

# ROAD SAFETY AUDIT

## BMC Area Traffic Circulation Improvements

City of Pittsfield

FINAL REPORT April 7, 2016

Prepared For:  
MassDOT



On Behalf Of:  
City of Pittsfield



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# Table of Contents

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## Contents

<b>Background .....</b>	<b>1</b>
<b>Project Data.....</b>	<b>1</b>
<b>Project Location and Description .....</b>	<b>2</b>
<b>Audit Observations .....</b>	<b>7</b>
Study Area Safety Issues .....	7
First Street and Burbank Street .....	8
First Street and Tyler Street .....	9
First Street at Stoddard Avenue and North Street at BMC Driveway .....	10
North Street and Charles Street.....	12
North Street and Springside Avenue .....	13
<b>Potential Safety Enhancements .....</b>	<b>15</b>
Study Area Safety Enhancements .....	15
First Street and Burbank Street .....	15
First Street and Tyler Street .....	16
First Street at Stoddard Avenue and North Street at BMC Driveway .....	17
North Street and Charles Street.....	18
North Street and Springside Avenue .....	19
<b>Summary of Road Safety Audit.....</b>	<b>21</b>

## List of Appendices

Appendix A.	RSA Meeting Agenda
Appendix B.	RSA Audit Team Contact List
Appendix C.	Detailed Crash Data
Appendix D.	Traffic Volume Figures

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## List of Figures

Figure 1: Locus Map .....	3
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## List of Tables

Table 1: Participating Audit Team Members .....	2
Table 2: Estimated Time Frame and Costs Breakdown .....	21
Table 3: Potential Safety Enhancement Summary .....	22

## Background

The City of Pittsfield, Massachusetts has initiated a traffic circulation improvement project for the Berkshire Medical Center (BMC) area. This project was recommended by the Downtown Pittsfield Circulation Study, completed in June 2006 by Berkshire Regional Planning Commission (BRPC) in cooperation with the City of Pittsfield, to improve north-south traffic flow of the area surrounding BMC. The project will also address background safety issues identified in the corridor under the Federal Highway Safety Improvement Program (HSIP). As such, MassDOT has incorporated a Roadway Safety Audit as a requirement for securing HSIP funds for this project.

The Federal Highway Administration (FHWA) defines a Road Safety Audit (RSA) as “the formal safety performance examination of an existing or future road or intersection by an independent, multidisciplinary team.” It is the task of the RSA team to identify potential safety issues and offer possible short and long term safety improvements. This report was prepared consistent with MassDOT’s RSA Guidelines and documents the RSA conducted on January 22, 2016 at the following intersections:

1. First Street at Burbank Street
2. First Street at Tyler Street
3. North Street and First Street at Stoddard Avenue and BMC Driveway
4. North Street at Charles Street
5. North Street at Springside Street

Both the design and construction of the proposed improvements will be funded through the MassDOT Transportation Improvement Program. The project is currently under preliminary design and 25% Design plans have not been submitted. The improvements recommended by this RSA will be incorporated into the planned reconstruction project to the greatest extent practicable.

## Project Data

The audit team conducted an RSA at the study area intersections in Pittsfield, MA on Friday January 22, 2016. The RSA team members met to review background material, conduct an on-site evaluation, and discuss recommendations. A copy of the RSA agenda is provided in Appendix A. A list of all participating audit team members, along with affiliation, is provided in Table 1 below. The contact information for all audit team members can be found in Appendix B.

Vehicle, bicycle, and pedestrian crash data is collected on a yearly basis from accident reports submitted to the Registry of Motor Vehicles for comparison with regional and statewide trends. The location and severity of these crashes are assessed to inform the data-driven Strategic Highway Safety Plan (SHSP). Under this plan, MassDOT endeavors to reduce the number of fatal and injury crashes by targeting high crash locations (Crash Clusters) through the HSIP.

The area for the proposed improvement project and this RSA has five Crash Clusters identified by the BRPC as within the top five percent. First, a HSIP Pedestrian Crash Cluster for the years between 2004 and 2013 is located along First Street and North Street. Specifically, the intersections of First Street at Burbank Street and First Street at Tyler Street are within the cluster, which extends to about 100 feet south of Stoddard Avenue. Also, there are four HSIP Intersection Crash Clusters for the years between 2011 and 2013. These intersections are noted in the following list:

- First Street at Burbank Street
- First Street at Tyler Street
- North Street at Charles Street
- North Street at Springside Street

**Table 1: Participating Audit Team Members**

<b>Audit Team Member</b>	<b>Agency/Affiliation</b>
Mark Cancilla	Pittsfield Fire Department
James McIntyre	Pittsfield Police
John Mullin	Pittsfield Police
Matt Billetter	City of Pittsfield
David Turocy	City of Pittsfield
Tim Croce	City of Pittsfield
Clete Kus	Berkshire Regional Planning Commission
Lisa Schletzbaum	MassDOT
Peter Frieri	MassDOT
Patrick Tierney	MassDOT
Mary Ringie	MassDOT
Joseph LaRoche	Berkshire Medical Center (BMC)
William Van Duzer	Fuss & O'Neill
Dmitriy Mayboroda	Fuss & O'Neill

A collision diagram and summary of crash details was prepared for assessing possible safety issues during the RSA. Crash records for this evaluation were supplied by the Pittsfield Police Department. A copy of the background data that was given to the audit team members prior to the RSA meeting is included in Appendix C. Weekday morning and weekday afternoon peak hour traffic volume figures are provided in Appendix D.

## Project Location and Description

This BMC traffic circulation improvement project is located north of the City of Pittsfield's downtown area. The project location is shown on the Locus map (Figure 1) provided below. The RSA included five intersections in the project area on North Street and First Street. Descriptions of the existing roadways and intersections are provided below.

### **First Street**

First Street (Route 7) is an Urban Principal Arterial under the jurisdiction of the City of Pittsfield. The roadway width of First Street in the study varies between 37 feet and 50 feet. One travel lane in each direction is provided on First Street in the vicinity of the study area. Auxiliary turning lanes are provided at intersections of First Street and Burbank Street. A continuous sidewalk is provided along the east side of First Street in the study area. The sidewalk along the west side continues from the south until Tyler Street. First Street ends at its intersection with Stoddard Avenue and North Street where Route 7 continues as North Street.



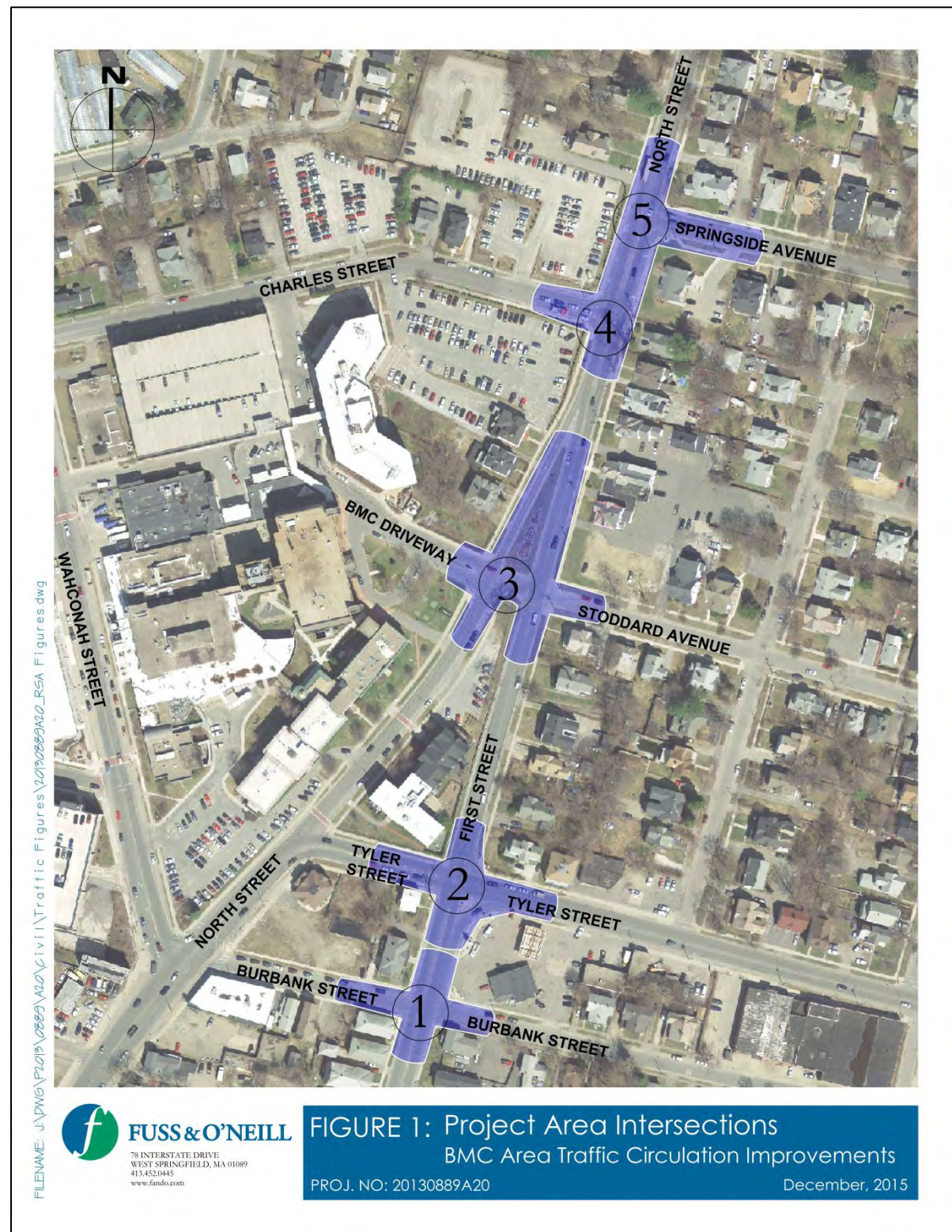


Figure 1: Locus Map

#### *First Street at Burbank Street*

First Street intersects Burbank Street forming an unsignalized four-way intersection. All four approaches consist of a single lane. The Burbank Street west approach is one way in the eastbound direction. The only approach at this intersection with a marked crosswalk is the east leg of Burbank Street.

#### *First Street at Tyler Street*

First Street intersects Tyler Street forming a four way signalized intersection. The First Street north approach consists of a left turn lane and a through lane. The south approach consists of a through lane and a channelized right turn lane. The channelized right-turn lane is free under yield control. The Tyler Street west approach consists of a single lane used for all movements. The east approach, on the other hand, has an auxiliary left turn lane and a shared through/right-turn lane. Crosswalks are provided across each of the four intersection approaches. The crosswalks are signalized with the exception of the channelized right-turn lane crossing.

#### *First Street at Stoddard Avenue/North Street*

First Street and Stoddard Avenue/North Street intersection is an unsignalized four way intersection. All four approaches to the intersection are single lane. The east and west minor street approaches to the intersection are stop-controlled. Crosswalks are provided across the south and east intersection approaches only. North Street approaches First Street at a skew angle of approximately 15 degrees. As a result, the North Street approach has a short distance of 50 feet to an adjacent intersection, which is described below.

### **North Street**

North Street is an Urban Principal Arterial under the jurisdiction of the City of Pittsfield that serves as the primary north-south arterial highway in the Downtown Pittsfield Central Business District (CBD). North Street intersects First Street at the intersection of Stoddard Avenue with a segment merging further north at the intersection with Charles Street. The roadway width of North Street in the study varies between 30 feet and 50 feet due to parking lanes and auxiliary turn lanes at various study area intersections. One continuous travel lane in each direction is provided on North Street in the vicinity of the study area. Continuous sidewalks are provided along both sides of North Street in the study area. Speed limit is posted at 30 mph.

Transit service is provided on North Street by Berkshire Regional Transit Authority (BRTA) Routes 7 and 16. While a shelter is provided near the intersection of North Street at Wahconah Street BRTA buses embark/disembark passengers only when flagged by transit riders.

#### *North Street at Stoddard Avenue*

North Street intersects Stoddard Avenue and the main driveway for the BMC forming a four-leg intersection. This intersection is only approximately 50 feet west of the First Street at Stoddard Avenue intersection, which is also unsignalized. The southbound approach of North Street is one way consisting of a single lane with free movement through the intersection. The south approach leg of intersection provides one travel lane shared for right and left turn movements with an adjacent parking lane. All northbound vehicles, except those turning into the BMC driveway, turn to the right and intersect First Street 50 feet to the east. The Stoddard Avenue east approach of the intersection is controlled by a stop sign and consists of a single lane used for left turn and through movements. Again, this approach is about 50 feet from First Street. The BMC Driveway approach west of the intersection is stop-controlled and consists of a single lane used for right-turn and through movements. Crosswalks are only provided across the west and south approaches of the intersection. Figure 2 below shows the intersection configuration.





Figure 2: First Street and Stoddard Avenue/North Street intersection

*North Street at Charles Street*

North Street at Charles Street is a signalized T-intersection. The Charles Street approach consists of an auxiliary left-turn lane and right- turn lane. The south approach on North Street consists of a through lane and an auxiliary left-turn lane. On the north approach, North Street consists of a through lane and an auxiliary right-turn lane. A Crosswalk is only provided across the Charles Street approach. This intersection is located approximately 150 feet south of the signalized intersection of North Street at Springside Avenue.

*North Street at Springside Avenue*

North Street at Springside Avenue is a signalized T-intersection. The northerly approach of North Street consists of a through lane and an auxiliary left-turn lane. The south approach provides a through lane and an auxiliary right-turn lane. The Springside Avenue approach consists of a left-turn lane and a right-turn lane. A Crosswalk is provided across the south and east approaches of the intersection.

**Existing Signal Operation:**

First Street and Tyler Street is a signalized intersection. The first phase services the left-turn movements and through movements of First Street in the southbound direction. Next, the northbound and southbound through movements are serviced along with the right turn moves. Afterwards, Tyler Street westbound left-turn movements and adjacent through moves are serviced. Finally, Tyler Street westbound and eastbound through movements are serviced along with the right turn moves.



North Street at Charles Street intersection traffic signal is coordinated with the North Street at Springside Avenue intersection traffic signal. During the first phase, the northbound left-turn movements onto Charles Street are serviced along with southbound left-turn movements onto Springside Avenue with a right-turn overlap from Springside Avenue. Next, the northbound and southbound through movements are serviced with permitted left-turns from North Street. Finally, the Charles Street and Springside Avenue movements are serviced.

## Audit Observations

Audit participants identified operational and safety issues based on a summary of the existing crash information and field observations. The issues identified apply to the corridor as a whole as well as to individual intersections. The corridor wide issues and intersection specific RSA findings are summarized below.

### **Study Area Safety Issues**

The following deficiencies were observed as a general condition throughout the RSA study area:

- **Roadway Lighting:** Twenty five out of eighty two (30.5%) crashes in the study area occurred during the dark hours of the day. The existing lighting infrastructure is obsolete, poorly spaced, and generally does not provide adequate, consistent illumination of the roadway. The Driver's ability to perceive and react to roadway conditions is reduced when subjected to variable lighting conditions. The current inconsistency between the well-lit areas and the areas without sufficient lighting could contribute to the crashes occurring during dark conditions, especially where pedestrians are involved.
- **Pedestrian Connectivity:** The existing configuration and lack of crosswalks at many locations results in poor pedestrian connectivity, which may increase the likelihood of illegal crossings. Crashes involving a pedestrian were noted near the intersection of First Street at Burbank Street (crash number 1,3 and 13) and near the intersection of First Street at Tyler Street (crash number 12). All of these crashes involve pedestrians crossing outside of a marked crosswalk.
- **Pedestrian Infrastructure:** Pedestrian accommodations are not compliant with current standards. Pedestrian ramps do not include detectable warning panels, push-button actuation, signal countdown display, or Accessible Pedestrian Signals (APS). Some of the existing sidewalks are in poor condition, which could present a tripping hazard.
- **Bicycle Accommodations:** There were no crashes involving bicycles during the reporting period reviewed. However, participants noted that separate bicycle accommodations are not provided on any of the study area roadways. The existing shoulder widths are not wide enough to provide a safe area for bicyclists to travel based on current bicycle accommodation standards.
- **Public Transportation:** There are no bus turnouts in the study area or signed bus stops, flag-stops are used for pick-up and discharge of passengers. Even though there were no reported crashes related to buses, this condition creates more potential conflict points due to the buses stopping within the vehicle stream when they pick-up/discharge passengers.



Image 1: Pedestrian ramp on North Street, south of BMC driveway

## ***First Street and Burbank Street***

- **Sight Line Obstructions:** The house in the south-west corner of the intersection blocks the sight line to the south (looking right) of vehicles exiting west leg of Burbank Street. The crash diagram for this intersection shows a majority of crashes (12 out of 14 or 86%) occurring at this intersection involved a vehicles going eastbound through the intersection. Audit participants noted the obstructed sight line as a potential factor contributing the eastbound crash experience.
- **Solar Glare:** Participants also noted solar glare as a potential impediment to sight lines. Burbank Street runs in an east-west direction and First Street runs north-south. There is a potential for solar glare affecting driver visibility on Burbank Street during sunrise and sunset as well as viewing to south on First Street during winter months.
- **Pedestrian Connectivity:** Apex ramps are installed at all four corners of the intersection, but there is only one marked crosswalk that is located across the east intersection approach. Participants noted the high desire for pedestrians to access the 24 hour convenience store at the corner of this intersection. Three pedestrian crashes happened at this intersection within the last three years (Crash numbers 1, 3 and 13 on the crash diagram). The lack of marked crossings on First Street where there is a desire for pedestrians to cross results in illegal crossings outside marked cross walks. This condition, along with the pedestrian crash experience, presents a safety concern at this intersection.
- **Signage:** Traffic control signs at and near this intersection are severely faded and are no longer effective for traffic control. Image 2 shows a “No Left Turn” sign with the legend faded.
- **Access Management:** There is a 42-foot driveway opening on the east side of First Street just north of the intersection with Burbank Street for the Shell gas station. This driveway is one of three curb-cuts for the gas station. During the audit, participants observed vehicles making an illegal left-turn from the driveway. Left-turning vehicles from this driveway are a potential contributing factor to angle collisions the Burbank Street intersection. Left-turns exiting the driveway are competing for gaps southbound on First Street with vehicles eastbound on Burbank Street. Angle Crashes such as numbers 5, 6, and 12 may have been caused by this issue. In addition, left-turns entering and exiting the Shell driveway must cross the queued traffic for the signal at the intersection with Tyler Street.



Image 2: Faded route marker sign



Image 3: “No Left Turn” sign at the gas station driveway, north of Burbank Street

- **Poor Compliance with Turn Prohibition:** As stated under the previous issue, vehicles make an illegal left-turn from the driveway Shell gas station driveway. Participants also noted the poor condition and placement location, to the left of the driveway and away from exiting vehicles, of the existing “No Left-Turn” sign (R3-2L). The driveway is 42 feet wide without channelizing geometry or physical barrier that would discourage left turns from the driveway. Image 4 shows this wide driveway.



Image 4: Looking easterly at the 42-foot gas station driveway, north of Burbank Street  
Source: Google Maps

- **Cut-Through Traffic:** Audit participants mentioned drivers use the Shell gas station’s Tyler Street and First Street driveways as a cut-through to avoid waiting at the signal for the First Street at Tyler Street intersection.
- **First Street at Tyler Queuing:** The northbound queue from the First Street at Tyler Street signal spills back through the intersection with Burbank Street. Under this condition eastbound vehicles from Burbank Street need to negotiate through the standing queue on First Street. This crossing maneuver may be causing angle collisions with northbound vehicles passing on the right of queued vehicles. There is roadway width north of Burbank Street for through traffic and right-turning traffic and, while lanes are not clearly marked, there is sufficient bypass width. Crash numbers 2, 4, 8, and 14 may have been caused by this issue.

## ***First Street and Tyler Street***

- **Traffic Signal Equipment:** Traffic signal equipment and timings at this intersection are obsolete and do not meet current design and equipment standards. For example, there is no emergency vehicle pre-emption or backplates on the signal heads. Signal operation is semi-actuated and participants noticed the loop detectors were not working properly leaving the signal unresponsive to traffic demand. This results in long queues that spill back into adjacent intersections, such as North Street at Tyler Street and First Street at Burbank Street.
- **Curb Cuts:** There are multiple driveways for residential and commercial properties in close proximity to the intersection. One of the three Shell gas station driveway openings is located within the radius of the channelized right on the southeast corner of the intersection. Crash numbers 7, 8 and 26 at this intersection might have been caused by this issue.
- **Signage:** Many of the traffic control signs in the vicinity of this intersection are faded and/or not compliant with the current standards for retroreflectivity. The advanced pedestrian crossing sign (W11-2) for the channelized right turn is partially blocked by the gas station sign.



Image 5: Gas Station driveway to the west of the intersection. Source: Google Earth

- **Drainage:** Audit participants noted that the storm drainage system at the sag curve just north of the intersection on First Street floods during heavy rainfall.
- **Pedestrian Infrastructure:** There is no sidewalk on the west side of First Street between Tyler Street and Stoddard Avenue.

- **Pavement Markings:** The stop bar for the west intersection approach is set back 14 feet. Drivers have a tendency to stop closer to the crosswalk, creating unsafe condition for pedestrians. It is likely that the stop bars are placed based on truck turning path through the intersection and the existing geometry may not adequately accommodate larger tractor trailer turning at the intersection.



