Massachusetts Department of Transportation

ROAD SAFETY AUDIT GUIDELINES

October 2024

MassDOT
Massachusetts Department of Transportation
Highway Division

WWW.MASS.GOV/ORGS/MASSACHUSETTS-DEPARTMENT-OF-TRANSPORTATION

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1.0 Introduction

1.1 Definition

To achieve Massachusetts' goal of zero deaths and serious injuries, a number of safety related actions have been adopted in the Strategic Highway Safety Plan throughout the years including Road Safety Audits. A Road Safety Audit (RSA), which is one of the Federal Highway Administration (FHWA)'s proven safety countermeasures is defined as "a formal safety performance examination of an existing or future road or intersection by an independent audit team." Simply stated, an RSA is a relatively quick process that identifies safety improvements focused on decreasing the number and severity of roadway crashes. The safety improvements recommended typically vary from low-cost measures to significant improvement projects. Many States that have employed the RSA technique and implemented the recommendations have seen measurable decreases in the number of incapacitating and fatal crashes as a result.

1.2 When is a Road Safety Audit Required?

The Massachusetts Department of Transportation (MassDOT) Highway Division has fully embraced the RSA process and has incorporated it into its safety programs. MassDOT has incorporated the RSA process as a requirement under any of the following conditions:

1. Projects that include improvements to roadways or intersections considered High Crash locations (Vehicle, Bicycle, or Pedestrian) of the most recent available years.
2. Projects that include improvements adjacent to a High Crash location or are anticipated to impact the operations of a High Crash location. (ex. Increasing the traffic volumes to a high crash location)
3. Projects securing federal funding through the Highway Safety Improvement Program (HSIP) or are anticipated to utilize HSIP funding.

Knowing the success of an RSA, MassDOT requires that RSAs be conducted at the initial stage of the design process (prior to the "Over-the-Shoulder" meeting (10% design plan) or submission of an Environmental Impact Report (EIR)) to help guide the design and reduce fatalities and serious injury crashes for locations in which safety has been noted to be a factor in determining needs for improvement.

When an RSA is not required, it can still be conducted if safety is a concern.

Tips: To determine if your project is located within a high crash location (vehicle, bicycle, or pedestrian) visit both the:

- MassDOT Top Crash Location Mapping service
  - The designer should check all available years' crash clusters.
  - The designer should also verify that the location does not exceed the threshold of a high crash intersection by comparing the calculated Equivalent Property Damage Only (EPDO) to the regional maximum located in the latest Highway Safety Improvement Program Criteria. All crashes (geolocated and non-geolocated) should be reviewed.
- MassDOT IMPACT Safety Analysis Tools Network Screening Crash Based
  - High crash locations in the Network Screening map can be determined by selecting Ranking Type = "MPO/RPA" and Crash Severity = "Fatal and Injury".

High crash locations within the most recent posted years will require an RSA. The designer should consult with the MassDOT Traffic and Safety Engineering Section to determine if your project is located within a high crash location. It should be noted that some municipalities may not report all their crashes to the RMV.

Finally, while not a determining requirement for an RSA, the designer should also utilize the MassDOT IMPACT Safety Analysis Tools Network Screening Risk Based to understand if the location is considered high risk for certain types of crashes.

Links:
MassDOT Top Crash Locations Map: https://gis.massdot.state.ma.us/topcrashlocations/
MassDOT Network Screening Crash Based Map:
https://apps.impact.dot.state.ma.us/sat/HotSpotNetworkScreening
MassDOT Network Screening Risk Based Map:
https://apps.impact.dot.state.ma.us/sat/NetworkEmphasisArea
MassDOT HSIP Eligibility & Criteria:
https://www.mass.gov/info-details/highway-safety-improvement-program

1.3 Who Facilitates the Road Safety Audit?

The RSA should be incorporated into a project designer's scope of work when a roadway improvement project has identified safety concerns as one of the reasons for the project or qualifies for one of the listed conditions detailed in Section 1.2. The intent is to have the designer of the improvement project facilitate the RSA and prepare the RSA report. As an RSA must be facilitated by an "Independent" organization, it is critical that the process be conducted early in the project stages prior to any preliminary design. Therefore, it shall be required that an RSA be conducted at the following stages:

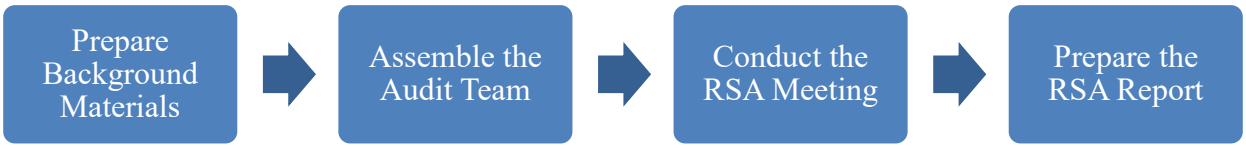
1. In relation to a MassDOT project scope, prior to the over-the-shoulder meeting (10% design plans).
2. In relation to a Massachusetts Environmental Policy Act (MEPA) filing, prior to the Environmental Impact Report (EIR) filing and prior to the Transportation Impact Assessment (TIA) report. Note that the RSA may be conducted following the Traffic Scoping Letter.

In the case where an RSA is being conducted after either of the listed stages have been completed, or MassDOT has determined that the project designer cannot be considered an independent organization, an outside consultant shall be retained by the designer to facilitate the RSA and prepare the RSA report in accordance with these guidelines.

The necessary steps to prepare, conduct and finalize an RSA are described in Section 2.0. Generally, RSAs last approximately three hours and include a pre-field visit meeting, a field visit, and a post-field visit meeting so that an audit report can be prepared. During the pre-field visit meeting, the team gathers to discuss the location and project, review materials and discuss general concerns of the location. The team, as a group, visits the project site to confirm safety concerns discussed previously and to identify additional deficiencies during the site visit. The team then reconvenes to discuss the safety issues that were noted and to develop short and long term recommendations to ameliorate the safety concerns.

2.0 Road Safety Audit Procedure

As described in the sections below, the RSA should follow a specific procedure to obtain the most useful information possible and hold a successful RSA. The figure below illustrates the steps to complete an RSA.



2.1 Preparing Background Materials

The designer shall obtain, review, and summarize the most recent pertinent available information regarding safety. This may include the following:

- Crash Data (Required)
- Traffic Speed Data (Required)
- Traffic Volumes
- Other Safety Concerns

Note that the crash data summaries obtained from the MassDOT Statewide database (IMPACT Data Query and Visualization (Q&V) tool) are not adequate and that the actual crash reports (including narratives and diagrams), from the police department reporting the crash, are critical to a successful audit. The designer shall submit a request to the police department(s) within the study area (State, Local, or other). Such request should encompass an area larger than the study intersection or project limits to have more accurate data for analysis (e.g., requesting crash reports for the entire length of local roadways intersecting the study corridor). The designer shall incorporate all crashes that occur in the study area or result from the design of the study area (e.g., crashes occurring within the limit of the queue of an intersection).

The designer should cross-reference the provided crash reports with IMPACT Q&V using both the Spatial and Basic Search Query tools separately (to compile located and non-located crashes). This cross-reference will help determine that the police department has provided all relevant crash reports for the study area. If crash reports are missing, the designer should contact the MassDOT Traffic and Safety Engineering Section.

The actual crash reports shall be used to prepare collision diagrams and summaries (See Appendix D).

Details of the crash analyses must be accurately represented since they will be used as the “before” information when an evaluation is performed on the effectiveness of the countermeasures.

Speed data should be compiled including regulatory or statutory speed limits, operating speeds, and roadway context. Operating speed data can be obtained through speed collection, crowd-sourcing, or other methods. Methods to obtain speed data may be discussed with MassDOT Traffic and Safety Engineering Section.

