CAPE COD
COMMISSION

2016 REGIONAL TRANSPORTATION PLAN

Technical Appendix C: Safety

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Technical Appendix C: Safety

The concern over safety is made clear in the first goal of the Regional Transportation Plan:

"Provide safe travel options for all users"

Transportation users have a right to a transportation system where their person and possessions will arrive at their destinations unharmed and undamaged. Moreover, protecting the value of freight traveling over the transportation network is essential to the economy of Cape Cod. Therefore, it is important that transportation infrastructure be designed to minimize the possibility of hazardous situations or accidents. Existing traffic laws must also be enforced to prevent the improper use of the transportation system. For all of these reasons, the Regional Transportation Plan sets the goal of providing safety for people and goods.

This appendix includes sections describing the seasonal and year-round issues affecting transportation safety including a description of the Cape demographics and some information about how they will change over time. Summaries of important safety studies are presented as well.

BARNSTABLE COUNTY HIGH CRASH LOCATIONS

In 2014, the Cape Cod Commission completed an effort to rank the top intersections of critical safety concern across Cape Cod. Before the data could be gathered and sorted into any particular order or rank, it was necessary to specify the characteristics that signify an intersection as a safety concern. The Commission decided that there are several ways to interpret crash data – meaning, several possible ways to determine which intersections are of highest safety concern.

The Cape Cod Commission identified four methods of sorting data to create a top list of intersections of critical safety concern:

- **Based on Number of Crashes:** Perhaps most simple method is to look at the total number of crashes for each location and then rank them from most number of crashes to least. This method is very basic, in that it does not consider the severity of the crashes or the number of vehicles using the roadway.
- **Based on Equivalent Property Damage Only (EPDO):** This method considers the severity of each location's crashes. A location's EPDO value is determined using a formula that weights each crash based on whether it included a fatality, an injury but no fatality, or property damage only. Fatal crashes are assigned a value of ten; injuries are assigned a value of five; and property damage only crashes are assigned a value of one. To determine an intersection's EPDO, the weighted values are summed to an aggregate value. Under this method, the intersection with the highest EPDO value is ranked most hazardous.

- **Based on Crash Rate:** A crash rate for a location compares the number of crashes to the number of vehicles passing through it. The crash rate is interpreted as number of crashes per million entering vehicles. It is possible that a location with many crashes is not geometrically flawed or in poor condition, but merely a victim of the law of averages – many entering vehicles inflating the number of crashes. The crash rate method attempts to distinguish locations with safety problems relative to their usage.
- **Based on EPDO Rate:** This method is based on the same idea as using the crash rate, whereas it compares an intersection's EPDO to its usage. The EPDO rate is interpreted as EPDO per million entering vehicles. The vehicle with the largest EPDO rate is ranked number one under this method.

Base data for this analysis was provided by the Massachusetts Department of Transportation (MassDOT) in the form of geographically located crash clusters for the most recently available three years of data (2009-2011). The data provided by MassDOT included the number of reported crashes at each location and the severity of the crashes. It should be noted, however, that this dataset only includes incidents whose reports contained enough information to accurately locate them. Of the 11,987 crash reports collected by the Massachusetts Registry of Motor Vehicles, 10,935 incidents were located by MassDOT. The incidents are mapped on the following figure.

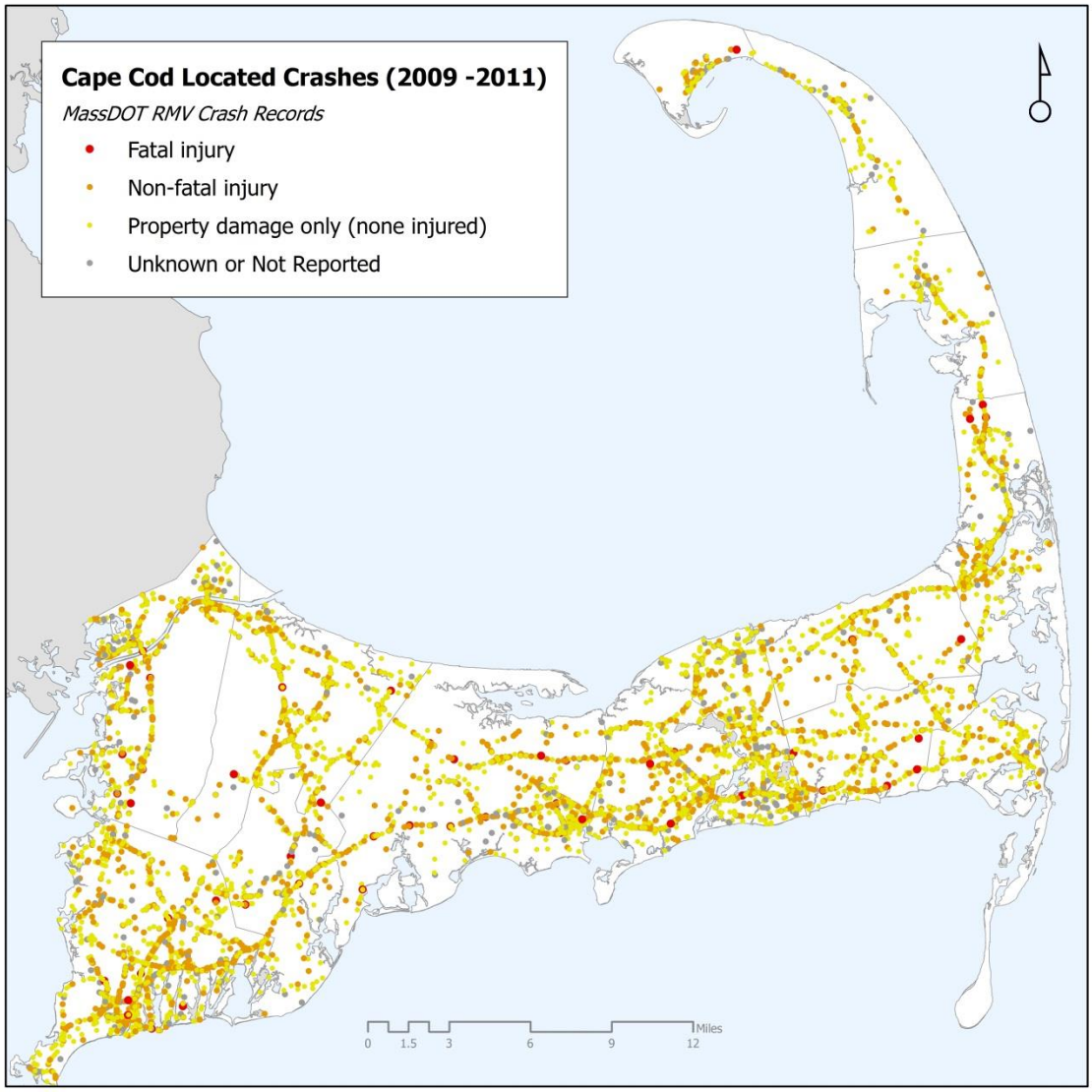

FIGURE 1 - CAPE COD LOCATED CRASHES 2009-2011

(Source: MassDOT Crash Records)

In each of the following top crash location lists, select locations are succeeded by a subscript. The subscript is a reference to a note in the Index of Notes table, which follows the fourth top crash list. The notes refer to any structural changes that have occurred or will occur at the intersections, and also highlight any studies that may have included the intersections.

TABLE 1 - TOP LOCATIONS BASED ON NUMBER OF CRASHES

Rank Crashes	TOWNS	Location	CrashCount	EPDO	Crash_Rate	EPDO_Rate
1	Dennis	Route 134 @ Patriot Square SD/Cumberland Farms [3]	125	181	5.0	7.2
2	Bourne	Bourne Rotary (Rte 28/Sandwich Rd/Trowbridge Rd) [32]	111	159	1.9	2.8
3	Dennis	Route 6 @ Route 134 (Exit 9) [37]	91	163	1.5	2.7
4	Barnstable	Route 6 @ Route 132 (Exit 6) [36]	84	184	1.2	2.7
5	Bourne	Otis Rotary (Rte 28/Rte 28A/Connery Ave) [8]	80	169	2.5	5.3
6	Sandwich	Route 6 @ Route 130 (Exit 2) [45]	74	154	1.1	2.3
7	Bourne	Route 6 @ Exit 1A/Exit1B [66]	63	119	0.9	1.8
8	Falmouth	Route 28 (Teaticket Hwy) @ Falmouth Mall east SD, Liquor Store, Apartments [4]	62	114	3.4	6.2
9	Bourne	Belmont Circle (Rt 28/Rt 6/Rt Bypass/Head of the Bay Rd) [42]	54	107	1.2	2.4
9	Yarmouth	Route 6 @ Willow St (Exit 7) [43]	54	142	0.9	2.4
9	Barnstable	Route 6 @ Route 149 (Exit 5) [76]	54	98	0.9	1.6
12	Eastham	Eastham Rotary (Rt 6/Rt 6A/Rt 28/Smith Ln) [22]	51	103	1.6	3.2
12	Falmouth	Route 28 (MacArthur Bvld) at Route 151 [38]	51	107	1.2	2.6
14	Yarmouth	Route 6 @ Union St/Station Ave (Exit 8) [59]	50	119	0.8	1.9
15	Falmouth	Route 28 (Teaticket Hwy) @ Stop & Shop Plaza SD/Hotel SD [15]	46	70	2.5	3.7
16	Dennis	Route 134 @ Theophilus F Smith Rd [35]	41	69	1.6	2.7
16	Harwich	Route 6 @ Route 124 (Exit 10) [61]	41	69	1.1	1.9
18	Falmouth	Route 28 (Davis Straits) @ Dillingham Ave/Spring Bars Rd [20]	35	63	1.9	3.3
18	Dennis	Route 134 @ Upper County Rd/Duck Pond Rd [39]	35	71	1.2	2.5
20	Falmouth	Route 28 (Teaticket Hwy) @ Maravista Av/Beagle Ln/Various Business SD [17]	34	66	1.9	3.6
21	Mashpee	Route 151 @ Old Barnstable Rd [16]	33	89	1.4	3.7
22	Harwich	Route 6 @ Route 137 (Exit 11) [63]	30	62	0.9	1.8
22	Sandwich	Route 6 @ Quaker Meetinghouse Rd (Exit 3) [83]	30	82	0.5	1.4
24	Mashpee	Mashpee Rotary (Rte 28/Rte 151/Great Neck Rd) [78]	28	56	0.8	1.5
25	Sandwich	Route 6 @ Chase Rd (Exit 4) [87]	26	70	0.5	1.3
26	Falmouth	Worcester Ct @ Spring Bars Rd [10]	24	44	2.7	4.9
26	Dennis	Route 134 @ Bob Crowell Rd/Hemlock Ln [67]	24	28	1.5	1.7
28	Falmouth	Route 151 @ Route 28A (North Falmouth Hwy) [33]	23	43	1.4	2.7
28	Falmouth	Route 28 (E Falmouth Hwy) @ Central Ave [52]	23	43	1.1	2.1
30	Dennis	Route 28 (Main St) @ Sea St [7]	22	50	2.4	5.4
31	Yarmouth, Barnstable	Route 28 @ East Main [68]	21	37	1.0	1.7
31	Orleans	Route 6 @ Route 6A (Exit 12) [91]	21	45	0.6	1.2
33	Falmouth	Route 28 @ Lorraine Rd/Dunkin Donuts SD/Family Food Plaza SD [49]	20	44	1.0	2.2
33	Falmouth	Route 151 @ Sandwich Rd [58]	20	40	1.0	1.9
33	Barnstable	Route 28 (Iyannough Rd) @ Yarmouth Rd [89]	20	32	0.8	1.3
36	Harwich	Route 39 (Orleans Rd) @ Pleasant Bay Rd [1]	19	43	3.6	8.0
36	Falmouth	Route 151 @ Boxberry Hill Rd [6]	19	47	2.3	5.7
36	Falmouth	Route 28 @ Old Meetinghouse Rd/Davisville Rd [27]	19	48	1.2	2.9
36	Dennis	Theophilus F Smith Rd @ Patriot Square Rear SD (near theater) [55]	19	19	2.0	2.0
36	Falmouth	Route 28 (Teaticket Hwy) @ Jones Rd [62]	19	39	0.9	1.9
36	Barnstable	Airport Rotary (Rte 132/Rte 28/Barnstable Rd) [98]	19	35	0.4	0.8
42	Dennis	Route 6A @ Post Rd/New Boston Rd [28]	18	34	1.5	2.9
42	Bourne	Sandwich Rd @ Adams St [41]	18	42	1.1	2.5
42	Falmouth	Route 28 (Teaticket Hwy) @ McDonalds SD/Various Business SD [47]	18	34	1.2	2.3
45	Bourne	Route 6A @ Cranberry Highway/Sandwich Rd [46]	17	37	1.0	2.3
46	Dennis	Route 28 (Main St) @ Depot St [9]	16	44	1.8	5.1
46	Sandwich	Route 130 (Forestdale Rd) @ Cotuit Rd [23]	16	56	0.9	3.1
46	Eastham	Route 6 (GAR Hwy) @ Samoset Rd [48]	16	40	0.9	2.3
46	Falmouth	Route 28 @ Old Barnstable Rd/Acapesket Rd [56]	16	36	0.9	2.0
46	Yarmouth	Route 28 @ Main St/N Main St [71]	16	28	0.9	1.7
46	Eastham	Route 6 (GAR Hwy) @ Brackett Rd/Old County Rd [73]	16	32	0.8	1.6
52	Mashpee	Great Neck Rd N @ Old Barnstable Rd [5]	15	55	1.6	5.8
52	Yarmouth	Buck Island Rd @ Town Brook Rd [13]	15	35	1.7	4.0
52	Falmouth	Route 28 (E Falmouth Hwy) @ Fresh Pond Rd [19]	15	43	1.2	3.4
52	Yarmouth	Station Ave @ Regional Ave/Studley Rd [21]	15	43	1.1	3.2
52	Falmouth	Brick Kiln Rd @ Sandwich Rd [53]	15	27	1.1	2.0
52	Dennis	Route 134 @ Route 28 (Main St)/Swan River Rd [54]	15	35	0.9	2.0
52	Falmouth	Route 28 (Main St) @ Perry Ln/Various Business SD [60]	15	31	0.9	1.9