Image 6: Green ball is faded on R10-11 sign. Tyler Street west approach.

- **Congestion:** During the audit, participants observed the queue from the Tyler Street and North Street intersection spilling back into the intersection with First Street. This condition is the result of the Stop sign on the Tyler Street approach to North Street. The available storage available between North Street and Tyler Street in less than 200 feet and is not able to store the queue length from the First Street signal westbound. During observations, a westbound vehicle backed out of the First Street intersection to allow northbound access through the intersection. This condition may be a cause for the five rear end collisions on the east approach of Tyler Street, backing crash number 22, and angle crash numbers 20 and 23.
- **Sight Lines:** Participants noticed that the crest vertical curve through and south of the intersection limits sight lines approaching the intersection on First Street. While there appears to be adequate sight line to meet stopping distance criteria this condition reduces the visibility of vehicles that may be traveling behind other vehicles northbound on First Street. Crash numbers 5, 16, 18 and 24 at this intersection may have been caused or influenced by this issue.

### ***First Street at Stoddard Avenue and North Street at BMC Driveway***

- **Close Proximity of Two Intersections:** The two intersections are only separated by approximately 50 feet. This close proximity results in significant impacts to typical traffic operations at both intersections. Inherent with the non-standard configuration is an overlap of the conflict points associated in the two intersections, which is exacerbated during peak hour congestion. Based on the equivalent property damage only (EPDO) method of identifying high crash locations, the intersection is located within the top 5% of high crash locations. Nearly all crashes are angle collisions (15 of 19 crashes) where failure to yield right of way was cited



Image 7: Looking from Stoddard Avenue approach across First and North Streets towards BMC Driveway.



as a reason for the crash. The close proximity and non-standard configuration of the two intersections was noted by the audit participants as a cause or contributing factor to this issue.

- **Confusion over Right of Way:** Audit participants noted that there seems to be confusion over right of way at the intersection. Drivers approaching westbound on Stoddard Avenue are typically opposed to an eastbound vehicle queue on North Street, which has higher roadway classification and volume. There is a significant northbound/southbound left-turn volume on First Street as well. Mainline left-turns reduce and interrupt the available gaps in the through traffic stream for the minor street approaches. As such drivers on either Stoddard Street or North Street may not recognize the need to alternate right of way. Additionally, crash numbers 18 and 19 may be courtesy crashes caused by drivers waving each other through the intersection.
- **Congestion:** Participants noted that vehicles appear to be trying to maneuver both intersections in a single break in traffic. This is particularly the case for drivers exiting the BMC driveway eastbound or westbound from Stoddard Avenue heading south on North Street. The distance between the intersections does not permit queue storage, which may contribute to this driver behavior. Crash data indicates approximately 60% (11 of 19 crashes) of the reported crashes occur between 2pm and 4pm. This concentration of crashes occurring around the afternoon peak hour is unique among the corridor intersections reviewed for this RSA.
- **Sight Lines:** Participants noted the following sight line restrictions on intersection approaches.
  - The fencing on the west and east side of First Street along with traffic signs obstruct the sight lines for drivers crossing First Street.
  - The sight lines from the BMC driveway looking north (to the left) are obstructed by bushes and the ground mounted BMC entrance sign locating within the driveway median.
  - There is concern that the planting bed located in the median just north of this intersection obstructs sight lines to the north, particularly when vehicles have not reached the stop bars.
- **Traffic Signs:** There are several regulatory and warning traffic control signs in the vicinity of this intersection. A review of the signage identified a number of issues related to MUTCD standards such as the size of the sign legend, application, and installed location.
  - A diamond pedestrian warning sign (W11-2) is mounted at the northwest corner between the BMC driveway and North Street on the same pole as a rectangular “Do Not Enter”



Image 8: Looking north at the BMC Driveway Source: Google Maps



Image 9: Looking north from North Street near the BMC Driveway Source: Google Maps

(R5-1) sign, which faces the opposite direction of travel. The warning sign overhangs the edges of the “Do Not Enter” sign and obscures the shape. It would be preferred to mount the warning sign at a different location and on a separate post. Similarly, a “One-Direction Arrow” (W1-6R), mounted within the median north of the intersection, is mounted on the same post as a regulatory “Do Not Enter” sign and should be mounted separately.

- A horizontal advisory “Right Turn” sign (W1-1) is posted on the southeast corner of the intersection between North Street and First Street. This type of sign should be mounted in advance of the horizontal alignment change at a distance based on the required speed differential. However, given that the curve occurs at intersection a combination “Curve/Intersection” sign (W1-10b) may be more appropriate. Furthermore, the Stop sign is not visible approaching the intersection before the curve and there is no “Stop Ahead” sign (W3-1) to alert northbound vehicle of this condition.
- The pedestrian crossing warning signs (W11-2) on North Street southbound and First Street southbound were installed at inappropriate locations. The W11-2 located on the one way North Street southbound approach is located north of the BMC driveway, but the closest crosswalk is located south of the driveway (refer to Image 10 above). A “Hospital Zone” sign is mounted at the North Street crosswalk. The First Street southbound facing W11-2 is installed beyond the crosswalk located and may direct the driver to look for pedestrians in the wrong location.



Image 10: Ped crossing sign located in advance of the crosswalk.



Image 11: Looking southbound on North Street at the diverging lane.

- **Guide Signs:** The First Street/North Street diverge in the southbound direction creates confusion for drivers not familiar with the area. There are no guide signs in that area to help drivers choose the correct lane.

## ***North Street and Charles Street***

- **Traffic Signal Heads:** Participants noted that the easterly head assembly on the span wire is twisted out of alignment. This condition affects the North Street northbound approach and the Charles Street eastbound approach where the signal indications are partially obscured. The northbound and southbound heads are not equipped with backplates. The eastbound traffic signal heads have backplates. Of



Image 12: Looking north from intersection with Charles Street.

the six crashes reported at this intersection four were rear-end collisions with three occurred northbound on North Street. Drivers may be confusing the signal indications at Charles Street with the indications at Springside Avenue, which is located approximately 150 feet to the north.

- **Signage:** The northbound lane designation signs are blocked by utility and mast arm poles.
- **Lane Geometry:** The westbound lane width on Charles Street is narrow to accommodate an auxiliary left-turn lane. Participants noted that drivers turning onto Charles Street encroach on the opposing lane. The condition may be a contributing factor to crash number two.



Image 13: Drivers encroach left-turn lane when turning onto Charles Street.

- **Pedestrian Connectivity:** There are no crosswalks on North Street at this intersection. The nearest crossing is located approximately 150 feet north of the intersection. Considering this distance, participants noted it is not realistic to expect pedestrians to cross at the marked crossing. The existing crosswalk on the Charles Street approach has apex ramps without tactile warning panels.
- **Sight Lines:** Bushes on the west side of North Street (looking left) block sight lines for drivers on Charles St.

### ***North Street and Springside Avenue***

- **Drainage:** The audit team observed ponding around catchbasins located near curb returns at this intersection.
- **Southbound Approach Stop Bar Location:** Driveway stop bar for the southbound movements is located about 55 feet away from the signal heads north of a driveway. The driveway directly accesses the intersection without signal control or visibility of the heads/signal indications. The clearance interval for the signal may not have been updated with the change in stop bar location.
- **Pedestrian Connectivity:** Crosswalks at this intersection are only provided across the south and east approaches. There is no crosswalk across the north approach.
- **Traffic Signal Equipment:** The northbound and southbound heads are not equipped with backplates. The westbound traffic signal heads have backplates.
- **Southbound Rear-end Pattern:** A review of the crash data for this intersection indicated a pattern of rear-end collisions southbound on North



Image 14: North Street looking south at North/Springside intersection.

Street, which accounted for seven of the 17 collisions. The rear-end crash pattern includes crash numbers 1, 2, 3, 8, 11, 14, and 16. Audit participants discussed potential safety issues and review field conditions with the following observations:

- **Queuing:** Approaching the intersection from the north, the nearest signal is located almost one-half mile away. This signal is for a school entrance with limited demand outside school arrival and dismissal. The traffic signal at Crane Avenue and Wahconah Street, which has significant minor street volume, is almost a mile north of Springside Avenue. Therefore, the Springside Avenue intersection signal has substantial queueing during peak hours as the first interruption in traffic flow approaching the BMC area from the north. Crash data indicates that four of the reported crashes occur during the morning peak hour, which is the highest for any time of day.
- **Signal Spacing:** Drivers may be confusing the signal indications at Springside Avenue with the indications at Charles Street, which is located approximately 150 feet to the south. There is a potential that while the Springside signals indicate “Red” in the southbound directions the Charles Street signals are indicating “Green” causing driver confusion and a potentially unsafe condition. Also, related to the close proximity of the intersection, drivers likely want to clear both of the signals. Drivers may be more likely to proceed through the intersection during the clearance or change interval while the vehicle ahead is stopping.
- **Approach grade:** The North Street roadway slopes downward in the southbound direction prior to the North Street and Springside Avenue Intersection. This condition effects the deceleration rate of approaching vehicles and may contribute to the rear-end crash experience.
- **Clearance overlap:** The crash data indicated four angle collisions at the intersection. Three of the crashes involved a southbound left-turn collision with a northbound through vehicle (crash numbers 7, 9, and 12). As noted above, this could be the result of drivers wanting to clear both intersections because of the close proximity. Another potential cause is the clearance overlap. The southbound left-turning vehicles may be initiating a left turn during the southbound clearance interval believing the northbound through vehicles will be stopping. However, the northbound vehicles have an extended green indication to clear the segment between Charles Street and Springside Avenue.

## Potential Safety Enhancements

After review of crash data, traffic count data and a discussion of potential safety issues, audit participants recommend the following safety improvements.

### **Study Area Safety Enhancements**

- **Roadway Lighting:** Evaluate the current lighting infrastructure and repair/replace broken parts. The goal of lighting improvements shall be to provide adequate, consistent illumination of the roadway and sidewalks.
  - A photometric study should be performed and used as the basis for lighting improvements.
  - Install LED bulbs for improved lighting (similar to recent upgrades installed on North Street to the south of the project area).
  - Consider providing additional light poles and/or optimizing the spacing to meet illumination standards.
- **Pedestrian Connectivity:** Consider providing more crosswalks or reconfiguring existing crosswalks through the study area to improve pedestrian connectivity. Special consideration should be given to placing crosswalks near high pedestrian interest points. The goal of these improvements is to increase crosswalk compliance and reduce illegal crossings.
- **Pedestrian Infrastructure:** Repair or replace heaved and damaged sidewalks to eliminate tripping hazards. Update the ramps and pedestrian signal equipment to current ADA standards. Bi-directional apex ramps should be replaced and avoided with future improvements. The goal of these improvements is to provide safe, accessible infrastructure for all pedestrian users.
- **Bicycle Accommodations:** Provide bicycle lanes (5-foot minimum) on study area roadways to allow safe bicycle travel throughout the study area.
- **Public Transportation:** Install bus pullouts to create clearly marked bus stops and allow buses to get out of the vehicle stream when stopping for passengers. The bus pullouts along with shelters improve safety of the transit users and vehicles on the roadway. Also, the transit service becomes more efficient with clearly specified bus stops as opposed to flag-stop operation.

### **First Street and Burbank Street**

- **Sight Line Obstructions:**
  - Consider providing an “Intersection Ahead” (W2-1) warning sign with a street name tab (W16-8p) to alert drivers on First Street northbound about the upcoming intersection.





- The City of Pittsfield shall discuss with other stakeholders the benefits and negative aspects of either closing off Burbank Street between North Street and First Street, or making it two-way. With a conversion to two-way option, improvements to the existing sight lines are recommended.
- **Solar Glare:** Faded traffic signs should be replaced with new, MUTCD compliant signs. The locations of the signs shall be reviewed and signs need to be moved to optimal locations to reduce the solar glare impacts.
- **Pedestrian Connectivity:** Install crosswalks across all of the intersection approaches to provide connections for pedestrians. The gas station and convenience store to the northwest of this intersection is a high demand location for pedestrian users. As such, it is very important to install crosswalks across all of the intersection approaches. These improvements are aimed at reducing illegal crossings and improve safety for all roadway users.
- **Signage:** Replace non-compliant, worn and damaged signs. Re-locate signs to the correct locations improving visibility.
- **Access Management:** Work with the owner of the 42-foot driveway to eliminate it or provide channelization prohibiting left turns out of the driveway. Consider installing a raised median to reinforce the left-turn prohibition out of this driveway.
- **Poor Compliance with Turn Prohibition, Cut-Through Traffic and First Street at Tyler Queuing:** Driveway and roadway improvements are recommended at the 42-foot driveway location to prohibit the left turns out of this driveway. Geometry improvements to the driveway in the form of channelizing the right-turns in and out of the driveway, as well as installing a raised median on First Street, would provide physical barriers to discourage left-turns out of this driveway. R3-2L “No Left Turn” sign should be relocated to the right side of the driveway and installed on the opposite side of First Street. It is recommended that the City of Pittsfield work with the property owner to reduce the width of the driveway or eliminate it all together.

### ***First Street and Tyler Street***

- **Traffic Signal Equipment:** Update traffic signal equipment to provide safer and more efficient traffic control at this intersection, improve safety and reduce queuing.
  - Replace outdated traffic signal controller and auxiliary hardware to provide updated capabilities for phasing and detection.
  - Provide detection (loops or video) for each approach as well as emergency vehicle pre-emption
  - Optimize the timings for fully actuated approached based on the current demand.

- Install new heads with hoods, backplates, and retroreflective boarders to match updated phasing
- **Curb Cuts:** Work with the property owners in the vicinity of the intersection to eliminate or re-configure the driveways that are in close proximity to the intersection to eliminate the unnecessary conflict points.
- **Signage:** Replace all traffic signs that are not compliant with MUTCD or are worn or damaged. Relocate signs to correct/unobstructed locations improving visibility.
- **Drainage:** The existing condition of the storm drainage in the vicinity of the intersection shall be evaluated and improved to provide adequate drainage on the roadways. Participants recommended that the City assess the condition of utility infrastructure (such as water and sewer lines) in the project area to coordinate improvements with roadway improvements.
- **Pedestrian Infrastructure:** Consider installing a sidewalk on the west side of First Street between Tyler Street and Stoddard Avenue to provide pedestrian connection along west side of First Street.
- **Pavement Markings:** Move the west approach stop bar to be four feet away from the crosswalk to provide adequate and clear stopping location.
- **Congestion:** Intersection improvements are recommended to reduce congestion, improve safety, and increase the efficiency of the First Street-North Street corridor. These include a review of the signal phasing to utilize approach detection and allocate adequate green time for approach demand. Capacity should be increased for both the northbound and westbound approaches. Concept improvements eliminating the existing stop condition on Tyler Street at the intersection with North Street should also be evaluated. Removing the stop condition at this location will prevent the westbound queue from spilling back into the First Street at Tyler Street intersection.
- **Sight Lines:** Evaluate protected only phasing to prohibit turning across conflicting vehicle movements. Consider installing offset left-turn lanes to improve the sight line to conflicting vehicles behind the lead vehicle.

### ***First Street at Stoddard Avenue and North Street at BMC Driveway***

- **Close Proximity of Two Intersections:** The audit team recommended consideration of constructing a roundabout to replace the two intersections. This improvement would address the close proximity of the two intersections by configuring all approaches into a single roundabout. This would also have the benefit of simplifying the currently confusing right of way. Roundabouts are proven to reduce crash severity and improve overall safety. Minimum volume warrants are not required for roundabouts.
- **Confusion of Right of Way:** Two suggestions were made during the audit to clarify the confusion over right of way between vehicles at the two intersections. First, a warrant review

installation of a traffic signal should be conducted. The approaches could be brought to a single intersection point under one signal or signalized as two separate intersections. Signalization would be expected to reduce right of way confusion and decrease the experience of angle crashes. A second alternative was eliminating the southbound one-way slip lane. This would reduce the number of approaches at the westerly intersection with the BMC driveway. The immediate stop condition on the short east approach is not needed if the slip lane approach from the north is eliminated, which simplifies the right of way. This alternative requires modifying the planter in the island north of the intersection between the existing slip lane and North Street to improve the sight line from the BMC driveway.

- **Congestion:** Participants suggested alleviating the congestion by eliminating traffic through the westerly intersection with the BMC driveway. One option for this would be a full closure of North Street between Stoddard Avenue and Tyler Street. The existing North Street traffic for this segment would be re-routed through the Tyler Street and First Street intersection. A second option is to limit North Street between Stoddard Avenue and Tyler Street to one-way southbound traffic. Both options reduce the traffic through the westerly intersection as well as the turning move conflicts at the east intersection.
- **Sight Lines:** The City should work with property owners in the vicinity of the intersection to provide clear sight lines for drivers. The following are recommended:
  - Move fencing out of sight lines on the east and west sides of First Street
  - Clear vegetation to the north of BMC Driveway and move BMC entrance sign
  - Reconfigure the planting bed north of the intersection such that the sight line impacts are eliminated or reduced to improve driver visibility through the intersection.
- **Signage:** The following recommendations are proposed in order to correct and improve signage in the vicinity of the intersection:
  - Replace non-compliant traffic signs and replace with MUTCD compliant signage.
  - Relocate pedestrian crossing signs (W11-2) to the correct locations
  - Consider installation of W1-10b sign in advance of the intersection
  - Consider installing “Stop Ahead” (W3-1) warning signage
- **Guide Signs:** Provide guide signs at the diverge of First Street and North Street to help drivers properly navigate through the area.

### ***North Street and Charles Street***

- **Traffic Signal Heads:** Replace any damaged traffic signal equipment and fix the westerly left three-section signal head alignment.

- **Visibility of Traffic Signal Heads:** Provide backplates to northbound and southbound signal heads. Provide reflectorized borders to all backplates.
- **Signage:** Move traffic signs to unobstructed locations to improve visibility.
- **Lane Geometry:** Widen westbound lane on Charles Street to provide enough space for turning vehicles. The goal of this improvement is reducing potential conflicts caused by encroachments on the eastbound lane by vehicles turning onto Charles Street.
- **Pedestrian Connectivity:** Consider providing crosswalks across North Street at this intersection to improve pedestrian connectivity in the vicinity of this intersection. Crosswalk compliance will be increased with more convenient crossing locations. Especially where there is an existing traffic signal.
- **Sight Lines:** The City should work with property owners in the vicinity of the intersection to provide clear sight lines to the north of this intersection.

### ***North Street and Springside Avenue***

- **Drainage:** Adjust catchbasin rims and repair pavement around catchbasins to reduce ponding and provide adequate drainage at this intersection.
- **Southbound Approach Stop Bar Location:** The following recommendations are aimed at improving existing conditions between the intersection and the driveway:
  - Check and adjust clearance intervals as needed
  - Provide signal indications to the driveway
  - Provide property direct access to Charles Street if re-aligned
- **Pedestrian Connectivity:** Consider providing a crosswalk across the north approach of the intersection to improve pedestrian connectivity in the vicinity of this intersection.
- **Visibility of Traffic Signal Heads:** Install backplates to northbound and southbound traffic signal heads to improve signal visibility. The backplates shall have reflectorized borders.
- **Southbound Rear-end Pattern and Clearance Overlap:** The following recommendations are aimed at reducing rear-end collisions at this intersection to improve safety and increase capacity. These recommendations can be implemented together or individually as opportunities to do so become available.
  - Evaluate feasibility of realigning Charles Street to offset between Springside Avenue to make a typical four-way intersection.
  - Install optically programmed traffic signal heads.
  - Install “Traffic Signal Ahead” signage north of the intersection

- Check and adjust clearance intervals as needed adjusting for approach grade
- Improve capacity of the southbound approach to reduce queuing
- Review and adjust the clearance overlap between the two intersections



## Summary of Road Safety Audit

Based on the observations and discussions, the RSA team identified the issues and possible enhancements that could improve the safety in the study area. Further study and design is needed to determine the feasibility of making such improvements to the intersection.

Table 3 summarizes these safety issues, possible enhancements, estimated safety payoff, time frame, cost and responsibility. Safety payoff estimates are based on engineering judgement and are categorized as low, medium and high. The time frame is categorized as short-term (<1 year), mid-term (1 to 3 years), or long-term (>3 years). The costs are categorized as low (<\$10,000), medium (\$10,001 to \$50,000), or high (>\$50,001).

It is the responsibility of MassDOT to ensure that the designer incorporates the relevant safety enhancements identified as part of this RSA. The RSA is intended to identify potential safety improvements. Those improvements should be evaluated and included as part of the design process.