Other relevant information regarding the location may include, but is not limited to: traffic volumes (including pedestrians and bicycles if available), citation data, available roadway plans, traffic reports, and/or signal timings and phasing information (if appropriate).

Tips:
The consultant should include in the Collision Data Summary Table pertinent information in the comments section for each crash to assist the audit team in identifying a specific cause for the crash.

It may also be helpful to determine crash elements that are overrepresented at the study location. The IMPACT Test of Proportions tool can provide this information. Direct linkage to the Test of Proportions tool is also available on the end result page of the Q&V tool.

Links:
MassDOT IMPACT Data Query and Visualization (Q+V) Tool:
https://apps.impact.dot.state.ma.us/cdv/
MassDOT IMPACT Safety Analysis Test of Proportions Tool:
https://apps.impact.dot.state.ma.us/sat/TestofProportions

2.2 Assembling an Audit Team

With input and assistance from the community and/or MassDOT, the designer will select the multidisciplinary RSA team, date, time and location. At a minimum, the RSA team requires a representative from Engineering, Enforcement, Emergency Response and the MassDOT's Traffic and Safety Engineering Section (as shown in bold below). The audit team typically includes (but is not limited to) the following:

- **Engineering (Municipal Engineering, MassDOT District Traffic and Projects)**
- **Enforcement (local and/or state police, depending upon jurisdiction)**
- **Emergency response (Police, fire, and EMS whom respond to crashes in the project area)**
- **MassDOT Traffic and Safety Engineering Unit**
- Federal Highway Administration (Safety Engineer & Area Engineer)
- MassDOT HQ Project Management and Design including Complete Streets Engineer
- Transit (MBTA, RTA, and other transit providers)
- Regional Planning Agency (RPA)
- Maintenance (Local Public Works and/or MassDOT maintenance depending upon jurisdiction)
- Municipal Planning Department
- Local Public Health Professionals
- Bicycle and Pedestrian Advocacy Groups

The designer shall contact the MassDOT Traffic and Safety Engineering Section initially for availability. It shall be the responsibility of the designer to ensure that all required interested parties are available to attend the scheduled RSA. An email invitation should be sent to all RSA team participants at least two weeks from the audit date and include an attachment with the RSA agenda, background materials, prompt

list and FHWA Proven Safety Countermeasures. (See Appendix A for copy of a sample meeting agenda, Appendix B for the Safety Review Prompt List and Appendix C for the FHWA Proven Safety Countermeasures).

Tips: It is best for the meetings to take place in close proximity to the project location for meeting efficiency. The designer should discuss with the City/Town officials who would be appropriate to attend the meeting. The designer should also to determine if applicable advocacy groups should be invited to the RSA. (Groups such as MassBike, WalkMassachusetts, etc.)

2.3 Conducting the Road Safety Audit Meeting

It will be the responsibility of the designer to facilitate the RSA meeting, take notes and photos, and then prepare the report in a timely manner. The RSA meeting shall be conducted in three (3) stages:

2.3.1 Pre-Field Visit Meeting

During the pre-field visit meeting, the designer will provide handouts of all information that was provided in the invitation email. The RSA participants will meet (pre-field visit meeting) to discuss the process and goals for the RSA. The designer will present the existing crash data, speed data, reason for the RSA and any other relevant information to the participants in order to provide an introduction to the project. The designer will then begin the conversation of potential safety issues so that participants can expound upon why they may be happening (e.g., if a location exhibits a high number of rear end crashes from one approach, this should be suggested as an observation and solicit ideas as to why this may be occurring). General comments, safety issues and concerns will also be solicited about the subject location.

Tips: The intention of the RSA meeting is to solicit thoughts and ideas about issues and solutions; therefore, the designer should avoid specific design details regarding any proposed project (e.g., that a signal or a re-alignment is being proposed). The designer should prepare visuals such as overall satellite imagery or mapping to assist in pointing out specific issues. Good practice in keeping a record of the safety issues discussed in the meeting is the utilization of note boards.

2.3.2 *Perform Field Visit*

Following the pre-field visit meeting, the team will perform a field visit (audit), during which specific issues and concerns will be pointed out by the RSA team (and/or designer) and recorded by the designer. The safety review prompt list (see Appendix B) is a tool that can be used to ensure that a comprehensive list of safety issues is discussed at the audit site visit. Additionally, the designer should obtain photographs of key safety issues that may be included in the final report.

Tips: The group should verify the issues discussed during the pre-audit meeting. The designer should also ensure that the team walks the site as a group so that all members are able to participate in the conversation. It's important for the designer to keep the group on topic and moving as needed. Designers are advised to bring two (2) representatives as one may act as the facilitator and one as the recorder/photographer to ensure that all information discussed during the RSA is captured for the final report.

2.3.3 *Post-Field Visit Meeting*

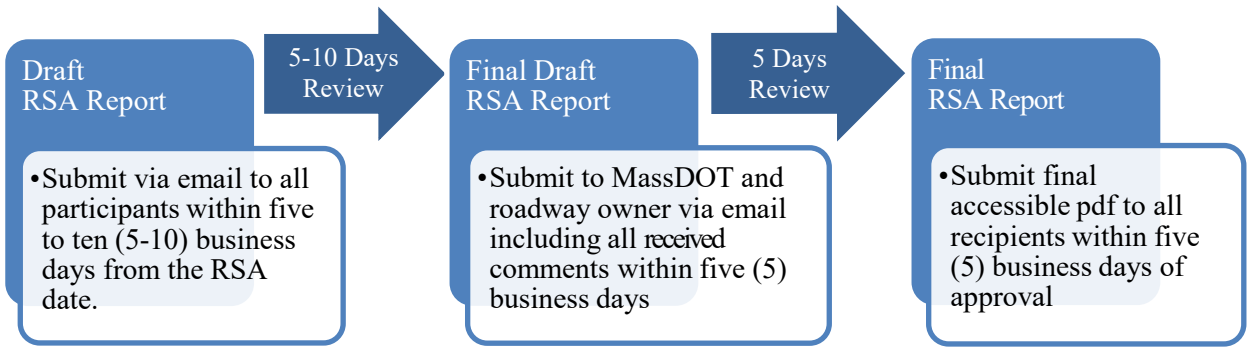
Following the field visit, the RSA participants will return to the meeting facility (post- field visit meeting) and the designer will facilitate a group discussion, which would confirm that a complete list of safety issues has been identified during the RSA. This is followed by a discussion identifying potential safety countermeasures. The safety countermeasures may include short-term, intermediate-term, and long-term improvements and range from low to high cost. It should be noted that recommendations should be comprehensive, align with FHWA's Safe System Approach and may include engineering, maintenance, enforcement, educational and behavioral countermeasures. In cases where recommendations are presented that do not meet federal or state guidelines, a detailed explanation should be given to the participants. The designer should then adjourn the meeting by describing the next steps in the process which includes circulating the draft and final reports to be reviewed by the group.

Tips: During the post-field visit meeting, the designer should confirm that each safety issue discussed previously is presented with one or many possible solutions. The designer should also stress the importance of the report review process finalizing the meeting as this is critical to ensuring a quality product.

2.4 Preparing the Road Safety Audit Report

An RSA Report, based on MassDOT's report template will be prepared describing the safety issues and countermeasures identified during the RSA. Countermeasures which were not discussed during the RSA may also be included, if they are found to be appropriate. Potential countermeasures which do not conform to MassDOT or FHWA standards will be noted as such in the report. It is recommended that the designer review past RSA Reports for examples.