Source: MassDOT Crash Records 2009-2011

TABLE 2 - TOP LOCATIONS BASED ON EQUIVALENT PROPERTY DAMAGE ONLY

Rank EPDO	Location	TOWNS	Crash Count	EPDO	Crash_Rate	EPDO_Rate
1	Route 6 @ Route 132 (Exit 6) [36]	Barnstable	84	184	1.2	2.7
2	Route 134 @ Patriot Square SD/Cumberland Farms [3]	Dennis	125	181	5.0	7.2
3	Otis Rotary (Rte 28/Rte 28A/Connery Ave) [8]	Bourne	80	169	2.5	5.3
4	Route 6 @ Route 134 (Exit 9) [37]	Dennis	91	163	1.5	2.7
5	Bourne Rotary (Rte 28/Sandwich Rd/Trowbridge Rd) [32]	Bourne	111	159	1.9	2.8
6	Route 6 @ Route 130 (Exit 2) [45]	Sandwich	74	154	1.1	2.3
7	Route 6 @ Willow St (Exit 7) [43]	Yarmouth	54	142	0.9	2.4
8	Route 6 @ Union St/Station Ave (Exit 8) [59]	Yarmouth	50	119	0.8	1.9
8	Route 6 @ Exit 1A/Exit1B [66]	Bourne	63	119	0.9	1.8
10	Route 28 (Teaticket Hwy) @ Falmouth Mall east SD, Liquor Store, Apartments [4]	Falmouth	62	114	3.4	6.2
11	Route 28 (MacArthur Bvld) at Route 151 [38]	Falmouth	51	107	1.2	2.6
11	Belmont Circle (Rt 28/Rt 6/Rt Bypass/Head of the Bay Rd) [42]	Bourne	54	107	1.2	2.4
13	Eastham Rotary (Rt 6/Rt 6A/Rt 28/Smith Ln) [22]	Eastham	51	103	1.6	3.2
14	Route 6 @ Route 149 (Exit 5) [76]	Barnstable	54	98	0.9	1.6
15	Route 151 @ Old Barnstable Rd [16]	Mashpee	33	89	1.4	3.7
16	Route 6 @ Quaker Meetinghouse Rd (Exit 3) [83]	Sandwich	30	82	0.5	1.4
17	Route 134 @ Upper County Rd/Duck Pond Rd [39]	Dennis	35	71	1.2	2.5
18	Route 28 (Teaticket Hwy) @ Stop & Shop Plaza SD/Hotel SD [15]	Falmouth	46	70	2.5	3.7
18	Route 6 @ Chase Rd (Exit 4) [87]	Sandwich	26	70	0.5	1.3
20	Route 134 @ Theophilus F Smith Rd [35]	Dennis	41	69	1.6	2.7
20	Route 6 @ Route 124 (Exit 10) [61]	Harwich	41	69	1.1	1.9
22	Route 28 (Teaticket Hwy) @ Maravista Av/Beagle Ln/Various Business SD [17]	Falmouth	34	66	1.9	3.6
23	Route 28 (Davis Straits) @ Dillingham Ave/Spring Bars Rd [20]	Falmouth	35	63	1.9	3.3
24	Route 6 @ Route 137 (Exit 11) [63]	Harwich	30	62	0.9	1.8
25	Route 130 (Forestdale Rd) @ Cotuit Rd [23]	Sandwich	16	56	0.9	3.1
25	Mashpee Rotary (Rte 28/Rte 151/Great Neck Rd) [78]	Mashpee	28	56	0.8	1.5
27	Great Neck Rd N @ Old Barnstable Rd [5]	Mashpee	15	55	1.6	5.8
28	Route 28 (Main St) @ Sea St [7]	Dennis	22	50	2.4	5.4
29	Route 28 @ Old Meetinghouse Rd/Davisville Rd [27]	Falmouth	19	48	1.2	2.9
30	Route 151 @ Boxberry Hill Rd [6]	Falmouth	19	47	2.3	5.7
31	Route 6 @ Route 6A (Exit 12) [91]	Orleans	21	45	0.6	1.2
32	Route 28 (Main St) @ Depot St [9]	Dennis	16	44	1.8	5.1
32	Worcester Ct @ Spring Bars Rd [10]	Falmouth	24	44	2.7	4.9
32	Route 28 @ Lorraine Rd/Dunkin Donuts SD/Family Food Plaza SD [49]	Falmouth	20	44	1.0	2.2
35	Route 39 (Orleans Rd) @ Pleasant Bay Rd [1]	Harwich	19	43	3.6	8.0
35	Route 28 (E Falmouth Hwy) @ Fresh Pond Rd [19]	Falmouth	15	43	1.2	3.4
35	Station Ave @ Regional Ave/Studley Rd [21]	Yarmouth	15	43	1.1	3.2
35	Route 151 @ Route 28A (North Falmouth Hwy) [33]	Falmouth	23	43	1.4	2.7
35	Route 28 (E Falmouth Hwy) @ Central Ave [52]	Falmouth	23	43	1.1	2.1
40	Route 124 (Harwich Rd) @ Tubman Rd [2]	Brewster	13	42	2.4	7.7
40	Sandwich Rd @ Adams St [41]	Bourne	18	42	1.1	2.5
42	Route 151 @ Jobs Fishing Rd/Public Safety Facility SD [29]	Mashpee	13	41	0.9	2.9
43	Route 3A/Canal St @ Scenic Hwy/Meetinghouse Ln [12]	Bourne	12	40	1.2	4.0
43	Route 6 (GAR Hwy) @ Samoset Rd [48]	Eastham	16	40	0.9	2.3
43	Route 151 @ Sandwich Rd [58]	Falmouth	20	40	1.0	1.9
46	Route 28 (Teaticket Hwy) @ Jones Rd [62]	Falmouth	19	39	0.9	1.9
47	Route 28 (Teaticket Hwy) @ Trotting Park Rd/Alphonse St [44]	Falmouth	14	38	0.9	2.4
48	Route 6A @ Cranberry Highway/Sandwich Rd [46]	Bourne	17	37	1.0	2.3
48	Route 28 @ East Main [68]	Yarmouth,Barnstable	21	37	1.0	1.7
48	Route 28 @ Wendward Way [86]	Yarmouth	13	37	0.5	1.3
51	Jones Rd @ Gifford St [50]	Falmouth	12	36	0.7	2.1
51	Route 28 @ Old Barnstable Rd/Acapesket Rd [56]	Falmouth	16	36	0.9	2.0
51	Station Avenue near Former Rail Crossing [64]	Yarmouth	12	36	0.6	1.8

Source: MassDOT Crash Records 2009-2011

TABLE 3 - TOP LOCATIONS BASED ON CRASH RATE

Rank Crashes/ MEV	Location	TOWNS	CrashCount	EPDO	Crash_Rate	EPDO_Rate
1	Route 134 @ Patriot Square SD/Cumberland Farms [3]	Dennis	125	181	5.0	7.2
2	Route 39 (Orleans Rd) @ Pleasant Bay Rd [1]	Harwich	19	43	3.6	8.0
3	Route 28 (Teaticket Hwy) @ Falmouth Mall east SD, Liquor Store, Apartments [4]	Falmouth	62	114	3.4	6.2
4	Water St @ Luscombe Ave/School St [11]	Falmouth	13	21	2.8	4.5
5	Worcester Ct @ Spring Bars Rd [10]	Falmouth	24	44	2.7	4.9
6	Otis Rotary (Rte 28/Rte 28A/Connery Ave) [8]	Bourne	80	169	2.5	5.3
7	Route 28 (Teaticket Hwy) @ Stop & Shop Plaza SD/Hotel SD [15]	Falmouth	46	70	2.5	3.7
8	Route 124 (Harwich Rd) @ Tubman Rd [2]	Brewster	13	42	2.4	7.7
9	Route 28 (Main St) @ Sea St [7]	Dennis	22	50	2.4	5.4
10	Route 151 @ Boxberry Hill Rd [6]	Falmouth	19	47	2.3	5.7
11	Theophilus F Smith Rd @ Patriot Square Rear SD (near theater) [55]	Dennis	19	19	2.0	2.0
12	Bourne Rotary (Rte 28/Sandwich Rd/Trowbridge Rd) [32]	Bourne	111	159	1.9	2.8
13	Route 28 (Teaticket Hwy) @ Maravista Av/Beagle Ln/Various Business SD [17]	Falmouth	34	66	1.9	3.6
14	Route 28 (Davis Straits) @ Dillingham Ave/Spring Bars Rd [20]	Falmouth	35	63	1.9	3.3
15	Route 28 (Main St) @ Depot St [9]	Dennis	16	44	1.8	5.1
16	Buck Island Rd @ Town Brook Rd [13]	Yarmouth	15	35	1.7	4.0
17	Depot St @ Upper County Rd [51]	Dennis	13	17	1.6	2.1
18	Old Town House Rd @ Forest Rd [24]	Yarmouth	13	25	1.6	3.1
19	Eastham Rotary (Rt 6/Rt 6A/Rt 28/Smith Ln) [22]	Eastham	51	103	1.6	3.2
20	Route 134 @ Theophilus F Smith Rd [35]	Dennis	41	69	1.6	2.7
21	Great Neck Rd N @ Old Barnstable Rd [5]	Mashpee	15	55	1.6	5.8
22	Route 6A @ Post Rd/New Boston Rd [28]	Dennis	18	34	1.5	2.9
23	Route 6 @ Route 134 (Exit 9) [37]	Dennis	91	163	1.5	2.7
24	Route 134 @ Bob Crowell Rd/Hemlock Ln [67]	Dennis	24	28	1.5	1.7
25	Cotuit Rd @ Harlow Rd [14]	Sandwich	12	32	1.5	3.9
26	Route 151 @ Route 28A (North Falmouth Hwy) [33]	Falmouth	23	43	1.4	2.7
27	Route 151 @ Old Barnstable Rd [16]	Mashpee	33	89	1.4	3.7
28	Route 134 @ Setucket Rd [25]	Dennis	12	28	1.3	3.0
29	Route 134 @ Upper County Rd/Duck Pond Rd [39]	Dennis	35	71	1.2	2.5
30	Belmont Circle (Rt 28/Rt 6/Rt Bypass/Head of the Bay Rd) [42]	Bourne	54	107	1.2	2.4
31	Route 28 (MacArthur Bvld) at Route 151 [38]	Falmouth	51	107	1.2	2.6
32	Route 6 @ Route 132 (Exit 6) [36]	Barnstable	84	184	1.2	2.7
33	Route 3A/Canal St @ Scenic Hwy/Meetinghouse Ln [12]	Bourne	12	40	1.2	4.0
34	West Yarmouth Rd @ Buck Island Rd [34]	Yarmouth	13	29	1.2	2.7
35	Route 28 (Teaticket Hwy) @ McDonalds SD/Various Business SD [47]	Falmouth	18	34	1.2	2.3
36	Route 28 (E Falmouth Hwy) @ Fresh Pond Rd [19]	Falmouth	15	43	1.2	3.4
37	Route 28 @ Old Meetinghouse Rd/Davisville Rd [27]	Falmouth	19	48	1.2	2.9
38	County Rd @ Barlows Landing Rd [26]	Bourne	10	26	1.2	3.0
39	Brick Kiln Rd @ Sandwich Rd [53]	Falmouth	15	27	1.1	2.0
40	Station Ave @ Regional Ave/Studley Rd [21]	Yarmouth	15	43	1.1	3.2
41	Route 28 (E Falmouth Hwy) @ Central Ave [52]	Falmouth	23	43	1.1	2.1
42	Route 6 @ Route 124 (Exit 10) [61]	Harwich	41	69	1.1	1.9
43	Route 6 @ Route 130 (Exit 2) [45]	Sandwich	74	154	1.1	2.3
44	Sandwich Rd @ Adams St [41]	Bourne	18	42	1.1	2.5
45	Route 28 (Main St) @ King St/Gifford St [85]	Falmouth	13	17	1.0	1.4
46	Route 6A @ Cranberry Highway/Sandwich Rd [46]	Bourne	17	37	1.0	2.3
47	Route 130 @ Great Neck Rd [40]	Mashpee	11	27	1.0	2.5
48	Route 28 @ Lorraine Rd/Dunkin Donuts SD/Family Food Plaza SD [49]	Falmouth	20	44	1.0	2.2
49	Dillingham Avenue @ Gifford St [18]	Falmouth	10	34	1.0	3.4
50	Route 28 @ East Main [68]	Yarmouth,Barnstable	21	37	1.0	1.7