**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

Table 3: Potential Safety Enhancement Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
<b>Study Area Safety Issues</b>					
Roadway Lighting Deficiencies	Install LED light bulbs	Low	Short-Term	Low	City of Pittsfield
	Perform a photometric study	Medium	Mid-Term	Medium	City of Pittsfield
	Provide proper spacing of light poles	Medium	Mid-Term	High	City of Pittsfield
Lack of Pedestrian Connectivity	Provide more crosswalks. Re-configure existing crosswalks	High	Mid-Term	Low	City of Pittsfield
Non-Compliant Pedestrian Infrastructure	Replace damaged sidewalks	Low	Long-Term	High	City of Pittsfield
	Update ramps and pedestrian signal equipment to current ADA standards	Medium	Long-Term	High	City of Pittsfield
Lack of Bicycle Accommodations	Widen the roadways to provide 5' min bicycle lanes	High	Long-Term	High	City of Pittsfield
Public Transportation	Construct bus pullouts	Medium	Long-Term	High	City of Pittsfield and Berkshire Regional Transit Authority
<b>First Street and Burbank Street</b>					
Sight Line Obstructions	Consider providing an "Intersection Ahead" (W2-1) warning sign	Low	Short-Term	Low	City of Pittsfield
	Consider closing off Burbank Street between North Street and First Street	Medium	Mid-Term	Low	City of Pittsfield
Solar Glare	Replace faded signs and adjust location to minimize solar impacts	Low	Short-Term	Low	City of Pittsfield
Lack of Pedestrian Connectivity	Install crosswalks across all of the intersection approaches	Medium	Short-Term	Low	City of Pittsfield
Poor Traffic Sign Condition and Placement	Replace non-compliant, worn and damaged signs. Re-locate signs to the correct locations improving visibility	Medium	Short-Term	Low	City of Pittsfield

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Access Management	Work with property owners to eliminate/re-configure driveways	High	Long-Term	High	City of Pittsfield and property owners
Poor Compliance with Turn Prohibition, Cut-Through Traffic and First Street at Tyler Queuing	Work with the property owner to establish driveway geometry to restrict left turns	High	Long-Term	High	City of Pittsfield and property owners

**First Street and Tyler Street**

Poor Condition of Traffic Signal Equipment	Update signal equipment and optimize timings	Medium	Long-Term	High	City of Pittsfield
Access Management	Eliminate or re-configure driveways in close proximity to the intersection	Medium	Mid-Term	Medium	City of Pittsfield and Property Owners
Poor Traffic Sign Condition and Placement	Replace non-compliant, worn and damaged signs. Re-locate signs to the correct locations improving visibility	Medium	Short-Term	Low	City of Pittsfield
Roadway Flooding	Repair/Improve drainage system	Low	Long-Term	High	City of Pittsfield
Lack of Pedestrian Infrastructure	Provide sidewalk on the west side of First Street	Low	Long-Term	High	City of Pittsfield
Stop Bar Location	Move the west approach stop bar to be four feet away from the crosswalk	Low	Short-Term	Low	City of Pittsfield
Congestion	Update signal timings	Low	Short-Term	Low	City of Pittsfield
	Add detection to all approaches	Low	Short-Term	Medium	City of Pittsfield
	Consider eliminating stop condition at Tyler and North Street intersection	Medium	Long-Term	High	City of Pittsfield
	Add capacity on northbound and westbound approaches	Low	Mid-Term	Medium	City of Pittsfield
Poor Sight Lines	Evaluate protected only phasing	Medium	Short-Term	Low	City of Pittsfield
	Offset the left turn lanes	Low	Mid-Term	High	City of Pittsfield

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
<b>First Street at Stoddard Avenue and North Street at BMC Driveway</b>					
Close proximity of two intersections, Congestion and Confusion of Right of Way	Change North Street between Stoddard Avenue and Tyler Street to one way southbound	Low	Mid-Term	Low	City of Pittsfield
	Construct a roundabout to replace the existing intersections	High	Long-Term	High	City of Pittsfield
	Close off North Street between Stoddard Avenue and Tyler Street	Medium	Long-Term	High	City of Pittsfield
	Review warrants for signal installation	Medium	Long-Term	High	City of Pittsfield
	Eliminate the southbound one way slip lane	Low	Mid-Term	Medium	City of Pittsfield
Obstructed Sight Lines	Move fencing out of sight lines on the east and west side of First Street	Low	Mid-Term	Low-High	City of Pittsfield and property owners
	Clear vegetation and move sight line obstruction - BMC entrance sign	Medium	Mid-Term	Low-High	City of Pittsfield and property owners
	Maintain the planting bed north of the intersection in such a way that it does not provide sight line obstructions	Low	Long-Term	Low	City of Pittsfield
Traffic Signs	Replace/Relocate traffic signs to bring to compliance with MUTCD	Medium	Short-Term	Low	City of Pittsfield
Lack of Proper Guide Signs	Provide guide signs at the diverge of First Street and North Street	Low	Short-Term	Low	City of Pittsfield
Improper Horizontal Alignment Change Sign	Consider installation of W1-10b in advance of the intersection	Low	Short-Term	Low	City of Pittsfield
Inappropriate location of pedestrian crossing signs	Revise location of W11-2 signs.	Low	Short-Term	Low	City of Pittsfield

Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Visibility of northbound stop sign	Consider installing "Stop Ahead" (W3-1) warning signage	Low	Short-Term	Low	City of Pittsfield
<b>North Street and Charles Street</b>					
Traffic Signal Head Alignment	Fix the Charles Street west approach left three-section signal head	Medium	Short-Term	Low	City of Pittsfield
Visibility of Traffic Signal Heads	Provide backplates to northbound and southbound signal heads	Low	Short-Term	Low	City of Pittsfield
	Provide reflectorized borders to all backplates	Low	Short-Term	Low	City of Pittsfield
Obstructed Traffic Signs	Move traffic signs to unobstructed locations	Low	Short-Term	Low	City of Pittsfield
Lane Encroachment of Opposing Vehicles	Widen Charles Street westbound lane	High	Long-Term	High	City of Pittsfield
Poor Pedestrian Connectivity	Install crosswalks across all of the intersection approaches	Medium	Short-Term	Low	City of Pittsfield
Obstructed Sight Lines	Work with property owners to maintain clear sight lines.	Low	Mid-Term	Low	City of Pittsfield and Property Owners
<b>North Street and Springside Avenue</b>					
Ponding at Intersection	Raise catchbasins and repair pavement	Low	Short-Term	Low	City of Pittsfield
Southbound Approach Stop Bar Location	Provide signal indications to the driveway	Low	Mid-Term	Medium	City of Pittsfield
	Provide property access to re-aligned Charles Street	Low	Long-Term	Medium	City of Pittsfield
	Check and adjust clearance intervals as needed	Low	Short-Term	Low	City of Pittsfield



Table 3: Potential Safety Enhancement Summary (Continued)

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Responsible Agency
Poor Pedestrian Connectivity	Install crosswalks across the north intersection approach	Low	Short-Term	Low	City of Pittsfield
Visibility of Traffic Signal Heads	Provide backplates to northbound and southbound signal heads	Low	Short-Term	Low	City of Pittsfield
	Provide reflectorized borders to all backplates	Low	Short-Term	Low	City of Pittsfield
	Realign Charles Street to come in across Springside Avenue to make a regular four-way intersection.	High	Long-Term	High	City of Pittsfield
Southbound Rear-end Pattern and Angle Collisions	Install optically programmed traffic signal heads	Medium	Mid-Term	Medium	City of Pittsfield
	Install "Intersection Ahead" or "Traffic Signal Ahead" signage	Low	Short-Term	Low	City of Pittsfield
	Check and adjust clearance intervals as needed adjusting for grading	Low	Short-Term	Low	City of Pittsfield
	Improve capacity of the southbound approach to reduce queuing	Low	Long-Term	High	City of Pittsfield
	Review and adjust the clearance overlap between the two intersections	Low	Short-Term	Low	City of Pittsfield

## Appendix A. RSA Meeting Agenda

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# Agenda

## Road Safety Audit Berkshire Medical Center (BMC) Area Traffic Circulation Improvements

Meeting Location: Board Meeting Room (#203)  
70 Allen Street, Pittsfield, MA 01201  
January 22, 2015  
9:00 AM – 4:00 PM

Type of meeting:	High Crash Location – Road Safety Audit
Attendees:	Invited Participants to Comprise a Multidisciplinary Team
Please bring:	Thoughts and Enthusiasm!!

9:00 AM	Welcome and Introductions
9:15 AM	Review of Site Specific Material <ul style="list-style-type: none"><li>• Crash, Speed &amp; Volume Summaries</li><li>• Existing Geometries and Conditions</li></ul>
10:00 AM	Visit the Site <ul style="list-style-type: none"><li>• Drive to the study area</li><li>• As a group, identify areas for improvement</li></ul>
1:00 PM	Lunch / Post Visit Discussion / Completion of RSA <ul style="list-style-type: none"><li>• Discuss observations and finalize findings</li><li>• Discuss potential improvements and finalize recommendations</li></ul>
4:00 PM	Adjourn for the Day – but the RSA has not ended

### Instructions for Participants:

- Before attending the RSA on January 22, participants are encouraged to drive 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

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## Participating Audit Team Members

Date: January 22, Location: Pittsfield, MA  
2016

<b>Audit Team Members</b>	<b>Agency/Affiliation</b>	<b>Email Address</b>	<b>Phone Number</b>
Mark Cancilla	Pittsfield Fire Department	mcancilla@pittsfieldfd.org	413-448-9765
James McIntyre	Pittsfield Police	jmcintyre@pittsfieldpd.org	413-448-9700
John Mullin	Pittsfield Police	jmullin@pittsfieldpd.org	413-448-9777
Matt Billetter	City of Pittsfield	mbilletter@pittsfieldch.com	413-499-9327
David Turocy	City of Pittsfield	dturocy@pittsfieldch.com	413-499-9319
Tim Croce	City of Pittsfield	troce@pittsfieldch.com	413-499-9327
Clete Kus	Berkshire Regional Planning Commission	ckus@berkshireplanning.org	413-442-1521
Peter Frieri	MassDOT	peter.frieri@state.ma.us	413-637-5767
Pat Tierney	MassDOT	patrick.tierney@state.ma.us	413-637-5770
Mary Ringie	MassDOT	mary.ringie@dot.state.ma.us	413-637-5760
Lisa Schletzbaum	MassDOT	lisa.schletzbaum@state.ma.us	857-368-3634
Joseph LaRoche	Berkshire Medical Center (BMC)	jlaroche@bhs1.org	413-447-2303
William Van Duzer	Fuss & O'Neill	wvanduzer@fando.com	413-452-0445
Dmitriy Mayboroda	Fuss & O'Neill	dmayboroda@fando.com	413-452-0445

## Appendix C. Detailed Crash Data

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## **BMC Area Traffic Circulation Improvements**

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Project Area



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**FUSS & O'NEILL**

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WEST SPRINGFIELD, MA 01089  
413.452.0445  
www.fando.com

## FIGURE 1: Project Area Intersections

BMC Area Traffic Circulation Improvements

PROJ. NO: 20130889A20

December, 2015

## **BMC Area Traffic Circulation Improvements**

### Location 1

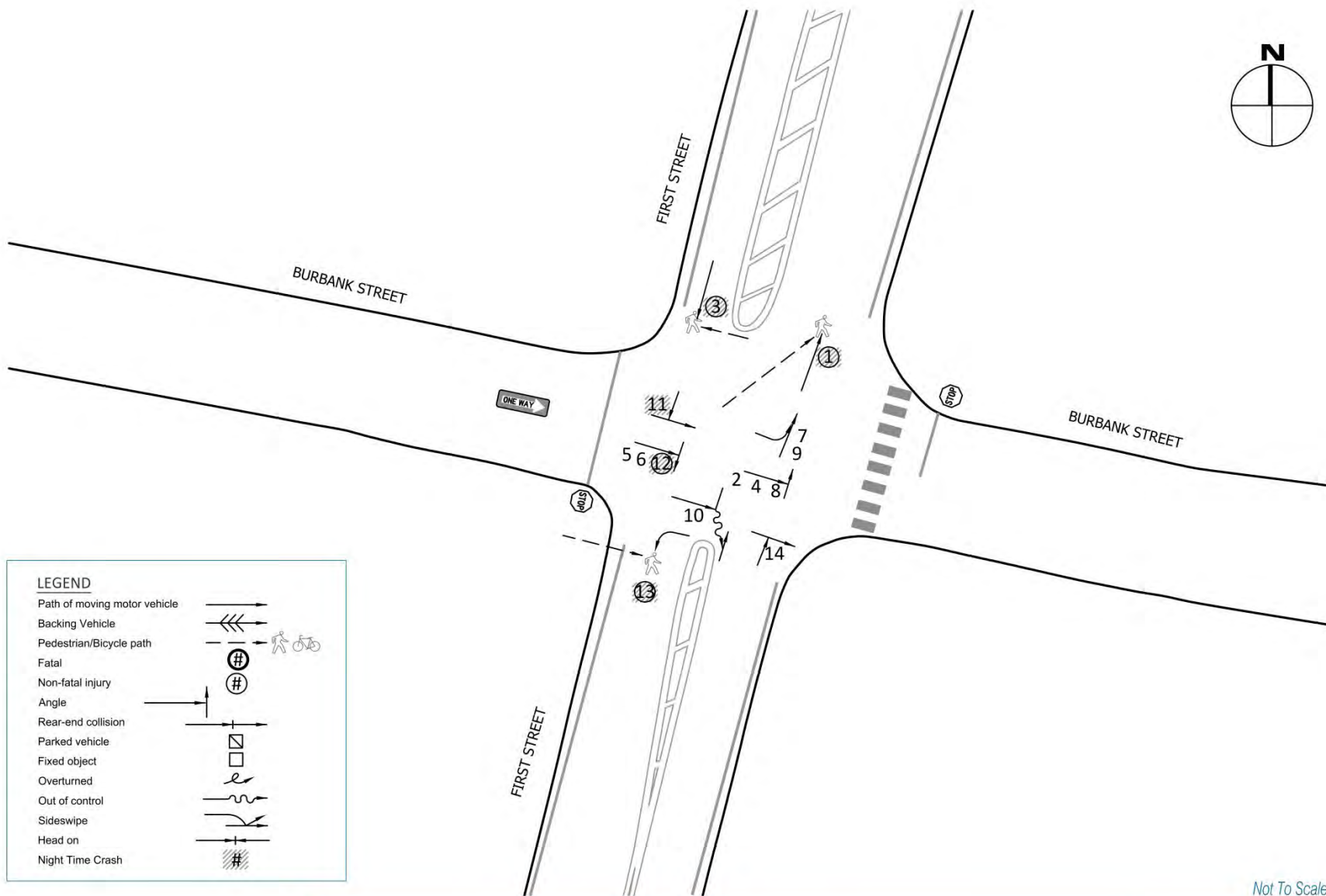




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December, 2015





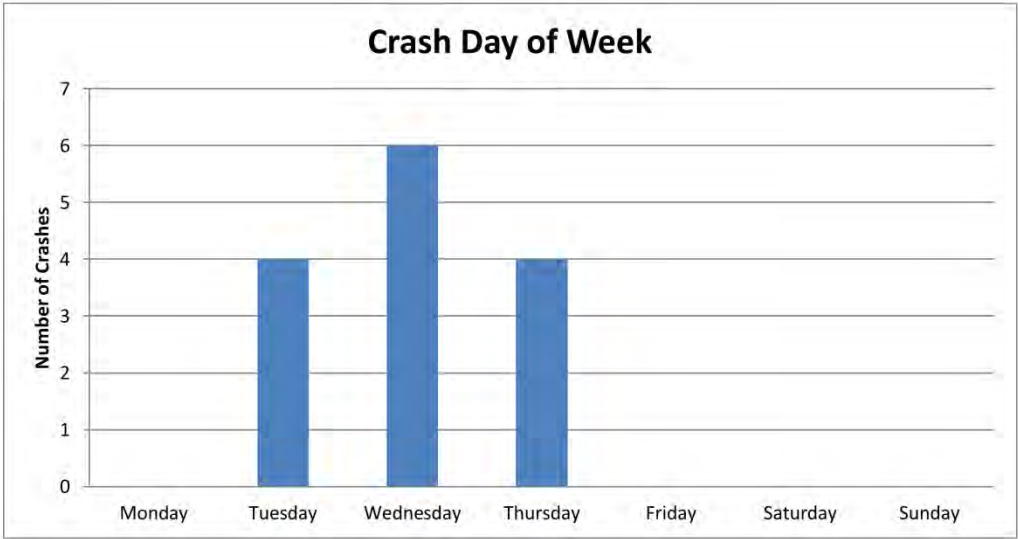
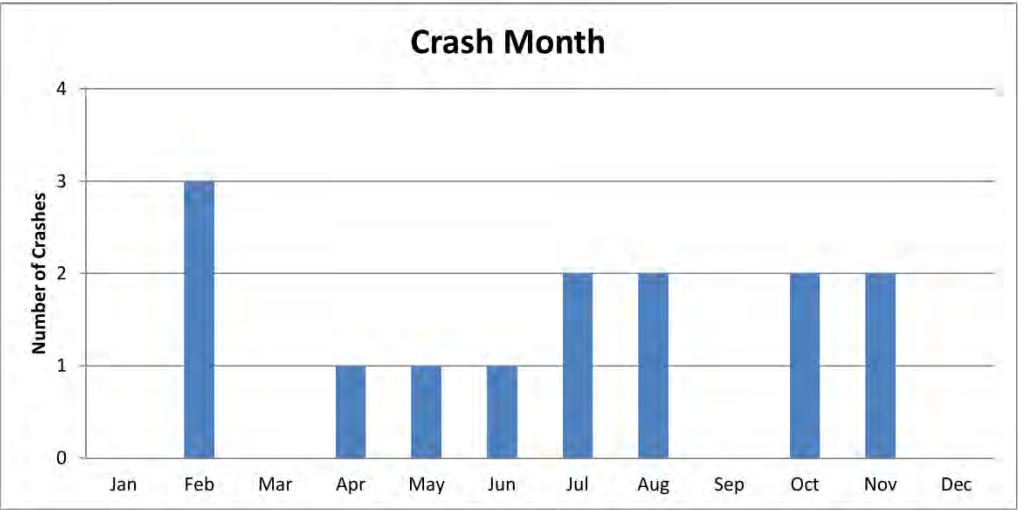
# Crash Data Summary Table

First Street at Burbank Street, Pittsfield, MA

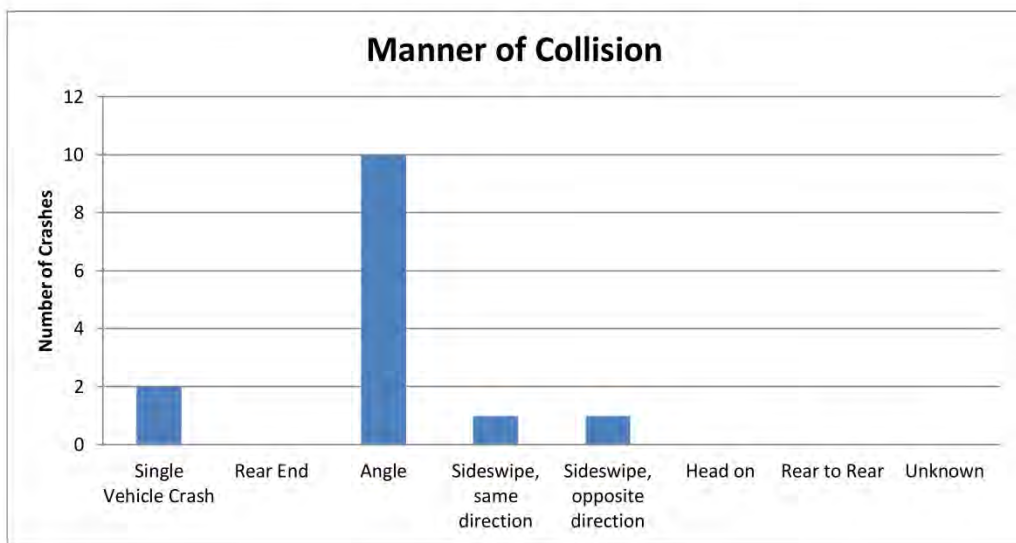
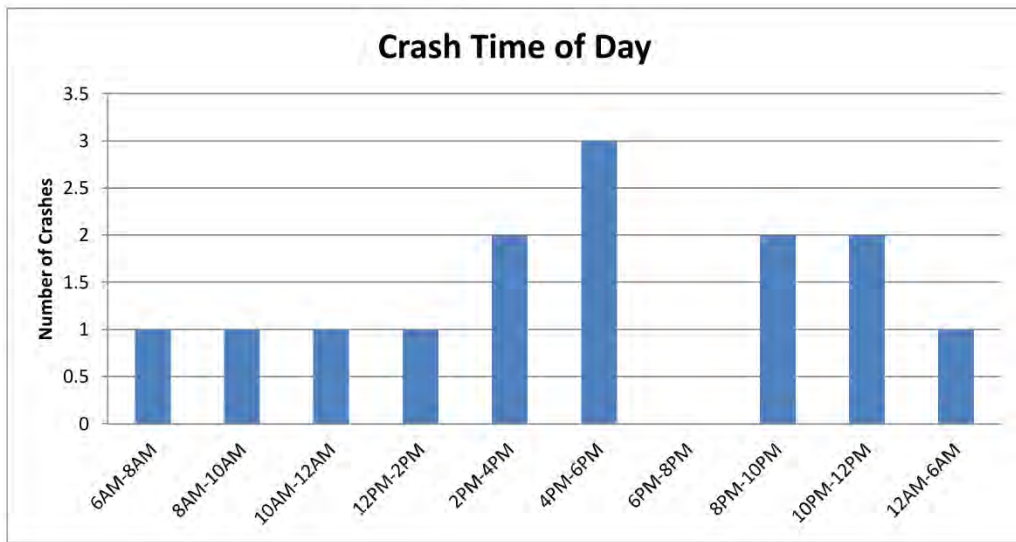
November 1, 2012 - October 31, 2015

