

ROAD SAFETY AUDIT

Route 9 (Main Street/Bridge Street) From West Street and
Elm Street to Market Street and Hawley Street

Northampton, MA

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Prepared For:
Massachusetts Department of Transportation



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Background

As a prerequisite to meeting funding criteria under the Federal Highway Administration’s (FHWA) Local and Rural Road Safety Program, a Road Safety Audit (RSA) was conducted for the approximately half-mile segment of Main Street/Bridge Street in Northampton, Massachusetts extending from Elm Street and West Street on the west to Market Street and Hawley Street on the east. Main Street/Bridge Street is the main east-west running thoroughfare providing pedestrian, bicycle, bus, freight, and vehicular access through Downtown Northampton. During the years analyzed (2015 – 2017), 167 crashes occurred along the corridor. During the RSA, members of the audit team discussed safety issues on a corridor-wide and intersection-by-intersection basis.

A RSA is an important part of the Highway Safety Improvement Program (HSIP). A RSA is required for HSIP funding applications, and if all or part of the proposed project is HSIP-eligible, as RSA is required for 25% design plans. Within the study area limits, the intersection of Main Street at King Street/Pleasant Street is part of the 2014-2016 HSIP crash cluster. This report documents the findings of the RSA and is intended to be used by planners, engineers, and local stakeholders to inform future design modifications. Knowing the success of an RSA, the MassDOT Safety Management Unit is encouraging MassDOT Districts and communities to conduct RSAs at the initial stage of the design process so as to help guide the design and reduce fatalities and injury crashes for locations in which safety has been noted to be a factor in determining needs for improvement. All future projects to follow from RSAs should implement the latest MassDOT, FHWA, ADA, MUTCD & City design, traffic signal, and material standards/ guidance (for example, a new MassDOT Engineering Directive, E-20-001 dated 1/2/2020 regarding “Controlling Criteria and Design Justification Process for MassDOT Highway Division Projects”).

Project Data

Toole Design Group (Toole Design) facilitated the RSA on Thursday, November 21st, 2019. The audit was held at the Northampton City Council Chambers in Northampton, MA beginning at 8:00 a.m. and concluded at 3:30 p.m. Attendants of the RSA (shown in Table 1 below) included local and state stakeholders including representatives from the Northampton Police Department, Northampton Fire Department, various Northampton City departments, Pioneer Valley Planning Commission (PVPC), District 2 of the Massachusetts Department of Transportation (MassDOT), MassDOT Traffic and Safety Engineering Section, and other advocacy and education groups.

Table 1. Participating Audit Team Members

Audit Team Member	Agency/Affiliation
Wayne Feiden	Northampton Planning and Sustainability
Carolyn Misch	Northampton Planning and Sustainability
Ann-Marie Moggio	Northampton Parks and Recreation
David Veleta	Northampton Public Works
Maggie Chan	Northampton Public Works
Nanci Forrestall	Northampton Parking Administration
Jody Kasper	Northampton Police Department
Andrew Pelis	Northampton Fire Department
Amy Cahillane	Downtown Northampton Association
Bao Lang	MassDOT District 2 Traffic Operations
Katherine Maszta	MassDOT District 2 Traffic Operations
Laura Hanson	MassDOT District 2 Bicycle and Pedestrian Coordinator
Ana Fill	MassDOT Traffic and Safety Engineering
Kevin Fitzgerald	MassDOT Traffic and Safety Engineering
Christopher Ng	MassDOT Traffic and Safety Engineering
Gary Roux	Pioneer Valley Planning Commission
Khyati Parmar	Pioneer Valley Planning Commission
Galen Mook	Massachusetts Bicycle Coalition
Dano Weisbord	Smith College
Heather Georgallas	Toole Design Group
Lydia Hausle	Toole Design Group
Sneha Adhikari	Toole Design Group

Prior to meeting, audit team members received a packet containing an agenda, crash details, and RSA Prompt List. The agenda and additional meeting materials are provided in Appendices A and B, respectively. Audit team members were asked to review the materials and visit the Main Street/Bridge Street corridor prior to the audit.

The crash data analyzed for the RSA included 167 crashes occurring over a three-year period between 2015 and 2017. Of the 167 crashes, there were 37 non-fatal injury crashes (22%), with the rest being non-injury crashes. Crash reports showed that the most common crash type was angle crashes, with 49 angle crashes (29%) occurring during the study period. However, a similar number of single vehicle (45, 27%) and rear-end crashes (43, 26%) were reported. In the single vehicle category, 12 crashes involved a parked vehicle (27%), 11 crashes involved a pedestrian (24%), 11 crashes involved the railroad bridges (24%), 7 crashes involved a fixed object (16%), and 4 crashes involved bicyclists (9%). Lastly, there were 30 reported side-swipe crashes (18%).

Patterns in crash manner and locations guided the RSA discussion and form the basis for the organization of this document. Table 2 and the list below describes the high-frequency crash locations. In addition to

these locations, other selected locations were discussed during the audit as high-risk locations. Safety issues and potential enhancements were identified for these areas as well.

Table 2. Location and manner of crash along the corridor

Location/Manner of collision	Single Vehicle Crash (%)	Rear-end (%)	Angle (%)	Sideswipe (%)
Main Street at Elm Street/West Street and State Street/New South Street	14	28	39	19
Main Street and Masonic Street	40	40	13	7
Main Street at Cracker Barrel Alley and Crafts Avenue	29	43	0	29
Main Street at Old South Street	23	18	36	23
Main Street at Center Street	38	25	38	0
Main Street at Gothic Street	8	23	54	15
Main Street at Pleasant Street and King Street	75	5	15	5
Bridge Street at Market Street and Hawley Street	26	26	37	11

- Main Street at Elm Street/West Street and State Street/New South Street:** 36 crashes occurred during the analyzed period, with 12 (33%) non-fatal injuries reported. 14 (39%) angle crashes, 10 rear-end crashes (28%), 7 (19%) sideswipe crashes, and 5 (14%) single vehicle crashes were reported. Out of the 5 single vehicle crashes, 2 (40%) involved a bicyclist, 2 (40%) more involved a fixed object, and 1 (20%) involved collision with a parked vehicle.
- Main Street at Masonic Street:** 15 crashes occurred during the analyzed period, with 7 (47%) non-fatal injuries reported. 6 (40%) single vehicle crashes were reported, 4 (67%) of which involved a pedestrian at the crosswalk and 2 (33%) of which involved a parked vehicle. One of the parked vehicle crashes also involved pedestrians getting hit. Additionally, 6 (40%) rear-end crashes were reported which primarily involved near the vehicles stopping for pedestrians at the crosswalk. Additionally, 1 (7%) side-swipe crash, and 2 (13%) angle crashes were also reported. The trend at this location involve pedestrian being hit by vehicles on the crosswalk or vehicles being rear-ended when they stop for pedestrians on the crosswalk.
- Main Street at Cracker Barrel Alley and Crafts Avenue:** 7 crashes occurred during the analyzed period, with no injury crashes reported. 3 (43%) rear-end crashes were reported which all involved vehicles stopping for pedestrian on the crosswalk. Furthermore, 2 (29%) side-swipe crashes, and 2 (29%) single vehicle crashes involving parked vehicles were reported.
- Main Street at Old South Street:** 22 crashes occurred during the analyzed period, with 5 (23%) non-fatal injuries reported. 8 (36%) angle crashes, 5 (23%) side-swipe crashes, 5 (23%) single vehicle crashes, and 4 (18%) rear-end crashes (3 of which involved vehicles stopping for pedestrian on the crosswalk) were reported. Of the 5 single vehicle crashes, 3 (60%) involving a

pedestrian, 1 (20%) involving a bicyclist, and 1 (20%) involving a fixed object was reported. Most of the injury cases at this location involved a pedestrian and bicyclist.

- **Main Street at Center Street:** 8 crashes occurred during the analyzed period, with 3 (38%) non-fatal injuries reported, all of which were single vehicle crashes involving pedestrians. Additionally, 3 (38%) angle crashes involving a vehicle backing out of parking space, and 2 (25%) rear-end crashes which was a result of vehicles stopping for pedestrians were reported. The overarching trend is that crashes either involved a pedestrian (directly or indirectly) or a parked vehicle backing out.
- **Main Street at Gothic Street:** 13 crashes occurred during the analyzed period, with no injury crashes reported. 7 angle crashes (54%) were reported, in which 4 (57%) out of the 7 crashes involved a vehicle backing out of a parking space. Additionally, 3 (23%) rear-end crashes, 2 (15%) side-swipe crashes, and 1 (8%) single vehicle crash involving a parked vehicle were reported.
- **Main Street at Pleasant Street and King Street:** 27 crashes occurred during the analyzed period, with 3 (11%) non-fatal injuries reported. 10 (37%) side-swipe crashes with many vehicles colliding while making right turns were reported. 9 (33%) rear-end crashes, 5 (19%) angle crashes, and 3 (11%) single vehicle crashes involving parked vehicles were also reported.
- **Main Street/Bridge Street at Strong Avenue and the railroad bridges:** 20 crashes occurred during the analyzed period, with 2 (10%) non-fatal injuries reported. 15 (75%) single vehicle crashes were reported, 11 (73%) of which involved the crash of trucks with the railroad bridges, 2 (18%) of which involved a crash with a parked vehicle, 1(9%) of which involved a crash with a fixed object, and 1 (9%) crash involved a pedestrian. Additionally, 3 (15%) angle crashes, 1 (5%) rear-end crash, and 1(5%) side-swipe crash was reported. The main trend at this location involved the bridge crashes.
- **Bridge Street at Market Street and Hawley Street:** 19 crashes occurred during the analyzed period, with 5 (26%) non-fatal injuries reported. 7 (37%) angle crashes, 5 (26%) rear-end crashes, and 2 (11%) side-swipe crashes were reported. Additionally, 5 (26%) single vehicle crashes were reported, 2 (40%) of which involved a parked vehicle, 2 (40%) of which involved a fixed object, and 1 (20%) of which involved a bicyclist.

Project Location Description

The RSA was conducted for the Main Street/Bridge Street corridor in Northampton, MA for the approximately half-mile segment extending from Elm Street and West Street on the west to Market Street and Hawley Street on the east (Figure 1). Main Street transitions to Bridge Street east of the Railroad Bridge, located just west of Market Street and Hawley Street. The corridor, Route 9, is classified as a Principal Arterial. The corridor is the primary east-west running thoroughfare providing pedestrian, bicycle, bus, freight, and vehicle transportation across Downtown Northampton. Main Street/Bridge Street is a wide two-way roadway, divided by either a double solid yellow line or a median (indicating no passing allowed). The roadway functions as two lanes in each direction but is often unclear as there are no existing lane markings provided aside from the centerline. The roadway width ranges from 62-92 feet (ft). The speed limits throughout the half-mile corridor is posted as 25 mph.

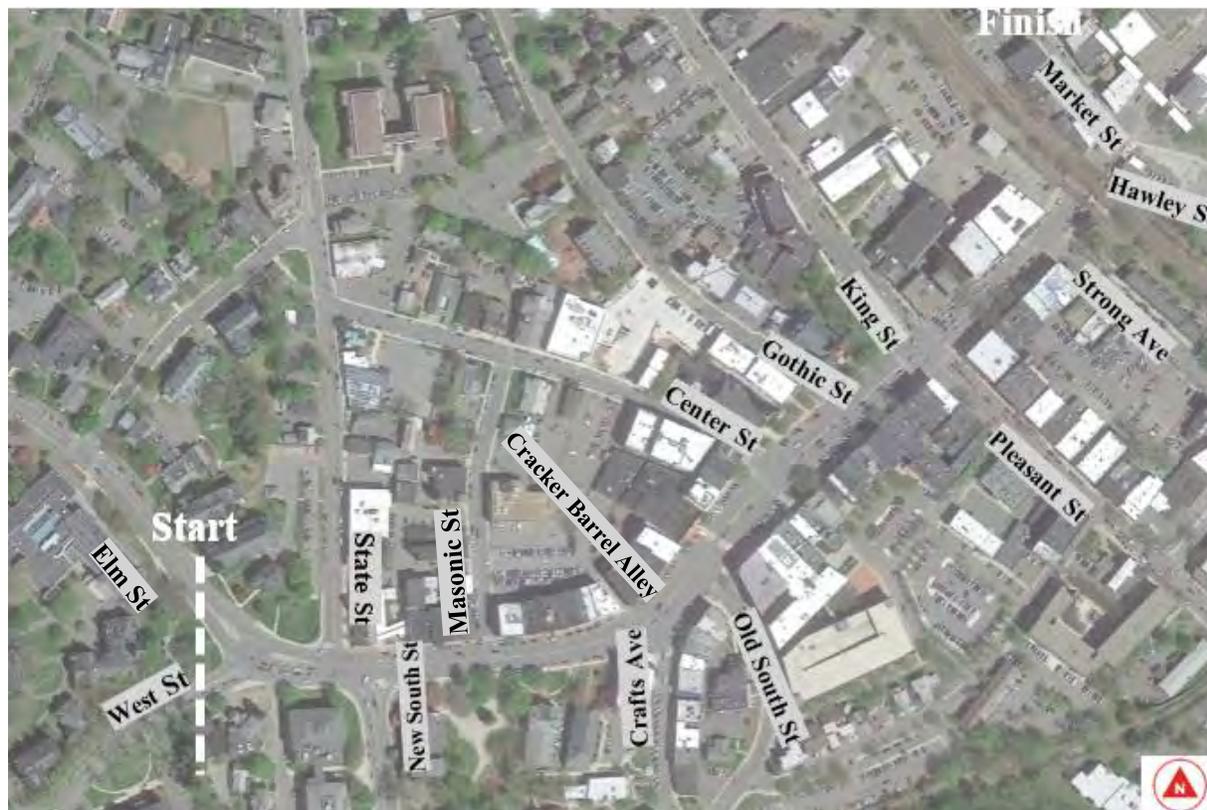


Figure 1: Route 9 study corridor

There are concrete sidewalks provided on both sides of the corridor lined with a brick and landscaped buffer along the majority of the study area. Curb ramps are generally provided along the corridor; however ADA-compliance is not provided throughout the corridor. Excessive ramp slopes and cross slopes as well as missing detectible warning panels were noted at many locations. The corridor has several crosswalks that are located at midblock and at intersections which are unsignalized. There are no dedicated bicycle facilities along the majority of the corridor. An existing bicycle lane terminates at the western limit of the corridor at Main Street and State Street. New South Street also has an existing northbound-only bicycle lane that terminates 500 ft before the intersection of Main Street and New South Street. Additionally, there is an existing sidewalk-level separated bike lane along a short segment of Pleasant Street south of Main Street. ValleyBike bikeshare stations are located within the sidewalk on the northwest corner of the intersection of Main Street at King Street and Pleasant Street, on the sidewalk under the railroad bridge, and at Pulaski Park just off of Main Street near New South Street. Just south of the railroad bridges, at Union Station, the New Haven and Northampton Canal Trail connects with the the Manhan Rail Trail in Easthampton and eventually leads to New Haven. The MassCentral Rail Trail runs from Union Station north, crossing a bike path bridge across Main Street, adjacent to the railroad bridge, and then extends east to Hadley and Amherst, and west to Florence, Leeds, and Haydenville.

The Pioneer Valley Transit Authority (PVRTA) operates bus service with six different routes (39/39E, B43, R41, R42, R44, B48), and the Franklin Regional Transit Authority (FRTA) runs one route (Rt 31) within

the corridor These routes provide access between Smith College and Mount Holyoke College, Florence and Downtown Northampton, Hadley and Northampton, Williamsburg and Northampton, Northampton and Hampshire Mall/Plaza, and Greenfield to Northampton. The bus stop in front of Pulaski Park and the Academy of Music is a major stop for the majority of the routes, and functions as the city’s primary pulse point (for PVRTA and FRTA routes). Peter Pan buses stop at the nearby Peter Pan bus terminal at the bottom of Crafts Avenue and utilize a portion of the corridor. Bus stops along the corridor are indicated with a street post with inconsistent signage and other transit amenities. The Northampton Courthouse and the Pulaski Park pulse point are the only stops with bus shelters within the study area. The corridor is also connected to the Northampton Amtrak station, located south of the railroad bridges between Strong Avenue and Hawley Street.

The corridor has on-street front-in angled parking as well as parallel parking throughout the roadway as well as side streets. Conflicts with parked vehicles backing out and general difficulty navigating and finding parking spaces was noted.

The entire half-mile stretches of roadway with intersecting streets, which are all owned and maintained by the City of Northampton, was discussed during the RSA.

Specific descriptions of the intersections within the study area are provided below.

Main Street at Elm Street/West Street and State Street/New South Street

These two signalized intersections (see Figure 2) are located at the westernmost end of the RSA study area. Main Street transitions to Elm Street at the intersection with West Street and runs in the general east-west direction. West Street, an Urban Minor Arterial, and New South Street, an Urban Principal Arterial, intersects Main Street from the southwest and southeast, respectively. State Street is classified as an Urban Minor Arterial and is a two-way roadway consisting of one lane in each direction that meets Main Street from the north.



Figure 2: Main Street at Elm Street/West Street and State Street/New South Street

The Elm Street eastbound approach has two marked travel lanes with one through lane and one shared through/right-turn lane. The westbound approach has one left-turn only lane onto West Street and a through travel lane to Elm Street. The West Street northbound approach consists of one left-turn only lane and one right-turn lane for traffic proceeding eastbound to Main Street.

The eastbound Main Street approach at New South Street/State Street has four marked travel lanes: one left-turn lane onto State Street, two through lanes, and one right-turn lane onto New South Street. There is also a bicycle lane that terminates into the bicycle storage queue boxes at the intersection. New South Street provides a shared through/left-turn lane and a dedicated right-turn lane at the northbound approach to Main Street. The right-turn lane is a slip lane that is not operated through a signal control and is lacking

a stop or yield sign. The westbound approach of Main Street at State and New South Street has three lanes: one marked left-turn lane, one unmarked through lane, and one unmarked dedicated right-turn lane.

With the exception of the west side of West Street, sidewalks are provided along both sides of all approaches, although the sidewalks on the west side of State Street only extend a short distance from the Main Street intersection. Continental-style crosswalks are provided across the West Street, New South Street, State Street, and Main Street on the east side of State Street. Medians on the West Street and New South Street approaches are also provided. There is also a diagonal crosswalk provided across Main Street from the southwest corner of New South Street and to the northeast corner of State Street with simple crosswalk edge markings. Though not ADA-compliant, ramps are provided on either end of the crosswalks at this intersection. There are bicycle lanes on either side of Elm Street and Main Street that terminates into the bicycle storage queue boxes before the eastbound approach at State Street and Main Street.

Elm Street has parallel parking on its north side west of West Street. West Street and New South Street also have parallel parking provided on their west sides just south of Main Street, while State Street has parallel parking on both sides. Furthermore, Main Street has some parallel parking spaces on its north side east of the New South Street and Main Street intersection.

Main Street at Masonic Street

The intersection of Main Street and Masonic Street (see Figure 3) is an unsignalized, three-legged intersection with Masonic Street intersecting from the north. Masonic Street is classified as an Urban Collector and is a two-way, unmarked roadway. The street has marked parallel parking spaces along the west side of the street as it approaches the intersection. Sidewalks are provided along both sides of all approaches. Continental crosswalks are provided across the Masonic Street and Main Street westbound approaches. Existing ramps at this intersection do not appear to be ADA-compliant on all crosswalk



Figure 3: Main Street at Masonic Street

legs. A major bus stop and layover site is located on the south side of the intersection just west of the Main Street crosswalk in front of Pulaski Park and the Academy of Music. There is another bus stop on the north side just west of Masonic Street servicing westbound buses. There is one on-street parallel parking space provided along the south side of Main Street, between the Main Street crosswalk and the bus stop location, as well as several other parallel parking spaces provided east of this intersection.

Main Street at Cracker Barrel Alley and Crafts Avenue

The intersection of Main Street at Cracker Barrel Alley and Crafts Avenue is a skewed, three-legged intersection (see Figure 4). The Alley was closed to vehicular access in the past year and now serves as a pedestrian-only access point. Craft Avenue intersects Main Street from the south, providing a one-way southbound roadway away from Main Street. Crafts Avenue is classified as an Urban Collector and is a one-lane roadway. Sidewalks are provided along both sides of all approaches. Continental crosswalks are provided across Craft Avenue and Main Street west of the intersection, in-line with Cracker Barrel Alley and the Northampton City Hall. Ramps for the crosswalks are provided, however they did not appear to be ADA-

compliant. A traffic island is located on the Main Street westbound approach to Crafts Avenue which ends before the intersection. There are parallel parking spots west of the intersection and angled parking spots east of the intersection on both sides of Main Street. Angled parking is also provided on Crafts Avenue on the west side of the street south of intersection. Additionally, the City Hall parking driveway is located immediately west of the Main Street crosswalk and it provides one alternating travel lane for both entering and exiting vehicles.



Figure 4: Main Street at Crafts Avenue and Cracker Barrel Alley

Main Street at Old South Street

The intersection of Main Street at Old South Street (see Figure 5) is a three-legged, unsignalized intersection with Old South Street intersecting Main Street from the south. Old South Street, classified as an Urban Collector, is a STOP-controlled, northbound one-way, two-lane roadway (operates as one-lane until intersection approach where it splits into a right-only and a left-only lane).. Sidewalks are provided along both sides of all approaches. A traditional continental crosswalk is provided across Old South Street, while a larger, mid-block, decorative crosswalk is provided across Main Street east of Old South Street. Ramps for the crosswalks are provided, however they do not appear to be ADA-compliant. There is a median present on Main Street on both approaches with the westbound approach median that serves as pedestrian refuge for the Main Street crosswalk. Front-in angled parking is provided along the north and south sides of Main Street at this intersection. Old South Street

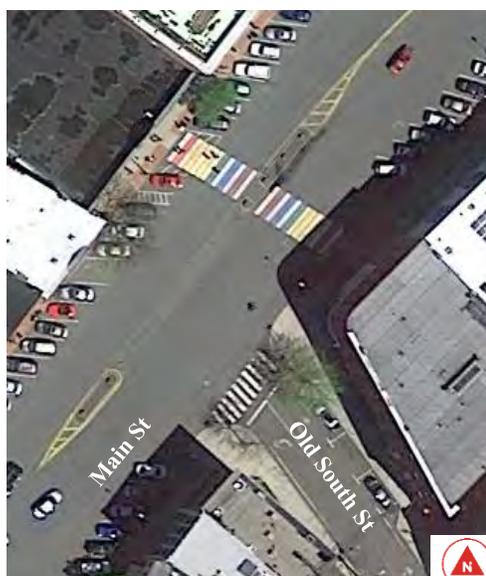


Figure 5: Main Street at Old South Street

has three parallel parking spaces along the east side, immediately south of the intersection. Additionally, there is a bus stop located just east of the Main Street crosswalk in front of Thornes Marketplace.

Main Street at Center Street

The intersection of Main Street and Center Street (see Figure 6) is a three-legged, unsignalized intersection with Center Street intersecting Main Street from the north. Center Street is classified as an Urban Collector and is a two-way roadway. Center Street does not have any pavement markings to designate directional lanes and no stop bar or sign is present. Continental crosswalks are provided across the Center Street and Main Street west of the intersection. Sidewalks are provided along both sides of all approaches. The crosswalk across Main Street at this intersection includes an in-street 'Yield to Pedestrian' sign (R1-6) in the middle within the yellow centerline line. These signs are removed during wintertime. Ramps for the crosswalks are provided, however they do not appear to be ADA-compliant. A double yellow centerline is provided on Main Street; however, no lane markings are provided in either direction despite the wide roadway. Front-in angled parking spaces are provided on both the north and south sides of Main Street. Center Street also has parallel parking spaces on its west side north of the intersection. Additionally, Main Street was noted to have low clearance sign and warning lights for trucks, mounted on the light pole on eastbound approach of the intersection.

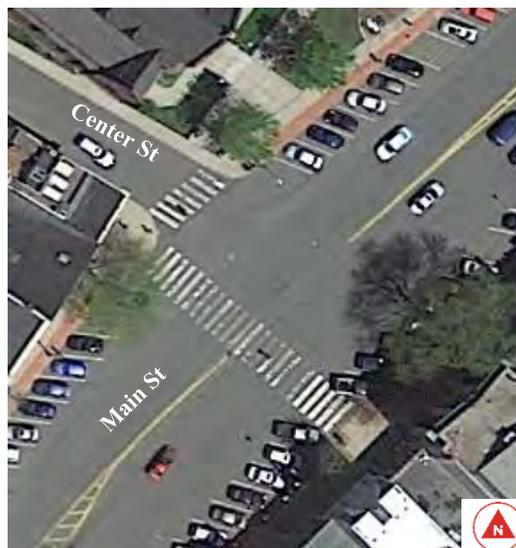


Figure 6: Main Street at Center Street

Main Street and Gothic Street

The intersection of Main Street and Gothic Street (see Figure 7) is a three-legged, unsignalized intersection with Gothic Street intersecting Main Street from the north. Gothic Street is classified as an Urban Collector and is a two-way roadway. Gothic Street does not have any lane markings or a stop bar or sign. Sidewalks are provided along both sides of all approaches. A continental crosswalk is provided across Gothic Street, with ramps that did not appear to be ADA-compliant. The west side of Main Street at this intersection has yellow hatched centerlines while the east side has a constructed median. Like much of the corridor, Main Street does not have any lane markings, despite the wide roadway. Front-in angled parking spaces are provided on the northwest and southern parts of the intersection. The northeast corner includes a PVTA bus stop with a bus shelter in front of the historic Courthouse. Gothic Street has parallel parking spaces on its west side.



Figure 7: Main Street at Gothic Street

Main Street at King Street and Pleasant Street

The intersection of Main Street and King Street/Pleasant Street (see Figure 8) is a four-legged, signalized intersection with King Street intersecting from the north and Pleasant Street from the south. Main Street eastbound consists of three travel lanes providing a dedicated left-turn lane, a through lane, and a dedicated right-turn lane. The westbound Main Street approach consists of three travel lanes including a dedicated left-turn lane, one unmarked through lane, and an unmarked shared through/right-turn lane.

However, it was noted that it is sometimes used as a four-lane roadway as vehicles sneak past the on-street parking to make right turns. King Street is classified as an Urban Principal Arterial and consists of a dedicated left-turn lane, through lane, and a dedicated right-turn lane. Pleasant Street is also classified as an Urban Principal Arterial and consists of a dedicated left-turn lane, through lane, and a dedicated right-turn lane. The Main Street eastbound and King Street southbound approaches have center medians while the Main Street westbound and Pleasant Street northbound approaches have double yellow centerlines. Sidewalks and on-street parallel parking is provided on both sides of all approaches except for the space in the northwest corner for the bus shelter and bikeshare station. The northwest corner of the intersection includes a ValleyBike bikeshare station within the sidewalk. There are continental crosswalks on all intersection approaches. Ramps are provided on either ends of all crosswalks, however they did not appear to be ADA-compliant.

Exclusive pedestrian phasing is provided at this intersection. All corners of the intersection have “No Right on Red” signage. The mast arm extending from the eastbound traffic signal located on the southeast corner includes a non-standard “Low Under Pass 11’ Ahead” sign.



Figure 8: Main Street at King Street/Pleasant Street

Main Street at Strong Avenue and the railroad bridges

The intersection of Main Street and Strong Avenue (see Figure 9) is a three-legged, unsignalized intersection with Strong Avenue intersecting Main Street from the south immediately west of the Railroad Bridge. Strong Avenue is classified as a local road and is a STOP-controlled, two-way roadway. Strong Avenue provides one travel lane in each direction, however there are no lane markings provided. Main Street consists of one travel-lane in each direction, separated by a double yellow centerline. On-street parallel parking is provided on both sides of Main Street and Strong Avenue. Sidewalks are provided along both sides of all approaches. Continental crosswalks are provided across Strong Avenue and the Main Street west of the intersection. Though ramps are provided for the crosswalks, they did not appear to be ADA-complaint.

Just east of the intersection, two railroad bridges sit above Main Street that carries rail activity and a separate bicycle path bridge that carries the rail trail. Main Street becomes Bridge Street immediately east of the bridges. The sidewalk underneath the bridges is significantly elevated from the roadway with a metal railing provided between the sidewalk and the vertical drop down to the street level. The northeast side of the intersection has a driveway curb cut to a commercial parking lot. A low clearance sign with warning lights for the bridge is mounted on a light pole at the southeast corner of the intersection. A clearance elevation sign is also posted on the eastbound side of the bridge, and low clearance signs are mounted on posts on each side of the roadway on the westbound approach. A ValleyBike station is located on the south side of the road under the railroad bridges.



