

# ROAD SAFETY AUDIT

Crafts Street / North Street at Albemarle Road

City of Newton

September 2022

Prepared For:  
MassDOT



Prepared By:  
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## Background

The Federal Highway Administration (FHWA) defines a Road Safety Audit (RSA) as the formal safety examination of an existing or future road or intersection by an independent, multidisciplinary team. The purpose of an RSA is to identify potential safety issues and possible opportunities for safety improvements, considering all roadway users. This RSA evaluates the Crafts Street / North Street at Albemarle Road intersections in Newton, Massachusetts, as shown in **Figure 1**.

At the time of this audit, Massachusetts Department of Transportation (MassDOT) selected Howard Stein Hudson (HSH) to provide engineering services for the Horace Mann Elementary School Improvement Safe Routes to School (SRTS) Project (MassDOT Project #611997). The elementary school is located at 225 Nevada Street in Newtonville, Massachusetts, however, the study area is located at the intersections of Crafts Street at Albemarle Road East & Albemarle Road West, North Street at Albemarle Road East & Albemarle Road West, and Crafts Street at North Street. Albemarle Road is comprised of two parallel roadways, separated by the Cheese Cake Brook for its entire length; therefore, throughout this report, Albemarle Road is identified as Albemarle Road East & Albemarle Road West to individually reference the portions on the east and west side of the brook.

MassDOT has identified the intersection of Crafts Street at Albemarle Road as a Highway Safety Improvement Program (HSIP) high crash cluster. A HSIP-eligible cluster is one where the total number of equivalent property-damage-only crashes is within the top 5% within the regional planning agency (RPA). HSIP clusters were identified for the intersection of Crafts Street at Albemarle Road West from 2017-2019. Due to the proximity of North Street at Albemarle Road East & Albemarle Road West and Crafts Street at North Street, the intersections are included in the study area.

The RSA is intended to identify potential short-, mid-, and long-term safety improvements that can be evaluated for inclusion as part of future design efforts for potential reconstruction.

## Project Data

The RSA was conducted in-person on Wednesday, June 15, 2022, from 10:00 a.m. to 3:00 p.m. The agenda for the RSA meeting held at the City of Newton Town Hall is provided in **Appendix A. Table 1** shows the participating members of the audit team, which included multidisciplinary representatives from state, regional, and local agencies. Contact information for the RSA team members is provided in **Appendix B**.

Crash data was compiled for the entire study area for the time period from 2017-2019. Crash data for the time period from 2017-2019 was obtained from local police crash reports provided by MassDOT Traffic and Safety Engineering section.

A breakdown of the collected crash data from 2017-2019 is as follows:

**Crafts Street at Albemarle Road East & Albemarle Road West (Unsignalized)**

44 crashes were reported, including 12 crashes (27%) that resulted in personal injury. Of the 44 crashes, 35 (79.5%) were angle crashes, one (2%) was a collision with a pedestrian, seven (15.9%) were rear-end crashes, one (2.3%) was a same direction sideswipe, and one (2.3%) was a single-vehicle crash with a bicyclist. The angled collisions were most frequently attributed to vehicles turning left in or out of Albemarle Road East & Albemarle Road West and colliding with a vehicle along Crafts Street. The rear-end crashes which occurred along Crafts Street at Albemarle Road East & Albemarle Road West were commonly attributed to vehicles following too close and failing to stop in traffic. 35 crashes (80%) occurred during clear conditions, 36 crashes (82%) occurred during daylight, and 38 crashes (86%) occurred on a dry roadway surface. Crashes were also more prevalent between 8:00 a.m. and 8:00 p.m. and the peak period was 4:00 p.m. to 6:00 p.m. with 11 crashes (25%).

**North Street at Albemarle Road East & Albemarle Road West (Unsignalized)**

Four crashes were reported, none of which reported personal injuries. Of the four crashes, two (50%) were angle crashes, one (25%) was a rear-end crash, and one (25%) was a single-vehicle crash. The angled collisions were attributed to exiting Albemarle Road East & Albemarle Road West and colliding with a vehicle along North Street. All crashes occurred during clear conditions, two crashes (50%) occurred during daylight, and three crashes (75%) occurred on a dry roadway surface. Crashes were also more prevalent between 10:00 a.m. and 10:00 p.m. with two of the crashes occurring from 4:00 p.m. to 6:00 p.m.

**Crafts Street at North Street (Signalized)**

10 crashes were reported; including eight crashes (80%) that resulted in personal injury. Of the 10 crashes, one (10%) was an angle crash, five (50%) were rear-end crashes, two (20%) were same direction sideswipes, and two (20%) were single-vehicle crashes. The rear-end collisions were most frequently attributed to vehicles following too closely and failed to stop in traffic. Eight crashes (80%) occurred during clear conditions, seven crashes (70%) occurred during daylight, and six crashes (60%) occurred on a dry roadway surface. Crashes were also more prevalent between 8:00 a.m. and 8:00 p.m. where the peak period was 4:00 p.m. to 6:00 p.m. with 2 crashes (20%).

