

ROAD SAFETY AUDIT

Worcester - Providence Turnpike (Route 146)
at Boston Road
Town of Sutton
October 25, 2022

Prepared For:
MassDOT



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Table of Contents

Contents

Background	1
Project Data	1
Project Location and Description.....	4
Study Area Roadways	4
Worcester-Providence Turnpike (Route 146)	4
Boston Road	5
Study Intersection	5
Crash Data	6
Audit Observations and Potential Safety Enhancements	7
Safety Issue #1: Rear End Crashes.....	7
Traffic Signal Related.....	7
Vehicle Speeds	8
Vehicle Queues	8
Vehicle Clearance Times	8
Safety Issue #2: Turning Movements.....	9
Safety Issue #3: Inadequate Guide Signage	12
Safety Issue #4: Curb Cuts	13
Safety Issue #5: Emergency Vehicle Preemption.....	14
Safety Issue #6: Pedestrian and Bicycle Facilities	14
Safety Issue #7: Driver Behavior	15
Summary of Road Safety Audit	16

List of Appendices

Appendix A.RSA Meeting Agenda
Appendix B.RSA Audit Team Contact List
Appendix C.Study Intersection Photos
Appendix D.Detailed Crash Data
Appendix E. Additional Resources
Appendix F. Road Safety Audit References

List of Figures

Figure 1: Locus Map 3

List of Tables

Table 1: Participating Audit Team Members 4
Table 2: Estimated Time Frame and Costs Breakdown..... 16
Table 3: Potential Safety Enhancement Summary 17

Background

The Federal Highway Administration (FHWA) defines a Road Safety Audit (RSA) as the formal safety examination of an existing or future road or intersection by an independent, multidisciplinary team. The purpose of an RSA is to identify potential safety issues and possible countermeasures to improve safety considering all roadway users. As part of the Massachusetts Department of Transportation (MassDOT) Road Safety Audit guidelines, RSAs are required for Highway Safety Improvement Program (HSIP) eligible locations and should be conducted prior to the development of the 25-percent design submission or prior to the submission of a Draft Environmental Impact Report for a project of regional impact. A HSIP-eligible location is defined as a crash cluster based on crash incidence and severity that ranks within the top five percent of each Regional Planning Agency. High crash locations are determined by the Equivalent Property Damage Only (EPDO) crashes. Fatal and injury crashes have a weighting of 21 when compared to a weighting of 1 for a property damage only crash. This RSA evaluates the signalized intersection of the Worcester-Providence Turnpike (Route 146) at Boston Road in Sutton, Massachusetts, as shown in Figure 1. This intersection has been identified by MassDOT as a HSIP Top 200 Crash Cluster for 2017-2019. The intersection was previously identified as an HSIP cluster for the period between 2015 – 2017 and was a top 200 crash cluster for the period between 2016 – 2018.

Project Data

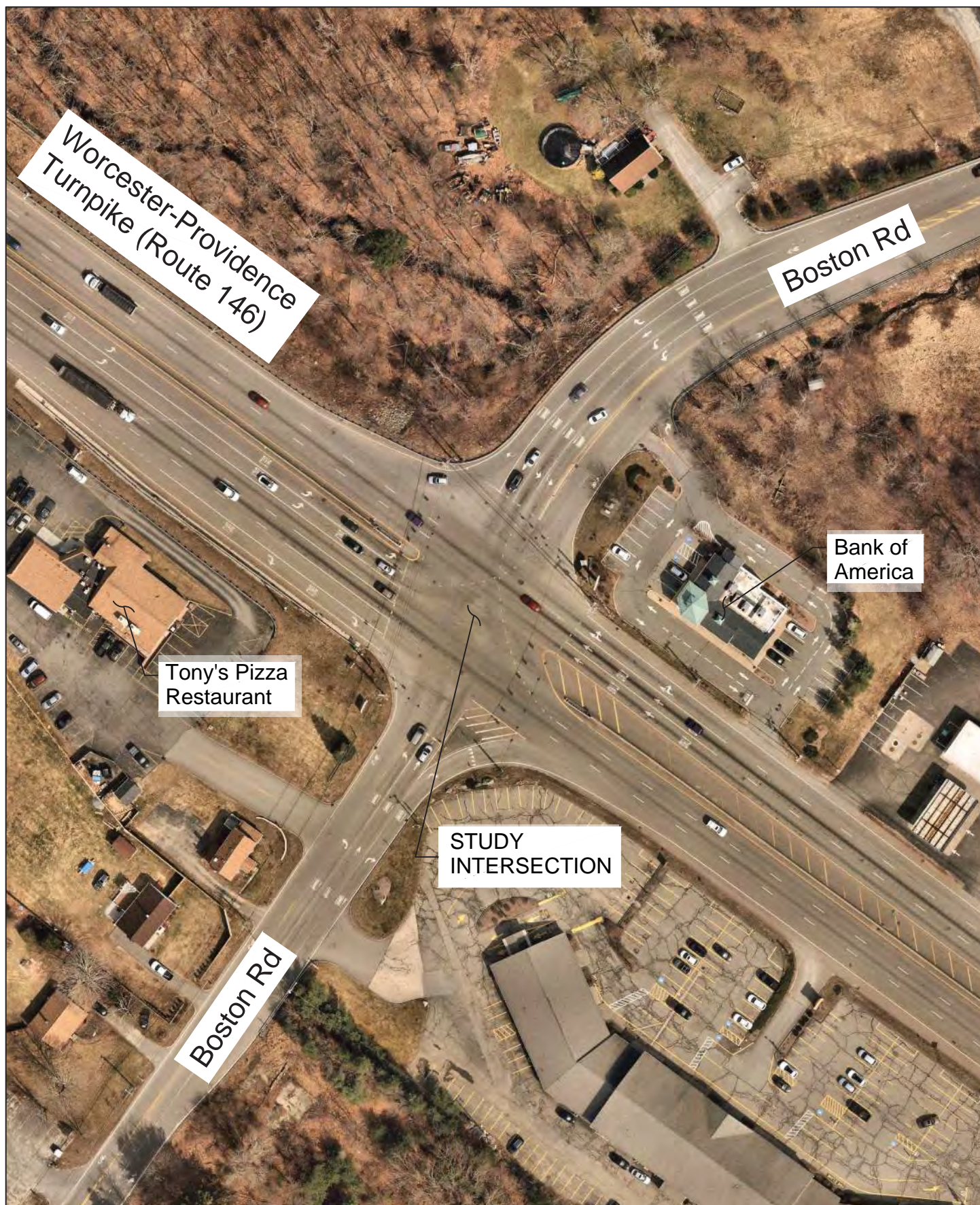
An RSA was conducted for the Worcester-Providence Turnpike (Route 146) at Boston Road intersection on October 25, 2022. The pre- and post-audit meetings were held at Sutton Town Hall located at 4 Uxbridge Road, Sutton, Massachusetts. A copy of the agenda for the meeting is provided in Appendix A. The RSA team, as shown in Table 1, comprised of representatives from State, Regional, and local agencies and included a cross-section of engineers, planners, and law enforcement fields. A complete list of the contact information of all attendees can be found in Appendix B.

Prior to the meeting, VHB distributed a copy of the agenda, crash diagrams, crash summary tables, and a safety prompt list to all RSA attendees. Crash diagrams and summary tables for the 2017-2022 collision data were compiled from police crash reports obtained from the Sutton Police Department and the Massachusetts State Police. All attendees were encouraged to visit the study area intersection prior to the meeting.

The meeting at Town Hall started with a brief outline of the agenda of the RSA meeting, followed by introductions and a description of the RSA process. During the pre-audit meeting, using the crash materials and safety prompt list provided in advance, VHB facilitated the discussion of existing safety issues with all RSA attendees. RSA attendees were encouraged to bring their local knowledge and expertise to the discussion on existing safety and operational issues for the study area intersection.

Following the pre-audit meeting, the audit team visited the intersection as a group to identify additional safety concerns. After the field visit, the team returned to Sutton Town Hall to discuss potential solutions,

ranging from short-term to long-term and from low-cost to high-cost countermeasures for each identified safety concern.



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Locus Map
Road Safety Audit
Worcester-Providence Turnpike at Boston Road
Sutton, Massachusetts

Figure 1

Table 1: Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Jennifer Hager	Sutton Planning Department
Dennis Towle	Sutton Police Department
Matt Belsito	Sutton Fire Department
Matt Stencil	Sutton Highway Department
Robert Raymond	CMRPC
Dakota Delsignore	MassDOT Traffic & Safety
Kevin Fitzgerald	MassDOT Traffic & Safety
Colby Roussel	MassDOT D3 Traffic
Chris Silva	MassDOT D3 Permits
Shane Leary	MassDOT D3 Traffic
Lori Shattuck	MassDOT D3 Traffic
Matt Piekarski	The Kraft Group
Vinod Kalikiri	VHB
Michael Santos	VHB
James Vorosmarti	VHB

Project Location and Description

Study Area Roadways

Worcester-Providence Turnpike (Route 146)

The Worcester – Providence Turnpike (Route 146) runs northwest to southeast between the City of Worcester and the Massachusetts/Rhode Island State Line in Millville, MA. Route 146 is classified as an urban principal arterial under MassDOT jurisdiction. The directions of travel along Route 146 are separated by a jersey barrier median within the Project study area. The majority of Route 146 within Massachusetts is a two-lane, limited-access, divided highway that serves as the primary route between Worcester and Providence, RI. The study intersection is the only major at-grade intersection on Route 146 in Massachusetts. Route 146 serves the communities within the Blackstone River Valley including Sutton,

Millbury, Uxbridge, and Worcester. There are numerous existing and planned industrial uses throughout the Route 146 corridor that generate vehicular and truck activity through the study intersection.

Route 146 northbound widens to three lanes at the Central Turnpike interchange approximately one mile south of Boston Road and tapers back to two lanes approximately 1,500 feet north of Boston Road. Route 146 southbound widens to three lanes at Marble Road, approximately 750 feet north of Boston Road, and tapers back to two lanes approximately 1,400 feet south of Boston Road. The segment of Route 146 within the study area was reconstructed in 2014-2015 to add the third lane along both directions of Route 146, remove existing northbound left-turn lanes, and add turn lanes on the southbound, eastbound, and westbound approaches at the intersection with Boston Road.

The regulatory and posted speed limit along Route 146 is 40 miles per hour (mph) through the intersection. North of Boston Road, the posted speed limit along Route 146 increases to 50 mph in the southbound direction approximately 1,500 feet north of the study intersection and increases to 50 mph in the northbound direction approximately 3,000 feet north of the study intersection. South of Boston Road, the posted speed limit increases to 55 mph in the northbound direction approximately 900 feet south of the study intersection and to 55 mph in the southbound direction approximately 800 feet south of the study intersection.