Figure 9: Main Street at Strong Avenue and the railroad bridges

Bridge Street at Market Street and Hawley Street

The intersection of Bridge Street at Market Street and Hawley Street (see Figure 10) is a four-legged, signalized intersection. Market Street is an Urban Collector and intersects Bridge Street from the north. Hawley Street is a local street and intersects Bridge Street from the south. Bridge Street consists of one-lane in each direction separated with a double-yellow centerline. Both Market and Hawley Streets are also two-way roadways consisting of one lane in each direction, however, there are no centerlines provided.

Market Street has parallel parking along the east side, and Hawley Street also has parallel parking on the east side but further south of the intersection. Bridge Street has parallel parking along the north and south sides, extending under the bridge and along the south side of the roadway. Sidewalks are provided along both sides of all approaches. Crosswalks and ramps are provided for all legs of the intersection; however, the ramps do not appear to be ADA-compliant.



Figure 10: Bridge Street at Market Street/Hawley Street

Audit Observations and Safety Enhancements

During the RSA, the audit team identified safety issues and discussed potential safety enhancements to address the issues on both a corridor-wide and intersection-by-intersection basis. Each safety issue and associated enhancement are described below for each location.

Corridor-Wide

Roadway Geometry

Observations

The wide geometry of the roadway was a common topic of discussion among RSA Members. The RSA team noted that the wide roadway contributes to irregular traffic patterns for motorists and long crossings for pedestrians (see Figure 11). The Main Street corridor typically ranges from 62 to 92 feet in width. The corridor operates as a two-way, two-lane roadway with only a double centerline provided, which causes confusion and discomfort for many, especially those who are unfamiliar with the area. The lack of lane delineation within the wide roadway as well as the overall geometry also contributes to vehicle weaving, last-minute position changes, vehicle turning movement issues, and pedestrian safety issues. As a result, a significant number of crashes along the corridor were side-swipe (18.5%) and angle (27.5%) crashes. However, RSA members also noted that the confusion associated with lack of defined lanes may help to slow down traffic as drivers are more cautious navigating the roadway.

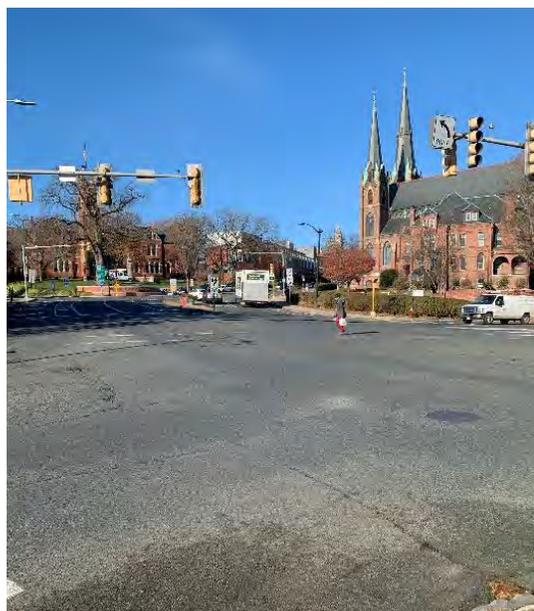


Figure 11: Pedestrian crossing on the wide intersection of Main Street at State Street and New South Street

Sightline issues on the side street connections with Main Street were cited as a contributing factor to unsafe conditions, queuing in crosswalks, and congestion on Main Street. Specific sight line restriction locations are discussed further under the appropriate intersection section below. Snow clearance and storage along the corridor were also discussed as a factor that contributes to low visibility, as snow is currently piled in the center of roadway during snow events. Furthermore, audit members discussed the general feeling of chaos and overstimulation throughout the corridor.

Potential safety enhancements

- Evaluate the feasibility of narrowing the roadway corridor and reallocate available space for vulnerable users to increase safety and accessibility.
- Evaluate the need for existing turn lanes and the feasibility of providing additional designated turn lanes.
- Evaluate the number and mix of travel lanes needed for the corridor and stripe travel lanes accordingly

- Evaluate the feasibility of curb extensions at intersections to increase sight lines from the minor approaches and increase safety for pedestrians. Consideration should be given to the potential interference with bicycle lanes.
- Evaluate the feasibility of installing RRFBs or other crossing enhancement signage to improve crosswalk visibility.
- Evaluate the installation of medians (raised or flushed) along the Main Street approaches.

Pavement Markings and Conditions

Observations

Many sections of the corridor were noted to have missing or fading pavement markings (see Figure 12). Stop bars, lane lines, lane designations markings, and crosswalks were all noted to be missing or faded at numerous locations along the corridor. This was discussed as a source of confusion for drivers and a safety issue for pedestrian visibility.

Potential safety enhancements

- Reinstall missing or faded pavement markings to reduce vehicular confusion and improve vehicular and pedestrian safety. Consider updating the markings with polyurea or recessed thermoplastic markings.



Figure 12: Missing travel lane pavement markings



Figure 13: Countdown timer missing on pedestrian signal

Signal Equipment

Observations

Members of the audit team observed that the signal equipment along the corridor was inconsistent, old, or outdated. At several locations, the signal heads were misaligned with their appropriate travel lane locations and were missing retro-reflective backplates, which improve driver awareness and visibility of traffic signals. Traffic signal locations vary between side-mounted post signals or mast arm mounted. Signals for all Main Street approaches along the corridor are provided on mast arms. State Street, New South Street, Hawley Street and Market Street signals are side-mounted signals while King Street, Pleasant Street, Elm Street and West Street have mast arm mounted signals. These inconsistencies and missing safety countermeasures were noted as contributing factors to potentially unsafe conditions for road users.

Existing pedestrian signals do not have Flashing Don't Walk countdown timers (see Figure 13) and accessible pedestrian signals (APS) were missing at the vast majority of signalized crossings.

Potential safety enhancements

- Replace outdated and old signal equipment, where necessary.
- Evaluate signal head locations according to lane locations and relocate to appropriate locations to increase signal visibility. Evaluate the need to upgrade all traffic signal infrastructure and assess mast arm capacity.
- Install retroreflective backplates on signals to improve signal visibility.
- Update signal equipment with APS push buttons and pedestrian countdown timers for all signalized intersections to increase safety for pedestrians.
- Evaluate the use of camera detection rather than loop detectors, some of which are not functioning.

Signal Timing and Phasing

Observations

The audit team discussed that inconsistent signal timing and phasing schematics lead to excessive delay for all users. These long delays can also lead to unsafe behavior. For example, vehicle weaving, and red-light running were discussed as a result of impatience caused by long wait times. RSA team members also noted that there was no signal coordination present throughout the corridor.

Audit team members noted that the pedestrian phasing at intersections is inconsistent across the corridor. There are some locations that provide exclusive pedestrian phasing, while others provide concurrent pedestrian crossings. This inconsistency was noted to cause confusion and to potentially encourage jaywalking. The crosswalk across New South Street was the only observed location equipped with LPIs. Leading Pedestrian Intervals (LPIs) give the pedestrians an advanced start time to begin crossing an approach before the parallel street receives their green light. This allows pedestrians to establish themselves within the crosswalk before traffic may advance and potentially turn across the pedestrian path of travel.

Audit team members also noted that flashing Don't Walk times for pedestrians generally did not provide adequate time for a pedestrian to safely cross the intersection. Furthermore, where exclusive pedestrian signal phasing is provided, many pedestrians were observed to traverse the intersection diagonally. The current crossing times within the signal do not account for the distance for a pedestrian to cross diagonally and therefore do not provide adequate time.

Potential safety enhancements

- Evaluate signal re-timing and phasing at all signalized intersections to reduce delays.
- Consider signal coordination along the corridor, with the need for transit pre-emption where appropriate.
- Evaluate the preferred pedestrian phasing for the corridor and provide consistent pedestrian phasing throughout the corridor.
- Install pedestrian advance walk signals for any intersections that have concurrent vehicle/pedestrian phases.

- Consider implementing LPIs for all signalized crosswalks to increase pedestrian visibility and safety.
- Evaluate duration of flashing “Don’t Walk” times.

Signage

Observations

Signage clutter, faded signs, and non-compliant signs were consistently brought up by audit members throughout the corridor.

Potential safety enhancements

- Evaluate signage along the corridor and at study area intersections. Remove and replace all non-compliant MUTCD signs. All new signs should confirm to current MUTCD standards.
- Remove unnecessary signage to reduce sign clutter and potential confusion.

Pedestrian Accommodations and Crossings

Observations

A total of eleven crashes (6.6%) involved pedestrians at unsignalized marked crosswalks throughout the corridor. Audit members noted that long crossings (see Figure 14), restricted sight lines, and low lighting were contributing factors to pedestrian crashes at unsignalized crosswalks. The excessive wait times for pedestrians throughout the corridor were also discussed as contributing to impatience and jaywalking at signalized crosswalks. As previously mentioned, inconsistent pedestrian signal phasing (concurrent or exclusive) throughout the corridor was noted as a source of pedestrian confusion. Continental crosswalks are provided throughout the corridor, however audit team members noted that several crosswalks were faded. Curb ramps are generally provided, however many were not ADA-compliant and were missing tactile warning panels.



Figure 14: Pedestrian walking beyond the long crosswalk lines on Main Street and State Street

With the exception of the north side of West Street and the west side of State Street just north of Main Street, sidewalks are provided along both sides of all approaches within the study area. Sidewalks are generally constructed of concrete with a brick buffer strip. The condition of sidewalks throughout the corridor was frequently discussed by audit members. Heaving and c racking was observed as well as errant signposts and street furniture that create tripping hazards. Some audit members also mentioned that since Main Street has many restaurant and shops, seasonal sidewalk cafes narrow the sidewalks and force pedestrians to travel closer to the edge of the roadway onto the brick buffer strip that may not meet ADA standards. The DPW issues permits for tables and chairs while requiring that a minimum clear path of pedestrian travel be maintained. The minimum clear path ranges from 5.5 to 9.0 feet in width, depending on the segment along Main Street.



Figure 15: Parking space too close to crosswalk

Limited lighting was also mentioned as a cause of concern for pedestrian visibility, particularly for the side street approaches. Audit members mentioned that parking spaces too close to crosswalks contributed to the problem of limited sight lines as well (See Figure 15). Additionally, overhead lighting was observed above Main Street, however lighting is not provided over the minor street approach crosswalks. This may have contributed to the four (36.3%) of the eleven crashes involving pedestrians on a crosswalk took place at night.

Potential safety enhancements

- Consider widening sidewalks using reinforced concrete materials to narrow the roadway, provide more pedestrian space, and accommodate sidewalk cafes without sacrificing pedestrian clearances.
- Consider implementing curb extensions and/or pedestrian refuge islands to shorten crossing distances and increase pedestrian safety while being cognizant of potential interference with bicycle lanes and snowplow operations.
- Consider installing enhanced visibility crossing signs and pavement markings. Evaluate specific locations for High-Intensity Activated CrossWalk (HAWK) beacon or Rectangular Rapid Flashing Beacon (RRFB) applications.
- Consider replacing bricks in the buffer spaces next to the sidewalk with smoother, ADA-compliant surface treatment including consideration for design to enhance infiltration from surface drainage (such as porous pavement, rain gardens, etc.).
- Evaluate lighting along the corridor and above minor street approaches and install or replace where necessary to improve visibility and safety in low-light conditions.
- Reinstall crosswalks with high visibility thermoplastic crosswalks to increase visibility.
- Evaluate and upgrade all ramps, pedestrian signals, and sidewalks to be ADA-compliant.
- Evaluate the location of existing crosswalks and if they should be moved to more visible locations.
- Evaluate feasibility of raised crossings on Main Street and side streets to slow vehicular traffic at key crosswalks. Coordination with the Police and Fire Departments should be considered.
- Evaluate installation of gore markings to prevent parked vehicles within 20 feet on each side of a crosswalk.

Bicycle Accommodations

Observations

Bicycle accommodations are not provided along the corridor, with the exception of conventional bike lanes that terminate at the westernmost end of the corridor at Main Street and State Street. New South Street also has an existing northbound-only bicycle lane that terminates 500 ft before the intersection of Main Street and New South Street. Additionally, there is an existing sidewalk-level separated bike lane on a short segment of Pleasant Street south of Main Street. A ValleyBike bikeshare station is located within the sidewalk on the northwest corner of the intersection of Main Street at King Street and Pleasant Street (See Figure 16) and under the railroad bridges on the south side of Main Street and Bridge Street. Just south of the railroad bridge, at Union Station, the New Haven and Northampton Canal Trail connects with the Manhan Rail Trail in Easthampton and eventually leads to New Haven. The MassCentral Rail Trail runs from Union Station north, crossing a bike path bridge across Main Street, adjacent to the railroad bridge, and then extends east to Hadley and Amherst, and west to Florence, Leeds, and Haydenville. Regarding biking in the corridor itself, some members noted that this corridor was listed in the MassDOT Bicycle Transportation Plan as having “100% Potential for Everyday Biking” as it connects to many existing trails (Figure 17). . The variety and volume of bicycle parking throughout the corridor was described as inadequate by RSA members. During the audit, members also observed multiple bicyclists traversing intersections during exclusive pedestrian phases.



Figure 16: ValleyBike bike share location and wayfinding map

Four crashes (2.4%) reported for the corridor involved a bicyclist. With no designated space for bicyclists within the roadway, sidewalk biking is a common behavior even though it is illegal according to City of Northampton ordinance. In some instances, contraflow biking was also noted. While Valley-Bike bikeshare locations are provided along the corridor, RSA members discussed that some stations are placed within the sidewalk and limit space for pedestrians. This can pose a safety hazard for pedestrians with accessibility needs and cause queuing at sidewalks. Audit members recommended that while this audit references crash data from 2015-2017, it would be a worthwhile task to go beyond to see if any bicyclist fatalities existed in the corridor. In 2012, one bicyclist fatality was identified in the intersection of Main Street and Pleasant Street, in which the bicyclist was struck by a vehicle making a left turn from Main Street to Pleasant Street.

Potential safety enhancements

- Evaluate the feasibility of providing separated or protected bicycle accommodations throughout the corridor connecting to existing facilities.

- Consider installing high-friction surface treatment for bike lanes especially at intersections, high-volume driveways or areas where traffic is merging to another lane and crossing the bike lane.
- Consider dedicated pavement markings for bicycles turning left from bicycle lanes including two-stage turn queue boxes at intersections.
- Add enhancements along the corridor, including MUTCD-compliant signage and wayfinding, to provide better Rail Trail connections
- Assess bicycle parking locations, styles, and supply. Consider additional bicycle parking options including corrals, bicycle storage boxes, bike racks, etc.
- Evaluate bikeshare locations to maximize pedestrian space and improve access to bicycles.

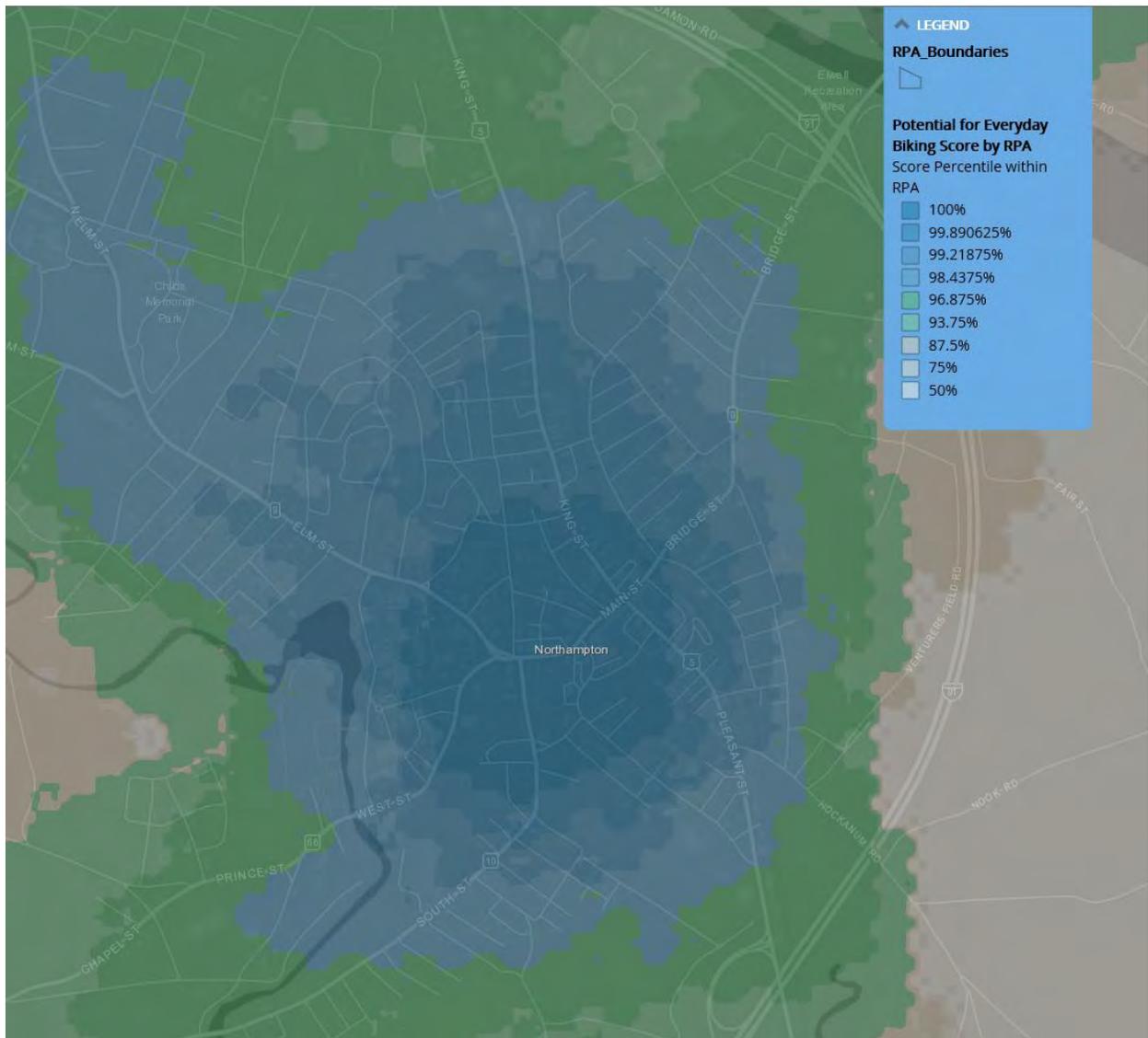


Figure 17: Potential for Everyday Biking Score for Northampton as per 2019 Bicycle Transportation Plan

Transit Accommodations

Observations

Audit members remarked that there are many bus stops along the corridor that may not be optimally located or sited for demand. Additionally, there were observed instances of backups and queuing due to transfers in bus driver shifts and layover time. Buses were sometimes noted to block crosswalks due to lack of queue space. The locations of the bus stops being sub-optimal and issues with coordination with the Amtrak station may be contributing to more queuing and confusing traffic operations.

Potential safety enhancements

- Coordinate with PVTA, FRTA, and other relevant stakeholders to evaluate bus stop locations corridor wide. Consideration should be given to coordination schedules of bus operations with the Amtrak station.
- Discuss upgrading transit facilities with all transit authorities' needs (such as concrete pads, shelters, benches with compatible seating, real-time electrical connections, bike racks, etc.).



Figure 18: Trucks observed to be loading/unloading in the middle of roadway

Parking and Loading

Observations

Dedicated loading zones are not provided throughout the corridor and contribute to curbside challenges for commercial loading and unloading. Furthermore, truck loading and unloading is generally unavailable behind Main Street buildings. As a result, trucks use the center of roadway to load and unload (See Figure 18). Audit team members noted that majority of the commercial loading occurs during peak traffic times. Trucks were also noted to parallel park behind the angled parking, which blocks in vehicles using the angled parking and limits visibility for vehicles backing out of angled parking.

Police and the City Parking Enforcement Administrator also noted that enforcement of the road can be challenging because of parking patterns in the area, which leave the police with few options for parking. With the rise of rideshare services, pick up and drop off activity has increased in the area, however no taxi or rideshare zones or curb control are provided, which contribute to double parking, and standing at fire hydrants and in wheelchair accessible parking spaces. Specific locations where double parking was observed include spots near banks and the Starbucks at 211 Main Street. The City recently upgraded to a pay-by-plate parking policy, which has been useful for conducting utilization and turnover analysis.

Front-in angled parking and parallel parking spaces are provided throughout the study area. Many safety challenges are associated with head-in angled parking including low visibility when backing and quick

movements, including U-turns, by vehicles to turn into open spots. These challenges are illustrated in the crash reports where 13 (7.8%) of total crashes involving vehicles backing out of the head-in spots. The City noted that a short period trial to test out converting the head-in parking to back-in parking was conducted in recent years, however, the trial was done only along a small segment of the corridor and was not clearly communicated. As a result, the trial was poorly received.



Figure 19: Parking spaces within 10 ft of a hydrant

Parking stall widths and angles are inconsistent throughout the corridor. In addition, multiple parking spaces were located within 10 feet of a hydrant, which is against state law (See Figure 19). On-street parking was also noted to be located too close to crosswalks, which restricts visibility between motorists and pedestrians within the crosswalk. While there were some ADA parking spaces, audit members mentioned that the utilization of the spaces may need to be evaluated. Residents and retailers have the perception that parking along the corridor is limited, however the lack of wayfinding to parking garages is contributing to this perceived notion.

Potential safety enhancements

- Evaluate the feasibility of designating loading zones, specified loading times, and shared ride curb control.
- Restrict parking within appropriate distances of all fire hydrants and crosswalks to improve safety and accessibility to the hydrants and crosswalks.
- Evaluate alternate parking schemes including removal of parking, reverse-angle parking, parallel parking etc.
- Restripe parking to provide consistent parking stall widths and angles or lengths.
- Provide adequate daylighting for on-street parking from all crosswalks based on sight distance requirements.
- Evaluate the number of ADA parking spaces along the corridor to ensure demand is met.
- Evaluate parking and loading spaces for the police, taxi, shuttle, and ride share services.
- Coordinate with business district to modify parking spaces.
- Install parking garage wayfinding signage.

Freight Accommodations

Observations

Audit members noted that a large volume of heavy trucks pass through the corridor, as the corridor serves as the main east-west access route from I-91.

Potential safety enhancements

- Evaluate truck routes that provide access without taking away space from the corridor. Alternate route options should be coordinated at the federal level. Care must be taken, however, to avoid diverting vehicles that bring business to downtown.

Main Street at Elm Street/West Street and State Street/New South Street

Roadway Geometry



Figure 20: Pedestrian crossing across the wide intersection at Main Street and State Street

Observations

The entire intersection(s) was perceived by audit members to be too expansive (See Figure 20). The wide roadway and offset geometry complicate turning movements and may have been a contributing factor in the reported 15 angle crashes (41.7%) out of the total 36 crashes at this location. The Main Street eastbound approach consists of two thru travel lanes, but only provides one wide receiving lane without pavement markings or signage, forcing vehicles to merge within the intersection and potentially contributing to the five reported side-swipe crashes (13.9%) at this location.

This intersection is downhill in the eastbound direction, which encourages high speeds from drivers and bicyclists, specifically eastbound from Elm Street to Main Street. One reported crash at this location involved an eastbound bicyclist attempting to turn right from Main Street onto New South Street, for which speed was listed as a contributing factor. In general, this intersection was noted to have many congestion-related crashes, which may have contributed to the 10 rear-end crashes (27.8%) at this location. Additionally, New South Street and State Street

have offset geometry that was noted to be a cause of confusion.

There is a driveway that intersects Main Street from the south between West Street and New South Street. The driveway intersects Main Street at a location where Main Street also has a dedicated right turn lane, bike lane, two through lanes, and a dedicated left turn lane for the eastbound approach at New South Street and State Street. During the audit, multiple vehicles were observed making a left turn from the driveway onto Elm Street, causing them to travel in opposing traffic. Additionally, some vehicles were also observed making a left lane U-turn from Main Street into the driveway causing conflicts with West Street right turning vehicles.

Potential safety enhancements

- Evaluate the feasibility of a roundabout or a peanut-about treatment to better accommodate traffic demands and deter speeding.
- Evaluate options that tighten the intersection box to reduce crosswalk and vehicle distances crossing the intersection.
- Confirm that the number of feeding lanes match the receiving lanes to avoid merging problems.
- Extend the median on Main St, between West Street and State Street, to prohibit vehicles from turning left out of the residential driveway.
- Consider prohibiting U-turns for the Main Street westbound approach, forcing users of the driveway to take a safer left turn onto New South St to utilize the alternate entrance.
- Consider the required geometry to accommodate large tractor trailer trucks on these numbered state routes.

Pavement Markings and Conditions

Observations

The audit team discussed missing and faded pavement markings at this intersection. In particular, no advanced warning lane designations along West Street and State Street are provided. The lack of advance warning markings on West Street was noted to contribute to eastbound vehicles attempting to turn left onto State Street and queuing within the dedicated left-turn lane intended for vehicles turning westbound onto Elm Street. With vehicles attempting to turn left onto State Street after turning right from the left-turn lane on West Street, conflicts with merging becomes an issue with existing eastbound vehicles turning left onto State Street. Additionally, westbound vehicles on Main Street were unaware that there is a left-turn only lane on the approach to New South Street since markings are faded. As a result, people attempt to switch lanes at the last moment. This confusion may be a contributing factor for the 5 (13.9%) of same direction sideswipe crashes out of the total 36 crashes at this location.

Audit team members also noted that the New South Street stop bar was set back, limiting available sight lines and visibility primarily for the right-turning vehicles. Furthermore, the Main Street eastbound bicycle turning queue boxes at State Street were not painted green and were too wide spanning several travel lanes (See Figure 21).

Potential safety enhancements

- Install advanced lane designation markings where appropriate to reduce driver confusion.
- Implement lane tracking pavement markings for West Street left and right turn movements.
- Evaluate and relocate the New South Street stop bar location to maximize sight lines.
- Evaluate narrowing the size of the stop bar/box at Main/State/New South to reduce crossing distances for vehicles and pedestrians.



Figure 21: Bicycle turning queue boxes at Main Street on eastbound State Street are not painted green

- Reinstall the Main Street bicycle queue box with appropriate green paint and continue bicycle lane broken white line through intersection.



Figure 22: Traffic signal at Main Street and New South Street showing green arrow for right-turning vehicles

Signal Equipment

Observations

Signal heads are provided overhead on mast arms for the Main Street, Elm Street, and West Street approaches while the State Street and New South Street approaches have post mounted signal heads. The audit team noted several instances of signal equipment related inconsistencies. Audit team members discussed that the Main Street eastbound right-turn green signal at New South Street should have a green ball or the existing green arrow. Currently, the signal includes a green through arrow as well as a green right turn arrow. The eastbound right-turns operate protected/permmissive, being allowed to proceed with the through traffic. Team members noted that the green arrow should be changed to a green ball for this reason and that right-turning vehicles are to yield to the pedestrians crossing New South Street during the permissive part of their phase (See Figure 22). Additionally, the Elm Street westbound signal at West Street has one overhead signal serving both through and left-turn lane, with an additional post mounted signal with flashing beacons that activate when the pedestrian phase across West Street is active. It was

noted that this sign is active during inappropriate times of the signal cycle. When vehicles have a green left arrow, that movement should be protected, and the beacons should not be flashing during this time. Other inconsistencies include the pedestrian head crossing in the southwest corner which was noted to be mounted too low, Main Street westbound approach to State Street, which has a four-section signal head with a yellow ball not used, and the out of service “no right on red” box on the mast arm on Main Street eastbound approach west of New South Street. 8 (22.2%) out of the total 36 crashes at this location involved a vehicle heading eastbound and another vehicle making a westbound left-turn movement, a pattern that was brought up by some to be due to confusion with signal equipment

In the Main Street westbound direction, the glare from the sun was noted to restrict visibility of the signal heads, particularly the left-turn signal head, at West Street. One of the reported angle crashes at this location involved this westbound left-turning movement, for which sun glare was noted as the contributing factor.

Potential safety enhancements

- Evaluate the effectiveness and safety of green right-turn arrow versus the green ball options to reduce driver confusion.

- Evaluate Main Street westbound signal head at West St to reduce conflicts with West Street crosswalk and westbound left turn movements
- Evaluate pedestrian head crossing height to meet MUTCD standards and install pedestrian countdown timers and APS at all existing crosswalks.
- Evaluate Main Street westbound signal head at State Street. Replace yellow ball if necessary or replace signal head with three-section signal head, as appropriate.
- Evaluate the feasibility of making eastbound Main Street at New South Street a “no right on red” and swap out the red/yellow balls with red/yellow right arrows.
- Replace the Main Street eastbound green arrow with a green ball.

