massDOT
Massachusetts Department of Transportation

Safety Action Planning Primer for Massachusetts Communities

July 2024

Introduction

A ROADMAP TO ACHIEVE SAFE STREETS FOR ALL

In 2022, Massachusetts experienced the highest number of annual deaths due to traffic crashes in **15 years**. A **Safety Action Plan** is a vital tool that communities across Massachusetts can use to support the Commonwealth's commitment to the goal of zero roadway fatalities and serious injuries.

A Safety Action Plan is a community-supported framework for reducing traffic fatalities and serious injuries. The process to develop a Safety Action Plan involves identifying, analyzing, and prioritizing roadway safety projects and strategies, and building a coalition of stakeholders to effectively implement these projects and strategies. Safety Action Planning builds on years of planning, policies and programming related to achieving **Vision Zero** and implementing the **Safe System Approach** across Massachusetts.

Vision Zero

First implemented in Sweden in the 1990s, Vision Zero is an approach to eliminate all traffic fatalities and severe injuries. Notable Vision Zero communities include Oslo, Norway and Hoboken, New Jersey.

The Safe System Approach

Building on the foundation of Vision Zero, the Safe System Approach is USDOT's guiding framework to address roadway safety. The Safe System Approach prioritizes the elimination of crashes that result in fatal and serious injuries. It moves beyond a traditional safety approach to both prevent crashes from happening in the first place and to mitigate the harm caused by crashes that do occur.

The Commonwealth of Massachusetts adopted the Safe System Approach in the 2023 Strategic Highway Safety Plan.

See the Tools and Resources section of this document for additional information on Vision Zero and the Safe System Approach.

This Primer outlines the **key elements** of a Safety Action Plan, shares **success stories** from Brockton, Lynn, and Springfield, Massachusetts that are actively developing and implementing Safety Action Plans, and highlights **MassDOT resources** that any community can use to jumpstart their Safety Action Plan.

THE FUNDING OPPORTUNITY

There is ***unprecedented safety funding available to local jurisdictions through the federal Safe Streets and Roads for All (SS4A) discretionary grant program*** to support the development and implementation of Safety Action Plans.

The federal Bipartisan Infrastructure Law (BIL) established the SS4A discretionary program in 2021, with $5 billion in appropriated funds over five years (2022-2026). As of Spring 2024, over $3 billion is still available for future funding rounds and every Regional Planning Agency in Massachusetts has received funding through SS4A to develop a Regional Safety Action Plan.

The SS4A discretionary program includes two categories of funding:

1. **Planning and Demonstration Grants** provide funding to develop, complete, or enhance an Action Plan. These grants also fund demonstration activities (e.g., pilot projects) in support of an Action Plan. Communities can apply for these grants while local or regional Safety Action Plan development is in process.
2. **Implementation Grants** provide funding to implement projects and strategies identified in an Action Plan. Eligible projects and strategies can be infrastructural, behavioral, and/or operational.

To be eligible for SS4A implementation funding, Safety Action Plans must include eight key components. The Planning Process Flowchart (Figure 1) outlines the eight components of a Safety Action Plan.

MassDOT will continue to create and share resources on Safety Action Planning as they are developed. Cities and towns can also look to their Metropolitan Planning Organizations (MPOs) or Regional Planning Agencies (RPAs) as a resource and refer to MassDOT's Regional Planning webpage.

MassDOT created this document in response to the unique SS4A funding opportunity. Though the components outlined in this document are specific to SS4A, this document can be used beyond the SS4A funding period. Developing a safety action plan will remain beneficial even without SS4A funding as it provides a framework for communities to identify, implement, and track progress towards eliminating serious injuries and fatalities on our roadways.

Success Story – SS4A in Springfield, MA

In 2022, Springfield, MA initiated a collaboration with MassDOT to prevent deaths and serious injury crashes through the Safe System Approach. MassDOT helped the City develop a **Safety Action Plan**, using that plan as the foundation to apply for a Safe Streets and Roads for All (SS4A) Implementation Grant.

The successful grant application resulted in an award of **$15 million to implement safety improvements** in locations across Springfield with a disproportionately high number of fatal and serious injury crashes.

PRESS RELEASE

17 Massachusetts Communities Getting Total of $30.6 Million for Projects to Increase Road Safety

Funds being awarded to municipalities and regional planning agencies from federal Safe Streets For All Grant Program

Figure 1. The Safety Action Planning Process

THE SAFETY ACTION PLANNING PROCESS

This planning process follows the eight elements required in the 2024 SS4A Self-Certification Eligibility Worksheet. The process may happen sequentially, but this is not required. Underlined text includes a hyperlink to relevant sections in this Primer.

1. Leadership Commitment and Goal Setting — Page 5

- Committing publicly to Vision Zero.
- Developing goals to achieve Vision Zero.

2. Planning Structure — Page 6

- Establishing a diverse working group to develop, implement, and monitor the plan.

3. Safety Analysis — Page 7

- Identifying target crash types and crash risks.
- Confirming systemic and specific safety needs.
- Locating higher-risk locations.

4. Engagement and Collaboration — Page 13

Collaborating with the community to:

- Ground-truth safety analysis.
- Raise awareness of traffic safety issues.
- Build support for implementation.

5. Equity Considerations — Page 15

- Ensuring vulnerable and underserved communities are considered in plan development.

6. Policy and Process Changes — Page 16

- Reviewing policies, plans, and standards to improve how existing processes prioritize safety.

7. Strategy and Project Selections — Page 17

- Developing strategies and projects to address safety problems, including a timeline for implementation.

8. Progress and Transparency — Page 25

- Measuring progress over time and adjusting strategies and projects as needed.

1 – Leadership Commitment and Goal Setting

Publicly committing to Vision Zero enables community leaders to **foster an environment where traffic safety action is expected**, so accountability mechanisms can be put in place. Adopting a commitment is an eligibility criterion for SS4A Supplemental Planning and Demonstration Activities, as well as Implementation Grant funding. Completion of four out of six eligibility criteria is required (see the Self-Certification Eligibility Worksheet), so adopting a commitment brings the community one step closer to accessing federal funding.

Commitments can be made in several ways, including:

- A public announcement from a high-ranking official (e.g. Mayor, City/Town Manager)
- The adoption of a resolution by a city council
- The adoption of a commitment by a town Select Board
- The adoption of a commitment by an MPO/RPA governing board

The commitment can be made at the local or regional level. A regional commitment covers the local communities within that MPO/RPA. The commitment should be measurable and specify a target year for reaching zero serious injuries and fatalities. The selection of a target year should consider the size of the jurisdiction, the average annual number of serious injuries and fatalities, and the resources and capacity that they and their partners have available to address safety issues.

Success Story – Building a Core Planning Team

A successful Safety Action Plan needs a champion. In Lynn, MA the City's Principal Planner led the development of the **Lynn Safe Streets for People Playbook**. They leveraged their authority and contacts to foster communication and actions across key agency departments and in the community. In Springfield, the Public Work's Director championed development of the city's Safety Action Plan.

A strong leader does not work alone. Both Lynn and Springfield collaborated with their own staff, MassDOT and outside consultants to form a **core planning team** responsible for developing the plan.

2 – Planning Structure

An enthusiastic study working group with diverse skillsets and perspectives is a vital element of a successful Safety Action Plan and creating buy-in for plan implementation. Working groups may also be referred to as committees, boards, or advisory groups. Study working groups engage with the **core planning team** at key milestones to provide input on draft analysis results, recommendations, and final plan. Study working group members also support implementation, evaluation, and future updates to the plan.