The RSA Report preparation and report review will require the following submissions:



The report preparation and review period will be dependent on the complexity of the RSA. The report preparation and review will be dependent on the complexity of the RSA. The draft RSA report shall be submitted to all participants within 5-10 business days from the RSA. The participants will then have 5-10 days to review and provide comments on the draft report. The designer will then have 5 business days to revise and submit a draft final report to MassDOT and the roadway owner. MassDOT and the roadway owner will then have 5 business days to review and comment on the draft Final report. The designer will submit an accessible PDF to all participants within 5 business days of MassDOT and roadway owner approval. The designer should consult the MassDOT Traffic Safety Engineering Section to confirm the expected timeline for deliverables. Additional time may be granted upon request under special circumstances.

The final RSA report must be submitted in a fully accessible PDF format.

A complete RSA report should clearly state the safety issues and potential enhancement related to the subject location. Each potential safety enhancement should describe how it will mitigate the safety issue. The designer should recognize that this stage of the design is intended to suggest possible mitigation techniques and that multiple enhancements may be applicable to single safety issues. The report should avoid phrasing such as "Install bicycle lane" but rather suggest this as a possible solution by stating "Consider providing bicycle accommodations."

TIPS: The designer should avoid vague language and broad descriptions and instead should provide a detailed description of safety issues. An example of a poorly worded safety issue description may be:

"The sight distance looking north from Side Street is inadequate and may be the cause of crashes".

In contrast, the following represents a clearer, complete description of the safety issue:

"The sight distance on Side Street looking north is impeded by many objects including brush, utility poles, guardrail, and the vertical curvature of the roadway. This poor sight distance appears to be a contributing factor in the number of angle crashes occurring from this approach."

The final report should be broken out into six (6) main sections.

Background	The background should define a RSA and explain why the audit was conducted. This should describe that the location of the project is within a high crash location in the planning region (if applicable).
RSA Process	This section should describe the date and location of the audit, as well as names and affiliations of the audit team members. It should also describe the process that took place and materials that were utilized and discussed during the audit.
Project Location and Description	This section should describe the location in detail (required descriptions may vary if project includes isolated intersections or a roadway corridor). It should also include a location map of the area.
Project Data	This section should include a discussion of the RSA materials provided including at a minimum crash data and speed data. Other supporting materials can also be discussed if available.
Observations and Potential Enhancements	This section must include all safety issues discussed during the RSA and subsequent potential enhancements. This section may be laid out with each issue described directly followed by the enhancements.
Summary of Road Safety Audit	The summary should provide a basic overview of the recommendations. It should also include a complete table listing of all issues and enhancements. The table should provide a general description of the enhancement.

Tips: All observed safety issues must have at least one clearly stated enhancement which describes in detail how it would help to mitigate the safety issue being described. Crashes and/or crash risks that are present due to the safety issue should also be highlighted. More information for preparing the Road Safety Audit report can be found in the MassDOT RSA Report Template with additional tips on formatting and editing to create a fully accessible document.

Appendix A. Sample Meeting Agenda

Agenda

Road Safety Audit

Municipality, MA

Road X & Road Y

Meeting Location: Meeting Building, Room
Meeting Address, Municipality, MA
Month Date, 20XX
XX:XX AM/PM – XX:XX AM/PM

Type of meeting:	**High crash location – Road Safety Audit**
Attendees:	**Invited participants to comprise a multidisciplinary team**
Please bring:	**Thoughts and enthusiasm!!**
XX:XX AM/PM	**Welcome and Introductions**
XX:XX AM/PM	**Discussion of Safety Issues** • Crash history, speed regulations, recent and existing projects – all provided in advance • Existing geometries and conditions
XX:XX AM/PM	**Site Visit** • Drive to the intersection of Road X and Road Y • As a group, identify areas for improvement
XX:XX AM/PM	**Discussion of Potential Improvements** • Discuss observations and finalize safety issue areas • Discuss potential improvements and finalize recommendations
XX:XX AM/PM	**Adjourn for the Day – but the RSA has not ended**

Instructions for Participants:

- **Before attending the RSA on MONTH DATE, participants are encouraged to drive/walk through the intersection and complete/consider elements on the RSA Prompt List with a focus on safety.**
- **All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.**
- **After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.**

Appendix B. Safety Review Prompt List

GEOMETRIC DESIGN	
Issue	**Comment**
A. Speed – (Design Speed; Speed Limit & Zoning; Sight Distance; Overtaking)	
Are there speed-related issues along the corridor? Please consider the following elements: • Horizontal and vertical alignment • Posted and advisory speeds • Driver compliance with speed limits • Approximate sight distance • Safe passing opportunities	
B. Road alignment and cross section	
With respect to the roadway alignment and cross-section please consider the appropriateness of the following elements: • Functional class (Urban Principal Arterial) • Delineation of alignment; • Widths (lanes, shoulders, medians); • Sight distance for access points; • Cross-slopes • Curbs and gutters • Drainage features	
C. Intersections	
For intersections along the corridor please consider all potential safety issues. Some specific considerations should include the following: • Intersections fit alignment (i.e. curvature) • Traffic control devices alert motorists as necessary • Sight distance and sight lines seem appropriate • Vehicles can safely slow/stop for turns • Conflict point management • Adequate spacing for various vehicle types • Capacity problems that result in safety problems	
D. Auxiliary lanes	
• Do auxiliary lanes appear to be adequate? • Could the taper locations and alignments be causing safety deficiencies? • Are shoulder widths at merges causing safety deficiencies?	

E. Clear zones and crash barriers	
For the roadside the major considerations are clear zone issues and crash barriers. Consider the following: • Do there appear to be clear zones issues? — Are hazards located too close the road? — Are side slopes acceptable? • Are suitable crash barriers (i.e, guard rails, curbs, etc.) appropriate for minimizing crash severity? • Barrier features: end treatments, visibility, etc.	
F. Bridges and culverts – (if necessary)	
Are there specific issues related to bridges and culverts that may result in safety concerns?	
G. Pavement – (Defects, Skid Resistance, and Flooding)	
• Is the pavement free of defects including excessive roughness or rutting, potholes, loose material, edge drop-offs, etc. that could result in safety problems (for example, loss of steering control)? • Does the pavement appear to have adequate skid resistance, particularly on curves, steep grades and approaches to intersections? • Is the pavement free of areas where flooding or sheet flow of water could contribute to safety problems? • In general, is the pavement quality sufficient for safe travel of heavy and oversized vehicles?	
H. Lighting (Lighting and Glare)	
It is important to consider to the impacts of lighting. Some specifics include the following: • Is lighting required and, if so, has it been adequately provided? • Are there glare issues resulting from headlights during night time operations or from sunlight?	

TRAFFIC CONTROL DEVICES	
Issue	**Comment**
I. Signs	
Signage is a critical element in providing a safe roadway environment. Please consider the following: • Are all current signs visible (consider both night and day)? Are they conspicuous and clear? Are the correct signs used for each situation? • Does the retroreflectivity or illumination appear satisfactory? • Are there any concerns regarding sign supports?	
J. Traffic signals	
• If present, do the traffic signals appear to be designed, installed, and operating correctly? • Is the signal processing the traffic efficiently? • Is the controller located in a safe position? (where it is unlikely to be hit, but maintenance access is safe) • Is there adequate sight distance to the ends of possible vehicle queues?	
K. Marking and delineation	
• Is the line marking and delineation: — appropriate for the function of the road? — consistent along the route? — likely to be effective under all expected conditions? (day, night, wet, dry, fog, rising and setting sun, oncoming headlights, etc.) • Are centerlines, edgelines, and lane lines provided? If not, do drivers have adequate guidance?	

