

## CHAPTER 6



*Photo: East Longmeadow Rotary*

### SAFETY

Transportation Safety is one of the primary emphasis areas of the Pioneer Valley Metropolitan Planning Organization. The Pioneer Valley Planning Commission works in cooperation with MassDOT to identify and prioritize transportation projects that improve traffic safety in the region. The PVPC also provides assistance to local communities to increase safety at locations with a history of crashes.

#### **A. HIGHWAY SAFETY IMPROVEMENT PROGRAM**

The Highway Safety Improvement Program (HSIP) is a core Federal-aid program which aims to reduce traffic fatalities and serious injuries on all public roads. The HSIP was established under the SAFETEA-LU legislation and continued under MAP-21. It consists of three main components, the Strategic Highway Safety Plan (SHSP), State HSIP or program of highway safety improvement projects and the Railway-Highway Crossing Program (RHCP).

To receive HSIP funds, a State must:

- Produce a program of projects or strategies to reduce identified safety problems.
- Develop, implement, and update a SHSP.
- Evaluate the SHSP on a regular basis.

**Table 6-1 – Projects Advertised under HSIP**

Year	Community - Project Description
2015	Hadley- Signal & Intersection Improvements at Route 9 (Russell Street) & Route 47 (Middle Street)
2016	Springfield- Signal & Intersection Improvements at Roosevelt Avenue, Island Pond Road, and Alden
2017	Ludlow- Reconstruction of Center Street (Route 21)
2019	Chicopee- Signal & Intersection Improvements at 13 Intersections along Route 33 Memorial Drive
2019	Springfield- Intersection Improvements at Bay Street and Berkshire Avenue

Source MassDOT

## **B. STRATEGIC HIGHWAY SAFETY PLAN**

A Strategic Highway Safety Plan (SHSP) is a major component and requirement of the Federal Highway Safety Improvement Program (HSIP). It is a statewide-coordinated safety plan that provides a comprehensive framework for reducing highway fatalities and serious injuries on all public roads. The SHSP identifies a State's key safety needs and guides investment decisions towards strategies and countermeasures with the most potential to save lives and prevent injuries.

MassDOT developed the Massachusetts SHSP in a cooperative process with Federal, State, local, private, and public sector safety stakeholders. The SHSP is a data-driven, strategic plan that integrates the four E's: engineering, education, enforcement and emergency medical services (EMS).

Since the first Massachusetts SHSP was prepared in 2006, highway fatalities have dropped by 19% and serious injuries have dropped by 44%.

Massachusetts updated the Plan in 2013, completed a second revision in December 2018 and is now actively implementing the strategies included in the SHSP. The Pioneer Valley Planning Commission works in cooperation with MassDOT to achieve the regional targets and goals set in the SHSP.

### **1. 2018 Update to the SHSP**

The latest update to the SHSP has the:

**Vision:** A roadway system with zero roadway deaths and serious injuries.

**Mission:** To work collaboratively on strategies that will reduce roadway fatalities and serious injuries.

**Goal:** Zero roadway fatalities and serious injuries gradually. By year 2022, the SHSP interim goal is to reduce the five-year average fatalities by 12% and serious injuries by 21%.

### a) **Emphasis Areas**

In order to meet these SHSP target, a multidisciplinary team of policymakers, advocates and practitioners has prioritized a set of data-driven strategies associated with 14 emphasis areas (EAs) to address the causes of crashes in Massachusetts. These EAs are outlined by annual fatality average:

- Lane Departure Crashes [198]
- Impaired Driving [124]
- Occupant Protection [102]
- Speeding and Aggressive Driving [97]
- Intersection Crashes [96]
- Pedestrians [80]
- Older Drivers [74]
- Motorcycle Crashes [49]
- Younger Drivers [41]
- Large Truck-Involved Crashes [34]
- Driver Distraction [30]
- Bicyclists [10]
- Safety of Persons Working on Roadways [2]
- At-Grade Rail Crossings [1]

### b) **Legislative Policies**

The SHSP proposes that Massachusetts consider six high-leverage policies to reduce the frequency and severity of roadway fatalities. These legislative measures target the most predominant types of crashes and address the contributing factors such as speeding, driver distraction, and impaired driving.

**Hands Free:** Would allow police to stop and issue citations to motorists using mobile electronic devices while operating a vehicle.

**Primary Seat Belt:** Would enable law enforcement to stop motorists who appear to not be wearing seatbelts while operating a vehicle.

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

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

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

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

**c) Overview of the Plan**

The SHSP reflects the efforts of 250 stakeholders from more than 50 partner agencies. The outcome of their work is an implementation plan that includes 61 specific strategies, 283 direct actions and 5 legislative proposals to move Massachusetts closer towards zero deaths and to an interim goal of a 12% drop in five-year average fatalities and a 21% drop in five-year average serious injuries.

The latest update to the SHSP can be downloaded at:

[https://www.mass.gov/files/documents/2019/01/18/dot\\_SHSP\\_2018.pdf](https://www.mass.gov/files/documents/2019/01/18/dot_SHSP_2018.pdf)

**2. Role of Pioneer Valley Metropolitan Planning**

The Pioneer Valley Metropolitan Planning Organization is responsible for providing support to MassDOT to achieve the SHSP targets. Regional Planning Agencies (RPAs) and MPOs are identified as responsible agencies for 23 strategies included in the SHSP.

PVPC has developed specific safety criteria as part of its Transportation Evaluation Criteria (TEC) in compliance with the goals and objectives set forth in the SHSP. More information is available through this link:<http://www.pvpc.org/projects/transportation-evaluation-criteria-information-center>. The regional needs and strategies for the RTP Emphasis Area of Safety are also based on the Action Plans proposed in the SHSP and included in Chapter 14.

