the time, city officials did not express a desire to pursue the long-term recommendations. Although the recommendations remain viable, the Regional Transportation Plan cannot recommend this project until the City of Taunton fully supports it or any other viable alternative.

Recently the city of Taunton has implemented traffic modifications between the intersections of Taunton Green / Weir St (138) / Main St and Main Street / School Street.

These changes included raised islands for traffic mitigation and travel lanes designations at the Taunton Green approach at Weir Street.

Highway Interchanges - There are a total of 66 numbered interchanges along the region's major limited access highways (Interstates 95, 195, 295 and 495; and Routes 24, 25, 79 and 140). The variety of geometric configurations at these interchanges make them difficult to compare (for example, a full cloverleaf configuration with no intersections, versus interchanges with at-grade intersections).

Table D-4 displays 59 of the region's interchanges where injury and fatal crashes accounted for 30% or greater of all the crashes at the interchange.

Table D-4: Highway Interchanges Identified as Safety Problems 2014 – 2016

City/Town	Highway Interchange		2014-2016 Total Crashes	2014-2016 Injury & Fatal Crashes	% of Total Injury & Fatal Crashes
Attleboro	Interstate 95S (Exit 5)	Robert Toner Boulevard	11	5	45%
Attleboro	Interstate 95N (Exit 4)	Interstate 295	18	7	39%
Attleboro	Interstate 95 N (Exit 2)	Newport Avenue (Rte. 1A)	71	26	37%
Attleboro	Interstate 95 S (Exit 1)	Washington Street (Rte. 1)	20	7	35%
Attleboro	Interstate 195 N (Exit 2)	Interstate 95	44	14	32%
Attleboro	Interstate 95 S (Exit 3)	South Street (Rte. 123)	48	15	31%
Attleboro	Interstate 95 N (Exit 3)	South Street (Rte. 123)	71	22	31%
Dartmouth	Interstate 195 W (Exit 12)	Faunce Corner Road	62	27	44%
Dartmouth	Interstate 195 E (Exit 12)	Faunce Corner Road	79	29	37%

City/Town	Highway Interchange		2014-2016 Total Crashes	2014-2016 Injury & Fatal Crashes	% of Total Injury & Fatal Crashes
Fall River	Route 24 S (Exit 1)	William S. Canning Blvd.	13	6	46%
Fall River	Route 24 N (Exit 1)	William S. Canning Blvd.	20	8	40%
Fall River	Route 24 N (Exit 8)	Industrial Park Road	63	24	38%
Fall River	Route 24 N (Exit 2)	Brayton Avenue	43	16	37%
Fall River	Route 24 S (Exit 8)	North Main Street	46	17	37%
Fall River	Interstate 195 W (Exit 7)	Plymouth Avenue	69	24	35%
Fall River	Route 24 S (Exit 2)	Brayton Avenue	15	5	33%
Fall River	Interstate 195 E (Exit 6 & 7)	Plymouth Avenue/ Hartwell Street	55	18	33%
Fall River	Route 24 S (Exit 5)	Route 6	43	14	33%
Fall River	Route 24 N (Exit 5)	Route 6	19	6	32%
Fall River	Route 79	Route 24 N	10	3	30%
Fall River	Interstate 195 E (Exit 8)	Route 24	60	18	30%
Fall River	Interstate 195 W (Exit 8)	Route 24	47	14	30%
Lakeville	Route 140 S (Exit 9)	County Street	25	11	44%
Lakeville	Route 140 N (Exit 9)	County Street	24	8	33%
Mansfield	Interstate 95 N (Exit 6)	Interstate 495	66	22	33%

City/Town	Highway Interchange		2014-2016 Total Crashes	2014-2016 Injury & Fatal Crashes	% of Total Injury & Fatal Crashes
Mansfield	Interstate 95 S (Exit 6)	Interstate 495	50	16	32%
Mansfield	Interstate 495 N (Exit 13)	Interstate 95	45	14	31%
Middleborough	Interstate 495 S (Exit 5)	Route 18/Bedford St.	19	6	32%
New Bedford	Route 140 N (Exit 4)	Kings Highway	21	14	67%
New Bedford	Route 140 S (Exit 5)	Phillips Road	18	9	50%
New Bedford	Route 140 S (Exit 4)	Mount Pleasant Street	16	8	50%
New Bedford	Interstate 195 E (Exit 15)	Route 18	13	6	46%
New Bedford	Interstate 195 W (Exit 17)	Coggeshall Street	19	7	37%
New Bedford	Route 140 S (Exit 7)	Barley Road	15	5	33%
New Bedford	Route 140 N (Exit 3)	Hathaway Road	18	6	33%
New Bedford	Interstate 195 W (Exit 13)	Route 140	38	12	32%
New Bedford	Interstate 195 E (Exit 13)	Route 140	48	15	31%
New Bedford	Route 140 N (Exit 5)	Phillips Road	13	4	31%
New Bedford	Route 140 N (Exit 2)	Interstate 195	23	7	30%
North Attleborough	Interstate 95 S (Exit 5)	Robert Toner Boulevard	90	28	31%
Raynham	Route 24 N (Exit 14)	Interstate 495	22	9	41%

City/Town	Highway Interchange		2014-2016 Total Crashes	2014-2016 Injury & Fatal Crashes	% of Total Injury & Fatal Crashes
Raynham	Interstate 495 N (Exit 7)	Route 24	20	7	35%
Raynham	Interstate 495 N (Exit 8)	Route 138/Broadway	29	10	34%
Seekonk	Interstate 195 E (Exit 1)	Route 114A/Fall River Avenue	86	26	30%
Somerset	Interstate 195 W (Exit 4)	Route 103/Wilbur Avenue	77	29	38%
Somerset	Interstate 195 E (Exit 4)	Lees River Avenue	75	27	36%
Swansea	Interstate 195 E (Exit 3)	Route 6/Grand Army of the Republic Highway	83	30	36%
Swansea	Interstate 195 W (Exit 3)	Route 6/Grand Army of the Republic Highway	61	22	36%
Swansea	Interstate 195 W (Exit 2)	Route 136/James Reynolds Road	36	11	31%
Taunton	Route 140 S (Exit 12)	Route 24	14	6	43%
Taunton	Interstate 495 N (Exit 9)	Bay Street	19	7	37%
Taunton	Route 140 N (Exit 11)	Stevens Street	35	12	34%
Wareham	Interstate 495 S (Exit 1)	Interstate 195	11	6	55%
Wareham	Route 25 W (Exit 2)	Glen Charlie Road	14	7	50%
Wareham	Interstate 195 W (Exit 21)	Route 28/Cranberry Highway	23	9	39%
Wareham	Interstate 495 N (Exit 2)	Route 58	38	12	32%
Wareham	Route 25 E (Exit 2)	Maple Springs Road	35	11	31%