ROADWAY ACTIVITY	
Issue	**Comment**
With respect to roadway activity please consider safety elements related to the following: • Pedestrians • Bicycles • Public transportation vehicles and riders • Emergency vehicles • Commercial vehicles • Slow moving vehicles	

ENVIRONMENTAL CONSIDERATIONS	
Issue	**Comment**
Weather & Animals	
From an environmental perspective it is important to consider any potential impacts. Most notably is likely to be the impacts of weather or animals, including: • Possible effects of rain, fog, snow, ice, wind on design features. • Has snow fall accumulation been considered in the design (storage, sight distance around snowbanks, etc.)? • Are there any known animal travel/migration routes in surrounding areas which could affect design?	

Appendix C. FHWA office of Safety Proven Safety Countermeasures

MAKING OUR ROADS SAFER

One Countermeasure at a Time

The FHWA has identified and is promoting widespread use of a set of 28 Proven Safety Countermeasures that can offer significant, measurable impacts as part of any agency's data-driven, systemic approach to improving safety. These strategies are designed to enhance safety on all kinds of roads—from rural to urban, from high-volume freeways to less traveled two-lane State and county roads, from signalized crossings to horizontal curves, and everything in between. Each countermeasure addresses **speed management, intersections, roadway departures,** or **pedestrians/ bicyclists**—along with crosscutting strategies that address all four safety focus areas.

Which Proven Safety Countermeasures Will You Use?

For more information on this and other FHWA Proven Safety Countermeasures, please visit https://safety.fhwa.dot.gov/provencountermeasures.

U.S. Department of Transportation
Federal Highway Administration

ZERO IS OUR GOAL
A SAFE SYSTEM IS HOW WE GET THERE

https://safety.fhwa.dot.gov/

OFFICE OF SAFETY

Proven Safety Countermeasures

SPEED MANAGEMENT

Speed Safety Cameras
(Currently Cannot Be Applied in MA)

Variable Speed Limits

Appropriate Speed Limits for All Road Users

ROADWAY DEPARTURE

Wider Edge Lines

Enhanced Delineation for Horizontal Curves

Longitudinal Rumble Strips and Stripes on Two-Lane Roads

SafetyEdge℠

Roadside Design Improvements at Curves

Median Barriers

INTERSECTIONS

Backplates with Retroreflective Borders

Corridor Access Management

Dedicated Left- and Right-Turn Lanes at Intersections

Reduced Left-Turn Conflict Intersections

Roundabouts

Systemic Application of Multiple Low-Cost Countermeasures at Stop-Controlled Intersections

Yellow Change Intervals

PEDESTRIANS/BICYCLES

Crosswalk Visibility Enhancements

Bicycle Lanes

Rectangular Rapid Flashing Beacons (RRFB)

Leading Pedestrian Interval

Medians and Pedestrian Refuge Islands in Urban and Suburban Areas

Pedestrian Hybrid Beacons

Road Diets (Roadway Reconfiguration)

Walkways

CROSSCUTTING

Pavement Friction Management

Lighting

Local Road Safety Plans

Road Safety Audit

FHWA-SA-21-082

Appendix D. Sample Crash Data Summary

massDOT
Massachusetts Department of Transportation
Highway Division

CRASH DIAGRAM

SYMBOLS

Involved / Non-Involved

- Moving Vehicle
- Backing Vehicle
- Non-Involved Vehicle
- Pedestrian
- Bicycle
- Animal
- Direction of Motion
- Parked Vehicle
- Fixed Object

TYPE OF CRASH

- Head on
- Rear End
- Angle
- Turning Movement
- Sideswipe
- Out of Control
- Night Time Crash

SEVERITY

- (#) Injury
- (#) Fatal
- # Property Damage Only

SOUTHBOROUGH, MA

Turnpike Road (ROUTE 9) AT MIDDLE ROAD

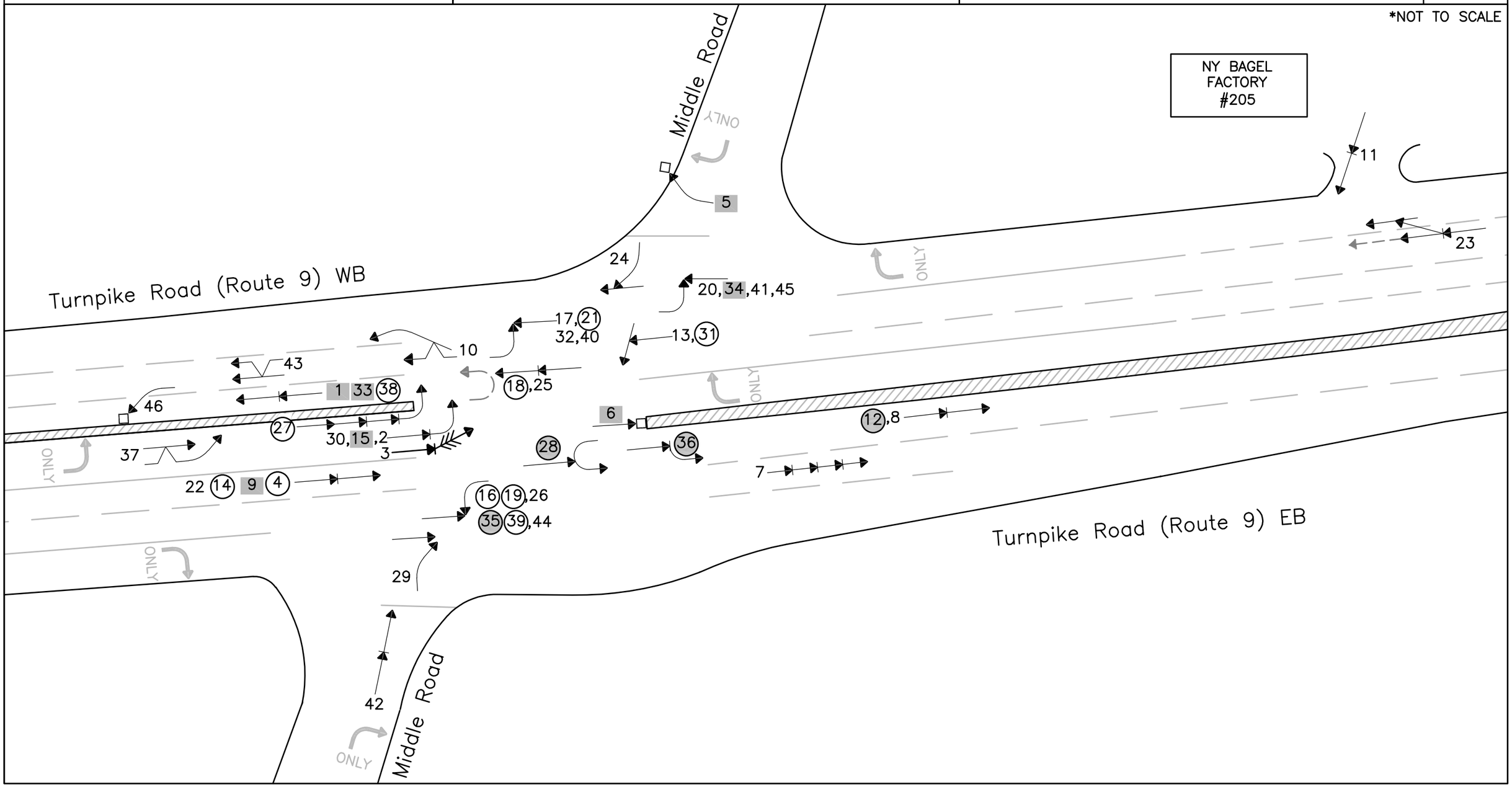
REGION: MAPC

TIME PERIOD ANALYZED: 2017–2021
SOURCE OF CRASH REPORTS: SOUTHBOROUGH POLICE DEPARTMENT
DATE PREPARED: 06/27/2022
PREPARED BY: DD