Detailed crash diagrams and trend charts are provided in **Appendix C**.

Table 1: Participating Audit Team Members

<b>Audit Team Member</b>	<b>Agency/Affiliation</b>
Nicole Freedman	Newton City Planner
David Koses	Newton Department of Public Works (DPW)
Isaac Prizant	Newton Department of Public Works (DPW)
Jason Sobel	Newton Department of Public Works (DPW)
Adrian Ayala	Newton Department of Public Works (DPW)
Mike Wade	Newton Police Department
Jay Bourgeoise	Newton Fire Department
Cedar Pruitt	Friends of Albemarle, Day School PTO
Robert Solomon	Bike Newton
Jenn Martin	Newton Safety Routes to School
Michael Halle	Newton Transportation Advisory Group (TAG)
John Pelletier	Newton Safety Routes to School / Transportation Advisory Group (TAG)
Stephanie Upson	MassDOT Project Manager
Jesus Bastardo	MassDOT District 6
Michele Deng	MassDOT Traffic & Safety
Mia Gerbino	MassDOT Traffic & Safety
Jacqueline White	MassDOT Traffic & Safety
Kevin Fitzgerald	MassDOT Traffic & Safety
Teren Wong	Howard Stein Hudson
Jared Hite	Howard Stein Hudson

## Project Location and Description

The audit site is located at the unsignalized intersections of Crafts Street at Albemarle Road and North Street at Albemarle Road, and the signalized intersection of Crafts Street at North Street. The audit area abuts a residential neighborhood to the north and schools/recreation complex to the south.

### ***Study Area Roadways/Intersections***

#### **Albemarle Road East & Albemarle Road West**

Albemarle Road runs in a north-south direction between Eddy Street to the south and the Charles River to the north, where it connects to the Charles River Greenway and is under local jurisdiction South of North Street. Albemarle Road provides one 20 to 35-foot travel lane in each direction, and is classified as an urban collector; Albemarle Road provides two-way travel on each side of Cheese Cake Brook north of North Street, where it is classified as a local roadway. Albemarle Road East & Albemarle West has a posted safety zone speed regulation of 20 mph just south of Crafts Street in each direction. It should be noted where no speed is posted, the City of Newton has adopted a statutory default speed limit of 25 mph (made effective March 2017). Albemarle Road east provides a sidewalk on the east side of the

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northbound roadway and Albemarle Road West provides a sidewalk on the west side of the southbound roadway, except for south of Crafts Street where a sidewalk is not provided on either side of the Albemarle Road west southbound roadway. South of Crafts Street, angled parking is provided in the northbound direction on Albemarle Road East with regulatory signage posted saying “No Parking 10:30PM to 7AM”. Along the southbound direction of Albemarle Road west south of Crafts Street, wide shoulders are provided which can accommodate parked vehicles and parking is unregulated. Along Albemarle Road East north of Crafts Street on-street parking is permitted. Albemarle Road provides mainly residential, recreational, and institutional land uses, including the Russell J. Halloran Sports and Recreation Complex and Pallotta Athletic Center.

The City of Newton closed access to Albemarle Road east from Crafts Street in September 2020 to improve traffic flow and eliminate cut through traffic to North Street. The City of Newton is also looking to provide traffic calming measures and improved bike accommodations along Albemarle Road and Brookside Avenue from the Charles River to Washington Street. This will be a short-term project that proposed paint, flex posts and temporary rubber speed cushions to calm traffic.

### **Crafts Street**

Crafts Street runs in an east-west direction between Washington Street to the east and Waltham Street to the west and is classified as an urban minor arterial under local jurisdiction. Crafts Street generally provides one-lane in each direction with on-street parking provided on each side of the roadway. The Crafts Street eastbound and westbound approaches to the Albemarle Road East and Albemarle Road West intersections provide a 15-foot shared-use lane, a 10-foot striped median and an 11 to 12-foot receiving lane, with four-foot bike lane on the eastbound receiving lane and a four and a half-foot shoulder on the westbound receiving lane. Along Crafts Street between the two Albemarle Road directions, a 10-foot westbound left-turn lane is provided instead of the striped median. The posted speed limit along Crafts Street is 30 mph. Bicycle lanes are provided in each direction along Crafts Street with bicycle crossings on Albemarle Road. Sidewalks are provided on each side of Crafts Street. No parking is provided within the study area limits along Crafts Street. Crafts Street provides mainly residential and recreational land uses, and some commercial and institutional land uses to the east of the project limits.

The Massachusetts Bay Transit Authority (MBTA) provides service along Crafts Street via bus route 556 (Waltham Highlands). No other transit service is provided along the corridor.

### **North Street**

North Street runs in a northwest-southeast direction between Crafts Street to the south and Farwell Street to the north and is classified as an urban minor arterial under local jurisdiction. North Street generally provides one-lane in each direction measuring 11-12 feet with 5-5.5-foot shoulders on each side of the roadway. The posted speed limit along North Street is 30 mph. Sidewalks are provided on each side of North Street. No parking is provided within the project limits along North Street. North Street serves mainly residential land uses.