City/Town	Highway Interchange		2014-2016 Total Crashes	2014-2016 Injury & Fatal Crashes	% of Total Injury & Fatal Crashes
Wareham	Route 25 N (Exit 1)	Interstate 195	16	5	31%
Wareham	Interstate 195 E (Exit 21)	Route 28/Cranberry Highway	27	8	30%

Roadways (Commercial Corridors) – There can be many contributing factors to safety issues along roadways. These issues are attributed to poor access management along dense commercial corridors with excessive curb-cuts, the existence of one or two dangerous intersections or driveways or ineffective road design such as dangerous curves which can lead to lane departure crashes (discussed in the following section). Proper access management would alleviate many of these issues.

Inadequate drive-thru facility design and storage capacity (such as at coffee shops or fast food restaurants) can create safety issues along our roadways. Frequently, drive-thru bays are not long enough to accommodate the large volume of vehicles that wish to access the facility, especially during peak periods. This situation causes spill over of the queue into the adjacent roadway. This is especially unsafe along roadways with high volumes and speeds where motorists do not anticipate the need to stop.

Corrective measures to address access issues include shared driveways; proper spacing of adjacent curb cuts, proper alignment of opposing driveways, etc.

Implementation of Access Management Techniques - Access management utilizes zoning regulations and engineering design standards to provide safety and efficiency of traffic flow along commercial corridors. Zoning ordinances and engineering design are intended to separate or limit the number of conflict points along a roadway. The need for access management is clearly illustrated by the miles of strip commercial development often found along major arterial roadways such as Route 1 and Route 6 in the region. Turning movements, especially left turns to and from parking areas, interrupts traffic flow and increases the potential for collisions. Access management provides a cost effective alternative to the expensive, time consuming and socially disruptive roadway reconstruction or relocation projects.

Many of the traffic congestion and safety problems on our arterial network are caused by poorly designed and uncoordinated curb cuts. Community officials are often unaware of the authority granted by state statute to regulate curb cuts onto the road network.

Amendments to M.L., Chapter 81, Section 21 (the Highway Access statute) strengthened the authority of the Massachusetts Department of Transportation (MassDOT) to regulate access onto state highways. MassDOT, with this statute, has the ability to include regulation of access driveways on adjacent local streets that will impact a state highway. Local officials have the ability to comment on and object to MassDOT decisions on driveways on the grounds of safety. If the MassDOT accepts the safety claim, the permit cannot be issued. A community can have further influence on access along a state highway by increasing the minimum lot frontage in its zoning by-laws.

Local officials have the power to regulate access on roads other than state highways. It is their responsibility to make sure that proper access management is considered in the project development stage, even though often times they are reluctant to do so in fear of losing economic development and local tax revenue. Addressing these issues during the planning process eliminates the need to use state funding on a problem that could have been prevented with good sound planning.

The Home Rule Amendment and the Home Rule Procedure Act (M.G.L., Chapter 43B, Section 13) give municipalities the ability to exercise any power which "the General Court has the power to confer upon it..." as long as the power is not inconsistent with the constitution or state law or which is not denied to the municipality by its charter.

Several methods can be used to regulate access to local roads. An access ordinance can provide standards and review requirements for access location, spacing and design. Grouping streets by functional classifications and land use activities provides guidance on access standards. An ordinance can be as general or specific as the community desires, but it should grant authority to a municipal body such as the planning board or perhaps the highway superintendent.

The following basic by-law, found in Massachusetts General Law Chapter 81 Section 21, can be adopted to establish the local power to regulate curb cuts:

"Any person who builds or expands a business, residential, or other facility intending to utilize an existing or new access to an Arterial/Collector/Local roadway, other than a state highway location, shall be required to obtain a permit from the City/Town Department of Public Works under this section before constructing or using such access. Said person may be required by the City/Town Department of Public Works to install and pay for, pursuant to a permit under

this section, standard traffic control devices, pavement markings, channelization, or other roadway improvements to facilitate safe and efficient traffic flow, or such roadway improvements may be installed by the department and up to one hundred percent of the cost of such improvements may be assessed upon such persons. Access from properties on or abutting state highways must be formally permitted by MassDOT."

SRPEDD has developed model curb cut by-laws that can be used as a starting point for local consideration. Implementation of curb cut by-laws within each community is encouraged.

Implementation of Drive-thru Window Standards - Sufficient stacking space, efficient traffic flow, adequate parking and site access are key components of a well-designed drive-thru facility. When a drive-thru window lacks one or more of these components, the safety of those using the facility, as well as those on adjacent public roadways, are compromised**.**

Drive-thru facilities present special challenges, where internal circulation is complicated by the combination of queueing vehicles, parked vehicles, pedestrians, and delivery trucks. These problems frequently spill out into the street. The high volume of traffic and quick turnover, especially during peak periods, require special consideration in the permitting stage. Implementation of drive-thru by-laws within each community is encouraged.

Lane Departure Crashes - A lane departure crash is a non-intersection crash which occurs after a vehicle leaves the designated travel lane. Lane departure crashes are primarily single vehicle collisions with a roadside fixed object (trees, utility poles, mail boxes, guardrails, etc.), but can also involve another vehicle intruding into the opposing lane or crossing over a narrow median. Lane Departure Crashes are frequently severe and account for the majority of highway fatalities. During 2014 – 2016 69% of all fatal crashes were lane departure crashes in the SMMPO region. Responding to the state's SHSP, MassDOT and regional planning agencies across the state have acted to identify and recommend actions to reduce these collisions. Since 2007 SRPEDD and MassDOT have conducted RSA's in the SMMPO region, both on local roads and along limited access highways.