Signal Timing and Phasing

Observations

Signal timing and phasing was described by audit members as inefficient in meeting the needs of existing traffic demands. The intersection of Main Street at Elm Street and West Street operates on a three-phase cycle: Main Street westbound with Elm Street eastbound; West Street; Main Street westbound and West Street right-turns. The intersection of Main Street at State Street and New South Street operates on a five-phase cycle: protected left-turns for the State southbound and Main Street eastbound and westbound approaches with the concurrent diagonal pedestrian crosswalk; Main Street through movement; New South Street and Main Street eastbound right-turns; State Street and Main Street westbound right-turns. Both signal phasing sequences provide concurrent pedestrian phasing.

The Main Street westbound left-turn to New South Street was noted to have an unnecessarily long signal phase, creating delays for the other movements. In addition, the State Street southbound phase was noted to be too short, only allowing for approximately three vehicles to clear the intersection. Inadequate signal timing can cause driver frustration and yellow or red-light running. This may have contributed to the 10 (27.8%) reported rear-end crashes out of the total 36 crashes at this location.

Potential safety enhancements

- Evaluate signal timing and phasing to allow for efficient and safe flow of traffic based on existing demands of all users.
- Address the length of the full signal cycle that leads to excessively aggressive pedestrian and vehicle movements (e.g., jaywalking, continuing through intersections into the red cycle).
- Evaluate if concurrent crosswalk phasing is adequate for safety with turning volumes at the intersection



Figure 23: "No turn on red" sign blocked by a pole and "Right turn must turn right" sign at Main Street westbound approach to State Street

Signage

Observations

Missing, faded, and inconsistent signage was brought up by audit members at this location. There was a “Stop for Pedestrians When Turning” sign within an outdated message box on the Main Street eastbound mast arm at New South Street. Audit team members noted that the West Street median had a “Keep Right” sign and “Left turn must turn left” sign stacked, which may cause confusion for drivers.

Sign clutter was noted corridor-wide, however particularly in this location. An existing “No turn on red” sign for the Main Street eastbound approach at State Street was observed to be blocked by a pole and “Right turn must turn right” sign (See Figure 23). Additionally, there were many non MUTCD compliant signs including the “Left Turners Yield on Green Light” and the “Left Turn Yield to Pedestrians and Vehicles When Flashing” for vehicles at westbound approach of Main Street and West Street

Street. Main Street eastbound vehicles queuing to turn left onto State Street were noted to be queued back within the West Street left-turn lane, intended for vehicles turning left to go westbound on Elm Street. The vehicles attempting to turn left onto State Street from the left-turn lane on West Street creates a conflict with eastbound vehicles attempting to turn left onto State Street that have to merge into the left lane at the appropriate time. As a result, people attempt to switch lanes in the last minute. This confusion may be a contributing factor to the 5 (13.9%) same direction sideswipe crashes out of the total 36 crashes at this location. Furthermore, as mentioned earlier, many westbound vehicles were observed making a U-turn into the driveway causing conflict with eastbound traffic.

There is no lane assignment signage for the West Street approach and Main Street eastbound approach at State

Potential safety enhancements

- Remove unnecessary signage and to reduce sign clutter and potential confusion. Ensure all signs are MUTCD compliant.
- Install lane assignment signage to reduce driver confusion.
- Evaluate if the outdated box that historically displayed the message “No Turn on Red” should be reactivated/reinstalled/removed from the traffic signal.
- Evaluate appropriate placement of signs to reduce confusion and improve visibility.
- Install a “No U-Turn” sign for westbound Main Street at West Street to prevent dangerous U-turns into the driveway.

Pedestrian Accommodations and Crossings

Observations

Audit members noted that Smith College building locations along the Elm Street approach generated high pedestrian traffic along the sidewalks and jaywalking across Elm Street. There is currently no crosswalk across Elm Street east of Bedford Terrace. Audit members discussed providing a midblock crosswalk across Elm Street or across Elm Street at the intersection of Main Street. Additionally, a “goat path” was observed on the west corner of Elm Street at West Street, indicating a clear desire line from the sidewalk terminus to the on-street parallel parking provided along the north side of West Street (See Figure 24). There is currently no sidewalk provided along the north side of West Street outside of the intersection corner.

Continental-style crosswalks are provided across the West Street, New South Street, State Street, and Main Street westbound approaches. Medians on the West Street and New South Street approaches provide pedestrian crossing refuge but also make the crossing longer and less direct. Audit members noted that the refuge islands are too narrow and does not provide detectable warning panels within the refuge as required by ADA standards.

A crosswalk is provided across Main Street from the southwest corner of New South Street and to the northeast corner of State Street. Due to the geometry of the crosswalk, the crosswalk is an extremely long crossing for pedestrians. Audit members noted that the signal phase for this crossing required excessive time within the cycle to allow for adequate pedestrian crossing time. Audit members discussed relocating the Main Street crossing to shorten the crossing and necessary time within the signal phase. The crosswalk had been relocated for a short period before, but it was noted that pedestrians kept crossing in this direction anyway.

Potential safety enhancements

- Evaluate feasibility of providing a designated crossing with appropriate safety enhancements across Elm Street, either at West Street, Main Street or midblock.
- Evaluate feasibility of installing sidewalks from the west corner of Elm Street at West Street along the north side of West Street to provide safe pedestrian accommodations to the on-street parking along West Street.
- Evaluate the feasibility of relocating the diagonal Main Street crosswalk to provide a shorter and safer crossing. Recommendations included: a crosswalk west of State Street or across Elm Street.
- Restripe the diagonal crosswalk with continental-style crosswalk markings (the standard for all other downtown crosswalks).



Figure 24: "Goat path" observed on the corner of Elm Street at West Street

- Consider widening the median at West Street to provide an ADA-compliant pedestrian refuge with detectable warning panels.

Bicycle Accommodations

Observations

The existing bicycle lanes on Elm Street terminate at State Street (See Figure 25). A bicycle queue box is provided for the Main Street eastbound approach at New South Street. The bicycle queue box spreads over multiple lanes, which makes it difficult for bicyclists to safely and comfortably make turns. Audit team members noted that the queue box was not painted green, but rather left empty with the white bicycle symbols. Two reported crashes involving bicyclists were reported at this location during the study period.

Audit team members also noted that the horizontal curve along Elm Street and the position of the Elm Street median force vehicles who are queued at the stop bar to block the bicycle lane with the rear passenger-side corner of their vehicles.

Potential safety enhancements

- Consider reinstalling queue box with green paint.
- Consider providing a two-stage turn box in front of the crosswalk at the northbound West Street approach to facilitate turns for less-experienced bicyclists.
- Consider realigning the Elm Street travel lanes and bicycle lane.
- Consider adding vertical delineation to help keep vehicles from encroaching on the bicycle lane.



Figure 25: Bicycle lane on Elm Street which terminates at State Street

Main Street at Masonic Street

Roadway Geometry

Observations

The wide geometry at this intersection was cited as a challenge for southbound vehicles turning left onto Main Street. When turning left from Masonic Street onto Main Street, vehicles must find a gap and navigate this wide turn against the wide travel lanes (See Figure 26). Furthermore, audit members noted that left-turning vehicles are typically focused on waiting for the queued traffic to clear on Main Street and often overlook pedestrians within the Main Street crosswalk. Five of the reported crashes (33.3%) out of 15 total crashes at this intersection involved a left-turning vehicle from Masonic Street. Out of the five, three (60%) crashes involved a pedestrian within the crosswalk. Some members of the audit team also noted that since the closure of the Cracker Barrel Alley, Masonic Street has seen more traffic as it is now the only access to the Masonic parking lot from Main Street. Others noted, however, that vehicles approaching from the east often use Center Street and there are no traffic counts to support higher traffic on Masonic between Main Street and the parking lot.



Figure 26: Sight line issues for southbound vehicles on Masonic Street

Potential safety enhancements

- Consider restricting left turns from Masonic Street to discourage the unsafe vehicular maneuvers.
- Consider installing a center median on Main Street to restrict this movement.
- Consider reducing the roadway width to decrease the number of lanes being crossed while making left turns in and out of Masonic Street



Figure 27: Missing stop bar and centerline on Masonic Street

Pavement Markings and Conditions

Observations

The audit team noted that queuing from the traffic signal at State Street blocks the Masonic Street intersection. Queuing related congestion may have contributed to the six reported rear-end crashes (40%) out of the total of 15 crashes at this intersection. Additionally, it was noted that there are no lane markings on Main Street at this location which contributes to difficulty exiting Masonic Street and as a result, can contribute to conflicts with pedestrians and courtesy crashes for left-turning vehicles.

It was also noted that although Masonic Street operates as STOP-controlled, there is no stop bar or centerline on Masonic Street (See Figure 27).

Potential safety enhancements

- Install “Don’t Block the Box” pavement markings and signage to ensure that the intersection is clear from traffic queuing for vehicles to access and egress Masonic Street.
- Install stop bar on Masonic Street
- Consider installing a centerline on Masonic Street.

Signage

Observations

The Masonic Street southbound approach operates as stop-controlled, however audit members observed that a stop sign was not present. Adding STOP sign can alleviate safety risks as an approaching vehicle becomes aware that they are required to stop for the traffic on Main Street. The lack of appropriate signage and STOP-control ordinance on this street may have contributed to the six (40%) rear-end crashes along the Masonic Street approach.

Potential safety enhancements

- Install stop sign for Masonic Street southbound approach.

Pedestrian Accommodations and Crossings

Observations

Pulaski Park and a major transit stop is located across from the Masonic Street intersection. A continental crosswalk is provided across the Main Street westbound approach at Masonic Street, located at the eastern corner of the park. Though a crosswalk is present at one corner of the park, members of the audit noted jaywalking from Pulaski Park to the north side of Main Street. Audit members also noted that this intersection experiences high pedestrian activity, specifically during a transit bus pick-up/drop-off time. Pedestrians clustered at the bus stop may make it difficult for vehicles to determine whether they are just waiting for the bus or if they intend to cross Main Street at the crosswalk. Crash reports show that four

(26.7%) out of the total of 15 crashes in this intersection involved a pedestrian at the Main Street crosswalk. Additionally, outdoor cafes were mentioned to be popular in this area, occupying available sidewalk space during spring, summer and fall. The outdoor cafes force pedestrians to travel closer to the edge of the roadway.

Potential safety enhancements

- Consider installing a crosswalk across the Main Street eastbound approach or widening the existing crosswalk to accommodate the high volume of pedestrians and potentially address jaywalking.
- Consider curb extensions at the existing crosswalk to reduce crossing distance, increase pedestrian visibility, and deter parking close to the intersection.
- Evaluate if the road can be narrowed to be only one lane in each direction to prevent vehicles from swerving around other vehicles.
- Evaluate the feasibility of installing a hawk signal or RRFB at the Main Street crosswalk to provide increased safety for crossing pedestrians, being cognizant of the fact that this might encourage more jaywalking of pedestrians due to the high volume of pedestrians in this area who are not used to waiting.
- Consider widening sidewalks or converting some brick buffers to concrete sidewalks to ensure that adequate sidewalk space is available for the pedestrian demand and to accommodate outdoor cafes.

Transit Accommodations

Observations

The bus stop in front of the Academy of Music and Pulaski Park was identified by the audit members as highly utilized with multiple buses serving the stop (See Figure 28). The stop has become challenging with multiple buses attempting to pull into the designated stop that provides space for only two buses. There is an on-street parallel parking space located between the front of the bus stop and the Main Street crosswalk at Masonic Street. This



Figure 28: PVTA buses stopped in front of Pulaski Park and Academy of Music

parking space was noted by RSA members to be important for deterring buses from parking too close to the crosswalk. However, audit members noted that when the parking spot is not occupied, buses will still park within the space and may encroach on the crosswalk. It was also noted that due to multiple buses parked at the stop, eastbound vehicles often cross the double yellow centerline to go around the buses.

Potential safety enhancements

- Consider whether the main transit pulse point at Pulaski Park should be relocated or lengthened while minimizing crosswalk conflicts and if there are any Bus Rapid Transit light strategies that could increase the speed of bus loading.
- Evaluate the bus lane at the Pulaski Park pulse point and determine if it needs to be lengthened while minimize crosswalk conflicts to the east and the west.

- Consider marking out individual bus parking spaces (at Pulaski Park stop and the bus stop on the north side across for buses going westbound) to ensure that buses have a designated space, and consider providing additional queueing space for buses on an intersecting street to accommodate longer bus layovers.
- Consider replacing the parking space between the crosswalk and bus stop with a curbed bump-out to physically prevent the buses from encroaching on the crosswalk. This bump-out would also help reduce pedestrian crossing distance and improve pedestrian visibility.

Parking and Loading

Observations

The audit team noted that since the closure of the Cracker Barrel Alley, Masonic Street has seen more traffic, with some of the traffic from Main Street and some from Main Street to Center Street to Masonic Street. The audit team members noted that the northeast corner of Masonic Street and northwest corner of Main Street at Masonic Street was a common loading zone, however due to the narrow geometry of Masonic Street this can cause additional congestion. In addition, the on-street parallel parking along Masonic Street, at the corners of Main Street, restrict the visibility for southbound vehicles approaching the intersection.

Potential safety enhancements

- Evaluate potential designated loading zones to reduce potential conflict.
- Consider parking signage at Center Street/Main Street to direct vehicles to the Masonic Street lot.

Restrict parking within 20 feet of the intersection to improve visibility.

Main Street at Cracker Barrel Alley and Crafts Avenue

Roadway Geometry

Observations

The Northampton City Hall driveway is a narrow one-way alternating street with one access point for entry and exit, with a difficult east facing line of sight for existing vehicles (See Figure 29). The audit team discussed that this has caused traffic delays and unsafe conditions when a vehicle is exiting the driveway, and another is attempting to enter. Additionally, pedestrians often don't expect this crossing and due to the nature of entry and exit points being in one spot, they are often overlooked.

On the east side of City Hall, Crafts Avenue intersects Main Street from the south and provides one-way travel southbound away from Main Street. There is on-street angled parking along the west side of Crafts Avenue and a notable downward slope away from Main Street. The wide

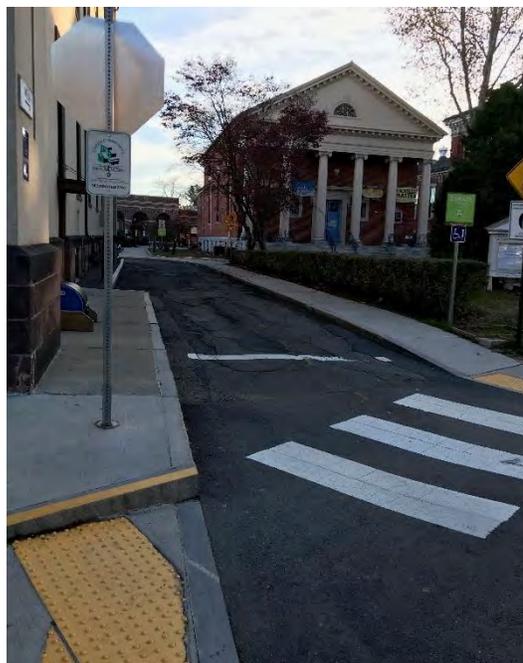


Figure 29: City Hall parking entrance with one access point for entry and exit

geometry of Main Street at Crafts Avenue encourages vehicles to enter Crafts Avenue at excessive speeds. The excessive speeds, downward slope, and on-street parking can make navigating the intersection difficult.

Crafts Avenue was discussed as an area with many simultaneous movements including movements into and out of angle parking, wide left turns onto Crafts Avenue, and steep slope away from Main Street. When combined, the confluence of these many movements can be difficult to process and navigate for motorists as well as other users. Furthermore, the PVRTA and Peter Pan currently runs bus routes down Craft Avenue. Audit team members noted that right turns from Main Street eastbound onto Crafts Avenue is challenging due to the width of the intersection.

Potential safety enhancements

- Consider closing the City Hall driveway or removing public parking in the lot to limit activity into and out of the driveway.
- Consider closing Crafts Avenue to vehicle traffic.
- Evaluate the possibility of flipping the one-way operations for Crafts Avenue and Old South Street to make Crafts Avenue one-way northbound and Old South Street one-way southbound. Coordination with PVRTA and Peter Pan buses would be necessary.
- Consider narrowing all sides of the intersection to control many movements occurring at the intersection. This can potentially be achieved with stamped/scored concrete allowing for truck/bus movements.
- Consider adding a turn pocket for the westbound left turn from Main Street to Crafts Avenue.

Signage

Observations

Audit members noted that the “Do Not Enter” sign is turned to be parallel with the closed alley, rather than perpendicular (See Figure 30). Additionally, audit members mentioned that it can be difficult to see the Crafts Avenue when travelling west on Main Street.

Potential safety enhancements

- Reposition “Do Not Enter” sign to be in appropriate location to increase visibility.
- Remove the street name sign as the alley is closed to traffic and consider installing a pedestrian oriented wayfinding sign instead.
- Consider installing better signage earlier on westbound approach of Main Street and Crafts Avenue to improve street visibility.



Figure 30: "Do Not Enter" sign is parallel with Cracker Barrel Alley

Pedestrian Accommodations and Crossings

Observations

Sidewalks on the northeast side and west of Cracker Barrel Alley were noted to be narrow. The crosswalk across Main Street was also noted to be long with poor visibility due to parking on the north side and southwest side of the intersection, a tight roadway curve to the east. Additionally, audit members noted that it was difficult for vehicles to see pedestrians crossing Crafts Avenue because of steep grading, a parked vehicle, newspaper boxes, and mailboxes at the southwest corner of Main Street at Crafts Avenue.

Potential safety enhancements

- Evaluate the feasibility of widening the sidewalks and/or installing sidewalk/curb extensions around this area to add to more sidewalk space and shorten crossing distance.
- Consider RRFB treatment for the Main Street crosswalk due to existing horizontal curve of Main Street.
- Evaluate installing pedestrian crossing warning signs for all crosswalks.
- Consider installing a raised crosswalk on Crafts Ave to increase pedestrian visibility.
- Consider restricting parking and relocating newspaper and mailboxes on the southwest corners of the intersection to improve visibility between motorists and pedestrians.

Bicycle Accommodations

Observations

The audit team remarked that the New Haven and Northampton Canal Trail bike path begins south of Crafts Avenue and Pulaski Park.

Potential safety enhancements

- Evaluate the feasibility of adding a connection along Crafts Avenue towards the rail trail/bike path.

Transit Accommodations

Observations

Audit members noted that PVRTA and Peter Pan buses go southbound on Crafts Avenue. The angle for the right-turn from Main Street onto Crafts Avenue was brought up to be a challenge due to many movements that could be conflicting at this intersection.

Potential safety enhancements

- Coordinate with PVRTA and Peter Pan on changes to bus route, especially, if the roadway is to be closed or if the one-way direction is changed.

Parking and Loading

Observations

Audit members noted that the loading/unloading zone in front of City Hall was too close to the crosswalk which comes with sight line concerns.

Potential safety enhancements

- Remove the parking spot in front of City Hall to create additional sidewalk space, potentially shortening the crosswalk length, and improve pedestrian visibility.

Main Street at Old South Street



Figure 31: Steep grading observed at Old South Street

on Old South Street, the City of Northampton has reported occasionally closing this street to vehicles during snowy and icy conditions.

Potential safety enhancements

- Install curb extensions and relocate the stop bar further north on Old South Street so vehicles can queue on flatter road surface and do not have to accelerate to pass the intersection.
- Due to the vertical/horizontal curves effect on the sight lines, vehicles encroach onto the crosswalk, to prevent this, the flipping of one-way operations is being recommended as it would be safer/easier movement. Consider closing Old South Street to vehicles.

Roadway Geometry

Observations

The audit members discussed that Old South Street has extremely steep grading which has led to vehicles accelerating when they enter Main Street (See Figure 31). This movement can be unsafe due to the potential of conflicts between right-turning vehicles and the adjacent Main Street crosswalk and left-turning vehicles and oncoming eastbound traffic. Five (22.7%) crashes at this intersection were reported during the study period that involved right and left-turning vehicles and oncoming eastbound and westbound traffic. In addition, there were two crashes that occurred in the Old South Street crosswalk, one involving a bicyclist and one involving a pedestrian, with a northbound vehicle. Old South Street serves as one of the exit routes from one of the busiest parking garages in the Downtown area, which increases the potential of more traffic conflicts. Furthermore, sightlines around this intersection are poor due to both horizontal and vertical curves in the roadway and vehicles are currently encroaching onto the crosswalk. In addition, due to the significant slope

Signage

Observations

Audit members noted that crosswalk signage was only provided at the median and the signs were missing on the ends of the crosswalk (See Figure 32).

Potential safety enhancements

- Install appropriate crosswalk signage in all directions.

Pedestrian Accommodations and Crossings

Observations

It was noted that the rainbow crosswalk was further away from the Old South Street intersection which may be undesirable and pose safety concerns. Parking spaces adjacent to the crosswalk was also noted to cause visibility issues for pedestrians.

Potential safety enhancements

- Evaluate feasibility of moving rainbow crosswalk closer to Old South Street intersection.
- Consider restricting parking before the rainbow crosswalk to increase pedestrian visibility and after the crosswalk to prevent vehicles from backing into the crosswalk.
- Evaluate feasibility of curb extensions to shorten the Main Street crossing and to increase pedestrian visibility.



Figure 32: Crosswalk sign on the median adjacent to the rainbow crosswalk

Main Street at Center Street

Roadway Geometry

Observations

The audit members discussed that Center Street has problems with limited sightlines. The left-turning movement from Center Street was noted to be difficult because it involves crossing two westbound traffic lanes just as traffic becomes more congested on the approach to the large Main Street/King Street/Pleasant Street intersection.

Potential safety enhancements

- Consider restricting left turns and turning the intersection to a right-in and right-out roadway. Evaluate installing a center median on Main Street to restrict left turn movements.

Pavement Markings and Conditions

Observations

Audit members noted that Center Street does not have a stop bar and sign or any centerlines.

Potential safety enhancements

- Install stop bar and sign on Center Street if it meets warrants.
- Consider installing a centerline on Center Street.

Pedestrian Accommodations and Crossings

Observations

Audit members noted that crosswalk visibility from Center Street is limited due to alignment, parking, and oncoming traffic from Main Street. Additionally, the crosswalk across Main Street at this intersection was noted to be very long and well-utilized with parking spaces on both sides of the crosswalk causing sight line issues.

Potential safety enhancements

- Evaluate relocating the crosswalk on Main Street slightly west to provide better visibility from right-turning vehicles from Center Street to Main Street.
- Evaluate making the crosswalk more perpendicular with Main Street to reduce crossing distance.
- Consider installing enhanced crossing treatments, such as a hawk signal or Rectangular Rapid Flashing Beacon (RRFB)) at crosswalks to increase visibility and compliance.
- Consider restricting parking before the crosswalk to increase visibility.
- Evaluate feasibility of curb extensions to shorten the Main Street crossing and to increase pedestrian visibility.

Main Street at Gothic Street

Roadway Geometry

Observations

The audit members discussed that Gothic Street has problems with limited sightlines. The street was also noted to be used as a northbound cut-through for vehicles looking to avoid Main Street traffic. The left-turning movement from Gothic Street was noted to be difficult because it involves crossing two westbound traffic lanes and the beginning of three eastbound lanes (left turn to King Street, thru, and right lanes to turn to Pleasant Street) which are often queued up.

Potential safety enhancements

- Consider restricting left turns and turning the intersection to a right-in and right-out roadway.
- Extend the median on Main Street to restrict left turns.

Pavement Markings and Conditions

Observations

Audit members noted that Gothic Street does not have a stop bar and sign or any centerlines (See Figure 33).

Potential safety enhancements

- Install stop bar and sign on Gothic Street if it meets warrants.
- Consider installing a centerline on Gothic Street.

Pedestrian Accommodations and Crossings

Observations

Audit members noted that there were no crosswalks provided across Main Street at this intersection. People were observed to be jaywalking and using the traffic signals at King Street and Pleasant Street to find gaps in traffic to cross.

Potential safety enhancements

- Consider installing treatments to deter pedestrians from crossing and direct them to existing crosswalks at King/Pleasant Street or Center Street since this intersection is within 300 feet of an existing controlled intersection (King Street/Pleasant Street). Consider extending the median and fencing.



Figure 33: Gothic Street has no stop bar or centerline. No crosswalk across Main Street.

Parking and Loading

Observations

The audit team noted that the angled parking spots at this intersection were 15-minute quick turnaround type. Many frequent movements and backing out crashes were observed as a result. The crash reports show that four (30.8%) out of the total 13 crashes at this location occurred with vehicles backing out of these parking spots.

Potential safety enhancements

- Consider alternate parking schemes to prevent head-in angle parking crashes including removal of parking spots, reverse-angle parking, parallel parking, etc.

Main Street at King Street and Pleasant Street

Roadway Geometry

Observations

The audit team noted that this intersection is extremely large and is traversed by a large volume of heavy vehicle traffic from Pleasant Street northbound to Main Street westbound and Main Street westbound to

Pleasant Street southbound (with a tight curb radii). To facilitate some of these movements, the City of Northampton installed a westbound left-turn lane from Main Street to Pleasant Street southbound.

Potential safety enhancements

- Evaluate the impact of the new left-turn lane.

Pavement Markings and Conditions

Observations

Audit members mentioned that the eastbound right turning lane on Main Street is not well-marked and as a result, vehicles don't realize it is there and sometimes assuming it is a parking spot. The crash reports show that there were four (14.8%) out of the total 27 crashes at this intersection that involved vehicles getting side-swiped while making this turn. Furthermore, trucks as well as fire vehicles that were making this turn were observed crossing the Pleasant Street centerline due to the tight radii. The left-turn pocket on Pleasant Street was noted to be too short and identified as a potential contributor to the three side-swipes crashes (11.1%) observed.

Potential safety enhancements

- Consider moving the stop bar on Pleasant Street further south to allow for adequate turning space for trucks and fire vehicles without encroaching to the centerline and reducing any oncoming traffic-related conflicts.
- Evaluate the feasibility of installing mountable truck aprons to keep the radii as is while allowing truck movements
- Consider removing the right turn lane if the turning radii cannot be adequately accommodated.
- Consider installing clearer right-turn-only pavement markings for the eastbound right-turning lane on Main Street.
- Consider moving the island on Main Street west of Pleasant and King northerly to provide more space for the tight eastbound movements and reduce excess space for westbound movements.

Signal Equipment

Observations

The audit team noted that the pedestrian push buttons at this intersection were further away from the ramps than stated in the ADA requirements. Additionally, each mast arm at this intersection has only one overhead signal but each approach has multiple lanes with additional signals on the posts. Some of the signals were also missing back plates and none of them have retroreflective borders.

Potential safety enhancements

- Evaluate if push button locations are ADA-compliant and if not, relocate to ensure compliancy.
- Evaluate adequate placement of signals equipment with respect to the number of approaching lanes in all directions.
- Consider installing back-plates and retro-reflective borders to the signals to improve equipment visibility.

Signal Timing and Phasing

Observations

Exclusive pedestrian phasing is provided at this intersection. The audit team noted that pedestrians cross diagonally at this location to avoid the long signal cycle (See Figure 34). However, the timing of the phase does not accommodate for the distance to cross diagonally. It was also noted that the pedestrian pushbuttons are “dummy” buttons and the WALK phase is included in every cycle. Additionally, the cycle length was over three minutes which creates excessive delays for all roadway users and leads to aggressive disregard of signals.

Potential safety enhancements

- Adjust exclusive pedestrian time to accommodate for diagonal crossing distance.
- Evaluate the appropriateness of providing concurrent pedestrian crossings.
- Evaluate converting the “dummy” pedestrian pushbuttons to actually activated pushbuttons so that the exclusive pedestrian phase is only called when pedestrian actuated.
- Re-time existing cycle length so it is shorter to reduce pedestrian wait times.



Figure 34: Pedestrians observed crossing diagonally on Main Street at King Street/Pleasant Street



Figure 35: Low clearance sign for the railroad bridges on the mast arm was not visible

Signage

Observations

The audit members pointed out that the low clearance sign for the two railroad bridges at this intersection located on the mast arm was not very visible (See Figure 35). The lack of sign visibility might have been a contributor to the eleven crashes involving trucks with the railroad bridges.

Potential safety enhancements

- Evaluate the condition and location of the low clearance sign to increase visibility. Ensure that the signage is MUTCD compliant.

Pedestrian Accommodations and Crossings

Observations

Members of the audit team noted that the northwest corner of this intersection has limited sidewalk space but has a high volume of pedestrians looking to cross. That corner is also next to a well-used bus stop just west of an angled ValleyBike bikeshare station that occupies the sidewalk space at this corner (See Figure 36).