## **Intersections**

A description of the unsignalized and signalized intersections within the study is provided below.

### **Crafts Street at Albemarle Road East & Albemarle Road West**

Crafts Street at Albemarle Road is an unsignalized intersection. The two directions of Albemarle Road are separated by approximately 50 feet by the Cheese Cake Brook and the intersection is formed by two four-legged intersections. The intersection has been reconstructed in 2020 to provide new sidewalks, pedestrian curb ramps and roadway resurfacing with new pavement markings. Crafts Street eastbound and westbound approaches each provide a 15-foot shared thru/right-turn lane. Between the two directions of Albemarle Road a 10-foot exclusive left-turn lane and an 11-foot exclusive thru lane are provided. The Albemarle Road East northbound approach provides a 34-foot shared left-turn /right-turn lane; however, access to Albemarle Road East from Crafts has recently been restricted to improve traffic flow and eliminate cut through traffic to North Street. The Albemarle Road West southbound approach provides an 18-foot shared left/thru/right-turn lane with a 30-foot receiving lane continuing the one-way travel southbound. Crosswalks are provided on each approach to the intersection measuring 9-10.5 feet in width and provide Americans with Disabilities (ADA)-complaint pedestrian curb ramps. While the crosswalks are unsignalized they do provide pedestrian warning signage for approaching vehicles. The MBTA provides a bus stop location traveling outbound for the bus route 556 (Waltham Highlands) within the project limits at the Crafts Street at Albemarle Road intersection. The bus stop (ID #81685) is located nearside to the intersection on the westbound approach. The MBTA provides bus stop signage for the bus route 556 (Waltham Highlands) on the Crafts Street eastbound approach but does not currently stop at this location traveling inbound.

### **North Street at Albemarle Road East & Albemarle Road West**

North Street at Albemarle Road East and North Street at Albemarle Road West are two unsignalized, four-legged intersections. Albemarle Road provides one lane in each direction to the south of North Street separated by Cheese Cake Brook. North of North Street, Albemarle Road provides two roadways with two-way travel separated by Cheese Cake Brook. The intersections have recently been reconstructed to provide new sidewalks, pedestrian curb ramps and roadway resurfacing with new pavement markings.

The intersection of North Street at Albemarle Road West provides three approaches. The North Street eastbound approach provides a 12-foot shared left-turn/thru/right-turn lane and the North Street westbound approach provides an 11-foot shared left-turn/thru/right-turn lane. The Albemarle Road West southbound approach provides an 18.5-foot shared left-turn/thru/right lane with a 19-foot receiving lane to continue southbound. A crosswalk is provided on the North Street eastbound approach to the intersection measuring 8-feet in width with pedestrian curb ramps that appear to be ADA-complaint. Crosswalks are not provided at the Albemarle Road West legs of the intersection. The crosswalks are unsignalized and provide pedestrian warning signage for approaching vehicles.

The intersection of North Street at Albemarle Road East provides four approaches. North Street eastbound approach provides an 11-foot shared left-turn/thru lane and the North Street westbound approach provides an 11-foot shared thru/right-turn lane. The Albemarle Road East northbound approach provides a 22-foot shared left-turn/thru/right-turn lane. The Albemarle Road East southbound approach provides a 10.5-foot shared left-turn/thru/right-turn lane. A crosswalk is provided on the North Street westbound approach to the intersection measuring 8-feet in width with pedestrian curb ramps that appear to be ADA-complaint. Crosswalks are not provided across the Albemarle Road East legs of the



intersection. While the crosswalks are unsignalized they do provide pedestrian warning signage for approaching vehicles.

### **Crafts Street at North Street**

Crafts Street at North Street is a three-legged, signalized intersection. The following description of the intersection's lane configuration was observed prior to the pavement milling and overlay operations that occurred during the RSA which removed all existing pavement markings. Once the mill and overlay are complete, a five-foot bike lane will be provided on Crafts Street eastbound to the east of North Street, and sharrows will be provided for westbound travel on Crafts Street to the east of North Street. The Crafts Street eastbound approach provides an approximately 12-foot left-turn lane and 12-foot thru lane and the Crafts Street westbound approach provides an approximately 11-foot thru lane and 26-foot right-turn lane (at its widest point). The North Street southbound approach provides one approximately 15-foot shared left-turn/right-turn lane (at its widest point). Crosswalks are provided on each of the approaches to the intersection and provide pedestrian signalization. The Crafts Street eastbound crosswalk is approximately 15-feet in width, the Crafts Street westbound approach is approximately 12-feet in width, and the North Street southbound approach is approximately 8-feet in width. The pedestrian crossings provide curb ramps for each crossing that appear to be ADA-compliant. The existing signal equipment at the intersection are post mounted without backplates and appear to be in poor condition. The MBTA provides bus stop signage for the bus route 556 (Waltham Highlands) within the intersection but does not currently stop at this location traveling inbound.

A study area map is shown in Figure 1.