Boston Road

Boston Road runs in an east-west direction within the Town of Sutton between Providence Road (Route 122A) in the east and West Sutton Road in the west. Boston Road is classified as an urban minor arterial under Town of Sutton jurisdiction. The directions of travel along Boston Road are separated by a double-yellow centerline. Boston Road primarily serves residential uses, Town uses west of Route 146, and commercial uses at the intersections with Route 146 and Providence Road. The regulatory speed limit along Boston Road is 25 mph at the intersection and increases to 35 mph further west of the intersection and 40 mph further east of the intersection. Sidewalks and bicycle facilities are not provided along Boston Road.

Study Intersection

Boston Road intersects Route 146 from the east and west to form a four-legged intersection under traffic signal control. The intersection was the subject of a major upgrade and reconstruction as part of a MassDOT project (Project # 606110) that was completed in 2014-15. The Route 146 northbound approach consists of three travel lanes accommodating through and right-turning turn movements from the outermost lane. Route 146 northbound left- and right-turns onto Boston Road are made by exiting at Pleasant Valley Road, approximately 800 feet south of Boston Road. Left turns onto Boston Road occur at the intersection of Boston Road at Pleasant Valley Road and travel across Route 146 with the Boston Road westbound movements at the study intersection. The Route 146 southbound approach consists of two 525-foot-long exclusive left-turn lanes, three through travel lanes, and a 225-foot-long exclusive right-turn lane. Supplemental vehicle tracking lines are provided through the intersection for the southbound left-turns. The Boston Road eastbound approach consists of a 425-foot-long exclusive left-turn lane, a through travel lane, and a 275-foot long exclusive, channelized right-turn lane that operates under yield-sign control. The Boston Road westbound approach consists of two 300-foot-long exclusive left-turn

lanes, a through travel lane, and a 300-foot-long exclusive right-turn lane. Supplemental vehicle tracking lines are provided through the intersection for the westbound left-turns. Shoulders are provided along both sides of all legs of the intersection. Route 146 north of the intersection has 5-foot-wide shoulders along both sides, Route 146 south of the intersection has 8-foot-wide shoulders along both sides, and Boston Road has 1-foot wide shoulders along both sides of the roadway east and west of the intersection. Sharrows are provided on Boston Road eastbound, east of the intersection and Boston Road westbound, west of the intersection. Bicycle pavement markings and bicycle detection are provided within the shoulder along Route 146 northbound and along the Boston Road eastbound and westbound approaches at the intersection. Sidewalks and pedestrian accommodations are not provided at the intersection.

General land use at the intersection consists of commercial properties. Commercial/retail plazas are located on the west and south corners of the intersection, a bank is located on the east corner, and undeveloped woodland is located on the north corner. Numerous curb cuts serving the adjacent land uses are located along Route 146 and Boston Road within 500 feet of the intersection. Entering and exiting movements for the curb cuts along Route 146 are right-turn only.

The traffic signal at the study intersection operates with standard dual-ring phasing, with an advance phase for the southbound left turns. The Route 146 southbound right-turn also operates with an overlap phase that coincides with the Boston Road eastbound left-turn movements. The Boston Road eastbound and westbound approaches operate with leading left turn movements. All left-turns at the intersection operate with exclusive phasing and are provided green arrows. The traffic signal is fully actuated, with detection provided on all approaches. The overall maximum cycle length is approximately 180 seconds when all signal phases reach their maximum allowable time. The traffic signals are supported by span wire assemblies that cross each leg of the intersection. The Route 146 northbound and southbound directions are equipped with three 6' x 30' loop detectors spaced at 100 feet intervals. The Route 146 southbound left-turns and the Boston Road approaches are equipped with two 6' x 25' loop detectors per lane. All signal approaches are also equipped emergency vehicle preemption.

Photos of each approach at the intersection are provided in Appendix C.

Crash Data

Crash data provided by MassDOT and the Sutton Police Department show 188 reported crashes in the vicinity of the intersection of Worcester-Providence Turnpike at Boston Road from January 2017 to May 2022. At the time of this report, crash data for the years 2020 – 2022 have not been closed in the State's database and the information presented for those years may be incomplete. Some of the crash reports from these years may be missing specific information and details from the crashes and are reported as "unknown" in the crash summary. Crash data summaries and collision diagrams are provided in Appendix C.

The most prevalent crash types identified were rear-end crashes and sideswipe type crashes, accounting for 49 percent and 14 percent, respectively, of the total crashes at the intersection. Single vehicle crashes were third most frequent that accounted for 10 percent of the collisions. The most frequent crash

incidents to occur involved traffic travelling either northbound or southbound along Route 146. A total of 43 rear-end collisions occurred on Route 146 northbound and 35 occurred on Route 146 southbound. Sideswipe crashes also occurred most often along Route 146, with eleven sideswipes in the northbound direction and eight sideswipes observed in the southbound direction. Twenty-nine of the crashes along Route 146 resulted in injury, while only two of the crashes on Boston Road crashes did. Additionally, six crashes were caused by vehicles making illegal left turn movements from Route 146 northbound onto to Boston Road. No reported crashes involved pedestrians or bicyclists. Several crashes occurred at the various curb cuts near the intersection.

Approximately 46 percent of crashes at the intersection occurred during daylight, 45 percent of crashes occurred during clear weather conditions and 48 percent of crashes occurred when the roadway surface was dry. A total of 19 percent of the crashes were reported as occurring in dark or nighttime conditions, with 14 percent reported as “dark – lighted roadway” conditions and 5 percent reported as “dark – roadway not lighted”. Additionally, twenty-two percent of crashes occurred on Fridays, and the time period with the most crashes was between 4 pm to 6 pm (16 percent). Heavy vehicles were involved with ten percent of the crashes that occurred at the intersection during the review period.

An average of 38 crashes per year occurred annually between 2017 and 2019 at the study intersection. A total of 23 crashes were reported at the study intersection in 2020 and 38 crashes were being recorded at the study intersection in 2021.

Audit Observations and Potential Safety Enhancements

During the RSA meeting and prior to the field visit, a brief introduction of the RSA process was presented to the audit team members. The members of the audit team were asked to discuss the existing issues that may affect safety at the intersection using the provided crash data and summaries. The audit team then visited the study area intersection, at which time observations of various safety concerns and deficiencies were identified and documented. A list of the safety concerns that were identified during the RSA for the intersection along with potential enhancements identified during the RSA is provided in the following sections.

Safety Issue #1: Rear End Crashes

As mentioned in the Crash Data section, rear-end crashes were noted as the most prevalent type of collision between 2017 – May 2022, most of which occurred along Route 146 northbound and southbound. The following topics related to rear-end collisions were discussed at the RSA.

Traffic Signal Related

The study intersection is the only signalized location along Route 146 in Massachusetts, with the remainder of the highway operating as a limited-access highway with grade separated interchanges. An overhead warning sign is mounted on a mast arm in the southbound direction approximately 750 feet in

advance of the intersection that warns motorists of the upcoming traffic signal and if it is showing a red indication. Advance warning signage is not provided along Route 146 northbound to notify motorists of the traffic signal at Boston Road. The traffic signal may create an unexpected stop for motorists traveling along both directions of Route 146, resulting in rear-end collisions.

Vehicle Speeds

Vehicular speeds were not collected as part of this study. However, RSA participants stated that vehicle speeds may be a contributing factor to rear end collisions. Vehicle speeds traveling southbound may be increased due to the downgrade along Route 146 entering the intersection, requiring longer distances to stop when the signal indication is red for southbound movements.

Vehicle Queues

Due to the high traffic volumes that travel through the intersection and a cycle length of approximately 180 seconds (three minute), vehicle queues occasionally extend for over a thousand feet in both directions along the Route 146 approaches, especially during the peak periods. Additionally, there is a moderate downgrade on the Route 146 southbound approach to the intersection. The queues from the intersection may create unexpected stops for motorists traveling along Route 146. An overhead warning sign is mounted on a mast arm in the southbound direction approximately 750 feet in advance of the intersection that warns motorists of the upcoming traffic signal and indicates if it is showing a red indication. However, RSA participants stated that observed queues may extend beyond the warning sign during the peak periods. During times when the vehicle queues extend beyond the warning sign, drivers may not have sufficient time to react and stop while traveling along Route 146 southbound. RSA participants observed that the through lanes on Route 146 are not sufficiently balanced for queue storage use, which creates longer queues. High amounts of truck traffic may impede signal visibility for other motorists while in the queue, resulting in the inability to see the traffic signal indications.

Vehicle Clearance Times

RSA participants noted that the clearance times for the yellow indication may not be appropriate for the vehicular speeds and crossing distance at the intersection, potentially leading to rear-end collisions. There is also heavy truck traffic along Route 146. Trucks have longer stopping distances than typical passenger vehicles and during the RSA site visit were observed to enter and travel through the intersection during the yellow and all-red phases of the traffic signal, using the full clearance interval to clear the intersection.

Potential Enhancements:

- Consider the construction of a grade separated interchange with frontage roads for existing driveways.
- Consider adding advance warning signage on Route 146 northbound to alert drivers of the traffic signal at the study intersection. Consideration of this signage could be implemented with potential enhancements to guide signage, which is described under Safety Issue #3.
- Evaluate the location of the overhead warning signage on Route 146 southbound and consider providing additional advance signage to alert drivers of the traffic signal at the study intersection.

- Evaluate the clearance (yellow/all-red) signal timings to determine if they are adequate for this intersection based on MassDOT guidance.
- Consider installing “Signal Ahead” pavement markings on Route 146 to provide additional emphasis for motorists of the upcoming traffic signal.
- Consider additional advance lane assignment signage on the Route 146 approaches to inform motorists that there are three travel lanes through the intersection.
- Evaluate right-turn-on-red movements on Boston Road westbound to determine the impacts on vehicle operations along Route 146 northbound.
- Consider implementing a “no turn on red” restriction and/or adding an acceleration lane for the Boston Road westbound right-turn movements.

Safety Issue #2: Turning Movements

As shown on the Crash Diagram in the attachments, a total of 8 crashes occurred that were related to turning movements at the study intersection. Several of these crashes were due to vehicles turning left or making a u-turn maneuver along the Route 146 northbound approach, although left-turns are prohibited. Broken white lane line tracking is provided through the intersection for the Route 146 southbound left turns and the Boston Road westbound left turns but are only provided between the left turn lanes and not on the inside edge of each lane. RSA participants noted that there is a wide painted median along the Route 146 northbound approach that does not provide a physical edge to prevent motorists from traveling outside of the designated through lanes. RSA participants observed that the signal indications along Route 146 are green balls and no directional arrows are provided. While there is overhead lane assignment signage on the span wires at the intersection that prohibits left-turns and u-turns along the northbound approach, there is no signage on the left side of the roadway in advance of the intersection.

The Boston Road eastbound channelized right-turn lane was reviewed at the RSA. The right-turn lane currently operates under yield-sign control. RSA participants stated that this right turn is a safety concern due to sight distance limitations for conflicting vehicles traveling along Route 146 southbound through the intersection.

The Boston Road westbound right-turn movement was also reviewed at the RSA. RSA participants stated that the right-turn movement is not provided an acceleration lane which may create a safety concern between vehicles traveling at higher speeds along Route 146 that are required to decelerate due to the westbound right-turning vehicles.