**a) Roadway Safety Audit**

A Road Safety Audit (RSA) is a formal safety review of an existing, or planned road or intersection. During the audit, an independent, multidisciplinary team identifies potential safety issues and opportunities for safety improvements.

RSAs have become an important part of the HSIP. An RSA is required for HSIP eligible projects. PVPC participates in all RSAs in the region. PVPC also works in cooperation with MassDOT and local Police departments at some of the locations to help provide most recent crash data and other relevant traffic volume and congestion data for the RSA team to study and review. Since 2015, 30 RSAs have been conducted in the Pioneer Valley Region. Copies of RSA reports can be obtained from the MassDOT website at: <https://gis.massdot.state.ma.us/roadsafetyaudits/>.

**Table 6-2 – Roadway Safety Audits by Community (2015-2019)**

No.	Community	Number of RSAs
1	Agawam	1
2	Amherst	1
3	Chicopee	2
4	Holyoke	3
5	South Hadley	1
6	Springfield	15
7	Ware	1
8	West Springfield	2
9	Westfield	4
	<b>Total</b>	<b>30</b>

Source: MassDOT

## **C. EXISTING CONDITIONS**

The following section provides an update to the existing traffic safety condition in the region.

### **1. Massachusetts Crash Data**

MassDOT publishes and updates a report which summarizes the top 200 high crash locations in the state. The most recent report is based on reported crashes from 2014 – 2016. This report is based on a new methodology of ranking the crash clusters. The report can be accessed at:

<https://www.mass.gov/files/documents/2019/03/01/dot-2016TopCrashLocationsRpt.pdf>

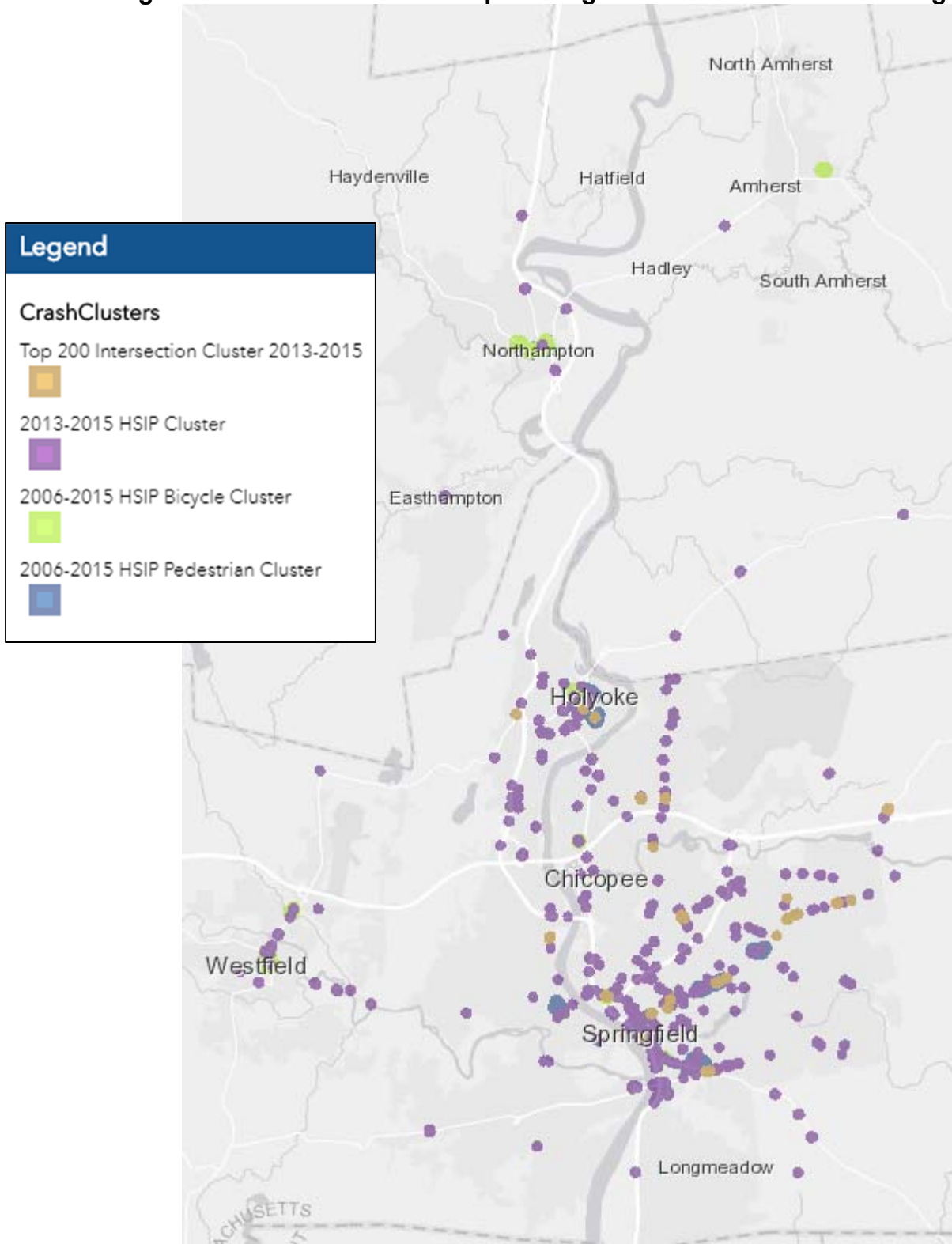
A total of 28 locations from Hampshire and Hampden counties were included in the most recent version of this report. The City of Springfield has 21 of the 28 locations. A large crash cluster identified in the document in the vicinity of the Holyoke Mall in the City of Holyoke is likely a result of crashes occurring on private property that are incorrectly assigned to a local intersection.