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Figure 1: Locus Map

## Audit Observations and Potential Safety Enhancements

The following sections will identify safety issues and RSA participant observations along the corridor and at specific study area intersections. Each safety issue will identify the type of collision that could have resulted from the safety issue. Finally, each safety issue will identify potential enhancements and safety improvements developed by the RSA team. The following section summarizes the issues and potential solutions, and assigns a safety payoff, timeframe, and jurisdiction.

### ***Safety Issue #1: Speed Limit/Zoning***

#### **Issues**

##### **Crafts Street**

The City of Newton established 20 MPH safety school zones on Albemarle Road-northbound and southbound between Watertown Street and Crafts Street, and along Watertown Street. However, the segment of Crafts Street located adjacent to the Fessenden School, F.A. Day Middle School, and the Sports and Recreation Complex has not been identified as a safety school zone area. Crafts Street has a posted speed limit of 30 MPH. A member of the audit team raised concerns about drivers being unaware that this area has a large presence of school children.

A large presence of school bus traffic was observed during the audit, exiting the Albemarle Road east northbound approach from the school bus loading/unloading area in front of the Harry Gath memorial pool. A member of the audit team mentioned a new pre-school is slated to open January 2023 at the old Horace Mann Elementary building located at the intersection of Watertown Street and Albemarle Road east, likely increasing the number of school children in the area.

Although pedestrian crossing warning signs are provided at all crosswalks, an audit team member observed that drivers fail to yield to pedestrians as they travel along Crafts Street in both eastbound and westbound directions.

#### **Potential Enhancements:**

1. Consider establishing a school zone along Crafts Street and provide school zone flashers.
2. Consider establishing a 20 mph Safety Zone along Crafts Street from Waltham to Washington St. (abutting Fessenden School, Albemarle Fields, Avery Woods, triangle park, Ed Center).

## **Safety Issue #2: Intersection Geometry and Conflict Points**

### **Issues**

Based on the crash data provided, the intersection of Crafts Street at Albemarle Road East and Albemarle Road West experienced a total of 44 crashes, 20 (73%) were angled crashes which were noted to generally occur between vehicles traveling along Crafts Street and vehicles exiting the Albemarle Road East northbound and Albemarle Road West southbound approaches.

Permanently closing access to Albemarle Road northbound via Crafts Street will require coordination with the property owner at 409 Crafts Street. The property provides two access driveways; one on Crafts Street and the other on Albemarle Road northbound. If the 409 Crafts Street driveway on Albemarle Road northbound is removed, there is potential to redevelop the section of Albemarle Rd NB between Crafts Street and North Street and provide a better connection for cyclists and pedestrians.



**Pictured: Crafts Street at Albemarle Rd East northbound road closure.**

### **Crafts Street at Albemarle Road East**

Twenty angled crashes (crash summary #5, #4, #7, #8, #10, #11, #13, #16, #17, #18, #19, #21, #22, #25, #26, #27, #29, #34, #38, and #41) were reported, three of which (crash summary #11, #21, and #38) were noted to be crashes involving injury. The City of Newton closed access to Albemarle Road northbound, in September 2020 to improve traffic flow, manage conflict points, and eliminate cut-through traffic to North Street. This closure forces vehicles to make a left turn at the signalized intersection with Crafts Street at North Street. The crash data recorded reflects the crashes prior to the roadway closure.

The vehicles exiting the Albemarle Road East approach are observed to yield to the traffic present on Crafts Street. Due to lack of gaps on Crafts Street, Albemarle Road driver impatience was observed as vehicles slowly move into the intersection forcing oncoming vehicles to slow down to let the vehicles turn onto Crafts Street. Crash summary #15 reported a vehicle slowed down for a vehicle entering the intersection from Albemarle Road East and then was rear-ended.

### **Crafts Street at Albemarle Road West**

The Crafts Street intersection with the Albemarle Road West southbound movement reported 11 of the 44 crashes (crash summary #2, #9, #12, #20, #23, #30, #31, #32, #33, #40, and #43) were angled crashes, four of which (crash summary #20, #23 #30, and #32) were noted to be crashes involving injury. Vehicles exiting the Albemarle Road West approach were often reported to fail to yield to the traffic on Crafts Street, most likely due to the lack of gaps on Crafts Street and drivers becoming impatient to enter the intersection.



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The Albemarle Road West approach consists of only one travel lane for right turns, left turns, and through traffic; however, vehicles were observed queued side by side at the stop line. The Albemarle Road West approach is wide enough to allow a de-facto right turn lane as right-turning vehicles go around vehicles waiting to take a left turn onto Crafts Street. This driver behavior limits the sight distance of both drivers as they attempt to enter the intersection. Crash summary #33 reports a vehicle exiting Albemarle Road West southbound failed to yield right of way to a vehicle traveling on Crafts Street due obstructed sight lines. The left-turn movement from Albemarle Road West creates additional conflict points within the intersection.