Any corridor where more than one third of the lane departure crashes consist of serious injuries and fatalities should have a safety audit conducted to determine recommended improvements to reduce the severity of lane departure crashes. Table D-5 displays locations where greater than one third of all lane departure crashes involved an injury or fatality.

Table D-5: Lane Departure Crash Locations 2014 – 2016

Community	Location	Fatal	Injury	PDO	Total	% Fatal & Injury
Attleboro	County Street	0	5	10	15	33%
Attleboro	Newport Avenue	0	4	9	13	31%
Attleboro	Pleasant Street	0	6	11	17	35%
Attleboro	West Street	0	5	10	15	33%
Dartmouth	Chase Road	0	5	8	13	38%
Dartmouth	Faunce Corner Road	0	11	22	33	33%
Dartmouth	Hathaway Road	0	5	4	9	56%
Dartmouth	High Hill Road	0	3	6	9	33%
Dartmouth	Hixville Road	0	5	6	11	45%
Dartmouth	Old Fall River Road	1	5	12	18	33%
Dartmouth	Old Westport Road	0	5	8	13	38%
Dartmouth	Potomska Road	1	5	3	9	67%
Dartmouth	Russells Mills Road	1	8	14	22	41%
Dartmouth	Slocum Road	0	5	5	10	50%
Dartmouth	State Road	1	18	29	48	40%
Dartmouth	Tucker Road	0	15	22	37	41%
Fairhaven	Huttleston Avenue	0	7	12	19	37%
Fairhaven	Main Street	0	3	6	9	33%
Fairhaven	New Boston Road	0	5	9	14	36%
Fairhaven	Sconticut Neck Road	0	5	6	11	45%
Fall River	Bedford Street	0	3	7	10	30%
Fall River	North Main Street	0	10	17	27	37%
Fall River	Pleasant Street	0	5	9	14	36%
Fall River	President Avenue	0	8	16	24	33%
Fall River	Robeson Street	0	6	3	9	67%
Fall River	Stafford Road	0	5	11	16	31%
Fall River	William S. Canning Boulevard	0	5	9	14	36%
Lakeville	Bedford Street	0	7	13	20	35%
Middleborough	Old Center Street	0	4	5	9	44%
Middleborough	Marion Road	0	3	7	10	30%
Middleborough	Miller Street	0	6	5	11	55%
Middleborough	Spruce Street	0	6	5	11	55%
Middleborough	Thompson Street	0	4	6	10	40%
Middleborough	Wareham Street	2	14	18	34	47%
Middleborough	Wood Street	0	4	7	11	36%

Community	Location	Fatal	Injury	PDO	Total	% Fatal & Injury
New Bedford	Acushnet Avenue	0	12	27	39	31%
New Bedford	Ashley Boulevard	0	4	6	10	40%
New Bedford	County Street	0	7	10	17	41%
New Bedford	Cove Street	0	7	3	10	70%
New Bedford	Hathaway Road	0	5	4	9	56%
New Bedford	Kempton Street	0	3	6	9	33%
New Bedford	John F. Kennedy Highway	0	5	4	9	56%
New Bedford	Rodney French Boulevard	0	3	7	10	30%
North Attleborough	South Washington Street	0	4	9	13	31%
Raynham	Broadway	0	7	9	16	44%
Raynham	King Philip Street	0	5	9	14	36%
Rehoboth	County Street	0	5	4	9	56%
Rehoboth	Fairview Avenue	0	7	5	12	58%
Rehoboth	Plain Street	0	11	9	20	55%
Rehoboth	Tremont Street	1	7	15	23	35%
Seekonk	Arcade Avenue	0	5	7	12	42%
Somerset	County Street	0	6	11	17	35%
Somerset	Riverside Avenue	0	6	6	12	50%
Taunton	Bay Street	0	8	11	19	42%
Taunton	County Street	1	4	9	14	36%
Taunton	Hart Street	0	10	5	15	67%
Taunton	Middleboro Avenue	0	3	6	9	33%
Taunton	Myles Standish Boulevard	0	7	4	11	64%
Taunton	Tremont Street	0	6	13	19	32%
Taunton	Winthrop Street	0	4	7	11	36%
Wareham	Cranberry Highway	0	20	32	52	38%
Wareham	Onset Avenue	0	5	5	10	50%

Climate Change and the Effects on Safety

Environmental changes including severe storm events impact our transportation infrastructure. (This issue is discussed fully in Appendix N – Environmental Coordination and Climate Change.) With the changing levels of precipitation related to climate change, our communities will become more vulnerable to flood events. Low-lying roads with inadequate drainage or drainage facilities could be affected by rising water, higher tides, and intense storms.

SRPEDD's Geographic Roadway Runoff Inventory Program (GRRIP) provides an analysis of roadway drainage facilities on state and local roads. The data identifies problem areas where the infrastructure is deficient. In combination with the GRIPP data SRPEDD is taking a closer look at crashes that have occurred on wet pavement to draw a correlation between high crash locations and sites with chronic problems as identified by public works departments, municipal boards, and commissions. Based on this data SRPEDD can present recommendations for prioritizing projects that can meet multiple goals.
The following locations have been identified by GRRIP and the Flood Inundation Study as having problems related to standing water, over topping and flooding:

- Old Fall River Road/New Plainville Road at Turner Pond and Shawmut Avenue/High Hill Road at the New Bedford/Dartmouth line: all experience localized flooding during/after rain storm events.

- School Street @ Hodges Brook in Mansfield: This location has been identified as a recurring problem area due to flooding and overtopping of the roadway.

- West Street @ the Bridge in Mansfield: This location has been identified as a recurring problem area due to flooding and overtopping of the roadway.