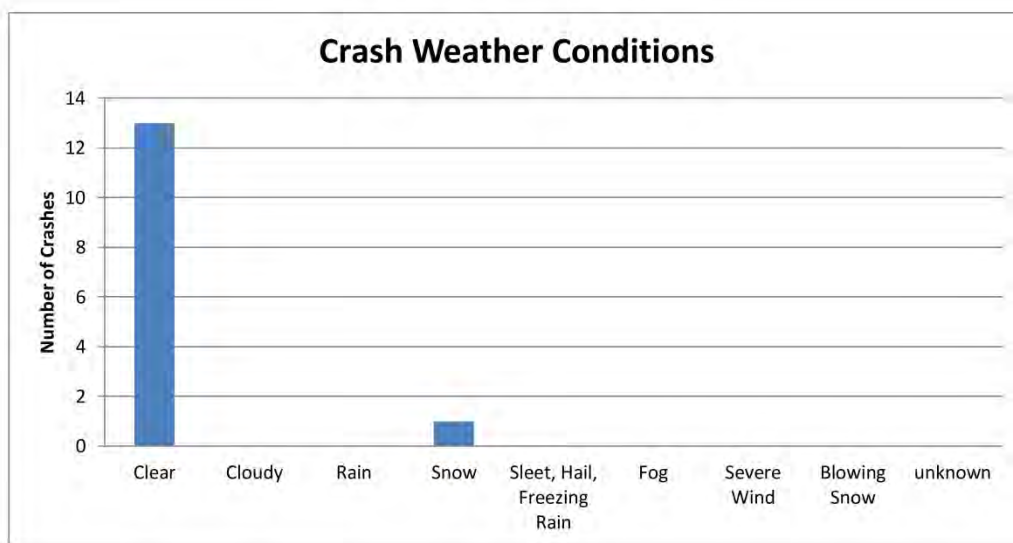
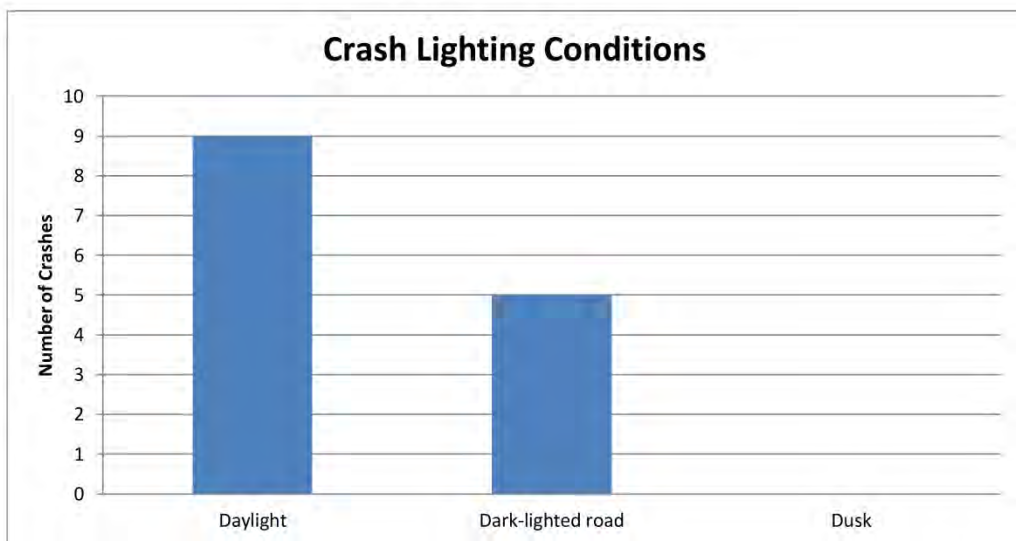
Crash Diagram	Crash Date	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Crash Severity	Ages			Comments
1	11/14/2012	9:43pm	Single Vehicle	Dark-lighted road	Clear	Dry	Visibility obstructed	Non-fatal injury	26	53		Vehicle hit a pedestrian that was crossing the street in improper location
2	7/9/2013	12:24pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	21	23		Vehicle going straight from the minor street was struck by a vehicle that was traveling straight through on the major street
3	8/8/2013	10:37pm	Single Vehicle	Dark-lighted road	Clear	Dry	Inattention	Non-fatal injury	67	24		Pedestrian was crossing the street and hit by a vehicle
4	10/2/2013	3:15pm	Angle	Daylight	Clear	Dry	Inattention	Unknown	63	31		Vehicle going straight from the minor street was struck by a vehicle that was traveling straight through on the major street
5	11/20/2013	7:57am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	21	38		Vehicle going straight from the minor street struck a vehicle that was traveling straight through on the major street
6	2/13/2014	8:09am	Angle	Daylight	Snow	Snow	Driving too fast for conditions	Property damage only	64	59		Vehicle going straight from the minor street struck a vehicle that was traveling straight through on the major street
7	2/25/2014	2:10pm	Angle	Daylight	Clear	Dry	No improper driving	Property damage only	52	24		Vehicle turning left from the minor street struck a vehicle that was traveling straight through on the major street
8	4/16/2014	11:57am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	20	36		Vehicle failed to yield right of way to the major street traffic and struck another vehicle
9	7/22/2014	4:46pm	Angle	Daylight	Clear	Dry	Inattention	Property damage only	17	20		Vehicle turning left from the minor street struck a vehicle that was traveling straight through on the major street
10	10/8/2014	5:00pm	Sideswipe (Opposite dir.)	Daylight	Clear	Dry	Disregarded traffic signs, signal	Property damage only	35	49	42	Vehicle failed to stop at a stop sign and struck a vehicle that was traveling straight through on the major street, which in turn hit a third vehicle.
11	2/10/2015	9:17pm	Sideswipe (Same dir.)	Dark-lighted road	Clear	Dry	Visibility obstructed	Property damage only	20	43		Vehicle going straight from the minor street struck a vehicle that was traveling straight through on the major street
12	5/27/2015	12:51am	Angle	Dark-lighted road	Clear	Dry	Other improper action	Non-fatal injury	24	41		Vehicle failed to stop at a stop sign and struck a vehicle that was traveling straight through on the major street
13	6/25/2015	11:08pm	Angle	Dark-lighted road	Clear	Dry	Visibility obstructed	Non-fatal injury	50	21		Vehicle turning left from the minor street struck a pedestrian
14	8/6/2015	5:28pm	Angle	Daylight	Clear	Dry	Failure to keep in proper lane	Property damage only	47	26		Vehicle bypassing congested traffic on the right hit a vehicle crossing the street

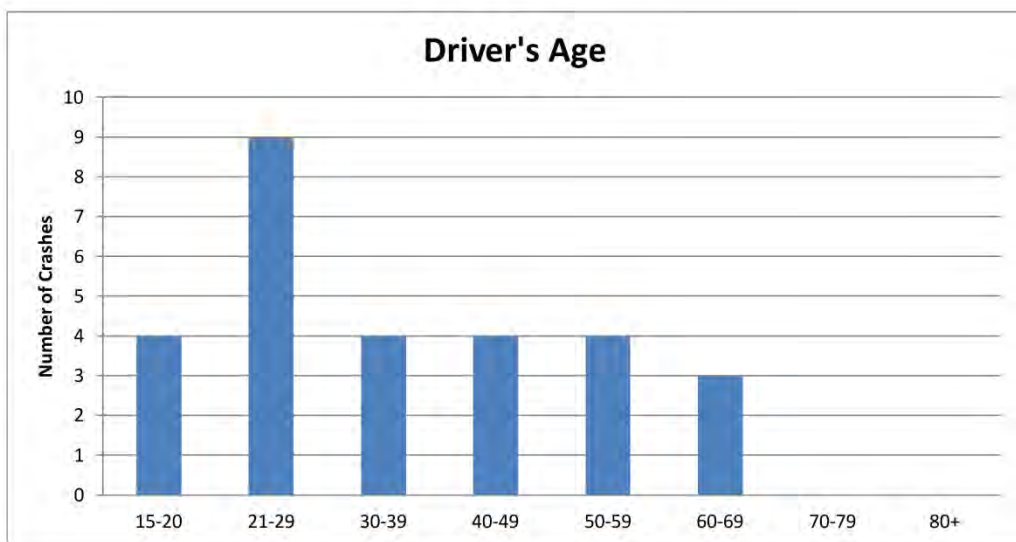
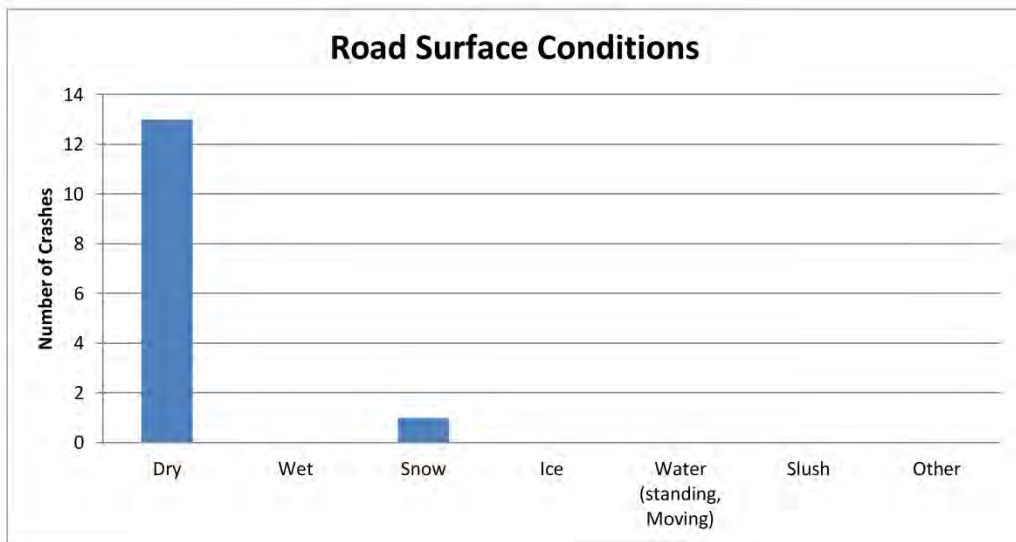
Summary based on Crash Reports obtained from the Local and State Police











## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Pittsfield COUNT DATE : 7/24/2014  
 DISTRICT : 1 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : First Street  
 MINOR STREET(S) : Burbank Street

INTERSECTION  
 DIAGRAM  
 (Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	625	80	454	44		1,203
"K" FACTOR :	0.083	INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :				14,494
TOTAL # OF CRASHES :	14	# OF YEARS :	3	AVERAGE # OF CRASHES PER YEAR ( A ) :		4.67

CRASH RATE CALCULATION :

0.88

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Completed by Fuss and O'Neill, Inc. - 12-17-2015

Project Title & Date: BMC Area Traffic Circulation Improvements

## **BMC Area Traffic Circulation Improvements**

### Location 2



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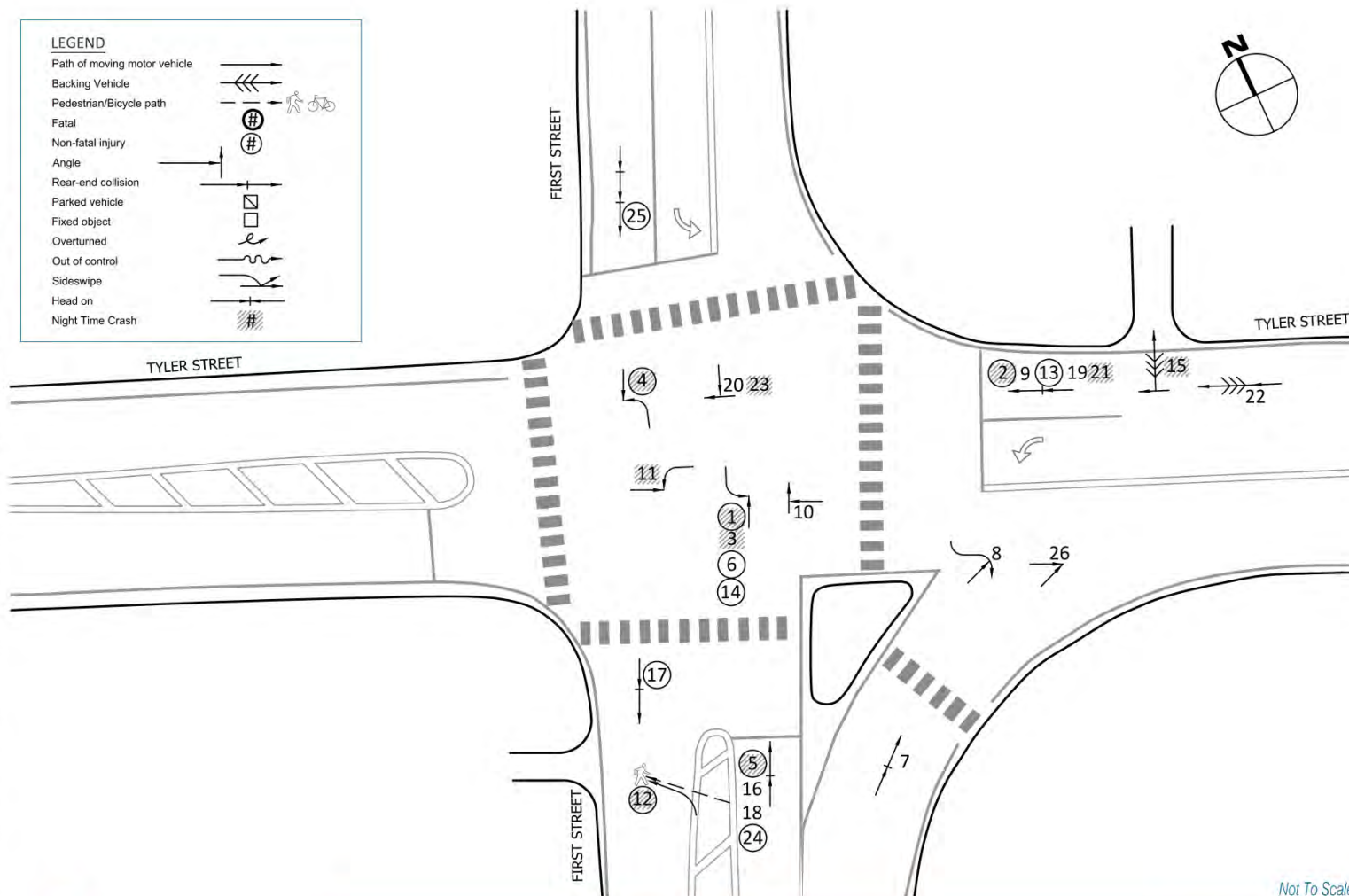
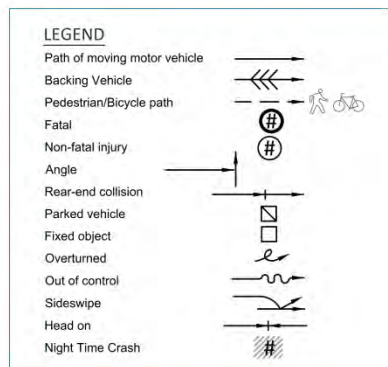
## FIGURE 2: Intersections 1 and 2 BMC Area Traffic Circulation Improvements

PROJ. NO: 20130889A20

December, 2015



File Path: J:\DWG\12013\0689A20\Civil\Collision Diagrams\20130689A20\_COLLISION DIAGRAMS.dwg Layout: TYLER-FIRST Plotted: Wed, December 23, 2015 - 12:26 PM User: DMITRY MAYBORODA



Not To Scale



## COLLISION DIAGRAM

### INTERSECTION OF FIRST STREET AND TYLER STREET

TIME PERIOD ANALYZED: NOVEMBER 1, 2012 TO OCTOBER 31, 2015

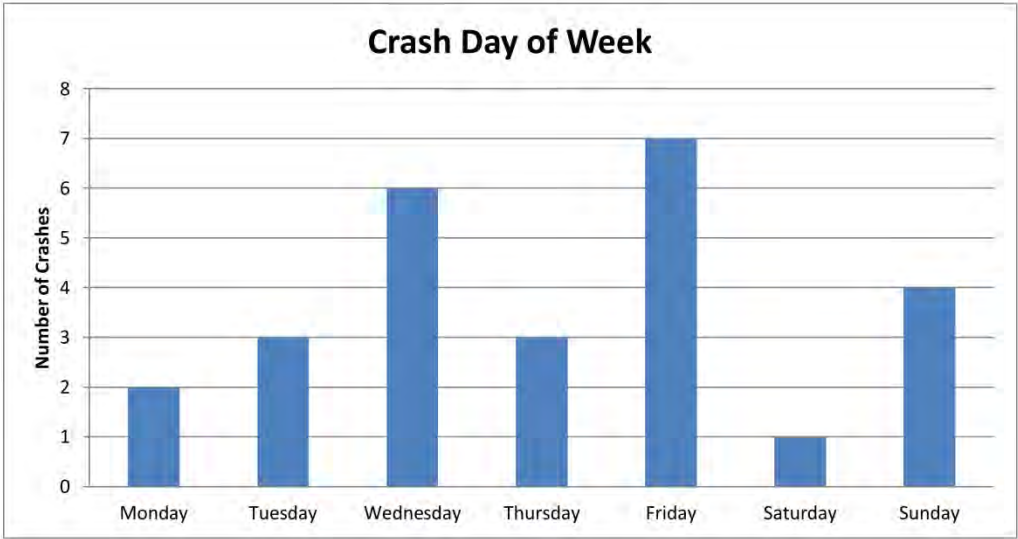
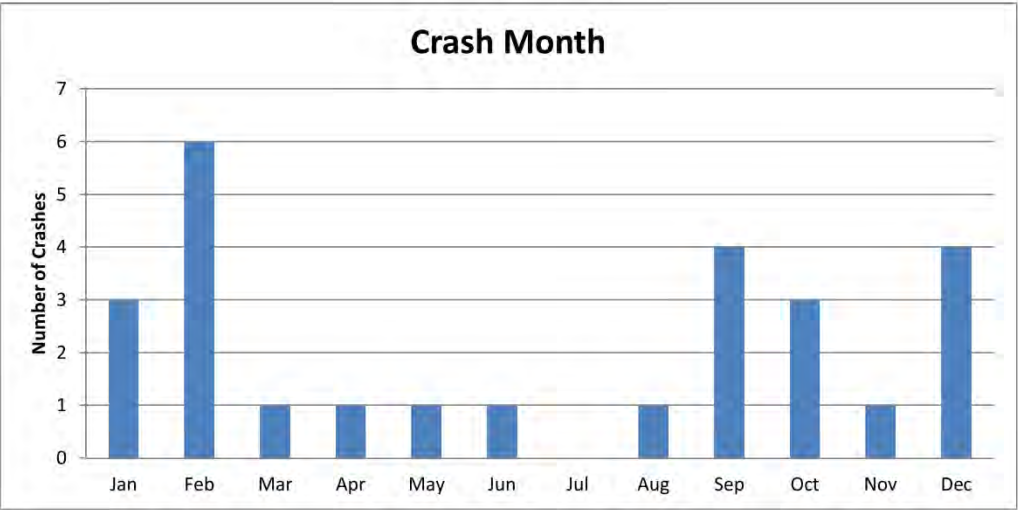
Location: Pittsfield, MA  
Source: Police Crash Reports  
MassDOT Proj. No: 606233  
Date Prepared: 11-12-15  
Prepared By: MP

Crash Data Summary Table

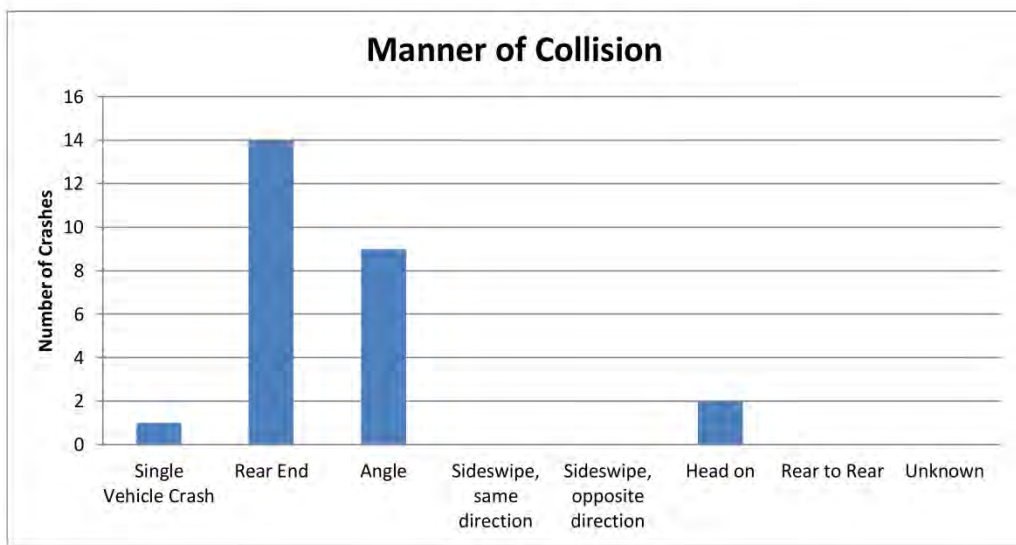
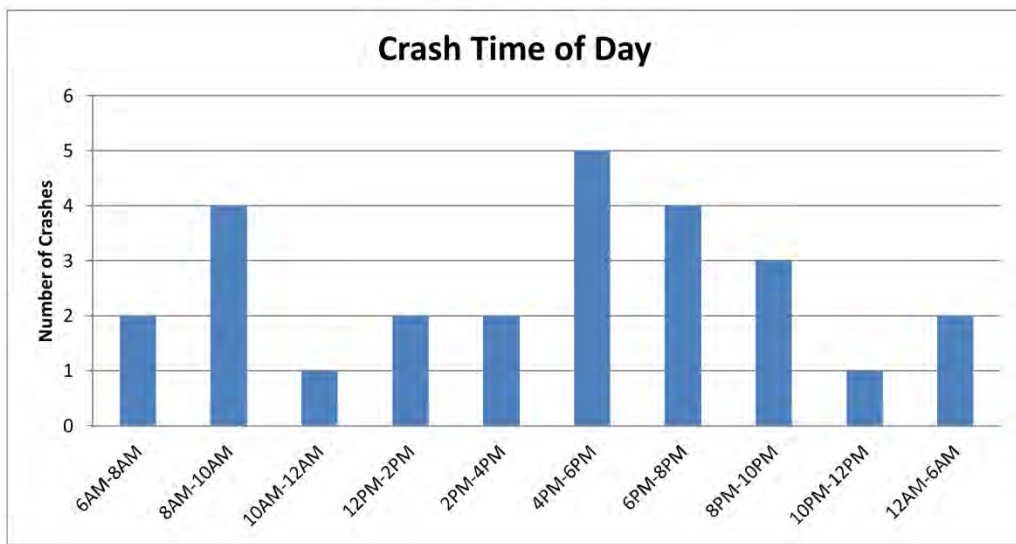
First Street at Tyler Street, Pittsfield, MA  
November 1, 2012 - October 31, 2015