Study working group members can represent diverse groups such as:

City/Town/MPO/RPA Leadership (i.e., The Town Manager/Mayor/Executive Director's Office)		
Local Agency Partners	**Regional/State Agency Partners**	**Community Leaders**
• Health Department • Parks and Recreation • Public Works • Planning • Fire Department • Police Department • Public Schools • Finance Department	• Transit Authority • Regional Planning Agency • MassDOT District Staff • MassDOT Safe Routes to School Coordinator	• Neighborhood Councils • Community-based organizations serving immigrant-, youth-based, or elderly populations • Active transportation advocacy groups • Chamber of Commerce • Business Associations

Study working group members represent different aspects of the Safe System Approach and its implementation. Each working group member offers a unique perspective on roadway safety. For example:

- Police officers and fire fighters can contribute their perspectives as first responders.
- MassDOT can be included as needed to review, engage in dialogue, and answer questions about state-owned facilities in the community.
- Community based organizations and advocacy groups can represent the perspectives of vulnerable road users and/or marginalized people who may face a higher risk of severe crashes.

The study working group may evolve over time. For example, local champions identified through community engagement can be incorporated as the plan develops. Learn more about building a study working group in FHWA's Local Road Safety Plan DIY Toolkit.

Success Story – Coordination with a Regional Planning Association

Like all other Regional Planning Associations in Massachusetts, the Old Colony Planning Council (OCPC) received an SS4A Planning & Demonstration Grant Award to develop a Regional Safety Action Plan (RSAP).

OCPC staff served on the Study Working Group for Brockton's Safety Action Plan to provide input, coordination, and continuity for both local and regional plans. It is anticipated that Brockton's Safety Action Plan will be incorporated into the larger Regional Safety Action Plan.

3 – Safety Analysis

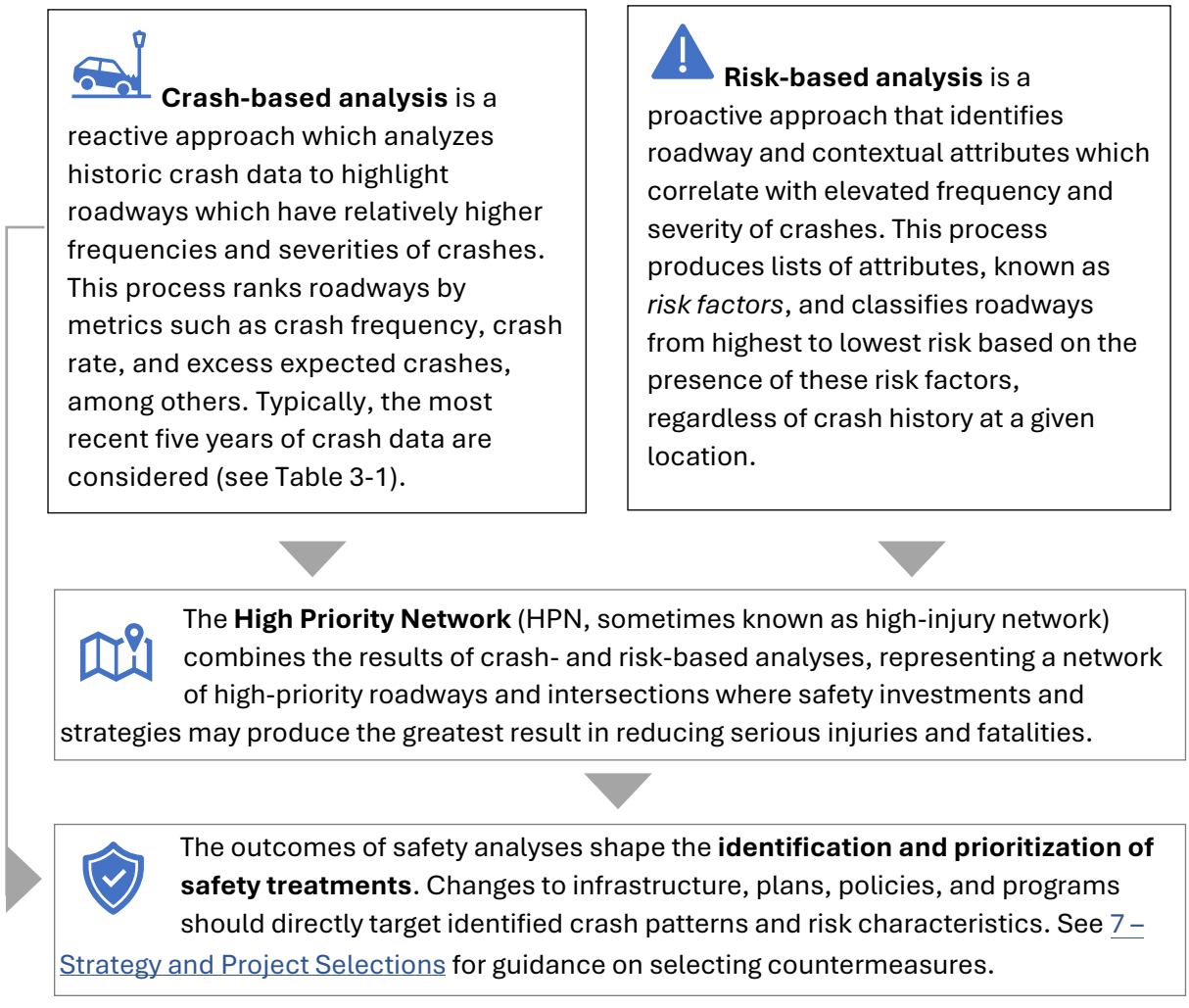
UNDERSTANDING THE ROLE OF SAFETY ANALYSIS

Safety analyses are the **foundation of Safety Action Plans** and **guide the development of strategies** to reduce serious injuries and fatalities from crashes.

There are two broad categories of safety analysis processes and products: crash-based and risk-based analyses. Together the outcomes of these analyses can shape the High Priority Network and the process to identify and prioritize safety treatments.

Engagement with the community can help confirm findings from this analysis.

Figure 3-1. Safety Analysis Process Graphic



DEVELOPING A CONTEXT-SENSITIVE APPROACH

Safety analyses should be tailored to suit your community context and consider street design, land use, and travel behavior patterns which vary widely across the Commonwealth. Table 3-1 below outlines several considerations for safety analysis related to more rural, suburban, or urban contexts.

Table 3-1. Summary of Contextual Considerations for Safety Analysis

Considerations	Rural to low-density suburban	High-density suburban to urban
Selecting study period and study crash severity	Typically, analysis will consider five to seven years of crashes, focusing on fatal and serious injury crashes but including crashes of all injury severities if crashes are especially sparse.	Typically, analysis will consider five years of crashes, focusing on fatal and serious injury crashes. Crashes of all injury severities are usually included for less frequent crash types like pedestrian and bicyclist crashes.
Risk- vs. crash-based analysis	Greater emphasis on risk-based analysis to identify proactive safety projects where crashes are sparse.	Similar focus on both crash- and risk-based analyses to identify both reactive and proactive opportunities.
Potential Emphasis Areas	Lane Departure, Speeding, Distracted Driving, Head-on	Intersection-related, Speeding, Pedestrian, Bicyclist
Pedestrian and bicycle crashes	Consider latent demand (MassDOT's Potential for Everyday Biking and Potential for Walkable Trips) due to lower activity.	More common due to higher activity. Risk-based analysis should be emphasized. Pedestrian and bicyclist analyses may consider all crash severities.