SHEET 1 OF 1

N

*NOT TO SCALE



Crash Data Summary Table

Turnpike Road (Route 9) at Middle Road, Southborough, MA
2017-2021

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Driver Distracted By	Injury Severity	D1 Age	D2 Age	D3 Age	D4 Age	Comments
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	Type	Type	#	#	#	#	
1	01/03/17	Tuesday	6:19 PM	Rear-end	Dark - lighted roadway	Rain	Wet	No improper driving		No Injury	23	57			Both vehicles traveling west on Route 9 in the far left lane. V2 slowed for traffic, V1 failed to stop in time and collided with V2. It was determined that V1's brakes were malfunctioning at time of collision.
2	01/05/17	Thursday	4:25 PM	Rear-end	Daylight	Clear	Dry	Distracted	Other activity, electronic device (navigation system, DVD player, etc.)	No Injury	41	45			V2 traveling east on Rte 9 in the left hand turn lane, with V1 behind it. V2 was slowing to a stop when it was rear-ended by V1, who was looking down at their GPS.
3	02/07/17	Tuesday	2:06 PM	Rear-end	Daylight	Rain	Wet	Other improper action		No Injury	26	31			V1 (tractor-trailer) and V2 were eastbound on Turnpike Rd waiting to turn left in the left-hand turn lane. V1 reversed in order to gain more room to execute the turn. In doing so, V1 backed into V2 despite V2 honking horn.
4	03/04/17	Saturday	3:38 PM	Rear-end	Daylight	Clear	Dry	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.		Non-fatal injury	33	28			V1 traveling behind V2 eastbound on Turnpike Rd at Middle Rd. An unknown vehicle that was in the left turn lane turned back into the left travel lane at the last second. V2 slammed on its brakes which led to V1 rear-ending V2.
5	05/11/17	Thursday	12:35 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner		No Injury	24				V1 was traveling erratically westbound on Turnpike Rd when it struck a guardrail at the intersection of Middle Rd. OUI.
6	05/24/17	Wednesday	2:30 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Fatigued/asleep		No Injury	20				V1 fell asleep while driving eastbound on Turnpike Rd and crashed into the median barrier.
7	06/13/17	Tuesday	8:20 AM	Rear-end	Daylight	Clear	Dry	Distracted	External distraction (outside the vehicle)	No Injury	19	69	25	61	All 4 vehicles traveling east on Turnpike Rd and were slowing or stopped for traffic. V1 operator was looking off the road at construction and struck the rear of V2, which struck the rear of V3, which struck V4.
8	06/13/17	Tuesday	8:40 AM	Rear-end	Daylight	Clear	Dry	Inattention		No Injury	51	47			V1 had slowed while in traffic eastbound on Turnpike Rd. V2 failed to slow in time and rear-ended V1.
9	06/27/17	Tuesday	8:44 PM	Rear-end	Dark - lighted roadway	Rain	Wet	Inattention; Followed too closely		No Injury	18	17			V1 and V2 both traveling east on Turnpike Rd when V2 slowed dur to traffic ahead. V1 failed to slow in time and rear-ended V2.
10	07/10/17	Monday	8:26 AM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown		No Injury	30	51			V1 was attempting a U-Turn from Turnpike Rd EB to WB and could not complete the turn and stopped in the roadway. V2 (tractor-trailer) traveling WB on Turnpike Rd could not stop or move over in time and truck the left rear of V1 with right side of their trailer.
11	11/8/17	Wednesday	9:33 AM	Rear-end	Daylight	Clear	Dry	Followed too closely		No Injury	52	32			V1 and V2 waiting to merge onto Turnpike Rd WB. V1 thought that V2 had begun to enter traffic when it had not, causing V1 to rear-end V2.
12	11/08/17	Wednesday	5:25 PM	Rear-end	Dark - roadway not lighted	Clear	Dry	Inattention		Non-fatal injury	28	28			V1 was traveling EB in the left lane on Turnpike Rd near Middle Rd. V2 was traveling behind V1. V1 slowed in heavy traffic. V2 failed to stop in time and crashed into the rear of V1.
13	01/18/18	Thursday	1:00 PM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings; Failed to yield right of way		No Injury	75	21			V2 was traveling west on Turnpike Rd when V1 entered from Middle Rd and cut across all lanes of traffic in front of V2. V2 could not stop in time and struck V1.
14	02/09/18	Friday	8:02 AM	Rear-end	Daylight	Clear	Ice	Driving too fast for conditions		Non-fatal injury	20	37			Both vehicles traveling EB on Turnpike Rd. Another vehicle had stopped in front of V1 causing it to slam on it brakes to stop. As a result, V2 tried to stop but struck V1 in the rear. The weather was reported cold and the roadway was slick from road salt and moisture.
15	02/09/18	Friday	9:03 PM	Rear-end	Dark - lighted roadway	Cloudy	Dry	Inattention		No Injury	28	62			V1 and V2 were both traveling on Turnpike Rd east. V2 was stopped waiting to turn left in the left turn only lane. V1 rear-ended V2 and stated they did not see V2.
16	02/16/18	Friday	3:32 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way		Non-fatal injury	19	22			V1 traveling west on Turnpike Rd attempting to make a left turn onto Middle Rd SB. V2 was traveling east. V1 failed to yield, executed the left turn while traveling fast and colided with V2 in the intersection.
17	04/03/18	Tuesday	3:42 PM	Angle	Daylight	Rain	Wet	Disregarded traffic signs, signals, road markings		No Injury	19	44		*CC	V2 attempting a legal U-Turn from Turnpike Rd EB to WB. Both travel lanes heading WB had stopped to let V2 turn. V1 drove up the right turn only lane WB and struck the right side of V2.
18	04/23/18	Monday	9:41 AM	Rear-end	Daylight	Clear	Dry	Driving too fast for conditions	External distraction (outside the vehicle)	Non-fatal injury	71	40	25		V3 (tractor-trailer) was traveling Rte 9 EB at Middle Rd and stopped in the WB lane while executing a U-turn. V2 was traveling Wb approaching the intersection with V1 (motorcycle) behind it. V2 stopped and manuevered towards the median upon seeing V3 stopped. V1 struck the rear of V2 after traveling at an unsafe speed.
19	04/30/18	Monday	6:59 PM	Angle	Daylight	Rain	Wet	Failed to yield right of way		Non-fatal injury	46	19			V1 attempting to turn left onto Middle Rd SB from Turnpike Rd WB. V2 was traveling EB on Turnpike Rd approaching the intersection. V1 turned left in front of V2, causing V2 to crash into the side of V1.
20	05/17/18	Thursday	5:32 PM	Angle	Daylight	Clear	Dry	Other improper action		No Injury	54	38		*CC	V1 was traveling WB on Turnpike Rd in the right turn lane. V2 was turning left from Turnpike Rd EB onto Middle Rd NB. Traffic stopped to let V2 cross the WB lanes. V2 collided with the right side of V2.
21	06/02/18	Saturday	4:42 PM	Angle	Daylight	Clear	Dry	Inattention		Non-fatal injury	32	17			V1 was traveling WB on Turnpike Rd. V2 was traveling EB and turned left to make a U-Turn onto Turnpike Rd WB when it struck V1.
22	06/14/18	Thursday	6:34 AM	Rear-end	Daylight	Clear	Dry	Inattention	Manually operating an electronic device (texting, typing, dialing)	No Injury	21	64			V1 had slowed while traveling EB on Turnpike Rd. V2 was behind V1. The operator had been looking at their phone and rear-ended V1.
23	06/20/18	Wednesday	8:24 AM	Rear-end	Daylight	Clear	Dry	Followed too closely		No Injury	20	30	45		V1, V2, and V3 traveling west on Turnpike Rd near Red Barn. V2 slowed in traffic due to an unknown vehicle that braked abruptly. V1 struck the rear of V2, then turned to the right and struck the side of V3.
24	08/01/18	Wednesday	9:41 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way; Operating defective equipment		No Injury	45	32			V2 traveling WB on Turnpike Rd was struck on the side by V1 as it passed Middle Rd. V1 had pulled into the center travel lane, stating they did not see V1 and their brakes had failed.

