

# HSIP Project Selection Criteria

The purpose of the Highway Safety Improvement Program (HSIP) is to reduce the number of fatal and injury crashes by targeting high crash locations and causes. Projects, using (HSIP) funding, are required, by MAP-21, the Federal Legislation, to be selected based a data driven process and identified in the Strategic Highway Safety Plan (SHSP). Specifically, the Legislation states, “A highway safety improvement project is any strategy, activity or project on a public road that is consistent with the data-driven State Strategic Highway Safety Plan (SHSP) and corrects or improves a hazardous road location or feature or addresses a highway safety problem. MAP-21 provides an example list of eligible activities, but HSIP projects are not limited to those on the list. Workforce development, training, and education activities are also an eligible use of HSIP funds.” [§1109; 23 USC 504(e)]. For more details on HSIP, refer to the FHWA website: <http://safety.fhwa.dot.gov/hsip/>.

According to MAP-21, the program has to address a strategy specifically identified in the SHSP (<http://www.massdot.state.ma.us/Portals/8/docs/traffic/shsp/shspSeptember2013.pdf>). The strategies include the following:

Focus Areas	Strategies
<b>Impaired Driving</b>	<ul style="list-style-type: none"> <li>Enhance collaborative enforcement efforts to reduce alcohol and drug-related motor vehicle fatalities and injuries</li> <li>Enhance collaboration between ABCC and law enforcement to enforce alcohol beverage-control laws and prevent alcohol service to underage youth and intoxicated persons.</li> <li>Provide targeted information and education programs to prevent alcohol-related motor vehicle fatalities and injuries</li> <li>Educate the public on the dangers and consequences of impaired driving</li> </ul>
<b>Intersections</b>	<ul style="list-style-type: none"> <li>Identify intersection crash locations and causes.</li> <li>Educate safety practitioners on best practices for design.</li> <li>Incorporate safety elements into intersection design and maintenance.</li> <li>Enhance enforcement of intersections</li> </ul>
<b>Lane Departures</b>	<ul style="list-style-type: none"> <li>Identify lane departure crashes and causes.</li> <li>Educate safety practitioners on best practices for design.</li> <li>Incorporate safety elements into roadway design and maintenance.</li> <li>Enhance enforcement of some driver-contributing factors in lane departure crashes, e.g., driver inattention and speeding.</li> </ul>
<b>Occupant Protection</b>	<ul style="list-style-type: none"> <li>Enhance enforcement of safety belt use in Massachusetts.</li> <li>Educate the public on use of safety belts and passenger restraints. (Accurate injury data for unrestrained motor vehicle occupants are currently unavailable. An accompanying objective for incapacitating injuries from unrestrained vehicle occupants will be developed when data become available.)</li> </ul>
<b>Speeding and Aggressive Driving</b>	<ul style="list-style-type: none"> <li>Enhance enforcement efforts to curb speeding and aggressive driving.</li> <li>Improve the design and engineering of highway speed limits.</li> <li>Educate the public on the risks associated with speeding and aggressive driving behavior.</li> </ul>
<b>Young Drivers</b>	<ul style="list-style-type: none"> <li>Conduct research to more effectively impact crashes involving young drivers.</li> <li>Enhance enforcement efforts to impact traffic violations by young drivers.</li> <li>Improve education of young drivers, parents, and the general public.</li> </ul>
<b>Older Drivers</b>	<ul style="list-style-type: none"> <li>Utilize existing data for improved problem identification.</li> <li>Support initiatives to improve the transportation system for older users.</li> </ul>