Using Open Crash Data

Crash data years are considered open and subject to change until the RMV closes the crash file at which time no changes/edits may be made to crash data. Typically, the lag is about 2 years. More recent data may better reflect current trends and conditions, but the accuracy of open data may be lower than that of closed data. Confirm with your local law enforcement agency that reporting to the Registry of Motor Vehicles (RMV) is substantially complete and confirm that the crashes have been geocoded before using open data.

What are Emphasis Areas?

Targeted crash types in the state's Strategic Highway Safety Plan (SHSP) that were associated with the highest number of fatalities and serious injuries in the Commonwealth. The 2023 SHSP moves away from Emphasis Areas as a framework for action, but they are still important to address and are embedded in many tools discussed below. See the 2018 SHSP for more information on Emphasis Areas.

Though most streets statewide are locally owned and managed, almost all cities and towns have roads and bridges within their borders that are under the jurisdiction of MassDOT, the Department of Conservation and Recreation (DCR), or another state or federal agency. While local communities do not have control over these facilities, safety analyses should include all roads within the study area regardless of jurisdiction. In this way, Safety Action Plans can present a comprehensive picture of road safety issues and create a starting point for cross-jurisdictional collaboration and problem-solving.

SAFETY ANALYSIS STEPS

The safety analysis process can be summarized in a few general steps. The analysis steps described here can be completed with the aid of MassDOT crash- and risk-based datasets and safety analysis tools. Most of these tools and datasets, which are described in greater detail in the Tools and Resources section of this document, are hosted on the MassDOT IMPACT portal. Other sound safety analysis practices and tools can also be used.

Understanding the Safety Baseline

Build an understanding of the crash types happening in the community and establish a baseline against which future trends and progress can be measured.

Questions to consider...

- What context can we gather about trip types from the crash data?
- What kinds of crash patterns does the community see throughout the day? Throughout the year?
- Which crash types lead to most fatalities and serious injuries?

Helpful tools...

- Safety Data Dashboards
- Crash Query and Visualization Tool
- Crash Tree Generator
- Test of Proportions

Finding Areas of Focus

Dig deeper into preliminary patterns, including creating an HPN, defining the crash types to target, and identifying treatments that might address common severe crash risk factors (see 7 – Strategy and Project Selections for guidance on selecting treatments).

Questions to consider…

- What Emphasis Areas lead to most fatal and serious injury risk and crashes in the community (Table 3-1)?
- How can these priorities be used to target the analysis?
- Are there crash types other than those recognized as Emphasis Areas that lead to many fatalities and serious injuries in the community?
- Are there crash characteristics that, compared to the region and/or Commonwealth, are overrepresented in the community?
- Where are most fatal and serious injury crashes happening?
- Where does the infrastructure present the most risk for future crashes?
- Are any of the community's top-crash and top-risk locations also top-crash and top-risk locations in the region and/or Commonwealth?

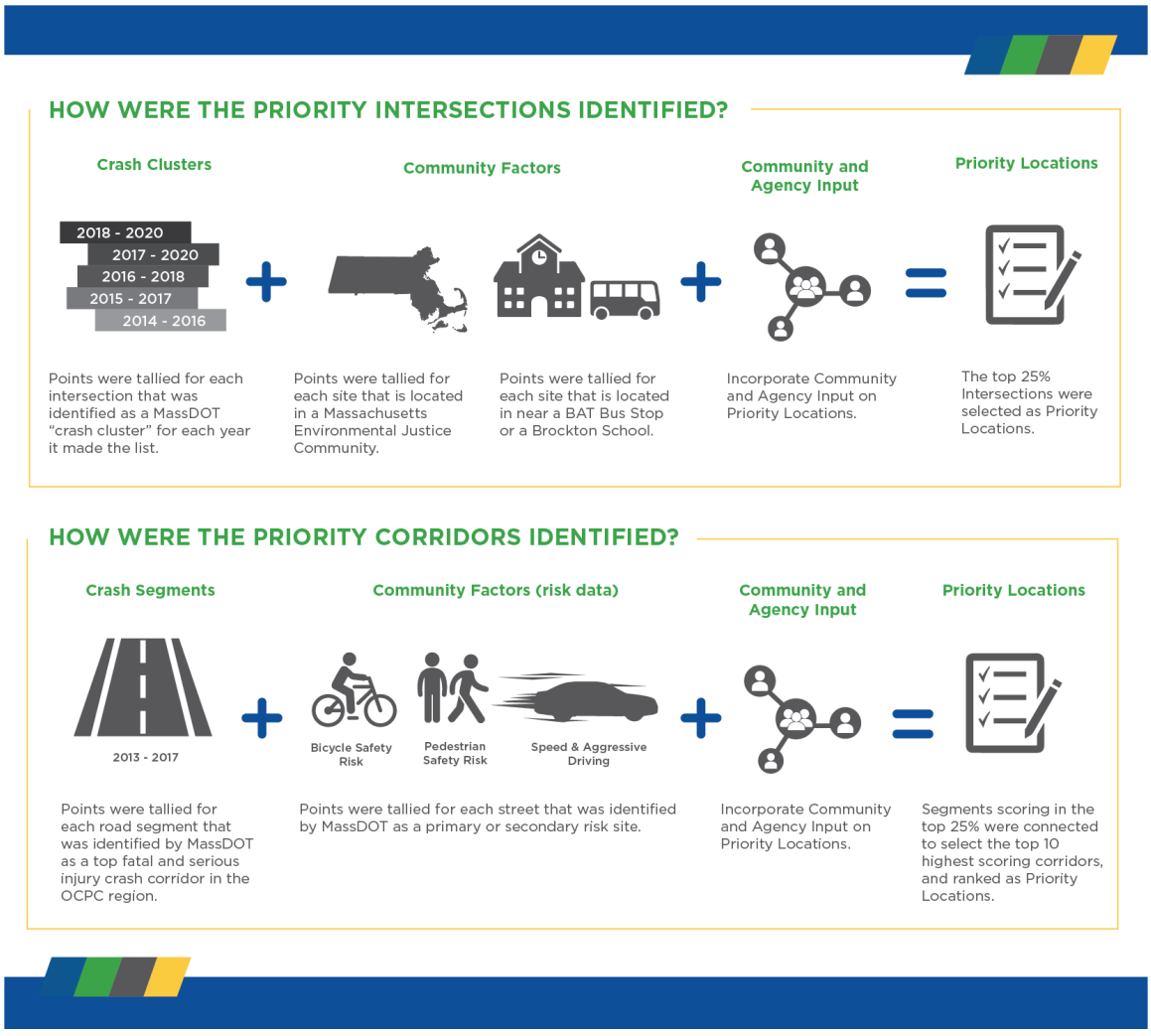
Helpful tools…

- Safety Data Dashboards (Emphasis Areas)
- Safety Analysis Tools
- Top Crash Locations
- Test of Proportions Tool
- Crash-based Network Screening
- Risk-based Network Screening

Success Story – Prioritizing High-crash, High-risk Locations in Brockton

Brockton's Safety Action Plan prioritizes high-crash and high-risk intersections and corridors using the following MassDOT data:

- Top-crash locations
- Crash-based network screening
- Risk-based network screening for three Emphasis Areas**:** Bicycle, Pedestrian, and Speeding
    - The study working group chose these three Emphasis Areas because each area had a substantial number of primary and secondary risk sites in Brockton.
- Community factors from MassGIS (Environmental Justice Community, Bus Stops, Schools)



Contextualizing the Analysis

Overlay the safety data with other information to contextualize analysis findings and help prioritize locations and strategies for action. In particular, SS4A-compliant Safety Action Plans must include a spatial analysis of safety risks relative to equity within the study area. More information on integrating equity in a Safety Action Plan is provided in section 5 – Equity Considerations.