Source: MassDOT Crash Records 2009-2011

TABLE 4 - TOP LOCATIONS BASED ON EPDO RATE

Rank EPDO/MEV	Location	TOWNS	CrashCount	EPDO	Crash_Rate	EPDO_Rate
1	Route 39 (Orleans Rd) @ Pleasant Bay Rd [1]	Harwich	19	43	3.6	8.0
2	Route 124 (Harwich Rd) @ Tubman Rd [2]	Brewster	13	42	2.4	7.7
3	Route 134 @ Patriot Square SD/Cumberland Farms [3]	Dennis	125	181	5.0	7.2
4	Route 28 (Teaticket Hwy) @ Falmouth Mall east SD, Liquor Store, Apartments [4]	Falmouth	62	114	3.4	6.2
5	Great Neck Rd N @ Old Barnstable Rd [5]	Mashpee	15	55	1.6	5.8
6	Route 151 @ Boxberry Hill Rd [6]	Falmouth	19	47	2.3	5.7
7	Route 28 (Main St) @ Sea St [7]	Dennis	22	50	2.4	5.4
8	Otis Rotary (Rte 28/Rte 28A/Connery Ave) [8]	Bourne	80	169	2.5	5.3
9	Route 28 (Main St) @ Depot St [9]	Dennis	16	44	1.8	5.1
10	Worcester Ct @ Spring Bars Rd [10]	Falmouth	24	44	2.7	4.9
11	Water St @ Luscombe Ave/School St [11]	Falmouth	13	21	2.8	4.5
12	Route 3A/Canal St @ Scenic Hwy/Meetinghouse Ln [12]	Bourne	12	40	1.2	4.0
13	Buck Island Rd @ Town Brook Rd [13]	Yarmouth	15	35	1.7	4.0
14	Cotuit Rd @ Harlow Rd [14]	Sandwich	12	32	1.5	3.9
15	Route 28 (Teaticket Hwy) @ Stop & Shop Plaza SD/Hotel SD [15]	Falmouth	46	70	2.5	3.7
16	Route 151 @ Old Barnstable Rd [16]	Mashpee	33	89	1.4	3.7
17	Route 28 (Teaticket Hwy) @ Maravista Av/Beagle Ln/Various Business SD [17]	Falmouth	34	66	1.9	3.6
18	Dillingham Avenue @ Gifford St [18]	Falmouth	10	34	1.0	3.4
19	Route 28 (E Falmouth Hwy) @ Fresh Pond Rd [19]	Falmouth	15	43	1.2	3.4
20	Route 28 (Davis Straits) @ Dillingham Ave/Spring Bars Rd [20]	Falmouth	35	63	1.9	3.3
21	Station Ave @ Regional Ave/Studley Rd [21]	Yarmouth	15	43	1.1	3.2
22	Eastham Rotary (Rt 6/Rt 6A/Rt 28/Smith Ln) [22]	Eastham	51	103	1.6	3.2
23	Route 130 (Forestdale Rd) @ Cotuit Rd [23]	Sandwich	16	56	0.9	3.1
24	Old Town House Rd @ Forest Rd [24]	Yarmouth	13	25	1.6	3.1
25	Route 134 @ Setucket Rd [25]	Dennis	12	28	1.3	3.0
26	County Rd @ Barlows Landing Rd [26]	Bourne	10	26	1.2	3.0
27	Route 28 @ Old Meetinghouse Rd/Davisville Rd [27]	Falmouth	19	48	1.2	2.9
28	Route 6A @ Post Rd/New Boston Rd [28]	Dennis	18	34	1.5	2.9
29	Route 151 @ Jobs Fishing Rd/Public Safety Facility SD [29]	Mashpee	13	41	0.9	2.9
30	Route 6 @ Cranberry Hwy (Exit 1C) [30]	Bourne	10	30	0.9	2.8
31	Route 134 @ Center St [31]	Dennis	10	30	0.9	2.8
32	Bourne Rotary (Rte 28/Sandwich Rd/Trowbridge Rd) [32]	Bourne	111	159	1.9	2.8
33	Route 151 @ Route 28A (North Falmouth Hwy) [33]	Falmouth	23	43	1.4	2.7
34	West Yarmouth Rd @ Buck Island Rd [34]	Yarmouth	13	29	1.2	2.7
35	Route 134 @ Theophilus F Smith Rd [35]	Dennis	41	69	1.6	2.7
36	Route 6 @ Route 132 (Exit 6) [36]	Barnstable	84	184	1.2	2.7
37	Route 6 @ Route 134 (Exit 9) [37]	Dennis	91	163	1.5	2.7
38	Route 28 (MacArthur Bvld) at Route 151 [38]	Falmouth	51	107	1.2	2.6
39	Route 134 @ Upper County Rd/Duck Pond Rd [39]	Dennis	35	71	1.2	2.5
40	Route 130 @ Great Neck Rd [40]	Mashpee	11	27	1.0	2.5
41	Sandwich Rd @ Adams St [41]	Bourne	18	42	1.1	2.5
42	Belmont Circle (Rt 28/Rt 6/Rt Bypass/Head of the Bay Rd) [42]	Bourne	54	107	1.2	2.4
43	Route 6 @ Willow St (Exit 7) [43]	Yarmouth	54	142	0.9	2.4
44	Route 28 (Teaticket Hwy) @ Trotting Park Rd/Alphonse St [44]	Falmouth	14	38	0.9	2.4
45	Route 6 @ Route 130 (Exit 2) [45]	Sandwich	74	154	1.1	2.3
46	Route 6A @ Cranberry Highway/Sandwich Rd [46]	Bourne	17	37	1.0	2.3
47	Route 28 (Teaticket Hwy) @ McDonalds SD/Various Business SD [47]	Falmouth	18	34	1.2	2.3
48	Route 6 (GAR Hwy) @ Samoset Rd [48]	Eastham	16	40	0.9	2.3
49	Route 28 @ Lorraine Rd/Dunkin Donuts SD/Family Food Plaza SD [49]	Falmouth	20	44	1.0	2.2
50	Jones Rd @ Gifford St [50]	Falmouth	12	36	0.7	2.1

Source: MassDOT Crash Records 2009-2011

TABLE 5 - INDEX OF NOTES (PAGE 1 OF 3)

Note	Location	TOWNS	Rank EPDO /MEV	Rank Crashes /MEV	Rank EPDO	Rank Crashes	Comment
1	Route 39 (Orleans Rd) @ Pleasant Bay Rd	Harwich	1	2	35	36	Flashing LED stop signs added on minor approaches after 2011
2	Route 124 (Harwich Rd) @ Tubman Rd	Brewster	2	8	40	64	RSA 2011, Additional signage and vegetation management 2012
3	Route 134 @ Patriot Square SD/Cumberland Farms	Dennis	3	1	2	1	Cumberland Farms drive reconfigured in 2012
4	Route 28 (Teaticket Hwy) @ Falmouth Mall east SD, Liquor Store, Apartments	Falmouth	4	3	10	8	
5	Great Neck Rd N @ Old Barnstable Rd	Mashpee	5	21	27	52	
6	Route 151 @ Boxberry Hill Rd	Falmouth	6	10	30	36	
7	Route 28 (Main St) @ Sea St	Dennis	7	9	28	30	CCC Report "Dennisport - Analysis of High-Crash Locations" 2012
8	Otis Rotary (Rte 28/Rte 28A/Connery Ave)	Bourne	8	6	3	5	CCC safety study 2006, RSA 2013
9	Route 28 (Main St) @ Depot St	Dennis	9	15	32	46	CCC Report "Dennisport - Analysis of High-Crash Locations" 2012
10	Worcester Ct @ Spring Bars Rd	Falmouth	10	5	32	26	CCC Spring Bars Road report analysis 2013
11	Water St @ Luscombe Ave/School St	Falmouth	11	4	128	64	
12	Route 3A/Canal St @ Scenic Hwy/Meetinghouse Ln	Bourne	12	33	43	83	
13	Buck Island Rd @ Town Brook Rd	Yarmouth	13	16	54	52	
14	Cotuit Rd @ Harlow Rd	Sandwich	14	25	64	83	Roundabout constructed 2012
15	Route 28 (Teaticket Hwy) @ Stop & Shop Plaza SD/Hotel SD	Falmouth	15	7	18	15	
16	Route 151 @ Old Barnstable Rd	Mashpee	16	27	15	21	RSA 2014 scheduled
17	Route 28 (Teaticket Hwy) @ Maravista Av/Beagle Ln/Various Business SD	Falmouth	17	13	22	20	
18	Dillingham Avenue @ Gifford St	Falmouth	18	49	57	117	
19	Route 28 (E Falmouth Hwy) @ Fresh Pond Rd	Falmouth	19	36	35	52	
20	Route 28 (Davis Straits) @ Dillingham Ave/Spring Bars Rd	Falmouth	20	14	23	18	CCC Spring Bars Road report analysis 2013
21	Station Ave @ Regional Ave/Studley Rd	Yarmouth	21	40	35	52	
22	Eastham Rotary (Rt 6/Rt 6A/Rt 28/Smith Ln)	Eastham	22	19	13	12	CCC safety study 2009; Recommendations included in Outer Cape Safety Study 2004
23	Route 130 (Forestdale Rd) @ Cotuit Rd	Sandwich	23	61	25	46	
24	Old Town House Rd @ Forest Rd	Yarmouth	24	18	87	64	
25	Route 134 @ Setucket Rd	Dennis	25	28	76	83	

TABLE 6 - INDEX OF NOTES (PAGE 2 OF 3)

Note	Location	TOWNS	Rank EPDO /MEV	Rank Crashes /MEV	Rank EPDO	Rank Crashes	Comment
26	County Rd @ Barlows Landing Rd	Bourne	26	38	85	117	
27	Route 28 @ Old Meetinghouse Rd/Davisville Rd	Falmouth	27	37	29	36	TIP year 2013
28	Route 6A @ Post Rd/New Boston Rd	Dennis	28	22	57	42	
29	Route 151 @ Jobs Fishing Rd/Public Safety Facility SD	Mashpee	29	57	42	64	
30	Route 6 @ Cranberry Hwy (Exit 1C)	Bourne	30	53	69	117	
31	Route 134 @ Center St	Dennis	31	55	69	117	
32	Bourne Rotary (Rte 28/Sandwich Rd/Trowbridge Rd)	Bourne	32	12	5	2	Bourne Rotary study completed 2014; safety improvements scheduled for FY2014
33	Route 151 @ Route 28A (North Falmouth Hwy)	Falmouth	33	26	35	28	TIP year 2017
34	West Yarmouth Rd @ Buck Island Rd	Yarmouth	34	34	74	64	
35	Route 134 @ Theophilus F Smith Rd	Dennis	35	20	20	16	Analysis 2013
36	Route 6 @ Route 132 (Exit 6)	Barnstable	36	32	1	4	Signalized 2007
37	Route 6 @ Route 134 (Exit 9)	Dennis	37	23	4	3	RSA completed 2009; new analysis 2013
38	Route 28 (MacArthur Bvld) at Route 151	Falmouth	38	31	11	12	
39	Route 134 @ Upper County Rd/Duck Pond Rd	Dennis	39	29	17	18	Reconstruction begun 2013
40	Route 130 @ Great Neck Rd	Mashpee	40	47	82	101	
41	Sandwich Rd @ Adams St	Bourne	41	44	40	42	Under review by Town of Bourne 2014
42	Belmont Circle (Rt 28/Rt 6/Rt Bypass/Head of the Bay Rd)	Bourne	42	30	11	9	MassDOT study begun 2013
43	Route 6 @ Willow St (Exit 7)	Yarmouth	43	58	7	9	
44	Route 28 (Teaticket Hwy) @ Trotting Park Rd/Alphonse St	Falmouth	44	65	47	59	
45	Route 6 @ Route 130 (Exit 2)	Sandwich	45	43	6	6	Signalized 2012
46	Route 6A @ Cranberry Highway/Sandwich Rd	Bourne	46	46	48	45	RSA completed 2012
47	Route 28 (Teaticket Hwy) @ McDonalds SD/Various Business SD	Falmouth	47	35	57	42	
48	Route 6 (GAR Hwy) @ Samoset Rd	Eastham	48	60	43	46	
49	Route 28 @ Lorraine Rd/Dunkin Donuts SD/Family Food Plaza SD	Falmouth	49	48	32	33	
50	Jones Rd @ Gifford St	Falmouth	50	76	51	83	

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51	Depot St @ Upper County Rd	Dennis	51	17	186	64	
52	Route 28 (E Falmouth Hwy) @ Central Ave	Falmouth	52	41	35	28	
53	Brick Kiln Rd @ Sandwich Rd	Falmouth	53	39	82	52	
54	Route 134 @ Route 28 (Main St)/Swan River Rd	Dennis	54	66	54	52	Added left turn lanes and new signal phasing, pedestrian improvements 2010
55	Theophilus F Smith Rd @ Patriot Square Rear SD (near theater)	Dennis	55	11	153	36	Analysis 2013
56	Route 28 @ Old Barnstable Rd/Acapesket Rd	Falmouth	56	62	51	46	
57	Cranberry Highway @ Adams St	Bourne	57	68	82	101	
58	Route 151 @ Sandwich Rd	Falmouth	58	51	43	33	
59	Route 6 @ Union St/Station Ave (Exit 8)	Yarmouth	59	70	8	14	RSA completed 2011
60	Route 28 (Main St) @ Perry Ln/Various Business SD	Falmouth	60	56	67	52	
61	Route 6 @ Route 124 (Exit 10)	Harwich	61	42	20	16	Signalization of Rt 124/Queen Anne Road adjacent to interchange 2011
62	Route 28 (Teaticket Hwy) @ Jones Rd	Falmouth	62	59	46	36	TIP year 2013
63	Route 6 @ Route 137 (Exit 11)	Harwich	63	63	24	22	Signalized eastbound ramps 2013
64	Station Avenue near Former Rail Crossing	Yarmouth	64	81	51	83	
65	West Main St @ Pitchers Way	Barnstable	65	89	76	175	
66	Route 6 @ Exit 1A/Exit1B	Bourne	66	54	8	7	
67	Route 134 @ Bob Crowell Rd/Hemlock Ln	Dennis	67	24	76	26	Analysis 2013
68	Route 28 @ East Main	Yarmouth, Barnstable	68	50	48	31	Recommendations included in Rt 28 Safety and Traffic Flow Study 2006
69	Buck Island Rd @ Higgins Crowell Rd	Yarmouth	69	64	87	64	
70	Route 28 (E Falmouth Hwy) @ Corte Real Ave	Falmouth	70	72	69	59	
71	Route 28 @ Main St/N Main St	Yarmouth	71	52	76	46	
72	Route 28 (Falmouth Rd) @ Orchard Rd/Ashers Path	Mashpee	72	85	67	101	
73	Route 6 (GAR Hwy) @ Brackett Rd/Old County Rd	Eastham	73	69	64	46	Signal upgrade & westbound left turn lane added 2010
74	Willow St @ Higgins Crowell Rd	Yarmouth	74	94	76	175	
75	Route 137 @ Route 39 (Orleans Rd)	Harwich	75	79	61	64	

CAPE COD DRIVERS

The demographics of Cape Cod depict a typical year-round resident that is older than the average population in the United States. Over 58% of Cape Cod's population as reported in the U.S Census Bureau (2013 estimates) was aged 45 or older (as compared to 40% for the national average). This trend is continuing. The migration of retirees to Cape Cod and a stable aging population is not being offset by new younger residents or births. With the trend toward an older population in America, the Federal Highway Administration (FHWA) has recognized that older drivers require special consideration. This recognition is demonstrated in the publication of several recent documents and a special address to Congress by the National Highway Traffic and Safety Administration (NHTSA). The focus in both cases was on the behavior of older drivers with respect to the "typical" driver. The NHTSA address also included issues related to younger drivers. Recommended guidelines for design standards that will help accommodate the needs of an older driver are also included in the literature.