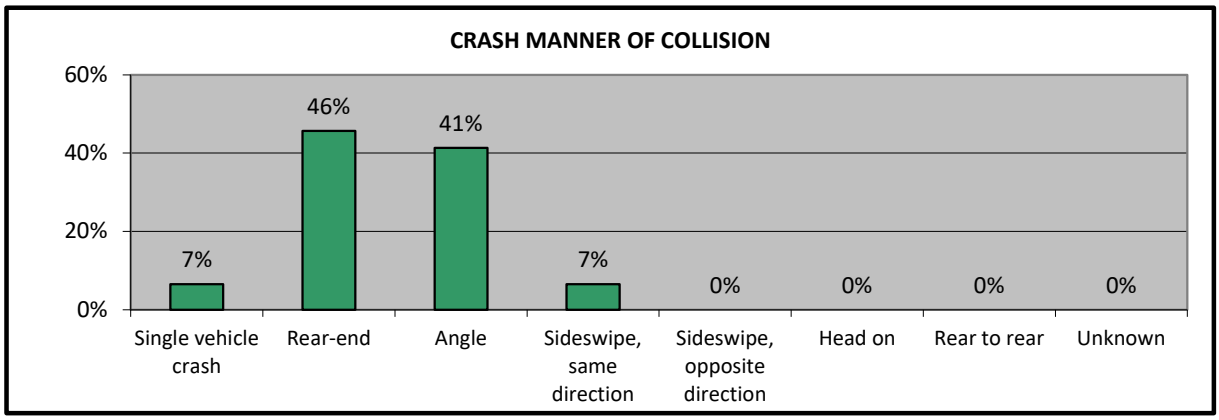
Crash Data Summary Table

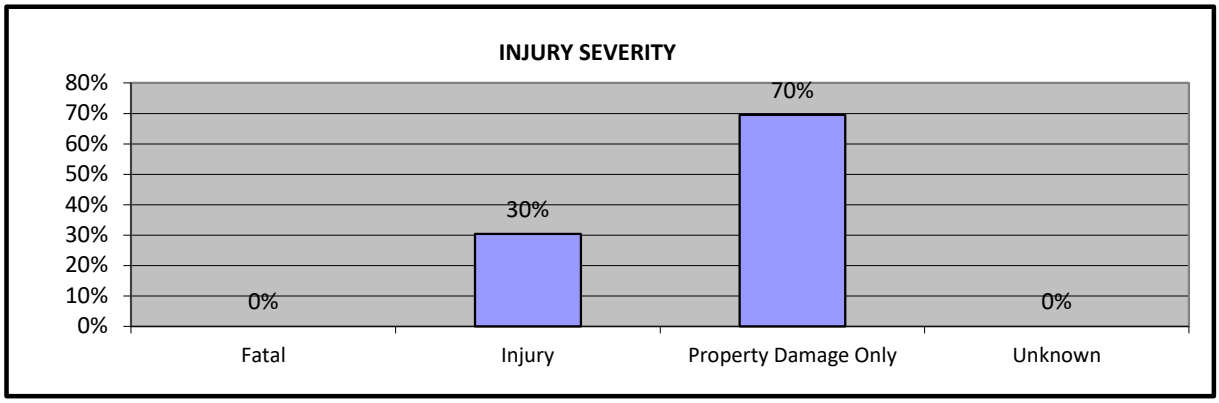
Turnpike Road (Route 9) at Middle Road, Southborough, MA
2017-2021