Additionally, the intersection of Route 146 at Pleasant Valley was reviewed as part of the site visit. Participants noted that the entrance to Pleasant Valley Road is not well defined and that there is a lack of street lighting at this intersection. The Route 146 northbound turning movements must exit onto Pleasant Valley Road to travel east or west on Boston Road. RSA participants stated that the signage to direct motorists to exit Route 146 northbound to make turning maneuvers is unclear and poorly signed. A lane assignment sign is provided along the right side of Route 146 northbound indicating that the two

leftmost lanes are for through movements and that the right lane is a shared through/right-turn lane. This sign is located approximately 650 feet in advance of the intersection and 100 feet north of Pleasant Valley Road. A lane assignment sign is provided along the right side of Route 146 southbound indicating that the two leftmost lanes are for left-turns. Lane assignment signs are not provided on the median in either direction and the lane assignment sign in the southbound direction does not indicate lane assignments for through or right-turn movements at the intersection.



Image 1: Route 146 NB Approach - Green Ball Indications



Image 2: Painted Median on Route 146 NB

Potential Enhancements:

- Consider the construction of a grade separated interchange with frontage roads for existing driveways.
- Consider replacing the painted portion of the median on Route 146 northbound with a raised median to clarify that it is not a drivable area.
- Consider installing delineators to mark the painted median on Route 146 northbound.
- Consider replacing the green ball signal indications along the Route 146 northbound approach with vertical green arrows to reinforce that left turns are not allowed.
- Consider installing additional broken lane lines to delineate the edge of the inner lane for the Route 146 southbound left turns and Boston Road westbound left turns to enhance vehicle turning movement tracking through the intersection.
- Consider enhancing the lane assignment signage with an overhead sign assembly or placing an additional sign on the left-hand side of Route 146 northbound in advance of the intersection. An

evaluation should be conducted to determine the feasibility and specific location of this signage to provide motorists with sufficient distance to select the correct lane. Enhancements to the lane assignment signage should be considered with upgraded guide signage that is described in the next section.

- Consider adding street lighting at the intersection of Route 146 at Pleasant Valley Road.
- Consider trimming vegetation and refreshing pavement markings to better define and improve visibility of Pleasant Valley Road.
- Evaluate implementing a right-turn on red restriction for the Boston Road westbound approach. If implemented, replace red ball signal indication with a red arrow to reinforce the restriction.

Safety Issue #3: Inadequate Guide Signage

A set of guide signs is provided along the Route 146 northbound approach to the intersection to notify motorists that they must exit onto Pleasant Valley Road to access Boston Road. However, these signs are not located well in advance of Pleasant Valley Road. Additionally, the first of the guide signs is obscured by a speed limit ahead warning sign. The second of these signs is located slightly north of Pleasant Valley Road within the small traffic island beyond where vehicles turn and may be in a location where motorists do not have sufficient time to see it and maneuver into the right-turn lane. These signs are located on the right-side of the roadway and may be difficult for motorists traveling in the center or left lanes to see and maneuver, especially during congested traffic conditions.



Image 3: Route 146 NB Guide Sign Obscured By Speed Limit Warning Sign

Potential Enhancements:

- Evaluate the location of the guide signs that direct motorists to Boston Road and consider placing additional signage further south on Route 146 northbound. Considerations to including Galaxy Pass and Pleasant Valley Road should also be included in this evaluation.
- Evaluate the potential for adding guide signage on the median or overhead.
- Consider moving the guide signage that is obscured by the speed limit ahead warning sign.
- Consider moving the guide sign at Pleasant Valley Road on the right-hand side of the roadway in advance of the intersection.
- Consider installing graphical signage for the left-turn maneuver at Pleasant Valley Road to assist motorists with wayfinding.

Safety Issue #4: Curb Cuts

There are numerous curb cuts that serve adjacent parcels along Route 146 near the study intersection. South of Boston Road, the Sutton Plaza is located on Route 146 southbound and an Xtra Mart gas station and Bank of America are located on Route 146 northbound. Sutton Plaza has an entrance-only approximately 350 south of Boston Road and an exit-only drive approximately 530 feet south of Boston Road. The Bank of America has a right-in/right-out driveway approximately 175 south of Boston Road and the Xtra Mart gas station has two curb cuts 250 feet and 400 feet south of Boston Road. Signage indicating vehicles must make a right-turn are provided on the Sutton Plaza exit-only driveway, but no signage is provided on the median, opposite the driveway indicating that vehicles must turn right. The Bank of America also has a right-in/right-out driveway along Boston Road, with signage indicating that left-turns are not allowed. Two of the reported crashes involved motorists making illegal lefts to/from the Bank of America driveway on Boston Road. RSA participants also observed vehicles making illegal left turns at the Bank of America driveway on Boston Road during the site visit. Directional signage is not provided for the Bank of America or Xtra Mart driveways to indicate that vehicles must turn right onto Route 146 northbound.

As mentioned in the Crash Data section, several crashes occurred at the curb cuts near the intersection. A total of eight crashes related to the curb cuts were documented. Five fixed-object crashes occurred at the Bank of America driveway on Route 146, two crashes occurred at the Bank of America driveway on Boston Road involving vehicles turning to/from the driveway, and four crashes occurred at the Xtra Mart gas station driveway.

Galaxy Pass intersects Route 146 northbound from the east approximately 1,500 feet south of the intersection and 600 feet south of Pleasant Valley Road. Right turns from Galaxy Pass enter directly into the right travel lane of Route 146 northbound from a stop condition. Immediately north of Galaxy Pass, an exclusive right-turn lane is provided for vehicles exiting to Pleasant Valley Road, which creates a weaving condition along Route 146 northbound. Participants noted that an acceleration lane is not provided for vehicles exiting Galaxy Pass onto Route 146 northbound.

Potential Enhancements:

- Consider installing signage along the Route 146 median facing each driveway to indicate that left-turns are prohibited.
- Evaluate the potential for wider acceleration and deceleration lanes for driveways along Route 146 or providing them where they do not currently exist.
- Evaluate geometric modifications to the segment of Route 146 northbound between Galaxy Pass and Pleasant Valley Road to extend the exclusive right-turn lane at Pleasant Valley Road to Galaxy Pass to serve as an acceleration lane for vehicles exiting Galaxy Pass.
- Consider adding flexposts along Boston Road and enhancing the posts on the Bank of America driveway to reinforce the left-turn prohibition.

Safety Issue #5: Emergency Vehicle Preemption

RSA participants stated that the emergency vehicle preemption does not function properly and that it creates issues for police and fire vehicles that travel through the study intersection. The participants noted that the emergency vehicles traveling along the Boston Road approaches sometimes have issues activating the pre-emption, which increases response times.

Potential Enhancements:

- Evaluate the existing emergency vehicle detection system and implement necessary upgrades.
- Consider providing advanced emergency vehicle detection on the Boston Road approaches to the study intersection.

Safety Issue #6: Pedestrian and Bicycle Facilities

Sidewalks and crosswalks are not provided at the intersection. RSA participants stated that there are occasionally pedestrians that cross both Boston Road and Route 146 and must do without the protection of formal pedestrian facilities. Sharrows are painted on Boston Road for movements away from the intersection (in the eastbound direction east of Route 146 and in the westbound direction west of Route 146). Bicycle symbols and bicycle detection are provided on the shoulder of the Route 146 northbound approach and along the Boston Road eastbound and westbound approaches.

Potential Enhancements:

- Evaluate the potential for adding crosswalks, sidewalks, and pedestrian signal equipment at the intersection.
- Evaluate the potential for adding bicycle accommodations at the intersection.

Safety Issue #7: Driver Behavior

RSA participants stated that vehicles speed through the intersection and some are often distracted, resulting in collisions. During periods of inclement weather such as rain or snow, these behaviors may be amplified and stopping distances become longer, especially on Route 146 southbound, which has a downgrade as it approaches the study intersection. During the field visit, RSA participants observed and commented on numerous instances of vehicles speeding on Route 146. The speed limit reduction along Route 146 occurs near the intersection with Boston Road and within the area in which vehicles queue.

RSA participants also observed the abundance of commercial signage and various types of lighting for each commercial property at and near the intersection. Participants also stated that the commercial lighting may be inadequate and have an impact on visibility during night time conditions at the intersection, especially at the Bank of America site.

Potential Enhancements:

- Consider providing additional law enforcement near the intersection.
- Evaluate the installation of additional rumble strips on both sides of the Route 146 northbound approach and the right side of the Route 146 and southbound approach at the intersection.
- Consider additional public education measures to alert drivers of reduced speed limits and traffic patterns through the study intersection.
- Evaluate the location of the “Reduced Speed Limit Ahead” signs on the Route 146 northbound approach to provide drivers with adequate warning of the upcoming speed reduction.
- Evaluate the usage of digital speed feedback signs along all approaches in advance of the intersection.
- Consider additional public education measures to alert drivers of reduced speed limits and traffic patterns through the study intersection.

Summary of Road Safety Audit

Following the site visit and discussions of existing safety issues, audit team members were asked to consider various safety related improvements. The audit team members were encouraged to consider both short-term and long-term improvements for each of the existing safety issues. Each improvement considered has been categorized as short-term, mid-term, or long-term based on the definitions shown in Table 3. Additionally, a cost category has been assigned to each improvement based on the parameters set forth in Table 3. The safety payoff is a subjective judgement of the potential effectiveness of the safety recommendations listed below.

Table 2: Estimated Time Frame and Costs Breakdown

Time Frame		Costs	
Short-Term	<1 Year	Low	≤\$10,000
Mid-Term	1-3 Years	Medium	\$10,001-\$50,000
Long-Term	>3 Years	High	>\$50,000

A list of each potential safety enhancement for the intersection is provided below in Table 3.