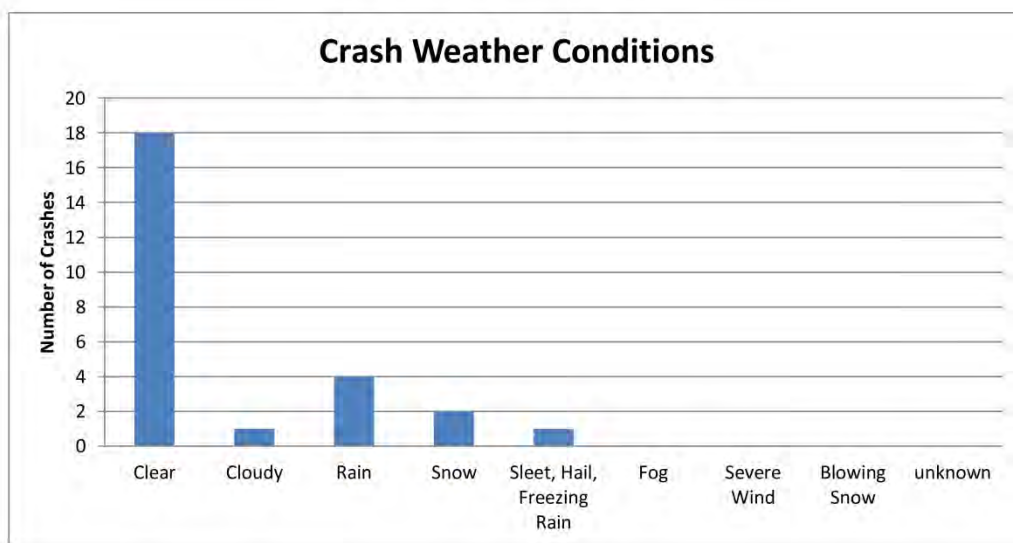
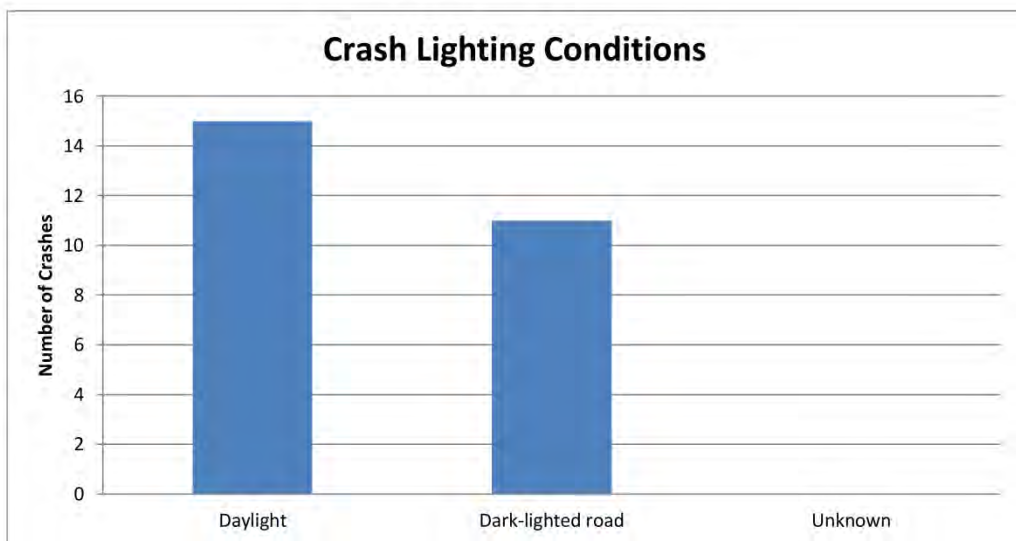
Crash Diagram	Crash Date	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Crash Severity	Ages		Comments
1	11/10/2012	12:37am	Head-on	Dark-lighted road	Clear	Dry	Unknown	Non-fatal injury	U	21	Head on collision
2	12/7/2012	4:56pm	Rear-end	Dark-lighted road	Rain	Wet	Physical impairment	Non-fatal injury	52	59	Vehicle rear-ended another vehicle
3	12/12/2012	8:44pm	Angle	Dark-lighted road	Clear	Dry	Failed to yield right of way	Property damage only	17	18	Vehicle was turning left and struck another vehicle coming straight through the intersection.
4	12/17/2012	6:34pm	Angle	Dark-lighted road	Clear	Wet	Made an improper turn	Non-fatal injury	54	22	Vehicle was turning left and struck another vehicle coming straight through the intersection.
5	1/1/2013	12:23am	Rear-end	Dark-lighted road	Clear	Wet	Other improper action	Non-fatal injury	19	42	Vehicle rear-ended another vehicle, then fled the scene, injuring the other driver who got out of his car.
6	2/19/2013	7:26pm	Angle	Daylight	Rain	Wet	Failed to yield right of way	Non-fatal injury	23	27	Vehicle was turning left and struck another vehicle coming straight through the intersection.
7	2/22/2013	4:50pm	Rear-end	Daylight	Clear	Dry	Followed too closely	Property damage only	42	20	Vehicle rear-ended another vehicle
8	8/13/2013	9:16am	Rear-end	Daylight	Rain	Wet	Inattention	Property damage only	44	59	Vehicle wat turning right onto Tyler St. eastbound and rear-ended another vehicle which was truning right into the gas station following a left turn from First Street.
9	9/13/2013	11:04am	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	32	29	Vehicle rear-ended another vehicle
10	12/1/2013	8:47am	Angle	Daylight	Clear	Wet	Failed to yield right of way	Property damage only	66	35	Vehicle traveling eastbound on Tyler St., ran a red light and struck another vehicle
11	1/6/2014	5:27pm	Head-on	Dark-lighted road	Freezing Rain	Ice	Failed to yield right of way	Property damage only	21	37	Vehicle was turning left and struck another vehicle coming straight through the intersection.
12	2/20/2014	6:05pm	Single Vehicle	Dark-lighted road	Clear	Dry	No improper driving	Non-fatal injury	52	34	Pedestrian crossing the street at an improper location was hit by a vehicle
13	4/16/2014	8:52am	Rear-end	Daylight	Clear	Dry	Visibility ostructed	Non-fatal injury	36	66	Vehicle rear-ended another vehicle
14	6/6/2014	3:27pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	22	65	Vehicle was turning left and was struck by another vehicle coming straight through the intersection.
15	9/10/2014	8:05pm	Angle	Dark-lighted road	Clear	Dry	Inattention	Property damage only	21	24	Vehicle backed out of a driveway and hit another vehicle
16	10/5/2014	1:22pm	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	52	37	Vehicle rear-ended another vehicle that was stopped in traffic.
17	10/24/2014	3:41pm	Rear-end	Daylight	Clear	Dry	Inattention	Non-fatal injury	28	33	Vehicle rear-ended another vehicle that was stopped in traffic.
18	1/15/2015	4:34pm	Rear-end	Daylight	Clear	Dry	Unknown	Property damage only	39	45	Vehicle rear-ended another vehicle which stopped at the intersection.
19	2/4/2015	6:45am	Rear-end	Daylight	Cloudy	Slush	Followed too closely	Property damage only	49	34	Vehicle slowed down due to traffic and was rear-ended by another vehicle
20	2/5/2015	9:25am	Angle	Daylight	Snow	Snow	Failed to yield right of way	Property damage only	32	25	Vehicle traveling southbound on First St. failed to stop for a red light and struck another vehicle
21	2/15/2015	10:44pm	Rear-end	Dark-lighted road	Snow	Ice	Other improper action	Property damage only	59	30	Vehicle failed to stop and rear-ended another vehicle
22	3/22/2015	1:38pm	Rear-end	Daylight	Clear	Dry	Operating vehicle recklessly	Property damage only	67	60	Vehicle backed into another vehicle behind in a travel lane.
23	5/8/2015	9:33pm	Angle	Dark-lighted road	Clear	Dry	No improper driving	Property damage only	60	54	Vehicle traveling westbound on Tyler St. ran a red light and struck another vehicle
24	9/9/2015	7:11am	Rear-end	Daylight	Clear	Dry	Distracted	Non-fatal injury	29	31	Vehicle rear-ended another vehicle that was stopped in traffic.
25	9/11/2015	4:41pm	Rear-end	Daylight	Clear	Dry	Followed too closely	Non-fatal injury	29	59	29 Three vehicle rear-end crash
26	10/28/2015	7:10pm	Angle	Dark-lighted road	Rain	Wet	Inattention	Property damage only	66	29	Vehicle failed to yield while doing a right turn and struck another vehicle

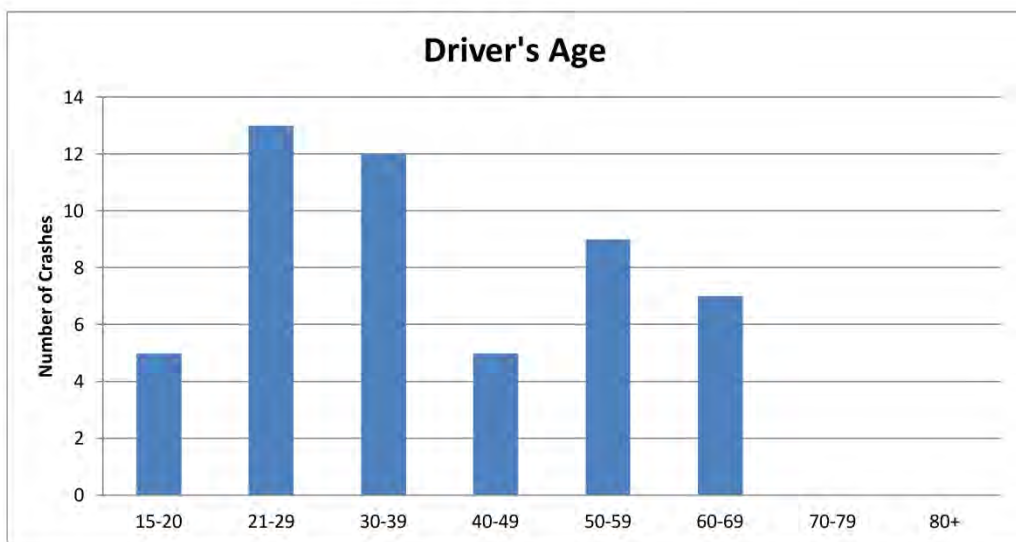
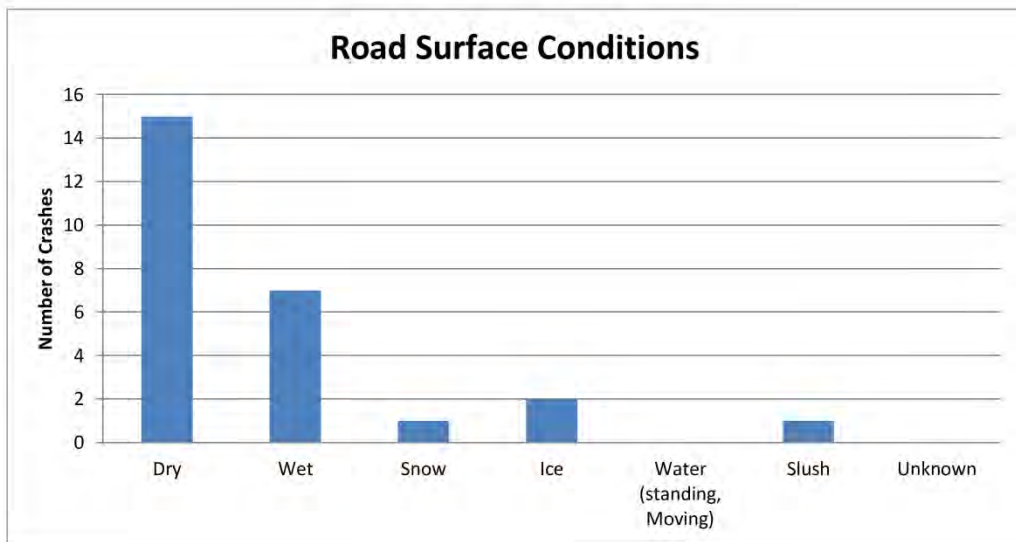
Summary based on Crash Reports obtained from the Local and State Police













## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Pittsfield COUNT DATE : 7/24/2014

DISTRICT : 1 UNSIGNALIZED : ☐ SIGNALIZED : ☒

### ~ INTERSECTION DATA ~

MAJOR STREET : First Street

MINOR STREET(S) : Tyler Street

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	636	541	436	281		1,894

"K" FACTOR : 0.083 INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : 22,819

TOTAL # OF CRASHES : 27 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( A ) : 9.00

**CRASH RATE CALCULATION :**

**1.08**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Completed by Fuss and O'Neill, Inc. - 12-17-2015

Project Title & Date: BMC Area Traffic Circulation Improvements

## **BMC Area Traffic Circulation Improvements**

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### Location 3





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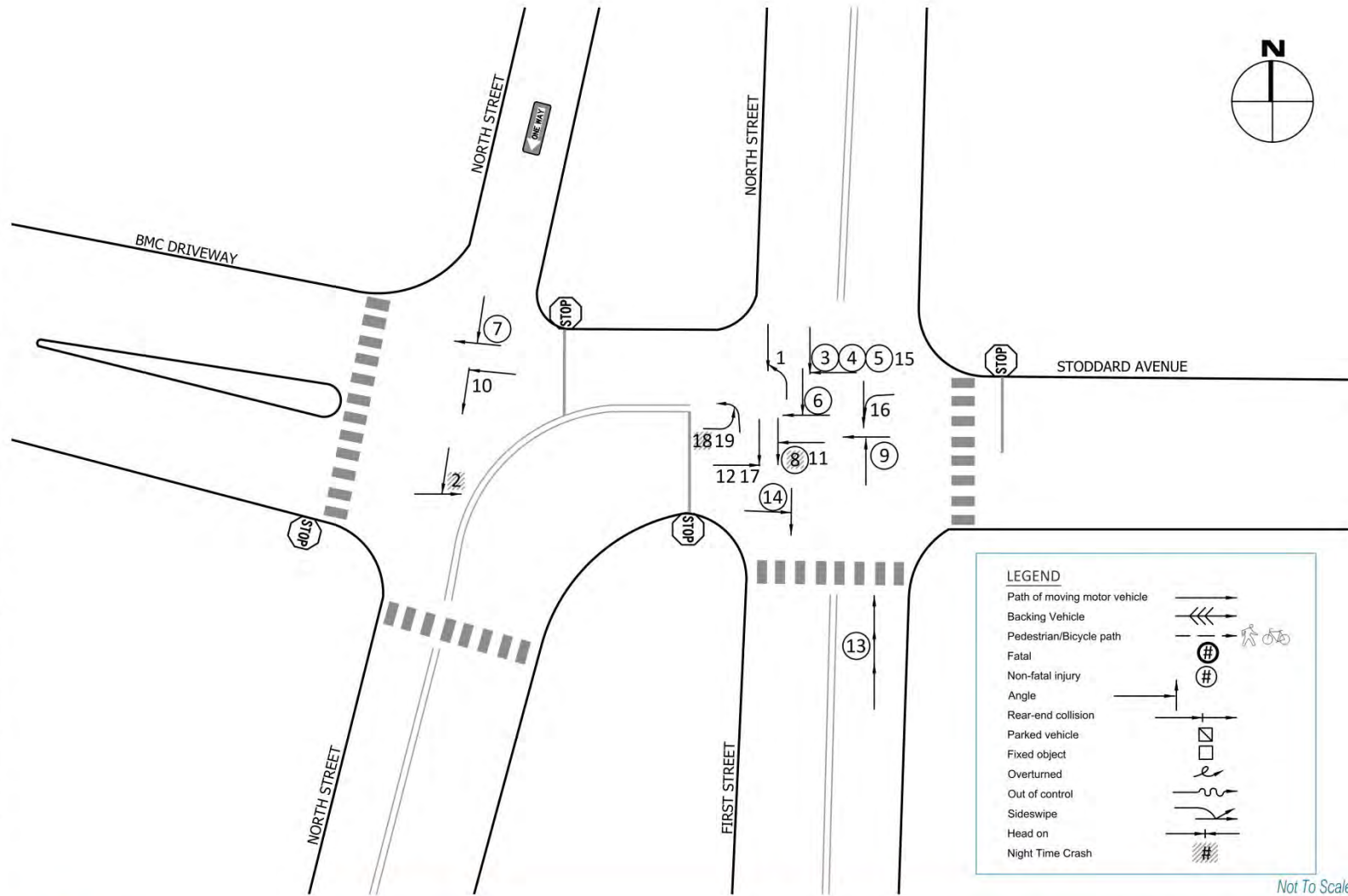
78 INTERSTATE DRIVE  
WEST SPRINGFIELD, MA 01089  
413.452.0445  
www.fando.com

## FIGURE 3: Intersection 3 BMC Area Traffic Circulation Improvements

PROJ. NO: 20130889A20

December, 2015





**FUSS & O'NEILL**

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## COLLISION DIAGRAM

INTERSECTION OF FIRST STREET, STODDARD AVENUE, NORTH STREET AND BMC DRIVEWAY  
TIME PERIOD ANALYZED: NOVEMBER 1, 2012 TO OCTOBER 31, 2015

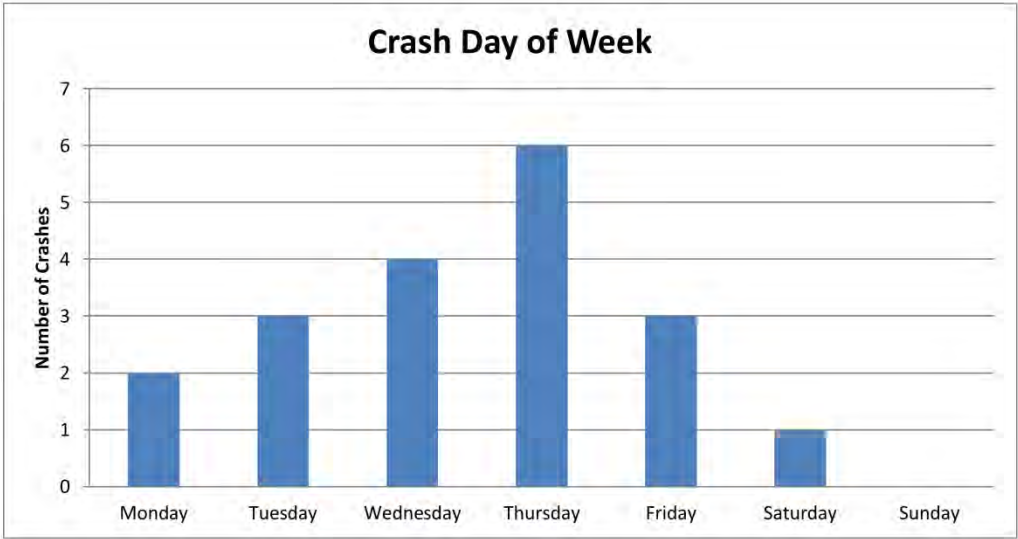
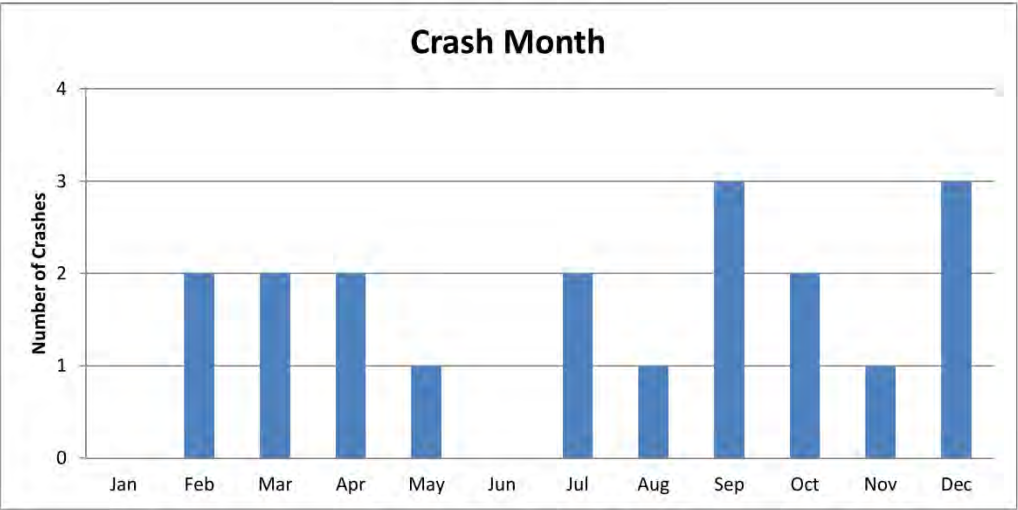
Location: Pittsfield, MA  
Source: Police Crash Reports  
MassDOT Proj. No: 606233  
Date Prepared: 11-12-15  
Prepared By: DVM