Questions to consider...

- What context can we gather about trip types from the crash data?
- What kinds of crash patterns does the community see throughout the day? Throughout the year?
- Which crash types lead to most fatalities and serious injuries?

Helpful tools...

- Safety Data Dashboards
- Crash Query and Visualization Tool
- Crash Tree Generator
- Test of Proportions

Questions to consider...

- What unique needs does your study area have that may need specific attention or additional stakeholder involvement?
- How can areas of focus be prioritized based on equity and land use criteria?

Helpful tools...

- Environmental justice and equity populations data
- Latent demand for walking and biking
- Land use and destination data

4 – Engagement and Collaboration

Public engagement on Safety Action Plans serves three main purposes:

Generating awareness of traffic safety issues.

Building support for the future implementation of safety projects.

Confirming the results of safety analyses.

FOCUSING EFFORTS FOR INCLUSIVE ENGAGEMENT

A successful engagement strategy should include a variety of ways for the community to get involved with the plan. A concerted effort should be made to involve vulnerable road users and populations with specific transportation needs, in line with section 5 – Equity Considerations. The steps below form a high-level guide to carrying out inclusive engagement processes:

1. Identify Focus Populations

Focus populations for Safety Action Planning vary from community to community and may include:

- Children and families
- Older adults
- People with disabilities
- Members of single- or zero-car households
- People who walk, bike, and take transit
- Lower-income people
- People of color
- Immigrants
- People with limited English proficiency
- Residents of MA Environmental Justice Communities and/or USDOT Disadvantaged Communities

2. Establish Partnerships with Ties to the Identified Focus Populations

This could be:

- City or town departments
- Resident boards and committees
- Community-based organizations

Partnerships can range from promoting engagement opportunities through social media and email to hiring individuals or organizations as paid partners to conduct outreach.

3. Meet People Where They Are

Consider how to proactively reach members of your community's focus populations. Some options include:

- Hold in-person pop up conversations at bus stops or at community events
- Translate materials into commonly spoken languages

Provide multiple opportunities and methods for people to share input.

The Resources for Engaging the Public section includes additional guidance to assist with planning to engage with focus populations.

Success Story – Lynn Safety Action Plan Engagement

To support safety planning work in Lynn, MassDOT and the City partnered with a local community organization to lead on-the-ground engagement. LEO, Inc., a local service provider with a long history in Lynn, had not been involved in transportation planning work before but understood promoting safe mobility as part of their larger mission to help Lynn communities thrive. The groups that LEO serves also strongly overlapped with focus populations for Safety Action Planning.

Throughout the summer of 2021, LEO integrated engagement for the citywide safety initiative into their existing programming and outreach, including at outdoor festivals and planned COVID-19 and food assistance outreach events. LEO staff collected surveys and shared incentives such as raffle entries for bikes and gift cards, small giveaways, and free bike tune-ups. The LEO team also produced and circulated a 2-minute video in English and Spanish highlighting traffic safety issues in Lynn and introducing possible street design solutions to common problems.

LEO's work reached many vulnerable users of Lynn's transportation network and whose input likely would not have been captured through conventional public engagement methods. Of the 250 paper surveys the LEO team collected, one third were filled out in Spanish, and one third were filled out by people who walk, bike, or take transit every day. The engagement informed the City's approach to improving safety for vulnerable road users.

5 – Equity Considerations

Mobility impacts land use, economic development, housing, and the environment, among other aspects of living in Massachusetts. In underserved communities, transportation infrastructure and services are often inadequate, present higher safety and health risks, and create challenges in connectivity. Economic stability and wealth are highly related to one's ability to access employment and services. Policies have historically prioritized investment in auto-oriented transportation. This negatively impacts people of color, people living with disabilities, and people experiencing poverty.

Equity is a cornerstone of Safety Action Planning. Equity means distributing resources to people in a just and impartial way that addresses the disproportionate harm that vulnerable populations and people of color often suffer on Massachusetts roadways.

Higher rates of transit and active transportation dependence, and other compounding vulnerabilities, put some people at greater risk of serious and fatal crashes. For example, the 2023 Massachusetts Strategic Highway Safety Plan (SHSP) identified that Black/African American residents accounted for a higher proportion of motor-vehicle and pedestrian deaths as well as hospitalizations than their share of the population. Racial inequity is only one equity lens (other focus populations are identified in section 4 - Engagement and Collaboration).

Safety Action Plans should affect change in transportation equity by following these principles:

- **Invest equitably.** Focus on the safety needs of marginalized communities disproportionately affected by serious and fatal crashes by spatially implementing actions where crash risk and equity indicators overlap.
- **Expand alternatives to driving and vehicle ownership.** Increase the availability and safety of walking, biking, and transit for daily trips. This empowers people to choose less expensive transportation options which are also healthier and more sustainable than driving.
- **Implement self-enforcing street design.** Design streets and roadway networks to reinforce desirable roadway user behavior, thereby reducing reliance on traffic enforcement.
- **Engage stakeholders authentically.** Execute an inclusive and representative process for plan development (described in section 4 - Engagement and Collaboration).

Safety Action Plans require an analysis of population characteristics and initial impact assessments of proposed projects and strategies.

Questions to consider…

- Where is there overlap between traffic safety issues and indicators of inequity?
- How will projects be distributed across different Census tracts, and which populations will benefit from the changes?

Helpful tools…

- Massachusetts Environmental Justice Populations interactive map
- Equitable Transportation Community Explorer (ETCE)
- Climate and Economic Justice Screening Tool (CEJST)

6 – Policy and Process Changes

An important step in developing a Safety Action Plan is **identifying current policies, plans, guidelines, and standards that need to be updated or revised** to prioritize transportation safety. Safety Action Plans should recommend updates and revisions to policies and processes and address how to put these changes into action.

To identify these changes, communities first need to understand existing best practices and how other communities are addressing transportation safety through policy and processes. Developing a literature review or a document that summarizes key sources on a topic can be a helpful exercise for communities seeking to understand the breadth of policies, plans, guidelines, and standards available. Completing a literature review can also help communities identify innovative practices that were successful in other places.

Following the literature review, communities should work with their Safety Action Plan working Groups to identify local opportunities for change and work directly with decision makers to move the changes forward. Communities should include identified opportunities in the Safety Action Plans as recommendations. Different recommendations will have different pathways to implementation. These pathways can range from updating internal departmental processes to updating guidance documents to codifying policies through legislation.

Communities should also work with their MPOs/RPAs to gain regional context and learn more about what other communities in the region are doing. MPOs/RPAs can also facilitate communication between communities and MassDOT. Examples of policy and process changes include:

Developing or revising the development review guidelines to prioritize road user safety over driver delay in operations and design decisions to align with national best practices and state guidance such as the MassDOT Project Development and Design Guide

Prioritizing transportation improvement projects that are on the high injury network or have a vulnerable road user safety concern identified by the community.

Becoming a partner with the Safe Routes to School Program, and requiring Transportation Safety Education as part of the school curriculum.

Opting-in to Ch90s17C of Massachusetts General Law to reduce the statutory speed limit from 30 mph to 25 mph on any or all city- or town-owned roadways within a thickly settled or business district that do not have existing special speed regulations.

Adopt or update your local Complete Streets policy to align with national best practices and state resources.

Refer to Table 7-1 for additional policy and process changes.