Table 3: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Rear-End Crashes	Consider the construction of a grade separated interchange with frontage roads for existing driveways.	High	Long-Term	High	MassDOT
	Consider adding advance warning signage on Route 146 northbound to alert drivers of the traffic signal at the study intersection. Consideration of this signage could be implemented with potential enhancements to guide signage.	Medium	Short-Term	Low	MassDOT
	Evaluate the location of the overhead warning signage on Route 146 southbound and consider providing additional advance signage to alert drivers of the traffic signal at the study intersection.	Medium	Mid-Term	Low	MassDOT
	Evaluate the clearance (yellow/all-red) signal timings to determine if they are adequate for this intersection based on MassDOT guidance.	Medium	Short-Term	Low	MassDOT
	Consider installing “Signal Ahead” pavement markings on Route 146 to provide additional emphasis for motorists of the upcoming traffic signal.	Medium	Short-Term	Low	MassDOT
	Consider additional advance lane assignment signage on the Route 146 approaches to inform motorists that there are three travel lanes through the intersection.	Medium	Short-Term	Low	MassDOT
	Evaluate right-turn-on-red movements on Boston Road westbound to determine the impacts on vehicle operations along Route 146 northbound.	Medium	Short-Term	Low	MassDOT
	Consider implementing a “no turn on red” restriction and/or adding an acceleration lane for the Boston Road westbound right-turn movements.	Medium	Short/Mid-Term	Low-High	MassDOT

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Turning Movements	Consider the construction of a grade separated interchange with frontage roads for existing driveways.	High	Long-Term	High	MassDOT
	Consider replacing the painted portion of the median on Route 146 northbound with a raised median to remove space for vehicles to use to turn left.	Medium	Long-Term	Medium - High	MassDOT
	Consider installing delineators to mark the painted median on Route 146 northbound.	Medium	Short-Term	Low	MassDOT
	Consider replacing the green ball signal indications along the Route 146 northbound approach with vertical green arrows to reinforce that left turns are not allowed.	Low	Short-Term	Low	MassDOT
	Consider installing additional broken lane lines to delineate the edge of the inner lane for the Route 146 southbound left turns and Boston Road westbound left turns to enhance vehicle turning movement tracking through the intersection.	Low	Short-Term	Low	MassDOT
	Consider enhancing the lane assignment signage with an overhead sign assembly or placing an additional sign on the left-hand side of Route 146 northbound in advance of the intersection. An evaluation should be conducted to determine the specific location of this signage to provide motorists with sufficient distance to select the correct lane. Enhancements to the lane assignment signage should be considered with upgraded guide signage that is described in the next section.	Medium	Mid-Term	High	MassDOT
	Consider adding street lighting at the intersection of Route 146 at Pleasant Valley Road.	Medium	Mid-Term	Medium	Town of Sutton

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Turning Movements (Continued)	Consider trimming vegetation and refreshing pavement markings to better define and improve visibility of Pleasant Valley Road.	Medium	Short-Term	Low	MassDOT
	Evaluate implementing a right-turn on red restriction for the Boston Road westbound approach. If implemented, replace red ball signal indication with a red arrow to reinforce the restriction.	Medium	Short-Term	Low	MassDOT
Inadequate Guide Signage	Evaluate the location of the guide signs that direct motorists to Boston Road and consider placing additional signage further south on Route 146 northbound. Considerations to including Galaxy Pass and Pleasant Valley Road should also be included in this evaluation.	Medium	Short-Term	Low	MassDOT
	Evaluate the potential for adding guide signage on the median or overhead.	Medium	Short/Mid-Term	Low - High	MassDOT
	Consider moving the guide signage that is obscured by the speed limit ahead warning sign.	Low	Short-Term	Low	MassDOT
	Consider moving the guide sign at Pleasant Valley Road on the right-hand side of the roadway in advance of the intersection.	Low	Short-Term	Low	MassDOT
	Consider installing graphical signage for the left-turn maneuver at Pleasant Valley Road to assist motorists with wayfinding.	Medium	Short-Term	Low	MassDOT

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Curb Cuts	Consider installing signage along the Route 146 median facing each driveway to indicate that left-turns are prohibited.	Low	Short-Term	Low	MassDOT
	Evaluate the potential for wider acceleration and deceleration lanes for driveways along Route 146 or providing them where they do not currently exist.	Medium	Long-Term	High	MassDOT
	Evaluate geometric modifications to the segment of Route 146 northbound between Galaxy Pass and Pleasant Valley Road to extend the exclusive right-turn lane at Pleasant Valley Road to Galaxy Pass to serve as an acceleration lane for vehicles exiting Galaxy Pass.	Medium	Long-Term	High	MassDOT
	Consider adding flexposts along Boston Road and enhancing the posts on the Bank of America driveway to reinforce the left-turn prohibition.	Medium	Short-Term	Low	Town of Sutton/ Private Owner
Emergency Vehicle Preemption	Evaluate the existing emergency vehicle detection system and implement necessary upgrades.	Medium	Short-Term	Low	Town of Sutton
	Consider providing advanced emergency vehicle detection on the Boston Road approaches to the study intersection.	Medium	Mid-Term	Low	Town of Sutton
Pedestrian and Bicycle Facilities	Evaluate the potential for adding crosswalks, sidewalks, and pedestrian signal equipment at the intersection.	High	Long-Term	Medium	MassDOT
	Evaluate the potential for adding bicycle facilities at the intersection that can connect to the surrounding transportation network.	High	Long-Term	Low-Medium	MassDOT

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Driver Behavior	Consider providing additional law enforcement near the intersection.	Medium	Short-Term	Low	Town of Sutton/ Massachusetts State Police
	Evaluate the installation of additional rumble strips on both sides of the Route 146 northbound approach and the right side of the Route 146 and southbound approach at the intersection.	Low	Mid-Term	Medium	MassDOT
	Consider additional public education measures to alert drivers of reduced speed limits and traffic patterns through the study intersection.	Low	Short-Term	Low	MassDOT/ Town of Sutton
	Evaluate the location of the “Reduced Speed Limit Ahead” signs on the Route 146 northbound approach to provide drivers with adequate warning of the upcoming speed reduction.	Medium	Short-Term	Low	MassDOT
	Evaluate the usage of digital speed feedback signs along all approaches in advance of the intersection.	Medium	Short-Term	Medium	MassDOT

Appendix A. RSA Meeting Agenda

Agenda

Road Safety Audit

Sutton, MA

Route 146 & Boston Road

Meeting Location: Sutton Town Hall, 3rd Floor Room 1C

4 Uxbridge Road, Sutton, MA

October 25, 2022

10:00 AM – 2:00 PM

Type of meeting:

High crash location – Road Safety Audit

Attendees:

Invited participants to comprise a multidisciplinary team

Please bring:

Thoughts and enthusiasm!!

10:00 AM

Welcome and Introductions

10:15 AM

Discussion of Safety Issues

- Crash history, speed regulations, recent and existing projects – all provided in advance
- Existing geometries and conditions

11:00 AM

Site Visit

- Drive to the intersection of Route 146 and Boston Road
- As a group, identify areas for improvement

12:30 PM

Discussion of Potential Improvements

- Discuss observations and finalize safety issue areas
- Discuss potential improvements and finalize recommendations

2:00 PM

Adjourn for the Day – but the RSA has not ended

Instructions for Participants:

- Before attending the RSA on October 25, 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. RSA Audit Team Contact List

Participating Audit Team Members

Audit Team Member	Agency/Affiliation	Email
Jennifer Hager	Sutton Planning Department	j.hager@town.sutton.ma.us
Dennis Towle	Sutton Police Department	d.towle@suttonpolice.com
Matt Belsito	Sutton Fire Department	m.belsito@town.sutton.ma.us
Matt Stencel	Sutton Highway Department	mstencel@town.sutton.ma.us
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Dakota Delsignore	MassDOT Traffic & Safety	dakota.d.delsignore@state.ma.us
Kevin Fitzgerald	MassDOT Traffic & Safety	kevin.t.fitzgerald@state.ma.us
Colby Roussel	MassDOT D3 Traffic	colby.roussel@dot.state.ma.us
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Matt Piekarski	The Kraft Group	mattp@thekraftgroup.com
Vinod Kalikiri	VHB	vkalikiri@vhb.com
Michael Santos	VHB	masantos@vhb.com
James Vorosmarti	VHB	jvorosmarti@vhb.com

Appendix C. Study Intersection Photos



Route 146 Southbound at Boston Road



Route 146 Northbound at Boston Road



Boston Road Eastbound at Route 146



Boston Road Westbound at Route 146

Appendix D. Detailed Crash Data

SYMBOLS

→

Moving Vehicle

↔

Backing Vehicle

Non-Involved Vehicle

Involved

Non-Involved

Pedestrian

Bicycle

Animal

Direction of Motion

Parked Vehicle

Fixed Object

TYPES OF CRASH

Head on

Rear End

Angle

Turning Movement

Sideswipe

Out of Control

Night Time Crash

SEVERITY

#

Injury

#

Fatal

#

Property Damage Only

TRAFFIC CONTROL

S

Traffic Signal

STOP

Stop Sign

YIELD

Yield Sign

ONE WAY

One Way Sign

Source of Crash Reports: Massachusetts State Police; Town of Sutton Police Dept.

Crashes: 4,6,11,18,19,40,43,47,49,53,56,80,83,89,92,96,101,103,106,128,132,135,136,142,145,146,151,152,158,174,177,180,181,183,184,185,186,188 were not shown due to insufficient data provided.

Collision Diagram (2017-2022)
Worcester-Providence Tnpk (Rt. 146) at Boston Road
Sutton, MA

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
1	01/07/17	Saturday	1:55 PM	35				No injury	Single vehicle crash	Daylight	Snow	Snow	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.	MV1 was travelling SB, lost control in the snow and collided with a utility pole near Tony's Pizza.
2	01/07/17	Saturday	1:30 PM	22	50			No injury	Rear-end	Daylight	Snow	Snow	Driving too fast for conditions	MV1 (Heavy Vehicle) was stopped at the red light while travelling SB on 146. MV2 was unable to stop in the snow and rear-ended MV1.
3	01/10/17	Tuesday	8:38 AM	Unknown	Unknown			No injury	Sideswipe, same direction	Daylight	Unknown	Unknown	Disregarded traffic signs, signals, road markings	MV1 was stopped on 146 NB at at red light. MV2 did not stop and sideswiped MV1,
4	01/16/17	Monday	3:56 PM	Unknown	Unknown			No injury	Unknown	Daylight	Unknown	Unknown	Unknown	Unknown
5	1/24/17	Tuesday	3:18 AM	25				Non-incapacitating	Angle	Dark - lighted roadway	Sleet, hail, freezing rain	Snow	Unknown	MV1 was heading the wrong way on Route 146 SB and collided with MV2
6	02/01/17	Wednesday	5:31 PM	51	43			No injury	Rear-end	Dark - roadway not lighted	Clear	Dry	Followed too closely	MV1 slowed for stopped traffic, V2 failed to stop
7	2/14/17	Tuesday	8:20 AM	43	31			No injury	Rear-end	Daylight	Clear	Dry	Fatigued/asleep	MV2 fell asleep on 146 NB, collided with MV1 which was waiting at intersection
8	02/16/17	Thursday	9:20 AM	55	41	59		Non-incapacitating	Rear-end	Daylight	Cloudy	Dry	Disregarded traffic signs, signals, road markings	MV1 and MV2 were traveling NB on 146 and stopped at the red light in adjacent lanes. MV3 (Heavy Vehicle) was unable to stop in time and rear-ended MV1 and MV2
9	03/02/17	Thursday	1:20 AM	23	19			Non-incapacitating	Sideswipe, same direction	Dark - roadway not lighted	Clear	Dry	Operating defective equipment	MV1 and MV2 were travelling NB on 146 before the intersection. MV1 lost control when a tire blew. MV1 then sideswiped MV2.
10	03/03/2017	Friday	6:18 PM	19	63			No injury	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Unknown	MV1 and MV2 were traveling SB on 146, MV2 swerved into left lane and sideswiped MV1.
11	03/30/17	Thursday	3:02 PM	Unknown				No injury	Unknown	Daylight	Unknown	Unknown	Unknown	Unknown
12	04/25/17	Tuesday	3:10 PM	45	33			No injury	Angle	Daylight	Rain	Wet	Driving too fast for conditions	MV1 and MV2 were travelling SB on 146. MV2 lost control, hydroplaned, and collided with MV1.
13	05/15/17	Monday	3:53 PM	Unknown	Unknown			No injury	Unknown	Daylight	Unknown	Unknown	Failed to yield right of way	MV1 was traveling SB on 146. MV2 pulled out from Tonys Pizza Driveway, failed to observe MV1 and struck MV1
14	06/06/17	Tuesday	7:33 PM	51				No injury	Sideswipe, same direction	Daylight	Rain	Wet	Disregarded traffic signs, signals, road markings	MV1 was stopped waiting to turn left on 146 SB. MV2 approached in the adjacent lane and sideswiped MV1
15	06/07/17	Wednesday	5:55 PM	57	19	24		Non-incapacitating	Rear-end	Daylight	Clear	Dry	Inattention	MV2 and MV3 were stopped at the intersection of Boston Rd and 146 while travelling SB. MV1 failed to pay attention and rear-ended MV2. MV2 was pushed into MV3.
16	06/21/17	Wednesday	2:28 PM	Unknown	Unknown	Unknown		Non-incapacitating	Sideswipe, same direction	Daylight	Unknown	Unknown	Followed too closely	MV1 and MV2 were heading SB on 146 in adjacent lanes. MV3 approached from the rear at a high rate of speed and sideswiped both vehicles.