### **2. Regional Crash History**

MassDOT maintains a database of crashes by collecting the records from the Registry of Motor Vehicles. PVPC utilizes this information as well as crash information collected locally from police departments to analyze and evaluate safety problems at different locations in the region. A summary of the total number of crashes reported by each community to the Massachusetts Registry of Motor Vehicles over the last ten years is provided in Table 6-3.

This information consists of crashes that either resulted in a personal injury or fatality, or resulted in greater than \$1000.00 worth of property damage.

Figure 6-1 – Massachusetts Top 200 High Crash Locations in the Region



Source: MassDOT

The City of Springfield experienced the highest number of crashes (29,371) over the ten year period while the City of Holyoke experienced the highest number of average annual crashes per roadway mile (9.8). The City of Springfield was under reporting its crash data until the year 2011. As a result the number of crashes in the city increased significantly after that period. The Pioneer Valley experienced a 3.2% increase in the number of reported crashes between the calendar years of 2015 and 2016.

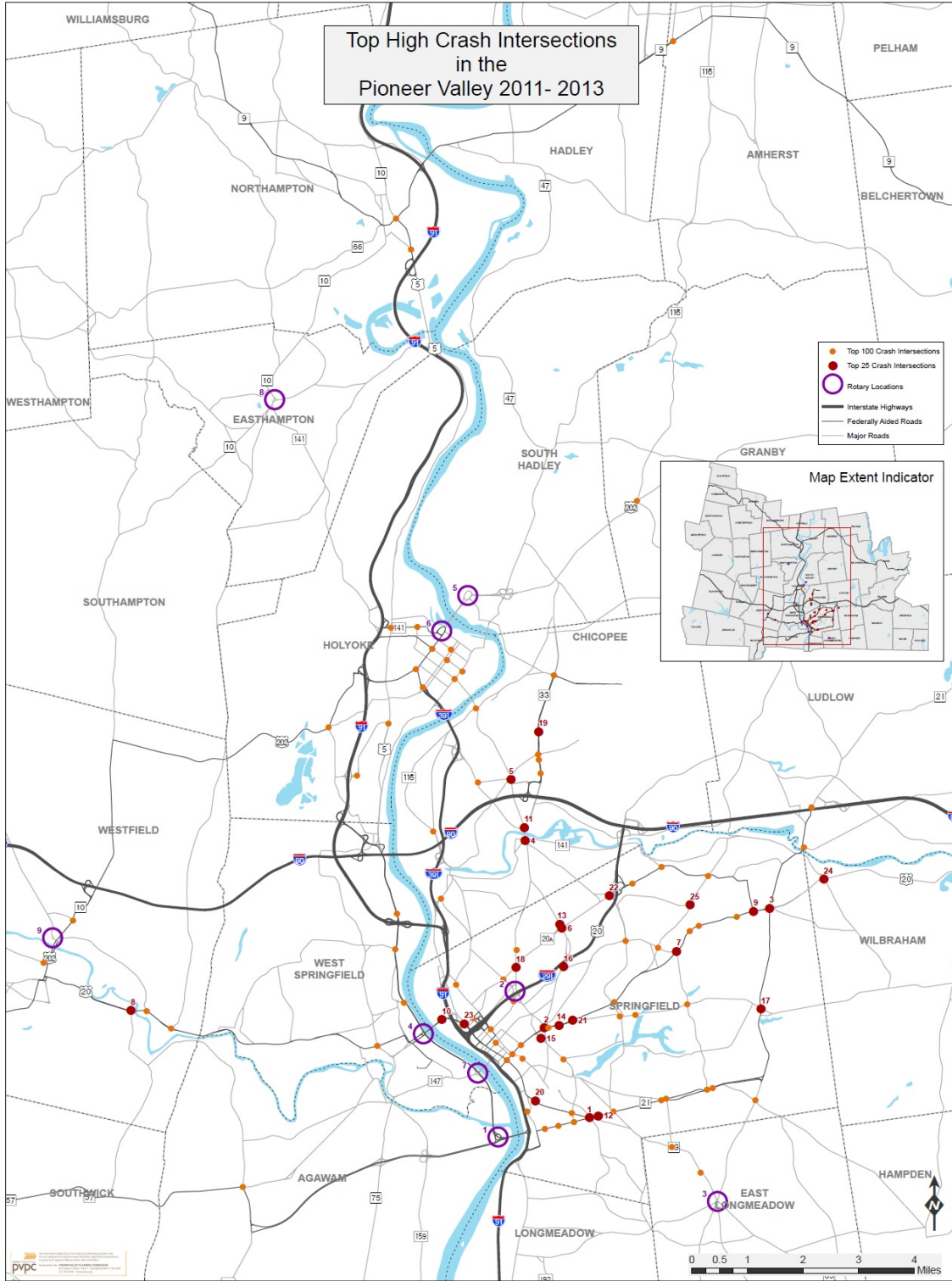
**Table 6-3 – Ten Year Community Crash History**