**Pictured: Two vehicles side-by-side exiting the Albemarle Road West approach.**

Crash summary #43 reports a vehicle exited Albemarle Road southbound and proceeded into the intersection assuming the gap in traffic was sufficient prior to crashing into a vehicle traveling eastbound on Crafts Street. The driver sight line from the Albemarle Road southbound approach looking right onto Crafts Street is poor due to the tree screening at the private property (427 Crafts Street), causing vehicles to encroach onto or prematurely pulling out onto Crafts Street. Intersection ahead warning signs are provided along the eastbound and westbound approaches of Crafts Street to warn drivers of the Albemarle Road intersection.

### **Crafts Street at North Street**

The northeast side of the intersection has a wide curb radius, which encourages higher speeds for vehicles turning right from Crafts Street westbound onto North Street and creates a longer pedestrian and bicycle crossing. The access driveway to the private residence at 5 North Street is located on the curb radius.

The North Street southbound approach provides one travel lane; however, two vehicles will attempt to turn left simultaneously during the green light which could lead to sideswipe collisions.

### **Potential Enhancements:**

1. Evaluate restricting Albemarle Road West left turns onto Crafts Street, to minimize conflict points at the intersection.
2. Evaluate adding "do not block intersection" signage and pavement markings to allow Albemarle Road West traffic to enter Crafts Street.
3. Permanently close the Albemarle Road East section between Crafts Street and North Street.
4. Consider a bicycle and pedestrian facility accompanied with additional greenspace if feasible.

- 
5. Consider closing the driveway curb-cut to 409 Crafts Street located on Albemarle Road northbound. The property at 409 Crafts Street provides two access driveways; one on Crafts Street and the other on Albemarle Road northbound. If the 409 Crafts Street driveway on Albemarle Road northbound is removed, there is potential to redevelop the section of Albemarle Rd NB between Crafts Street and North Street. Newton Fire Department suggested fire truck trial runs for any concepts that involve closing of access points and changes to curb radii.
  6. Perform a signal warrant analysis study for the intersection of Crafts Street at Albemarle Road West & Albemarle Road East; and if warrants are met, consider implementation of a signal at this location to reduce the potential for angled collisions.
  7. Consider raising the intersection on Crafts Street and North Street with transitions east of Albemarle Road East and west of Albemarle Road West to help calm traffic and raise driver awareness of pedestrians waiting to cross the street. Raised intersections improve visibility of pedestrians, reduce speeds, and eliminate ponding at pedestrian curb ramps which are especially beneficial for people with mobility and vision impairments.
  8. Decrease the width of the Albemarle Road West and Albemarle Road East approaches at Crafts Street to clearly delineate the one approach lane provided.
  9. If the intersections are to remain stop control, evaluate intersection sight distance at all approaches based on AASHTO standards and identify opportunities to improve the sight lines for drivers entering Crafts Street.
  10. Consider reconstructing the northeast corner of the Crafts Street at North Street intersection to provide tighter curb radii and help reduce vehicle speeds, improve sight lines, and provide a safer crossing for pedestrians and cyclists.
  11. Consider reducing the width of the North Street southbound approach at Craft Street to provide better delineation of the lane configuration and shorten crossing length.
  12. Investigate reconfiguring/combining the Albemarle Road East and Albemarle Road West roadway segments to intersect with Crafts Street as one leg, creating a traditional 4-way intersection.

### **Safety Issue #3: Lighting**

#### **Issues**

Crash summary #23 reports a vehicle exiting the Albemarle Road West approach at Crafts Street and striking a cyclist traveling westbound on Crafts Street. The time of the crash was at 6:24 p.m. on a dark – lighted roadway. A general observation was made during the audit, that lighting at the intersection appeared to be insufficient specifically at all the pedestrian crossing locations; there is only one streetlight located on the northwest corner of the Crafts Street and Albemarle Road West intersection. 10 of the summarized collisions or 18% occurred outside of daylight conditions.

## Potential Enhancements:

1. Evaluate current roadway lighting and upgrade/replace any existing lighting structures at the unsignalized pedestrian crossings to increase visibility of pedestrians and cyclist; and improve roadway visibility. Street lighting can be incorporated into the traffic signal mast arm design, if a traffic signal is preferred.

## Safety Issue #4: Pedestrian and Bicycle Accommodations

### Issues

At all the study area intersections, sidewalks and pedestrian curb ramps near crosswalks have been reconstructed or were under reconstruction during the time of the audit and all crossings provide pedestrian curb ramps that appear to be ADA compliant. The Crafts Street corridor within the RSA project limits, provides bicycle lanes in each direction with bicycle conflict markings across the Albemarle Road approaches. Crosswalks are not provided across the Albemarle Road approaches with the North Street intersections. An audit team member stated traffic queues from the Crafts Street eastbound approach at the North Street intersection, extends through the Albemarle Road intersections and vehicles traveling along Crafts Street eastbound destined to turn right onto Albemarle Road West will bypass the queue of traffic by traveling into the bike lane and unused parking lane located along the south side of Crafts Street.