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
17	07/03/17	Monday	4:00 PM	Unknown	Unknown			No injury	Sideswipe, same direction	Daylight	Clear	Dry	Followed too closely	MV1 and MV2 were heading EB on Boston Rd. MV1 was in the left hand lane turn left when MV2 attempted attempted to pass on the left and sideswiped MV1
18	07/16/17	Sunday	11:36 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
19	08/03/17	Thursday	1:12 PM	Unknown	Unknown	Unknown	Unknown	Non-incapacitating	Sideswipe, same direction	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 sideswiped MV5 when MV1 attempted to change lanes. MV1 and MV5 them collided with MVs 2, 3, 4, and 6.
20	08/05/17	Saturday	12:50 PM	23	49	47		No injury	Rear-end	Daylight	Rain	Wet	Followed too closely	MV2 and MV3 were stopped at the intersection of boston Rd and 146 while travelling NB. MV1 failed to pay attention and rear-ended MV2. MV2 was pushed into MV3.
21	08/06/17	Sunday	2:40 PM	66	38			Non-incapacitating	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	MV1 and MV2 (motorcycle) were heading SB on 146. MV1 attempted to change lanes and struck MV2.
22	08/26/2017	Saturday	5:54 AM	68				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	No improper driving	MV1 was traveling NB on 146 when it struck a deer
23	09/03/17	Sunday	5:00 PM	22	55			No injury	Rear-end	Dusk	Rain	Wet	Followed too closely	MV1 was stopped at the SB left turn on Rt 146. MV2 failed to stop and rear-ended MV1
24	09/20/2017	Wednesday	8:20 AM	50				Non-incapacitating	Single vehicle crash	Daylight	Rain	Wet	Failure to keep in proper lane or running off road	MV1 attempted to turn into XTramart plaza from 146 NB but failed to negotiate the turn and struck the guardrail
25	10/03/17	Tuesday	7:10 AM	33	41			No injury	Rear-end	Daylight	Cloudy	Dry	Inattention	MV1 was stopped at the light on Rt 146 while travelling SB. MV2 failed to stop and rear-ended MV1
26	10/24/17	Tuesday	4:12 AM	35	37	66		Non-incapacitating	Single vehicle crash	Dark - roadway not lighted	Rain	Wet	Driving too fast for conditions	MV1 was travelling on 146 SB South of the intersection (near pleasant valley road) lost control and struck the utility pole.
27	11/25/2017	Saturday	9:05 PM	52				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	No improper driving	MV1 traveling SB on 146 when it struck a deer
28	12/01/17	Friday	10:12 PM	Unknown				No injury	Angle	Unknown	Unknown	Unknown	Failed to yield right of way	MV1 was travelling WB on Boston Rd. MV2 pulled out from Tonys Pizza Driveway, failed to observe MV1 and struck MV1
29	12/06/17	Wednesday	2:07 PM	19	38			No injury	Rear-end	Dark - lighted roadway	Clear	Dry	Followed too closely	MV1 and MV2 were heading NB on 146. MV2 failed to stop and rear-ended MV1
30	12/09/17	Saturday	9:32 PM	Unknown	Unknown			No injury	Single vehicle crash	Unknown	Unknown	Unknown	Followed too closely	MV1 swerved in to the barrier on 146 SB to avoid a stopped car.
31	12/14/17	Thursday	6:54 PM	49	27	52		No injury	Rear-end	Dark - roadway not lighted	Clear	Dry	Distracted	MV3 was distracted and rear ended MV2 and MV2 rear-ended MV1 while travelling SB on 146.
32	12/15/17	Friday	6:45 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Distracted	MV1 was stopped on 146 SB. MV2 failed to stop and Rear-ended MV1.

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
33	12/16/17	Saturday	1:25 AM	30	25	Unknown		No injury	Rear-end	Dark - lighted roadway	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 and MV2 were travelling SB on 146. MV1 was driving eratically and rear-ended MV2.
34	12/25/17	Monday	10:24 AM	33	24			No injury	Rear-end	Daylight	Clear	Snow	Driving too fast for conditions	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
35	01/07/18	Sunday	11:50 AM	32	65			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was turning right from 146 NB. MV2 failed to stop and Rear-ended MV1.
36	01/12/18	Friday	5:56 PM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Failure to keep in proper lane or running off road	MV1 was sideswiped by MV2 on 146 SB
37	01/22/18	Monday	7:39 AM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Failure to keep in proper lane or running off road	MV1 was sideswiped by MV2 on 146 NB
38	01/23/18	Tuesday	2:46 PM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Failure to keep in proper lane or running off road	MV1 was sideswiped by MV2 on 146 NB
39	03/18/18	Sunday	1:00 AM	33				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	MV1 was travelling SB on 146. MV1 Lost control and struck the median barrier.
40	03/23/18	Friday	7:03 AM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
41	03/31/18	Saturday	10:30 AM	63	21			Incapacitating	Angle	Daylight	Clear	Dry	Made an improper turn	MV1 was traveling NB on 146 and attempted to make a left turn onto Boston Rd. MV2 was heading SB on 146. MV2 struck MV1.
42	04/10/18	Tuesday	2:55 PM	38	25			No injury	Angle	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 was heading SB on 146 with a green light. MV2 was heading WB on Boston Rd, failed to stop for a red signal and stuck MV1,
43	04/18/18	Wednesday	4:51 PM	Unknown	Unknown			Non-incapacitating	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
44	04/19/18	Thursday	3:04 PM	41	71			No injury	Rear-end	Daylight	Cloudy	Wet	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 and MV2 were stopped on Boston Rd WB. When the light turned green MV1 reversed into MV2
45	05/07/18	Monday	8:00 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	MV1 was sideswiped by MV2 on 146 NB
46	05/23/18	Wednesday	2:06 PM	41	62			No injury	Rear-end	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 and MV2 were in the left turn lanes on Boston Rd WB. MV2 thought the WB Thru light was a green for her, and accelerated into MV1.
47	05/31/18	Thursday	6:15 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
48	06/04/18	Monday	10:17 PM	33				Non-incapacitating	Single vehicle crash	Dark - lighted roadway	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 lost control and struck the wall near the Bank of America and a MassDOT sign post

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
49	06/08/18	Friday	6:17 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
50	06/18/18	Monday	10:09 AM	57	27			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 and MV2 were heading NB on 146 stoppped at a red light. MV2 was following MV1. MV2 accelerated faster when the light turned green and rear-ended MV1.
51	06/21/2018	Thursday	1:44 PM	60				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	MV1 accidentally backed into parked vehicle in work zone on 146 NB
52	07/15/18	Sunday	9:05 PM	25	41			No injury	Rear-end	Dark - lighted roadway	Clear	Dry	Followed too closely	MV1 was heading NB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
53	07/17/18	Tuesday	4:07 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
54	07/28/18	Saturday	10:30 PM	30	35			No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	MV1 was heading SB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
55	08/05/18	Sunday	5:45 PM	60	33			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Operating defective equipment	MV1 was stopped at the light on Rt 146 while travelling SB. MV2 failed to stop and rear-ended MV1
56	08/15/18	Wednesday	12:25 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
57	09/06/18	Thursday	7:48 AM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	MV1 was heading NB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
58	09/14/18	Friday	12:58 PM	Unknown	Unknown	17		No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	MV1 was heading NB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
59	09/16/18	Sunday	10:20 AM	32	28	17		No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was heading WB on Boston Rd stoppped at a red light. MV2 failed to stop and rear-ended MV1. MV1 was pushed into MV3
60	9/24/18	Monday	5:46 AM	55	19			No injury	Rear-end	Dark - lighted roadway	Cloudy	Dry	Followed too closely	MV1 was heading eastbound on boston road and stopped suddenly for a amnimal. MV2 failed to stop and rear-ended MV1.
61	09/27/18	Thursday	6:31 AM	28	34			Non-incapacitating	Angle	Daylight	Clear	Dry	Made an improper turn	MV1 was traveling NB on 146 and attempted to make a left turn onto Boston Rd. MV2 was heading SB on 146. MV2 struck MV1.
62	10/12/18	Friday	11:24 AM	29	25			No injury	Rear-end	Daylight	Cloudy	Dry	Followed too closely	MV1 was heading NB on 146 slowing for a vehicle ahead. MV2 failed to stop and rear-ended MV1.
63	10/13/18	Saturday	1:17 PM	66	38			No injury	Rear-end	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 was heading NB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
64	10/15/2018	Monday	11:28 AM	46	35			No injury	Rear-end	Daylight	Rain	Wet	Driving too fast for conditions	MV1 waiting at red light on 146 SB, struck by MV2 from behind who was unable to stop in time.