No.	Community	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total Crashes	Average Crashes per year	Average Crashes per mile
1	AGAWAM	603	586	513	564	541	494	480	505	554	589	5,429	543	3.61
2	AMHERST	218	182	92	443	450	390	276	368	430	407	3,256	326	2.40
3	BELCHERTOWN	215	221	259	229	228	230	208	261	254	226	2,331	233	1.50
4	BLANDFORD	72	70	58	76	76	77	55	67	53	66	670	67	0.75
5	BRIMFIELD	68	85	43	57	74	77	55	46	58	114	677	68	0.85
6	CHESTER	17	16	9	18	13	12	15	15	17	13	145	15	0.22
7	CHESTERFIELD	11	9	9	3	11	19	17	9	5	17	110	11	0.19
8	CHICOPEE	1,624	1,471	1,445	1,437	1,502	1,390	1,351	1,425	1,854	1,908	15,407	1,541	5.92
9	CUMMINGTON	11	9	3	3	0	4	2	4	7	3	46	5	0.07
10	EAST LONGMEADOW	452	452	444	388	446	384	384	402	391	375	4,118	412	4.38
11	EASTHAMPTON	135	124	78	286	274	303	277	293	282	334	2,386	239	2.70
12	GOSHEN	23	17	6	11	18	14	10	18	20	13	150	15	0.34
13	GRANBY	150	165	136	116	138	166	168	154	173	210	1,576	158	2.33
14	GRANVILLE	18	22	10	22	18	12	10	9	10	6	137	14	0.19
15	HADLEY	388	318	324	266	256	290	267	263	399	461	3,232	323	3.88
16	HAMPDEN	55	63	39	55	47	37	68	59	57	54	534	53	0.99
17	HATFIELD	50	32	19	35	36	29	25	23	18	30	297	30	0.50
18	HOLLAND	5	7	10	12	6	9	10	9	7	8	83	8	0.22
19	HOLYOKE	1,342	1,654	1,702	1,705	2,054	1,636	1,673	1,707	1,771	1,783	17,027	1,703	9.81
20	HUNTINGTON	13	19	21	22	19	21	14	12	28	25	194	19	0.36
21	LONGMEADOW	284	238	244	185	212	216	224	187	194	187	2,171	217	2.20
22	LUDLOW	479	449	457	433	454	448	409	395	589	599	4,712	471	3.64
23	MIDDLEFIELD	7	5	0	2	1	3	1	5	1	3	28	3	0.07
24	MONSON	117	110	87	51	65	50	62	61	51	53	707	71	0.63
25	MONTGOMERY	9	8	15	18	16	17	11	9	9	12	124	12	0.40
26	NORTHAMPTON	706	670	606	623	630	565	573	577	605	628	6,183	618	3.42
27	PALMER	429	379	288	417	436	347	409	210	344	379	3,638	364	3.18
28	PELHAM	20	11	13	7	6	17	6	13	6	11	110	11	0.24
29	PLAINFIELD	9	7	9	4	7	10	9	4	2	6	67	7	0.14
30	RUSSELL	36	45	30	39	46	50	44	43	53	32	418	42	1.16
31	SOUTH HADLEY	289	276	245	283	254	261	241	246	251	225	2,571	257	2.48
32	SOUTHAMPTON	60	50	53	46	51	44	51	52	58	73	538	54	0.73
33	SOUTHWICK	192	202	189	97	234	179	154	144	141	146	1,678	168	2.19
34	SPRINGFIELD	911	805	561	470	4,643	4,501	4,330	4,139	4,347	4,664	29,371	2,937	5.90
35	TOLLAND	3	1	2	2	4	5	3	3	3	2	28	3	0.07
36	WALES	6	12	8	8	7	5	7	6	8	9	76	8	0.26
37	WARE	181	162	192	211	233	196	188	197	198	234	1,992	199	1.70
38	WEST SPRINGFIELD	150	145	527	611	850	823	727	662	782	630	5,907	591	4.13
39	WESTFIELD	850	755	725	812	813	778	735	623	780	786	7,657	766	3.10
40	WESTHAMPTON	17	20	17	14	18	20	15	19	18	19	177	18	0.37
41	WILBRAHAM	334	308	287	353	363	317	304	313	336	349	3,264	326	2.93
42	WILLIAMSBURG	65	67	61	39	64	54	57	41	56	50	554	55	1.11
43	WORTHINGTON	9	14	6	1	5	4	6	10	12	5	72	7	0.11
	<b>TOTAL</b>	<b>10,633</b>	<b>10,261</b>	<b>117,762</b>	<b>10,474</b>	<b>120,631</b>	<b>122,645</b>	<b>125,285</b>	<b>130,233</b>	<b>139,050</b>	<b>143,474</b>	<b>930,448</b>	<b>12,985</b>	<b>3.00</b>

Source: MassDOT

The PVPC also develops and updates its own list of top 100 crash intersections. The latest report utilized the crash data between the calendar years of 2011 – 2013.

**Figure 6-2 – Top 100 High Crash Intersections in the Pioneer Valley**



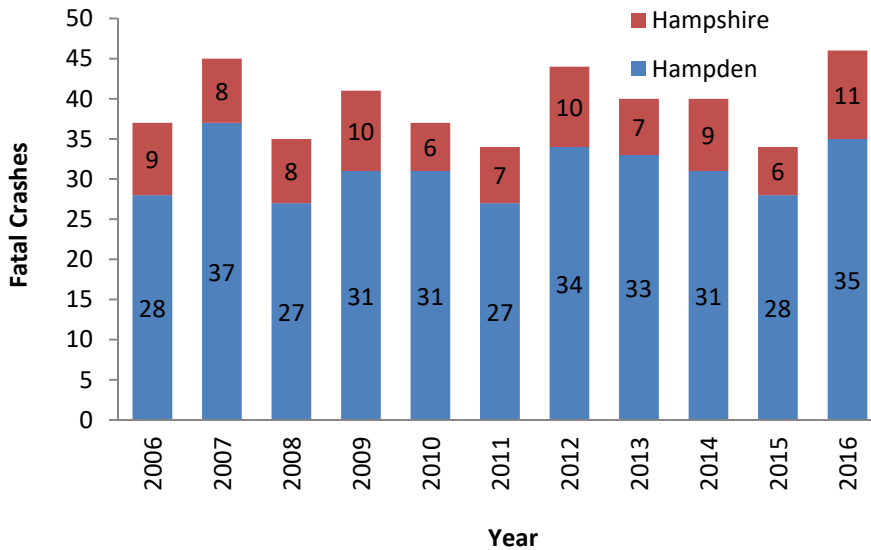


The top locations depicted in this report differ from the MassDOT report because of the different crash data time periods and due to a recent change by MassDOT in its ranking system. PVPC will review this change as part of a future update to the regional Top 100 report.