	<ul style="list-style-type: none"> <li>• Develop infrastructure improvements that accommodate older road user needs.</li> <li>• Educate older road users and the public on older road user safety.</li> <li>• Provide alternative transportation.</li> <li>• Consider enhancements to licensing.</li> <li>• Provide education and technical assistance to the medical and legal communities on older road user impairment.</li> </ul>
<b>Pedestrians</b>	<ul style="list-style-type: none"> <li>• Provide training and technical assistance to improve the design and engineering of pedestrian facilities.</li> <li>• Educate the public on pedestrian safety.</li> <li>• Integrate pedestrian safety activities with other plans.</li> <li>• Incorporate changes precipitated by new directives related to healthy transportation.</li> </ul>
<b>Motorcycles</b>	<ul style="list-style-type: none"> <li>• Improve and enhance motorcycle safety training and communications opportunities.</li> <li>• Enhance motorcycle enforcement.</li> <li>• Improve analysis of motorcycle crashes.</li> <li>• Increase motorcycle safety awareness</li> </ul>
<b>Bicycles</b>	<ul style="list-style-type: none"> <li>• Improve design and engineering of bicycle facilities.</li> <li>• Educate the public on bicycle safety.</li> <li>• Integrate bicycle safety activities with other plans.</li> <li>• Incorporate changes precipitated by new directives related to healthy transportation</li> </ul>
<b>Truck/Bus-Involved</b>	<ul style="list-style-type: none"> <li>• Enhance enforcement of motor carrier safety.</li> <li>• Increase awareness of motor carrier safety.</li> <li>• Improve data quality and collection.</li> <li>• Provide engineering roadway improvements.</li> <li>• Improve Massachusetts motor carrier systems.</li> </ul>
<b>At Grade Crossings</b>	<ul style="list-style-type: none"> <li>• Enhance at-grade rail crossing safety.</li> <li>• Educate everyone about safe crossing practices.</li> <li>• Improve data collection and analysis capabilities.</li> <li>• Improve communication and collaboration among those responsible for rail grade crossing safety.</li> </ul>
<b>Safety of Persons Working on Roadways</b>	<ul style="list-style-type: none"> <li>• Ensure work zones and other traffic incident set-ups are designed and constructed to maximize safety.</li> <li>• Increase enforcement to enhance safety for all people working on the roadway.</li> <li>• Educate the driving public about the importance of driving safely in work zones and other traffic incident locations.</li> <li>• Develop processes for collecting data to measure and quantify fatalities and injuries to better understand crashes involving roadway workers.</li> </ul>
<b>Data Systems</b>	<ul style="list-style-type: none"> <li>• Develop a TRCC Subcommittee.</li> <li>• Identify data needs and review the performance measures in the SHSP</li> </ul>
<b>Driver Inattention</b>	<ul style="list-style-type: none"> <li>• Develop public information and enforcement programs to reduce inattentive driving.</li> <li>• Develop processes to collect data to measure/quantify fatalities and injuries to better understand driver inattention.</li> <li>• Develop and deliver targeted training on the dangers of inattentive driving.</li> <li>• Incorporate design elements into roadway engineering to combat inattentive and drowsy driving.</li> </ul>

Based on the above strategies a spot improvement, at a particular location, or a systemic approach can be taken. According to FHWA, “The systemic approach to safety involves widely implemented improvements based on high-risk roadway features correlated with specific severe crash types. The

approach provides a more comprehensive method for safety planning and implementation that supplements and compliments traditional site analysis. It helps agencies broaden their traffic safety efforts and consider risk as well as crash history when identifying where to make low cost safety improvement locations. Rather than managing risk at certain locations, a systemic approach takes a broader view and looks at risk across an entire roadway system.” As long as the systemic approach is addressing a safety concern raised in the SHSP and identified in one of the strategies, it is HSIP eligible.