Figure 36: ValleyBike bikeshare station at the northwest corner of Main Street and King Street

Potential safety enhancements

- Consider Northampton Courthouse easement to widen this portion of the sidewalk to accommodate more pedestrians.
- Evaluate narrowing the roadway as it is currently too wide for two westbound lanes.

Main Street at Strong Avenue and the railroad bridges

Roadway Geometry

Observations

Audit team members observed that the Main Street westbound traffic coming from Bridge Street doesn't always stop before making a left onto Strong Avenue.

Potential safety enhancements

- Evaluate feasibility of tightening the intersection at Strong Avenue by using curb extensions that would force vehicles to stop before turning and prevent them from making a wide turn.

Pavement Markings and Conditions

Observations

The audit team observed that there were no pavement markings on Strong Avenue which could be a source of confusion. Additionally, the pavement surface was noted to be cracking under the bridges.

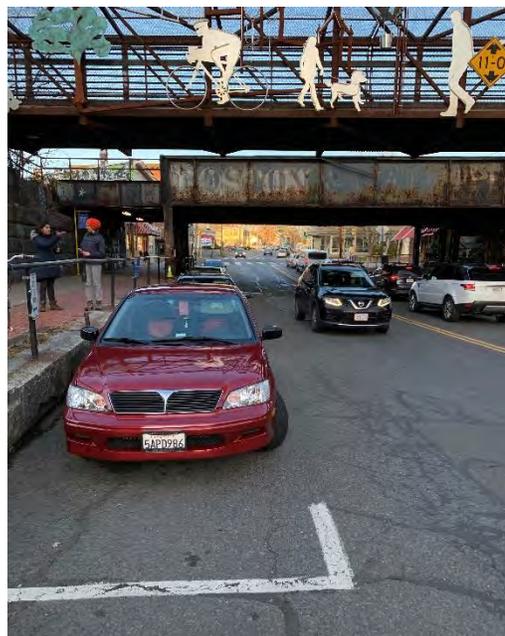


Figure 37: Parallel parking under the railroad bridges

Potential safety enhancements

- Install appropriate pavement markings on Strong Avenue.

- Improve drainage under the bridge and repave as necessary to improve pavement conditions.

Signage

Observations

The audit team pointed out that the flashing lights indicating caution for trucks under the railroad bridges for trucks is often on, which has resulted in people ignoring the sign. Audit members also mentioned that the rail trail access from the bridge is hidden and non-intuitive.

Potential safety enhancements

- Evaluate feasibility for a laser actuated sign that will detect heavy trucks at adjacent intersections for diversion from the railroad bridges.
- Install wayfinding tools to direct people to the rail trail access point.

Pedestrian Accommodations and Crossings

Observations

The audit team noted that the Main Street crosswalk at Strong Avenue is diagonal due to issues with sidewalk grading. Additionally, there is a driveway with a steep curb cut adjacent to the crosswalk on the north side of Main Street (See Figure 38). This driveway portion was identified to be Commonwealth-owned and can be accessed by King Street or Merrick Lane. Sight lines to and from the driveway were observed to be restricted due to the on-street parallel parked vehicles along the north side of Bridge Street immediately east of the driveway. Pedestrian access from parallel parking was also brought up as a concern as currently, the sidewalk is at much higher grade than roadway and people have to walk on the travel lane after getting out of the parallel parking spot.



Figure 38: Driveway with steep curb cut adjacent to Main Street crosswalk at Strong Avenue

Potential safety enhancements

- Evaluate feasibility of removing the driveway and limit parking lot access to Merrick Lane from King Street.
- If parking lot access can be closed, move crosswalk across Main Street to westbound approach for better geometry.
- Consider curb extensions to shorten the pedestrian crossing on Main Street.
- Consider feasibility of safety enhancements including a secondary sidewalk at street level on one or both sides of the street for people to access parking spaces. May require removal of parking from one side of the street.

Bicycle Accommodations

Observations

The audit team noted that there was very limited bicycle parking around this area.

Potential safety enhancements

- Consider installing more bicycle parking at this section.

Freight Accommodations



Figure 39: Railroad Bridge dented due to several truck collisions

Observations

The audit team noted that truck collisions continue to be a problem regardless of signage improvements. The crash report identified that out of the total 20 crashes at this location, 11 (55%) involved trucks hitting the bridge. During the audit, there were dents on the westbound side of the bridge that show evidence of the crashes (See Figure 39). The protocol for truck rescue was brought up to be a big hassle requiring police effort, creating delays and other issues. MassDOT members mentioned that they are working with industry partners to warn drivers to change their route well before Main Street near the highway. It was also noted that currently, the truck escape route to avoid the railroad bridges is to go down Hawley Street, Philips Place, Pomeroy Terrace, and then to Bridge Street eastbound. However, there are issues with trucks travelling on these routes as the areas are residential and potentially unsuitable as frequent truck routes.

Potential safety enhancements

- Evaluate feasibility for a laser actuated sign that will detect heavy trucks at adjacent intersections for diversion from the railroad bridges, and a more aggressive warning system with the police help number.

Bridge Street at Market Street and Hawley Street

Roadway Geometry

Observations

Audit members noted that Hawley Street is a key school walking route, that there is future residential development planned, and the business district is expanding in this direction. The Post Office is located just northeasterly of the intersection and audit members noted that this created vehicular movements along Hawley Street and Bridge Street to access and egress the site while visiting the site or utilizing the site as a cut-through to avoid the signal at the study area intersection. The high activity the Post Office driveways

experience may have contributed to two crashes that involved a vehicle leaving the parking lot and the three rear-end collisions potentially from vehicles abruptly deciding to enter the driveways.

Audit team members mentioned that Hawley Street is often the entrance to the route that trucks will use upon realizing that they will not clear the bridge height restriction to the rail bridge across Bridge Street immediately west of the intersection. Audit team members also noted the skewed offset between the Market Street and Hawley Street approaches. The Market Street approach was noted to be particularly narrow while the Hawley Street approach was noted to be wider. The wide geometry of Hawley Street and misalignment of the minor street approaches at the intersection may have contributed to the reported five turning-vehicle crashes that occurred within the intersection.

Potential Safety Enhancements

- Consider narrowing the Hawley Street approach to better align the Hawley Street and Market Street approaches.
- Install lane tracking pavement markings.

Pavement Markings and Conditions

Observations

All approaches at the intersection of Bridge Street at Market Street and Hawley Street provide one travel lane in each direction. Audit team members noted that both Market Street and Hawley Street provide no centerline separating the opposing travel lanes.

Potential Safety Enhancement

- Install double yellow centerlines along Market Street and Hawley Street approaches.

Signal Equipment

Observation

The intersection of Bridge Street at Market Street and Hawley Street is a signalized intersection that, as previously discussed under Corridor-wide Observations, has dated signal equipment (See Figure 40). Signal heads for Bridge Street are provided overhead on mast arms, while the Market Street and Hawley Street approaches provide signal heads mounted on street side posts. Audit team members also noted a telephone pole, and traffic signal pole located on the southeast corner of the intersection are often struck by heavy vehicles who are forced to travel along Hawley Street or Bridge Street eastbound due to the truck height restriction.

Potential Safety Enhancement

- Relocate Market Street and Hawley Street signal heads to overhead mast arms to increase visibility.
- Consider relocating the telephone pole to reduce the risk of heavy vehicles striking the pole while performing a turn to or from Hawley Street



Figure 40: Outdated pedestrian push button

Signal Timing and Phasing

Observation

The intersection of Bridge Street at Market Street and Hawley Street is a signalized intersection that operates on a three-phase cycle, including an exclusive pedestrian phase. The cycle consists of both Bridge Street eastbound and westbound approaches, followed by an exclusive pedestrian phase actuated by pushbuttons, then the Market Street southbound and Hawley Street northbound approaches. Left-turn movements from all approaches are permissive, which requires vehicles to attempt to find gaps within the vehicular traffic traveling through the intersection. This may have been a contributing factor for the five crashes within the intersection and involved a left-turning vehicle.

During the site visit, audit members observed multiple vehicles turn right during their red signal, particularly during the exclusive pedestrian phase. Furthermore, multiple pedestrians were observed to cross the intersection diagonally during the exclusive pedestrian phase. The existing signal phase provides Flashing Don't Walk time for pedestrians crossing a single approach and does not provide adequate time for a pedestrian to safely traverse the intersection diagonally within the time provided.

Potential Safety Enhancement

- Evaluate providing protected left-turn phasing to increase safety for turning vehicles.
- Evaluate restricting right-turns on red to increase safety for pedestrians.
- Evaluate providing concurrent pedestrian crossing phasing to improve delay for all users.
- Retime the exclusive pedestrian phase to provide adequate crossing time for pedestrians crossing the intersection diagonally.

Signage



Figure 41: Bridge height restriction sign

Observation

The rail bridges overpass is located approximately 70 feet west of the intersection of Bridge Street at Market Street and Hawley Street. There is a bridge height restriction sign located on both directions along Main Street (See Figure 41). The bridge height restriction sign was noted to not have the fluorescent ambers that increase sign visibility.

Potential Safety Enhancement

- Replace the bridge height restriction signage with a high visibility sign with ambers.

Summary of Road Safety Audit

Based on observations and discussions, the RSA team identified the issues and potential enhancements that could improve safety along Main Street and Bridge Street in Northampton, MA. The timeframe and costs are categorized below in Table 3 and Table 4.

Table 3. Estimated Time Frame

Time Frame	Number of Years
Short-Term	<1 Year
Mid-Term	1-3 Years
Long-Term	>3 Years

Table 4. Estimated Costs

Cost category	Dollar Amount
Low	<\$10,000
Medium	\$10,001-\$50,000
High	>\$50,000

Table 5 to Table 14 lists each safety issue and the corresponding potential safety enhancements, for each intersection and corridor-wide, that were discussed at the audit and within the previous section. These tables include the safety benefit, estimated timeframe for completion, estimated construction cost, and the responsible agency for each observed safety issue and potential safety enhancement. Safety payoff estimates are subjective and may be based on the relative percent of crashes that may be reduced by the enhancement based on known and documented crash reduction factors, if available, or estimated crash reduction based on a stated source.

Table 5. Potential Safety Enhancement Summary: Main Street/Bridge Street (Corridor-Wide)

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Evaluate the feasibility of narrowing the roadway corridor and reallocate available space for vulnerable users to increase safety and accessibility.	High	Long-Term	High	City of Northampton
	Evaluate the need for and feasibility of providing existing and potential designated turn lanes.	Medium	Mid-Term	Medium	City of Northampton
	Evaluate the number and mix of travel lanes needed for the intersection and stripe travel lanes, accordingly.	Medium	Mid-Term	Medium	City of Northampton
	Evaluate the feasibility of curb extensions at intersections to increase sight lines from the minor approaches and increase safety for pedestrians. Consideration should be given to the potential interference with bicycle lanes.	High	Mid-Term	Medium	City of Northampton
	Evaluate the feasibility of installing RRFBs or other crossing enhancement signage to improve crosswalk visibility.	Medium	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Reinstall missing or faded pavement markings to reduce vehicular confusion and improve vehicular and pedestrian safety. Consider updating the markings with longer-lasting thermoplastic or polyurea markings and/or recessed markings	Medium	Short-Term	Low	City of Northampton
Signal Equipment	Replace outdated and old signal equipment, where necessary.	Medium	Short-Term	Medium	City of Northampton
	Evaluate signal head locations according to lane locations and relocate to appropriate location to increase signal visibility. Evaluate the need to upgrade all traffic signal infrastructure and assess mast arm capacity.	Medium	Short-Term	Medium	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
	Install retroreflective backplates on signals to improve signal visibility.	Low	Short-Term	Low	City of Northampton
	Update signal equipment with APS push buttons and pedestrian countdown timers for all signalized intersections to increase safety for pedestrians.	High	Mid-Term	Medium	City of Northampton
	Evaluate the use of camera detection rather than loop detectors that are currently being used.	Low	Mid-Term	Medium	City of Northampton
Signal Timing and Phasing	Evaluate signal re-timing and phasing at all signalized intersections to reduce delays.	High	Mid-Term	Low	City of Northampton
	Consider signal coordination along the corridor, with the need for transit pre-emption where appropriate.	Medium	Mid-Term	Low	City of Northampton
	Evaluate the preferred pedestrian phasing for the corridor and provide consistent pedestrian phasing throughout the corridor.	High	Mid-Term	Low	City of Northampton
	Install pedestrian advance walk signals for any intersections that have concurrent vehicle/pedestrian phases.	Medium	Short-Term	Low	City of Northampton
	Consider implementing LPIs for all signalized crosswalks to increase pedestrian visibility and safety.	Medium	Short-Term	Low	City of Northampton
	Evaluate duration of flashing “Don’t Walk” times.	Medium	Short-Term	Low	City of Northampton
Signage	Evaluate signage along the corridor and at study area intersections. Remove and replace all non-compliant MUTCD signs. All new signs should confirm to current MUTCD standards.	Low	Short-Term	Low	City of Northampton
	Remove unnecessary signage to reduce sign clutter and potential confusion	Low	Short-Term	Low	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Pedestrian Accommodations and Crossings	Consider widening sidewalks using reinforced concrete materials to narrow the roadway, provide more pedestrian space, and accommodate sidewalk cafes without sacrificing pedestrian clearances.	High	Long-Term	High	City of Northampton
	Consider implementing curb extensions to shorten crossing distances and increase pedestrian safety. Consideration should be given to the potential interference with bicycle lanes.	High	Mid-Term	Medium	City of Northampton
	Consider installing enhanced crossing treatments, such as a hawk signal or Rectangular Rapid Flashing Beacon (RRFB) at crosswalks to increase visibility and compliance.	Medium	Short-Term	Low	City of Northampton
	Consider replacing bricks in the buffer spaces next to the sidewalk with smoother, ADA-compliant surface treatment including consideration for design to enhance infiltration from surface drainage (such as porous pavement, rain gardens etc.)	Low	Short-Term	Low	City of Northampton
	Evaluate lighting along the corridor and above minor street approaches and install or replace where necessary to improve visibility and safety in low-light conditions.	Medium	Short-Term	Low	City of Northampton
	Reinstall crosswalks with high visibility thermoplastic crosswalks to increase visibility.	High	Short-Term	Low	City of Northampton
	Evaluate and upgrade all ramps and sidewalks to be ADA-compliant.	High	Short-Term	Medium	City of Northampton
	Evaluate feasibility of raised crossings to slow vehicular traffic at key crosswalks. Coordination with the Police and Fire Departments should be considered.	High	Long-Term	High	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Bicycle Accommodations	Evaluate the feasibility of providing protected and/or separated bicycle accommodation throughout the corridor.	High	Long-Term	High	City of Northampton
	Consider installing high-friction surface treatment for bike lanes especially at intersections, high-volume driveways or areas where traffic is merging to another lane and crossing the bike lane.	Medium	Short-Term	High	City of Northampton
	Consider dedicated pavement markings for bicycles turning left from bicycle lanes including two-stage turn queue boxes at intersections.	Medium	Short-Term	High	City of Northampton
	Add enhancements along the corridor, including signage and wayfinding, to provide better Rail Trail connections	Low	Short-Term	Low	City of Northampton
	Assess bicycle parking locations, styles, and supply. Consider additional bicycle parking options including corrals, bike racks, bicycle storage boxes, etc.	Medium	Mid-Term	Low	City of Northampton
	Evaluate bikeshare locations to maximize pedestrian space and improve access to bicycles.	Low	Short-Term	Low	MassDOT/City of Northampton
Transit Accommodations	Coordinate with PVTA and other relevant stakeholders to evaluate bus stop locations corridor wide. Consideration should be given to bus operations with the Amtrak station.	Medium	Long-Term	Medium	MassDOT/City of Northampton
	Consider including transit priority with any future signal upgrades.	Medium	Mid-Term	Low	MassDOT/City of Northampton
	Discuss upgrading transit facilities with all transit authorities' needs (such as concrete pads, shelters, benches with compatible seating, real-time electrical connections, bike racks, etc.).	Medium	Long-Term	Low	MassDOT/City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Parking and Loading	Evaluate the feasibility of designating loading zones and specified loading times.	Medium	Long-Term	Low	City of Northampton
	Restrict parking within appropriate distances of all fire hydrants and crosswalks to improve safety and accessibility to the hydrants and crosswalks.	Medium	Short-Term	Low	City of Northampton
	Evaluate alternate parking schemes including removal of parking, reverse-angle parking, parallel parking etc.	High	Long-Term	Medium	City of Northampton
	Restripe parking to provide consistent parking stall widths and angles.	Low	Short-Term	Low	City of Northampton
	Provide adequate daylighting for on-street parking from all crosswalks based on sight distance requirements.	Medium	Short-Term	Low	City of Northampton
	Evaluate the number of ADA parking spaces along the corridor to ensure demand is met.	Low	Short-Term	Low	City of Northampton
	Evaluate parking and loading spaces for the police, taxi, and ride share services.	Low	Short-Term	Low	City of Northampton
	Install parking garage wayfinding signage.	Low	Short-Term	Low	City of Northampton
Freight Accommodations	Evaluate truck routes that provide access without taking away space from the corridor. Alternate route options should be coordinated at the federal level. Care must be taken, however, to avoid diverting vehicles that bring business to downtown.	Medium	Long-Term	Medium	MassDOT/City of Northampton

Table 6. Potential Safety Enhancement Summary: Main Street at Elm Street/West Street and State Street/New South Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Evaluate the feasibility of a roundabout or a peanut-about treatment to better accommodate traffic demands and deter speeding.	High	Long-Term	High	City of Northampton
	Evaluate options that tighten the intersection box to reduce crosswalk and vehicle distances crossing the intersection.	High	Long-Term	High	City of Northampton
	Confirm that the number of feeding lanes match the receiving lanes to avoid merging problems.	Medium	Short-Term	Low	City of Northampton
	Extend the median on Main St, between West Street and State Street, to prohibit vehicles from turning left out of the residential driveway.	Medium	Mid-Term	Low	City of Northampton
	Consider prohibiting U-turns for the Main Street westbound approach.	Low	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Install advanced lane designation markings where appropriate to reduce driver confusion.	Medium	Short-Term	Low	City of Northampton
	Implement lane tracking pavement markings for West Street throughs and right turns.	Low	Short-Term	Low	City of Northampton
	Evaluate and relocate the New South Street stop bar location to maximize sight lines.	Low	Short-Term	Low	City of Northampton
	Evaluate narrowing the size of the stop bar/box at Main/State/New South to reduce crossing distances for vehicles and pedestrians.	Low	Short-Term	Low	City of Northampton
	Reinstall the Main Street bicycle queue box with appropriate green paint.	Medium	Short-Term	Low	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Signal Equipment	Evaluate the effectiveness and safety of green right-turn arrow versus the green ball options to reduce driver confusion.	Medium	Short-Term	Low	City of Northampton
	Evaluate pedestrian head crossing height to meet MUTCD standards.	Low	Short-Term	Low	City of Northampton
	Evaluate Main Street westbound signal head at State Street. Replace yellow ball if necessary or replace signal head with three-section signal head, as appropriate.	Low	Short-Term	Low	City of Northampton
	Replace the Main Street eastbound green arrow with a green ball.	Low	Short-Term	Low	City of Northampton
Signal Timing and Phasing	Evaluate signal timing and phasing to allow for efficient and safe flow of traffic based on existing demands of all users.	High	Short-Term	Low	City of Northampton
	Address the length of the full signal cycle that leads to excessively aggressive pedestrian and vehicle movements (e.g., jaywalking, continuing through intersections into the red cycle).	High	Short-Term	Low	City of Northampton
Signage	Remove unnecessary signage and to reduce sign clutter and potential confusion.	Low	Short-Term	Low	City of Northampton
	Install lane assignment signage to reduce driver confusion.	Medium	Short-Term	Low	City of Northampton
	Remove outdated “Stop for pedestrians when turning” sign and the box from the traffic signal.	Low	Short-Term	Low	City of Northampton
	Evaluate appropriate placement of signs to reduce confusion and improve visibility.	Medium	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Evaluate feasibility of providing a designated crossing with appropriate safety enhancements across Elm Street, either at Main Street or midblock.	High	Mid-Term	Medium	City of Northampton/Smith College

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
	Evaluate feasibility of installing sidewalks from the west corner of Elm Street at West Street along the north side of West Street to provide safe pedestrian accommodations to the on-street parking along West Street.	Medium	Mid-Term	Medium	City of Northampton/Smith College
	Evaluate the feasibility of relocating the diagonal Main Street crosswalk to provide a shorter and safer crossing. Recommendations included: a crosswalk west of State Street or across Elm Street.	High	Mid-Term	Low	City of Northampton
	Restripe the diagonal crosswalk with continental-style crosswalk markings (the standard for all other downtown crosswalks).	Low	Short-Term	Low	City of Northampton
	Consider widening the median at West Street to provide an ADA-compliant pedestrian refuge with detectable warning panels.	High	Short-Term	Low	City of Northampton
Bicycle Accommodations	Consider reinstalling queue box with green paint.	Medium	Short-Term	Low	City of Northampton
	Consider providing a two-stage turn box in front of the crosswalk at the northbound West Street approach to facilitate turns for less-experienced bicyclists.	High	Short-Term	Low	City of Northampton
	Consider realigning the Elm Street travel lanes and bicycle lane.	High	Long-Term	High	City of Northampton

Table 7. Potential Safety Enhancement Summary: Main Street at Masonic Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Consider restricting left turns from Masonic Street to discourage the unsafe vehicular maneuvers.	High	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Install “Don’t Block the Box” pavement markings and signage to ensure that the intersection is clear from traffic queuing for vehicles to access and egress Masonic Street.	Low	Short-Term	Low	City of Northampton
	Install stop bar on Masonic Street	Low	Short-Term	Low	City of Northampton
	Consider installing a centerline on Masonic Street.	Low	Short-Term	Low	City of Northampton
Signage	Install stop sign for Masonic Street southbound approach	Low	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Consider installing a crosswalk across the Main Street eastbound approach or widening the existing crosswalk to accommodate the high volume of pedestrians and potentially address jaywalking.	High	Short-Term	Low	City of Northampton
	Evaluate the feasibility of installing a hawk signal or RRFB at the Main Street crosswalk to provide increased safety for crossing pedestrians.	Medium	Short-Term	Low	City of Northampton
	Consider widening sidewalks, allocating specific locations for outdoor cafes, or converting some brick buffers to concrete sidewalks to ensure that adequate sidewalk space is available for the pedestrian demand and to accommodate outdoor cafes.	Medium	Mid-Term	Medium	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Transit Accommodations	Consider whether the main transit pulse point at Pulaski Park should be relocated or lengthened while minimizing crosswalk conflicts and if there are any Bus Rapid Transit light strategies that could increase the speed of bus loading.	High	Short-Term	Low	City of Northampton
	Mark out individual bus parking spaces to ensure that buses have a designated space, and consider providing additional queueing space for buses on an intersecting street to accommodate longer bus layovers.	Medium	Short-Term	Low	City of Northampton
	Consider replacing the parking space between the crosswalk and bus stop with a curbed bump-out to physically prevent the buses from encroaching on the crosswalk. This bump-out would also help reduce pedestrian crossing distance and improve pedestrian visibility	High	Short-Term	Medium	City of Northampton
Parking and Loading	Evaluate potential designated loading zones to reduce potential conflict.	Medium	Short-Term	Low	City of Northampton
	Consider parking signage at Center Street/Main Street to direct vehicles to the Masonic Street lot.	Low	Short-Term	Low	City of Northampton
	Restrict parking within 20 feet of the intersection to improve visibility.	High	Short-Term	Low	City of Northampton

Table 8. Potential Safety Enhancement Summary: Main Street at Cracker Barrel Alley and Crafts Avenue

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Consider closing the City Hall driveway or removing public parking in the lot to limit activity into and out of the driveway	High	Long-Term	High	City of Northampton
	Consider closing Crafts Avenue to vehicle traffic.	High	Long-Term	High	City of Northampton
	Evaluate the possibility of flipping the one-way operations for Crafts Avenue and Old South Street to make Crafts Avenue one-way northbound and Old South Street one-way southbound.	High	Long-Term	Low	City of Northampton
	Consider adding a turn pocket for the westbound left turn from Main Street to Crafts Avenue.	Medium	Short-Term	Low	City of Northampton
Signage	Reposition “Do Not Enter” sign to be in appropriate location to increase visibility.	Low	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Evaluate the feasibility of widening the sidewalks and/or installing sidewalk extensions around this area.	High	Mid-Term	Medium	City of Northampton
	Consider restricting parking on the southwest corners of the intersection to improve visibility between motorists and pedestrians.	High	Short-Term	Low	City of Northampton
Bicycle Accommodations	Evaluate the feasibility of adding a connection along Crafts Avenue towards the rail trail/bike path.	High	Long-Term	High	City of Northampton
Transit Accommodations	Coordinate with PVTA on changes to bus route, especially, if the roadway is to be closed.	High	Long-Term	Low	City of Northampton
Parking and Loading	Remove the parking spot in front of City Hall to create additional sidewalk space, potentially shortening the crosswalk length, and improve pedestrian visibility.	Medium	Short-Term	Low	City of Northampton

Table 9. Potential Safety Enhancement Summary: Main Street at Old South Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Install curb extensions and relocate the stop bar further north on Old South Street so vehicles can queue on flatter road surface and do not have to accelerate to pass the intersection.	High	Mid-Term	Medium	City of Northampton
	Evaluate the possibility of flipping the one-way operations for Crafts Avenue and Old South Street to make Crafts Avenue one-way northbound and Old South Street one-way southbound.	High	Long-Term	Low	City of Northampton
	Consider closing Old South Street to vehicles.	High	Long-Term	Low	City of Northampton
Signage	Install appropriate crosswalk signage in all directions.	Low	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Evaluate feasibility of moving rainbow crosswalk closer to Old South Street intersection.	Medium	Short-Term	Low	City of Northampton

Table 10. Potential Safety Enhancement Summary: Main Street at Center Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Consider restricting left turns and turning the intersection to a right-in and right-out roadway.	High	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Install stop bar and sign on Center Street if it meets warrants.	Low	Short-Term	Low	City of Northampton
	Consider installing a centerline on Center Street.	Low	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Evaluate relocating the crosswalk on Main Street slightly west to provide better visibility from right-turning vehicles from Center Street to Main Street.	Medium	Short-Term	Low	City of Northampton
	Evaluate making the crosswalk more perpendicular with Main Street to reduce crossing distance.	Medium	Short-Term	Low	City of Northampton
	Consider installing enhanced crossing treatments, such as a hawk signal or Rectangular Rapid Flashing Beacon (RRFB) at crosswalks to increase visibility and compliance.				City of Northampton

Table 11. Potential Safety Enhancement Summary: Main Street at Gothic Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Evaluate creating one-ways couplets for Center Street and Gothic Street.	High	Long-Term	Low	City of Northampton
	Consider restricting left turns and turning the intersection to a right-in and right-out roadway.	High	Short-Term	Low	City of Northampton
	Extend the median on Main Street to restrict left turns.	Medium	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Install stop bar and sign on Gothic Street if it meets warrants.	Low	Short-Term	Low	City of Northampton
	Consider installing a centerline on Gothic Street.	Low	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Consider installing a crosswalk across Main Street.	High	Short-Term	Low	City of Northampton
Parking and Loading	Consider alternate parking schemes to prevent head-in angle parking crashes including removal of parking spots, reverse-angle parking, parallel parking, etc.	High	Long-Term	Medium	City of Northampton

Table 12. Potential Safety Enhancement Summary: Main Street at King Street and Pleasant Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Evaluate the impact of new left-turn lane on Pleasant Street.	Low	Short-Term	Low	City of Northampton
Pavement Markings and Conditions	Consider moving the stop bar on Pleasant Street further south to allow for adequate turning space for trucks and fire vehicles without encroaching to the centerline and reducing any oncoming traffic-related conflicts.	Medium	Short-Term	Low	City of Northampton
	Evaluate the feasibility of installing mountable truck aprons to keep the radii as is while allowing truck movements	Medium	Mid-Term	Medium	City of Northampton
	Consider installing clearer right-turn-only pavement markings for the eastbound right-turning lane on Main Street.	Medium	Short-Term	Low	City of Northampton
	Considering moving the island on Main Street west of Pleasant and King northerly to provide more space for the tight eastbound movements and reduce excess space for westbound movements.	Medium	Mid-Term	Medium	City of Northampton
	Evaluate if push button locations are ADA-compliant and if not, relocate to ensure compliancy.	Medium	Short-Term	Medium	City of Northampton
Signal Equipment	Evaluate adequate placement of signals equipment with respect to the number of approaching lanes in all directions.	Medium	Short-Term	Medium	City of Northampton
	Consider installing back-plates and retro-reflective borders to the signals.	Medium	Short-Term	Medium	City of Northampton