- The Balcom Street/Otis Street/Gilbert Street area, near the Wading River and Sweet's Pond in Mansfield: These streets and their respective bridges have been chronic problems in terms of flooding during intense storm events.

- Walker Street, at the Wading River in Norton: The two culverts at Walker Street, at the Wading River are undersized and not functioning properly. During heavy storm events, the culverts cannot adequately convey flows and cause the road to function like a dam. This area is subject to severe flooding and the road has been closed numerous times in the past several years.

- Route 138 at Cobb Brook in Taunton: An undersized culvert west of Route 138, coupled with inadequate stormwater control/conveyance in the upper watershed has created chronic flooding, water quality, public health and safety issues and stream continuity problems for several decades. The area east of 138 was addressed since the last Regional Transportation Plan.

- Buttonwood Brook area south of Buttonwood Park (Hawthorne Street/Allen Street) in Dartmouth: dense development in the floodway, undersized culverts, and low elevations make the Buttonwood Brook area a problem when the brook swells during heavy storm and flood events. Some mitigation work has been completed along the corridor.

- Old Providence Road Bridge in Swansea: prone to flooding due to monthly tidal action during "New" and "Full" moon high tides as well as during moderate to intense storms; signage and guardrail has been recently installed as a safety precaution.

- The Route 1 Corridor from Plainville to the Attleboro-Rhode Island line: The problem with silt, sand, and debris from roadway run-off, has left many of the storm water receiving areas (streams, wetlands, culverts) silted up. These problems, in turn, limit the ability to convey storm water during periods of intense rain. This corridor has identified numerous crashes related to the wet pavement conditions. While Mass DOT has done some work in the Route 1 corridor, there is still much to be done.

Fatal Crashes

Between 2014 and 2016 there were **161 fatal crashes** in southeastern Massachusetts, resulting in 174 deaths and 113 people injured. The total number of fatal crashes decreased by 2% (4) during 2010-2012. More than half of all fatal crashes (68%) were lane departure collisions.

A closer examination of the crash data indicates: 66% (107) crashes involved either a passenger car or light truck; 16% (25) crashes involved a pedestrian, bicyclist, or other non occupant; 14% (23) involved a motorcycle; and 4% (6) involved either a large truck or bus. The breakdown is displayed in Figure D-1.

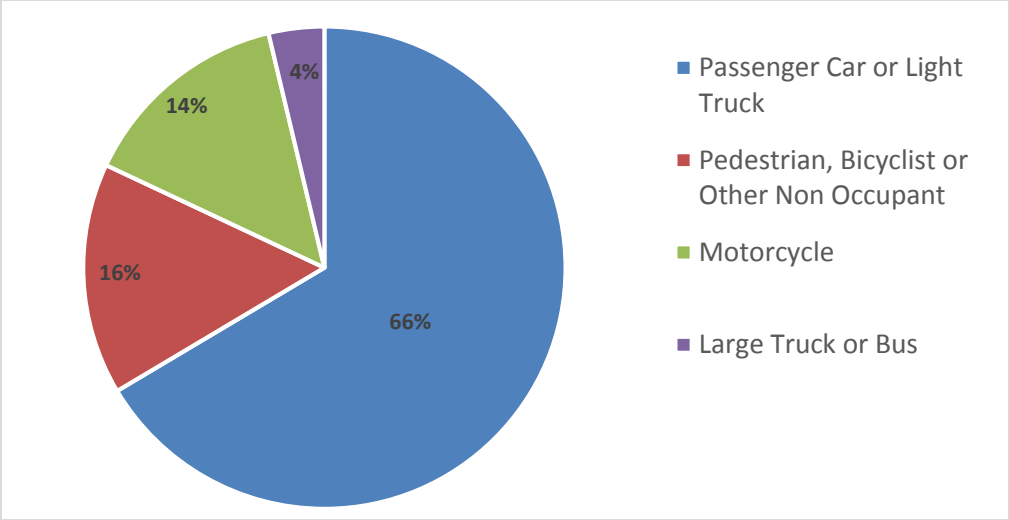

Figure D-1 Composition of Fatalities, 2014-2016

Locational data revealed that 47% (75) of the crashes occurred at mid block crossings, 29% (47) along interstate and state numbered routes, 22% (25) at intersections and 2% (4) at interchanges. The breakdown is displayed in Figure D-2.