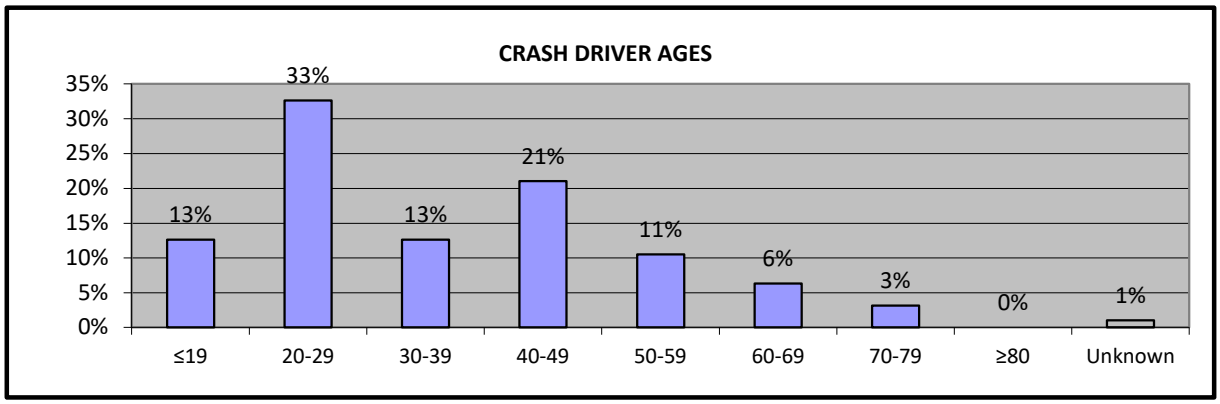
Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Driver Distracted By	Injury Severity	D1 Age	D2 Age	D3 Age	D4 Age	Comments
#	mm/dd/yy	Day	hh:mm	Type	Type	Type	Type	Type	Type	Type	#	#	#	#	
25	08/10/18	Friday	4:44 PM	Rear-end	Daylight	Rain	Wet	Followed too closely		No Injury	53	55			V1 traveling WB behind V2 on Turnpike Rd in heavy traffic. An unknown vehicle made a U-turn from Turnpike Rd EB to WB, cutting off V2. V2 hit its brakes abruptly and V1 failed to stop in time, rear-ending V2.
26	09/27/18	Thursday	8:04 AM	Angle	Daylight	Clear	Dry	Failure to keep in proper lane or running off road		No Injury	44	22			V2 was turning left from Turnpike Rd WB onto Middle Rd SB. Both left and right travel lanes on Turnpike Rd EB had stopped to let V2 turn. V1 went around the stopped EB vehicles in the right turn only lane and struck the right side of V2.
27	10/05/18	Friday	3:17 PM	Rear-end	Daylight	Cloudy	Dry	No improper driving		Non-fatal injury	60	22	24	Unknown	V1, V2, and V3 were traveling east on Turnpike Rd and were all stopped in the left-hand turn lane at Middle Rd. An unknown vehicle rear-ended V3, sending it into V2, which sent V2 into V1. Unknown vehicle fled.
28	02/04/19	Monday	8:48 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way		Non-fatal injury	59	49			V2 was traveling EB on Turnpike Rd. V1 was attempting to make a U-Turn from Turnpike Road WB to Turnpike Rd EB. V1 failed to yield to V2, causing V2 to crash into the right side of V1.
29	03/19/19	Tuesday	9:14 AM	Angle	Daylight	Clear	Dry	Unknown		No Injury	21	39			V2 traveling EB on Turnpike Rd and V1was turning right onto Turnpike Rd from Middle Rd. V1 failed to yield to V2 and struck the right front side of V2.
30	04/22/19	Monday	6:35 PM	Rear-end	Daylight	Rain	Wet	Inattention		No Injury	17	51			V2 was stopped waiting to turn left from Turnpike Rd EB. V1 was traveling EB, failed to stop and crashed into the rear of V2.
31	08/20/19	Tuesday	2:17 PM	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings; Failed to yield right of way		Non-fatal injury	44	46			V1 was traveling west on Turnpike Rd at the intersection of Middle Rd. V2 attempted to cross Turnpike Rd from Middle Rd SB, failing to obey the right turn only signs and arrows on the approach. V1 and V2 collided.
32	10/18/19	Friday	7:16 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way		No apparent injury	75	24			V1 was traveling on Turnpike Rd EB at the Middle Rd intersection waiting to make a U-Turn to go WB. V2 was traveling WB on Turnpike Rd. V1 failed to yield to V2 and was struck on the right side.
33	11/15/19	Friday	4:14 PM	Rear-end	Dusk	Clear	Dry	Operating defective equipment		No apparent injury	19	28			V1 was traveling WB on Turnpike Rd behind V2. V1 rear-ended V2 as V2 was slowing or stopped for traffic.
34	12/11/19	Wednesday	5:08 PM	Angle	Dark - lighted roadway	Clear	Wet	Inattention; Failed to yield right of way		No apparent injury	23	60			V2 traveling westbound on Turnpike Rd in the left lane when V1 turned in front of him from Turnpike Rd EB towards Middle Rd NB and vehicles collided. There was heavy traffic.
35	01/04/20	Saturday	11:36 PM	Angle	Dark - lighted roadway	Rain	Wet	Failed to yield right of way		Suspected minor injury	22	47			V2 traveling WB on Turnpike Rd attempted to make a left turn onto Middle Rd SB in front of V1, who was traveling EB through the intersection. V1 did not have time to stop and struck the side of V2.
36	03/24/20	Tuesday	6:08 AM	Rear-end	Dawn	Clear	Wet	Visibility obstructed; Made an improper turn		Suspected minor injury	30	29			V1 was attempting a U-Turn from Turnpike Rd WB to Turnpike Rd EB. There was another vehicle making the opposite turn across the intersection, which obstructed her view of the oncoming V2 traveling EB on Turnpike Rd. V1 executed the turn and was rear-ended by V2.
37	06/25/20	Thursday	7:41 PM	Sideswipe, same direction	Daylight	Clear	Dry	Emotional		No apparent injury	23	43			V1 and V2 were traveling EB on Turnpike Rd. V2 got into the left turn lane. V1 then cut in front of V2 causing a sideswipe collision.
38	06/30/20	Tuesday	3:26 PM	Rear-end	Daylight	Clear	Dry	Inattention		Suspected minor injury	40	21			V1 and V2 were traveling WB on Turnpike Rd. An unknown vehicle made an illegal turn which required V2 to take evasive action and slow. V1 did not notice V2 slowing and rear-ended V2.
39	09/24/20	Thursday	4:32 PM	Angle	Daylight	Clear	Dry	Failed to yield right of way; Inattention		Suspected serious injury	18	25			V2 was traveling EB on Turnpike Rd. V1 attempted to turn left from Turnpike Rd WB to Middle Rd SB and failed to yield to V2. V2 collided with the right side of V1.
40	03/17/21	Wednesday	3:09 PM	Angle	Daylight	Clear	Dry	Inattention		No apparent injury	23	26			V1 was attempting a U-Turn from Turnpike Rd EB to Turnpike Rd WB at Middle Rd. As V2 was passing, traveling WB, the front of V1 struck V2.
41	04/12/21	Monday	2:35 PM	Angle	Daylight	Cloudy	Unknown	Failed to yield right of way		No apparent injury	44	28			V1 was turning left from Turnpike Rd EB onto Middle Rd NB from the left turn lane. V2 was traveling west on Turnpike Rd. V1 failed to yield while turning left across the intersection and was struck by V2.
42	05/22/21	Saturday	4:23 PM	Rear-end	Daylight	Clear	Dry	Unknown		No apparent injury	47	49			V1 and V2 were traveling north on Middle Rd and stopped at the intersection of Turnpike Rd. V2 began to enter and stopped due to vehicles approaching from Turnpike Rd EB. V1 then struck the rear of V2.
43	06/05/21	Saturday	12:58 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention		No apparent injury	19	55			V2 was traveling west on Turnpike Rd in the left travel lane. V1 turned from Turnpike Rd EB onto Turnpike Rd WB into the right travel lane in front of V2. V1 then attempted to change lanes and struck V2 on the side.
44	08/18/21	Wednesday	11:43 AM	Angle	Daylight	Cloudy	Dry	Visibility obstructed		No apparent injury	20	19			V2 was traveling EB on Turnpike Rd. V1 was traveling WB on Turnpike Rd and attempting to turn left onto Middle Rd SB. V1 was struck on the right side by V2. Operator of V1 stated that vehicles in the left turn lane on Turnpike Rd EB side were blocking her view of through vehicles and she did not see V2.
45	09/08/21	Wednesday	5:14 PM	Angle	Daylight	Clear	Dry	Unknown		No apparent injury	42	46		*CC	V2 was traveling straight on Turnpike Rd WB. V1 was on Turnpike Rd EB turning left onto Middle Rd NB. Operator of V1 stated that vehicles in the WB travel lanes were stopped in traffic and allowed her to turn left. V2 was traveling in the far lane and struck V1 as it was turning.
46	12/14/21	Tuesday	9:55 AM	Single vehicle crash	Daylight	Clear	Dry	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.		No apparent injury	36				V1 made a U-turn at Middle Rd from Turnpike Rd EB to Turnpike Rd WB. After making the U-turn into the westbound lane, the operator swerved into the left lane to avoid striking another oncoming vehicle in the right lane. V1 then crashed into the concrete median barrier.

Crash Data Summary Charts

Turnpike Road (Route 9) at Middle Road, Southborough, MA







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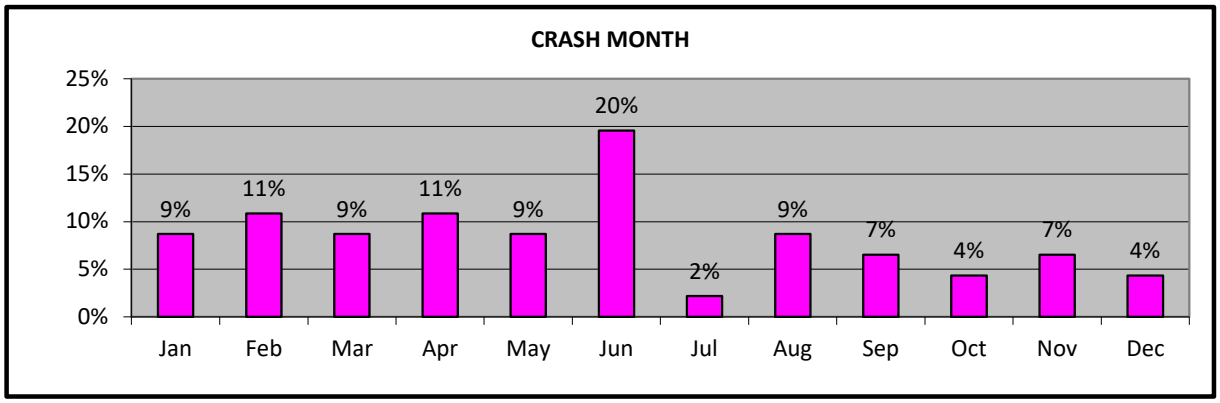