7 – Strategy and Project Selections

SELECTING SAFETY TREATMENTS

The next step in Safety Action Planning involves **identifying and developing projects and strategies** to address safety challenges. Safety treatments range from engineering solutions to planning and programming efforts to policy changes. An effective Safety Action Plan includes treatments that:

1. Target both community-wide and location-based road safety issues
2. Align with each element of Federal Highway Administration's (FHWA's) Safe System Approach

Safety analyses identify crash and crash-risk patterns at both the community-wide and location-based level. Practitioners generally use **projects** (engineering treatments) to address location-based roadway safety issues, which can occur at one location (location-specific) or across multiple locations with shared characteristics (systemic).

Practitioners generally use **strategies** (plans, programs, and policies) to address community-wide safety challenges – often related to behavior or components of a Safe System that build a culture of safety. Figure 7-1 provides a hypothetical example of how a suburban community could address safety issues related to motorist speeding. Figure 7-2 provides a hypothetical example of how a rural community could address safety issues related to lane departure.

The Safe System Approach

MassDOT's 2023 Strategic Highway Safety Plan adopts the **Safe System Approach**, a USDOT-endorsed framework that focuses on modifying transportation system design to anticipate human errors and lessen impact forces to reduce crash severity and save lives. The Safe System Approach is holistic and proactive, addressing every aspect of crash risks through **five key elements** to prevent serious crashes, rather than reacting to crashes that have already occurred.

Figure 7-1. Example Safety Analysis and Potential Treatment Types for Suburban Community A

Safety Analysis of Suburban Community A

Safety Analysis Results

Community-wide crash and crash-risk patterns	**Location-based** crash and crash-risk patterns
• MassDOT's Test of Proportions tool shows that, compared to the Commonwealth, fatal and serious injury crashes involving speeding are *overrepresented* in the community. • Public engagement confirms community-wide concern about motorist speeding.	• MassDOT's risk-based network screening tool shows 20 specific corridors that are primary risk or secondary sites for motorist speeding. • The corridors have similar transportation and land use contexts (i.e., suburban, four-lane arterials with 30 mph posted speed limits).

Potential Treatment Types

Use Strategies *Plans, Programs, and Policies*	**Use Projects** *Engineering Treatments*
• Opt-in to Ch90s17C of Massachusetts General Law to reduce the statutory speed limit from 30 mph to 25 mph on any or all city- or town-owned roadways within a thickly settled or business district. • Conduct educational campaign to raise awareness about the relationship between speed and safety.	• Develop **systemic safety projects** to reduce vehicle speeds across all 20 corridors, using engineering countermeasures from sources like FHWA's Proven Safety Countermeasures and MassDOT's Safe Speeds Toolkit.

Figure 7-2. Example Safety Analysis and Potential Treatment Types for Rural Community B

Safety Analysis of Rural Community B

Safety Analysis Results

Community-wide crash and crash-risk patterns	**Location-based** crash and crash-risk patterns
• MassDOT's Test of Proportions tool shows that, compared to the Commonwealth, fatal and serious injury crashes involving lane departure are *overrepresented* in the community. • Public engagement confirms community-wide concern about lane departure crashes.	• MassDOT's risk-based network screening tool shows 20 specific corridors that are primary risk or secondary sites for motorist lane departure. • The corridors have similar transportation and land use contexts (i.e., rural, two-lane arterials with horizontal curves).

Potential Treatment Types

Use Strategies *Plans, Programs, and Policies*	**Use Projects** *Engineering Treatments*
• Conduct an educational campaign to raise awareness about the relationship between severe lane departure crashes and human factors such as impaired driving, distracted driving, and seatbelt use.	• Develop **systemic safety projects** to reduce lane departure crashes across all 20 corridors, using engineering countermeasures from sources like FHWA's Proven Safety Countermeasures.

IDENTIFYING PROJECTS AND STRATEGIES

Engineering Treatments

Engineering and infrastructure-based countermeasures align with three elements of the Safe System Approach: Safe Streets, Safe Speeds, and Safe Road Users. Practitioners have a wealth of state and federal resources at their fingertips for reviewing the full extent of available treatments which are explored in the Tools and Resources section of this Primer.

Plans, Programs, and Policies

Strategies (i.e., behavioral countermeasures) can align with all five elements of the Safe System Approach: Safe Streets, Safe Speeds, Safe Road Users, Safe Vehicles, and Post-Crash Care. Notable state and national resources for potential strategies are explored in the Tools and Resources section of this Primer.

Along with these resources, Massachusetts-specific examples of plans, programs, and policies that support each element of the Safe System Approach are listed below (Table 7-1).

Table 7-1. Examples of Safe System Approach Elements

Safe System Approach Element	Plan, Program, and/or Policy Examples
Safer Road Users 	**Educational Program** – Road safety education for children includes strategies that promote road safety for all users, as well as associated driver education. Communities across the Commonwealth are involved in the Massachusetts Safe Routes to School Program. **Safety Equipment Program** – MassDOT's 2023 SHSP includes a goal to expand existing programs to get more safety equipment into the hands of road users (e.g., bicycle lights, car seats). **Complete Streets Policy** – Adopt or update your local Complete Streets policy to align with national best practices and state resources.
Safer Roads 	**Demonstration Program** – Pilot programs where communities implement quick-build safety improvements to build support for permanent implementation. During the summer of 2020, the City of Lynn received funding from the MassDOT Shared Streets & Spaces program to pilot quick-build bus lanes and bike lanes in several key locations. **Design Standards Update** – Communities can update existing design standards and decision-making frameworks to prioritize safe road designs, as is done in the Safe System Roadway Design Hierarchy and The Cross Section Guide. MassDOT is currently piloting the decision-making framework for the Cross Section Guide.

Safe System Approach Element	Plan, Program, and/or Policy Examples
Safer Vehicles 	**Educational Program** - MassDOT's 2023 SHSP includes a goal to provide communities with relevant information related to vehicle design and safety, including information on how vehicle design standards impact the safety of those outside of motor vehicles. **Policy Update** – Establish a community wide policy to order safer vehicles for local vehicle fleets.
Safer Speeds 	**Policy Update –** Massachusetts law allows communities to opt-in to Ch90s17C of Massachusetts General Law to reduce the statutory speed limit from 30 mph to 25 mph on any or all city- or town-owned roadways within a thickly settled or business district. **Enforcement Program –** MassDOT's 2023 SHSP includes a goal for MassDOT to work with municipal partners to develop pilots to test automated enforcement technologies for speed zones, which is not currently permitted under Massachusetts General Law, to inform recommendations for legislature approval.
Post-Crash Care 	**Plan update** - MassDOT's 2023 SHSP includes a goal to improve cell coverage in underserved areas, with a focus on the Commonwealth's roads due to challenges faced by those involved in car crashes in rural areas. **Policy Update** – Communities across Massachusetts can adopt policies to enhance crash reporting and EMS responses.

DEVELOPING PROJECTS

Projects are a key outcome of a Safety Action Plan. To be successful, projects require that the selected safety treatments are ready for implementation. Communities can ensure identified treatments and countermeasures are ready for implementation by focusing on key project types. Key project types that align with safety goals and existing funding sources include:

- **Systemic** – Projects that apply lower cost safety treatments to reduce severe crashes across the whole at-risk system. This does not mean treating all locations (i.e., systemwide). Rather, systemic projects enable communities to prioritize their highest-risk intersections and streets for rapid implementation of targeted critical safety improvements.
- **Location-specific** – Projects that address safety concerns at one intersection or on a specific segment of a corridor.

