

HSIP Project Selection Criteria

The purpose of the Highway Safety Improvement Program (HSIP) is to reduce the number of fatal and serious injury crashes by targeting high crash locations and causes on all public roads. Projects, using (HSIP) funding, are required, by FAST Act, the Federal Legislation Fixing America's Surface Transportation Act, to be a data-driven, strategic approach to improving highway safety on all public roads that focuses on performance. The overarching requirement that HSIP funds be used for safety projects that are consistent with the State's strategic highway safety plan (SHSP) and that correct or improve a hazardous road location or feature or address a highway safety problem. FAST Act 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: <https://www.fhwa.dot.gov/fastact/factsheets/hsipfs.cfm>

According to FAST Act, the program has to address a strategy specifically identified in the SHSP. The MA SHSP was completed in December 2018 and approved by the Governor's office. (https://www.mass.gov/files/documents/2019/01/18/dot_SHSP_2018.pdf).

The strategies include the following:

Focus Areas	Strategies
Impaired Driving	<ul style="list-style-type: none"> • Develop processes for collecting and analyzing data and research on impaired driving • Enhance collaborative enforcement efforts to reduce alcohol and drug-related motor vehicle fatalities and injuries • Prevent alcohol service to underage youth and intoxicated persons by enforcing alcohol beverage control laws • Provide targeted information and education programs to prevent alcohol-related motor vehicle fatalities and injuries • Continue the process of educating the public on the dangers and consequences of impaired driving (alcohol, other drugs, drowsy driving)
Intersections	<ul style="list-style-type: none"> • Identify intersection crash locations and causes • Educate safety practitioners on best practices for design • Incorporate safety elements into intersection design and maintenance • Educate new drivers and general population on intersection safety • Enhance enforcement at intersections
Lane Departures	<ul style="list-style-type: none"> • Identify lane departure crashes and causes • Educate safety practitioners on best practices for roadway design • Incorporate safety elements into roadway design and maintenance
Occupant Protection	<ul style="list-style-type: none"> • Enhance safety belt use enforcement in Massachusetts • Educate the public on use of safety belts and passenger restraints
Speeding and Aggressive Driving	<ul style="list-style-type: none"> • Enhance enforcement efforts to curb speeding and aggressive driving • Improve the process of setting roadway speed limits by including travel speeds and roadway context • Continue the process of educating the public on the risks associated with speeding and aggressive driving behavior
Young Drivers	<ul style="list-style-type: none"> • Conduct research to more effectively reduce the frequency and severity of crashes involving younger drivers • Enhance enforcement efforts to reduce the frequency and severity of traffic violations by younger drivers • Improve education of younger drivers, parents, and the general public
Older Drivers	<ul style="list-style-type: none"> • Collect and update data to improve problem identification and research to improve older driver safety programming • Develop infrastructure improvements that accommodate the needs of older road users