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Signal Timing and Phasing	Adjust exclusive pedestrian time to accommodate for diagonal crossing distance.	Medium	Short-Term	Low	City of Northampton
	Evaluate the appropriateness of providing concurrent pedestrian crossings.	Low	Short-Term	Low	City of Northampton
	Evaluate converting the “dummy” pedestrian pushbuttons to actually activated pushbuttons so that the exclusive pedestrian phase is only called when pedestrian actuated.	Low	Short-Term	Low	City of Northampton
	Re-time existing cycle length so it is shorter to reduce pedestrian wait times.	Medium	Short-Term	Low	City of Northampton
Signage	Evaluate the condition and location of the low clearance sign to increase visibility.	Medium	Short-Term	Low	City of Northampton
Pedestrian Accommodations and Crossings	Consider Northampton Courthouse easement to widen this portion of the sidewalk to accommodate more pedestrians.	Medium	Mid-Term	Medium	City of Northampton

Table 13. Potential Safety Enhancement Summary: Main Street at Strong Avenue and railroad bridge

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Evaluate feasibility of tightening the intersection on Strong Avenue by using curb extensions that would force vehicles to stop before turning and prevent them from making a wide turn.	High	Long-Term	Medium	City of Northampton
Pavement Markings and Conditions	Install appropriate pavement markings on Strong Avenue.	Medium	Short-Term	Low	City of Northampton
	Improve drainage under the bridge and repave as necessary to improve pavement conditions.	Medium	Long-Term	Medium	MassDOT/City of Northampton
Signage	Evaluate feasibility for a laser actuated sign that will detect heavy trucks at adjacent intersections for diversion from Railroad Bridge.	High	Long-Term	Medium	MassDOT
	Install wayfinding tools to direct people to the rail trail access point.	Low	Short-Term	Low	MassDOT/City of Northampton
Pedestrian Accommodations and Crossings	Evaluate feasibility of removing the driveway and limited parking lot access to Merrick Lane.	High	Long-Term	Medium	City of Northampton
	If parking lot access can be closed, move crosswalk across Main Street to westbound approach for better geometry.	Medium	Long-Term	Low	City of Northampton
Bicycle Accommodations	Consider installing more bicycle parking at this section.	Low	Short-Term	Low	City of Northampton
Freight Accommodations	Evaluate feasibility for a laser actuated sign that will detect heavy trucks at adjacent intersections for diversion from the railroad bridges, and a more aggressive warning system.	High	Long-Term	Medium	MassDOT

Table 14. Potential Safety Enhancement Summary: Bridge Street at Market Street and Hawley Street

Safety Issue	Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Roadway Geometry	Consider narrowing the Hawley Street approach to better align the Hawley Street and Market Street approaches.	High	Long-Term	High	City of Northampton
	Install lane tracking pavement markings.	Low	Short-Term	Low	City of Northampton
Signal Equipment	Relocate Market Street and Hawley Street signal heads to overhead mast arms to increase visibility.	Low	Short-Term	Low	City of Northampton
	Consider relocating the telephone pole to reduce the risk of heavy vehicles striking the pole while performing a turn to or from Hawley Street.	Low	Short-Term	Low	City of Northampton
Signal Timing and Phasing	Evaluate providing protected left-turn phasing to increase safety for turning vehicles.	High	Short-Term	Low	City of Northampton
	Evaluate restricting right-turns on red to increase safety for pedestrians.	Medium	Short-Term	Low	City of Northampton
	Evaluate providing concurrent pedestrian crossing phasing to improve delay for all users.	Medium	Short-Term	Low	City of Northampton
	Retime the exclusive pedestrian phase to provide adequate crossing time for pedestrians crossing the intersection diagonally.	Medium	Short-Term	Low	City of Northampton
Signage	Replace the bridge height restriction signage with a high visibility sign with ambers.	Medium	Short-Term	Low	City of Northampton

Appendix A. RSA Meeting Agenda

Agenda

Road Safety Audit

Northampton, MA

Main Street/Bridge Street

Elm Street/West Street to Market Street/Hawley Street

Meeting Location: City Council Chambers

212 Main Street

Northampton, MA

Thursday, November 21st, 2019

8:00 AM – 6:00 PM

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

8:00 AM	Welcome and Introductions
8:30 AM	Discussion of Safety Issues <ul style="list-style-type: none">• Crash history, – provided in advance• Existing Geometries and Conditions
10:00 AM	Site Visit <ul style="list-style-type: none">• We will begin at Main Street at Elm Street and West Street, working out way west.• As a group, identify areas for improvement
12:00 PM	Lunch and Discussion of Potential Improvements <ul style="list-style-type: none">• Lunch will be provided at Fitzwilly's• Discuss observations and finalize safety issue areas• Discuss potential improvements and finalize recommendations
2:00 PM	Site Visit <ul style="list-style-type: none">• We will pick-up wherever we left off for the site visit portion of the RSA
4:00 PM	Discussion of Potential Improvements <ul style="list-style-type: none">• Meet at the Northampton Council on Again, Great Room, 67 Conz Street• Discuss observations and finalize safety issue areas• Discuss potential improvements and finalize recommendations
6:00 PM	Adjourn for the Day – but the RSA has not ended

Instructions for Participants:

- Before attending the RSA on November 21st, participants are encouraged to drive/walk through the study area and complete/consider elements on the RSA Prompt List with a focus on safety.
- All participants will be actively involved in the process throughout. Participants are encouraged to come with thoughts and ideas, but are reminded that the synergy that develops and respect for others' opinions are key elements to the success of the overall RSA process.
- After the RSA meeting, participants will be asked to comment and respond to the document materials to assure it is reflective of the RSA completed by the multidisciplinary team.

Appendix B. RSA Audit Team Contact List

Participating Audit Team Members

Audit Team Members	Agency/Affiliation	Email Address	Phone Number
Wayne Feiden	Northampton Planning and Sustainability	wfeiden@northamptonma.gov	413-587-1265
Carolyn Misch	Northampton Planning and Sustainability	cmisch@northamptonma.gov	413-587-1287
Ann-Marie Moggio	Northampton Parks and Recreation	amoggio@northamptonma.gov	413-587-1040
David Veleta	Northampton Public Works	dveleta@northamptonma.gov	413-587-1570 x 4310
Maggie Chan	Northampton Public Works	mchan@northamptonma.gov	
Nanci Forrestall	Northampton Parking Administration	nforrestall@northamptonma.gov	413-587-1025
Jody Kasper	Northampton Police Department	jkasper@northamptonma.gov	413-587-1100
Andrew Pelis	Northampton Fire Department	apelis@northamptonma.gov	413-587-1241
Amy Cahillane	Downtown Northampton Association	amy@northamptondna.com	413-387-5145
Bao Lang	MassDOT District 2 Traffic Operations	bao.lang@dot.state.ma.us	413-582-0547
Katherine Masztal	MassDOT District 2	katherine.masztal@dot.state.ma.us	
Laura Hanson	MassDOT District 2 Bicycle and Pedestrian Coordinator	laura.hanson@dot.state.ma.us	413-582-0589
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Gary Roux	Pioneer Valley Planning Commission	gmroux@pvpc.org	413-781-6045
Khyati Parmar	Pioneer Valley Planning Commission	kparmar@pvpc.org	413-781-6045 x 319
Galen Mook	Massachusetts Bicycle Coalition	galen@massbike.org	617-542-2453
Dano Weisbord	Smith College	dweisbord@smith.edu	413-585-3352
Heather Georgallas	Toole Design Group	hgeorgallas@tooledesign.com	617-619-9910 x 219
Lydia Hausle	Toole Design Group	lhausle@tooledesign.com	617-619-9910 x 221
Sneha Adhikari	Toole Design Group	sadhikari@tooledesign.com	617-619-9910 x 207

Appendix C. Detailed Crash Data

COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	Injury
Backing Vehicle	Rear End	Fatal
Non-Involved Vehicle	Angle	
Pedestrian	Angle	
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

NORTHAMPTON, MA

REGION: PVPC

MAIN ST (ROUTE 9) AT ELM ST/WEST ST/STATE ST/NEW SOUTH ST

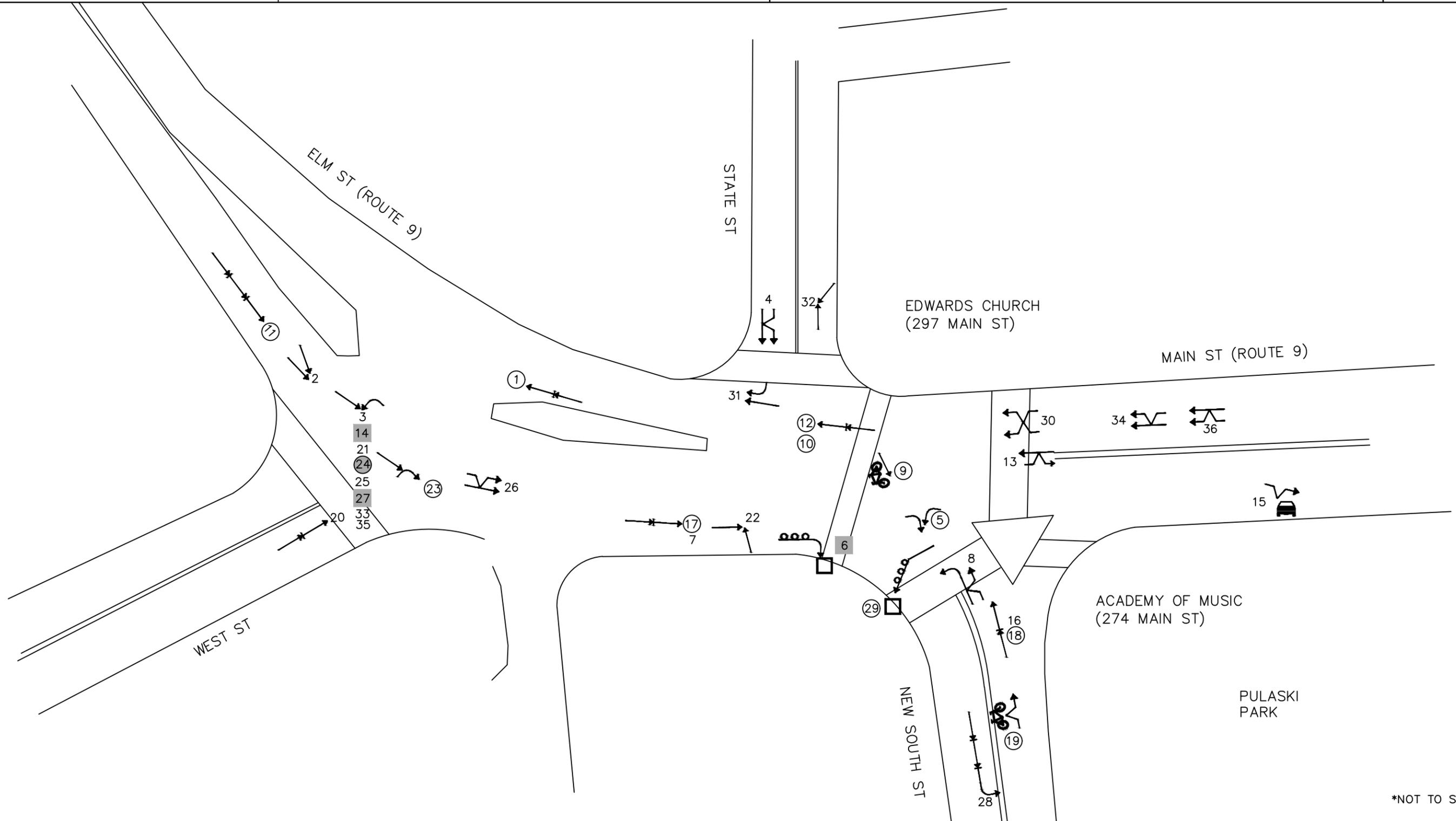
TIME PERIOD ANALYZED: 2015-2017

SOURCE OF CRASH REPORTS: NORTHAMPTON / STATE PD

DATE PREPARED: 11/19/2019

PREPARED BY: TOOLE DESIGN

SHEET 1 OF 5



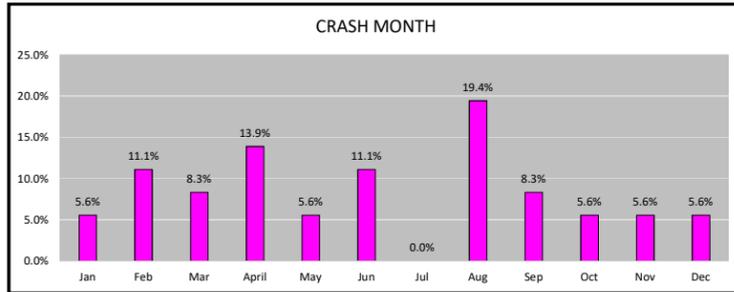
*NOT TO SCALE

Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street at Elm St/West St/State St/New South St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) at Elm St/West St/State St/New South St														
1	1/13/2015	Tuesday	9:47 AM	Rear-end	Daylight	Clear	Dry	Inattention	35	69				V1 travelling westbound on Elm St rear-ended by V2. V2 operator stated not seeing light turn red.
2	1/30/2015	Friday	3:16 PM	Angle	Daylight	Clear	Dry	No improper driving	32					V1 eastbound on Main Street next to V2 when V1 experienced mechanical issues and was unable to turn without colliding with V2
3	2/6/2015	Friday	8:13 AM	Angle	Daylight	Clear	Wet	Glare	40	51				V1 eastbound on Elm St while V2 west on Elm making a left turn to West St collide
4	3/23/2015	Monday	2:52 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	23	50				V1 southbound on State St tries to merge into right turning lane hits V2 heading southbound on the right lane
5	3/26/2015	Thursday	1:39 PM	Angle	Daylight	Cloudy/Rain	Wet	No improper driving	36					V1 (motorcycle) was driving eastbound turning right onto New South St when an unknown vehicle V2 turning left to New South St hits V1
6	4/8/2015	Wednesday	8:18 PM	Single vehicle crash	Dark - lighted roadway	Rain	Wet	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	40					V1 travelling eastbound on Main St about to turn right onto New South St when it went off the roadway on to the sidewalk and struck a traffic light pole - impaired driving
7	5/27/2015	Wednesday	11:58 AM	Rear-end	Daylight	Clear	Dry	Followed too closely	32	35				V1 eastbound stopped at traffic light in right lane on Elm at New South St rear-ends V2 ahead of it. V2 stated that while light turned green for eastbound through traffic, it remained red for eastbound right turn.
8	6/4/2015	Thursday	12:01 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Failed to yield right of way / wrong side of wrong way	22	63				V2 and V1 making left turn onto Main St from New South St when V2 stopped due to unknown vehicle attempting to go on the left lane. V1 attempting to go around V2 and hit V2. V1 operator thought V2 was trying to get into left lane.
9	6/26/2015	Friday	12:48 PM	Single vehicle crash	Daylight	Clear	Dry	No improper driving	48			53		V1 travelling south from State St attempting to pass through intersection to go to New South St when a cyclist tried to go around V1 to make a left turn and hits V1
10	6/29/2015	Monday	9:00 AM	Rear-end	Daylight	Cloudy	Wet	Unknown	32	24				V2 westbound on Main stopped at traffic signal before continuing on Elm when it was rear-ended by V1
11	6/29/2015	Monday	3:46 PM	Rear-end	Daylight	Clear/Other	Dry	Distracted	39	66				V1, V2, V3 eastbound at red light on Elm & West. V2 began to roll forward due to distraction and hits V1 which subsequently hits V3
12	8/20/2015	Thursday	1:33 PM	Rear-end	Daylight	Clear/Unknown	Dry	No improper driving	64	64				V1 westbound on Main St stopped at traffic signal before continuing on Elm when it was rear-ended by V2
13	8/25/2015	Tuesday	4:50 PM	Sideswipe, opposite direction	Daylight	Cloudy/Rain	Wet	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc	53	39				V2 stopped at red light in left turn lane of Main St to turn left onto New South St when V1 travelling eastbound on Main when V1 swerved to left to avoid another vehicle moving into his travel lane and impacted V2
14	9/10/2015	Thursday	7:49 PM	Angle	Dark - lighted roadway	Rain	Wet	Failed to yield right of way	23	21				V1 westbound making a left turn to West St hits V2 travelling eastbound on Elm St with right of way
15	9/29/2015	Tuesday	4:57 PM	Single vehicle crash	Daylight	Clear	Dry	Over-correcting/over-steering	38					V1 eastbound on Main St attempts to pull over to shoulder of roadway but hits V2 parked parallelly on Main St
16	11/12/2015	Thursday	9:15 AM	Rear-end	Daylight	Rain	Wet	Inattention	52	51				V1 travelling northbound on New South St stopped with traffic when V2 rear-ends V1
17	2/14/2016	Sunday	5:48 PM	Rear-end	Daylight	Clear	Dry	Distracted	41	66				V1 slowing/stopping at traffic rear-ended by V2 (both eastbound) when V2 was distracted by activity in front of Academy of Music
18	2/19/2016	Friday	4:13 PM	Rear-end	Daylight	Clear	Dry	Other improper action	23	45				V1 rear-ended by V2 (both northbound) when V1 was waiting for traffic light on New South St
19	3/9/2016	Wednesday	3:26 PM	Single vehicle crash	Daylight	Clear	Dry	No improper driving	55			32		Cyclist going eastbound turning south to New South St with high speed hits V1 travelling northbound on New South St
20	4/4/2016	Monday	10:01 AM	Rear-end	Daylight	Snow	Wet	No improper driving	23	56				V2 northbound stopped at red light on West St & Elm struck by V1 behind V2 due to snowy condition
21	4/11/2016	Monday	8:14 AM	Angle	Daylight	Cloudy/Rain	Wet	Inattention	59	52				V1 westbound making a left turn to West St hits V2 travelling eastbound on Elm St with right of way
22	5/26/2016	Thursday	8:26 AM	Angle	Daylight	Clear/Unknown	Dry	Inattention	63	46				V1 northbound on New South St to State St hit by V2 eastbound on Main St
23	8/8/2016	Monday	7:00 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	31	46				V1 eastbound on Elm St towards Main St hits V2 attempting to make a right turn from West St to Main St. V2 operator stated having green light.

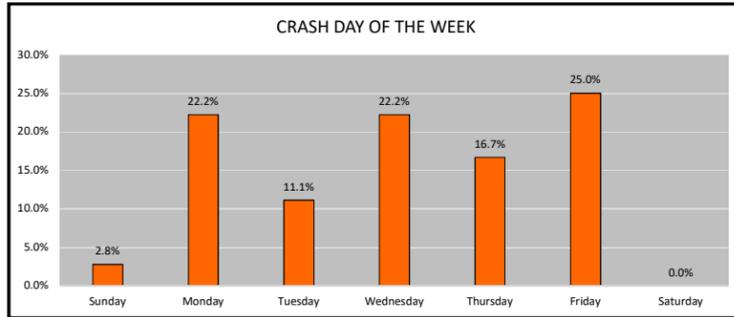
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) at Elm St/West St/State St/New South St														
24	8/12/2016	Friday	9:13 PM	Angle	Dark - lighted roadway	Rain	Wet	Unknown	57	54				V1 westbound making a left turn to West St collides with V2 travelling eastbound on Elm St . Both operators claimed to have green light.
25	8/26/2016	Friday	4:41 PM	Angle	Daylight	Clear/Other	Dry	No improper driving	67	22				V1 westbound making a left turn to West St collides with V2 travelling eastbound on Elm St
26	10/26/2016	Wednesday	12:02 PM	Sideswipe, same direction	Daylight	Clear/Cloudy	Dry	Failed to yield right of way	42	57				V1 on left lane, V2 in right adjacent lane both going from Elm to Main eastbound. V2 remained in right lane and V1 attempted to change lanes from left to right hitting V2
27	11/16/2016	Wednesday	8:36 PM	Angle	Dark - lighted roadway	Clear	Dry	Unknown	41	26				V1 westbound making a left turn to West St hits V2 travelling eastbound on Elm St with right of way. Both operators stated having green light.
28	2/6/2017	Monday	12:52 PM	Rear-end	Daylight	Clear	Dry	Inattention	60	30				V1 turning left into parking lot towards Academy of Music, V2 southbound stopped/stopping at South St when it was rear-ended by V3 which caused V2 to strike V1
29	4/5/2017	Wednesday	2:34 PM	Single vehicle crash	Daylight	Cloudy	Dry	Other improper action	22					V1 (motorcycle) westbound on Main & State at red light lost control of motorcycle and hits a pole
30	4/21/2017	Friday	3:12 PM	Sideswipe, same direction	Daylight	Rain/Cloudy	Wet	Unknown	40	28				V1 & V2 on westbound on Main St at New South St changed lanes to enter the left turn lane and sideswiped each other
31	8/8/2017	Tuesday	6:41 PM	Angle	Daylight	Clear	Dry	Unknown	21	63				V2 westbound through Main & State hit by V1 southbound on State turning right onto Main without right of way
32	8/18/2017	Friday	12:12 PM	Angle	Daylight	Cloudy	Wet	Failed to yield right of way	54	18				V1 entering traffic lane heading southbound when V2 travelling straight ahead northbound collide
33	9/13/2017	Wednesday	3:33 PM	Angle	Daylight	Clear	Dry	Inattention	66	17				V1 westbound making a left turn to West St hits V2 travelling eastbound on Elm St with right of way
34	10/13/2017	Friday	4:58 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	66	44				V1 westbound on Main St in left turn only lane, V1 merged into straight lane but then suddenly decided to go left and tried to merge to left turn lane when it hit V2
35	12/11/2017	Monday	7:26 AM	Angle	Daylight	Cloudy	Dry	Inattention	55	27				V2 westbound making a left turn to West St collides with V1 travelling eastbound on Elm St. V2 did not realize that V1 also had green light.
36	12/13/2017	Wednesday	2:38 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention	26	17				V1 westbound on Main St in straight travel lane attempts to change lanes into right-hand only lane and hits V2 already on right hand lane

Main Street at Elm St/West St/State St/New South St

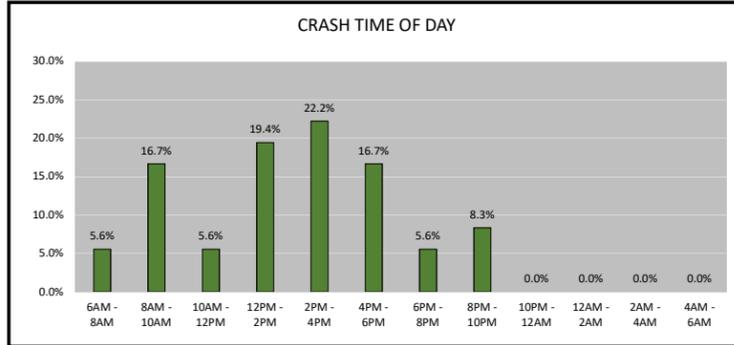
Crash month		
Jan	2	5.6%
Feb	4	11.1%
Mar	3	8.3%
April	5	13.9%
May	2	5.6%
Jun	4	11.1%
Jul	0	0.0%
Aug	7	19.4%
Sep	3	8.3%
Oct	2	5.6%
Nov	2	5.6%
Dec	2	5.6%
36		



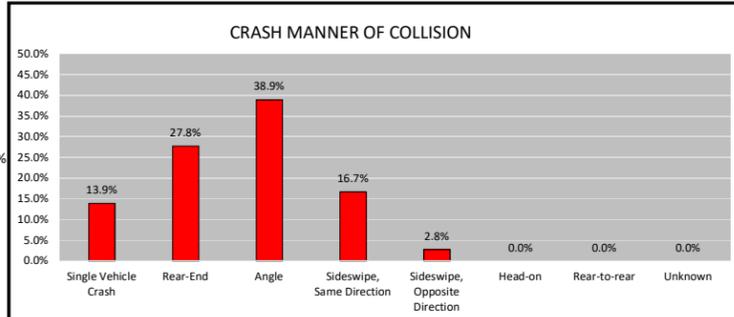
Crash day of the week		
Sunday	1	2.8%
Monday	8	22.2%
Tuesday	4	11.1%
Wednesday	8	22.2%
Thursday	6	16.7%
Friday	9	25.0%
Saturday	0	0.0%
36		



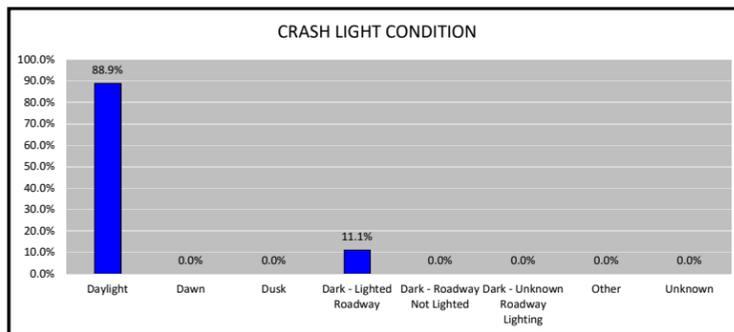
Crash time of day		
6AM - 8AM	2	5.6%
8AM - 10AM	6	16.7%
10AM - 12PM	2	5.6%
12PM - 2PM	7	19.4%
2PM - 4PM	8	22.2%
4PM - 6PM	6	16.7%
6PM - 8PM	2	5.6%
8PM - 10PM	3	8.3%
10PM - 12AM	0	0.0%
12AM - 2AM	0	0.0%
2AM - 4AM	0	0.0%
4AM - 6AM	0	0.0%
36		



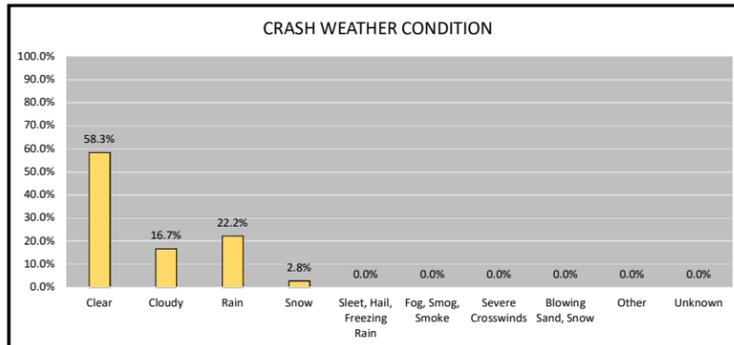
Crash manner of collision		
Single Vehicle Crash	5	13.9%
Rear-End	10	27.8%
Angle	14	38.9%
Sideswipe, Same Director	6	16.7%
Sideswipe, Opposite Direc	1	2.8%
Head-on	0	0.0%
Rear-to-rear	0	0.0%
Unknown	0	0.0%
36		



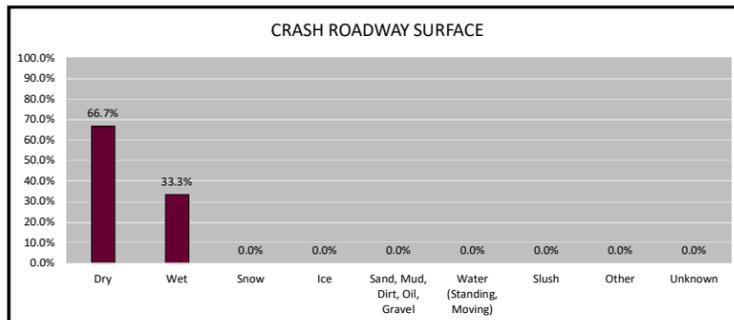
Crash light condition		
Daylight	32	88.9%
Dawn	0	0.0%
Dusk	0	0.0%
Dark - Lighted Roadway	4	11.1%
Dark - Roadway Not Lighted	0	0.0%
Dark - Unknown Roadway	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
36		



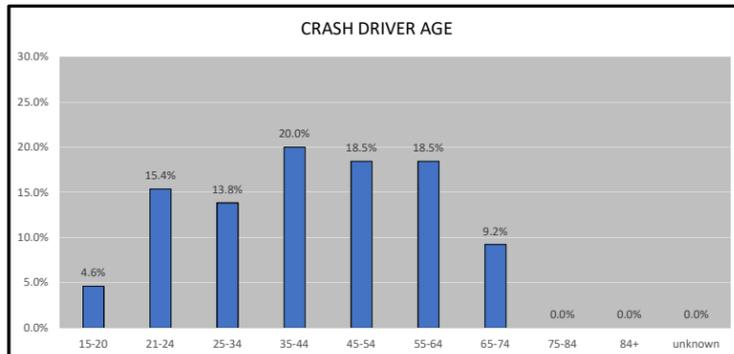
Crash weather condition		
Clear	21	58.3%
Cloudy	6	16.7%
Rain	8	22.2%
Snow	1	2.8%
Sleet, Hail, Freezing Rain	0	0.0%
Fog, Smog, Smoke	0	0.0%
Severe Crosswinds	0	0.0%
Blowing Sand, Snow	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
36		