**a) Fatal Crashes**

The Pioneer Valley experienced a total of 46 fatal crashes in 2016. This increase from 2015 and follows current state trends. Figure 6-3 depicts the fatal crashes in Hampshire and Hampden counties over the past decade. More information on fatal crashes is presented in Chapter 12 of the RTP.

**Figure 6-3 – Fatal Crashes in Hampshire and Hampden Counties**



Source: MassDOT

**3. Bridges**

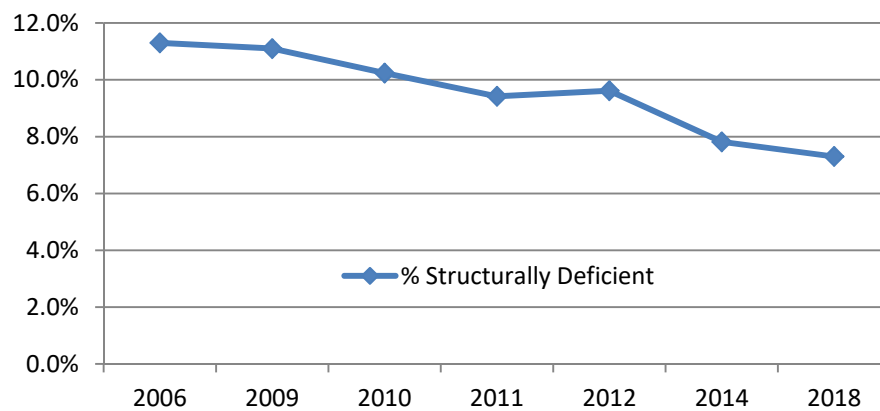
All bridges throughout the state undergo routine structural inspection. Previously the State utilized a generally accepted rating system developed by the American Association of State Highway and Transportation Officials (AASHTO) to ascertain the condition of the bridges. Beginning in 2018, that system was updated to a new 100 point scale system which measures the Bridge Health Index (BHI).

BHI is a weighted average of the health indices of all bridge elements (e.g. trusses, decks, bridge rails, etc.) to provide a comprehensive overview of bridge condition. A value of zero indicates that all of the bridge elements are in the worst condition, and a score of 85 or greater indicates that the bridge elements are in good condition.

Under this new system, a 'structurally deficient bridge' is defined as a bridge with a deck, substructure, or superstructure that requires attention. Table 6-4 summarizes the status of bridge conditions within the Pioneer Valley Region by community.

The percentage of structurally deficient bridges in the region has steadily declined over past decade by almost 4%. This trend is shown in Figure 6-4. There is a gap in data from 2014 and 2018 as a result of the transition to the new bridge classification system and scoring method.

**Figure 6-4 – Structurally Deficient Bridges in the Pioneer Valley**



#### **4. At-grade Railroad Crossings**

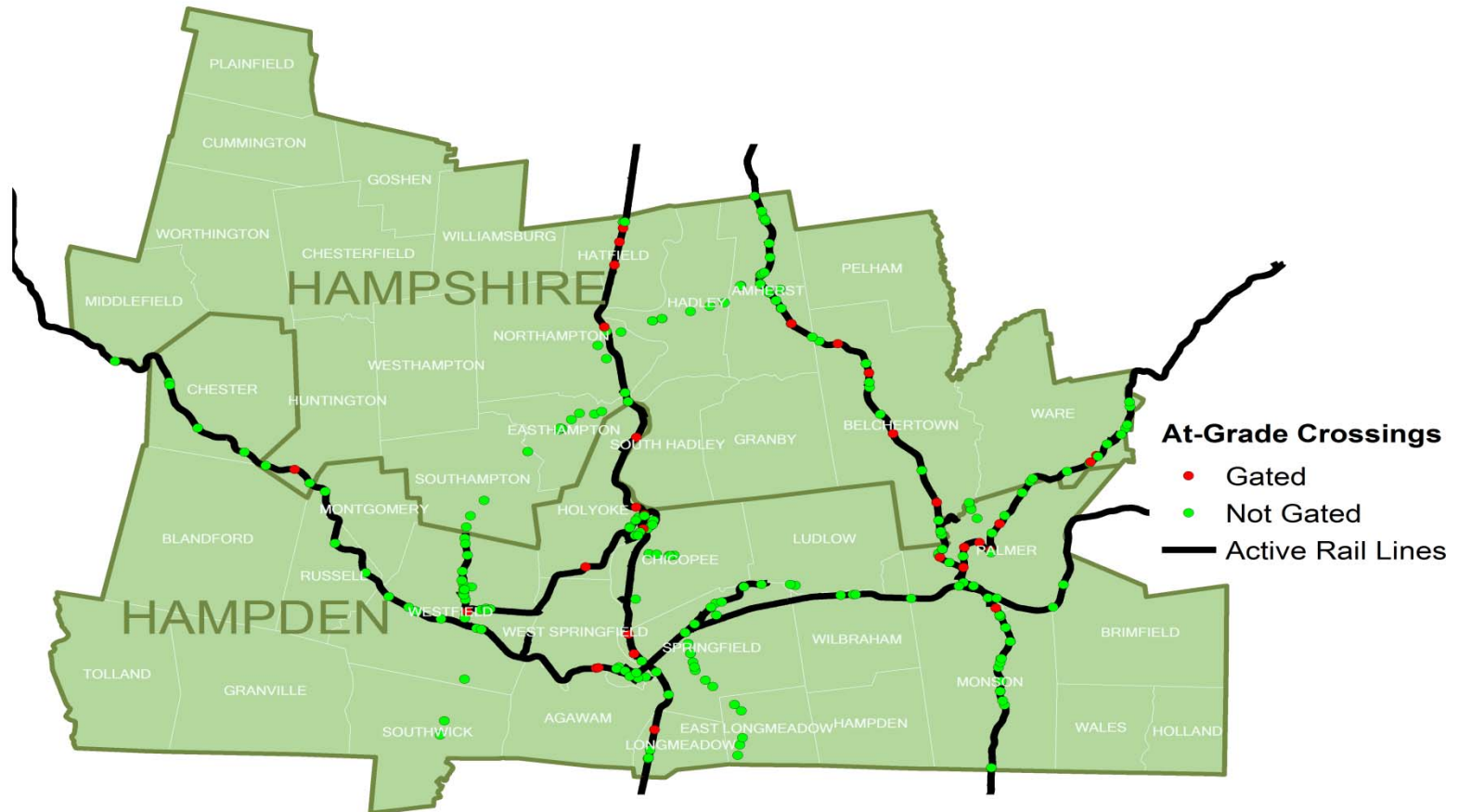
The Federal Railroad Authority's (FRA) rail crossing inventory summarizes at-grade rail road crossings in the region. There are currently 295 at-grade crossings in the region. Approximately two-thirds of these crossings are located in Hampden County. Many of the crossings are located on non-operational rail road tracks. A total of 31 crossings are gated. While safety gates are not present at most crossings, other supplemental warning devices such as flashing lights, warning signs, and pavement markings are present and require routine maintenance to provide maximum effectiveness. Figure 6-5 depicts the at-grade railroad crossings in the region.