Another dimension defining the unique character of Cape Cod drivers is their seasonal nature. The Cape is inundated with visitors, many of whom are not familiar with Cape Cod roads. Drivers that are used to city streets or parkways are also subjected to the scenic rural roads that compose a significant part of the Cape's character. The physical nature of these roadways may be somewhat unfamiliar to off-Cape drivers, leading to safety concerns.

Among the many drivers that visit to the Cape in the summer are a large number of younger motorists. These drivers have less experience in familiar surroundings and even less in the Cape driving environment. This coupled with a "vacation attitude" requires more considerations for roadway design and planning. These considerations must also be balanced with the natural qualities that bring people to Cape Cod.

THE SENIOR DRIVER

A large and increasing percentage of Cape drivers are 65 and older. According to the Census Bureau 2013 estimates, 27% or 58,320 residents of Barnstable County are aged 65 or older (see following table). This steadily increasing proportion of drivers will experience declining vision, slowed decision making and reaction times, additional difficulty in dividing attention between potential conflicts and traffic information, and reductions in strength, flexibility, and overall fitness. In many cases, these difficulties will outweigh the additional experience that older drivers have operating an automobile. The large majority of drivers who suffer from age-related driving deficiencies are not aware that a problem exists.

The overwhelming majority of Cape intersections are at grade. Based on FHWA crash statistics for drivers, 80 years and older, more than 50% of fatal crashes occur at intersections. This is compared with 24% or less for drivers up to age 50. According to studies referenced in the FHWA *Older Driver Highway Design Handbook* (1998), as driver age increases, involvement in intersection crashes increase as well. Older drivers typically experience two types of at-grade intersection difficulties. Left turn difficulties result from lack of sufficient caution and poor positioning on the road during the turn. Stopping difficulties result from a failure to stop, a

failure to make complete stops at stop signs, and stops that were abrupt. Comparing survey responses of drivers aged 66 to 68 with those aged 77 and older, showed that the older group had more difficulty following pavement markings, finding the beginning of left hand turn lanes, and driving across intersections. Another study of older drivers indicated that the most challenging aspect of intersection negotiation is making left turns during the green, left turn permitted signal phase. The protected "green arrow" left hand turn has been identified as an important improvement for older drivers.

Nighttime driving is associated with a higher crash risk for all drivers; however the effect of aging on vision is particularly compounded by the effect of darkness. The aging process causes gradual declines in a variety of ways; acuity, contrast sensitivity, glare-recovery, and peripheral vision. These declining functions make night driving particularly difficult for older drivers. The ability to notice and recognize objects at night and in low-light conditions such as dawn, dusk, rain, fog, haze, and snow is a chief concern. According to studies referenced in the FHWA handbook show that between age 20 and age 70, contrast sensitivity is reduced by a factor of three. This places the typical older driver at a relative disadvantage in low-light conditions. As expected, older drivers require significantly larger letters to read unfamiliar signs. Current sign standards are based on an assumed vision of 20/25 (as opposed to "perfect" 20/20 vision). Older drivers require a standard of 20/46.

OLDER DRIVER RECOMMENDATIONS

Based on the issues associated with the older driving population on Cape Cod the following suggestions are recommended as considerations for Cape Cod roadway improvements. Many of these recommendations are from FHWA's *Older Driver Highway Design Handbook* (1998). This resource should be consulted for more details. The Older Driver Handbook includes other recommendations and guidelines that should be considered in Cape roadway design but their use should also be tempered to maintain the character of Cape Cod's roadways.

Recommendations to accommodate older drivers include:

- Considering protected left turn phases into signalized intersections;
- Maintaining delineation through more frequent restriping and street cleaning;
- Improving signage standards to include larger lettering;
- Improving lighting level standards, in particular at intersections. Consider placing utilities underground and installing breakaway safety poles for lighting;
- Considering "all red" phases for signalized intersections;
- Establishing driver education programs for older drivers; and
- Providing education on other options for mobility.

Mobility programs to provide alternatives to driving also need to be improved. This was a major topic at Cape Cod's February 2000 Transit Summit. The recommendations from the Summit included a "dual challenge" of reducing auto dependency and meeting the needs of the transit dependent and those in need of human services. By improving mobility options, significant safety improvements may be realized

YOUNG DRIVERS

Safety and age-related crash statistics indicate that younger drivers' (under age 25) problems exceed those of any other age group. The shorter average trip length of older drivers is accompanied by a higher frequency of fatal crashes. Young drivers outnumber, out-travel, out-crash, and die more frequently by any other measure. There are slight differences between younger and older drivers in the types of crashes they experience. For example, young drivers have more speeding and alcohol-related crashes. Younger drivers' crashes are frequently caused by inexperience, poor judgment, and risk taking, while older drivers' crashes are more often related to reduced physical and cognitive capabilities.

Although most crashes occur at intersections, young drivers show a greater tendency than other age groups to be involved in non-intersection crashes. According to NHTSA statistics, 43% of crashes by drivers age 15 to 24 are at non-intersection locations. That number reduces to 41% for drivers age 25 to 64 and 31% for drivers age 65 to 74.

Younger drivers are more prone to risk-taking behavior and are subject to influences of youth culture and peer pressure. Many of these characteristics are evident in young visitors to Cape Cod.

YOUNGER DRIVER RECOMMENDATIONS

Recommendations to accommodate younger driver safety issues are divided between residents and visitors:

- Increased education for local young drivers.
- Additional enforcement and warnings during the busy traffic season to reach out to young visitor drivers.
- Develop and implement an advertising campaign and roadside signage reminding drivers that traffic and drunk-driving laws are strictly enforced on Cape Cod.

ADDITIONAL RECOMMENDATIONS

Additional recommendations include:

- Better signage for visitors directing them to popular destinations (e.g., larger, well-located signs to direct patrons of the Hyannis Transportation Center may improve safety at the driveway on Route 28).
- Signage explaining the rotary "rules of the road" and similar information to be included in visitor brochures and Cape-related websites

THE CAPE COD ROADWAY

There are nearly 3,900 miles of roadways in Barnstable County. These include 574 miles of Arterials and 213 miles of Collectors. The remaining 3,076 miles included local roads and the many miles of unimproved ways. The typical posted speed limit on the Cape is less than 40 miles per hour (mph) and, on average, the roadways carry 175% more traffic in July and August than they do in January and February.

The character of Cape Cod's rural roads includes narrow lanes and a typical speed limit of 35 mph. Most roads do not have shoulders and bicycles must often share the lanes with motorists. Many of the older roads evolved from Native American trails and stagecoach routes. Roadway geometry is therefore less accommodating than current state and federal standards. Included in the goals of this Plan is the preservation of the scenic and rural character of Cape Cod's narrow, winding roads. However, this must be accompanied by a program of enforcement and education especially for the drivers that visit the Cape in the summer. The following tables list crash rates for Routes 6, 6A, and 28, respectively. For comparison purposes, the latest available three years' data were from 2006-2008.

TABLE 8 - CRASH RATES (BASED ON YEARS 2009-2011): ROUTE 6

TOWN	ALL CRASHES (AVG. ANNUAL)	FATAL CRASHES (AVG. ANNUAL)	CRASHES PER MILLION VMT	FATAL CRASHES PER 100 MILLION VMT
Bourne	73	0.7	0.7	0.7
Sandwich	40	0.0	0.1	0.0
Barnstable	62	0.3	0.5	0.3
Yarmouth	28	0.3	0.4	0.4
Dennis	24	0.0	0.9	0.0
Harwich	31	0.0	0.6	0.0
Brewster	3	0.3	0.2	2.1
Orleans	15	0.0	0.7	0.0
Eastham	90	0.7	1.8	1.3
Wellfleet	39	0.0	0.6	0.0
Truro	24	0.0	0.5	0.0
Provincetown	6	0.3	0.5	2.9
Total	**435**	**2.7**	**6.1**	**3.8**

Registry of Motor Vehicles' Crash Records supplied by MassDOT
Vehicle Miles Traveled (VMT) calculated using Cape Cod Commission traffic data

TABLE 9 - CRASH RATES (BASED ON YEARS 2009-2011): ROUTE 28

TOWN	ALL CRASHES (AVG. ANNUAL)	FATAL CRASHES (AVG. ANNUAL)	CRASHES PER MILLION VMT	FATAL CRASHES PER 100 MILLION VMT
Bourne	182	1.7	1.9	1.7
Falmouth	353	0.7	4.1	0.8
Mashpee	51	0.3	2.2	1.5
Barnstable	101	1.7	1.7	2.7
Yarmouth	115	0.3	3.4	1.0
Dennis	64	0.3	5.5	2.9
Harwich	34	1.0	1.6	4.8
Chatham	31	0.0	0.8	0.0
Orleans	32	0.0	1.7	0.0
Total	**961**	**6.0**	**22.3**	**13.9**

Registry of Motor Vehicles' Crash Records supplied by MassDOT
Vehicle Miles Traveled (VMT) calculated using Cape Cod Commission traffic data

TABLE 10 - CRASH RATES (BASED ON YEARS 2009-2011): ROUTE 6A

TOWN	ALL CRASHES (AVG. ANNUAL)	FATAL CRASHES (AVG. ANNUAL)	CRASHES PER MILLION VMT	FATAL CRASHES PER 100 MILLION VMT
Bourne	26	0.0	9.9	0.0
Sandwich	43	0.0	2.1	0.0
Barnstable	6	0.0	0.3	0.0
Yarmouth	26	0.0	1.5	0.0
Dennis	40	0.0	2.6	0.0
Brewster	64	0.0	2.1	0.0
Orleans	35	0.0	5.0	0.0
Total	**241**	**0.0**	**14.6**	**0.0**

Registry of Motor Vehicles' Crash Records supplied by MassDOT
Vehicle Miles Traveled (VMT) calculated using Cape Cod Commission traffic data

SAFETY IMPROVEMENTS THROUGH INTERSECTION MODIFICATION

To help quantify the benefits of various safety treatments, several resources were consulted including *The Traffic Safety Toolbox: A Primer on Traffic Safety*, Chapter 28, Institute of Transportation Engineers, 2000; and *Prediction of the Expected Safety Performance of Rural*

Two-Lane Highways, Chapter 5, Federal Highway Administration, 2000. These reports include discussions on various vehicular access treatments and predictions of "Accident Reduction."

Modern Roundabouts v. Four-Way Intersections

A roundabout is a type of circular intersection with specific design and traffic control features. These features include yield control of all entering traffic, channelized approaches, and appropriate geometric curvature to ensure that travel speeds on the circulatory roadway are typically less than 20 mph. The decision to install a roundabout as a safety improvement should be based on a demonstrated safety problem of a type susceptible to correction by a roundabout. FHWA's *Roundabouts: an Informational Guide*, (FHWA –RD-00-067, June 2000) provides a review of the safety improvements afforded by roundabouts. For example, safety problems that could be improved by a roundabout include:

- High rates of crashes such as right angle, head-on, left/through, U-turns, etc.
- High crash severity that could be reduced by slower speeds
- Site visibility problems that reduce the effectiveness of stop sign control
- Inadequate separation of movements, especially on single-lane approaches

The following figure shows that roundabouts have fewer annual injury crashes than rural two-way stop-controlled (TWSC) intersections, and the total number of crashes at roundabouts is relatively insensitive to minor street demand volumes.