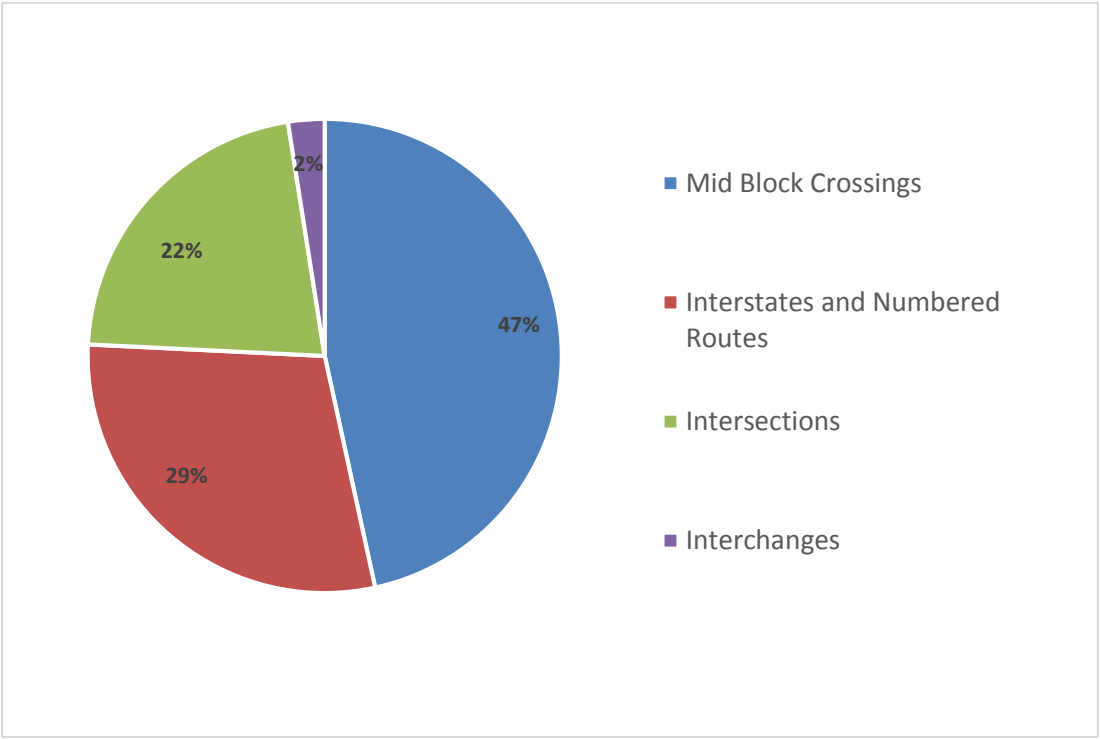

Figure D-2 Fatalities Locational Data, 2014 – 2016

Although there was only a slight decrease in fatalities in Southeastern Massachusetts, nationwide FARS data revealed an increase (approximately 12%) in fatalities in Massachusetts between 2015 (344) and 2016 (387).

Massachusetts is not a Primary Seat Belt law state; the violation is considered a secondary offense. Seat belt laws are divided into two categories: *primary* (adopted by 31 states) and *secondary* (adopted by 18 states).

The Primary Seat Belt Law allows police to stop and ticket a driver simply for not wearing a seat belt. Secondary seat belt laws allow police to issue a ticket for not wearing a seat belt only when there is another citable traffic violation. Primary seat belt laws are favored because they are associated with fewer traffic fatalities.

Slowly Massachusetts has seen a slow, but steady increase in seat belt use on average as follows:

- 67.46% (2006-2008),
- 73.2% (2010-2012)
- 81.6% (2016-2018)

In 2018, seat belt use across America was 89.6%, therefore showing that Massachusetts is slowly catching up. However, it is still important to move forward in pursuing the adoption of the Primary Seat Belt law.

Past efforts to enact a primary seat belt law in Massachusetts, making seat belt use mandatory, have been defeated by the state legislature. The tremendous costs attributed to the most serious crashes resulting in death and disabling injury are paid, in part, by everyone through higher insurance premiums, emergency services, Medicare and Medicaid costs over and above insurance coverage, etc. Consideration for enactment of the primary seat belt law in Massachusetts would reduce the number of tragic results from the most serious crashes and would save lives.

Pedestrian Crashes

From 2014 to 2016, there were 771 vehicle crashes involving pedestrians in southeastern Massachusetts, of which 17 were fatal and 628 resulted in injuries.

This shows a 5% decrease in total pedestrian crashes, a 3% decrease in crashes resulting in an injury, and a decrease of 22% in crashes resulting in a fatality from the last period studied, 2010-2012.

The locations of these crashes are important to note in order to prioritize safety improvements related to pedestrian travel. 239 (31%) of these pedestrian crashes occurred at intersections, while 532 (69%) occurred at mid-block locations. Lack of pedestrian facilities and safe crossing locations at pedestrian generators, as well as behavior of pedestrians and motorists contribute to the high rate of mid-block crashes.

Table D-6 displays top intersections with pedestrian crashes from 2014-2016. Table D-7 displays top pedestrian crash location corridors with crashes per mile equal to or greater than 10 from 2014-2016.

Table D-6 – Top Intersections with Pedestrian Crashes 2014-2016

Community	Intersection	Injuries	Fatalities	Total Crashes
Attleboro	Bank Street at Peck Street	2	0	2
Attleboro	Bank at Park	1	1	2
Fairhaven	Green Street at South Street	2	0	2
Fall River	Queuechan Street at Wamsutta Street	1	0	2
Fall River	South Main Street at Hamlet Street	2	0	2
New Bedford	Acushnet Avenue at Sawyer Street	2	0	2
New Bedford	Sawyer Street at Belleville Avenue	3	0	3
New Bedford	Pleasant Street at Union Street	3	0	3
New Bedford	Ashley Boulevard and Holly Street	2	0	2
New Bedford	Katherine Street at Crapo Street	2	0	2
New Bedford	Pleasant Street at Union Street	3	0	3
New Bedford	Hawthorn Street at County Street	2	0	2
New Bedford	Shawmut Avenue at Durfee Street	2	0	2
Taunton	Broadway at Monroe Street	1	2	3
Taunton	Taunton Green	4	0	4

Table D-7: Top Pedestrian Crash Location Corridors, 2014-2016

Municipality	Corridor	Sidewalk Presence	Total Crashes 2014-2016
Fall River	South Main Street	Both Sides	34
New Bedford	Acushnet Avenue	Both Sides	33
Fall River	Plymouth Avenue	Partial	24
New Bedford	County Street	Both Sides	24
Fall River	Pleasant Street	Both Sides	20
Dartmouth	State Road (Rte. 6)	Partial	16
Fall River	North Main Street	Both Sides	15
New Bedford	Ashley Boulevard	Both Sides	14
New Bedford	Belleville Avenue	Both Sides	13
New Bedford	Pleasant Street	Both Sides	11
Fall River	Bedford Street	Both Sides	9
New Bedford	Sawyer Street	Both Sides	9
New Bedford	Purchase Street	Both Sides	9
New Bedford	Cove Street	Both Sides	9
Fall River	Broadway	Both Sides	8
New Bedford	Rockdale Avenue	Both Sides	8
New Bedford	Nash Road	Both Sides	7
Fall River	Rodman Street	Both Sides	7
Fall River	President Avenue	Both Sides	7
Fall River	Columbia Street	Both Sides	7
Fall River	Quequechan Street	Both Sides	7
New Bedford	Elm Street	Both Sides	7
Taunton	Broadway	Both Sides	7
Taunton	Tremont Street	Both Sides	7
Wareham	Cranberry Highway	Both Sides	7
Attleboro	County Street	Both Sides	6
Attleboro	Pleasant Street	Both Sides	6
Attleboro	Washington Street	Both Sides	6
Attleboro	Newport Avenue	Partial	6
Attleboro	North Main Street	Partial	6
Attleboro	Park Street	Partial	6
Fall River	Robeson Street	Both Sides	6
New Bedford	Kempton Street	Both Sides	6
New Bedford	Hathaway Boulevard	Partial	6

Municipality	Corridor	Sidewalk Presence	Total Crashes 2014-2016
Seekonk	Highland Avenue/Fall River Avenue (Rte. 6)	Partial	6
Somerset	G.A.R. Highway (Rte. 6)	Partial	6

Ultimately, each road segment should be reviewed to determine appropriate measures to enhance pedestrian safety.