The audit area experiences a high volume of pedestrian and cyclist traffic throughout the year as it is bounded by schools that consist of a high population of children, the Newton Athletic complex that is used all year round, and a known biking and walking connection to the Charles River Greenway. The Charles River Greenway path is located to the north of Crafts Street and North Street, with pedestrian and cyclist access via Albemarle Road northbound. However, there are no bicycle accommodations to link the cyclist from Crafts Street to the Greenway path. As discussed in the Safety Issue #2: Intersection Geometry and Conflict Points, it was discussed to close off the Albemarle Road segment between Crafts Street and North Street in order to provide a better connection for cyclists and pedestrians.

It was mentioned during the road safety audit due to speeding of vehicles turning right onto North Street from the Crafts Street signal, pedestrians crossing North Street at the Albemarle Road intersections may need additional safety measure, because vehicles approach the crossing quickly.

The Crafts Street westbound approach at the North Street signalized intersection does not provide a clear path for cyclists to continue through the intersection, due to the location of the right-turn only lane.

The crosswalk located on the east leg of the North Street at Albemarle Road east intersection is poorly aligned and does not satisfy the pedestrian desire line, increasing the distance a pedestrian needs to cross; therefore, realignment should be considered to shorten pedestrian crossing. The pedestrian ramp on the northeast corner of Crafts Street at Albemarle Road east intersection is located behind a large tree, obstructing the sight lines for approaching drivers to yield to pedestrians and pedestrian looking for oncoming vehicles. The rear-end (crash summary #36) reported a vehicle stopped for a pedestrian at the crosswalk and the vehicle behind them collided the stopped vehicle.

## Potential Enhancements:

1. Investigate redesigning the Crafts Street westerly leg of the intersection at Albemarle Road West, with a bike lane to be parking protected or to be reconstructed as a separated bike lane.
2. Investigate the use of flex posts with a buffer (on Crafts Street, west of Albemarle Road West) to deter Craft Street eastbound travel vehicles from traveling in the bike lane.
3. Provide high visibility pavement markings for all existing and proposed pedestrian crossing locations for increased visibility during nighttime conditions.
4. Investigate adding a bike lane and bike box for the Crafts Street westbound approach at the Crafts Street at North Street intersection.
5. The City of Newton is looking to provide traffic calming measures and bike accommodations along Albemarle Road and Brookside Avenue from the Charles River to Washington Street.
6. Investigate providing an RRFB on North Street to one or both of at the Albemarle intersections to increase driver awareness along North Street to the presence of the crosswalks.
7. Investigate removing one of the crossings at the North Road and Albemarle Road intersections to consolidate, keeping in mind pedestrian and bicycle desire lines and future connections across Crafts St.
8. The apex curb ramp at the northeast corner of Crafts Street at Albemarle Road Northbound is not align with the crosswalk crossing the Albemarle Road NB north leg, realign it to meet ADA standard.
9. Relocate the crosswalk and pedestrian curb ramps on the east leg of Crafts Street at Albemarle Road northbound further to the west to improve sight lines and provide a better desired line for pedestrian crossing the street.
10. Realign the crosswalk on the east leg of the North Street at Albemarle Road East to shorten pedestrian crossing and provide a better desire line for pedestrians crossing the street.
11. Consider adding painted crosswalks across Albemarle Road at all four intersecting segments with North St., i.e., for the crossings parallel to North St.



**Pictured: Crosswalk on the east leg of the of Crafts Street at Albemarle Road northbound intersection.**



## **Safety Issue #5: Intersection Signalization**

### **Issues**

Issues at the signalized intersection of Crafts Street at North Street were raised during the audit including red light running, lack of Accessible Pedestrian Signals (APS), and signal equipment. The existing signal equipment at the intersection does not provide backplates and appears to be in poor condition.

A member of the audit team raised concerns about drivers running the red light at the Crafts St at North St intersection it was observed that school buses have been running the red lights as well. Crash summary #3 reports that a vehicle traveling southbound on North Street disregarded the red signal and collided with a westbound vehicle on Crafts Street.



**Pictured: Looking east on Crafts Street**

The lack of APS pushbuttons at the intersection was discussed at the audit meeting, and the Newton DPW explained APS pushbuttons were installed prior to an incident involving damage to a traffic signal post. Since the incident, non-APS pushbuttons were installed; however, the Newton DPW stated APS pushbuttons will be re-installed in the near future. Audit members also requested there be countdown pedestrian indications as without them pedestrians do not know how long they have to cross the intersection.

Audit members mentioned that emergency pre-emption is not provided at the signalized location and discussed the importance of it for emergency response.

### **Potential Enhancements:**

1. Evaluate the traffic signal timings at Crafts Street/North Street and check all clearance times to ensure they are adequate.
2. Consider adding backplates with reflectorized borders to the traffic signal heads.
3. Consider installing APS pushbutton system and countdown pedestrian indications.
4. Consider installing an emergency pre-emption system at the signal of Crafts Street at North Street.
5. If a signal is to be installed at the Crafts Street and Albemarle Road intersections, then ensure to provide coordination with the existing signal at the Crafts Street and North Street intersection.

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6. At the intersection of Crafts Street at North Street, consider installing a blank out No Turn on Red (NTOR) sign for the Crafts Street westbound approach, to control right on red conflicts during the pedestrian phase; and a NTOR on the North Street southbound approach.