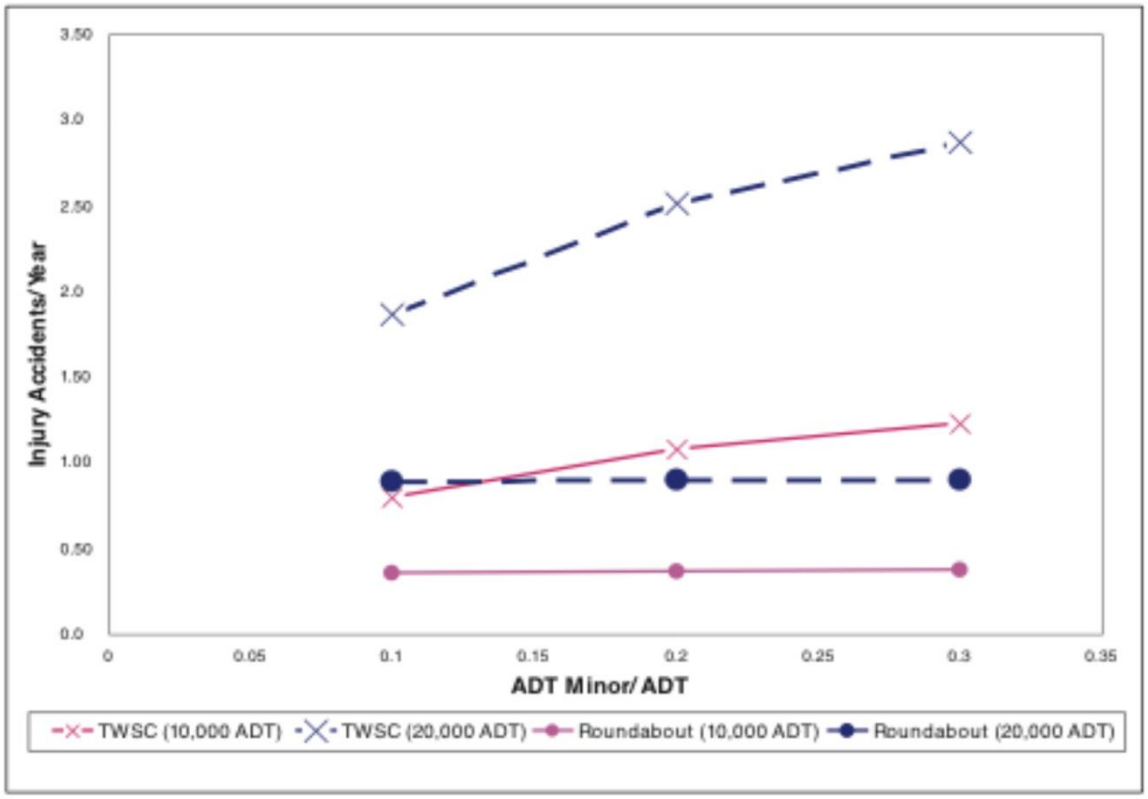

FIGURE 2 - COMPARISON OF PREDICTED ROUNDABOUT INJURY CRASHES WITH RURAL 2-WAY STOP - CONTROLLED INTERSECTIONS.

(Source: FHWA)

The Roundabout guide also includes information to compare roundabouts to signalized intersections. The following figure shows that roundabouts have fewer injury accidents per year than signalized intersections, particularly in rural areas. At volumes greater than 50,000 vehicles per day (shown on the figure as "ADT" – average daily traffic), urban roundabout safety may be comparable to that of urban signalized intersections.

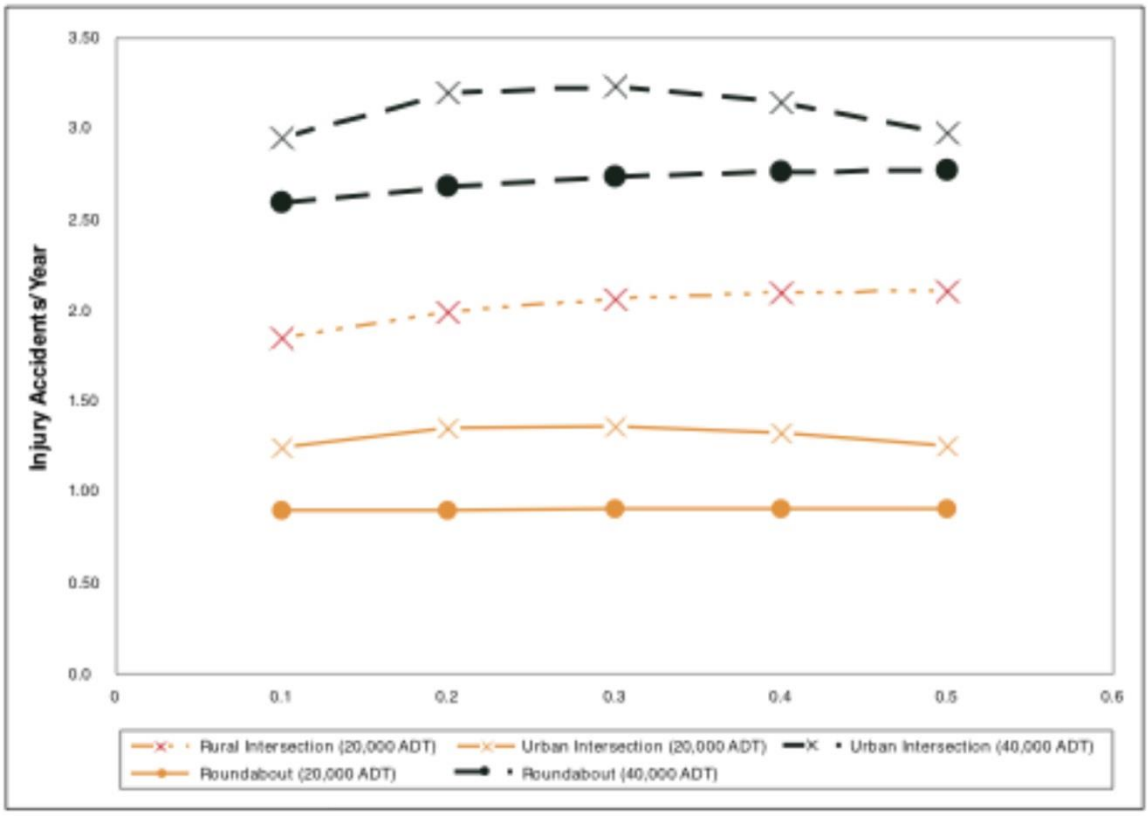

FIGURE 3 - COMPARISON OF PREDICTED INJURY CRASHES FOR SINGLE-LANE AND DOUBLE-LANE ROUNDABOUTS WITH RURAL OR URBAN SIGNALIZED INTERSECTIONS.

(Source: FHWA)

SAFETY-RELATED TECHNOLOGY

Improved technology provides new options for the enforcement of traffic laws and speed control. The Insurance Institute for Highway Safety (IIHS) and the FHWA have favorable reviews of applications such as red-light enforcement and photo radar. These techniques should be coupled with education as well, since a goal is to improve safety by deterring unsafe driving. The greatest benefit of these techniques has been a "halo effect" whereby drivers are complying

with traffic laws in un-monitored locations as well as those where the technology has been installed.

Red Light Enforcement

According to IIHS, nationwide, drivers who run red lights are responsible for 260,000 crashes each year. Of these, approximately 750 are fatal. Motorists are more likely to be injured in crashes involving red light running than in other types of crashes: occupant injuries occurred in 45% of red light running crashes compared with 30% for other crash types. Enforcing red light laws by traditional means poses special difficulties for police, who in most cases must follow a violating vehicle through a red light to stop it. This poses a danger to motorists, pedestrians, as well as the officers. Red light running violations typically decrease by as much as 60% at intersections where cameras automatically enforce the law.

In areas where red light cameras have been installed as well as areas without cameras, most drivers have supported the use of red light cameras, 80% in cities with cameras and 76% in cities without.

Opticom System

Many of the Cape's signalized intersections are equipped with the Opticom priority-based pre-emption system. Opticom includes infrared detection equipment installed adjacent to the signal heads. When an emergency vehicle (ambulance, fire engine, etc.) equipped with an Opticom infrared emitter approaches the intersection, the detector notifies the signal controller and a green phase is maintained for the emergency vehicle (other approaches are held under a red phase). Signal pre-emption is vital for emergency responders to safely and quickly travel to incident sites. Agencies responsible for intersection signal maintenance should also ensure continuous operation of the Opticom system. Upgrades to existing signals and new signal installations should be equipped with Opticom.

COORDINATION WITH MASSACHUSETTS' STRATEGIC HIGHWAY SAFETY PLAN

Building on the success of the 2006 "Strategic Highway Safety Plan" (SHSP), MassDOT released an update of the document in September 2013. The updated Massachusetts SHSP[1] is consistent with requirements outlined in the most recent Federal transportation legislation, Moving Ahead for Progress in the 21st Century (MAP-21). One requirement is to establish goals and performance measures. Goals in the Massachusetts SHSP include:

- Reduce motor vehicle fatalities and hospitalizations by 20 percent in the five-year period following adoption of the SHSP (Short-Term Goal);
- Halve the number of fatalities and serious injuries by 2030 (Interim Goal); and
- Move Toward Zero Deaths and eliminate fatalities and serious injuries on the roadways (Long-Term Goal).

[1] http://www.massdot.state.ma.us/Portals/8/docs/traffic/shsp/shspSeptember2013.pdf

The Massachusetts Strategic Highway Safety Plan update is organized to focus attention on the traffic safety problems exhibited by each emphasis area. An emphasis area is classified as Strategic, Proactive, or Emerging based on the number of fatalities, hospitalizations, or incapacitating injuries resulting from crashes related to the emphasis area.

Strategic Emphasis Areas

Each emphasis area listed here represents at least 10 percent of annual fatalities or severe injuries on Massachusetts roadways.[2]

- Impaired Driving
- Young Drivers
- Intersections
- Older Drivers
- Lane Departures
- Pedestrians
- Occupant Protection
- Motorcycles
- Speeding/Aggressive Driving

Proactive Emphasis Areas

Each of these emphasis areas represents less than 10 percent of annual fatalities or severe injuries on Massachusetts roadways. Strategies included within each emphasis area are designed to ensure fatalities and severe injuries for these areas are further reduced even though it may be more difficult in areas already experiencing very low crash rates.

- Bicycles
- At-Grade Crossings
- Truck/Bus-Involved Crashes
- Safety of Persons Working on Roadways

Emerging Emphasis Areas

These emphasis areas focus on continuously improving the data systems used to analyze traffic safety patterns and generate data on safety topics where the data currently are inconclusive.

- Data Systems
- Driver Inattention[3]

The safety goals, objectives, and performance measures of the Cape Cod RTP were developed to support the goals and performance measures of the Massachusetts SHSP.

[2] Severe injuries are based on injuries requiring hospitalizations or defined as incapacitating injuries by police reporting
[3] http://www.massdot.state.ma.us/Portals/8/docs/traffic/shsp/shspSeptember2013.pdf

POLICIES & STRATEGIES

In the interest of preserving the character of Cape Cod and achieving safer roads, non-traditional methods of improving safety must be explored. The following recommendations for improving safety will not substantially change the character of the roadways on Cape Cod. Recommendations consistent with the Massachusetts' *Strategic Highway Safety Plan's* (SHSP) "Emphasis Areas" are indicated with an asterisk.

- Consider Traffic Calming measures such as 4-way stop signs and roundabouts.*
- Improve striping maintenance and use of more reflective treatments.*
- Increase enforcement and police presence on rural roads such as 6A.*
- Investigate photo enforcement of red light running and speeding.*
- Make physical improvements that improve the safety and security of the transportation network a priority.*
- Continuously monitor the condition of the transportation system to ensure that it is safe to travel on all modes throughout Cape Cod.*
- Continue to identify the high priority safety locations throughout Cape Cod and then determine measures to increase safety at those locations.*
- Separate high and low speed travel modes, so that those traveling at slower speeds, such as bicycles and pedestrians, do not conflict with those traveling at higher speeds, such as rail and automobile traffic.*
- Encourage safe use of the transportation network through public awareness campaigns, promoting such things as seatbelts for motorists and helmet use for bicyclists.*

*Supports Massachusetts' Strategic Highway Improvement Program "Emphasis Areas"

COMMUNITY CHARACTER/SAFETY ISSUES

The following recommendations are intended to preserve community character while addressing safety issues.

- Use alternative guardrail treatments, such as steel Corten or steel backed timber - all on wood posts, where guardrail is necessary.
- Consider roundabouts as an alternative to signalized intersections.
- Continue policies that disallow business logo signs on state highways in Barnstable County.
- Preserve all state owned/town owned land along roads and other transportation rights-of-way, for transportation uses and/or conservation.
- Prohibit pruning and clearing within state rights-of-way except for safety purposes, such as making sight distance improvements.
- Encourage ornamental signal posts and mast arms.
- Develop design guidelines for Cape Cod to document preferred treatments in design concepts and details.
- Encourage use of simulated brick crosswalks and other contrasting materials in order to provide drivers with better visual identification. Crosswalks should be considered for all projects to accommodate walking as a viable mode of travel.

- Promote "Share the Road" and other bicycle education programs.

ROADWAY SAFETY AUDITS

Since 2007 there have been eighteen Road Safety Audits (RSAs) completed for locations throughout Cape Cod. The Audit process is overseen by MassDOT and brings together community officials and others in an intensive review of high-crash locations' operational and geometric deficiencies. Each audit includes a review of traffic and crash information, an onsite field review.

It is important to note that the RSAs were borne directly from the U.S. DOT & MassDOT's Highway Safety Improvement Program (HSIP). This program was formally created by the federal transportation legislation (SAFETEA-LU) and these efforts are intended to align the use of data to identify the most serious safety deficiencies responsible for fatal accidents and serious injuries.

BARNSTABLE ROAD SAFETY AUDITS

There have been six completed audits within the town of Barnstable since 2007:

Iyannough Road (Route 132) at Cape Cod Community College/Cape Cod Conservatory Intersection

Completed in 2014, the audit includes five safety issues and identified enhancements for each:

Safety Issue #1. Intersection Geometry & Vehicle Conflicts

Enhancements:

- Provide more control and definition at the intersection. This may include a right-turn lane on northbound Route 132. Modify pavement marking to allow for through-traffic exiting the college driveway.
- For traffic calming and to reduce vehicle conflicts, consider installation of a modern roundabout.
- To reduce left-turning vehicle conflicts, consider installation of a traffic signal.

Safety Issue #2. Sight Distance and Vegetation

Enhancement:

- Trim vegetation to increase available sight distance and signage visibility.

Safety Issue #3. Signage and Lighting

Enhancement:

- Upgrade (replace) signs to improve retro-reflectivity.

- Add a white on green sign in advance of the intersection with "Cape Cod Community College next right".
- Consider installing overhead lighting at the utility pole on the northwest quadrant of the intersection.

Safety Issue #4. Pavement and Markings

Enhancement:

- With intersection improvements the pavement condition and markings should be improved, as feasible.