Crash roadway surface		
Dry	24	66.7%
Wet	12	33.3%
Snow	0	0.0%
Ice	0	0.0%
Sand, Mud, Dirt, Oil, Grav	0	0.0%
Water (Standing, Moving)	0	0.0%
Slush	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
36		



Crash driver age		
15-20	3	4.6%
21-24	10	15.4%
25-34	9	13.8%
35-44	13	20.0%
45-54	12	18.5%
55-64	12	18.5%
65-74	6	9.2%
75-84	0	0.0%
84+	0	0.0%
unknown	0	0.0%
65		



COLLISION DIAGRAM

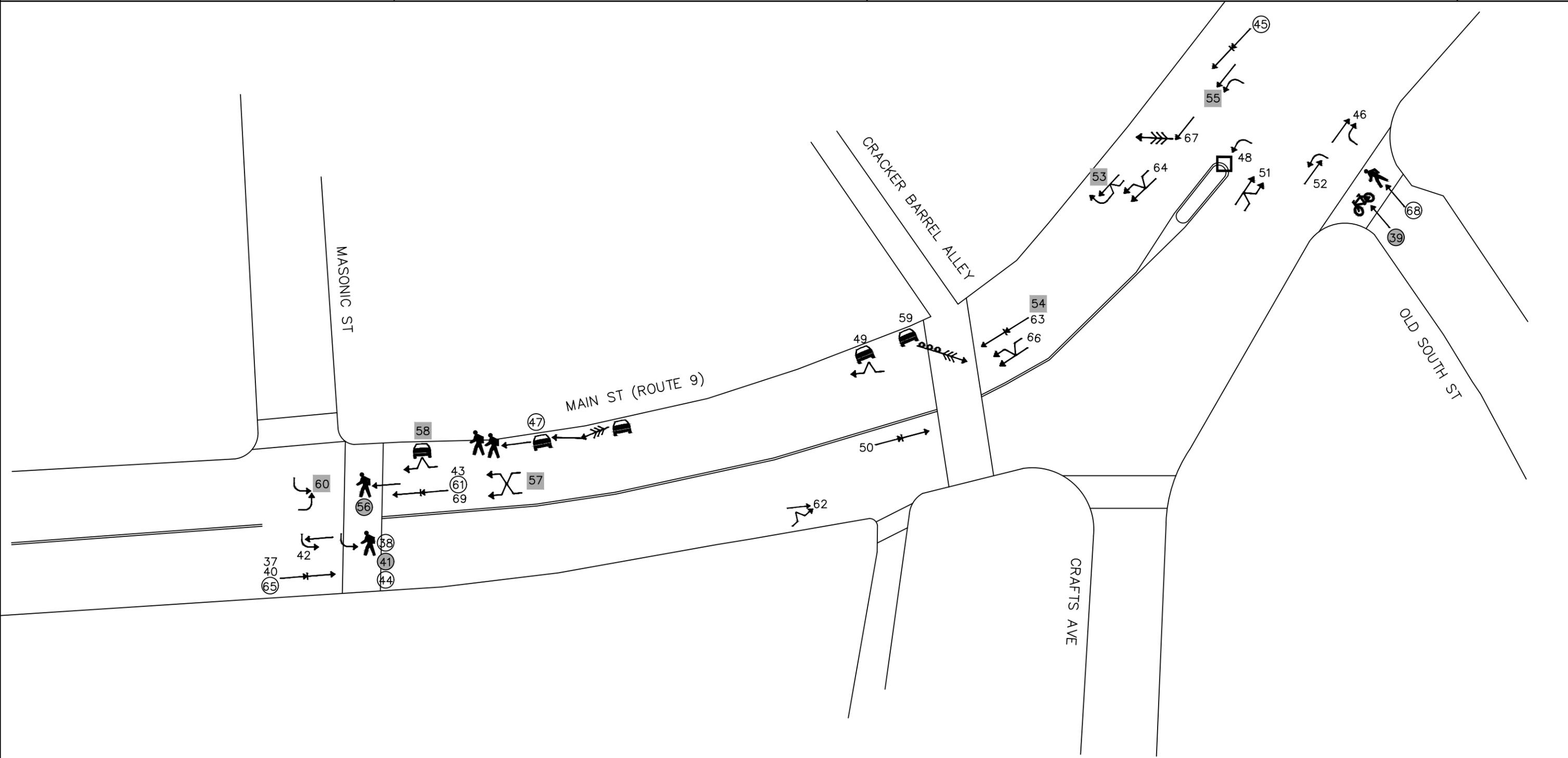
SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	Injury
Backing Vehicle	Rear End	Fatal
Non-Involved Vehicle	Angle	
Pedestrian	Angle	
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

NORTHAMPTON, MA

REGION: PVPC

MAIN ST (ROUTE 9) BETWEEN MASONIC ST AND OLD SOUTH ST

TIME PERIOD ANALYZED: 2015-2017
 SOURCE OF CRASH REPORTS: NORTHAMPTON / STATE PD
 DATE PREPARED: 11/19/2019
 PREPARED BY: TOOLE DESIGN
 SHEET 2 OF 5



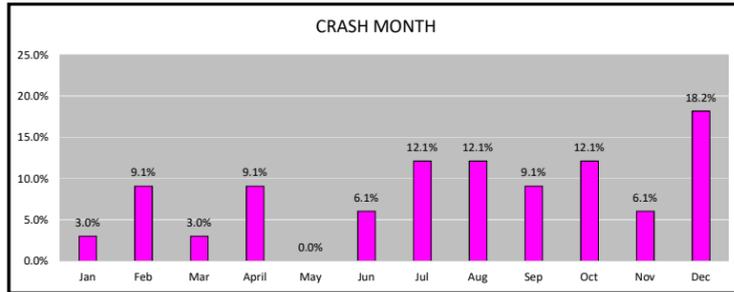
*NOT TO SCALE

Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street between Masonic St and Old South St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Masonic St and Old South St														
37	2/1/2015	Sunday	12:28 PM	Rear-end	Daylight	Clear	Dry	Inattention	60	42				V2 eastbound on Main St near Masonic rear-ends V1 stopped in traffic for a pedestrian at crosswalk
38	7/9/2015	Thursday	9:29 AM	Single vehicle crash	Daylight	Clear/Cloudy	Dry	Failed to yield right of way	59			52		Pedestrian crossing on marked crosswalk on Main St heading northbound when V1 turning left from Masonic to Main nips pedestrian with the driver side mirror
39	9/26/2015	Saturday	7:53 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	No improper driving	65			28		V1 stopped at Old South to turn left to Main when a cyclist going westbound in crosswalk crossing Old South hit V1
40	10/19/2015	Monday	12:35 PM	Rear-end	Daylight	Cloudy	Dry	Inattention	24	18				V1 eastbound on Main St near Masonic rear-ends V2 stopped in traffic for a pedestrian at crosswalk
41	12/5/2015	Saturday	5:03 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	No improper driving	53			24		V1 turning left from Masonic to enter Main St going eastbound strikes pedestrian in crosswalk
42	12/8/2015	Tuesday	8:06 AM	Angle	Daylight	Clear	Dry	Failed to yield right of way	40	23				V1 travelling westbound hits V2 turning left from Masonic to Main eastbound (courtesy crash)
43	1/21/2016	Thursday	11:28 AM	Rear-end	Daylight	Clear	Dry	No improper driving	58	49				V2 rear-ended V1 (both westbound) when V1 stopped suddenly when another vehicle pulled from Masonic St
44	2/9/2016	Tuesday	11:17 AM	Single vehicle crash	Daylight	Clear	Wet	Unknown	unknown			24		Pedestrian northbound on crosswalk when V1 making a left turn from Masonic to Main St hits pedestrian
45	2/15/2016	Monday	2:59 PM	Rear-end	Daylight	Snow	Snow	Inattention	48	58				V1 (westbound) stopped for another vehicle to come out of parking spot to park in that space, V2 (westbound) failed to stop and struck V1 in the rear
46	3/30/2016	Wednesday	5:24 PM	Angle	Daylight	Clear	Dry	Unknown	77	35				V2 eastbound on Main St slowing for crosswalk hit by V1 northbound at Old South & Main attempting to turn right onto Main
47	4/2/2016	Saturday	12:47 PM	Single vehicle crash	Daylight	Rain/Snow	Wet	Other improper action	86			50	23	V1, V2, V3 parked on Main St. V1 drove at an angle to V2 causing V2 to strike two pedestrians, V1 then reversed and struck V3 at an angle
48	4/27/2016	Wednesday	6:27 PM	Single vehicle crash	Daylight	Clear	Dry	Over-correcting/over-steering	62					V1 attempting to make a left turn onto Main St from Old South hits traffic island to swerve away from oncoming traffic
49	7/15/2016	Friday	8:22 AM	Single vehicle crash	Daylight	Clear	Dry	Inattention	58					V2 parked on Main St struck by V1 (westbound) when stopping to parallel park
50	8/10/2016	Wednesday	9:09 AM	Rear-end	Daylight	Rain	Wet	Inattention	52	53				V2 eastbound stopped at crosswalk for pedestrian, V1 behind V2 did not see pedestrian and continued striking V1 on the left rear
51	8/22/2016	Monday	1:08 PM	Sideswipe, same direction	Daylight	Clear	Dry	Visibility obstructed	38	18				V1 travelling eastbound on Main in inner travel lane sideswiped by V2 when V2 also going eastbound in outer lane attempted to change lanes. V2 stated not seeing red due to a large parked vehicle in left turn lane.
52	9/19/2016	Monday	10:58 AM	Angle	Daylight	Rain/Cloudy	Wet	Other improper action	69	23	41			V1 making a left turn from Old South St to Main going westbound. V3 eastbound was stopped in traffic on Main before Old South St leaving V1 room to turn. V2 eastbound on Main in left hand lane was not seen by V1 and made contact with V2, V2 spun and hit V3. (courtesy crash)
53	10/25/2016	Tuesday	8:53 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	20	21				V1 in left lane, V2 in right lane behind V1 (no divider lane). V1 turning right to the parking spot, V2 going straight struck by V1.
54	11/17/2016	Thursday	8:54 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Inattention	61	25				V1 behind V2 both westbound, V2 stopped at marked crosswalk for pedestrian, V1 failed to stop and rear-ends V2
55	11/29/2016	Tuesday	8:18 PM	Angle	Dark - lighted roadway	Rain	Wet	Unknown	23	64				V1 making a northbound left from Old South St westbound onto Main and V2 on curb lane of Main St going westbound collide
56	12/1/2016	Thursday	8:03 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings	84					V1 travelling westbound on Main St fails to see pedestrian and hits pedestrian at marked crosswalk near Masonic St.
57	12/2/2016	Friday	7:46 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road	33	78				V1 & V2 westbound on Main St approaching Masonic St collide
58	4/30/2017	Sunday	1:21 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	64	23				Bus going westbound hits side of parked V2
59	6/17/2017	Saturday	7:12 AM	Single vehicle crash	Daylight	Cloudy	Dry	No improper driving	unknown					V1 was left parking on Main but it was still running and while operator was away, it rolled backwards and traveled northbound across both lanes of Main St and struck V2 parked facing westbound on Main St
60	6/23/2017	Friday	10:06 PM	Angle	Dark - lighted roadway	Clear	Dry	Inattention	22	32				V1 turning left from Main to Masonic (northbound), V2 turning left from Masonic to Main (eastbound) collide

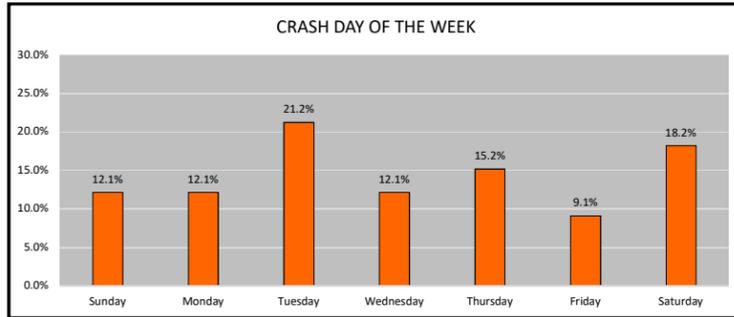
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Masonic St and Old South St														
61	7/12/2017	Wednesday	2:50 PM	Rear-end	Daylight	Rain	Wet	Inattention	44	56				V2 westbound on Main and slowed down for pedestrian when it was rear-ended by V1
62	7/29/2017	Saturday	10:07 AM	Sideswipe, same direction	Daylight	Cloudy	Dry	Inattention	79	43				V1 attempting to pull out of parking spot on Main in City Hall to go eastbound hit V2 travelling eastbound
63	8/1/2017	Tuesday	6:54 AM	Rear-end	Daylight	Clear	Dry	Distracted	44	20				V1 westbound stopped to let pedestrian walk southbound on crosswalk when it was rear-ended by V2. V2 admitted to being on the phone.
64	8/24/2017	Thursday	9:53 AM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	23	60				V2 westbound on Main in inner travel lane when V1 backed from parking spot to outer lane but later moved to inner lane and sideswiped V2
65	9/3/2017	Sunday	2:30 PM	Rear-end	Daylight	Rain	Wet	Inattention	57	44				V2 eastbound stopping for pedestrian on crosswalk rear-ended by V1 eastbound behind V2
66	10/8/2017	Sunday	12:27 PM	Sideswipe, same direction	Daylight	Cloudy	Wet	Failed to yield right of way	64	38				V2 westbound on Main in left lane, V1 westbound in right lane when V1 turns to left lane to make U-turn and hits V2
67	10/24/2017	Tuesday	1:01 PM	Angle	Daylight	Clear/Cloudy	Wet	Visibility obstructed	22	53				V1 backing out of parking space when it hit V2 westbound on Main
68	12/5/2017	Tuesday	12:58 PM	Single vehicle crash	Daylight	Clear	Dry	Inattention	23					V1 travelling northbound on Old South St hits pedestrian on crosswalk, stating that operator could not see pedestrian due to large number of vehicles in left turn lane
69	12/23/2017	Saturday	3:53 PM	Rear-end	Daylight	Cloudy/Sleet, hail (freezing rain or drizzle)	Wet	Inattention	18	59				V2 westbound stopped for pedestrian at crosswalk, V1 could not stop in time and rear-ended V2

Main Street between Masonic St and Old South St

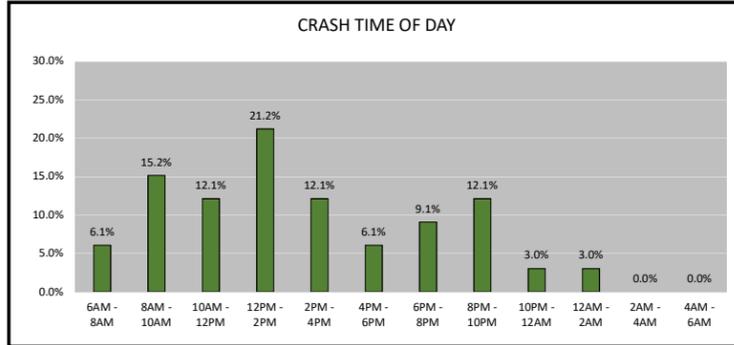
Crash month		
Jan	1	3.0%
Feb	3	9.1%
Mar	1	3.0%
April	3	9.1%
May	0	0.0%
Jun	2	6.1%
Jul	4	12.1%
Aug	4	12.1%
Sep	3	9.1%
Oct	4	12.1%
Nov	2	6.1%
Dec	6	18.2%
33		



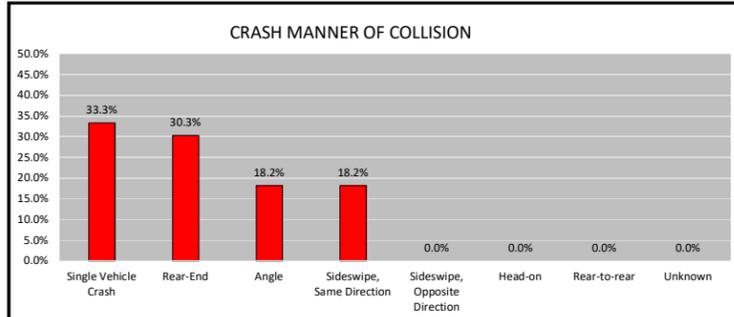
Crash day of the week		
Sunday	4	12.1%
Monday	4	12.1%
Tuesday	7	21.2%
Wednesday	4	12.1%
Thursday	5	15.2%
Friday	3	9.1%
Saturday	6	18.2%
33		



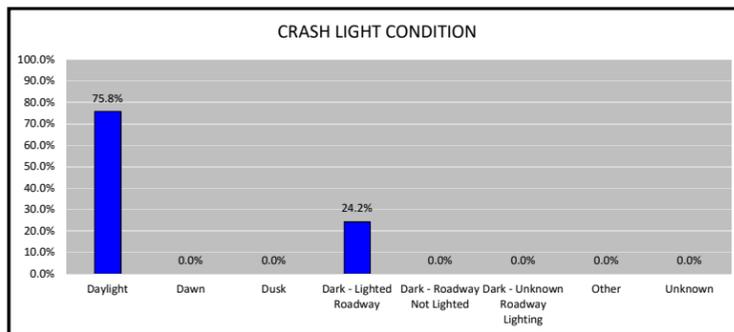
Crash time of day		
6AM - 8AM	2	6.1%
8AM - 10AM	5	15.2%
10AM - 12PM	4	12.1%
12PM - 2PM	7	21.2%
2PM - 4PM	4	12.1%
4PM - 6PM	2	6.1%
6PM - 8PM	3	9.1%
8PM - 10PM	4	12.1%
10PM - 12AM	1	3.0%
12AM - 2AM	1	3.0%
2AM - 4AM	0	0.0%
4AM - 6AM	0	0.0%
33		



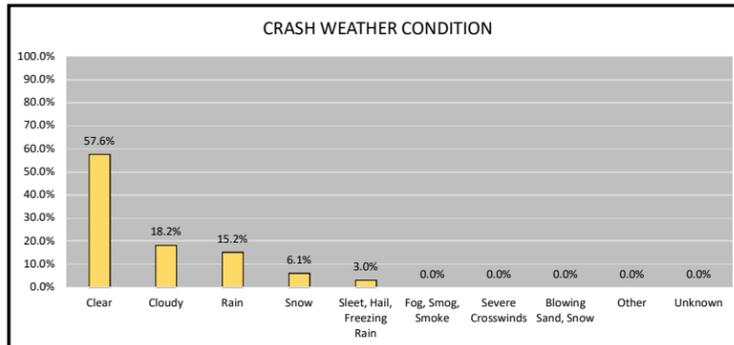
Crash manner of collision		
Single Vehicle Crash	11	33.3%
Rear-End	10	30.3%
Angle	6	18.2%
Sideswipe, Same Director	6	18.2%
Sideswipe, Opposite Direc	0	0.0%
Head-on	0	0.0%
Rear-to-rear	0	0.0%
Unknown	0	0.0%
33		



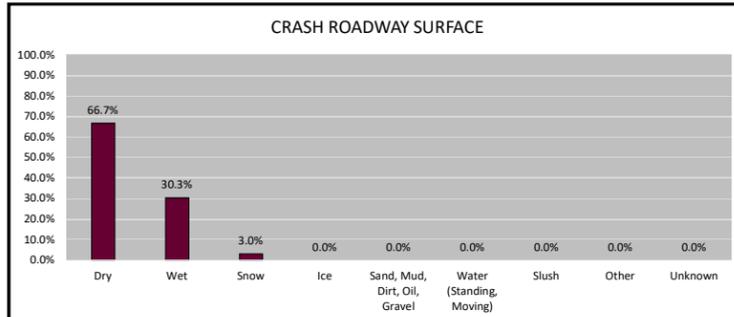
Crash light condition		
Daylight	25	75.8%
Dawn	0	0.0%
Dusk	0	0.0%
Dark - Lighted Roadway	8	24.2%
Dark - Roadway Not Lighted	0	0.0%
Dark - Unknown Roadway	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
33		



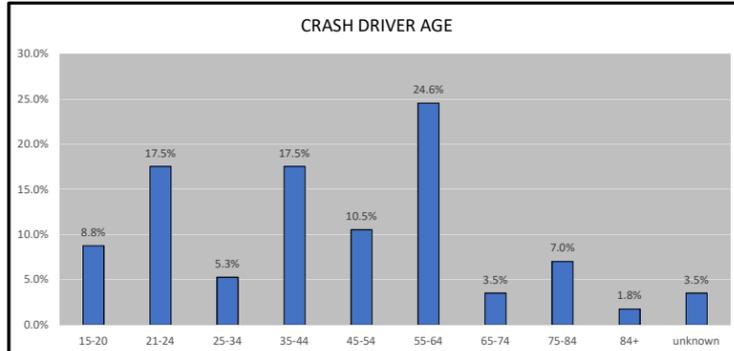
Crash weather condition		
Clear	19	57.6%
Cloudy	6	18.2%
Rain	5	15.2%
Snow	2	6.1%
Sleet, Hail, Freezing Rain	1	3.0%
Fog, Smog, Smoke	0	0.0%
Severe Crosswinds	0	0.0%
Blowing Sand, Snow	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
33		



Crash roadway surface		
Dry	22	66.7%
Wet	10	30.3%
Snow	1	3.0%
Ice	0	0.0%
Sand, Mud, Dirt, Oil, Grav	0	0.0%
Water (Standing, Moving)	0	0.0%
Slush	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
33		



Crash driver age		
15-20	5	8.8%
21-24	10	17.5%
25-34	3	5.3%
35-44	10	17.5%
45-54	6	10.5%
55-64	14	24.6%
65-74	2	3.5%
75-84	4	7.0%
84+	1	1.8%
unknown	2	3.5%
57		



COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	Injury
Backing Vehicle	Rear End	Fatal
Non-Involved Vehicle	Angle	
Pedestrian	Angle	
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

NORTHAMPTON, MA

REGION: PVPC

MAIN ST (ROUTE 9) BETWEEN OLD SOUTH ST AND GOTHIC ST

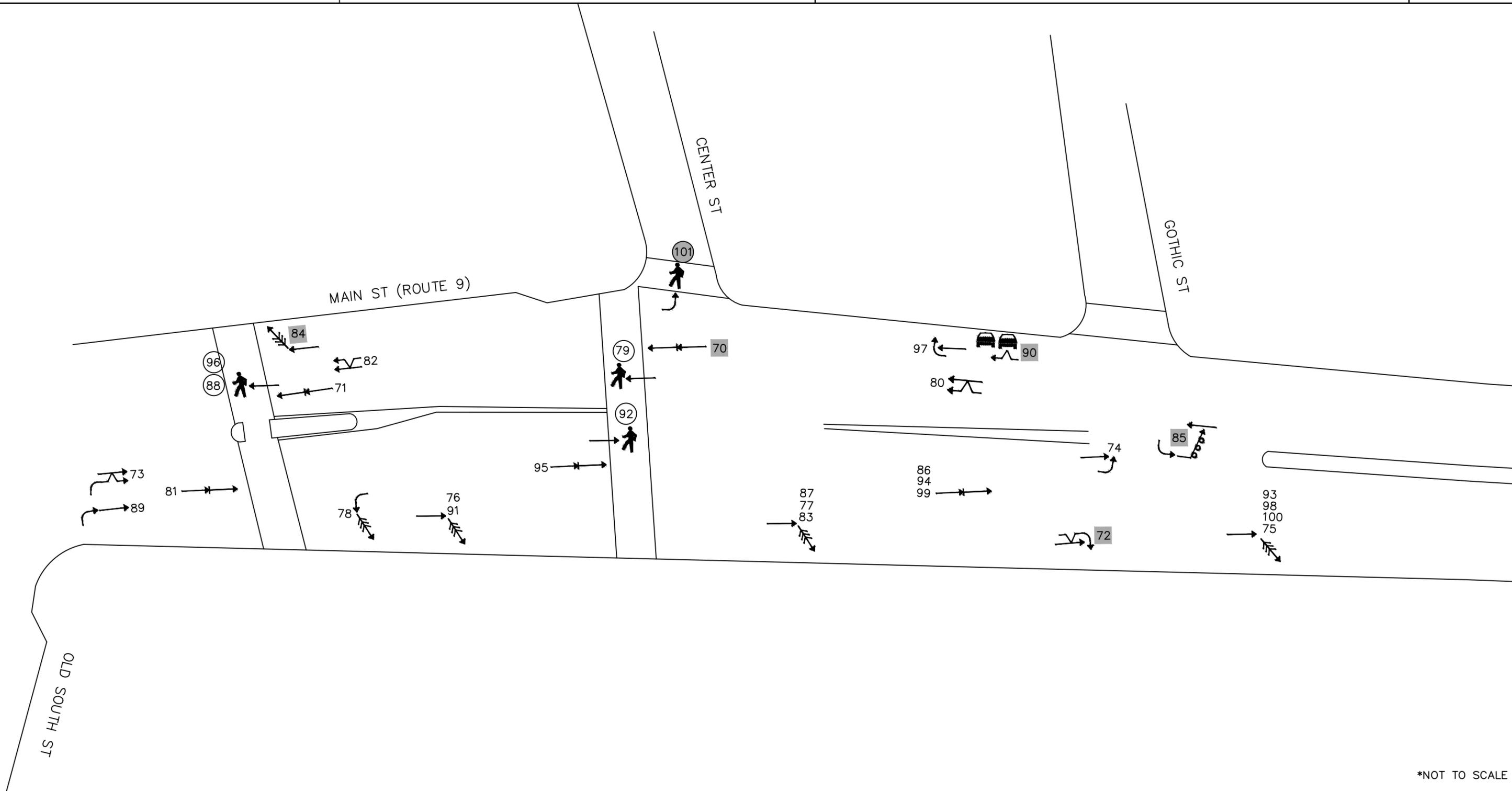
TIME PERIOD ANALYZED: 2015-2017

SOURCE OF CRASH REPORTS: NORTHAMPTON / STATE PD

DATE PREPARED: 11/19/2019

PREPARED BY: TOOLE DESIGN

SHEET 3 OF 5



*NOT TO SCALE

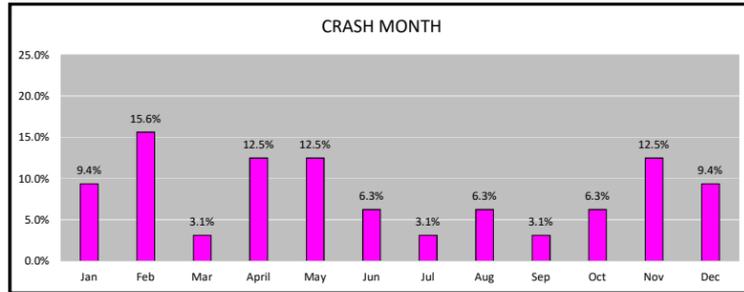
Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street between Old South St and Gothic St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Old South St and Gothic St														
70	1/6/2015	Tuesday	5:55 PM	Rear-end	Dark - lighted roadway	Snow	Snow	Unknown	47	58				V1 westbound on Main St, V2 turns from Center St onto Main St heading westbound and stops abruptly at the crosswalk right after making the turn. V1 hits V2 in the rear
71	1/7/2015	Wednesday	11:45 AM	Rear-end	Daylight	Clear	Wet	No improper driving	70	25				V1 westbound stopped for pedestrian crossing the street struck from behind by V2 (truck)
72	2/22/2015	Sunday	4:40 AM	Sideswipe, same direction	Dark - lighted roadway	Snow	Snow	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc	27	25				V2 eastbound on Main, V1 behind and right to V2. V2 signalled to turn right into angled parking when V1 eastbound struck V2 due to snowy conditions
73	4/8/2015	Wednesday	4:10 PM	Sideswipe, same direction	Daylight	Cloudy	Wet	Inattention	76	51				V2 inner lane, V1 outer lane on Main after turning right from Old South. V1 attempted to change lanes to be able to make a left turn on Center hit V2 eastbound
74	4/23/2015	Thursday	10:07 AM	Angle	Daylight	Clear	Dry	Inattention	48	39				V1 parked in parking spot facing 90 Main backed up into travel lane and began eastbound on Main just before attempting to turn left on Gothic when it collides with V2 eastbound on Main who was alongside V1 when V1 turned without checking
75	5/10/2015	Sunday	3:36 PM	Angle	Daylight	Clear	Dry	Inattention	71	17				V2 eastbound on Main St attempting to stop at traffic light of Main & Pleasant when V1 attempting to back out of parking spot hits V2
76	6/1/2015	Monday	5:26 PM	Angle	Daylight	Cloudy/Rain	Wet	Inattention	57	50				V1 stopped in eastbound traffic on Main St when V2 attempting to back out of parking spot hits V1
77	7/31/2015	Friday	2:44 PM	Angle	Daylight	Clear/Cloudy	Dry	Inattention	39	27				V1 backing out of parking spot on Main hits V2 travelling straight ahead eastbound on Main
78	9/30/2015	Wednesday	1:57 PM	Angle	Daylight	Cloudy	Dry	Made an improper turn	23	52				V1 backing from parking spot near 150 Main St when V2 westbound on Main turns left across eastbound lane to get to parking space and hits V1
79	11/6/2015	Friday	3:11 PM	Single vehicle crash	Daylight	Clear	Dry	Other improper action	75			41		V1 westbound on Main hits pedestrian southbound on marked crosswalk
80	12/23/2015	Wednesday	3:49 PM	Sideswipe, same direction	Daylight	Rain	Wet	Inattention	95	19				V1 westbound on Main attempting to merge to right lane sideswipes V2 on the right lane going westbound
81	2/27/2016	Saturday	2:59 PM	Rear-end	Daylight	Clear	Dry	Other improper action	21	18				V2 eastbound on Main stopped at crosswalk for pedestrian rear-ended by V1 who failed to stop
82	5/6/2016	Friday	11:34 AM	Sideswipe, same direction	Daylight	Clear	Dry	No improper driving	25	59				V1 westbound on right lane at Main St changing lanes to left lane fails to yield for V2 going straight on left lane
83	10/6/2016	Thursday	2:44 PM	Angle	Daylight	Clear	Dry	Distracted	56	59				V1 attempting to back out of packing spot did not see V2 going eastbound hit V2, V1 operator distracted by Uhaul truck nearby
84	11/29/2016	Tuesday	6:03 PM	Angle	Dark - lighted roadway	Rain	Wet	Unknown	67	37				V2 westbound stopped for pedestrian at crosswalk, V1 backed out of parking spot and hit V2
85	11/30/2016	Wednesday	5:37 PM	Angle	Dark - lighted roadway	Rain	Wet	Failed to yield right of way / Inattention	64	62				V1 making a southbound left onto Main St from Gothic St hits V2 (eastbound on Main approaching left turn lane to turn onto King St) when V2 spins to hit V3 westbound on Main between Gothic & King
86	12/17/2016	Saturday	10:39 AM	Rear-end	Daylight	Snow	Snow	Followed too closely	31	31				V2 eastbound stopped in traffic on Main St, V1 behind V2 could not brake due to slippery condition and rear ends V2
87	12/30/2016	Friday	11:20 AM	Angle	Daylight	Clear	Wet	Visibility obstructed	58	30				V1 backing up from parking spot on Main St strikes V2 eastbound stopped on traffic at Main
88	1/27/2017	Friday	9:43 AM	Single vehicle crash	Daylight	Cloudy	Dry	Other improper action	53			4		V1 westbound on Main St passes stopped vehicle at crosswalk and hits pedestrian southbound on crosswalk
89	2/2/2017	Thursday	7:42 AM	Rear-end	Daylight	Cloudy	Dry	Inattention	53	24				V1 eastbound stopped for pedestrian struck by V2 who was turning right from Old South St to Main St going eastbound, V2 operator was looking left and did not see V1 stopped
90	2/18/2017	Saturday	10:34 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road),(Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	22	unknown	unknown			V1 travelling westbound collided with V2 & V3 parked on parking spot

Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Old South St and Gothic St														
91	2/22/2017	Wednesday	10:00 AM	Angle	Daylight	Clear	Dry	Unknown	16	34				V1 eastbound on Main St on left land lane struck by V2 backing out of parking spot
92	3/31/2017	Friday	1:00 PM	Single vehicle crash	Daylight	Rain/Sleet, hail (freezing rain or drizzle)	Wet	Inattention	51			24		V1 eastbound on Main at Center hit pedestrian southbound at crosswalk
93	4/1/2017	Saturday	7:19 AM	Angle	Daylight	Sleet, hail (freezing rain or drizzle)	Slush	Inattention / Visibility obstructed	59	34				V2 southbound on Gothic stopped at Gothic & Main and proceeded straight across the travel lanes to park in front of 96 Main, V1 backing out of parking spot at an angle hit V2
94	4/8/2017	Saturday	3:26 PM	Rear-end	Daylight	Clear	Dry	Inattention	24	19				V1 eastbound on Main St rear-ends V2 who had stopped in traffic near Centre St due to red light
95	5/3/2017	Wednesday	10:03 AM	Rear-end	Daylight	Clear/Cloudy	Dry	No improper driving	30	67				V1 eastbound on Main St rear-ends V2 who had stopped for pedestrian at crosswalk
96	5/4/2017	Thursday	7:07 PM	Single vehicle crash	Daylight	Clear	Dry	Inattention	74			72		V1 westbound on Main St approaching crosswalk did not see pedestrian and left mirror of V1 hits pedestrian
97	6/22/2017	Thursday	8:42 AM	Angle	Daylight	Clear	Dry	Made an improper turn	55	25				V1 westbound on Main St in outer lane hit by V1 in inner lane when crossing in front of V1 while attempting to park
98	8/8/2017	Tuesday	10:29 AM	Angle	Daylight	Cloudy	Dry	Visibility obstructed	48	76				V1 backing out of parking spot to eastbound travel lane on Main when V2 eastbound on Main hit V1
99	8/29/2017	Tuesday	11:29 AM	Rear-end	Daylight	Clear	Dry	Unknown	43	75				V1 eastbound on Main when V2 hit V1 from behind trying to pass V2 on the right
100	10/12/2017	Thursday	4:50 PM	Angle	Daylight	Clear	Dry	Glare	18	70				V1 eastbound on Main hit by V2 backing up from parking space in front of 102 Main St
101	11/9/2017	Thursday	4:59 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	50					V1 turning left to Center St from Main St hits pedestrian on crosswalk

Main Street between Old South St and Gothic St

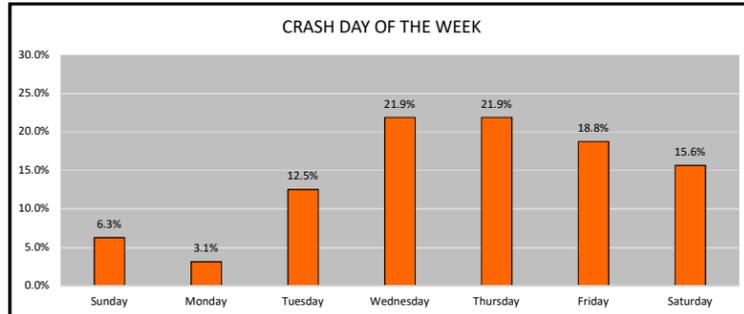
Crash month

Jan	3	9.4%
Feb	5	15.6%
Mar	1	3.1%
April	4	12.5%
May	4	12.5%
Jun	2	6.3%
Jul	1	3.1%
Aug	2	6.3%
Sep	1	3.1%
Oct	2	6.3%
Nov	4	12.5%
Dec	3	9.4%
		32



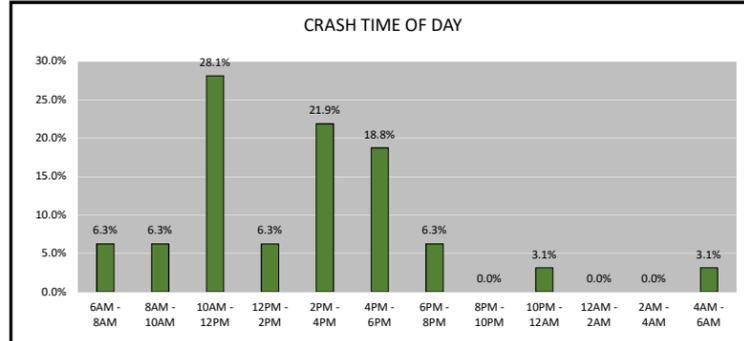
Crash day of the week

Sunday	2	6.3%
Monday	1	3.1%
Tuesday	4	12.5%
Wednesday	7	21.9%
Thursday	7	21.9%
Friday	6	18.8%
Saturday	5	15.6%
		32



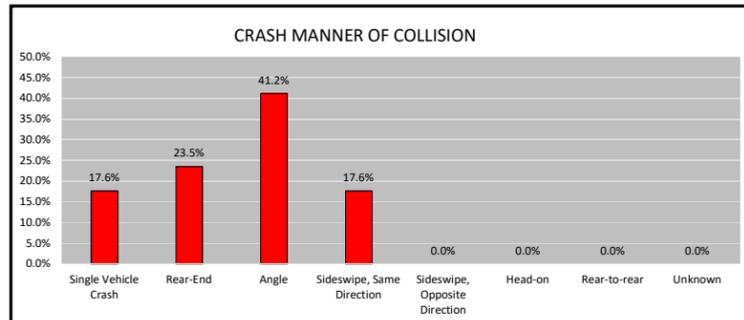
Crash time of day

6AM - 8AM	2	6.3%
8AM - 10AM	2	6.3%
10AM - 12PM	9	28.1%
12PM - 2PM	2	6.3%
2PM - 4PM	7	21.9%
4PM - 6PM	6	18.8%
6PM - 8PM	2	6.3%
8PM - 10PM	0	0.0%
10PM - 12AM	1	3.1%
12AM - 2AM	0	0.0%
2AM - 4AM	0	0.0%
4AM - 6AM	1	3.1%
		32



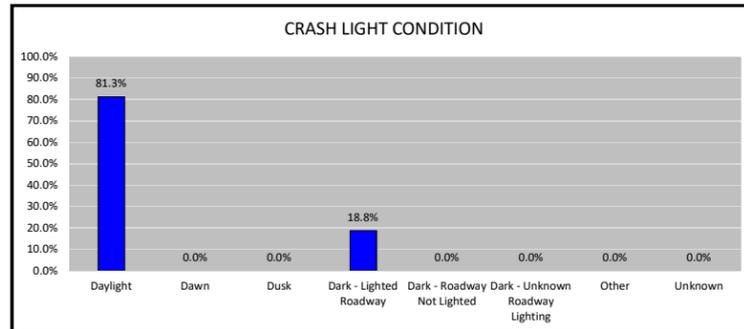
Crash manner of collision

Single Vehicle Crash	6	17.6%
Rear-End	8	23.5%
Angle	14	41.2%
Sideswipe, Same Direction	6	17.6%
Sideswipe, Opposite Direction	0	0.0%
Head-on	0	0.0%
Rear-to-rear	0	0.0%
Unknown	0	0.0%
		34



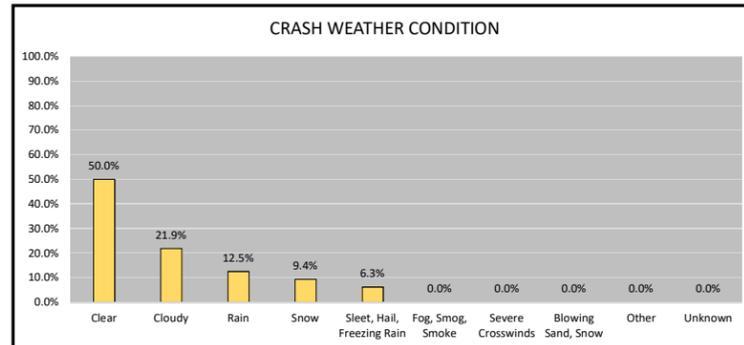
Crash light condition

Daylight	26	81.3%
Dawn	0	0.0%
Dusk	0	0.0%
Dark - Lighted Roadway	6	18.8%
Dark - Roadway Not Lighted	0	0.0%
Dark - Unknown Roadway	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
		32



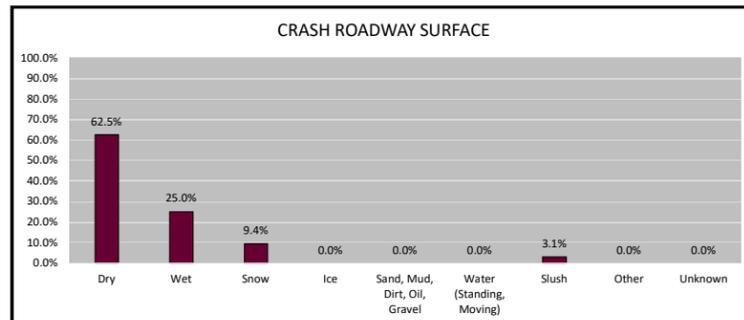
Crash weather condition

Clear	16	50.0%
Cloudy	7	21.9%
Rain	4	12.5%
Snow	3	9.4%
Sleet, Hail, Freezing Rain	2	6.3%
Fog, Smog, Smoke	0	0.0%
Severe Crosswinds	0	0.0%
Blowing Sand, Snow	0	0.0%
Other	0	0.0%
Unknown	0	0.0%
		32



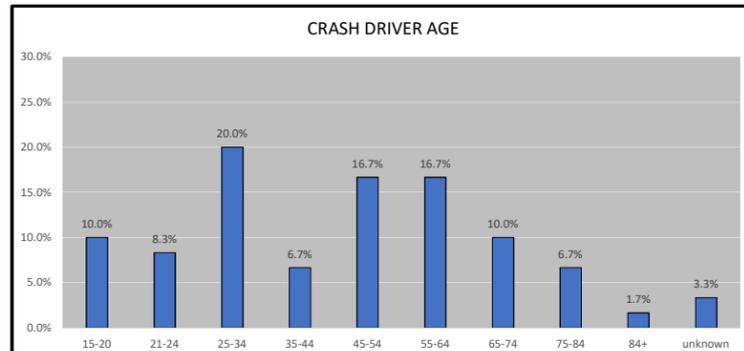
Crash roadway surface

Dry	20	62.5%
Wet	8	25.0%
Snow	3	9.4%
Ice	0	0.0%
Sand, Mud, Dirt, Oil, Gravel	0	0.0%
Water (Standing, Moving)	0	0.0%
Slush	1	3.1%
Other	0	0.0%
Unknown	0	0.0%
		32



Crash driver age

15-20	6	10.0%
21-24	5	8.3%
25-34	12	20.0%
35-44	4	6.7%
45-54	10	16.7%
55-64	10	16.7%
65-74	6	10.0%
75-84	4	6.7%
84+	1	1.7%
unknown	2	3.3%
		60



SYMBOLS

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

TYPE OF CRASH

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

SEVERITY

- Injury
- Fatal

NORTHAMPTON, MA

REGION: PVPC

MAIN ST (ROUTE 9) AT PLEASANT ST/KING ST

TIME PERIOD ANALYZED: 2015-2017

SOURCE OF CRASH REPORTS: NORTHAMPTON / STATE PD

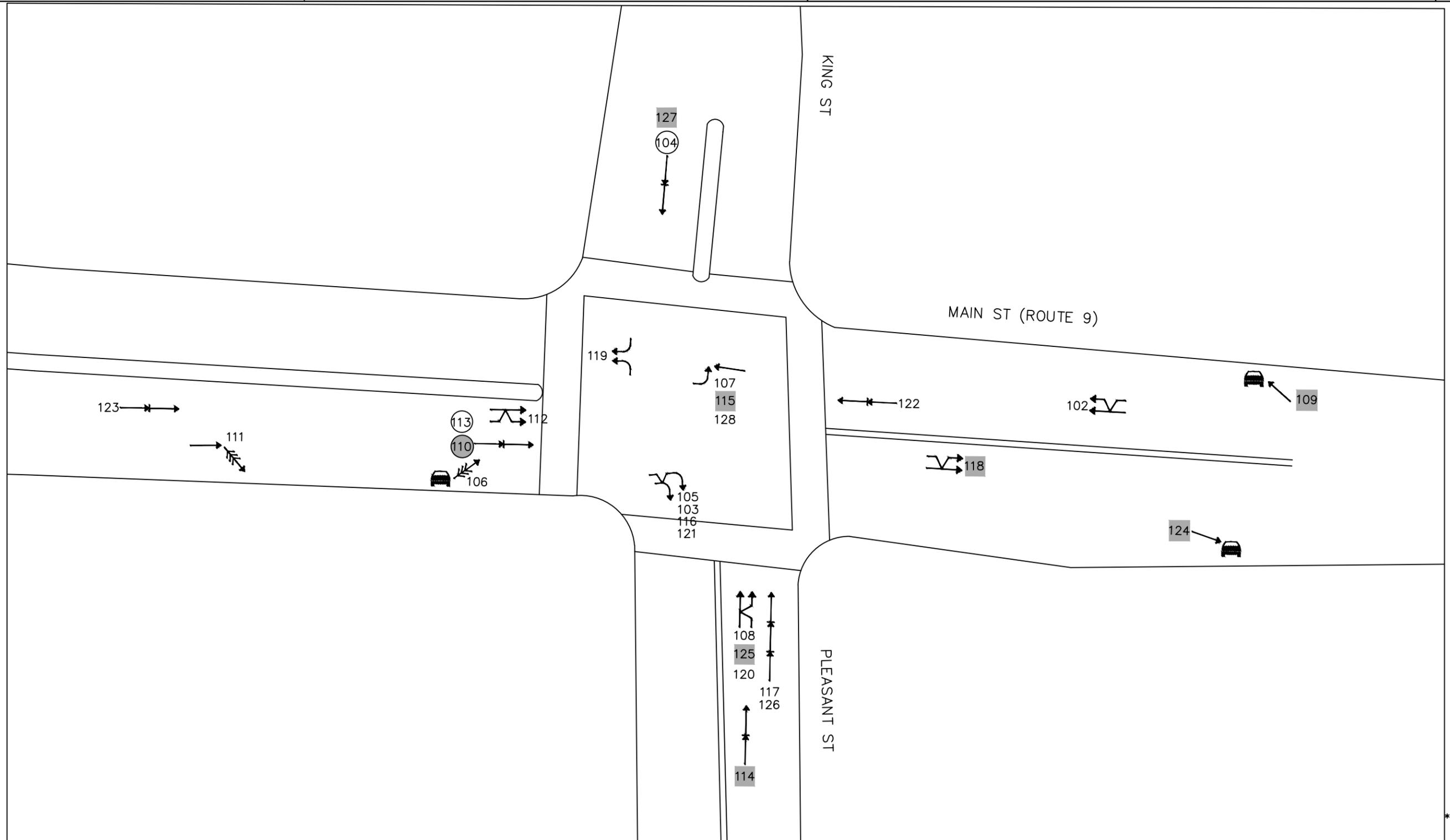
DATE PREPARED: 11/19/2019

PREPARED BY: TOOLE DESIGN

SHEET 4 OF 5



COLLISION DIAGRAM



*NOT TO SCALE

Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street at Pleasant St/King St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) at Pleasant St/King St														
102	2/20/2015	Friday	4:57 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failure to keep in proper lane or running off road	20	59				V1 merged into right lane on Main from parking space westbound and hit V2 westbound on Main St when merging into left lane
103	4/21/2015	Tuesday	5:37 PM	Sideswipe, same direction	Daylight	Clear	Dry	Inattention / Followed too closely	37	22				V1 & V2 eastbound at Main and Pleasant St when V1 (larger than V2) hit V2 while making a necessary wide right turn to go south on Pleasant
104	4/24/2015	Friday	4:52 PM	Rear-end	Daylight	Clear	Dry	No improper driving	54	23				V1 stopped in traffic rear-end by V2 (both southbound on King St)
105	5/26/2015	Tuesday	8:20 AM	Sideswipe, same direction	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings / Made an improper turn	31	73				V2 eastbound on Main St in right turn lane to turn to Pleasant when V1 in middle lane turned right getting hit by V2. V1 operator thought right lane was a parking lane.
106	6/11/2015	Thursday	12:22 PM	Single vehicle crash	Daylight	Clear	Dry	Other improper action	39	63				V1 attempting to parallel park into spot in front of 56 Main when it scraped the rear bumper of V2 parked
107	7/4/2015	Saturday	10:40 AM	Angle	Daylight	Cloudy	Dry	Failed to yield right of way	39	27				V2 westbound, V1 eastbound on Main St attempting to turn left to King St collide, V1 thought V2 was not proceeding
108	7/13/2015	Monday	3:59 PM	Sideswipe, same direction	Daylight	Clear	Dry	Failed to yield right of way	28	23				V2 northbound on Pleasant preparing to turn left sideswiped by V1 on through lane changing lanes to left lane
109	9/26/2015	Saturday	11:08 PM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	56					V2 westbound attempted to pull into parking spot and made contact with V2 already parked in a spot behind V1
110	12/10/2015	Thursday	9:26 PM	Rear-end	Dark - lighted roadway	Clear/Other	Dry	Other improper action	50	50				V1 stopped at Main/Pleasant intersection rear-ended by V2
111	2/15/2016	Monday	4:08 PM	Angle	Daylight	Snow/Blowing sand, snow	Snow	No improper driving	31	44				V1 backing out of parking space on Main hit V2 eastbound stopped at traffic
112	4/30/2016	Saturday	11:46 AM	Sideswipe, same direction	Daylight	Clear/Cloudy	Dry	Inattention	23	52				V2 eastbound in left turn lane on Main St to make a left turn on King, V1 on centre lane moves to left lane crashing to V2
113	5/3/2016	Tuesday	2:38 PM	Rear-end	Daylight	Cloudy	Dry	No improper driving	43	72				V1 stopped at red light eastbound on Main St at Pleasant St, V2 behind V1 rear-ended V1 stating that foot slipped off the brakes
114	5/13/2016	Friday	6:53 PM	Rear-end	Dawn	Rain	Wet	Inattention	20	26				V2 stopped at traffic on Pleasant approaching Main hit by V1 in rear. V1 thought V2 was moving forward as the light turned green
115	5/14/2016	Saturday	11:52 PM	Angle	Dark - lighted roadway	Rain/Cloudy	Wet	Failed to yield right of way	25	23				V2 westbound on Main when V1 eastbound turned left to go northbound on King and hit V2
116	5/5/2017	Friday	10:48 AM	Sideswipe, same direction	Daylight	Rain/Cloudy	Wet	Failed to yield right of way	67	33				V1 & V2 turning right to go southbound on Pleasant St collided, V1 was making a wide turn and was unaware that right lane of Main St was turn lane that was occupied by V2
117	5/26/2016	Thursday	10:34 AM	Rear-end	Daylight	Clear/Cloudy	Dry	Followed too closely	56	62				V1 northbound on Pleasant St behind V2 behind V3. V3 abruptly stopped at traffic light, V2 stopped but V1 did not and they all rear ended each other
118	7/15/2016	Friday	5:11 PM	Sideswipe, same direction	Dark - lighted roadway	Clear	Dry	Failure to keep in proper lane or running off road, Wrong side or wrong way	34	52				V1 eastbound on Main St attempted to pass V2 crossing the double yellow line, and hit V2 on the side upon re-entering the eastbound lane
119	8/11/2016	Thursday	4:09 PM	Sideswipe, same direction	Daylight	Clear	Dry	Unknown	21	42				V1 northbound on Pleasant turning left to Main, V2 southbound on King making a right to Main collide. Both operators claim to have green light
120	11/1/2016	Tuesday	2:01 PM	Sideswipe, same direction	Daylight	Clear/Cloudy	Dry	Failed to yield right of way / Made an improper turn	26	49				V2 was in left turn only lane on Pleasant St attempting to turn left onto Main St when V1 in main travel lane to proceed northbound to King. V1 operator tries to change lanes to go left and thought V2 was allowing it but V1 gets struck by V2.
121	11/17/2016	Thursday	11:05 AM	Angle	Daylight	Clear	Dry	Inattention / Failed to yield right of way, Visibility obstructed	55	40				V1 eastbound on Main St making a right turn onto Pleasant St hits V2 (truck) making the same maneuver. V2 needed to make a wide turn from through lane.
122	11/23/2016	Wednesday	9:10 AM	Rear-end	Daylight	Clear/Unknown	Dry	Followed too closely	53	24				V1 rear-ended by V2 (both westbound) at Main/Pleasant intersection
123	2/15/2017	Wednesday	12:01 PM	Rear-end	Daylight	Cloudy	Wet	Inattention / Other improper action	20	27				V2 eastbound on Main stopped at traffic approaching Pleasant St rear-ended by V1
124	3/15/2017	Wednesday	5:50 PM	Single vehicle crash	Dusk	Clear/Other	Wet	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc	60	unknown				V1 (eastbound) turning right to parking on parking spot hits V2 parked at 32 Main St
125	4/19/2017	Wednesday	8:19 PM	Sideswipe, same direction	Dark - lighted roadway	Rain	Wet	Inattention	41	22				V1 and V2 northbound on Pleasant St, V2 changing lanes hits V1
126	6/20/2017	Tuesday	8:36 AM	Rear-end	Daylight	Clear	Wet	No improper driving	42	53	31			V1, V2, V3 northbound on Pleasant St approaching Main St. V3 struck V2 which struck V1
127	8/10/2017	Thursday	11:17 PM	Rear-end	Dark - lighted roadway	Clear	Dry	Unknown	31	47				V1 rear-ends V2 while both heading southbound on King approaching Main
128	10/12/2017	Thursday	2:11 PM	Angle	Daylight	Clear	Dry	Unknown	28	66				V1 stopped westbound at Main/King hits V2 making a left turn from Main St to King St (on yellow turn arrow).