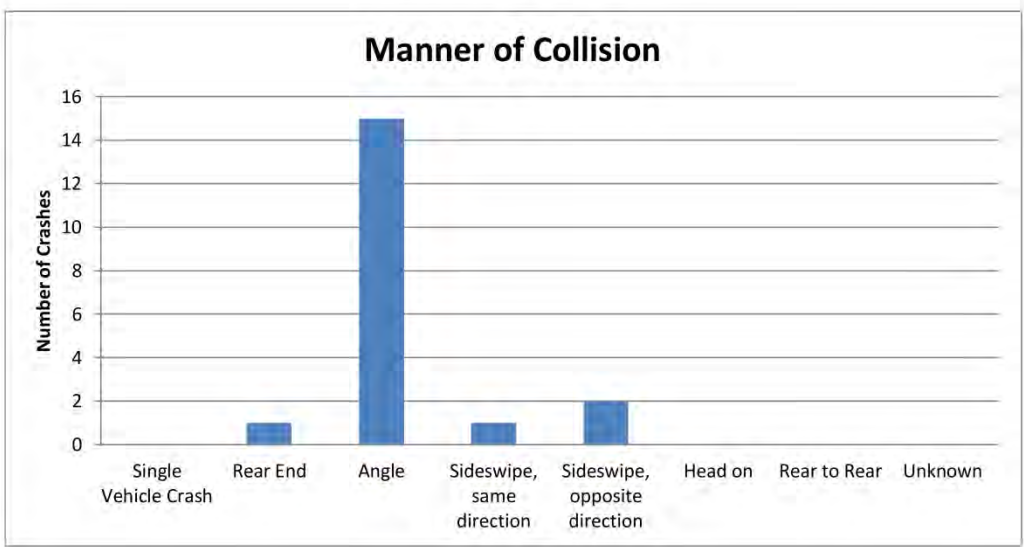
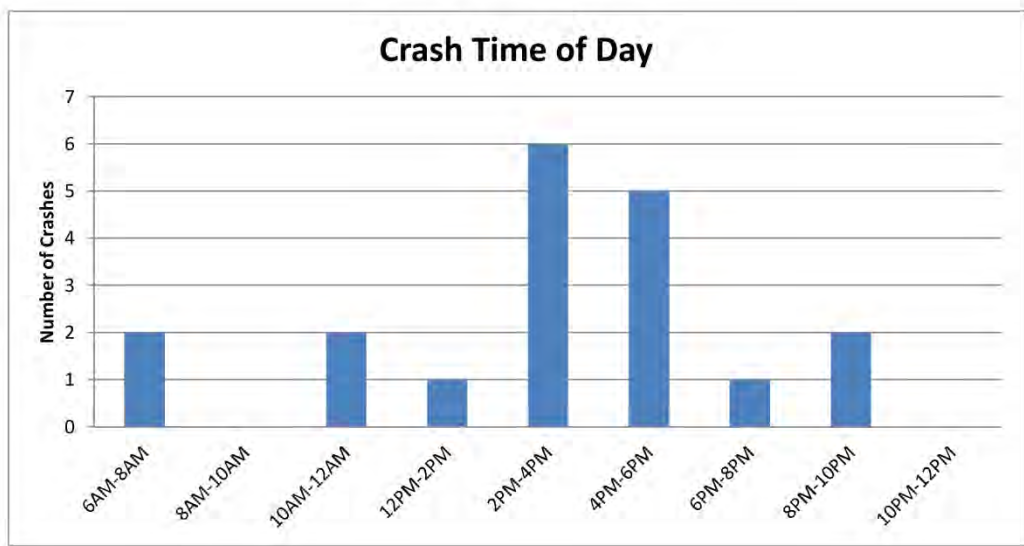
Crash Data Summary Table

North Street and First Street at Stoddard Avenue and BMC Driveway, Pittsfield, MA  
November 1, 2012 - October 31, 2015

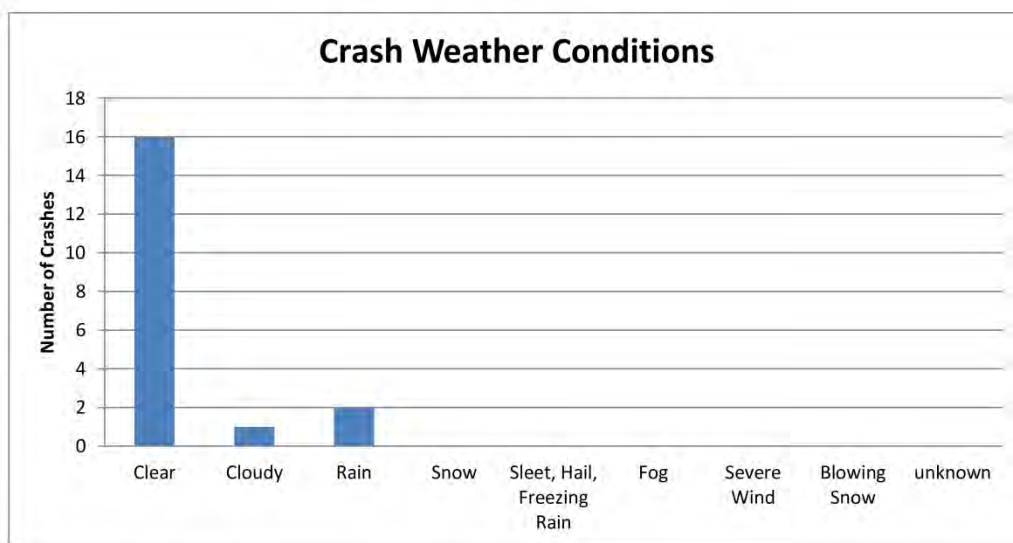
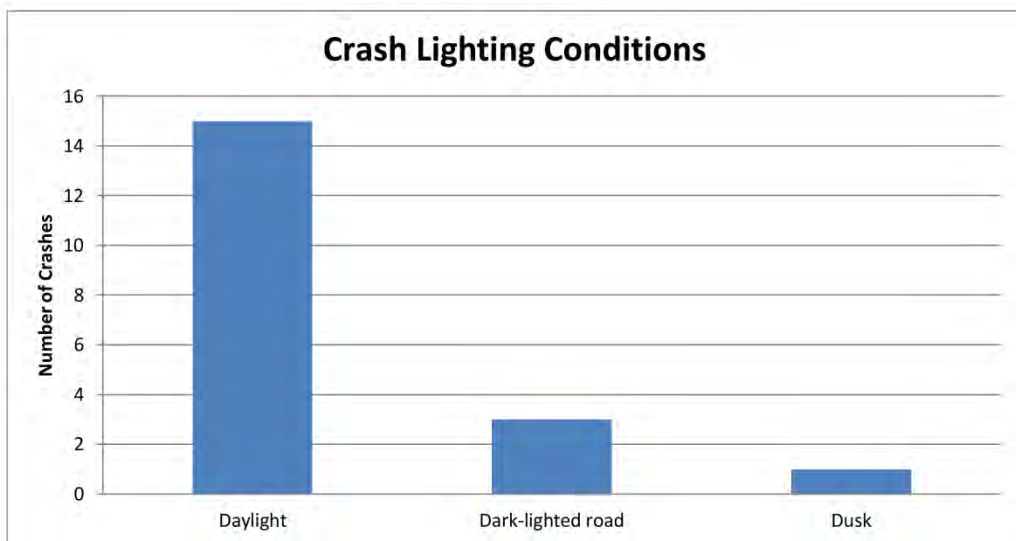
Crash Diagram	Crash Date	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Crash Severity	Ages		Comments
1	12/18/2012	3:38pm	Angle	Daylight	Rain	Wet	Failed to yield right of way	Property damage only	22	59	Vehicle struck another vehicle while making a left turn
2	12/27/2012	4:59pm	Angle	Dark-lighted road	Clear	Dry	Failed to yield right of way	Property damage only	56	51	Vehicle failed to yield right of way to the major street traffic and was struck by another vehicle
3	3/27/2013	4:12pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	50	48	Vehicle failed to yield right of way to the major street traffic and was struck by another vehicle
4	4/25/2013	5:08pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	19	72	Vehicle failed to yield right of way to the major street traffic and was struck by another vehicle
5	9/20/2013	3:46pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	37	30	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
6	12/18/2013	2:58pm	Angle	Daylight	Clear	Wet	Inattention	Non-fatal injury	27	48 19	Vehicle failed to yield right of way to the major street traffic and was struck by a vehicle traveling on the major street and struck a standing vehicle across the street
7	2/12/2014	10:54am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	48	21	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
8	3/7/2014	9:00pm	Angle	Dark-lighted road	Clear	Wet	Disregarded traffic signs, signal	Non-fatal injury	41	58	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
9	5/2/2014	7:18am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	18	54	Vehicle failed to yield right of way to the major street traffic and was struck by another vehicle
10	7/22/2014	11:54am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	35	77	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
11	10/27/2014	3:32pm	Angle	Daylight	Clear	Dry	Glare	Property damage only	61	64	Driver couldn't see the traffic on the major street due to glare and struck another vehicle while attempting to cross the street
12	11/12/2014	4:48pm	Sideswipe (Opposite dir.)	Dusk	Clear	Dry	Disregarded traffic signs, signal	Unknown	80	42	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
13	2/24/2015	4:01pm	Rear-end	Daylight	Clear	Dry	Inattention	Non-fatal injury	19	49 27	Three vehicle rear-end accident
14	4/30/2015	6:48am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Non-fatal injury	19	60	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
15	7/13/2015	3:55pm	Sideswipe (Opposite dir.)	Daylight	Rain	Wet	Unknown	Property damage only	53	66	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
16	8/13/2015	5:21pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	24	50	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
17	9/3/2015	3:45pm	Sideswipe (Same dir.)	Daylight	Cloudy	Dry	Inattention	Property damage only	61	44	Vehicle failed to yield right of way to the major street traffic and struck another vehicle
18	9/24/2015	9:53pm	Angle	Dark-lighted road	Clear	Dry	Other improper action	Property damage only	40	51	Vehicle turning left onto First Street northbound failed to yield right of way to another vehicle that was turning left from First Street.
19	10/17/2015	1:39pm	Angle	Daylight	Clear	Dry	Inattention	Property damage only	66	39	Vehicle turning left onto North St. northbound failed to yield right of way to the major street traffic and struck another vehicle that was turning left onto the BMC driveway

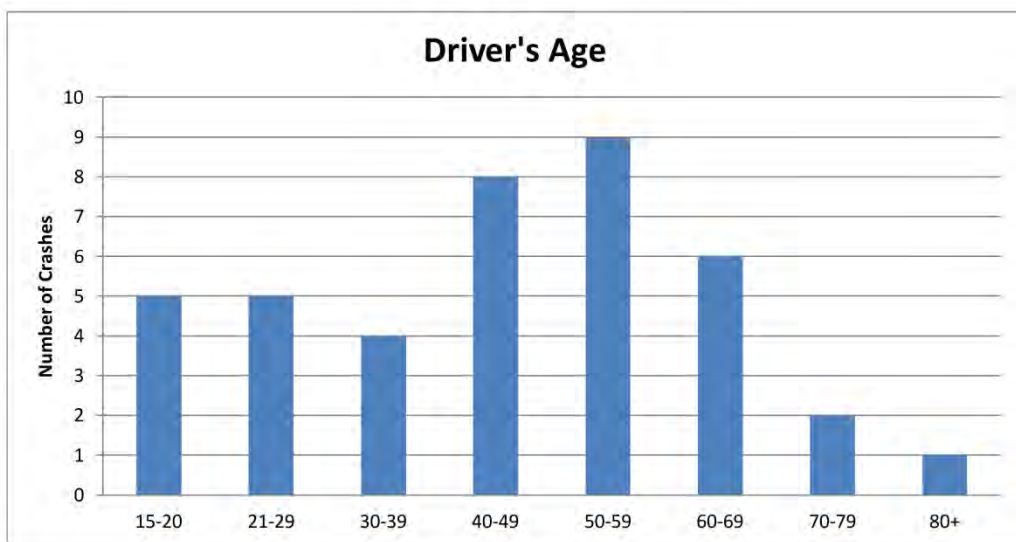
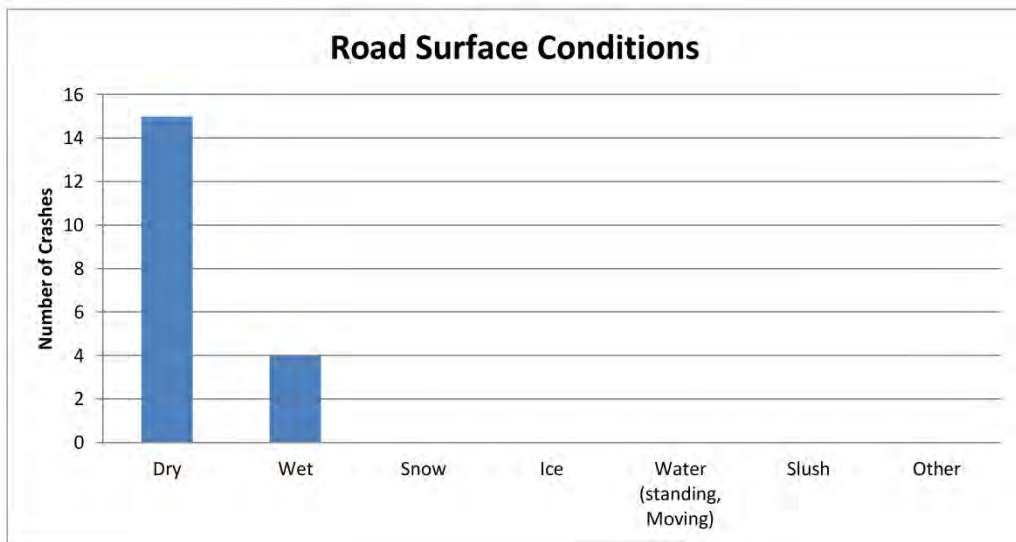
Summary based on Crash Reports obtained from the Local and State Police











## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Pittsfield COUNT DATE : 7/24/2014

DISTRICT : 1 UNSIGNALIZED : ☒ SIGNALIZED : ☐

### ~ INTERSECTION DATA ~

MAJOR STREET : First Street

MINOR STREET(S) : North Street

Stoddard Avenue

BMC Driveway

INTERSECTION  
 DIAGRAM  
 (Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	606	43	665	44		1,358

"K" FACTOR : 0.083 INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : 16,361

TOTAL # OF CRASHES : 19 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( A ) : 6.33

CRASH RATE CALCULATION :

**1.06**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Completed by Fuss and O'Neill, Inc. - 12-17-2015

Project Title & Date: BMC Area Traffic Circulation Improvements

## **BMC Area Traffic Circulation Improvements**

Location 4





FILENAME: J:\DWG\PROJECTS\2013\20130889A20\Civil\Traffic Figures\20130889A20\_RSA\_Figures.dwg



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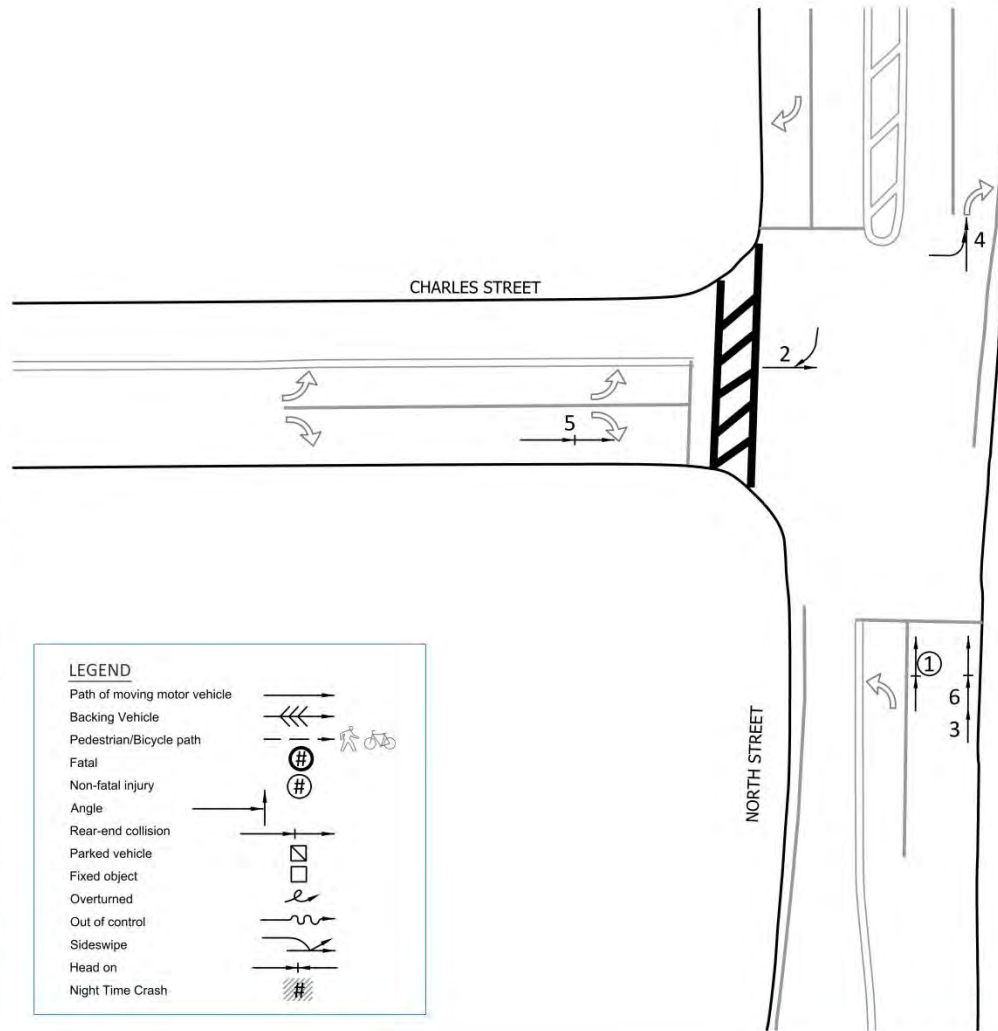
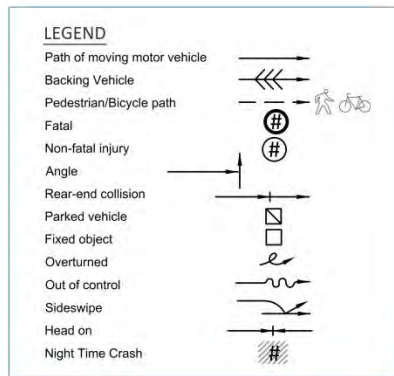
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## FIGURE 4: Intersections 4 and 5