**Table 6-4 – Bridge Condition in the PVPC Region**

Community	Total No. of Bridges	Average BHI	Jurisdiction				Structurally Deficient	
			Municipal		State		No.	Avg. BHI
			No.	Avg. BHI	No.	Avg. BHI		
Agawam	18	85.51	1	64.30	17	86.76	1	48.80
Amherst	15	76.47	10	71.13	5	87.16	1	11.40
Belchertown	12	87.68	8	92.45	4	78.15	1	43.90
Blandford	12	88.16	6	92.22	6	84.10	0	0
Brimfield	27	86.63	17	89.32	10	82.05	0	0
Chester	25	86.83	16	85.68	9	88.88	1	53.50
Chesterfield	10	76.17	7	75.01	3	78.87	2	58.00
Chicopee	50	77.68	5	86.12	45	76.74	2	53.20
Cummington	13	74.91	6	76.80	7	73.29	0	0
Easthampton	19	83.00	10	83.53	9	82.41	1	67.50
Goshen	4	95.48	2	97.15	2	93.80	0	0
Granby	8	84.13	7	83.21	1	90.50	0	0
Granville	7	85.44	4	83.78	3	87.67	0	0
Hadley	10	87.09	4	91.40	6	84.22	0	0
Hampden	8	86.16	8	86.16	0		1	100.00
Hatfield	15	81.43	5	79.82	10	82.24	2	74.05
Holland	2	0.00	2	0.00	0		0	0
Holyoke	49	77.48	9	81.97	40	76.47	4	33.23
Huntington	8	84.83	2	77.00	6	87.43	1	92.10
Longmeadow	4	73.98	0		4	73.98	0	0
Ludlow	23	67.26	8	55.48	15	73.54	2	66.05
Middlefield	9	72.54	9	72.54	0		1	51.50
Monson	23	77.71	13	77.82	10	79.63	4	56.53
Montgomery	5	81.54	4	87.08	1	59.40	0	0
Northampton	44	80.27	21	85.52	23	75.47	8	67.09
Palmer	30	76.92	8	83.38	22	74.58	3	78.33
Pelham	3	97.57	3	97.57	0		0	0
Plainfield	2	87.50	2	87.50	0		0	0
Russell	15	83.07	4	80.30	11	84.08	1	99.70
South Hadley	11	84.21	4	80.30	7	86.44	0	0
Southampton	11	76.14	9	71.42	2	97.35	0	0
Southwick	3	84.20	1	55.90	2	98.35	0	0
Springfield	61	75.75	13	67.40	48	78.00	5	50.70
Wales	1	93.20	1	93.20	0		1	93.20
Ware	16	84.62	9	80.57	7	89.83	3	74.37
West Springfield	26	73.40			26	73.40	1	12.10
Westfield	36	80.68	13	73.43	25	81.03	1	60.30
Westhampton	14	73.76	11	79.89	1	78.10	1	31.50
Wilbraham	4	83.23	2	84.00	2	82.45	0	0
Williamsburg	17	87.50	10	84.02	7	92.47	1	51.80
Worthington	15	77.85	10	74.06	5	85.44	1	90.30
<b>Grand Total</b>	<b>685</b>	<b>79.67</b>	<b>284</b>	<b>79.81</b>	<b>401</b>	<b>79.55</b>	<b>50</b>	<b>60.35</b>

Source: MassDOT

Figure 6-5 – At-grade Railroad Crossings



Data Sources: FRA Rail Crossing Inventory - April 2019 and MassGIS.

Prepared by: Pioneer Valley Planning Commission, April 2019.

## 5. Dams in the Pioneer Valley Region

There are approximately 260 dams in the PVPC region that are regulated by the Office of Dam Safety. To be regulated, these dams are in excess of 6 feet in height (regardless of storage capacity) and have more than 15-acre feet of storage capacity (regardless of height). There are also many dams in the region that because they fall below these parameters are known as non-jurisdictional dams. Of the regulated dams in the region, approximately:

- 40 have a hazard index rating of high,
- 130 are rated significant hazard, and
- 90 are rated low hazard<sup>1</sup>

Hazard index rating is a level of risk determined by the likelihood that a dam failure (an uncontrolled release of impounded water) would result in loss of life or substantial property damage.<sup>2</sup>

Under dam safety regulations owners have significant responsibilities for their dams. The financial burden associated with these responsibilities can vary greatly, depending on the number of dams for which an owner is responsible, and the dam's condition and hazard index rating. A dam in poor or unsafe condition can involve very costly repairs, and a hazard index rating also brings with it different requirements related to frequency of inspections by engineers and the need for development of emergency action plans.