Communication and interagency coordination are key in project development to understand where existing and planned projects are located and prevent duplicate efforts. If the identified project is on a regionally-significant local road, the community should consider involving their MPO to coordinate efforts across municipalities. If the safety analysis surfaces safety issues that may be addressed through a project on a state road, the community should coordinate with MassDOT to explore next steps.

To identify and develop a list of projects, communities should prioritize treatments and strategies based on the following factors:

Table 7-2. Factors to Prioritize Treatments and Strategies

Factors	Identify projects that...
Crash reduction potential	Address the community's HPN and reduce risk of serious and fatal injury crashes using the Safe System Roadway Design Hierarchy tool.
Potential for systemic application	Can have a systemic impact on fatal and serious injury crashes.
Cost/resource alignment	Can be implemented using existing or expected resources (e.g., limited staff time or funding).
Connection to relevant plans, programs, or policies	Can modify existing community plans, programs, and/or policies to incorporate the Safe System Approach and support roadway safety.
Community input	Will resonate with the community and meet the community's needs.

Success Story – Systemic Projects in Springfield, MA

The **Safety Action Plan** for Springfield, MA includes a list of low-cost engineering countermeasures related to the city's crash- and risk- based analysis findings:

- Confirmed Speeding, Pedestrian Safety, and Bicycle Safety as citywide Emphasis Areas
- Prioritized locations with overlapping crash history and risk related to speeding, pedestrian safety, and bicycle safety

Springfield used these resources to develop an SS4A grant application for the systemic application of countermeasures to address these Emphasis Areas at priority corridors and intersections across the city.

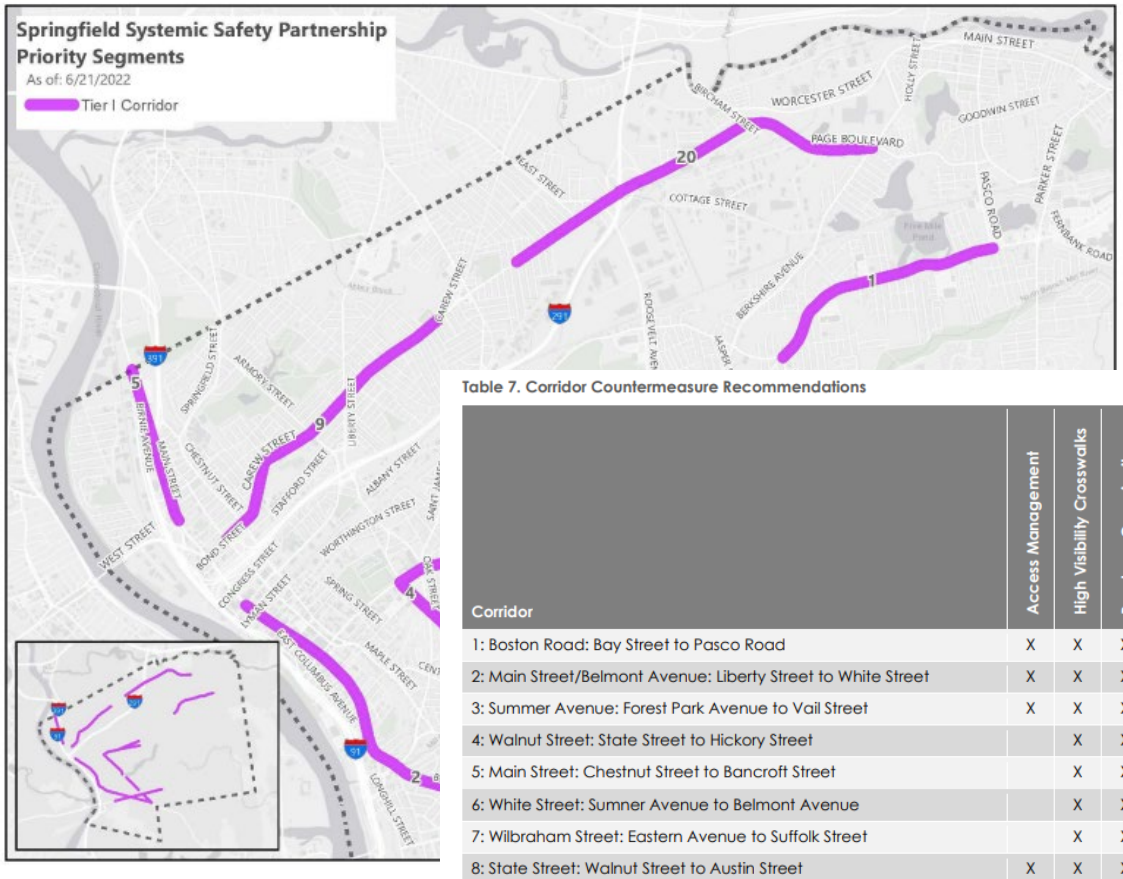


Table 7. Corridor Countermeasure Recommendations

Corridor	Access Management	High Visibility Crosswalks	Roadway Conspicuity	Speed Management
1: Boston Road: Bay Street to Pasco Road	X	X	X	X
2: Main Street/Belmont Avenue: Liberty Street to White Street	X	X	X	X
3: Summer Avenue: Forest Park Avenue to Vail Street	X	X	X	X
4: Walnut Street: State Street to Hickory Street		X	X	X
5: Main Street: Chestnut Street to Bancroft Street		X	X	X
6: White Street: Sumner Avenue to Belmont Avenue		X	X	X
7: Wilbraham Street: Eastern Avenue to Suffolk Street		X	X	X
8: State Street: Walnut Street to Austin Street	X	X	X	X
9: Carew Street: Dwight Street to Glenham Street		X	X	X
10: White Street: Revere Street to Ainsworth Street		X	X	X
20: Page Boulevard: Page Boulevard to Berkshire Avenue	X	X	X	X

Along with these prioritization criteria, communities should assess project readiness or the community's ability to implement the projects. Project readiness can be evaluated by working through the following questions with the project team and stakeholders.

Project Readiness Checklist

- ☐ **Concepts** - Are there existing concepts or do concepts need to be prepared?
- ☐ **Engagement** - Has there been adequate community engagement during project development? Is there community engagement planned throughout the course of the project?
- ☐ **Cost** - How much is the project estimated to cost?
- ☐ **Eligibility** - Does the project meet eligibility criteria for funding sources like SS4A or Highway Safety Improvement Program (HSIP)?
    - For example, a Road Safety Audit (RSA) (or similar engineering or planning report) is required for HSIP-funded projects.
- ☐ **Funding** - What are the potential funding sources for this project?
- ☐ **Permits** - What permits (if any) will this project require?
- ☐ **Agency Coordination** - Have the necessary agencies been engaged and are they onboard with the project?

IMPLEMENTING PROJECTS

Following the development of the Safety Action Plan, communities will need to pursue opportunities to implement the safety projects and integrate prioritized projects into capital plans, maintenance plans, and other implementation plans.

There are federal, state, and local funding sources available to implement the projects and countermeasures. A list of key funding sources can be found in the Safety Project Funding Opportunities section. If a community wants to advance a project outside of SS4A funding channels, the community should work with their MPO/RPA directly to advance the project through the STIP.

Successful implementation is also dependent on correctly evaluating local capacity and expectations for the project. Communities will need to understand what the local capacity is to implement projects and schedule accordingly. There is technical assistance and training available through the FHWA Resource Center and the DOT Navigator should an agency find itself needing additional support. Additional local assistance resources are available on FHWA's Technical Assistance / Local Support website.