Main Street at King St/Pleasant St

Crash month

Jan	0	0.0%
Feb	3	11.1%
Mar	1	3.7%
April	4	14.8%
May	6	22.2%
Jun	2	7.4%
Jul	3	11.1%
Aug	2	7.4%
Sep	1	3.7%
Oct	1	3.7%
Nov	3	11.1%
Dec	1	3.7%

27

Crash day of the week

Sunday	0	0.0%
Monday	2	7.4%
Tuesday	5	18.5%
Wednesday	4	14.8%
Thursday	7	25.9%
Friday	5	18.5%
Saturday	4	14.8%

27

Crash time of day

6AM - 8AM	0	0.0%
8AM - 10AM	3	11.1%
10AM - 12PM	5	18.5%
12PM - 2PM	2	7.4%
2PM - 4PM	4	14.8%
4PM - 6PM	7	25.9%
6PM - 8PM	1	3.7%
8PM - 10PM	2	7.4%
10PM - 12AM	3	11.1%
12AM - 2AM	0	0.0%
2AM - 4AM	0	0.0%
4AM - 6AM	0	0.0%

27

Crash manner of collision

Single Vehicle Crash	3	11.1%
Rear-End	9	33.3%
Angle	5	18.52%
Sideswipe, Same Direction	10	37.0%
Sideswipe, Opposite Direc	0	0.0%
Head-on	0	0.0%
Rear-to-rear	0	0.0%
Unknown	0	0.0%

27

Crash light condition

Daylight	19	70.4%
Dawn	1	3.7%
Dusk	1	3.7%
Dark - Lighted Roadway	6	22.2%
Dark - Roadway Not Lighte	0	0.0%
Dark - Unknown Roadway	0	0.0%
Other	0	0.0%
Unknown	0	0.0%

27

Crash weather condition

Clear	16	59.3%
Cloudy	6	22.2%
Rain	4	14.8%
Snow	0	0.0%
Sleet, Hail, Freezing Rain	0	0.0%
Fog, Smog, Smoke	0	0.0%
Severe Crosswinds	0	0.0%
Blowing Sand, Snow	1	3.7%
Other	0	0.0%
Unknown	0	0.0%

27

Crash roadway surface

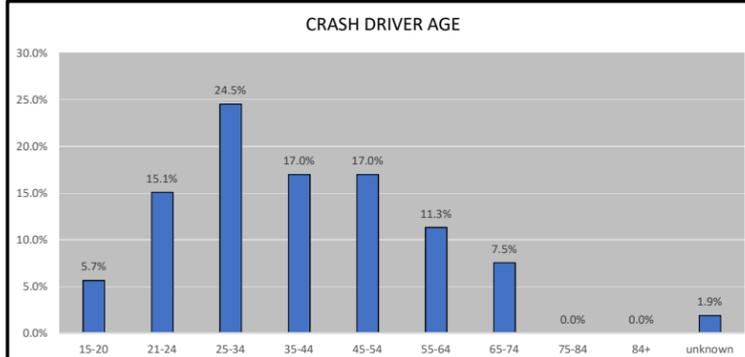
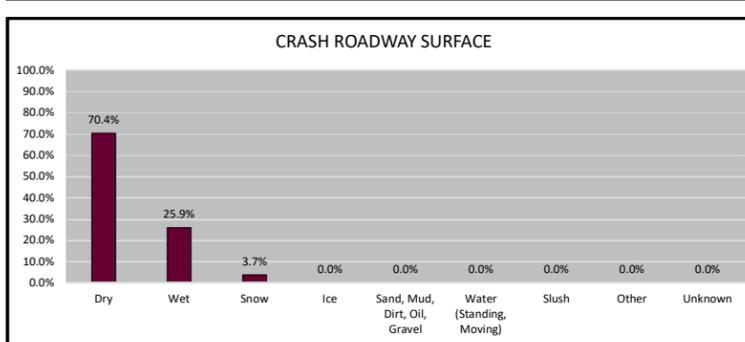
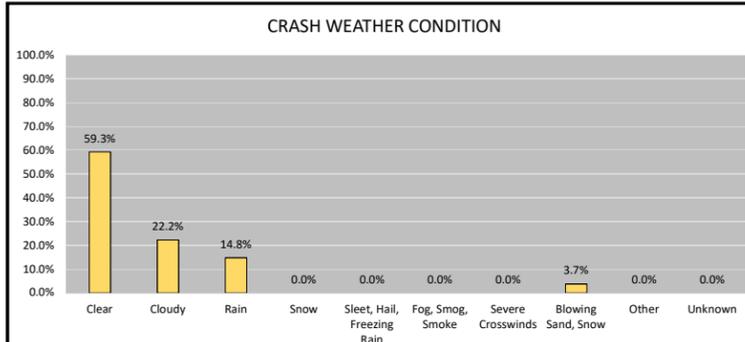
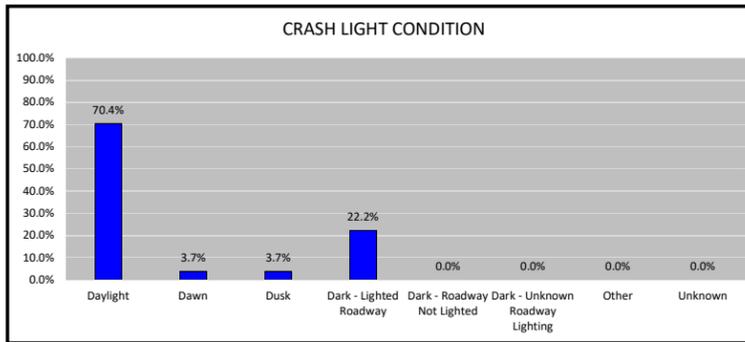
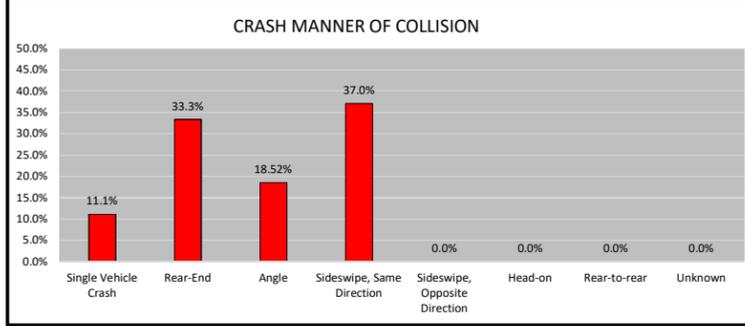
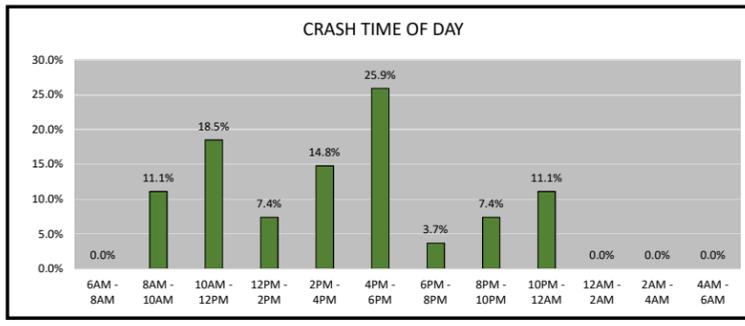
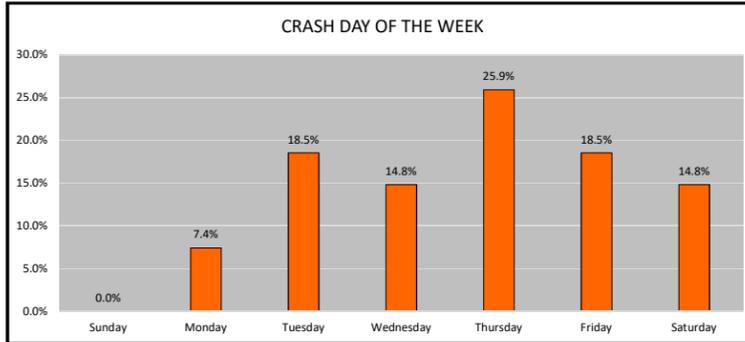
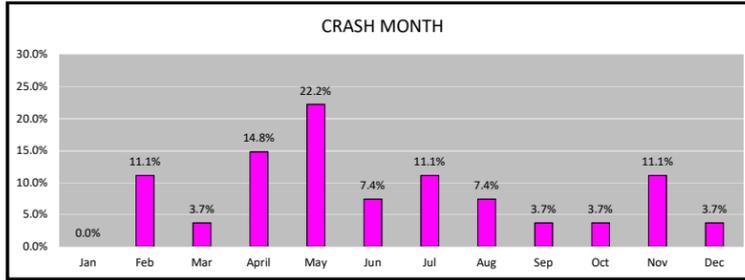
Dry	19	70.4%
Wet	7	25.9%
Snow	1	3.7%
Ice	0	0.0%
Sand, Mud, Dirt, Oil, Gravel	0	0.0%
Water (Standing, Moving)	0	0.0%
Slush	0	0.0%
Other	0	0.0%
Unknown	0	0.0%

27

Crash driver age

15-20	3	5.7%
21-24	8	15.1%
25-34	13	24.5%
35-44	9	17.0%
45-54	9	17.0%
55-64	6	11.3%
65-74	4	7.5%
75-84	0	0.0%
84+	0	0.0%
unknown	1	1.9%

53



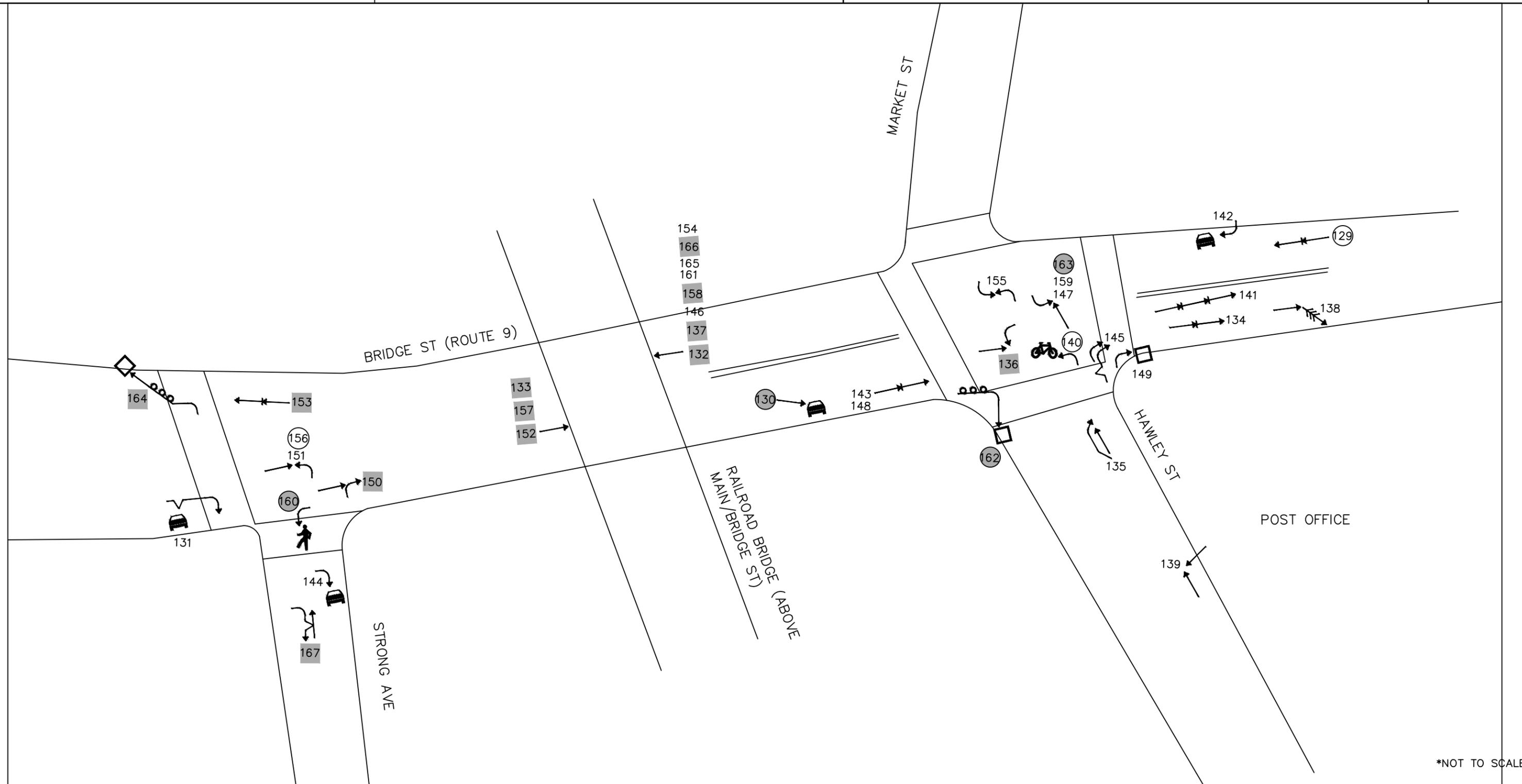
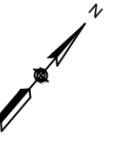
COLLISION DIAGRAM

SYMBOLS	TYPE OF CRASH	SEVERITY
Moving Vehicle	Head on	Injury
Backing Vehicle	Rear End	Fatal
Non-Involved Vehicle	Angle	
Pedestrian	Angle	
Bicycle	Sideswipe	
Animal	Out of Control	
Parked Vehicle	Night Time Crash	
Fixed Object		

NORTHAMPTON, MA

REGION: PVPC
 BRIDGE ST (ROUTE 9) BETWEEN STRONG AVE AND HAWLEY ST/MARKET ST

TIME PERIOD ANALYZED: 2015-2017
 SOURCE OF CRASH REPORTS: NORTHAMPTON / STATE PD
 DATE PREPARED: 11/19/2019
 PREPARED BY: TOOLE DESIGN
 SHEET 5 OF 5



*NOT TO SCALE

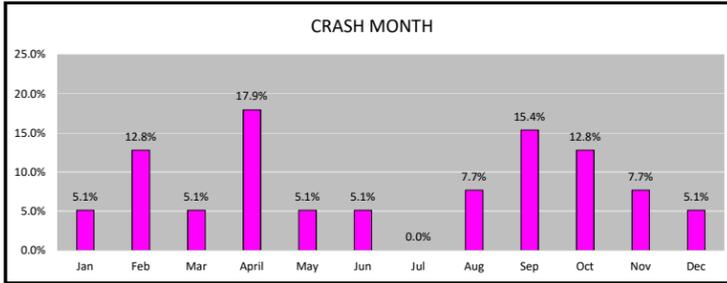
Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street between Strong Ave and Hawley St/Market St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Strong Ave and Hawley St/Market St														
129	2/11/2015	Wednesday	12:04 PM	Rear-end	Daylight	Clear/Cloudy	Dry	No improper driving	22	38				V1 behind V2 westbound on Bridge St, V2 stopped short for a vehicle that pulled out in front, out of Pop's Package Store parking lot. V1 rear-ended V2 when V2 stopped short.
130	2/18/2015	Wednesday	12:15 AM	Single vehicle crash	Dark - unknown roadway lighting	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	21	47				V1 eastbound on Bridge St hits rear of parked V2 on Bridge St
131	4/12/2015	Sunday	11:10 AM	Single vehicle crash	Daylight	Clear/Other	Dry	Inattention	31					V1 eastbound on Main St hit V2 parked when V1 was attempting to make a right turn towards Strong Ave
132	5/21/2015	Thursday	3:57 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	49					V1 (truck) westbound on Bridge St struck the railroad bridge - did not see low bridge sign
133	9/4/2015	Friday	1:15 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Disregarded traffic signs, signals, road markings, Inattention	60					V1 (truck) eastbound on Main St struck the railroad bridge - warning sign functional at time of crash
134	9/9/2015	Wednesday	2:36 PM	Rear-end	Daylight	Clear	Dry	Inattention	63	21				V2 eastbound rear-ended by V1. V2 had stopped for a vehicle turning left.
135	9/10/2015	Thursday	11:34 AM	Sideswipe, same direction	Daylight	Cloudy	Dry	Inattention	68	68				V1 and V2 northbound on Hawley St. V1 stopped at traffic, V2 behind V1 when V2 pulled from behind to make a right turn and hit V1
136	10/4/2015	Sunday	7:56 PM	Angle	Dark - lighted roadway	Clear/Unknown	Dry	Unknown	31	46				V1 turning left onto Hawley St from Bridge St hits V2 eastbound crossing Main and Hawley St. Operators indicated light turning yellow.
137	10/8/2015	Thursday	3:02 AM	Single vehicle crash	Dusk	Clear	Dry	Inattention	45					V1 (truck) westbound on Bridge St struck the railroad bridge
138	10/22/2015	Thursday	6:15 PM	angle	Daylight	Clear	Dry	Failed to yield right of way	44	21				V2 eastbound on Bridge St, V1 parked in legal parallel parking spot on Bridge. As V2 passed, V1 hit V2 as it attempted to pull out of parking spot.
139	11/23/2015	Monday	10:36 AM	Angle	Daylight	Clear	Dry	Inattention	67	65				V1 attempting to exit rear driveway at Post Office (37 Bridge) when V2 northbound on Hawley hits V1
140	11/23/2015	Monday	1:53 PM	Single vehicle crash	Daylight	Clear/Cloudy	Dry	No improper driving	65			55		V1 attempting to make a left turn to Main from Hawley when it collides with a cyclist eastbound through intersection. Cyclist went through red light.
141	1/18/2016	Monday	11:07 AM	Rear-end	Daylight	Clear/Unknown	Dry	No improper driving	65	65				V1, V2, V3 eastbound on Main St approaching Bridge St. V3 struck V2 which struck V1
142	2/11/2016	Thursday	12:00 PM	Single vehicle crash	Daylight	Cloudy	Dry	No improper driving	68					V2 getting to Bridge St from 20 Bridge St parking lot tried to go around V1 (parked) to go westbound but hit V1. V1 was illegally parked.
143	4/2/2016	Saturday	5:33 PM	Rear-end	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	18	28				V1 rear-ends V2 going eastbound on Main & Hawley St
144	4/4/2016	Monday	3:18 PM	Single vehicle crash	Daylight	Snow/Blowing sand, snow	Snow	No improper driving	32					V2 parked on Strong Ave, V1 eastbound on Main turning right to Strong hit V2 due to snow and ice
145	4/11/2016	Monday	2:25 PM	Sideswipe, same direction	Daylight	Cloudy	Dry	Made an improper turn	30	39				V1 northbound on Hawley approaching Bridge tried to turn next to a right turning V2 but ended up colliding with V2
146	9/23/2016	Friday	3:26 PM	Single vehicle crash	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	56					V1 (truck) travelling westbound hits railroad bridge above road. Operator stated it could not make right onto Market St.
147	9/24/2016	Saturday	10:02 AM	Angle	Daylight	Clear	Dry	Glare / Failed to yield right of way	37	69				V1 turning left from Market St to Bridge St, V2 travelling straight ahead northbound to Market St collided. V1 stated glare lead to not seeing V2
148	10/12/2016	Wednesday	4:01 PM	Rear-end	Daylight	Clear	Dry	Inattention	27	51				V1 rear-ends V2 going eastbound on Main & Hawley St. V2 had stopped to make a left turn onto Market St.
149	10/13/2016	Thursday	3:55 PM	Single vehicle crash	Daylight	Clear	Dry	Inattention	26					V1 (TT unit) making a right turn from Hawley St to Bridge St eastbound when rear of V1 went over the curb and it collides with traffic control signal on corner of Hawley and Bridge
150	11/14/2016	Monday	9:02 PM	Angle	Dark - lighted roadway	Clear/Other	Dry	Failed to yield right of way / Other improper action	32	29				V1 turning right from Strong Ave to Main hit V2 (police cruiser) eastbound on Main crossing intersection. V2 was responding to emergency, V1 failed to stop at stop sign
151	12/20/2016	Tuesday	12:39 PM	Angle	Daylight	Clear/Unknown	Dry	No improper driving	72	23				V1 making a northbound left turn from Strong Ave to Main St gets hit by V2 eastbound on Main St. Congested conditions.
152	12/24/2016	Saturday	2:00 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	44					V1 (truck) eastbound on Bridge struck the railroad bridge - failed to heed the low bridge sign
153	1/24/2017	Tuesday	6:50 PM	Rear-end	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	Slush	Inattention	20	43				V1 and V2 westbound, V1 rear-ends V2 who had stopped for pedestrian in crosswalk near Strong Ave
154	2/11/2017	Saturday	8:18 AM	Single vehicle crash	Daylight	Cloudy	Snow	Disregarded traffic signs, signals, road markings	31					V1 (truck) westbound on Bridge St struck the railroad bridge
155	2/13/2017	Monday	11:45 AM	Angle	Daylight	Clear	Wet	Inattention	23	74				V1 turning left from Hawley St, V2 turning left from Market St collide

Crash Data Summary Table (2015-2017)														
Town of Northampton: Main Street between Strong Ave and Hawley St/Market St														
Crash Diagram #	Crash Date	Crash Day	Time of Day	Manner of Collision	Light Condition	Weather Condition	Road Surface	Driver Contributing Code	Age					Comment
	m/d/y			Type	Type	Type	Type	Type	D1	D2	D3	P1	P2	
Main St (Route 9) between Strong Ave and Hawley St/Market St														
153	1/24/2017	Tuesday	6:50 PM	Rear-end	Dark - lighted roadway	Sleet, hail (freezing rain or drizzle)	Slush	Inattention	20	43				V1 and V2 westbound, V1 rear-ends V2 who had stopped for pedestrian in crosswalk near Strong Ave
154	2/11/2017	Saturday	8:18 AM	Single vehicle crash	Daylight	Cloudy	Snow	Disregarded traffic signs, signals, road markings	31					V1 (truck) westbound on Bridge St struck the railroad bridge
155	2/13/2017	Monday	11:45 AM	Angle	Daylight	Clear	Wet	Inattention	23	74				V1 turning left from Hawley St, V2 turning left from Market St collide
156	3/21/2017	Tuesday	12:34 PM	Angle	Daylight	Clear	Dry	Over-correcting/over-steering	30	72				V1 attempting to make a left turn onto Main St from Strong Ave struck by V2 eastbound on Main St. V1 operator stated not seeing V2
157	3/24/2017	Friday	12:55 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	38					V1 (truck) eastbound on Bridge St struck the railroad bridge
158	4/8/2017	Saturday	9:12 PM	Single vehicle crash	Dusk	Clear	Dry	Disregarded traffic signs, signals, road markings	59					V1 (truck) westbound on Bridge St struck the railroad bridge - did not see low bridge sign
159	4/18/2017	Tuesday	8:05 AM	Angle	Daylight	Clear	Dry	Inattention	61	72				V1 southbound turning left from Market St to Bridge St, V2 travelling straight ahead northbound to Hawley St collide
160	4/30/2017	Sunday	12:13 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Inattention	34					V1 turning left on Main to go southbound on Strong Ave hits pedestrian on crosswalk
161	5/4/2017	Thursday	5:35 PM	Single vehicle crash	Daylight	Clear	Dry	Inattention, Disregarded traffic signs, signals, road markings	42					V1 (truck) westbound on Bridge St struck the railroad bridge
162	6/1/2017	Thursday	1:21 AM	Single vehicle crash	Dark - lighted roadway	Clear	Dry	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	32					V1 eastbound on Bridge St making a right turn to Hawley St when operator loses control of vehicle and strikes a telephone pole
163	6/3/2017	Saturday	9:11 PM	Angle	Dark - lighted roadway	Clear	Dry	Failed to yield right of way	44	35				V1 turning left from Market St to Bridge St, V2 travelling straight ahead northbound to Market St collided
164	8/19/2017	Saturday	1:59 AM	Single vehicle crash	Dark - lighted roadway	Cloudy	Wet	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner	31					V1 turning left onto Main St from Strong Ave, V1 operator accelerates too quickly causing tires to spin and loses control on the westbound lane and hits curb and light pole
165	8/24/2017	Thursday	4:38 PM	Single vehicle crash	Daylight	Clear	Dry	Disregarded traffic signs, signals, road markings	43					V1 (truck) westbound on Bridge St struck the railroad bridge. GPS directed this way and operator failed to see the signs at I-91.
166	8/28/2017	Monday	7:37 PM	Single vehicle crash	Dusk	Clear	Dry	Disregarded traffic signs, signals, road markings	44					V1 (truck) westbound on Bridge St struck the railroad bridge
167	9/30/2017	Saturday	7:58 PM	Sideswipe, opposite direction	Dark - lighted roadway	Clear	Dry	Made an improper turn	36	36				V2 makes a right going southbound on Strong Ave and hits V1 northbound on Strong Ave stopped in traffic.

Main Street between Strong Ave and Hawley St/Market St

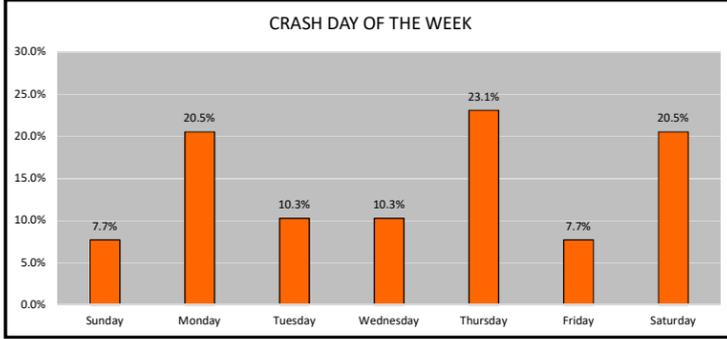
Crash month

Jan	2	5.1%
Feb	5	12.8%
Mar	2	5.1%
April	7	17.9%
May	2	5.1%
Jun	2	5.1%
Jul	0	0.0%
Aug	3	7.7%
Sep	6	15.4%
Oct	5	12.8%
Nov	3	7.7%
Dec	2	5.1%
39		



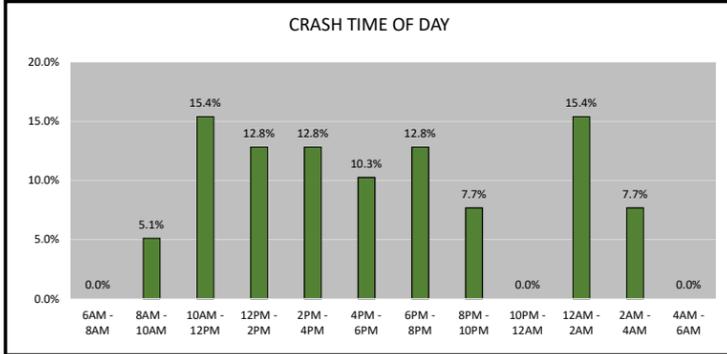
Crash day of the week

Sunday	3	7.7%
Monday	8	20.5%
Tuesday	4	10.3%
Wednesday	4	10.3%
Thursday	9	23.1%
Friday	3	7.7%
Saturday	8	20.5%
39		



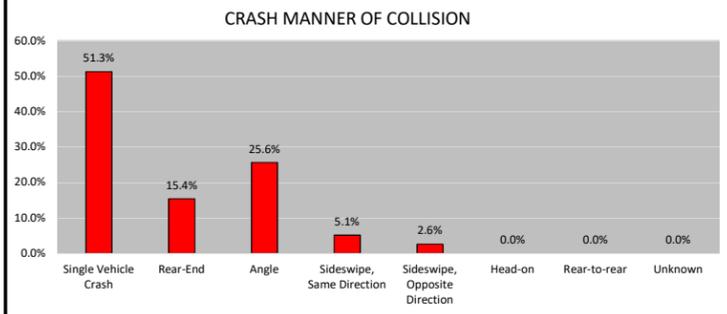
Crash time of day

6AM - 8AM	0	0.0%
8AM - 10AM	2	5.1%
10AM - 12PM	6	15.4%
12PM - 2PM	5	12.8%
2PM - 4PM	5	12.8%
4PM - 6PM	4	10.3%
6PM - 8PM	5	12.8%
8PM - 10PM	3	7.7%
10PM - 12AM	0	0.0%
12AM - 2AM	6	15.4%
2AM - 4AM	3	7.7%
4AM - 6AM	0	0.0%
39		



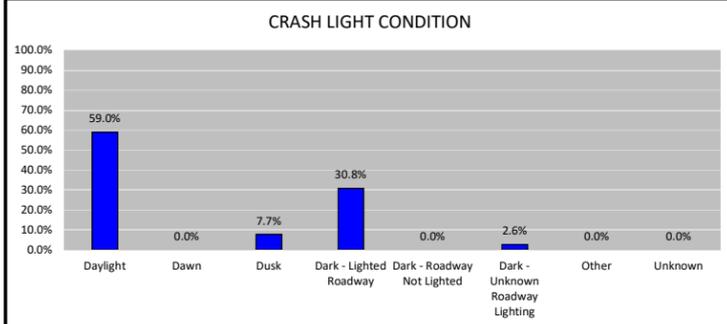
Crash manner of collision

Single Vehicle Crash	20	51.3%
Rear-End	6	15.4%
Angle	10	25.6%
Sideswipe, Same Direction	2	5.1%
Sideswipe, Opposite Direction	1	2.6%
Head-on	0	0.0%
Rear-to-rear	0	0.0%
Unknown	0	0.0%
39		



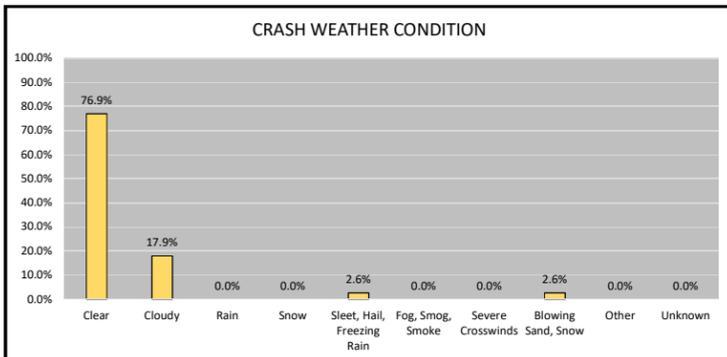
Crash light condition

Daylight	23	59.0%
Dawn	0	0.0%
Dusk	3	7.7%
Dark - Lighted Roadway	12	30.8%
Dark - Roadway Not Lighted	0	0.0%
Dark - Unknown Roadway Lighting	1	2.6%
Other	0	0.0%
Unknown	0	0.0%
39		



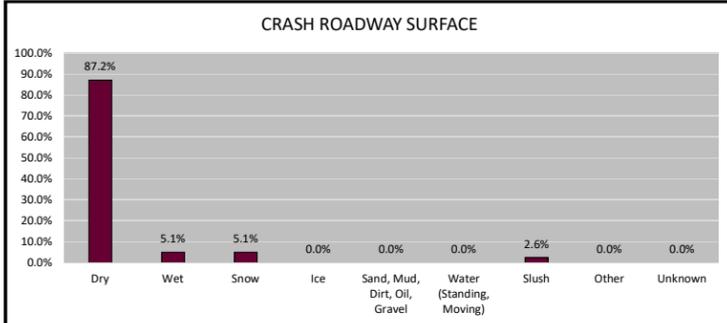
Crash weather condition

Clear	30	76.9%
Cloudy	7	17.9%
Rain	0	0.0%
Snow	0	0.0%
Sleet, Hail, Freezing Rain	1	2.6%
Fog, Smog, Smoke	0	0.0%
Severe Crosswinds	0	0.0%
Blowing Sand, Snow	1	2.6%
Other	0	0.0%
Unknown	0	0.0%
39		



Crash roadway surface

Dry	34	87.2%
Wet	2	5.1%
Snow	2	5.1%
Ice	0	0.0%
Sand, Mud, Dirt, Oil, Gravel	0	0.0%
Water (Standing, Moving)	0	0.0%
Slush	1	2.6%
Other	0	0.0%
Unknown	0	0.0%
39		



Crash driver age

15-20	2	3.4%
21-24	6	10.2%
25-34	14	23.7%
35-44	14	23.7%
45-54	5	8.5%
55-64	5	8.5%
65-74	13	22.0%
75-84	0	0.0%
84+	0	0.0%
unknown	0	0.0%
59		