Recently enacted regulations seek to promote greater dam safety by extending the requirement of emergency action plans to significant hazard dams (in addition to high hazard dams), strengthening the authority of the Office of Dam Safety by increasing fines for non-compliance, and establishing the Dam and Sea Wall Repair and Removal Fund, an annual grant and loan program available to dam owners.

While it appears high hazard dams in poor and unsafe condition in the region have been either repaired or removed, there are still 13 significant hazard dams in such condition. There are an additional 26 low hazard dams in poor or unsafe condition. It is important to note that most of these dams are located upstream of important roadway infrastructure. See Table 6-5 for a listing of specific dams.

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<sup>1</sup> These numbers are estimates based on periodic and partial updates to PVPC's dams data base from the Massachusetts Office of Dam Safety.

<sup>2</sup> Dams that are "likely" to cause such damage are classified as "high hazard"; dams that "may" cause such damage are classified as "significant" hazard; dams that "may cause minimal property damage to others" where "loss of life is not expected" are classified as "low" hazard. Dams that fall into these classifications are regulated by the Office of Dam Safety.

**Table 6-5 – Dams in the Pioneer Valley in Poor or Unsafe Condition**

Dam name	Town	Hazard index code rating	Condition
Nine Lot Dam	Agawam	Low	Poor
Rising Dam	Agawam	Low	Poor
Robinson Pond Dam	Agawam	Low	Poor
Factory Hollow Dike	Amherst	Significant	Poor
Owens Farm Pond Dam	Amherst	Low	Poor
Wetstone Tobacco Co. #3 Dam	East Longmeadow	Low	Poor
Forge Pond Dam	Granby	Significant	Poor
Forge Pond Dike	Granby	Significant	Poor
Quenneville Dam	Granby	Low	Unsafe
Dufrense Farm Pond Dam	Granby	Low	Poor
D.F. Riley Grist Mill Dam	Hatfield	Significant	Poor
Mountain Street Reservoir Dikes	Hatfield	Low	Poor
Clear Pond Dam	Holyoke	Low	Poor
Clear Pond West Dike	Holyoke	Low	Poor
Virginia Lake Shore Dam	Middlefield	Low	Poor
Church Manufacturing Co. Dam	Monson	Low	Poor
Boulder Hill Pond Dam	Monson	Significant	Poor
Springfield Sportsman Club Dam	Monson	Significant	Unsafe
Shepard Upper Pond Dam	Monson	Low	Poor
Rocky Hill Pond Dam	Northampton	Low	Poor
Queensville Pond Dam	South Hadley	Significant	Poor
Alder Pond Dam	Southampton	Low	Poor
Lyman Mill Pond Dam	Southampton	Significant	Unsafe
Dr. Logie Pond Dam	Southwick	Low	Poor
Porter Lake Dam	Springfield	Significant	Poor
Breckwood Pond Dam	Springfield	Significant	Poor
Putnam's Puddle Dam	Springfield	Low	Unsafe
Upper Van Horn Reservoir Dam	Springfield	Significant	Poor
Forest Park Middle Pond Dam	Springfield	Low	Poor
Camp Kinderland Dam	Tolland	Low	Poor
Vinica Pond Dam	Wales	Low	Poor
Norcross Pond #2 Dam	Wales	Low	Poor
Norcross Pond #3 Dam	Wales	Low	Poor
Beaver Lake Dam	Ware	Significant	Unsafe
Skowron Dam	Ware	Low	Poor
O'Brien Pond Dam	Ware	Significant	Poor
Horse Pond Dam	Westfield	Low	Poor
Lyman Pond Dam	Westhampton	Low	Unsafe
Brass Mill Pond Dam	Williamsburg	Low	Poor

Source: Massachusetts Office of Dam Safety, May 2019.

In Table 6-5, Dams labeled as “POOR” are dams with major structural, operational, maintenance and flood routing capability deficiencies. This category also includes unsafe-nonemergency dams. An “UNSAFE” dam indicates a dam whose condition, as determined by the Commissioner, is such that a high risk of failure exists. Among

the deficiencies which would result in this determination are: excessive seepage or piping, significant erosion problems, inadequate spillway capacity and/or condition of outlet(s), and serious structural deficiencies, including movement of the structure or major cracking.

With the more frequent larger storm events in the northeastern United States, these and other dams will be tested and dam failure may increase in likelihood.<sup>3</sup> The extreme storm flows produced by Tropical Storm Irene in 2011, for example, led to the failure of at least two dams in the Pioneer Valley Region. An unnamed private dam in Blandford failed, sending a surge of water downstream to inundate and damage nearby roads. At the Granville Reservoir Dam owned by the City of Westfield, the spillway failed when waters overwhelmed and then undermined the structure. Since then, the City of Westfield has had to spend \$3 million in repairs and improvements to the dam and spillway.

These storm events raise questions about dams and their current capacity to pass more frequent extreme flows. Poor condition dams in the region—as may have been the case in Blandford—will certainly be tested, but so will other dams—such as the Granville Reservoir Dam, which was reportedly in fair condition at the time of the failure.

Where a dam is no longer providing a specific beneficial function, such as water supply or power generation, it makes sense to focus resources on removal to avoid what could be the larger costs of damages in the wake of a failure. Throughout the state, there have been 50 dam removal projects in the past 10 years, with permitting and costs decreasing as professionals, local boards, and state agencies gain more experience with design, permitting, and construction.