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
65	10/19/18	Friday	5:42 PM	49	27	20		No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1, MV2, MV3 were traveling SB on 146. MV1 stopped in traffic. MV2 then rear-ended MV1. Then MV3 rear-ended MV2
66	10/26/18	Friday	9:57 PM	33	33			No injury	Rear-end	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	on 146 SB MV1 and MV2 rear-ended after an incident of road rage.
67	10/28/18	Sunday	6:35 PM	57	59			Non-incapacitating	Rear-end	Dark - lighted roadway	Clear	Dry	Followed too closely	MV1 was stopped at the intersection, MV2 was traveling NB on 146, failed to stop and rear-ended MV1
68	10/31/18	Wednesday	6:48 PM	27	Unknown			No injury	Sideswipe, same direction	Dusk	Clear	Dry	Failure to keep in proper lane or running off road	MV1 and MV2 were heading SB on 146. MV1 attempted to change lanes and struck MV2.
69	11/06/18	Tuesday	6:48 AM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
70	11/15/18	Thursday	7:18 PM	20	49			No injury	Rear-end	Dark - lighted roadway	Snow	Snow	Driving too fast for conditions	MV1 was stopped at the light on Rt 146 while travelling SB. MV2 failed to stop due to the snow and rear-ended MV1
71	11/17/18	Saturday	9:28 PM	66	17			Non-incapacitating	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 attempted to make a u turn on 146 NB. MV1 realized this was impossible, and tried to change lanes to the right and struck MV2.
72	11/29/2018	Thursday	9:55 AM	57	30			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 swerved to right lane to avoid construction zone, could not stop in time before striking MV2 in the rear on 146 NB
73	12/01/18	Saturday	6:05 PM	52	17			No injury	Rear-end	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 and MV2 were heading SB on 146. MV1 attempted to change lanes and struck MV2.
74	12/06/18	Thursday	7:23 AM	17	28			No injury	Angle	Daylight	Clear	Dry	Made an improper turn	MV1 and MV2 were heading NB on 146 MV1 attempted to make an illegal left turn from the center lane of 146 and struck MV2.
75	12/08/18	Saturday	7:39 AM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	on 146 NB MV1 sideswiped MV2 when attempting to switch lanes
76	12/12/18	Wednesday	11:11 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Disregarded traffic signs, signals, road markings	on 146 NB MV1 sideswiped MV2 when attempting to switch lanes
77	12/15/18	Saturday	11:28 AM	46	35			No injury	Rear-end	Daylight	Rain	Wet	Followed too closely	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
78	12/17/18	Monday	1:56 PM	44	47			No injury	Rear-end	Daylight	Cloudy	Dry	Followed too closely	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
79	12/18/18	Tuesday	8:30 AM	22	31			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 was stopped at the light on Rt 146 while travelling SB. MV2 failed to stop due to the snow and rear-ended MV1
80	01/01/19	Tuesday	7:03 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
81	01/11/2019	Friday	10:45 AM	48	54			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV2 stopped for traffic on 146 NB, MV1 was unable to stop in time and collided with the rear of MV2
82	01/29/2019	Tuesday	8:25 AM	43	27	Unknown	Unknown	No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV3 and MV4 were stopped for traffic on 146 NB. MV2 unable to stop and collided with rear of MV3, propelling it into rear of MV4. MV1 also unable to stop and collided with rear of MV2.
83	01/31/19	Thursday	11:03 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
84	02/13/19	Wednesday	7:25 AM	23	49			Non-incapacitating	Rear-end	Daylight	Sleet, hail, freezing rain	Ice	Driving too fast for conditions	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
85	02/13/19	Wednesday	5:25 PM	62	34			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Failed to yield right of way	on Boston Rd EB MV1 sideswiped MV2 when attempting to switch lanes
86	02/15/19	Friday	7:57 AM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
87	02/18/19	Monday	1:16 PM	36	55			No injury	Rear-end	Daylight	Snow	Wet	Distracted	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
88	02/22/19	Friday	7:38 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Unknown	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
89	02/23/19	Saturday	6:33 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
90	03/01/2019	Friday	1:05 PM	43	73			No injury	Angle	Daylight	Clear	Dry	Failed to yield right of way	MV1 leaving gas station to enter 146 NB, struck MV2 in right lane
91	03/02/19	Saturday	5:58 PM	26	36			Non-incapacitating	Rear-end	Daylight	Cloudy	Dry	Inattention	MV1 was stopped at the light on Rt 146 while travelling NB. MV2 failed to stop due to the snow and rear-ended MV1.
92	03/29/19	Friday	3:38 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
93	04/04/19	Thursday	9:19 AM	33	21	93	40	Non-incapacitating	Rear-end	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1, MV3 and MV4 were heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1, MV3 and MV4.
94	04/13/19	Saturday	3:38 PM	69	24	21	26	Non-incapacitating	Angle	Daylight	Clear	Dry	Made an improper turn	MV1 was traveling NB on 146 and attempted to make a left turn onto Boston Rd. MV2 was heading SB on 146. MV2 struck MV1. MV2 was then rear-ended by MV3. MV3 was then rear-ended by MV4.
95	04/25/19	Thursday	10:55 AM	23	50			No injury	Sideswipe, same direction	Daylight	Clear	Dry	Followed too closely	MV2 was traveling SB on 146, swerved to avoid a stalled vehicle in the lane and sideswiped an adjacent car.
96	05/08/19	Wednesday	4:28 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date mm/dd/yy	Crash Day Day	Time of Day hh:mm	Driver 1 Age	Driver 2 Age	Driver 3 Age	Driver 4 Age	Injury Status Type	Manner of Collision Type	Light Condition Type	Weather Condition Type	Road Surface Type	Driver Contributing Code Type	Comments
97	05/25/19	Saturday	3:02 PM	59	31			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
98	05/31/19	Friday	8:51 AM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 attempted to back up into the gas station driveway and struck a vehicle trying to exit
99	06/10/2019	Monday	10:19 PM	20				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	No improper driving	MV1 struck a deer while traveling SB on 146
100	06/21/19	Friday	10:49 PM	22	57			No injury	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	MV1 and MV2 were traveling NB on 146. MV1 attempted to chage lanes and sideswiped MV2.
101	06/29/19	Saturday	1:02 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Followed too closely	Unknown
102	07/16/19	Tuesday	9:11 AM	20	49			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 and MV2 were traveling NB on 146. MV1 was stopped at the light, MV2 failed to stop and rear-ended MV1.
103	07/25/19	Thursday	6:48 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
104	07/28/19	Sunday	6:21 AM	24	36	51		Non-incapacitating	Rear-end	Daylight	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1, MV3 were heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1 and sideswiped MV3.
105	08/17/19	Saturday	10:43 AM	25	54			No injury	Rear-end	Daylight	Cloudy	Dry	Inattention	MV1 (Heavy Vehicle) and MV2 (Heavy Vehicle) were traveling NB on 146. MV1 was stopped at the light, MV2 failed to stop and rear-ended MV1.
106	08/18/19	Sunday	11:52 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
107	09/10/19	Tuesday	3:50 PM	45	48			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 and MV2 were traveling NB on 146. MV1 was stopped at the light, MV2 failed to stop and rear-ended MV1.
108	09/30/19	Monday	5:17 PM	23	17			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 was heading SB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
109	10/11/19	Friday	4:28 PM	21	48	42	22	No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was stopped while travelling SB on 146. MV2 failed to stop and rear-ended MV1. MV3 and MV4 subsequently rear-ended MV2.
110	10/11/19	Friday	6:40 AM	63	25			No injury	Angle	Dawn	Clear	Dry	Made an improper turn	MV1 was heading WB on Boston Rd. MV2 attempted to make an improper turn Left out of the BoA driveway and struck MV1.
111	10/16/2019	Wednesday	8:00 AM	22	49	Unknown		No injury	Rear-end	Daylight	Clear	Dry	Driving too fast for conditions	MV1 attempted to switch lanes to right, struck rear of MV3, corrected, then sideswiped MV2 on 146 NB
112	10/22/19	Tuesday	6:04 AM	39	33			Non-incapacitating	Rear-end	Dark - lighted roadway	Rain	Wet	Distracted	MV1 was heading WB on Boston Rd stopped at a red light. MV2 failed to stop and rear-ended MV1.

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
113	12/01/19	Sunday	6:00 PM	61	61			No injury	Sideswipe, same direction	Dark - lighted roadway	Snow	Snow	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 and MV2 were traveling SB on 146. MV2 lost control in the snow and struck MV1.
114	12/06/19	Friday	8:25 AM	30				No injury	Single vehicle crash	Daylight	Clear	Wet	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 was heading SB on 146. MV1 lost control and collided with a snow bank on the far side of the intersection.
115	12/30/2019	Monday	7:29 PM	24	61	52		No injury	Rear-end	Dark - lighted roadway	Snow	Snow	Followed too closely	MV1 collided with rear of MV2, pushing it into MV3 on 146 SB
116	01/12/20	Sunday	10:11 PM	33				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	On 146 NB, MV1 lost control and crashed on the right side of the road
117	02/11/20	Tuesday	10:02 AM	81	56			No injury	Rear-end	Daylight	Clear	Dry	Other improper action	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
118	03/11/20	Wednesday	8:21 PM	24	44			No injury	Rear-end	Dark - lighted roadway	Clear	Dry	Other improper action	MV1 was stopped on 146 SB. MV2 failed to stop and Rear-ended MV1.
119	03/20/20	Friday	2:29 PM	19	62			No injury	Rear-end	Daylight	Rain	Wet	Followed too closely	MV1 was heading NB on 146 stoppped at a red light. MV2 failed to stop and rear-ended MV1.
120	3/29/20	Sunday	10:03 AM	69	34			No injury	Sideswipe, same direction	Daylight	Rain	Wet	Unknown	MV1 and MV2 were turning left from route 146 SB in adjacent lanes. MV1 sideswiped MV2
121	04/17/20	Friday	6:47 PM	45	54			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
122	4/18/20	Saturday	5:35 PM	57	42			Non-incapacitating	Rear-end	Daylight	Snow	Wet	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	on Route 146 NB, MV1 collided with MV2.
123	04/26/20	Sunday	8:45 PM	39	26			Non-incapacitating	Sideswipe, same direction	Dark - roadway not lighted	Rain	Wet	Exceeded authorized speed limit	MV1 and MV2 were traveling NB just past the intersection. MV1 was speeding, and sideswiped MV2.
124	5/3/20	Sunday	1:43 PM	59	61			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 and MV2 were travelling NB in 146 in the rightmost lane. MV1 stopped before turning right. MV2 failed to notice and rear-ended MV1.
125	05/12/20	Tuesday	2:30 PM	32	29			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Distracted	MV1 was stopped on 146 NB. MV2 was distracted; failed to stop and Rear-ended MV1.
126	07/16/20	Thursday	8:27 AM	25	61			No injury	Sideswipe, same direction	Daylight	Clear	Dry	Fatigued/asleep	on 146 SB MV1 sideswiped MV2 when attempting to switch lanes
127	07/30/20	Thursday	12:15 PM	24	32			No injury	Angle	Daylight	Clear	Dry	Failed to yield right of way	MV was heading EB on Boson Rd approaching the intersection. MV2 pulled out of the plaza driveway onto Boston Rd and struck MV1.
128	07/30/20	Thursday	4:18 PM	Unknown	Unknown			Non-incapacitating	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date mm/dd/yy	Crash Day Day	Time of Day hh:mm	Driver 1 Age	Driver 2 Age	Driver 3 Age	Driver 4 Age	Injury Status Type	Manner of Collision Type	Light Condition Type	Weather Condition Type	Road Surface Type	Driver Contributing Code Type	Comments
129	08/03/20	Monday	4:37 PM	Unknown	Unknown			Non-incapacitating	Rear-end	Unknown	Unknown	Unknown	Distracted	MV1 was heading EB on Boston Rd stopped at a red light. MV2 failed to stop and rear-ended MV1.
130	08/06/20	Thursday	11:46 AM	37	42			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Distracted	MV1 was stopped on 146 NB. MV2 was distracted; failed to stop and Rear-ended MV1.
131	08/10/20	Monday	7:20 AM	42	33			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 was stopped on 146 SB. MV2 was distracted; failed to stop and Rear-ended MV1.
132	09/30/20	Wednesday	6:40 AM	Unknown	Unknown			Non-incapacitating	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
133	10/19/20	Monday	1:43 PM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	No improper driving	On 146 NB MV1 and MV2 were travelling in adjacted lanes, both vehicles were close to the dash white line and sideswiped each other.
134	11/17/20	Tuesday	5:17 PM	42	42			No injury	Rear-end	Dark - roadway not lighted	Clear	Dry	Distracted	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
135	11/24/20	Tuesday	1:24 PM	Unknown				No injury	Single vehicle crash	Unknown	Unknown	Unknown	Unknown	Unknown
136	11/29/20	Sunday	1:49 PM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
137	12/10/20	Thursday	12:47 PM	57	29	59		No injury	Rear-end	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 was heading SB on 146 stopped at a left turn red light. MV2 failed to stop and rear-ended MV1.
138	12/18/20	Friday	1:05 PM	64	25	44		No injury	Angle	Daylight	Cloudy	Dry	Visibility obstructed	MV1 was exiting XtraMart Driveway, failed to notice MV2 heading NB in the right most lane of 146. MV1 struck MV2.
139	01/11/21	Monday	4:10 PM	32	32			No injury	Rear-end	Dusk	Cloudy	Dry	Inattention	MV1 was stopped at the light on Rt 146 SB. MV2 was distracted and rear-ended MV1
140	01/14/21	Thursday	5:43 PM	35	22			No injury	Sideswipe, same direction	Dark - roadway not lighted	Rain	Wet	Inattention	on Boston Rd EB MV1 sideswiped MV2 when attempting to switch lanes
141	02/16/2021	Tuesday	4:39 PM	29	57			No injury	Rear-end	Daylight	Clear	Dry	Physical impairment	On Route 146 SB in the left turn lanes MV2 was stopped for a red light. MV1 failed to stop and rear-ended MV2.
142	02/19/21	Friday	7:47 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
143	02/26/21	Friday	10:24 AM	19	52			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was slowing down at Rt. 146 SB light. MV2 rear-ended MV1.
144	02/27/21	Saturday	1:24 AM	26	63			Non-incapacitating	Angle	Dark - lighted roadway	Clear	Dry	Made an improper turn	MV1 was traveling NB on 146 and attempted to make a left turn onto Boston Rd. MV2 was heading SB on 146. MV2 struck MV1.