BMC Area Traffic Circulation Improvements

PROJ. NO: 20130889A20

December, 2015



Not To Scale

**COLLISION DIAGRAM**

INTERSECTION OF NORTH STREET AND CHARLES STREET

TIME PERIOD ANALYZED: NOVEMBER 1, 2012 TO OCTOBER 31, 2015

Location: Pittsfield, MA

Source: Police Crash Reports

MassDOT Proj. No: 606233

Date Prepared: 11-12-15

Prepared By: MP

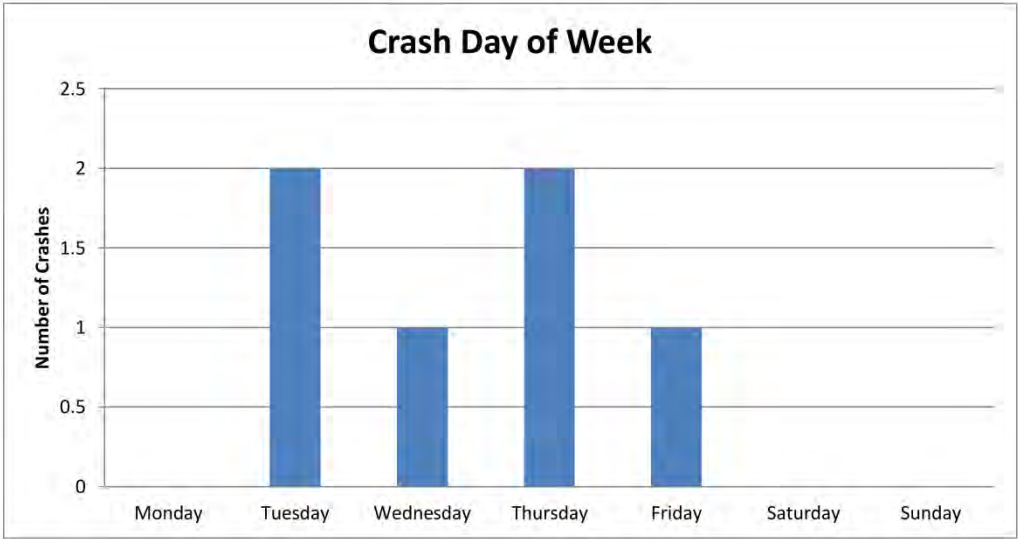
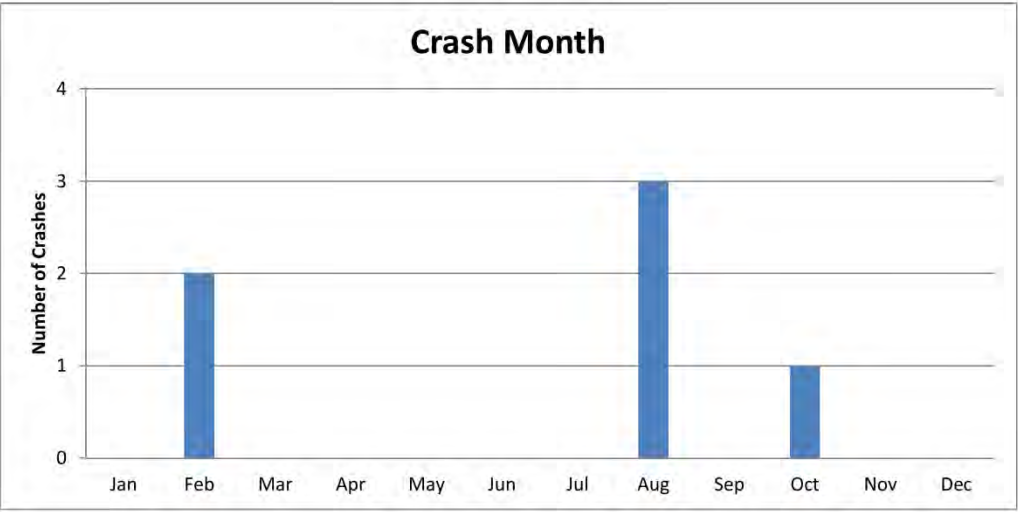


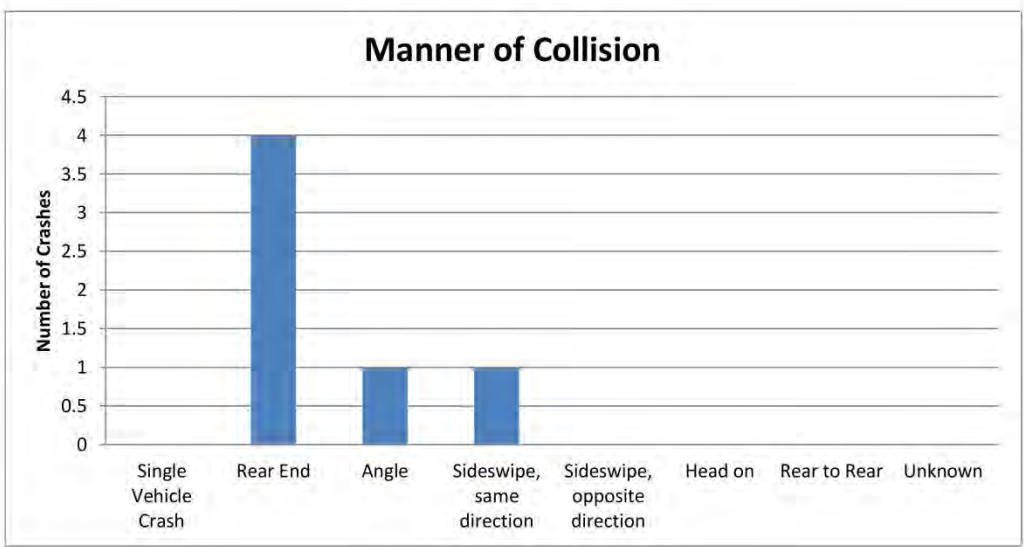
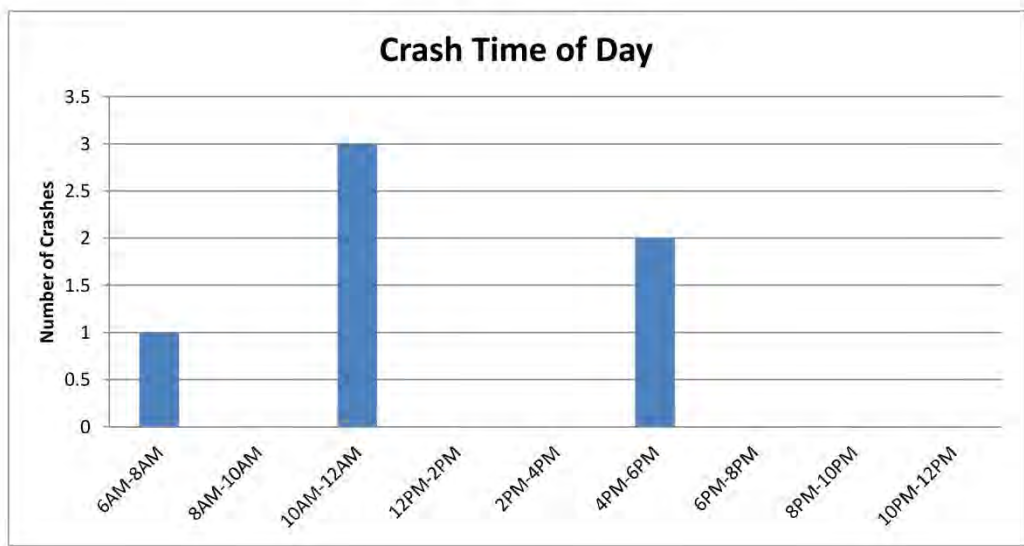
Crash Data Summary Table

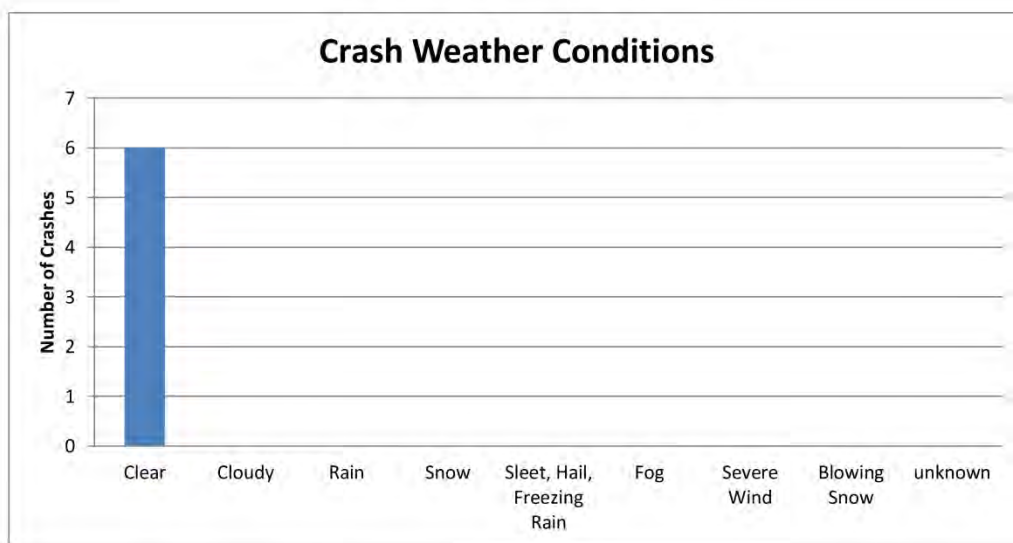
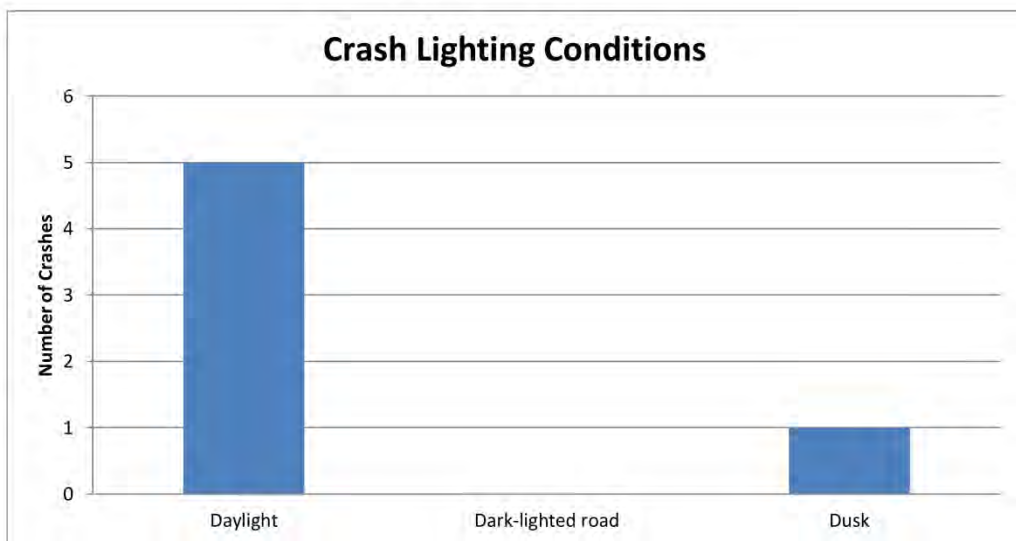
Charles Street at North Street, Pittsfield, MA  
November 1, 2012 - October 31, 2015

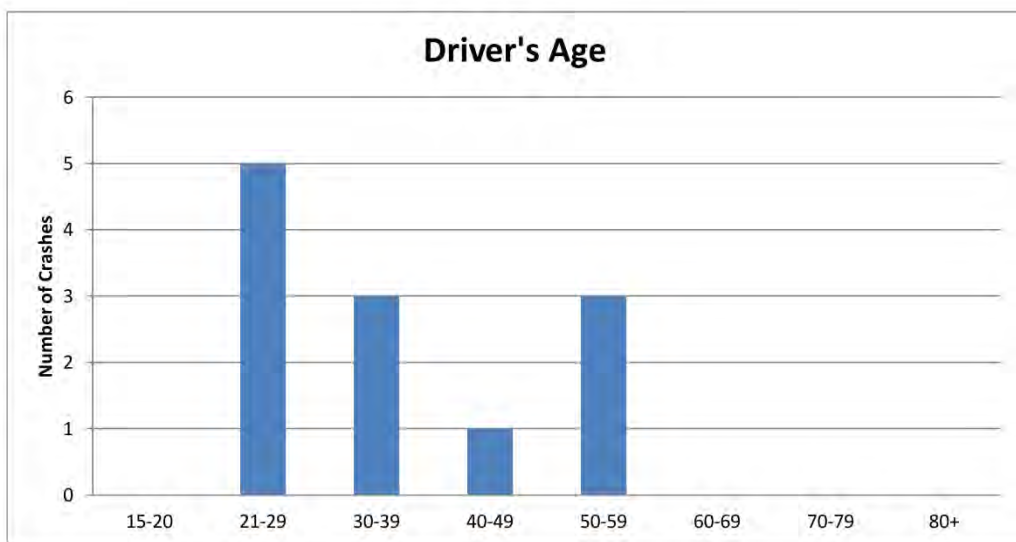
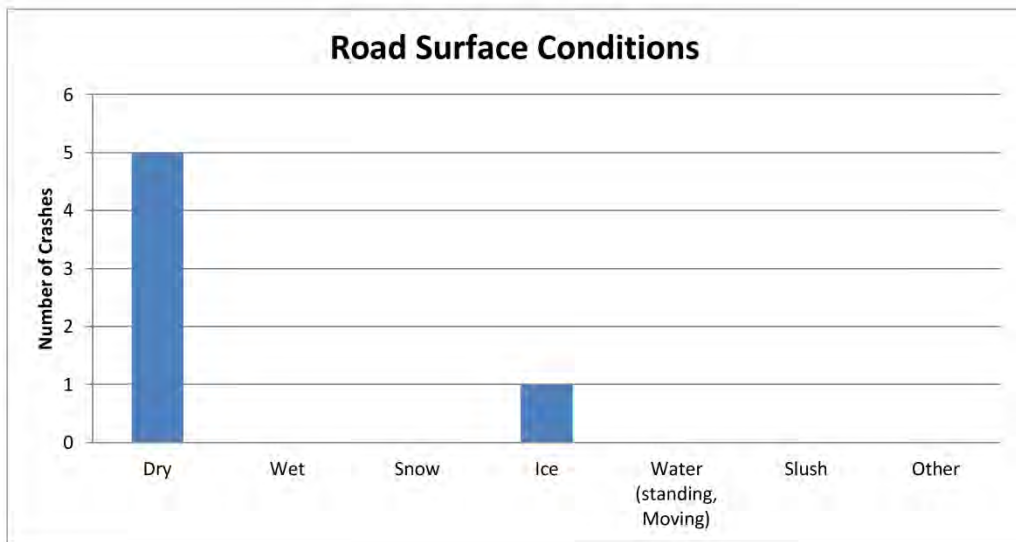
Crash Diagram	Crash Date	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Crash Severity	Ages			Comments
1	8/20/2013	11:45am	Rear-end	Daylight	Clear	Dry	Followed too closely	Non-fatal injury	53	25		Vehicle following too close, rear ended another vehicle
2	2/6/2014	10:36am	Angle	Daylight	Clear	Dry	Unknown	Property damage only	25	32		Opposing turning movements
3	8/13/2014	5:29pm	Rear-end	Daylight	Clear	Dry	Followed too closely	Property damage only	42	54		Three vehicle rear-end accident
4	10/24/2014	5:18pm	Sideswipe (Same dir.)	Dusk	Clear	Dry	Failed to yield right of way	Property damage only	39	59		Vehicle truning onto a major roadway struck another vehicle
5	2/17/2015	6:36am	Rear-end	Daylight	Clear	Ice	No improper driving	Property damage only	38	29		Vehicle slid on ice/snow rear-ending another vehicle
6	8/6/2015	10:54am	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	27	27	48	Three vehicle rear-end accident

Summary based on Crash Reports obtained from the Local and State Police









## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Pittsfield COUNT DATE : 12/13/2011  
 DISTRICT : 1 UNSIGNALIZED : ☐ SIGNALIZED : ☒

### ~ INTERSECTION DATA ~

MAJOR STREET : North Street  
 MINOR STREET(S) : Charles Street

**INTERSECTION  
 DIAGRAM**  
 (Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	601		631	457		1,689
"K" FACTOR :	0.092	INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME :				18,359
TOTAL # OF CRASHES :	6	# OF YEARS :	3	AVERAGE # OF CRASHES PER YEAR ( A ) :		2.00

**CRASH RATE CALCULATION :**

**0.30**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Completed by Fuss and O'Neill, Inc. - 12-17-2015

Project Title & Date: BMC Area Traffic Circulation Improvements



## **BMC Area Traffic Circulation Improvements**

Location 5



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## FIGURE 4: Intersections 4 and 5

BMC Area Traffic Circulation Improvements

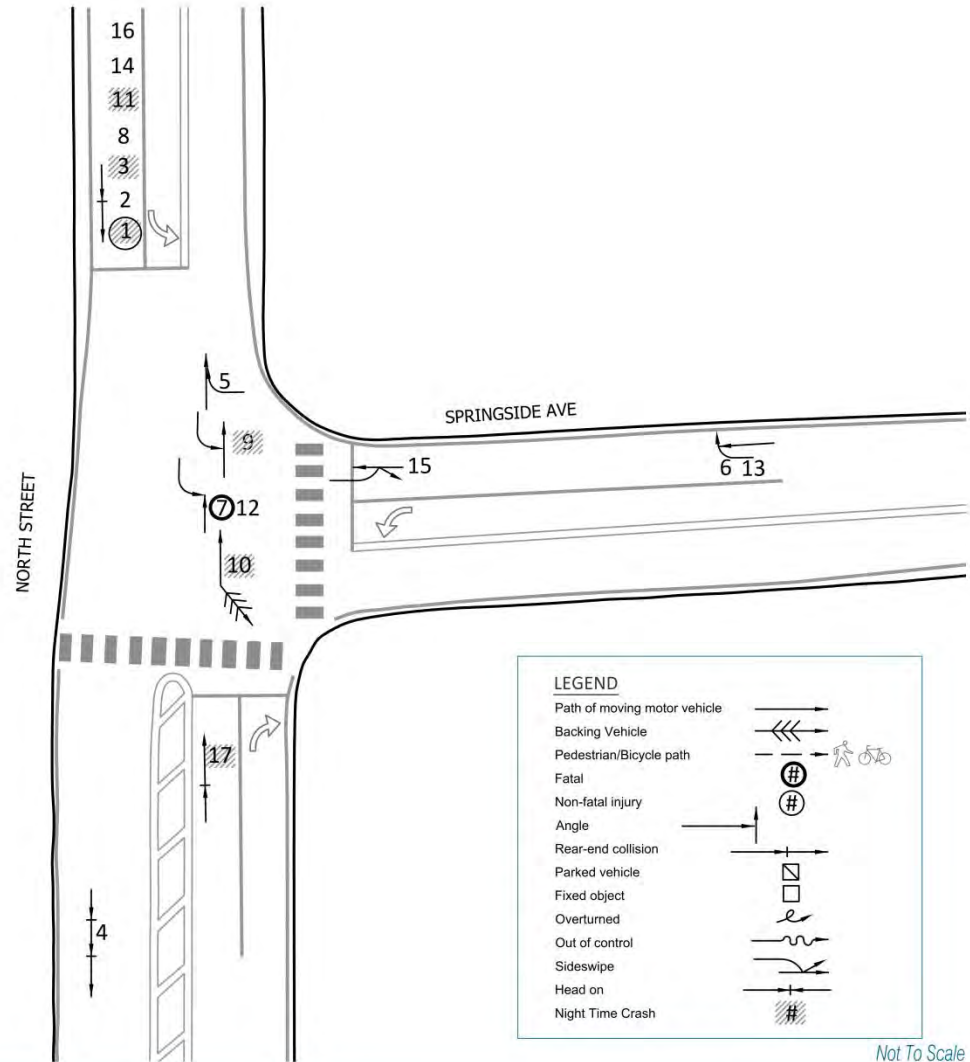
PROJ. NO: 20130889A20

December, 2015



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## COLLISION DIAGRAM

INTERSECTION OF NORTH STREET AND SPRINGSIDE AVENUE  
TIME PERIOD ANALYZED: NOVEMBER 1, 2012 TO OCTOBER 31, 2015

Location: Pittsfield, MA  
Source: Police Crash Reports  
MassDOT Proj. No: 606233  
Date Prepared: 11-12-15  
Prepared By: MP



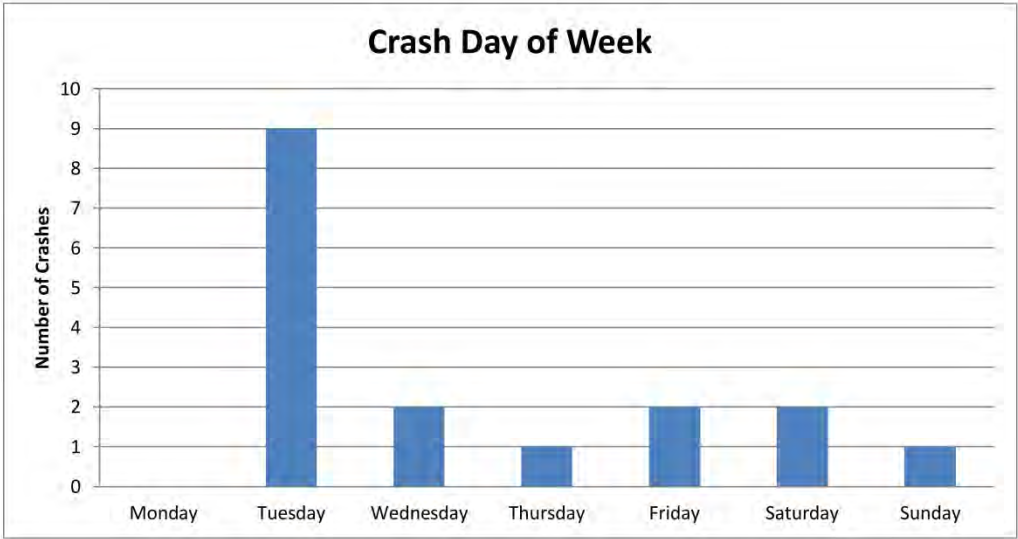
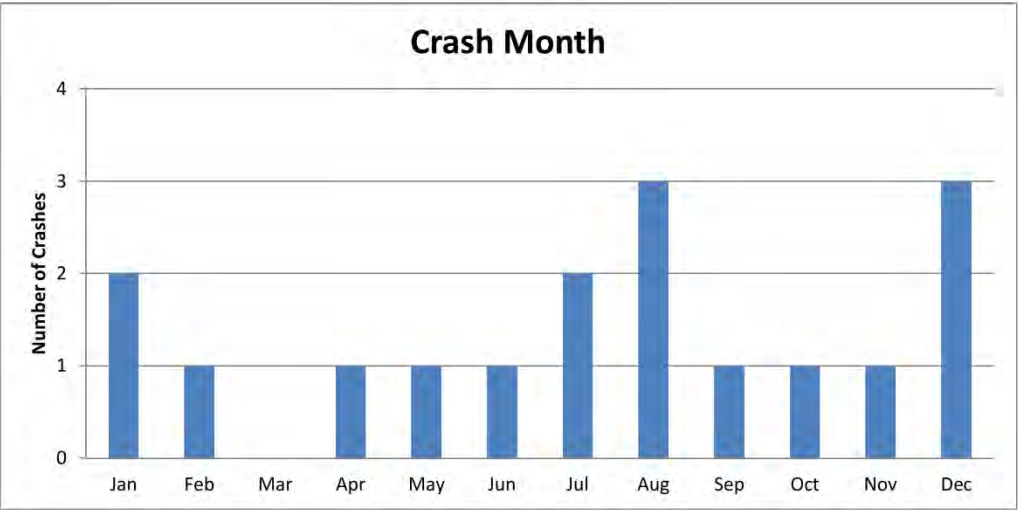
# Crash Data Summary Table