Safety Issue #5. Bicycle/Pedestrian Accommodations

Enhancement:

- Provide advance warning signage notifying motorists along Route 132 of the upcoming crosswalk.
- Install an accessible ramp on the western side of the Route 132 crosswalk.
- During intersection improvements, include accommodations for bicyclists such as widened shoulders or bike lanes on Route 132.
- Consider creating an accessible and well-lit unpaved path from Route 132 to Community College Parking Lot #2 to shorten walking distances between the college and the Park and Ride Lot; if warranted consider installation of a crosswalk on Route 132 on the northern leg of the Route 6A westbound ramps intersection to provide access to the path.

Route 28 at Osterville-West Barnstable Road

Completed in 2012, the audit includes seven safety issues and identified enhancements for each:

Safety Issue #1. Conflicting Movements

Enhancement:

- Provide more control and definition at the intersection and adjacent property driveways; consider installation of left turn lanes and phases on Route 28.

Safety Issue #2. Driver Behavior and Speed

Enhancements:

- Review signal timing to ensure that the clearance time (yellow and all red time) is adequate for the 85th percentile speeds and according to the Institute of Transportation Engineers (ITE) Traffic Engineering Handbook equation. When the intersection is reconstructed, consider providing dilemma zone detection.
- Provide periodic enforcement to provide visibility that promotes calming and improved behavior.

Safety Issue #3. Sight Distance and Vegetation

Enhancements:

- Trim vegetation for improved sight triangle at the intersection.
- Add black backplates to the signal heads for improved visibility.

Safety Issue #4. Signs

Enhancements:

- Upgrade signs for retro-reflectivity.
- Add a white on green sign in advance of the intersection with "Osterville-West Barnstable Road next signal".

Safety Issue #5. Pavement and Markings

Enhancement:

- With intersection improvements the pavement level and markings should be improved, as feasible.

Safety Issue #6. Bicycle/Pedestrian Accommodations

Enhancements:

- Upgrade bicycle and pedestrian accommodations with future maintenance and/or reconstruction efforts.
- Consider adding an island with the left turn lanes for a break in bicycle/pedestrian crossing of Route 28.

Safety Issue #7. Traffic Signal Equipment

Enhancements:

- Install pre-emption equipment in the traffic signal for emergency responders.
- Add black backplates to the signal heads.

Iyannough Road (Route 28) at Yarmouth Road

Completed in 2012, the audit includes ten safety issues and identified enhancements for each:

Safety Issue #1. Congestion and Driver Frustration

Enhancements:

- Consider the feasibility of improving traffic signal operations (e.g. traffic signal improvements, signal phasing changes, roadway widening, lane use modifications, etc.) to reduce queuing conditions and motorist frustration.
- Consider the appropriateness and safety benefits of providing a protected left-turn signal phase for Yarmouth Road northbound.
- Enforce red light running violations where possible.

- Review, and adjust as appropriate, clearance intervals per current standards in an effort to reduce rear-end and angle-type crashes.

Safety Issue #2. Unclear Lane Use

Enhancement:

- Review traffic volumes and operations at the Yarmouth Road northbound approach to evaluate the appropriateness of formalizing two lanes. Repaint and maintain lane use pavement markings along Yarmouth Road southbound.

Safety Issue #3. Intersection Geometry

Enhancements - Iyannough Road (Route 28) at Yarmouth Road:

- Consider the feasibility of increasing curb radii, particularly at the northeast corner of the intersection, and/or staggering stop bar placement to allow/ facilitate truck turns.
- Consider the appropriateness of replacing the current signalized intersection with a multilane modern roundabout to reduce the occurrence of angle type crashes.

Enhancements - Yarmouth Road /Camp Street:

- Explore the feasibility of making geometric changes, such as creating a 90 degree "T" intersection between Yarmouth Road and Camp Street, or a roundabout, to reduce conflicts, improve sightlines, reduce driver confusion, and improve overall safety. Consider emergency vehicle access/response times to Cape Cod hospital, queuing conditions along Yarmouth Road northbound at Route 28, and access to and from DJ's Family Sports Pub.
- Consider the appropriateness of adding a dotted double yellow center line and dotted white edge lines through the Camp Street/Yarmouth Road intersection to clarify the main road from the side street.

Safety Issue #4. Signage

Enhancements:

- Relocate "Left Lane Must Turn Left" (R3-7) sign along Route 28 eastbound so that it is visible to motorists.
- Consider improving guide signage for Route 28 eastbound to direct motorists to Route 6.
- Trim and maintain overgrown trees along Yarmouth Road northbound to improve visibility of Route 28 guide signage.
- Consider appropriateness for installing guide signage for Route 6 along Yarmouth Road northbound.
- Remove "Caution Crossing Traffic" sign near Dunkin Donuts/Hess driveway to reduce sign clutter.

Safety Issue #5. Access Management

Enhancements:

- Consider the appropriateness of physically precluding left turns out of Dunkin Donuts/Hess onto Yarmouth Road southbound through geometric changes and/or introduction of a median along Yarmouth Road as part of future reconstruction efforts.
- Explore the feasibility of prohibiting left turns out of the eastern Dunkin Donuts/Hess driveway if crash experience worsens. Consider fuel delivery requirements and the impacts of restricting all left turns out of the Dunkin Donuts/Hess site.

Safety Issue #6. Railroad Crossing

Enhancements:

- Consider the feasibility of providing preemption for the railroad crossing and ways to coordinate Route 28/Yarmouth Road signal to reduce/eliminate queuing within the intersection and to improve emergency vehicle response time.
- Consider the appropriateness of adding "Do Not Block Intersection" signage and appropriate pavement markings at Route 28/Yarmouth Road to discourage motorists from blocking the intersection during train crossings.
- Consider the long-term feasibility of creating grade separation between Route 28 and the railroad crossings.

Safety Issue #7. Signal Indications

Enhancements:

- Evaluate the visibility of the signal indications as part of the design process to ensure that it meets current Manual on Uniform Traffic Control Devices (MUTCD) standards. Relocate signal heads, and/or install additional overhead and/or post-mounted signal indications as appropriate to improve visibility.
- Consider the appropriateness of installing backplates on all traffic signal indications to reduce solar glare.
- Trim overgrown trees to improve visibility of the signal indications.

Safety Issue #8. Limited Bicycle Accommodations

Enhancements:

- Consider the feasibility/appropriateness of providing bicycle accommodations at the intersection (i.e., shared lanes and/or within a 4-foot shoulder, bicycle detection at signals, signage, and pavement markings) in accordance with the 2006 Project Development and Design Guide.
- As part of the design process and long-term planning efforts, include a Route 28 bicycle/pedestrian crossing to connect the future extension of the Cape Cod Rail Trail through the intersection.

Safety Issue #9. Limited Pedestrian Accommodations

Enhancement:

- Evaluate the feasibility and safety benefits of providing pedestrian accommodations at the Route 28/Yarmouth Road intersection, including crosswalks, accessible ramps, and pedestrian signal indications, and providing a connection between the intersection and the existing sidewalks on Camp Street and Yarmouth Road south of Route 28.

Safety Issue #10. Emergency Vehicles

Enhancements:

- Provide Opticom detection at the intersection of Route 28/Yarmouth Road to improve emergency vehicle response times.

Previous Barnstable Road Safety Audits

Audits listed below have been summarized in previous Regional Transportation Plans and are listed for convenience. Copies of Road Safety Audits are available from the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Meetinghouse Way (Route 149)/Route 6 Ramps (2010)
- Route 28 (Falmouth Road)/Bearses Way (2009)
- Route 28 in Barnstable – Lane Departure Safety Audit (2007)

BOURNE ROADWAY SAFETY AUDITS

There have been two completed audits within the town of Bourne since 2012:

Route 28 between Bourne Rotary and Otis Rotary

Completed in 2013, the audit includes a number of safety issues and identified enhancements for specific locations:

Bourne Rotary

Enhancements:

- Consider the safety benefits of providing advance guide signage along the approaches to the rotary. Consider providing diagrammatic guide signs (D1-5 or D1-5A) for each individual approach so that motorists know which exit they need to take before entering the rotary.
- Remove the guide signage from the center island of the rotary.

- Remove guide signage that is too small for circulating traffic to read. Replace with MUTCD-compliant signage if the signage is deemed necessary. Ensure that all guide signage visible from the rotary or the approaches to the rotary is useful and necessary.
- Provide larger "Reduced Speed Ahead" signage (W3-5) along the Route 28 northbound approach to the rotary. Consider whether more gradually reducing the speed limit along the approach would reduce the number of rear-end crashes.
- Continue enforcing speeding violations within the rotary and along approaches to the rotary.
- As part of long-term planning efforts, consider the safety benefits of providing overhead signage to improve motorist visibility.
- Consider the safety benefits of providing longitudinal markings and arrow pavement markings within the rotary, including dashed pavement markings to assist entering and exiting vehicles, as part of the upcoming Route 28 corridor resurfacing project.
- Consider providing additional pavement markings along the Trowbridge Road eastbound and Sandwich Road westbound approaches to the rotary that clearly indicate that vehicles should form a single travel lane.
- Consider the safety benefits of removing large trees and trimming overgrown vegetation on the mound behind the "Cape Cod" topiary within the rotary. Consider the feasibility and safety benefits of restricting the two Gulf gas station driveways to either entrance- or exit only using signage and/or pavement markings.
- Consider the feasibility of closing the easternmost Gulf gas station driveway. The maneuverability of fuel delivery trucks should be taken into consideration.
- Consider the safety benefits of restricting left-turn movements into and out of the IHOP driveways along Route 28.
- Consider the feasibility of closing one of the two IHOP driveways located along the northern leg of Route 28, in the vicinity of the Bourne Bridge.
- Provide pavement markings along the Route 28 northbound approach to the rotary that would help to deflect and slow vehicles entering the rotary.
- As part of mid-term reconstruction efforts, evaluate the safety benefits of realigning the Route 28 northbound approach so that traffic is deflected at a greater angle in order to slow vehicles entering the rotary.
- In long-term planning efforts, consider the feasibility and safety benefits of replacing the Bourne Rotary with a grade-separated option, such as a diamond interchange.
- Install "Except Pedestrians" placards on the "Do Not Enter" signage at the State Police Barracks to encourage pedestrians to use the State Police Barracks driveway instead of the rotary to access Trowbridge Road.

Otis Rotary

Enhancements:

- Consider the safety benefits of providing warning signage, including yellow flashing beacons along the Route 28 northbound and southbound approaches to the rotary, similar to what is provided along the Route 28 southbound approach to the Bourne Rotary, in order to warn motorists to be more alert within the rotary.
- Add deflection along the Route 28 approaches to the rotary using pavement markings to encourage motorists to enter the rotary at slower speeds.

- As part of long-term planning efforts, consider the feasibility and safety benefits of altering the alignment of the Route 28 northbound and southbound approaches, so that they align with the center point of the central island within the Otis Rotary.
- Continue to enforce speeding violations within the rotary and on the approaches to the rotary.
- As part of long-term planning efforts, consider replacing the rotary with a grade-separated intersection, such as a diamond interchange. A team member stated during the RSA that a diamond alignment fits well within the footprint of the rotary.
- Consider the safety benefits of providing advance guide signage along the approaches to the rotary. Consider providing diagrammatic guide signs (D1-5 or D1-5A) for each individual approach so that motorists know which exit they need to take before entering the rotary.
- Remove guide signage that is too small for circulating traffic to read. Replace with MUTCD-compliant signage if the signage is deemed necessary. Ensure that all guide signage visible from the rotary or the approaches to the rotary is useful and necessary.
- As part of mid-term planning efforts, consider the safety benefits of providing overhead signage within the rotary to improve visibility for motorists.
- Consider providing curve warning signage and/or chevron signs at the Connery Avenue exit from the rotary.
- Consider the safety benefits of providing lane pavement markings and arrow pavement markings within the rotary, including dashed pavement markings to assist entering and exiting vehicles, as part of the upcoming Route 28 corridor resurfacing project.
- Consider the feasibility and safety benefits of replacing any damaged or previously removed lighting within the Otis Rotary.
- As part of mid-long-term reconstruction efforts, provide adequate drainage within the Otis Rotary, particularly between Route 28 northbound and Connery Avenue.

Route 28 at Waterhouse Road

Enhancements:

- Clear any vegetation in the median that may obstruct sight lines to the north of the turnaround near Waterhouse Road.
- Consider formalizing a deceleration lane along the Route 28 southbound approach to Waterhouse Road, if feasible.
- As part of long-term construction efforts, consider the feasibility of altering the alignment of Waterhouse Road in order to create a T-intersection with Route 28 southbound. This would improve sight lines to the north of the intersection and prevent vehicles from entering Route 28 from Waterhouse Road without stopping. It would also increase the distance between the Waterhouse Road eastbound approach and the Bayview Campground driveway. An acceleration lane should be provided for Waterhouse Road traffic to safely merge onto Route 28 southbound, and intersection warning signs should be provided along the Route 28 southbound approach to Waterhouse Road.
- Replace guide signage for Trading Post Corner with advance guide signage for Waterhouse Road along Route 28 northbound and southbound.
- Replace the conflicting sign for the Bayview Campground along the Waterhouse Road eastbound approach with MUTCD-compliant brown Recreational and Cultural Interest Area guide signage, if the signage is deemed necessary. Consider moving the “No Turns” sign (R3-3) northward to avoid confusion.