For spot improvements, the following criteria have been established:

- Locations must originate from a comprehensive list of the highest crash locations. The primary source of data will be the MassDOT database (which is based on the Registry of Motor Vehicle (RMV) Crash Data System) and the High Crash Locations report (which includes Intersections, Pedestrian and Bicycle Crash Clusters based on weighted severity of crashes that have been geolocated). However, RPA’s may use their own data that have been edited to more accurately rank locations within their Region. It is also recognized that there is often a time delay with the release of the crash data from the RMV. If more up-to-date crash data are obtained from an alternative source and the data show that a particular location would rank high on a Region’s ranked list, the locations may be considered for eligibility in the HSIP program with approval from MassDOT.
- With the intent of the HSIP program to reduce the number of fatalities and serious injuries on Massachusetts’ roads, candidate projects must be locations where the data indicates a high incidence of crash severity. The Equivalent Property Damage Only (EPDO) index (Property Damage = 1 Point; Injury crash = 5 Points; Fatal crash = 10 points), or another measure that focuses more on the fatalities and injuries, will continue to be preferred for ranking locations because it provides a comparative measure of severity. When feasible, crash rate formulas (EPDO per Million Entering Vehicles or per million vehicle miles traveled) can be used to rank locations as this measure not only accounts for severity, but also exposure.
- All HSIP project spot candidate locations will require an accompanying Road Safety Audit (RSA) report, or similar report, to determine eligibility. The report must include a detailed analysis of crash data/crash reports/risks to identify the nature of the crash problem as well as identify appropriate corrective measures to address the problem. If the HSIP project utilizes the systematic approach, then a justification of the systematic approach will be required and will need to be based on data, as developed or approved by MassDOT.
- All HSIP projects will require a before and after evaluation (to be developed). MassDOT is currently developing the criteria and templates for these before and after studies.
- Candidate projects must be selected from one of the following categories and can be viewed on an interactive map by selecting the specific map or map layers to view: (<http://gis.massdot.state.ma.us/maptemplate/topcrashlocations>):

**Intersections** – Intersections must be within the top 5% of all intersection crash clusters within the geographic boundaries of each region based on MassDOT’s statewide crash database, from a ranked list prepared by the RPA, or a combination of the two. Note that the MassDOT list is based on located crashes only.

The emphasis for project selection should be on those locations ranking highest on the list, reflecting the highest crash intersection clusters in terms of crash severity (injury and/or fatality). Selection of an intersection that ranks lower on the list is acceptable, however, there must be reasons provided as to why those higher ranked locations were not selected. Examples may include: lack of public support or political will to pursue the project; or, improvements are pending developer mitigation; etc.

The table below is based on MassDOT’s 2011-2013 crash data. It provides the total number of intersection clusters and the number of intersection clusters within the top 5% in each region. It is recognized that a ranked list, developed by an RPA, may more accurately reflect the specific locations in that Region, therefore the RPA ranked list may be used to reflect the top crash intersection locations within that region. If more up-to-date crash data are obtained from an alternative source and those data show that a location would rank higher on a Region’s ranked list, the location may be considered for eligibility in the HSIP program.

### Intersections

RPA / MPO	Number of “Intersections”	Intersections in the Top 5%	Minimum Equivalent Property Damage
BRPC	1078	57	>= 25
CCC	2051	105	>= 34
CMRPC	4490	225	>= 41
FRCOG	420	21	>= 26
MAPC	18297	921	>= 42
MRPC	1857	93	>= 31
MVC	63	4	>= 17
MVPC	2388	127	>= 39
NMCOG	2314	118	>= 42
NPEDC	76	4	>= 10
OCPC	2600	136	>= 48
PVPC	5692	289	>= 46
SRPEDD	5938	300	>= 43

**Pedestrians** - The pedestrian crash location cluster must be within the top 5% of all pedestrian crash locations (based either on the list provided by MassDOT or from the list prepared by the RPA). Note that the MassDOT list is based on located crashes only. In addition, a simple reason must be provided why locations higher on the list are not selected. Based on the 2004-2013 crash data, the following table provides the number of pedestrian locations by RPA and the number of pedestrian locations within the top 5%. It is recognized that a ranked list, developed by an RPA, may more accurately reflect the specific locations in that Region, therefore the RPA ranked list may be used to reflect the top pedestrian crash locations within that region. If more up-to-date crash data are obtained from an alternative source and those data show that a location would rank higher on a Region’s ranked list, the location may be considered for eligibility in the HSIP program.