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
145	02/27/21	Saturday	1:35 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
146	03/13/21	Saturday	6:50 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Unknown	Unknown
147	03/25/21	Thursday	1:25 AM	45				No injury	Single vehicle crash	Dark - roadway not lighted	Clear	Dry	No improper driving	just before the intersection while heading NB on 146, MV1 struck a animal in the road.
148	03/27/21	Saturday	12:45 PM	32	41			No injury	Sideswipe, same direction	Daylight	Clear	Dry	Made an improper turn	MV1 was heading NB on 146, attempted to make a U-Turn and Struck MV2 who was heading SB on 146.
149	03/31/21	Wednesday	11:27 AM	30	74			No injury	Angle	Daylight	Clear	Dry	Failed to yield right of way	MV1 was heading EB on Boston Rd with a green light. MV2 was heading SB on 146, failed to stop for the red light and struck the side of MV1.
150	03/31/21	Wednesday	11:24 PM	Unknown				No injury	Single vehicle crash	Unknown	Unknown	Unknown	Unknown	On 146 NB, MV1 lost control and crashed on the right side of the road
151	04/22/21	Thursday	11:36 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
152	04/26/21	Monday	6:31 PM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
153	06/04/21	Friday	5:40 PM	46	25			No injury	Rear-end	Daylight	Cloudy	Wet	Followed too closely	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
154	06/10/21	Thursday	6:52 AM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 was heading SB on 146 stopped at a light. MV2 was stopped ahead of MV1 and backed up into MV1
155	06/11/21	Friday	9:44 AM	Unknown				No injury	Single vehicle crash	Unknown	Unknown	Unknown	No improper driving	On 146 SB MV1 struck a deer.
156	06/16/21	Wednesday	11:17 AM	47	72			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Distracted	MV1 struck MV2 as MV1 was switching lanes on 146 NB.
157	06/18/21	Friday	6:07 PM	58	52			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
158	06/22/21	Tuesday	4:02 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Unknown	Unknown
159	07/08/21	Thursday	7:30 AM	29	31	30		No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV2 and MV3 were stopped in traffic heading NB on 146. MV1 failed to stop and rear-ended MV2. MV2 then rear-ended MV3.
160	08/02/21	Monday	8:22 AM	Unknown	Unknown			No injury	Sideswipe, same direction	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	on 146 NB MV1 sideswiped MV2 when attempting to switch lanes

Crash Data Summary Table

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date mm/dd/yy	Crash Day Day	Time of Day hh:mm	Driver 1 Age	Driver 2 Age	Driver 3 Age	Driver 4 Age	Injury Status Type	Manner of Collision Type	Light Condition Type	Weather Condition Type	Road Surface Type	Driver Contributing Code Type	Comments
161	08/19/21	Thursday	10:00 AM	18				No injury	Single vehicle crash	Daylight	Rain	Water (standing, moving)	Driving too fast for conditions	MV1 was traveling NB on 146, lost control on a wet road and struck the guardrail.
162	08/27/21	Friday	6:04 PM	19	60	37		Non-incapacitating	Rear-end	Daylight	Clear	Dry	Followed too closely	MV2 and MV3 were stopped in traffic heading SB on 146. MV1 failed to stop and rear-ended MV2. MV2 then rear-ended MV3.
163	09/03/2021	Friday	2:07 PM	24	24			No injury	Rear-end	Daylight	Clear	Dry	Inattention	MV1 and MV2 stopped at red light on Route 146 SB. MV2 began rolling forward and rear-ended MV1.
164	09/03/21	Friday	4:55 PM	54	28	39		Non-incapacitating	Rear-end	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	MV2 and MV3 were stopped in traffic heading NB on 146. MV1 failed to stop and rear-ended MV2. MV2 then rear-ended MV3.
165	09/05/21	Sunday	8:28 PM	18	32			No injury	Angle	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	MV1 was traveling WB on boston rd, passed thru the intersection on a red light MV2 was traveling SB on 146, and struck MV1 in the middle of the intersection.
166	09/10/21	Friday	4:30 PM	59	17	31		Non-incapacitating	Rear-end	Daylight	Clear	Dry	Distracted	MV2 and MV3 were stopped in traffic heading NB on 146. MV1 failed to stop and rear-ended MV2. MV2 then rear-ended MV3.
167	09/10/21	Friday	4:58 PM	55	68	37		No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV2 and MV3 were stopped in traffic heading SB on 146. MV1 failed to stop and rear-ended MV2. MV2 then rear-ended MV3.
168	09/16/21	Thursday	10:30 AM	56	39			No injury	Angle	Daylight	Clear	Dry	Failed to yield right of way	MV1 was traveling West on Boston Rd and tried to turn left into BofA. MV2 was traveling East on Boston Rd and struck MV1.
169	10/01/21	Friday	12:19 AM	26				No injury	Single vehicle crash	Dark - roadway not lighted	Clear	Wet	Fatigued/asleep	MV1 Was traveling SB on 146, lost control and struck the median barrier.
170	10/01/21	Friday	12:03 AM	36				No injury	Single vehicle crash	Dark - lighted roadway	Clear	Other	No improper driving	just after the intersection while heading NB on 146, MV1 struck a animal in the road.
171	10/25/21	Monday	2:30 PM	17	63			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Inattention	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
172	10/30/21	Saturday	7:08 PM	63	66			No injury	Angle	Dark - lighted roadway	Rain	Wet	Disregarded traffic signs, signals, road markings	MV1 and MV2 were traveling SB on 146 in adjacent SB left lanes. MV1 tried to go striaght and struck MV2.
173	11/17/21	Wednesday	8:56 AM	62	19			Non-incapacitating	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 turned right onto 146 NB from Boston rd. MV2 came up 146 NB at a high rate of speed. MV2 rear-ended MV1.
174	11/20/21	Saturday	4:18 PM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
175	12/08/21	Wednesday	3:58 PM	41	75			No injury	Rear-end	Daylight	Cloudy	Dry	Followed too closely	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
176	12/15/21	Wednesday	9:12 PM	54	53			No injury	Rear-end	Dark - lighted roadway	Rain	Wet	Followed too closely	MV1 and MV2 were in the SB left turn lanes when MV1 slowed down abruptly to avoid being hit by a vehicle not involved in the crash. MV2 then rear-ended MV1.

Crash Data Summary Table

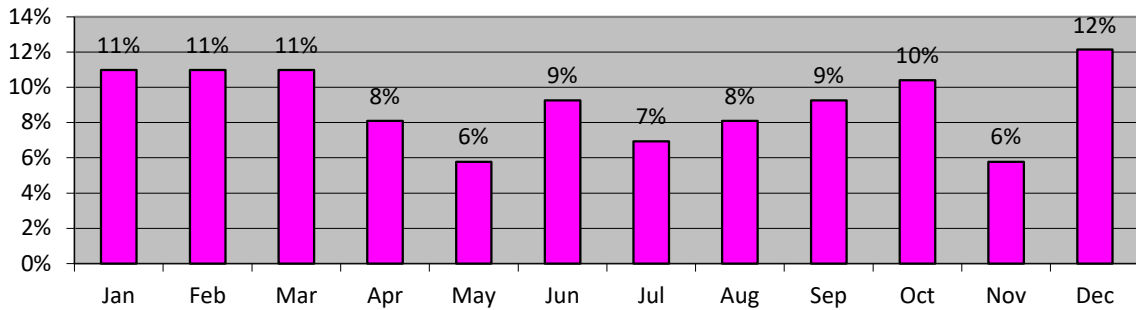
Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA
2017 - 2022

Crash Diagram Ref #	Crash Date	Crash Day	Time of Day	Driver 1	Driver 2	Driver 3	Driver 4	Injury Status	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Comments
#	mm/dd/yy	Day	hh:mm	Age	Age	Age	Age	Type	Type	Type	Type	Type	Type	
177	01/07/22	Friday	3:56 AM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
178	01/21/22	Friday	3:50 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Distracted	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
179	01/22/22	Saturday	10:20 AM	78	50			Non-incapacitating	Sideswipe, same direction	Daylight	Clear	Dry	Distracted	MV1 was traveling NB on 146, lost control and struck a utility pole, MV1 then collided with MV2
180	02/02/22	Wednesday	5:54 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
181	02/09/22	Wednesday	6:45 PM	Unknown	Unknown	Unknown		No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
182	02/14/22	Monday	5:28 PM	31	26			No injury	Rear-end	Daylight	Clear	Dry	Followed too closely	MV1 was stopped on 146 NB. MV2 failed to stop and Rear-ended MV1.
183	02/15/22	Tuesday	5:00 PM	Unknown	Unknown	Unknown		Non-incapacitating	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
184	03/01/22	Tuesday	3:23 PM	Unknown				Non-incapacitating	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
185	03/10/22	Thursday	1:01 PM	Unknown	Unknown			No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
186	04/23/22	Saturday	10:05 AM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown
187	04/29/22	Friday	5:09 PM	Unknown	Unknown			No injury	Rear-end	Unknown	Unknown	Unknown	Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner	MV1 was heading NB on 146 stopped at a red light. MV2 failed to stop and rear-ended MV1.
188	05/16/22	Monday	1:15 PM	Unknown				No injury	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown

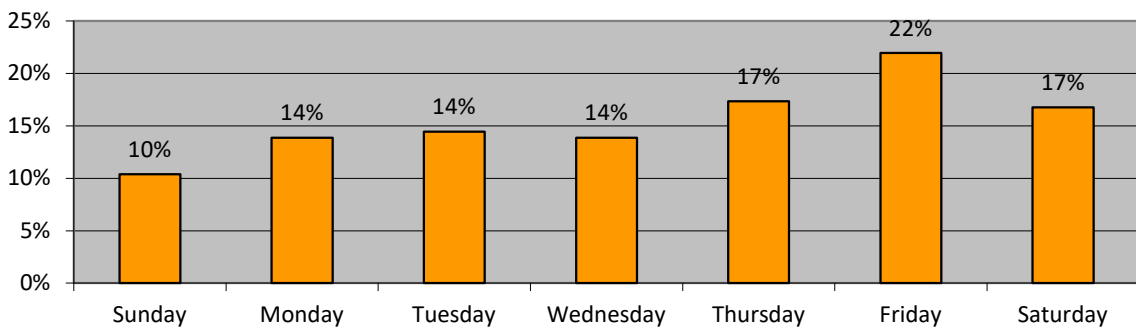
Crash Data Summary Charts

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA

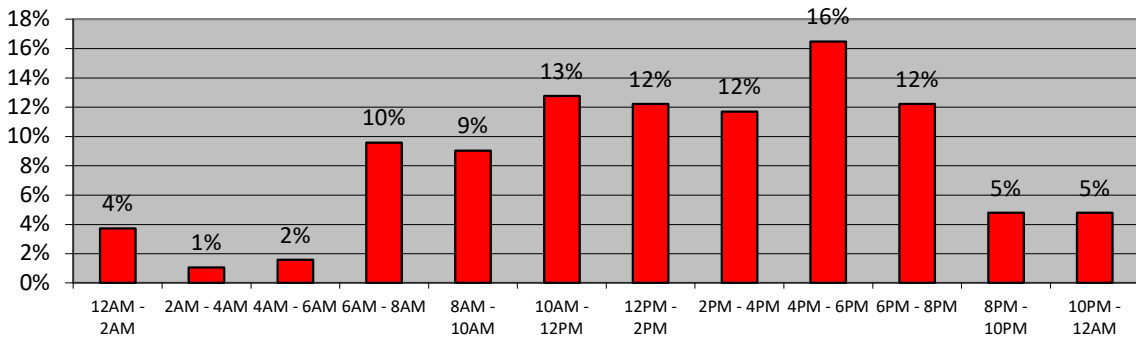
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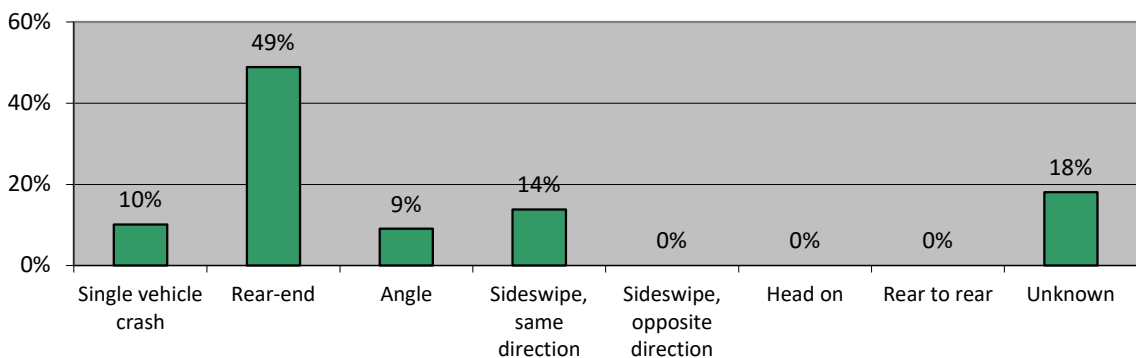
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CRASH TIME OF DAY



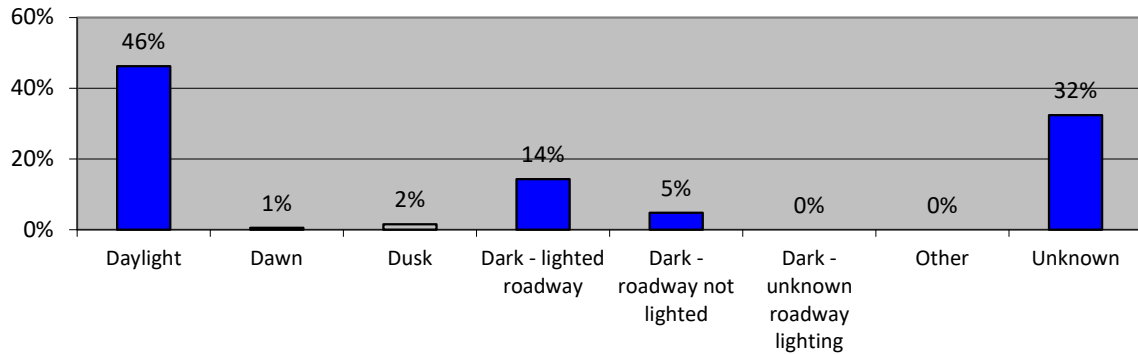
CRASH MANNER OF COLLISION



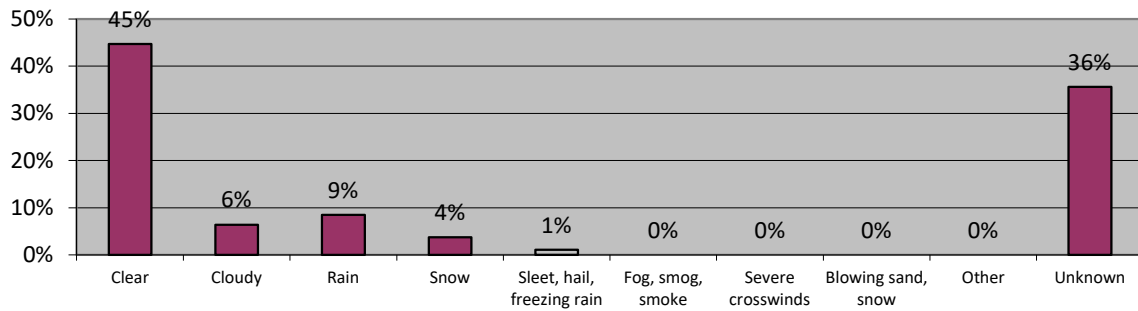
Crash Data Summary Charts

Worcester-Providence Turnpike (Route 146) at Boston Road, Sutton, MA

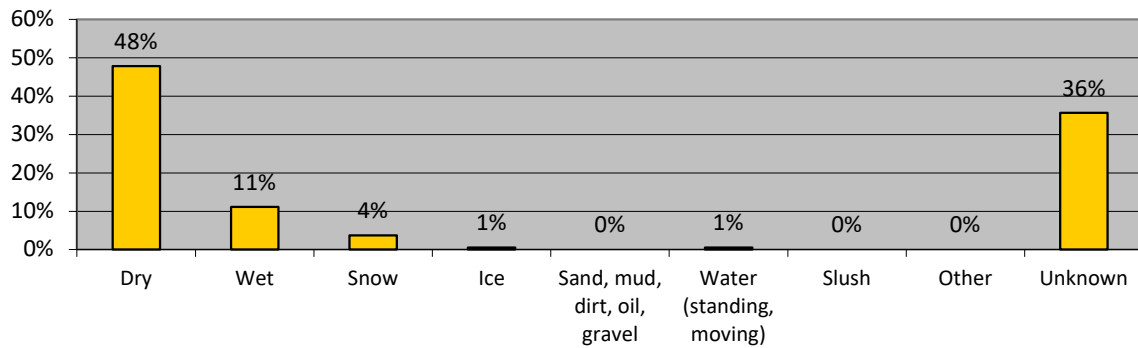
CRASH LIGHT CONDITION



CRASH WEATHER CONDITION



CRASH ROAD SURFACE



Appendix E. Additional Resources

GEOMETRIC DESIGN	
Issue	Comment
A. Speed – (Design Speed; Speed Limit & Zoning; Sight Distance; Overtaking)	
<p>Are there speed-related issues along the corridor? Please consider the following elements:</p> <ul style="list-style-type: none"> • 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	
<p>With respect to the roadway alignment and cross-section please consider the appropriateness of the following elements:</p> <ul style="list-style-type: none"> • 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	
<p>For intersections along the corridor please consider all potential safety issues. Some specific considerations should include the following:</p> <ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • 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	
<p>For the roadside the major considerations are clear zone issues and crash barriers. Consider the following:</p> <ul style="list-style-type: none"> • Do there appear to be clear zones issues? <ul style="list-style-type: none"> — 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)	
<ul style="list-style-type: none"> • 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)	
<p>It is important to consider to the impacts of lighting. Some specifics include the following:</p> <ul style="list-style-type: none"> • 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	
<p>Signage is a critical element in providing a safe roadway environment. Please consider the following:</p> <ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • 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	
<ul style="list-style-type: none"> • Is the line marking and delineation: <ul style="list-style-type: none"> — 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
<p>With respect to roadway activity please consider safety elements related to the following:</p> <ul style="list-style-type: none"> • Pedestrians • Bicycles • Public transportation vehicles and riders • Emergency vehicles • Commercial vehicles • Slow moving vehicles 	

ENVIRONMENTAL CONSIDERATIONS	
Issue	Comment
Weather & Animals	
<p>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:</p> <ul style="list-style-type: none"> • 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 F. Road Safety Audit References

Road Safety Audit References

Massachusetts Traffic Safety Toolbox, Massachusetts Highway Department,
www.mhd.state.ma.us/safetytoolbox.

Road Safety Audits, A Synthesis of Highway Practice. NCHRP Synthesis 336. Transportation Research Board, National Cooperative Highway Research Program, 2004.

Road Safety Audits. Institute of Transportation Engineers and U.S. Department of Transportation, Federal Highway Administration, www.roadwaysafetyaudits.org.

FHWA Road Safety Audit Guidelines. U.S. Department of Transportation, Federal Highway Administration, 2006.

Road Safety Audit, 2nd edition. Austroads, 2000.

Road Safety Audits. ITE Technical Council Committee 4S-7. Institute of Transportation Engineers, February 1995.