Within the Pioneer Valley, there is a good recent example of a dam removal in Pelham along Amethyst Brook that can help inform other local projects going forward. The project in Pelham involved removing the 20-foot high/170-foot wide significant hazard Bartlett Rod Shop Co. Dam. Located upstream of West Pelham Road and Route 9, the dam was in poor repair and estimated costs to bring it to good condition were \$300,000. Removal, funded through a combination of grants, cost a total of \$193,000, and involved a coalition that included the Massachusetts Department of Fish & Game, and the Pelham and Amherst conservation commissions.

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<sup>3</sup> A study examining climate records, found that New England has experienced the greatest change, with intense rainstorms and snowstorms now happening 85 percent more often than in 1948. This study also found that the biggest rainstorms and snowstorms are getting bigger. Extreme downpours are more frequent *and* more intense. See: *When it Rains, It Pours: Global Warming and the Increase in Extreme Participation from 1948 to 2011*, Environment America Research & Policy Center, Summer 2012.

## **D. TRANSPORTATION SAFETY PLANNING PROJECTS IN THE REGION**

The PVPC conducts studies at the regional and local scale in cooperation with MassDOT and local communities to improve safety. The following summarizes some of the studies performed to assist in the advancement of the SHSP objectives to reduce traffic-related fatalities and injuries.

### **1. Top 100 High Crash Intersections**

PVPC develops its own independent listing of high crash locations based on MassDOT data. This regional study identifies the regional intersections with the highest Equivalent Property Damage Only (EPDO) scores. EPDO places a weight on each crash based on the severity of the crash. Crashes that result in an injury or fatality received a higher weight. PVPC uses the regional GIS system to properly identify crash locations and group closely linked intersections into clusters. The first version of this report was completed in 2008. Two updates have since been completed with the most recent one released in 2016.

This report can be accessed

at: <https://www.pvpc.org/sites/default/files/files/Top%20100%20High%20Crash%20Intersections%20draft%20II.pdf>

### **2. Bicycle and Pedestrian Crash Clusters in the Region**

PVPC began summarizing the top 10 high crash bicycle and pedestrian clusters in the region beginning in 2016 as part of the Top 100 High Crash Intersections report. This data was used to assist local communities in their sustainability and livability planning as well as advance Complete Streets planning in the region. Figure 6-6 shows the top 10 regional non-motorist crash clusters.

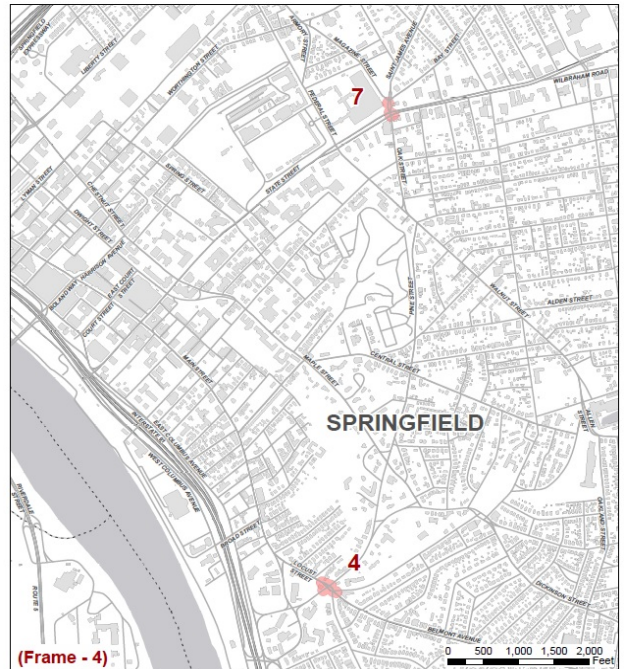
### **3. SafetyCompass**

The PVPC developed the SafetyCompass in 2017 to respond to concerns from the JTC and local communities that the Top 100 High Crash Intersections report did not provide safety data outside of the urban core. SafetyCompass summarizes crash data trends for every community in the region. In addition, the SafetyCompass identifies crash data and trends differently for rural and urban communities, recognizing that the total number of crashes is not the sole indication of a safety problem. Each community also received a digital version of the crash data included in the SafetyCompass to incorporate into their local GIS system. The SafetyCompass can be downloaded



from: <http://www.pvpc.org/sites/default/files/Final%20Report%20Safety%20Compass.pdf>

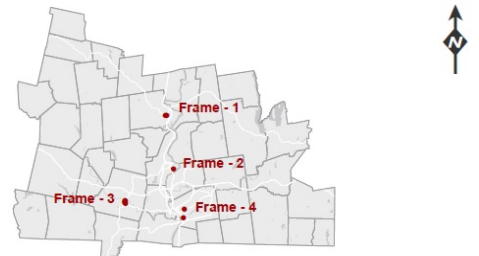


**Figure 6-6 – Top 10 Bicycle and Pedestrian Crash Clusters in the Region**



**Top 10 Bike/Ped Crash Clusters  
PVPC 2003 - 2013**

-  Bike/Ped Crash Clusters
-  Building Footprints
-  Road Network



#### **4. Transportation Safety Studies**

As a part of PVPC's Unified Planning Work Program (UPWP), locations in the region that have a history of safety related issues are identified for proposed traffic studies. Crash data obtained from both MassDOT's crash database and local police departments is used in this analysis. PVPC also works with the local community to develop a series of recommendations to improve safety. Past studies have been helpful to advance short term safety improvements and provide documentation to apply for funding to implement long term improvements. The PVPC utilizes information from products such as the Top 100 High Crash Intersections report and SafetyCompass to identify potential locations for safety studies and all studies are coordinated with MassDOT and the JTC.

#### **5. Local Technical Assistance**

PVPC helps member communities as part of the Local Technical Assistance (LTA) program to provide short term safety analysis and guidance. This assistance is performed at the request of the community and typically consists of the review of historic crash data and a brief in-field assessment. PVPC develops a technical memo to summarize the problem and propose a series of short term recommendations