Springside Street at North Street, Pittsfield, MA

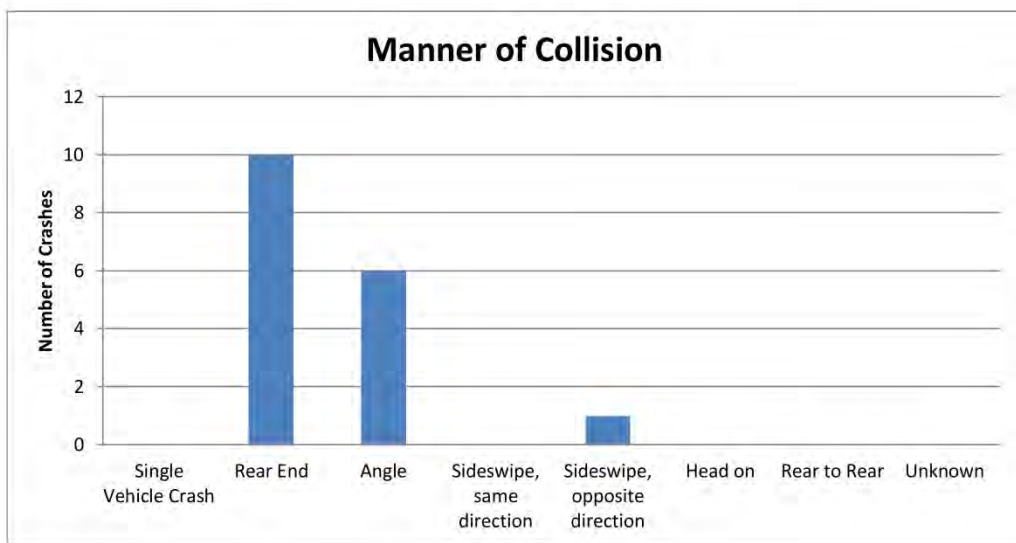
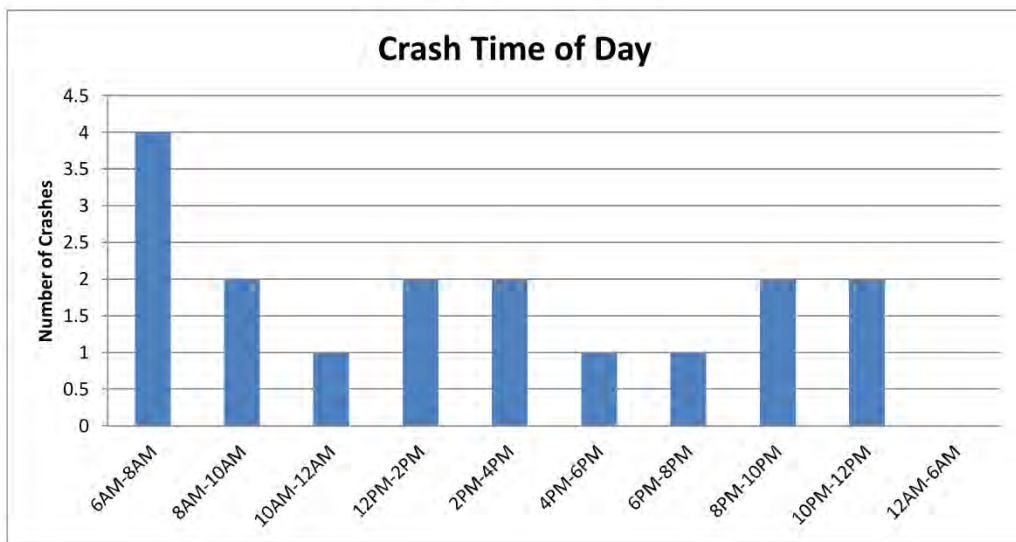
November 1, 2012 - October 31, 2015

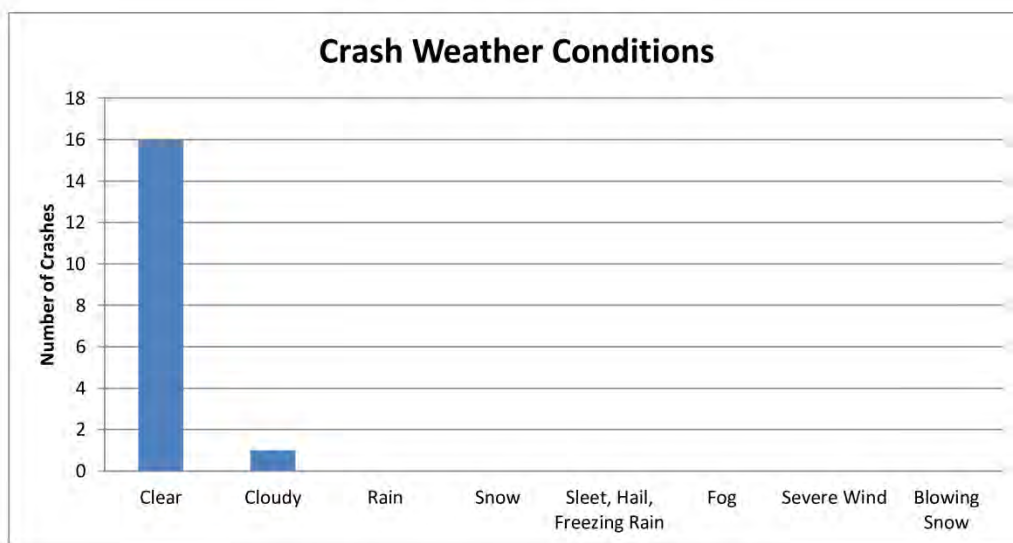
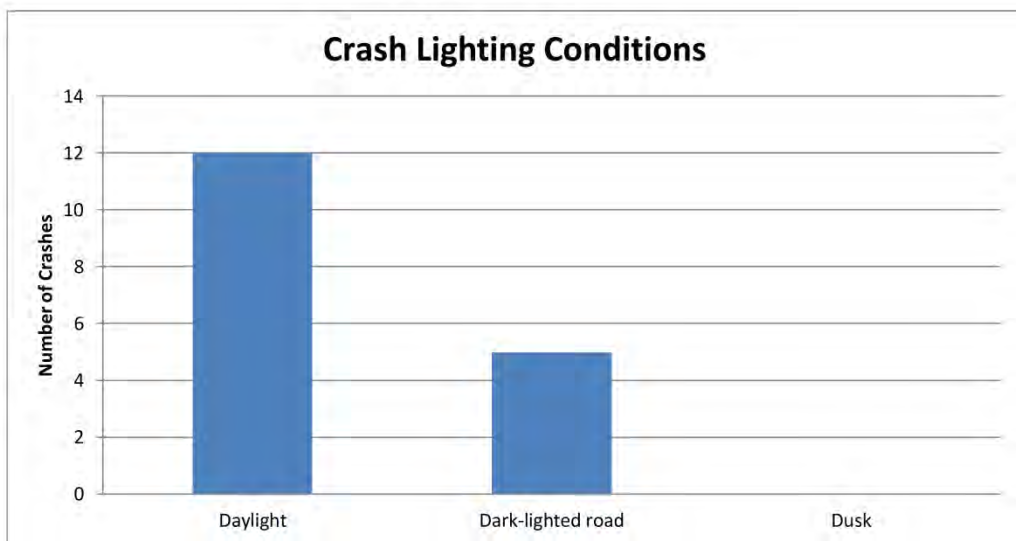
Crash Diagram	Crash Date	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Crash Severity	Ages			Comments
1	11/14/2012	6:34pm	Rear-end	Dark-lighted road	Clear	Dry	Inattention	Non-fatal injury	86	67		Vehicle rear-ended another vehicle that was stopped at the intersection.
2	12/11/2012	11:53am	Rear-end	Daylight	Clear	Dry	Followed too closely	Property damage only	43	70		Vehicle rear-ended another vehicle that was slowing down for a red light at the intersection.
3	12/18/2012	10:57pm	Rear-end	Dark-lighted road	Clear	Dry	Exceeded speed limit	Property damage only	21	34		Vehicle rear-ended another vehicle that was stopped at the intersection, then the driver left the scene on foot.
4	1/9/2013	7:08am	Rear-end	Daylight	Clear	Wet	Followed too closely	Property damage only	35	47	62	Three vehicle rear-end accident
5	9/27/2013	7:47am	Angle	Daylight	Clear	Dry	Failed to yield right of way	Property damage only	56	26		Vehicle turning right collided with another vehicle that was stopped to let a pedestrian go
6	1/21/2014	7:02am	Angle	Daylight	Clear	Dry	No improper driving	Property damage only	39	64		Vehicle making a wide right turn into a driveway was struck by another vehicle traveling on the right
7	7/15/2014	12:56pm	Angle	Daylight	Clear	Dry	Failed to yield right of way	Fatal injury	31	50		Vehicle failed to yield to oncoming traffic while turning left and struck a motorcyclist
8	8/12/2014	3:04pm	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	19	46		Vehicle rear-ended another vehicle that was stopped at the intersection.
9	8/12/2014	8:36pm	Angle	Dark-lighted road	Clear	Dry	Unknown	Non-fatal injury	54	34		Vehicle failed to yield to oncoming traffic while turning left and struck another vehicle
10	8/12/2014	9:08pm	Rear-end	Dark-lighted road	Clear	Dry	Glare	Property damage only	53			Tow truck backed into a police cruiser at an accident scene
11	10/5/2014	12:18pm	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	18	61		Vehicle rear-ended another vehicle that was stopped at the intersection.
12	12/16/2014	7:39am	Angle	Daylight	Clear	Dry	Inattention	Property damage only	23	23		Vehicle failed to yield to oncoming traffic while turning left and struck another vehicle
13	2/13/2015	3:24pm	Angle	Daylight	Clear	Snow	Other improper action	Property damage only	31	59		Vehicle making a wide right turn into a driveway was struck by another vehicle traveling on the right
14	4/21/2015	8:26am	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	27	33		Vehicle rear-ended another vehicle that was stopped at the intersection.
15	5/16/2015	9:36am	Sideswipe (Opposite dir.)	Daylight	Cloudy	Dry	Inattention	Property damage only	36	44		Tractor trailer making a tight turn struck a vehicle
16	6/13/2015	5:47pm	Rear-end	Daylight	Clear	Dry	Inattention	Property damage only	24	28		Vehicle rear-ended another vehicle that was slowing down for a red light at the intersection.
17	7/2/2015	10:42pm	Rear-end	Dark-lighted road	Clear	Dry	Inattention	Property damage only	24	45		Vehicle rear-ended another vehicle that was slowing down for a turning vehicle at the intersection.

Summary based on Crash Reports obtained from the Local and State Police









## INTERSECTION CRASH RATE WORKSHEET

CITY/TOWN : Pittsfield COUNT DATE : 12/13/2011

DISTRICT : 1 UNSIGNALIZED : ☐ SIGNALIZED : ☒

### ~ INTERSECTION DATA ~

MAJOR STREET : North Street

MINOR STREET(S) : Springside Avenue

**INTERSECTION  
DIAGRAM**  
(Label Approaches)



### PEAK HOUR VOLUMES

APPROACH :	1	2	3	4	5	Total Peak Hourly Approach Volume
DIRECTION :	NB	WB	SB	EB		
PEAK HOURLY VOLUMES (PM) :	794	295	600			1,689

"K" FACTOR : 0.092 INTERSECTION ADT ( V ) = TOTAL DAILY APPROACH VOLUME : 18,359

TOTAL # OF CRASHES : 17 # OF YEARS : 3 AVERAGE # OF CRASHES PER YEAR ( A ) : 5.67

**CRASH RATE CALCULATION :**

**0.85**

$$\text{RATE} = \frac{(A * 1,000,000)}{(V * 365)}$$

Comments : Completed by Fuss and O'Neill, Inc. - 12-17-2015

Project Title & Date: BMC Area Traffic Circulation Improvements

## Appendix D. Traffic Volume Figures

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# WEEKDAY MORNING PEAK HOUR

7:15 to 8:15am  
Conducted: Wednesday Dec. 15, 2011

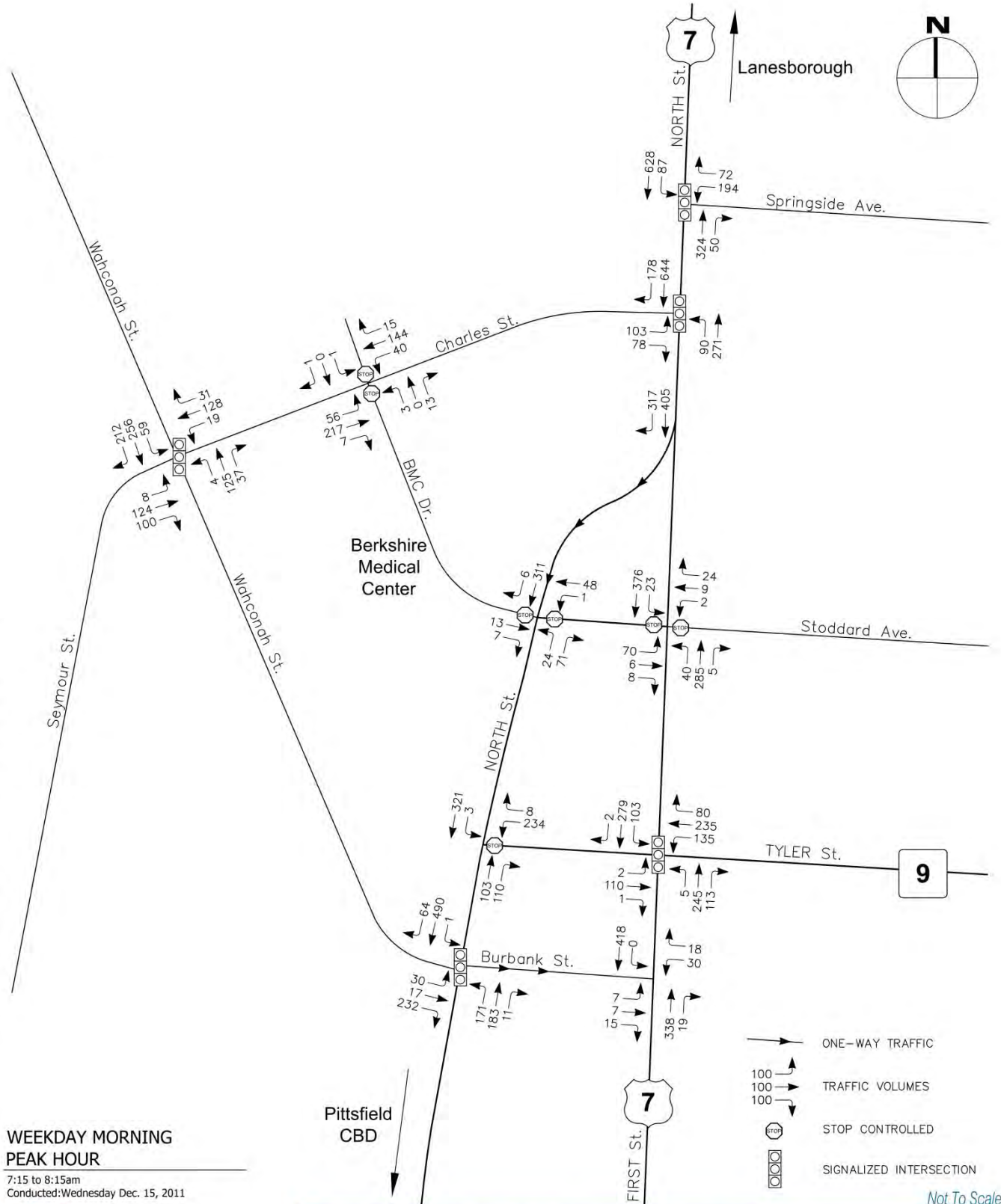


## FIGURE 8: WEEKDAY MORNING PEAK HOUR 2014 EXISTING TRAFFIC CONDITIONS

PROJ. NO: 20130889.A20

INTERSECTION IMPROVEMENTS NEAR BMC

JANUARY 2015





# WEEKDAY AFTERNOON PEAK HOUR

3:30 to 4:30pm  
Conducted: Wednesday Dec. 15, 2011

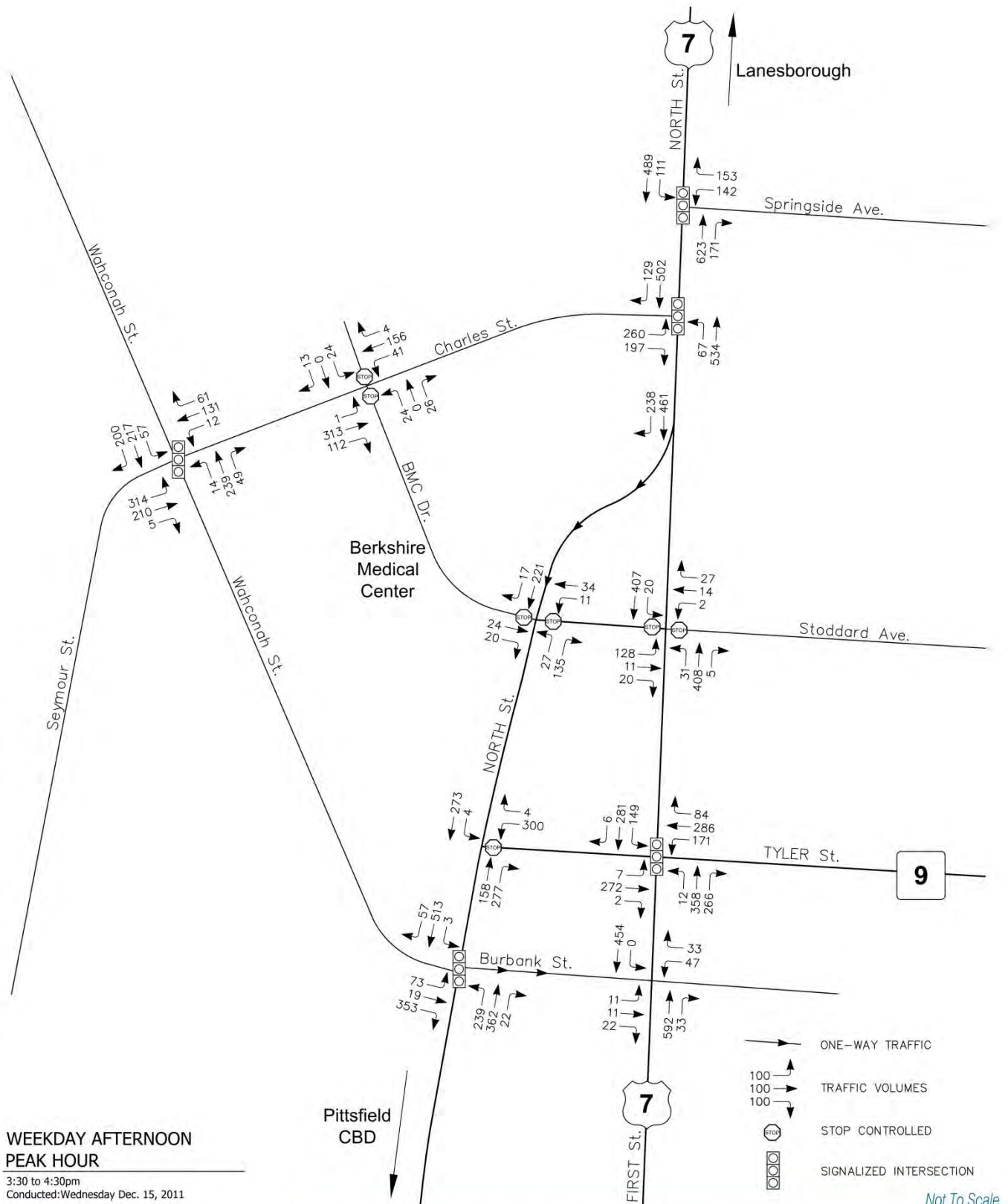


## FIGURE 9: WEEKDAY AFTERNOON PEAK HOUR 2014 EXISTING TRAFFIC CONDITIONS

PROJ. NO: 20130889.A20

INTERSECTION IMPROVEMENTS NEAR BMC

JANUARY 2015



## Road Safety Audit References

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[www.mhd.state.ma.us/safetytoolbox](http://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.

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