Bicycle Crashes

From 2014 to 2016, there were 335 bicycle crashes involving a motor vehicle, resulting in 257 injuries and 4 deaths in the region. Forty-Seven percent (47%) of these crashes (156) were concentrated along corridors while 53% (179) occurred at intersections. Table D-8 lists all corridors with three or more crashes over the three-year period and identified whether these crashes occurred at intersections or mid-block locations.

Table D-8: Top Corridors with Bicycle Crashes 2014 – 2016

Community	Corridor	Crashes at Intersections	Crashes at Mid-Block Locations	Total Crashes
Attleboro	Washington Street	2	3	5
Attleboro	Maple Street	4	0	4
Fall River	Pleasant Street	5	2	7
Fall River	Bedford Street	4	2	6
Fall River	South Main Street	3	3	6
Fall River	North Main Street	1	3	4
Mansfield	East Street	2	3	5
New Bedford	County Street	9	0	9
New Bedford	Purchase Street	4	4	8
New Bedford	Acushnet Avenue	6	0	6
New Bedford	Rockdale Avenue	3	3	6
New Bedford	Union Street	4	1	5
New Bedford	Pleasant Street	4	0	4

Community	Corridor	Crashes at Intersections	Crashes at Mid-Block Locations	Total Crashes
Rehoboth	Fairview Avenue	0	3	3
Taunton	Broadway	5	3	8
Wareham	Cranberry Highway	3	7	10

Most roadways have no formal bicycle accommodations, forcing bicyclists to share travel lanes with motor vehicle traffic. Properly designed and designated bicycle lanes, such as those along Bark Street and Route 118 in Swansea, or separate bicycle paths, such as the Phoenix Trail in Fairhaven and Mattapoisett, provide much safer conditions for bicyclists.

Massachusetts has taken an active role in providing bicycle accommodations at actuated signalized intersections. The 2006 MassDOT Project Development & Design Guide states:

"Bicyclists are required by law to obey control devices at intersections. Therefore, traffic control devices need to account for bicycle activity. Traffic signals which operate using detection systems (such as loop detection, video camera, and microwave) must be designed and field tested to be sensitive to bicycles."

Massachusetts has also taken further steps by issuing the Healthy Transportation Policy Directive, requiring projects constructed with federal and state funds to include bicycle and pedestrian infrastructure.

SRPEDD continues working with local and statewide bicycle groups promoting bicycle accommodations (paths and separate bike lanes) throughout the region. Expansion of bicycle facilities (shared road or exclusive paths) is a goal of this Transportation Plan.

Red Light Running Crashes

Red light running occurs when a motorist proceeds into an intersection after the light turns red. Many factors can influence red light running. Most crashes are caused in some way by driver error; however, driver error can be influenced by factors such as technology (cell phone use and texting), inadequate road design or ineffective traffic controls. Red light running crashes are either intentional or unintentional. Intentional red-light running is frequently due to deliberate circumstances such as motorists trying to beat the signal; driver frustration due to congestion; driving under the influence, etc. Unintentional red light running is often due to

ineffective or poorly visible signal equipment; obstructed vision (due to sunlight, weather conditions or vegetation), or inappropriate signal timing.

Red light running continues to be a problem in southeastern Massachusetts. Table D-9 displays 10 intersections in the region with a minimum of 14 red light running crashes over the three year (2014-2016) period.

Table D-9: Top Red Light Running Locations 2014 – 2016

Community	Intersection	PDO	INJ	TOTAL
Fall River	President Avenue at Highland Avenue	20	8	28
Mansfield	Chauncy Street at Copeland Drive	12	8	20
Fall River	Bedford Street at High Street	9	8	18
Fall River	Bedford Street at Rock Street	10	8	18
Fall River	Columbia Street at Eagle Street and Ponta Delgada Boulevard	9	7	16
New Bedford	Church Street at Park Avenue	12	4	16
Attleboro	Pleasant Street at Emory Street	9	5	14
Fairhaven	Bridge Street at Adams Street	12	2	14
Fall River	Bedford Street at Troy Street / High Street	10	4	14
New Bedford	County Street at Mill Street	11	3	14

Corrective measures range from added enforcement, improved signal visibility and more efficient operation to public awareness.

Previous studies have suggested the need for Red Light Camera legislation in Massachusetts that would allow remote ticketing at intersections with frequent intentional red light violations. However, efforts to implement red light camera legislation in Massachusetts have failed. Typically, the argument against passage involved invasion of privacy; the presumption of innocence; and the concern over misuse of ticketing as a revenue source. The “invasion of privacy” issue could be addressed by photographing the license plate only, avoiding a photograph of vehicle occupants, and treating the ticket with a moderate fine as is done with parking violations. The “presumption of innocence” is addressed by photographic evidence. If photography clearly depicts the vehicle and registration number, and the equipment is verified as being properly calibrated, the burden of proof appears to support the prosecution. Misuse of the cameras as a source of revenue has been cited, and perhaps correctly, in localities where insufficient yellow time encourages red light violations. This can be avoided by including adequate yellow/all red signal time calibrated to the posted speed limit of the approach plus

five miles per hour.

Realistically, with today's sophisticated equipment, a motorist who is photographed or videotaped running a red light has committed an illegal and dangerous act. Past experience clearly indicates that cameras significantly lower the crash rate at signalized intersections and more importantly, reduce those collisions that result in maximum costs and human suffering. There are arguments for and against the issue, but ultimately, motorists who intentionally violate a red light are breaking the law, endangering others, and increasing the cost of automobile insurance to all motorists.