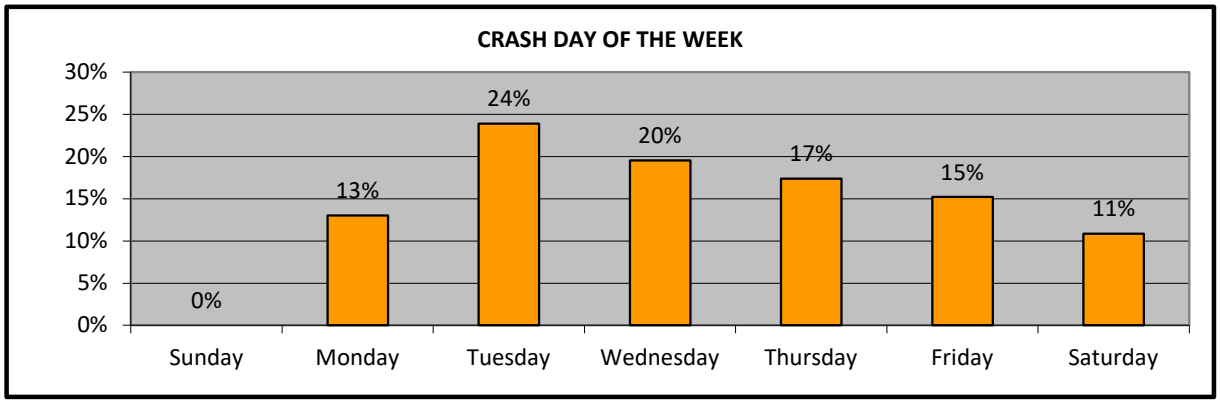

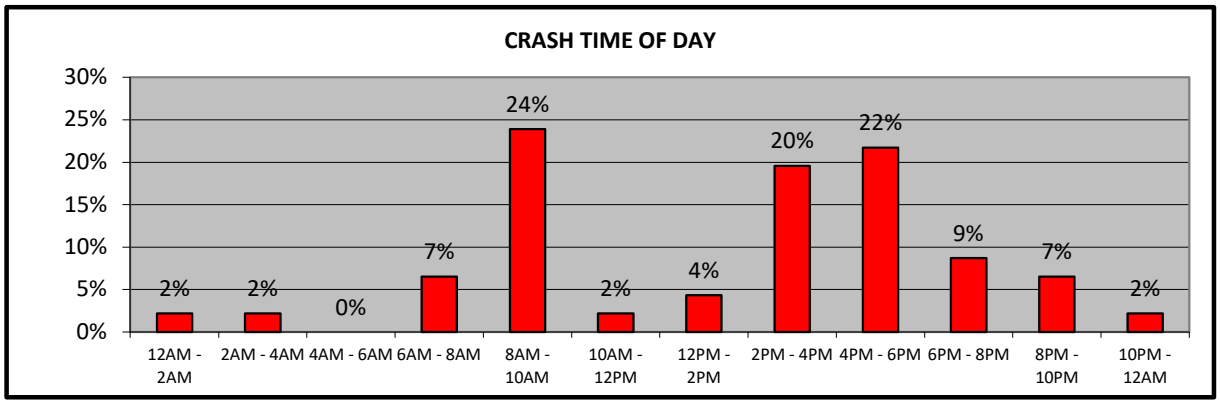

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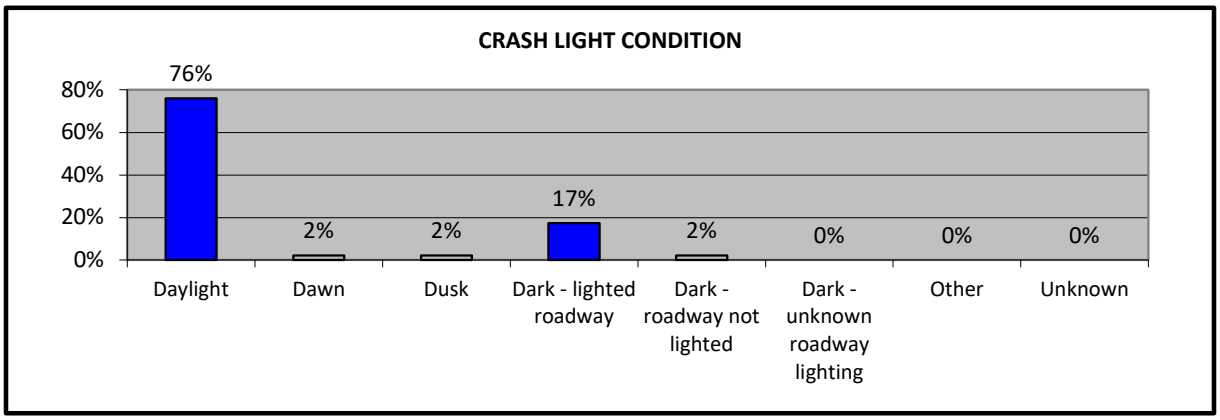
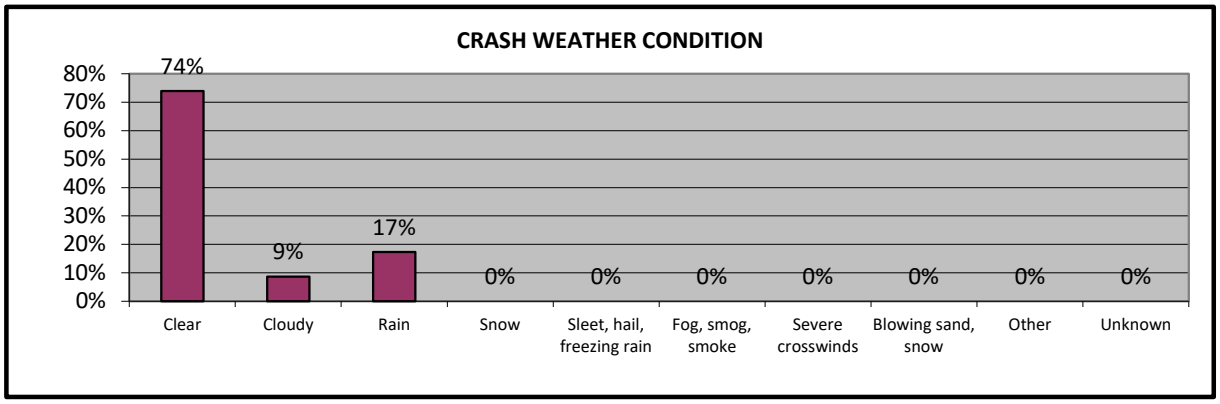
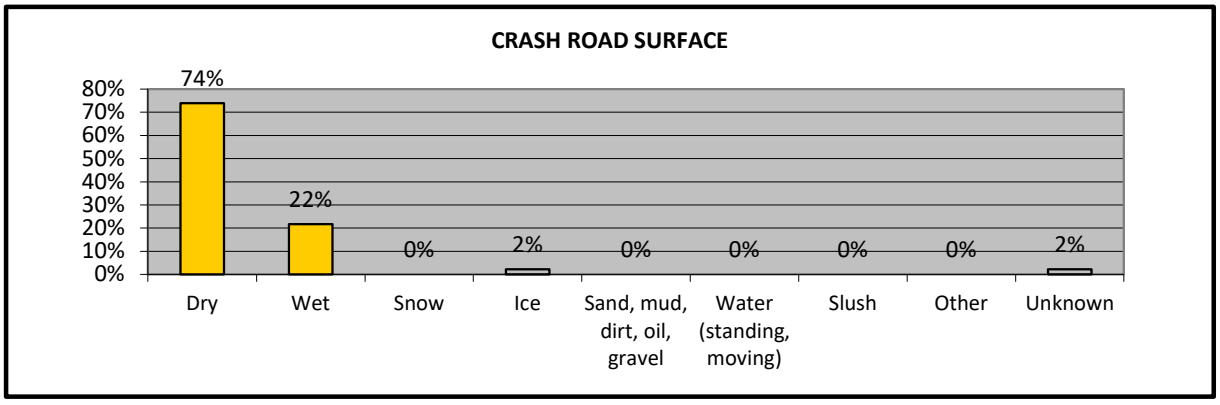
Turnpike Road (Route 9) at Middle Road, Southborough, MA







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