8 – Progress and Transparency

EVALUATING AND MONITORING PLAN IMPLEMENTATION

Communities should also identify ways to evaluate and monitor the implementation of the Safety Action Plan. Measures agencies can use to evaluate progress include:

- Number of projects implemented
- Number of projects continued from the previous year
- Frequency of communication with stakeholder and community groups
- Number of strategies and actions implemented

Consistent Data Collection

Consistent, up-to-date data that is geospatially recorded or linked to a specific location is essential for evaluating and monitoring progress. It allows communities to perform quantitative analysis and understand the projects' impacts while allowing agencies to transparently monitor progress towards goals like Vision Zero.

Before and After Studies

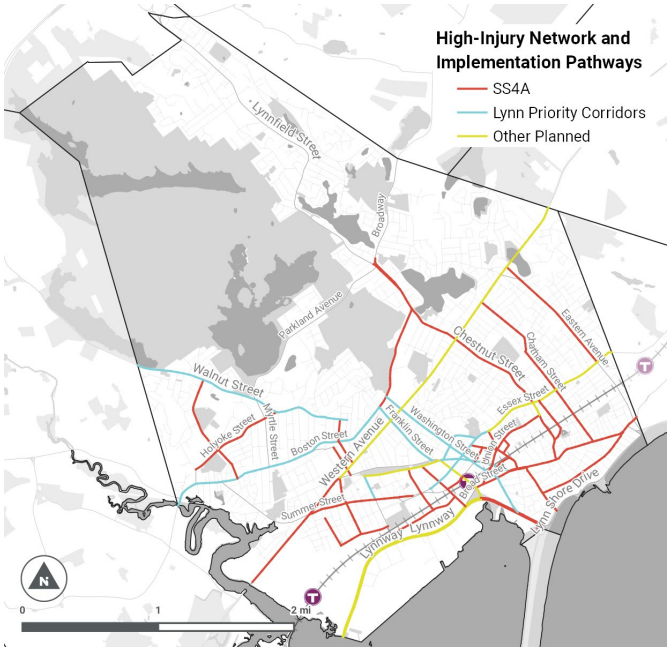
Before and after studies using geospatially recorded data is one of the most effective evaluation methods. They evaluate the effectiveness of specific safety treatments and inform future polices and implementation strategies of such safety treatments. To complete before and after studies, communities need to identify what data will be collected and how the data will be collected before, during, and

Success Story – Implementation Pathways in Lynn, MA

The Lynn Safe Streets for People Playbook produced a Safe Streets Network to guide the city's efforts to improve safety and accessibility on Lynn's streets in the coming years. The Safe Streets Network both identifies short-term Priority Projects and lays out a longer-term vision for future walking, biking, and transit connectivity.

The city also mapped out implementation pathways for its Safe Streets Network, considering diverse sources such as the SS4A discretionary program, the State Transportation Improvement Program, grants, and coordination with other agencies.

These implementation pathways will help the city to monitor plan implementation via the number of projects implemented on its Safe Streets Network by funding source.



after the project installation, such as crashes by type and severity, vehicle speed, vehicle volumes, and pedestrian and bicyclists counts.

As a complement to a traditional before and after study, communities can evaluate and compare the expected safety benefits of projects to the actual benefits of projects. Comparing the expected crash reduction potential of engineering treatments to their actual effectiveness can inform ongoing community investments in safety projects.

Annual Reporting

Communities should plan to report annual progress towards the Safety Action Plan. Many communities publish annual reports or updates and maintain webpages to share upcoming milestones or related events. Communities that have been awarded an SS4A Grant are specifically required to provide annual performance measurement reports to USDOT.

MassDOT also recommends communities understand the post-project reporting requirements for different funding programs. Each will be different including reporting formats, frequency, and level of detail. Communities should thoroughly review the requirements and plan for how they will meet the requirements.

Updating the Plan

Communities should review crash data for key findings and performance measures to track progress annually. More substantial updates to the Safety Action Plan can occur at longer intervals (approximately every five years).

Communities, in conjunction with the Safety Action Plan stakeholders, can assess the plan, consider new trends and technologies, and determine if an update to the plan is needed. As new strategies are identified, communities may update goals and assign champions for specific projects and strategies.

Tools and Resources

GENERAL INFORMATION: SAFE SYSTEM APPROACH & VISION ZERO

Resource	Uses
FHWA Safe System Approach	Overview of the Safe System Approach and associated principles.
Vision Zero Network	Best practices and case studies for policymaking, community advocacy, and planning and engineering to eliminate roadway fatalities.
Massachusetts 2023 Strategic Highway Safety Plan (SHSP)	Learn about why and how Massachusetts has adopted the Safe System Approach.

RESOURCES FOR ENGAGING THE PUBLIC

Resource	Uses
Equitable Community Engagement Toolkit (Boston Public Health Commission)	Template with step-by-step instructions to create a community engagement plan.
Community Engagement Guide (Boston Metropolitan Area Planning Council)	Detailed guidance with tips and best practices, examples of targeted engagement, outreach methods, and case study processes.
Promising Practices for Meaningful Public Involvement in Transportation Decision-Making (USDOT)	Step-by-step guide for making an engagement plan with context-appropriate techniques.
Building Capacity & Empowering People with Funding: Key to Vision Zero (Vision Zero Network)	Case study examples of safety initiatives that have fostered grassroots engagement with focus populations through paid partnerships with community-based organizations.
Walk Audit Academy (WalkMassachusetts)	Set of videos and resources to learn how to lead a group walk audit and use walk audits as an engagement tool. Cohort-based training can be requested at contact-us@walkmass.org.
Walk Audit Tool Kit (AARP)	A self-service guide for evaluating neighborhood walkability that can be used to conduct a walk audit. Available in English and Spanish.
Bike Audit Tool Kit (AARP and League of American Bicyclists)	A self-service guide for evaluating neighborhood bikeability that can be used to conduct a bike audit. Available in English and Spanish.

TOOLS AND DATASETS FOR SAFETY ANALYSIS

Basic Crash History Tools

Tool/Dashboard	Uses
Top Crash Locations	Identify the top locations statewide for intersection crashes, as well as clusters of bicycle and pedestrian crashes within a given area.
Crash Query and Visualization Tool	Filter and download crash data, visualize crashes using spatial and non-spatial tools, and generate crash summary graphs on attributes such as crash severity, lighting conditions, and driver demographics.

Safety Data Dashboards

MassDOT provides a variety of safety data dashboards which offer a high-level summary of crash characteristics and statistics that can be filtered by year, town, and crash severity. The following dashboards available through the IMPACT Operations Dashboards page can be useful for safety analysis.

Tool/Dashboard	Uses
SHSP Emphasis Area (updated annually)	View the fatal and serious injury trends and safety performance measures in the SHSP Emphasis Areas.
Serious Injury Information (updated daily; subject to change as new information becomes available)	View preliminary motor vehicle serious injury information using filters (year/YTD, region, town, sex, age, month, day, time and/or type).
Statewide Crashes by Severity and Year (updated annually)	Filter by a municipality and/or year (or multiple years) to view crash data statistics on various charts, graphs, and maps.
Fatal Crash Information (updated daily; subject to change as new information becomes available)	View preliminary motor vehicle fatality information using filters (year/YTD, region, town, sex, age, month, day, time and/or type).

Safety Analysis Tools

MassDOT's IMPACT suite includes four powerful tools for accessing robust safety analysis products prepared at the statewide level. These can be used to satisfy some safety analysis requirements and complement other local-scale analysis efforts. The safety analysis tools are available on the Safety Analysis Tools landing page.