Corridor-Wide Issues

Enhancements:

- Trim any vegetation within the Route 28 median that may obstruct the sight lines of vehicles using turnarounds.
- Consider locations where adding acceleration lanes and/or extending deceleration lanes may be feasible. Consider reallocating space from breakdown lanes, if possible.
- As part of long-term planning efforts, evaluate the placement of all turnaround locations. Consider the distance between turnarounds and merging distance between turnarounds and points of interest such as intersections or commercial driveways. Ensure that all turnarounds are constructed to allow for heavy vehicle movements, particularly in the vicinity of the Bourne Town Landfill. All turnarounds should have adequate acceleration and deceleration lanes so that traffic can safely slow or merge with Route 28 traffic.
- Continue to enforce speed violations along Route 28, especially in inclement weather, where possible.
- Consider providing additional speed limit signage (R2-1) after major intersections and commercial driveways, and where excessive speeds are common. Consider the use of oversized speed limit signage in areas where the speed limit decreases significantly, or where speeding is common, such as at the bottom of crest vertical curves.
- Consider the appropriateness of using visual speed bars in deceleration lanes, including deceleration lanes for local businesses, to alert motorists of a change in roadway characteristics within the deceleration lane.
- Consider use of oversized "One Way" (R6-1) signs at intersections and driveways along Route 28 and "All Traffic Turn Left" (W19-5 mod) at turnarounds within Route 28, replacing or complementing the existing signage, to reduce the occurrence of wrong-way travel along Route 28. Also consider installing Wrong Way (R5-1a) signs, as appropriate, along Route 28.
- Consider the use of flexible delineators on the flush concrete median in the vicinity of Clay Pond Road to prevent wrong-way turns.
- As part of long-term reconstruction efforts, consider replacing the flush concrete median with a raised median to prevent wrong-way travel along Route 28.
- As part of long-term reconstruction efforts, repair or replace damaged drainage structures and ensure that all areas drain properly.
- As part of long-term reconstruction efforts, consider providing pedestrian and bicycle accommodations, such as the planned shared-use path parallel to Route 28. Consider
- pedestrian/bicycle crossing infrastructure in conjunction with the proposed Route 28 parallel shared-use path.
- Consider enlarging signs and sign legend/text, providing better lighting, and maintaining pavement markings to accommodate the rising population of older drivers on Cape Cod.

Sandwich Road at Cranberry Highway

Completed in 2012, the audit includes six safety issues and identified enhancements for each:

Safety Issue #1. Signage

Enhancements:

- The directional information should be enhanced through additional or revised signs. Adding the information on the signs "to Route 6 west" and/or "to the Sagamore Bridge" will clarify that Cranberry Highway is the roadway connecting to Route 6 westbound. Many drivers traveling on Sandwich Road may be looking to connect with Route 6.
- Since the Bourne Bridge is closer to 195 / 495 and connections to Providence, RI Intersection warning signs should be added to Sandwich Road for improved awareness of the Cranberry Highway intersection. It was suggested that the W2-3L sign, showing the angled intersection, should replace the existing W1-0L sign that includes the arrow turning left.
- In addition, it would assist certain motorists to include directional signs to Factory Outlet Road, where redevelopment of that area has added additional shopping attractions.
- All signs should be upgraded for retro-reflectivity as the MassDOT District Office maintenance schedule allows.
- It was suggested that having street signs with the roadway names may assist in alleviating confusion with the change in Route 6A and the corresponding roadway names.
- An effort should be made to contact online map companies to update name and Route numbers. As more people use Global Positioning Systems (GPS), there should be a check to ensure that the street signs and the GPS have the same directional information.

Safety Issue #2. Sight Distance and Vegetation

Enhancements:

- Trim or cut back the vegetation for improved visibility on the corner island of the gas station property.
- Trim the tree branches back on Sandwich Road and/or relocate the sign for improved prominence.

Safety Issue #3. Speed

Enhancements:

- Continue periodic police enforcement of traveling speeds along Sandwich Road and in the vicinity of the intersection to encourage compliance for improved safety.
- Consider additional measures in the long term, such as a roundabout to reduce speeding and enhance multi-modal safety.

Safety Issue #4. Geometry

Enhancement:

- Consider improving the geometric configuration of the intersection through adjustment of the Cranberry Highway approach and island, or through conversion to a roundabout. Consider shoulder widening on Sandwich Road in the vicinity of the intersection.

Safety Issue #5. Pavement Level and Markings

Enhancements:

- Consider raising the level of the Cranberry Highway approach as part of roadway improvements or maintenance efforts.

Safety Issue #6. Bicycle/Pedestrian Accommodations

Enhancement:

- Provide improved accommodation for pedestrians and bicyclists through roadway improvements or maintenance efforts.

DENNIS ROADWAY SAFETY AUDIT

The audit listed below has been summarized in a previous Regional Transportation Plan and are listed for convenience. Copies of Road Safety Audits are available from the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Route 134 at the Route 6 Ramps (2009)

EASTHAM ROADWAY SAFETY AUDIT

Route 6 and Governor Prence Road

Completed in 2012, the audit includes six safety issues and identified enhancements for each:

Safety Issue #1. Speed

Enhancements:

- Continue police enforcement of traveling speeds along Route 6 and in the vicinity of the intersection to ensure compliance for improved safety.
- Consider additional measures, such as a roundabout at Governor Prence Road, or other traffic calming measures in certain areas to reduce speeding and enhance multi-modal safety. A partial median with a crossing for bicyclists and pedestrians in the vicinity of the information booth just north of the Gov. Prence Rd. intersection would calm traffic or that section.

Safety Issue #2. Conflicting Volumes

Enhancement:

- A partial median treatment or a roundabout concept may assist in calming traffic in the vicinity of the intersection. A roundabout, as a possible long-term improvement, would reduce intersection conflicts by removing left turns from the intersection; and slow traffic. This slowing of traffic would also benefit the information booth area.

Safety Issue #3. Bicycle and Pedestrian Accommodation

Enhancements:

- Consider a pedestrian beacon north of the intersection at the information booth.
- Discussion included the need for a sight distance measurement, and the possibility of a median in the vicinity to slow traffic at the Route 6 crossing.
- Consider improved bicycle/pedestrian accommodation when reconstruction for Route 6, or the intersection, is being considered.

Safety Issue #4. Signage

Enhancements:

- Reposition the STOP sign to face he vehicles approaching on Governor Prence Road, and install on both sides of the intersection.
- Trim brush for improved sight distance of the STOP signs. Trim on the eastbound Governor Prence Road approach for improved visibility of the flashing light.
- Relocate or add another "Fort Hill Area" sign for improved visibility of motorists looking for that destination.
- Street signs should be upgraded, with consideration of adding one of the Governor Prence Road street signs to the post for the flashing light.

Safety Issue #5. Pavement Level and Markings

Enhancements:

- Consider leveling the approach as part of roadway improvements or maintenance efforts.
- The right turn arrows directing traffic to exit should be repainted, and perhaps an earlier one added. In addition, a sign could be added prior to the turn, such as, an all traffic turn right sign.
- It may be possible to narrow he one-way section to further visually deter southbound vehicles.
- The mature trees provide much shade but make it difficult to perceive where to drive when acing "Do Not Enter" signs. Providing a sign, such as the "All Traffic ➡" sign, will assist in directing drivers to the appropriate path back to Route 6.

Safety Issue #6. Sight Distance

Enhancements:

- It was noted that further improvements may be required to improve sight distance from Governor Prence Road in the long term, but in the short term keeping the area mowed to reduce obstruction by the vegetative growth is desirable.
- The flashing light should be adjusted for improved alignment, and the vegetation trimmed on both approaches of Governor Prence Road.

MASHPEE ROADWAY SAFETY AUDITS

Mashpee has had three audits completed since 2007:

Nathan Ellis Highway (Route 151) at Old Barnstable Road Intersection

Completed in 2014, the audit includes five safety issues and identified enhancements for each:

Safety Issue #1. Speed & Driver Behavior

Enhancements:

- Remove the Route 151 eastbound "Speed Limit 50" sign from the western approach to the intersection. Consider additional advanced intersection warning signage
- Include "Don't Block the Box" signage on approaches to the intersection.
- Conduct traffic safety workshop to remind school bus drivers of the importance of obeying all traffic laws – especially stopping in advance of red signals.
- Consider intersection realignment to bring minor street approaches closer to 90-degree angles; also investigate feasibility of construction of a modern roundabout to lower travel speeds and improve safer merging.

Safety Issue #2. Bicycle & Pedestrian Accommodations

Enhancements:

- Realign the crosswalk on the northern leg to be parallel with Route 151; modify curbing on island to accommodate wheelchair users and meet ADA requirements.
- Replace pedestrian signal push buttons with APS vibro-tactile buttons (to accommodate senior residents.
- Schedule regular street sweeping to remove sand and debris from wheelchair ramps.
- Re-apply crosswalk markings.
- Consider construction of a crosswalk on Old Barnstable Road's southern leg to accommodate pedestrians traveling between the trailer park and the high school.
- During corridor-wide improvements, construct pedestrian and bicycle accommodations to the west of the intersection.

Safety Issue #3. Intersection Control & Auxiliary Lanes

Enhancements:

- Remove the "One Way" sign and replace the "Do Not Enter" sign currently located on the island on the western side of the southern leg of the intersection.
- Remove the left-turn prohibition sign from the east side of the southern leg of Old Barnstable Road
- Consider signalization modification to increase yellow times and include an advance green phase for southbound Old Barnstable Road.
- Consider lengthening storage areas of left-turn lanes on Route 151.
- Consider re-visiting lane allocation and revised signal timing and phasing.
- Consider intersection realignment; also investigate the feasibility of constructing a modern roundabout to improve safety and traffic flow.

Safety Issue #4. Lighting, Weather & Obstructions

Enhancements:

- Perform pavement rehabilitation during next intersection upgrade.
- Consider installation of larger signal heads and backplates on Route 151 approaches.
- Install street lighting on northern approach of Old Barnstable Road

Safety Issue #5. Animals

Enhancement:

- Explore techniques to reduce vehicular travel speeds to enhance safety for animals and other non-motorized travelers.

Previous Mashpee Road Safety Audits

Audits listed below have been summarized in previous Regional Transportation Plans and are listed for convenience. Copies of Road Safety Audits are available from the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Great Neck Road North/Old Barnstable Road (2009)
- Route 130 Lane Departure Road Safety Audit (2007)

SANDWICH ROAD SAFETY AUDITS

Since 2009, two safety audits were completed in Sandwich. The audits listed below have been summarized in a previous Regional Transportation Plan and are listed for convenience. Copies of Road Safety Audits are available from the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Cotuit Road/Harlow Road/South Sandwich Road (2009)
- Route 6: Major Highway Median Cross-Over Crashes (2009)

YARMOUTH ROAD SAFETY AUDITS

There have been two audits completed since 2010 in Yarmouth.

Route 6A – Willow Street to Union Street

- Completed in 2013, the audit includes a number of potential safety enhancements:
- Replace old non-compliant signs.
- Review locations of existing signs, especially advance warning signs.
- Investigate adding additional signage to alert motorists to crosswalks throughout the RSA corridor.
- Repaint existing crosswalks and consider upgrading crosswalk to "piano key" design.
- Trim trees to increase visibility of crosswalks.
- Review appropriateness of sidewalk locations and relocate as needed (would require full ADA compliance for new crosswalks).
- Install a double yellow centerline through the village to eliminate the existing passing zone.
- Additional edge line marking to delineate the Summer Street curve (dashed or full) to provide additional visual guidance to drivers. Install stop line on Summer Street.
- Install chevron and advisory speed limit signage on both approaches to the Summer Street curve.
- Relocate flashing sign approaching the Summer Street curve paying careful attention to ensure it is properly placed not to be too far in advance of the curve but to give sufficient warning of the curve. Replace damaged bulbs.
- Work with business owner at the Village Store to redesign site access using good access management principles.
- Investigate the feasibility of replacing existing lighting with LED.
- Evaluate the existing street lighting and the potential for additional street lighting, particularly for improved pedestrian safety.
- Conduct a further study of sight distance at Willow Street.
- Conduct formal study of intersections with Willow Street, Summer Street, and Union Street to determine if increased control (all way stop, signal, or roundabout) is warranted.
- Investigate installing textured pavement crosswalks or raised crosswalks in select locations understanding that they would require special approval and careful considerations of all safety impacts.
- Relocate utility poles behind sidewalks and add curbs where needed.
- Investigate modifying Old Church Street by closing it or making it one-way north with Playground Lane serving as the new connector.
- Consider developing on-street parking at select locations.
- Investigate town acquisition of rights to Route 6A from the state to allow for design flexibility.
- Consider geometric changes to the roadway such as bump outs to slow drivers down.

- Install digital speed limit signs to address speeding. Consider adding – "State Law" and – "$100 Fine" to the signs.
- Implement targeted police enforcement to address speeding and crosswalk compliance issues.
- Installation of small reflectors along the roadway (like the ones on the telephone poles) for additional roadway delineation.
- Install gateway treatments to visually identify the heart of the village for drivers and consider additional streetscape improvements to create a village feel to cue in drivers that they are entering a more populated and pedestrian oriented area.

Previous Yarmouth Road Safety Audit

The audit listed below has been summarized in a previous Regional Transportation Plan and is listed for convenience. Copies of Road Safety Audits are available from the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Old Townhouse Road/Forest Road (2010)

MULTIMODAL TRANSPORTATION SAFETY

Safety information is readily available for several modes of travel. The following sections provide safety issue details on several transportation modes. Bicyclist and Pedestrian safety are discussed in the RTP Technical Appendix "Bicycle/Pedestrian Safety Plan."

PUBLIC TRANSIT SAFETY

Public transit vehicles are generally considered to operate at a higher level of safety in comparison to private automobiles. Drivers are required to have higher qualifications and are subject to strict safety guidelines. The Cape Cod Regional Transit Authority has provided safety data for the years 2012-2014 as shown in the following table:

TABLE 11 - INJURIES FROM COLLISIONS/SLIPS AND FALLS IN TRANSIT VEHICLES AND ON TRANSIT PROPERTY

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2012						1						
2013							2					
2014						1	1					

(Source: Cape Cod Regional Transit Authority)

For the years 2012-2014, the values of property damage to CCRTA vehicles and private vehicles were $24,798.28 in July 2012 and $21,199.00 in June 2014 for a total of $45,997.24.