This plan recommends passage of Red Light Camera Legislation in Massachusetts as a means of reducing the number of right angle collisions at signalized intersections. Legislation must include the provision of an engineering evaluation at each candidate intersection prior to installation of camera equipment, to ensure that the existing signal system, its' timing, phasing, clearance interval, visibility (of the signal and pavement markings etc.) are functioning correctly.

***Safety analysis should include a review of operational characteristics* -** There are many issues that must be considered when evaluating safety problems. Often, an action that addresses a safety problem can have a negative impact on the operational characteristics of the intersection (i.e. level of service). A thorough examination of the specific safety issues contributing to the problem, including a review of the severity of all crashes, must be considered. Improvements to address safety must be weighed against the possibility of adversely impacting traffic flow.

Driver Behavior

One of the more controversial issues in transportation is that of driver behavior. Although obvious to most people that travel our highways, it is also the one issue that is more difficult to measure in order to determine the extent of the problem.

It is necessary to identify these problems to determine if driver behavior is a key component or a contributing factor to the problems with the transportation system. Issues that are currently being addressed by federal and state authorities include distracted driving, aggressive driving, speeding and impaired driving.

Distracted Driving involves the use of cell phones or hand held devices while driving. Statistics have shown that use of these devices while driving cause a significant distraction to the vehicle

operator that can result in a crash. National studies have documented that driving while talking or "texting," significantly impairs the driver's ability to safely operate a vehicle.

The increased use of these devices while driving has prompted legislation in several states to ban the use of these devices while driving. Massachusetts passed a law effective September 30, 2010 prohibiting the use of hand held devices while operating a motor vehicle. Currently there is a proposed bill (H 3793) to prohibit the use of mobile electronic devices by drivers unless the device is being used in hands-free mode. Violations would be punished by $100 for a first offense, $250 for a second offense, and $500 for third or later offenses. The bill would take effect 90 days after becoming law. Initially, police officers would issue warnings instead of fines to anyone they pull over for violations until 2020. SRPEDD fully supports this legislation.

Aggressive Driving has become a problem on our roadways. NHTSA defines aggressive driving as occurring when "an individual commits a combination of moving traffic offenses so as to endanger other persons or property." Behaviors typically associated with aggressive driving include exceeding the posted speed limit, following too closely, erratic or unsafe lane changes, improperly signaling lane changes, failure to obey traffic control devices (stop signs, yield signs, traffic signals, railroad grade cross signals, etc.). Not only is the Aggressive driver placing themselves in danger, but they are jeopardizing the safety of road users around them.

Speeding is another issue regarding driver behavior where motorists operate vehicles at travel speeds that exceed the posted speed limit. Although high vehicle speed is a contributing factor with vehicular crashes, determining what constitutes a dangerous operating speed is more difficult. SRPEDD collects traffic count data annually which includes the travel speed of vehicles at various locations throughout the region concentrated on minor arterials, collectors and local streets.

Traditionally, engineering standards use the 85th percentile speed from these counts to determine appropriate speed limits for roads. The 85th percentile is typically the speed at which a majority of motorists will drive in free flow traffic conditions along a roadway. In certain instances, the posted speed limits are lower than the 85th percentile speed and in some cases, lower than the average speed. This is common in areas of higher population, housing density, or specific land uses such as schools.

The 85th percentile speed, gathered through SRPEDD's traffic count program, was used to determine if speeding is an issue along the region's arterials, collector and local roadways. Comparing the 85th percentile speed to the posted speed limit for 261 locations in the region revealed that nearly 68% of these locations experience a speeding problem. Table

D-10 displays the percentage of locations where motorists were traveling over the speed limit by roadway function class.

Local roadways experienced the greatest number of locations where motorists were found to be exceeding the posted speed limit. Furthermore, the speed data from nearly 24% of local roads indicated that the 85th percentile speed exceeded the posted speeds by as much as 10 miles per hour and up to 15 miles per hour.

Table D-10: Locational Speed Limit Information by Roadway Function Class

Function Class	Total Number of Locations	Locations Over Speed Limit (5 miles per hour or >)	Percentage of Locations Exceeding Speed Limit (5 miles per hour or >)
Local Roads	75	58	77.33%
Arterials	96	52	54.17%
Collectors	90	68	75.56%

In certain cases, a community will artificially lower the posted speed limit to force motorists to operate their vehicles at lower speeds to enforce roadside safety. This occurs in densely populated or thickly settled neighborhoods where pedestrian traffic is more frequent, along narrow and rural roads with sharp curves and no shoulders, and in school zones for bus traffic and pedestrian safety. This trend should be further analyzed as more information is collected by SRPEDD as part of their traffic count program.

Impaired Driving, driving under the influence of drugs or alcohol, has been an on-going problem in this country for several decades. It was not until late in the 20th century that this issue was addressed by the cooperative efforts from the law enforcement community, Mothers Against Drunk Driving (MADD) and the U.S. Department of Transportation's National Highway Traffic Safety Administration (NHTSA). NHTSA cited that in 2016, of the 37,461 motor vehicle traffic fatalities 28% (10,497) were alcohol related. In Massachusetts in 2016, 233 (60%) of 389 roadway fatalities were alcohol related.

Impaired driving continues to be one of the most controversial issues confronting law enforcement and those who manage the transportation network. Although strict laws have reduced impaired driving, there remains a need for motorists to continue to take responsibility when operating motor vehicles. This responsibility extends to other behaviors such as with distracted or reckless driving. Driving is a privilege, not a right, for all who are eligible to operate a motor vehicle.

In addition, consideration should be given to passing legislation that supports Ignition Interlock for All Offenders. This would allow judges to order ignition interlock devices for first time Operating Under the Influence offense. Any death due to impaired driving is not acceptable.