Tool/Dashboard	Uses
Network Screening – Crash-based	Highlight segments of the street network with higher-than-expected rates of fatal and injury crashes.
Network Screening – Risk-based	Highlight segments of the street network with high modeled risk for 12 of the Commonwealth's Emphasis Areas.
Test of Proportions	Highlight crash attributes that are over-represented in a selection of crashes relative to a comparison group, such as comparing between geographies, severity levels, or roadway facility types.
Crash Tree Generator	Visualize groups of common characteristics and their relative prevalence among crashes with a generated crash tree to summarize data.

Network Screening at the Local Scale

Most jurisdictions in the Commonwealth will benefit from the MPO/RPA Ranking available within the Crash-based and Risk-based Network Screening tools, which ranks roads within the same MPO or RPA against each other rather than ranking all roads across the state. For more detailed analysis of relative road segment rankings within a local study area, the datasets can be downloaded from the geoDOT Open Data Portal and filtered to only rank segments within one town.

DATASETS TO CONTEXTUALIZE CRASH DATA

Contextual factors can add a dimension to spatial safety analyses to help understand crash patterns and potential causes.

Data Type	Tool/Dashboard	Uses
Environmental justice and equity populations	Massachusetts Environmental Justice Populations interactive map	Identify U.S. Census block groups that meet Environmental Justice community demographic criteria as defined by the Commonwealth.
Environmental justice and equity populations	Equitable Transportation Community Explorer (ETCE)*	Identify U.S. Census tracts with underserved communities experiencing transportation disadvantage, as defined by the USDOT Justice40 initiative.
Environmental justice and equity populations	Climate and Economic Justice Screening Tool (CEJST)*	Identify U.S. Census tracts with underserved communities experiencing climate and economic disadvantage.
Latent demand for walking and biking	MassDOT's Potential for Everyday Biking and Potential for Walkable Trips datasets	See where land use and travel patterns on the statewide street network have the potential to generate walking and biking trips. Combining this information with safety data can help prioritize investments that enhance both safety and multimodal access.
Land use and destination data	MassGIS Data Layers	Find data on land use, transit stops, schools, civic buildings, and other important contextual factors that can add dimensions to spatial safety analyses.

** Applications for SS4A funding require community metrics related to these tools. The datasets are developed at the national level, with data normalized at the state level available as well.*

RESOURCES FOR IDENTIFYING TREATMENTS AND STRATEGIES

Resource	Use this resource to…
FHWA Proven Safety Countermeasures	Review proven safety and strategies effective in reducing roadway fatalities and serious injuries.
FHWA STEP Guidance	Identify countermeasures and detailed guidance to specifically improve pedestrian safety at uncontrolled crossing locations.
FHWA Local Road Safety Plan DIY Toolkit	Explore videos, trainings, and examples of specific countermeasures to address common crash types on local roads and rural roads.
FHWA Safe System Roadway Design Hierarchy	Identify engineering treatments and strategies aligned with the Safe System Approach and prioritize treatments and strategies when developing transportation projects.
FHWA Pedestrian Lighting Primer	Understand how lighting impacts pedestrian safety and learn more about basic information that practitioners can consider when providing lighting to improve pedestrian safety.
Guide for Urban and Suburban Cross Section Reallocation	Apply a decision-making framework for reallocating roadway space in urban and suburban areas. Compare tradeoffs related to cross section changes, including community mobility, safety, economy, and quality of life.
NCHRP Research Report 926: Guidance to Improve Pedestrian and Bicyclist Safety at Intersections	Select intersection design and operational treatments that provide safety benefits for pedestrians and bicyclists and that are appropriate for the context.
Massachusetts 2023 SHSP	Explore Massachusetts programs and policies that your community can get involved in or build on.
Safe Routes to School Programs	Learn more about programs that promote walking and bicycling to school through infrastructure improvements, enforcement, tools, safety education, and incentives to encourage walking and bicycling to school.
MassDOT Safe Speeds Page	Learn more about opportunities to implement speed management programming in Massachusetts.

Resource	Use this resource to…
NHTSA Countermeasures That Work	Learn more about behavioral strategies and countermeasures that are relevant to State Highway Safety Offices. USDOT has specifically included the use of countermeasures that work in the grant selection criteria for SS4A Implementation funding.
NACTO City Limits Guide	Set safe speed limits on urban streets to slow vehicles and reduce the likelihood of a serious injury or fatality.
MassDOT Municipal Resource Guide for Walkability	Identify tools and information needed to hold discussions on why and how to improve walkability.
MassDOT Municipal Resource Guide for Bikeability	Identify tools and information needed to provide safe, comfortable, and convenient bike networks that appeal to the broadest base of people.
MassMobility: Active Transportation for Older Adults and People with Disabilities	Find more resources on programs and research supporting older adults and people with disabilities in walking and cycling.

SAFETY PROJECT FUNDING OPPORTUNITIES

Funding opportunity	Key things to know
SS4A Grant Program	The Bipartisan Infrastructure Law (BIL) established the SS4A discretionary program with $5 billion in appropriated funds over five years, 2022-2026. As of Spring 2024, over $3 billion is still available for future funding rounds. **Learn more about the SS4A Grant Opportunity.**
Highway Safety Improvement Program (HSIP)	A federal highway program that MassDOT uses to allocate statewide funding for safety projects. HSIP-eligible projects and programs are programmed in the State Transportation Improvement Program (STIP). **Learn more about MassDOT's HSIP Project Selection process.**

Funding opportunity	Key things to know
Vulnerable Road User (VRU) Funding	As part of the BIL, Massachusetts is required to allocate at least 15 percent of HSIP funding to safety projects that address the safety of vulnerable road users. Like all HSIP-eligible projects and programs, VRU funds are programmed in the STIP. **Learn more about MassDOT's plan to fund VRU projects.**
MassDOT Complete Streets Funding Program	A funding program that provides technical assistance and construction funding to eligible municipalities, who must pass a Complete Streets Policy and develop a Prioritization Plan.
Shared Streets and Spaces Grant Program	A funding program that supports quick-launch improvements to public health, safe mobility, and strengthened commerce in Massachusetts communities.
MassWorks	A competitive grant program that provides the largest source of capital funds in Massachusetts to municipalities and other eligible public entities primarily for public infrastructure projects.
MassDOT Safe Routes to School (SRTS) Infrastructure and Signs and Lines	A MassDOT program that provides design services and up to $10,000 in construction funding to a selected municipality for a low-cost infrastructure project around a public school that addresses barriers that prevent students from walking or biking to school.
Chapter 90 Program	Authorized through Massachusetts General Laws Chapter 90, Section 34, the Chapter 90 Program provides funding to municipalities for the implementation of capital improvements on local roads.

Funding opportunity	Key things to know
Congestion Mitigation and Air Quality Improvement Program (CMAQ)	A federal program that MassDOT uses to allocate statewide funding to transportation projects designed to reduce traffic congestion and improve air quality, particularly in areas that do not attain national air quality standards. CMAQ-eligible projects and programs are programmed in the State Transportation Improvement Program (STIP).
Transportation Alternatives (TA)	Federal set-aside funds that MassDOT uses to fund smaller-scale transportation projects such as pedestrian and bicycle facilities, trails, and safe routes to school projects. TA funding in Massachusetts is allocated to MPOs/RPAs that cover urbanized areas, and to Safe Routes to School infrastructure projects.
Local Funding	Local funding will vary by municipality. Be sure to coordinate with relevant city and town agencies.