## **Safety Issue #6: Drainage**

### **Issues**

#### **Crafts Street at North Street**

During the preliminary meeting and site visit, general observations were made regarding the condition of grading and roadway pavement. However, during the site walk, the pavement on Crafts Street at the intersection with North Street was in the process of mill and overlay construction and the pedestrian curb ramps were being reconstructed. Audit team members noted that there is an existing drainage issue on the northwest corner of Crafts Street at North Street.

#### **General Study Area**

Members of the audit team also noted that the Cheese Cake Brook has the tendency to flood and overtop its banks several times throughout the years. The flooding was noted to extend over Albemarle Road and into the Paul Burke baseball fields.

### **Potential Enhancements:**

1. Evaluate roadway cross slopes and grading for proper drainage conditions.
2. Investigate methods to alleviate floods from the Cheese Cake Brook. Where possible, future designs within the study area should consider incorporating methods to alleviate the flooding and/or protect any traffic signal equipment from flooding.



**Pictured: Water ponding on the northwest corner of Crafts Street at North Street.**

## Summary of Road Safety Audit

**Table 2** shows the estimated time frames of short-term, mid-term, and long-term solutions, as well as the cost ranges of low-cost, medium-cost, and high-cost projects. On the following pages, **Table 3** provides an estimate of the time frame and cost of each potential safety issue that may address each of the identified safety issues. Safety payoff determinations are also provided in **Table 3** and are based on engineering judgment.

Table 2: Estimated Time Frame and Costs Breakdown

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

Table 3: Potential Enhancements Summary

Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Speed Limit/Zoning	Consider establishing a 20-mph school zone along Crafts Street and provide school zone flashers.	High	Short-Term	Medium	City of Newton
Speed Limit/Zoning	Consider establishing a 20 mph Safety Zone along Crafts Street from Waltham to Washington St. (abutting Fessenden School, Albemarle Fields, Avery Woods, triangle park, Ed Center).	High	Short-Term	Low	City of Newton
Intersection Geometry and Conflict Points	Evaluate restricting Albemarle Road West left turns onto Crafts Street, to minimize conflict points at the intersection.	High	Short-Term	Low	City of Newton
Intersection Geometry and Conflict Points	Evaluate adding "do not block intersection" signage and pavement markings to allow Albemarle Road west traffic to enter Crafts Street.	Low	Short-Term	Low	City of Newton
Intersection Geometry and Conflict Points	Permanently close the Albemarle Road East section, between Crafts Street and North Street.	High	Short-Term	Medium	City of Newton
Intersection Geometry and Conflict Points	Create a bicycle/pedestrian facility accompanied with an expansive greenspace.	High	Mid-Term	Medium	City of Newton
Intersection Geometry and Conflict Points	Consider closing the driveway curb-cut to 409 Crafts Street located on Albemarle Road East.	Low	Short-Term	Low	City of Newton/ Abutters
Intersection Geometry and Conflict Points	Perform a signal warrant analysis study for the intersection of Crafts Street at Albemarle Road West & Albemarle Road East; and if warrants are met, consider implementation of a signal at this location to reduce the potential for angled collisions.	High	Long-Term	High	City of Newton
Intersection Geometry and Conflict Points	Consider raising the intersection on Crafts Street and North Street with transitions east of Albemarle Road East and west of Albemarle Road West to help calm traffic and raise driver awareness of pedestrians waiting to cross the street. Raised intersections improve visibility of pedestrians, reduce speeds, and eliminate ponding at pedestrian curb ramps which are especially beneficial for people with mobility and vision impairments.	Medium	Long-Term	High	City of Newton

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Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Intersection Geometry and Conflict Points	Decrease the width of the Albemarle Road West and Albemarle Road East approaches at Crafts Street to clearly delineate the one approach lane provided.	Medium	Short-Term	Low	City of Newton
Intersection Geometry and Conflict Points	If the intersections are to remain stop control, evaluate intersection sight distance at all approaches based on AASHTO standards and identify opportunities to improve the sight lines for drivers entering Crafts Street.	Medium	Mid-Term	Low	City of Newton
Intersection Geometry and Conflict Points	Consider reconstructing the northeast corner of the Crafts Street at North Street intersection to provide tighter curb radii and help reduce vehicle speeds, improve sight lines, and provide a safer crossing for pedestrians and cyclists.	High	Long-Term	High	City of Newton
Intersection Geometry and Conflict Points	Consider restructuring the North Street southbound approach at the intersection with Crafts Street to provide better delineation of the lane configuration and shorten crossing length.	High	Long-Term	High	City of Newton
Intersection Geometry and Conflict Points	Investigate reconfiguring/combining the Albemarle Road East and Albemarle Road West roadway segments to intersect with Crafts Street as one leg, creating a traditional 4-way intersection.	High	Long-Term	High	City of Newton
Lighting	Evaluate current roadway lighting and upgrade/replace any existing lighting structures at the unsignalized pedestrian crossings to increase visibility of pedestrians and cyclist; and improve roadway visibility. Street lighting can be incorporated into the traffic signal mast arm design, if a traffic signal is preferred.	Medium	Mid-Term	High	City of Newton
Pedestrian and Bicycle Accommodations	Investigate redesigning the Crafts Street westerly leg of the intersection at Albemarle Road West, with a bike lane to be parking protected or to be reconstructed as a separated bike lane.	Medium	Mid-Term	High	City of Newton
Pedestrian and Bicycle Accommodations	Investigate the use of flex posts with a buffer (on Crafts Street, west of Albemarle Road West) to deter Craft Street eastbound travel vehicles from traveling in the bike lane.	Medium	Short-Term	Low	City of Newton