AIR TRAVEL SAFETY

The National Transportation Safety Board has assembled a database of safety incidents at Cape Cod airports (Hyannis and Provincetown). During the years 2008-2011, four incidents were listed for these airports. These data are summarized in the following table:

TABLE 12 – HYANNIS AIR TRAVEL SAFETY INCIDENTS

YEAR	FATAL	NON-FATAL	INCIDENT
2008	1	0	0
2009	0	0	0
2010	0	0	1
2011	0	0	0

(Source: National Transportation Safety Board)

TABLE 14 – PROVINCETOWN AIR TRAVEL SAFETY INCIDENTS

YEAR	FATAL	NON-FATAL	INCIDENT
2008	0	1	0
2009	0	0	0
2010	0	0	0
2011	1	0	0

(Source: National Transportation Safety Board)

SUMMARY OF GENERAL TRANSPORTATION SAFETY RECOMMENDATIONS

- Work with state and local agencies to improve the accuracy and timeliness (e.g., within 12 months of the end of each year) of crash data
- Consider protected left turn phases into signalized intersections
- Maintain delineation through more frequent restriping and street cleaning
- Improve signage standards to include larger lettering
- Improve lighting level standards, in particular at intersections. Consider placing utilities underground and installing breakaway safety poles for lighting
- Consider extension of “all red” phases for signalized intersections
- Establish driver education programs for older drivers
- Provide education on other options for mobility
- Increase education for local young drivers
- Support additional enforcement and warnings during busy traffic season to reach out to young visitor drivers
- Develop and implement an advertising campaign and roadside signage reminding drivers that traffic and drunk driving laws are strictly enforced on Cape Cod.
- Provide better signage for visitors directing them to popular destinations

- Install signage explaining the rotary “rules of the road” and disseminate similar information to be included in visitor brochures and Cape-related websites
- Consider conversion of conventional intersections (signalized or unsignalized) which have high crash rates to roundabouts
- Promote the use of red-light cameras at high crash rate signalized intersections
- Support road designs which are estimated to reduce crashes and improve safety for all users

INTELLIGENT TRANSPORTATION SYSTEMS

Intelligent Transportation Systems (ITS) are applications of advanced technology in the field of transportation, with the goals of increasing operation efficiency and capacity, improving safety, reducing environmental costs, and enhancing personal mobility. A policy of Cape Cod MPO is to advocate and endorse the consideration of Intelligent Transportation Systems solutions for transportation problems as a routine part of the transportation planning process. As a stakeholder in the Southeastern Massachusetts Regional ITS Architecture, the Cape Cod MPO is committed to continuing an active role in these ITS systems. This includes maintaining channels of communication between the Cape Cod Commission and other stakeholders, including but not limited to: the MassDOT; the Southeastern Regional Planning and Economic Development District (SRPEDD); the Old Colony Planning Council (OCPC), and the Cape Cod Regional Transit Authority (CCRTA). A regional ITS architecture is a framework that defines component systems and their interconnections. Successful ITS deployment requires an approach to planning, implementation, and operations that emphasizes collaboration between relevant entities and compatibility of individual systems. The regional architecture is a mechanism design to ensure this collaboration and compatibility occurs. Inputs into ITS systems can involve any variety of a range of collection devices, including:

- Loop detectors in the pavement and sophisticated ground level radar systems are able to collect real time traffic volume and speed data.
- Video equipment is often used to monitor the transportation system, which is useful in allowing system operators to immediately detect areas of congestion that may be forming. It is also used to detect incidents such as crashes and disabled vehicles, in turn accelerating emergency dispatch and the overall incident management process. Video surveillance is also a useful tool for security and incident management in transit vehicles and around stops and terminals.
- Automatic vehicle locators (AVL) on board transit vehicles, emergency response vehicles, and roadside assistance vehicles allow operators to know where vehicles are in real time that allows for more efficient dispatch and adjustment of traffic controls if necessary.
- Automated Fare Payment Systems that allow riders on transit systems to pay electronically using a "smart card" (prepaid balance) or in the future conventional credit/debit cards rather than cash.
- Transmitters onboard transit and emergency vehicles alike are used to pre-empt traffic signals ahead or to alert travelers at a transit stop that the vehicle is approaching.
- Remote weather stations and Doppler radar provide real time weather conditions occurring throughout the transportation network, and provide alerts regarding events such as icing or flooding that may be occurring. These are some of the technological

applications that can be utilized for managing the regional transportation network. All of this information travels over both hard-wired and wireless communication systems to systems that manipulate the data and distribute it to users of the transportation system. End users of ITS system and the output media include:

- Transit Operation Centers that monitor the transit system through video feed, radio communications, and AVL signals, allowing operators to make improved decisions regarding security, dispatch, and incident management.
- Traffic Operation Centers that monitor the roadway system through reports from systems like loop detection and video feed, allowing operators to make improved decisions regarding congestion management, incident management, security, and maintenance management.
- Traveler Information Services such as the national 511 System or SmarTraveler locally, which receive traffic data from traffic and transit operations centers and distribute it to users via hard line and wireless communications.
- Variable Message Signage that allows operators from traffic and transit operation centers to instantly relay messages to users on the system.
- Kiosks that receive information from transit operation centers and transit vehicles, relaying it to users of the transit system.

MassDOT owns and operates several permanent variable message signs and a large fleet of portable variable message signs throughout the Commonwealth. Permanent stations are used to alert drivers to major events affecting locations such as the Route 128 belt and Interstate 93, as well as the tunnels. Portable variable message sign trailers are located throughout the state and are able to be dispatched to locations wherever and whenever needed. Often they are used for a major local event, such as a road race or sidewalk carnival. They can also be dispatched for major unplanned events, such as a chemical spill that forces an extended closure of a highway. All variable message signs are controlled from the MassDOT Traffic Operations Center in South Boston. MassDOT is using automated vehicle locators on their snow removal and highway maintenance fleet, increasing the efficiency of dispatch of resources to where they are needed. Travelers are able to obtain real time traffic conditions for highways in the Commonwealth, including highway approaches to the Cape such as Routes 3 and 495 as well as the Cape Cod Canal bridges, through SmartRoutes phone and web links, and will soon be available through a statewide 511 system and MassDOT website.

CAPE COD COMMISSION'S LOCATION-SPECIFIC SAFETY STUDIES

The Cape Cod Commission has completed several safety-related studies. The following is a summary of the locations that were studied and highlights of recommended safety improvements. Full reports are available on the internet:

www.capecodcommission.org/safety

WELLFLEET: ROUTE 6 SAFETY STUDY

This study published in 2012 included potential safety countermeasures at four high-crash locations:

Route 6 at Main Street

- Apply vegetative management and access management practices. Reduce visual clutter approaching the intersection. Complete signal head LED retrofit of the intersection
- Consider moving Rt. 6 NB left turn lane stop bar back to improve sightlines for Rt. 6 SB left turning vehicles
- Consider Rt. 6 SB left turn restrictions or a left turn arrow
- Evaluate bicycle and pedestrian accommodations relative to such demands
- Consider complete reconstruction of the intersection to accommodate safe turning movements and bicycle and pedestrian needs

Route 6 at LeCount Hollow Road

- Discuss removal of the utility poles on the splitter island with the utility company.
- Consider a breakaway Stop Sign on the splitter island to increase visibility to motorists.
- Evaluate alternative parking and delivery options for the PB Bistro.
- Consider the installation of a traffic signal or roundabout understanding that the signal warrants are met based on the June 21, 2012 traffic volumes, but such a treatment is not necessitated in the offseason.
- Consider possible relocation of the old Route 6 layout/LeCount Hollow Road intersection to add separation from the Route 6/LeCount Hollow Road intersection.
- Evaluate bicycle and pedestrian accommodations relative to such demands

Route 6 at Cove Road

- Review School Bus stopping location and procedure and consider a “Bus Stop Ahead” sign or other treatments to alert they may need to stop
- Access management to reduce the number of conflict points and avoid driver confusion including the following features shown of the graphic on the next page:
- Install a new stop sign at the end of Cove Road
- Close northern Cove’s Corner / Rt. 6 driveway
- Mark turn pocket for Cove Road left turns instead of long turn lane
- Restrict left turns from southern Cove’s Corner / Rt. 6 driveway
- Align Cove’s Corner / Cove Road driveway with the parking lot flow lines
- Mark turn pocket for Cove’s Corner left turns instead of long turn lane (optional)
- If issues persist, consider closing both Cove’s Corner driveways onto Rt. 6 and installing a signal or roundabout at the Cove Road and Rt. 6 intersection
- Evaluate bicycle and pedestrian accommodations relative to such demands

Route 6 Merge Area near Eastham Town Line

- Add/ update signage indicating lane drop
- Add pavement markings to indicate lane drop

- Continue dialogue with the Town of Eastham regarding the possibility of moving the Route 6 northbound merge back into Eastham and dedicating the left lane to vehicles turning left in Wellfleet Drive-In Theatre with additional guidance signage.

ANALYSIS OF HIGH-CRASH LOCATIONS IN DENNISPORT

This study published in 2012 included potential safety countermeasures at three high-crash locations:

Upper County Road at Depot Street

- Maintenance of sight lines, particularly vegetation management, can be a low-cost and effective safety countermeasure. As the parcels adjacent to the intersection are privately owned, it is important to engage the land owners and emphasize the importance of maintaining sightlines to the safety of the intersection.
- Installation of secondary stop sign on the left side of the road on the easterly approach similar to the installations currently on north and south approaches.
- Upkeep of advanced warning signs and markings is important to ensure their continued effectiveness. Easily visible warning signs and markings are important in altering motorists that they are approaching an intersection and should be prepared to act accordingly whether that means stopping or simply being aware of side street.
- Backplates with reflective borders on the warning beacon would make the warning beacon more visible and conspicuous in both daytime and nighttime conditions.
- Consider bicycle and pedestrian upgrades at the intersection consistent with the needs of the area.

If the safety issues persist, more expensive, long term solutions such as signalization or installation of a roundabout should be considered. At this time these measures are not warranted, but should be kept as options for the future.

Main Street (Route 28) at Sea Street

- Removal of site distance obstructions, particularly vegetation, can be a low-cost and effective safety countermeasure. As the parcels adjacent to the intersection are privately owned, it is important to engage the land owners and emphasize the importance of maintaining sightlines to the safety of the intersection.
- Advanced warning signs and markings are important tools in alerting motorists that they are approaching an intersection and should be prepared to act accordingly whether that means stopping or simply being aware of side streets. A more thorough analysis of the intersection crash reports will help reveal which approaches could benefit from these improvements.
- Traffic calming measures on Main Street (Route 28) would provide cues to drivers as to the appropriate speed to travel as they enter the village center. Drivers should understand that they are entering a village area where they must anticipate more frequent interactions with turning and parking vehicles as well as pedestrians and bicyclists. As drivers select more appropriate, slower speeds, the frequency and severity of accidents at the intersection could be reduced. To allow these slower speeds to be enforceable, the speed limit on this section of Main Street (Route 28) should be reduced.
- Improved access management in the vicinity of the intersection would reduce the number of conflict points and driver confusion around the intersection. There are a

number of expansive curb cuts within the functional area of the intersection that are negatively impacting the operation of the intersection. In close cooperation with the abutting land owners, an effort should be taken to reduce and/or eliminate curb cuts especially those nearest to the intersection. As much as possible, curb cuts should be limited to the minor street.

- Consider bicycle and pedestrian upgrades at the intersection consistent with the needs of the area.

Given that this intersection has proven to be a persistent safety hazard over the years, it would be prudent to further study this intersection to determine if long-term solutions such as a four-way stop, signalization, or installation of a roundabout should be considered. As a first step, a more intensive data collection should be performed including the following:

- Turning movement counts - weekday morning peak hour, afternoon peak hour, Saturday peak hour,
- Volume, speed , and classification data on Main Street (Route 28) and Sea Street,
- Measurements of sight lines, and
- Measurements of curb cuts in the vicinity of the intersection.

Main Street (Route 28) at Depot Street

- Removal of site distance obstructions, particularly vegetation, can be a low-cost and effective safety countermeasure. As the parcels adjacent to the intersection are privately owned, it is important to engage the land owners and emphasize the importance of maintaining sightlines to the safety of the intersection.
- Advanced warning signs and markings are important tools in alerting motorists that they are approaching an intersection and should be prepared to act accordingly whether that means stopping or simply being aware of side streets. A more thorough analysis of the intersection crash reports will help reveal which approaches could benefit from these improvements.
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- Turning movement counts - weekday morning peak hour, afternoon peak hour, Saturday peak hour,
- Volume, speed , and classification data on Main Street (Route 28) and Depot Street,
- Measurements of sight lines, and
- Measurements of curb cuts in the vicinity of the intersection.

PREVIOUS CAPE COD COMMISSION LOCATION-SPECIFIC SAFETY STUDIES

The following studies have been summarized in a previous Regional Transportation Plan and are listed for convenience. Copies of these reports are available on the Cape Cod Commission website at:

www.capecodcommission.org/safety

- Transportation Safety Report – Eastham: Route 6 at Brackett Road; Sandwich: Route 6 at Route 130 (Exit 2)(Westbound and Eastbound Ramps) (2008)
- Transportation Safety Report – Bourne: Route 28 at Otis Rotary; Harwich: Route 137 at Route 39; Orleans: Route 6A at Route 28 (2006)
- Route 28 Safety & Traffic Flow Study: Chatham, Harwich, Dennis, Yarmouth (2006)
- Route 6 Safety & Traffic Flow Study: Eastham, Wellfleet, Truro, Provincetown (2004)

CONCLUSION

Safety is the highest priority goal of the Regional Transportation Plan. The Cape's transportation system should ensure that travelers and their possessions will arrive at their destinations unharmed and undamaged. Travelers should be educated regarding transportation regulations and traffic laws, and these must also be enforced to prevent the improper use of the transportation system. The importance of safety requires a spectrum of strategies including education, enforcement, and engineering.

CAPE COD COMMISSION

3225 MAIN STREET • P.O. BOX 226 • BARNSTABLE, MASSACHUSETTS 02630
(508) 362-3828 • Fax (508) 362-3136 • www.capecodcommission.org