### Pedestrian Crash Locations

RPA	Number of Pedestrian Crash Locations	Locations in the Top 5%	Minimum Equivalent Property Damage
BRPC	48	2	>= 67
CCC	52	2	>= 25
CMRPC	196	10	>= 86
FRCOG	10	1	>= 75
MAPC	1338	74	>= 46
MRPC	57	2	>= 39
MVPC	137	7	>= 42
NMCOG	119	8	>= 70
NPEDC	1	1	>= 6
OCPC	153	10	>= 40
PVPC	272	11	>= 35
SRPEDD	284	17	>= 65

**Bicycles** - The bicycle crash location cluster must be within the top 5% of all bicycle crash locations (based either on the list provided by MassDOT or from the list prepared by the RPA).

Note that the MassDOT list is based on located crashes only. In addition, a simple reason must be provided why locations higher on the list are not selected. Based on the 2004-2013 crash data, the following table provides the number of bicycle locations by RPA and the number of bicycle locations within the top 5%. It is recognized that a ranked list, developed by an RPA, may more accurately reflect the specific locations in that Region, therefore the RPA ranked list may be used to reflect the top bicycle crash locations within that region. If more up-to-date crash data are obtained from an alternative source and those data show that a location would rank higher on a Region's ranked list, the location may be considered for eligibility in the HSIP program.

### Bicycle Crash Locations

RPA	Number of Bicycle Crash Locations	Locations in the Top 5%	Minimum Equivalent Property Damage
BRPC	35	2	>= 25
CCC	82	5	>= 26
CMRPC	126	7	>= 25
FRCOG	13	1	>= 33
MAPC	957	49	>= 35
MRPC	32	2	>= 20
MVC	6	1	>= 30
MVPC	68	4	>= 19
NMCOG	82	5	>= 41
NPEDC	4	1	>= 15
OCPC	90	5	>= 21
PVPC	203	11	>= 27
SRPEDD	165	10	>= 27

**Rural** – Massachusetts is comprised of approximately 90% urban areas and approximately 80% of the centerline miles are urban or higher order rural (approximately 20% of the statewide centerline miles are on rural collectors or rural local roadways). While the HSIP is a data driven process, due to the low percentage of rural areas, rural locations may not be selected for HSIP projects. As such, Massachusetts does not have a dedicated set-aside High Risk Rural Roads Program (HRRRP) and, in fact, there is no longer a HRRRP in MAP-21. However, there is still the old SAFETEA-LU HRRRP funding source that can be spent down. If a roadway is functionally classified as a rural major or minor collector or rural local road and the crash rate of that roadway exceeds the statewide average for the functional classification of that roadway, then this may be eligible as an HSIP project (provided a Road Safety Audit is conducted). The statewide average crash rate by functional classification is shown below. (<http://www.massdot.state.ma.us/highway/Departments/TrafficandSafetyEngineering/CrashData/CrashRates.aspx>)

### 2013 Crash Rate by Federal Functional Classification

(crashes per million vehicle miles traveled)

Roadway Federal Functional Classification	Rural	Urban
Statewide	1.70	2.14
Interstate	0.66	0.60
Principal Arterial – other freeways and expressways	1.39	0.71
Principal Arterial – other	1.28	3.47
Minor Arterial	1.81	3.64
Major Collector	2.83	3.62*
Minor Collector	3.55	-
Local	2.08	2.01

\* This rate is for all Urban Collector roads, including both Urban Major Collector and Urban Minor Collector roadways.

**Other** - There may be other crash types within a region that have not been identified as a state-wide issue and therefore, a ranking has not been prepared. Examples are locations involving collisions with deer. This criterion may be used as long as the RPA can justify a project based on providing the data that shows that this crash type and location is a priority within that Region and it can be tied to one of the strategies identified as part of the SHSP.

## HSIP Project Selection Process