	<ul style="list-style-type: none"> • Continue updating licensing processes and procedures to address safety concerns regarding older drivers • Provide education and technical assistance to the medical and legal communities on older road user impairment
Pedestrians	<ul style="list-style-type: none"> • Incorporate pedestrian safety elements into infrastructure design and engineering • Enhance pedestrian safety expertise • Support municipalities in their efforts to promote pedestrian safety • Increase public awareness about pedestrian safety • Continue to examine and improve processes for collecting pedestrian crash data to measure and quantify fatalities and injuries
Motorcycles	<ul style="list-style-type: none"> • Improve analysis of motorcycle crashes • Increase motorcycle safety awareness • Improve and enhance motorcycle safety training and communications opportunities • Enhance motorcycle enforcement
Bicycles	<ul style="list-style-type: none"> • Improve design and engineering of bicycle facilities on and off roadways • Enhance bicycle safety expertise • Support municipalities in their efforts to promote bicycle safety • Increase public awareness about bicycle safety • Integrate bicycle safety activities with other plans • Incorporate changes precipitated by new directives related to healthy transportation • Develop processes for collecting data to measure and quantify fatalities and injuries to better understand crashes involving bicyclists and regular crash data analysis
Truck/Bus-Involved	<ul style="list-style-type: none"> • Enhance motor carrier safety enforcement • Improve data quality and collection • Provide engineering roadway improvements • Collaborate with the trucking and bus industry on programs and initiatives to improve safety and reduce crashes specific to impaired/drugged driving and possession • Improve Massachusetts motor carrier systems in order to assist the MSP and RMV with enforcement and licensing issues
At Grade Crossings	<ul style="list-style-type: none"> • Enhance at-grade rail crossing safety • Educate general public about safe crossing practices • Improve data collection and analysis capabilities • Improve communication and collaboration among those responsible for at-grade rail crossing safety
Safety of Persons Working on Roadways	<ul style="list-style-type: none"> • Continue developing and implementing practices, policies, and procedures to improve work zone and traffic incident set-ups to maximize safety • Educate drivers on work zone safety issues, using unified themes across multiple agencies, in order to improve compliance with work-zone traffic controls • Develop and/or improve processes for collecting data related to measuring and quantifying fatalities and injuries in order to better understand crashes involving roadway workers • Educate workers on safety practices in work zones
Driver Distraction	<ul style="list-style-type: none"> • Educate the public on the risks associated with driver distraction • Develop and deliver targeted training and education on the dangers of inattentive driving • Enhance enforcement programs to reduce inattentive driving • Develop processes to collect data to measure/quantify fatalities and injuries to better understand driver inattention • Incorporate design elements into roadway engineering to combat inattentive and drowsy driving

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 (based on crash costs where Property Damage = 1 Point; and injury / fatal crashes = 21 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, expected crashes based on Safety Performance Functions and Empirical Bayes is preferred. If not, 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.
- Candidate projects can be viewed on an interactive map by selecting the specific map or map layers to view: (<https://gis.massdot.state.ma.us/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 2015-2017 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	453	24	>= 109
CCC	864	44	>= 111
CMRPC	1989	103	>= 135
FRCOG	176	9	>= 90
MAPC	8794	453	>= 114
MRPC	845	43	>= 102
MVC	37	2	>= 64
MVPC	1236	62	>= 118
NMCOG	1160	58	>= 142
NPEDC	38	2	>= 46
OCPC	1324	67	>= 193
PVPC	2576	131	>= 152
SRPEDD	2686	135	>= 132

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 2008-2017 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	81	5	>= 147
CCC	109	6	>= 126
CMRPC	267	14	>= 235
FRCOG	13	1	>= 191
MAPC	1801	91	>= 215
MRPC	79	4	>= 147
MVPC	164	9	>= 212
NMCOG	171	9	>= 265
NPEDC	3	1	>= 64
OCPC	211	12	>= 168
PVPC	397	20	>= 214
SRPEDD	358	18	>= 296

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 2008-2017 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	37	2	>= 86
CCC	136	7	>= 107
CMRPC	161	9	>= 109
FRCOG	13	1	>= 88
MAPC	1274	65	>= 149
MRPC	31	2	>= 84
MVC	8	1	>= 126
MVPC	71	4	>= 84
NMCOG	104	7	>= 129
NPEDC	11	1	>= 86
OCPC	87	7	>= 105
PVPC	309	17	>= 107
SRPEDD	204	16	>= 851

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, if Massachusetts is subjected to the High Risk Rural Road Rule because the rural fatality rate has increased (MassDOT has been required to advertise HRRR projects) then, 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. (<https://www.mass.gov/service-details/intersection-and-roadway-crash-rate-data-for-analysis>)

2017 Crash Rate by Federal Functional Classification

(crashes per million vehicle miles traveled)

Roadway Federal Functional Classification	Rural	Urban
Statewide	0.88	2.26
Interstate	0.40	0.61
Principal Arterial – other freeways and expressways	0.67	0.80
Principal Arterial – other	0.57	3.58
Minor Arterial	0.92	3.49
Major Collector	0.96	3.33*
Minor Collector	2.35	-
Local	1.20	2.36

* 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 weaving at interchanges, collisions with deer, etc. 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