Public Transportation

The Federal Transit Administration mandates safety and security reporting for all public transportation agencies and contractors from whom they purchase transportation. The thresholds for reporting incidents are specified in the *2015 Safety and Security Reporting Manual.* Reporting for safety and security is collected through the National Transit Database (NTD) and defines a reportable event as an event occurring on transit right-of way, in a transit revenue vehicle facility, in a transit maintenance facility, or involving a transit revenue vehicle that meets the thresholds identified in the *2015 Safety and Security Reporting Manual.*

Thresholds for reporting are as follows:

- A fatality;
- Injury requiring immediate transport away from the scene for medical attention;
- Estimated property damage equal to or exceeding $25,000;
- Collisions involving transit vehicles that require towing away from scene; and
- Evacuation of a transit facility or vehicle due to potentially unsafe conditions.

Table D-11 outlines the reportable incidents to the NTD in relation to the number of passengers carried and the annual vehicle revenue miles. The NTD was established by Congress in 1974 as a source for information and statistics on the transit systems in the United States. NTD is currently authorized under Section 5335 of Title 49 of the United States Code as amended by MAP-21. Annual vehicle revenue miles are the number of miles for which transit vehicles are in service transporting passengers.

Table D-11: GATRA & SRTA 2014-2018 Reportable Incidents

GATRA				
Year	**Passengers**	**Revenue Miles**	**Collisions**	**Injuries**
2014	1,113,207	2,920,026	5	11
2015	1,109,980	2,974,053	5	14
2016	1,104,652	3,095,782	4	8
2017	1,061,763	3,309,471	4	2
2018	1,066,077	3,325,490	1	0

SRTA				
Year	**Passengers**	**Revenue Miles**	**Collisions**	**Injuries**
2014	2,410,311	1,952,451	27	9
2015	2,659,374	1,864,506	30	10
2016	2,793,139	1,976,051	27	13
2017	2,734,062	2,045,367	18	17
2018	2,706,197	2,095,348	27	7

In our region, both Regional Transit Authorities (RTAs), The Greater Attleboro Taunton Regional Transit Authority (GATRA) and the Southeastern Regional Transit Authority (SRTA) saw an increase in the number of collisions and injuries since the 2016 Regional Transportation Plan. Between 2014 and 2018 GATRA experienced one collision per 822,359 revenue miles and one injury per 446,423 passenger trips; during the same period SRTA experienced one collision per 77,005 revenue miles and one injury per 56,441 passengers.

Safety Recommendations

Following are a list of recommendations that will support our pursuit for a safer region for all users:

D-1 Continue to compile safety data and publicize high crash locations throughout the Region to inform the public, initiate actions at the state and local level, and prioritize measures to make for a safe transportation system.

D-2 Continue to assist local communities and MassDOT in studying/auditing locations identified as having excessive crash rates.

D-3 Prioritize projects in our Transportation Improvement Program that concentrates on safety improvements.

D-4 Encourage safety enhancements in all projects seeking public funds.

D-5 Assist communities and MassDOT in determining cause and corrective measures to signalized intersections identified as experiencing a high rate of red light running crashes.

D-6 Assist local communities in their consideration of traffic control devices (i.e. all-way stop control, speed limit changes, etc.). Promote the use of sound engineering judgment in the decision making process on traffic control devices as assistance is requested through the SMMPO's UPWP Community Techincal Assistance Task;

D-7 Encourage, support and assist local communities in the implementation of access management (curb cut by-laws).

D-8 Encourage, support and assist local communities in the implementation of Drive-Thru Window standards to ensure drive-thru window queueing does not interfere with thru traffic flow on adjacent corridors.

D-9 Identify corridors with excessive lane departure crashes and assist communities and MassDOT to identify issues and support corrective measures to address them.

D-10 Support the enactment of a primary seat belt law in Massachusetts to reduce the number of fatalities and serious injury statewide.

D-11 Promote the addition of sidewalks along roadways that are currently lacking, especially in areas that provide connections to schools and other destinations.

D-12 Promote the proper placement and regular maintenance of crosswalks in compliance with the American with Disabilities Act (ADA) to provide safe walking accommodations. Encourage placement of warning signs alerting motorists of the law requiring that they yield to pedestrians.

D-13 Continue working with local and statewide bicycle groups promoting connectivity of bicycle accommodations (paths and separate bike lanes) throughout the region. Support the connection to designated bike paths/lanes in neighboring regions.

D-14 Promote signage and pavement markings to inform motorists of the potential presence of bicyclists along roadways.

D-15 Assist local high schools in organizing safe driving awareness programs as needed, informing students and parents of the dangers (dangerous intersections, corridors prone to lane departure crashes, etc.) on local roadways.

D-16 Support the passage of Red-Light-Running Camera Legislation in Massachusetts, including a requirement that sound engineering judgement be used in the selection of intersections to install camera enforcement equipment.

D-17 Maintenance, or replacement if necessary, of drainage structures to ensure roads are free of standing or ponding water and promote vehicular flow during inclement weather.

Proposed Studies

SRPEDD proposes to conduct studies at the following locations over the next four years:

Lane Departure Crashes – Continue to conduct Road Safety Audits at locations with excessive lane departure crashes.

Red Light Running – Conduct Intersection Safety Audits at intersections where red light running has been identified as a problem.

Dangerous Intersections – Conduct detailed safety audits of intersections that exceed the ACC/MEV or EPDO crash rate thresholds, as requested by state or local officials. Studies will include a review of the operational characteristics of each intersection.

Other Intersections – Conduct detailed safety audits of intersections not appearing on the list of dangerous intersections. This effort is intended to assist local officials in effectively considering appropriate traffic control changes prior to their implementation. It is intended to prevent implementation of inappropriate traffic control measures by local communities.

As the general public shifts in travel choices for commuting and recreational purposes as well as a healthier lifestyle, it is important to keep all roadway users safe. SRPEDD will work with local officials and MassDOT to compile the data, determine the circumstances influencing the high crash rates and offer solutions to improve safety along each corridor or location. SRPEDD will continue to assist the local communities in the identification and analysis of unsafe roadways and intersections throughout the region, leading to the implementation of corrective measures.