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Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Pedestrian and Bicycle Accommodations	Provide high visibility pavement markings for all existing and proposed pedestrian crossing locations for increased visibility during nighttime conditions.	Medium	Short-Term	Medium	City of Newton
Pedestrian and Bicycle Accommodations	Investigate restriping a bike lane/bike box for the Crafts Street westbound approach at the Crafts Street at North Street intersection.	High	Mid-Term	Medium	City of Newton
Pedestrian and Bicycle Accommodations	Investigate providing an RRFB on North Street to one or both of at the Albemarle intersections to increase driver awareness along North Street to the presence of the crosswalks.	High	Mid-Term	Medium	City of Newton
Pedestrian and Bicycle Accommodations	Investigate removing one of the crossings at the North Road and Albemarle Road intersections to consolidate.	Medium	Short-Term	Low	City of Newton
Pedestrian and Bicycle Accommodations	Relocate the crosswalk and pedestrian curb ramps on the east leg of Crafts Street at Albemarle Road northbound further to the west to improve sight lines and provide a better desire line for pedestrian crossing the street.	Medium	Mid-Term	Medium	City of Newton
Pedestrian and Bicycle Accommodations	The apex curb ramp at the northeast corner of Crafts Street at Albemarle Road Northbound is not align with the crosswalk crossing the Albemarle Road NB north leg, realign it to meet ADA standard.	Medium	Mid-Term	Medium	City of Newton
Pedestrian and Bicycle Accommodations	Realign the crosswalk on the east leg of the North Street at Albemarle Road East to shorten pedestrian crossing and provide a better desired line for pedestrian crossing the street.	Medium	Mid-Term	Low	City of Newton
Pedestrian and Bicycle Accommodations	Consider adding painted crosswalks across Albemarle Rd at all four intersecting segments with North St., i.e., for the crossings parallel to North St.	High	Short-Term	Low	City of Newton
Intersection Signalization	Evaluate the traffic signal timings at Crafts Steet/North Street and check all clearance times for the signalized intersections to ensure they are adequate.	Medium	Short-Term	Low	City of Newton

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Safety Issue	Potential Safety Enhancement	Safety Payoff	Time Frame	Cost	Jurisdiction
Intersection Signalization	Consider adding backplates with reflectorized borders to the traffic signal heads.	Low	Short-Term	Low	City of Newton
Intersection Signalization	Consider installing an APS pushbutton system and countdown pedestrian indications at Crafts Street/North Street.	High	Short-Term	Medium	City of Newton
Intersection Signalization	Consider installing an emergency pre-emption system at the Crafts Street/North Street signal.	Medium	Mid to Long-Term	Medium	City of Newton
Intersection Signalization	At the intersection of Crafts Street at North Street, consider installing a blank out No Turn on Red (NTOR) sign for the Crafts Street westbound approach, to control right on red conflicts during the pedestrian phase; and a NTOR on the North Street southbound approach	High	Short-Term	Low	City of Newton
Intersection Signalization	If a signal is to be installed at the Crafts Street and Albemarle Road intersections, then ensure to provide coordination with the existing signal at the Crafts Street and North Street intersection	High	Long-Term	High	City of Newton
Drainage	Evaluate cross slopes and grading for proper drainage conditions, on the Northwest corner of Crafts Street at North Street intersection.	Medium	Mid-Term	Medium	City of Newton
Drainage	Investigate flood alleviation methods where possible, future designs within the study area should consider incorporating methods to alleviate the flooding and/or protect any signal design equipment from flooding of Cheese Cake Brook.	Medium	Long-Term	High	City of Newton

## Appendix A. RSA Meeting Agenda

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## Appendix B. RSA Audit Team Contact List

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## Participating Audit Team Members

Date: Wednesday, June 15, 2022

Location: City of Newton Town Hall

<b>Audit Team Members</b>	<b>Agency/Affiliation</b>	<b>Email Address</b>
Nicole Freedman	Newton City Planner	nfreedman@newtonma.gov
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Mia Gerbino	MassDOT Traffic & Safety	Mia.Gerbino@dot.state.ma.us
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Kevin Fitzgerald	MassDOT Traffic & Safety	Kevin.T.Fitzgerald@dot.state.ma.us
Teren Wong	Howard Stein Hudson	TWong@hshassoc.com
Jared Hite	Howard Stein Hudson	JHite@hshassoc.com

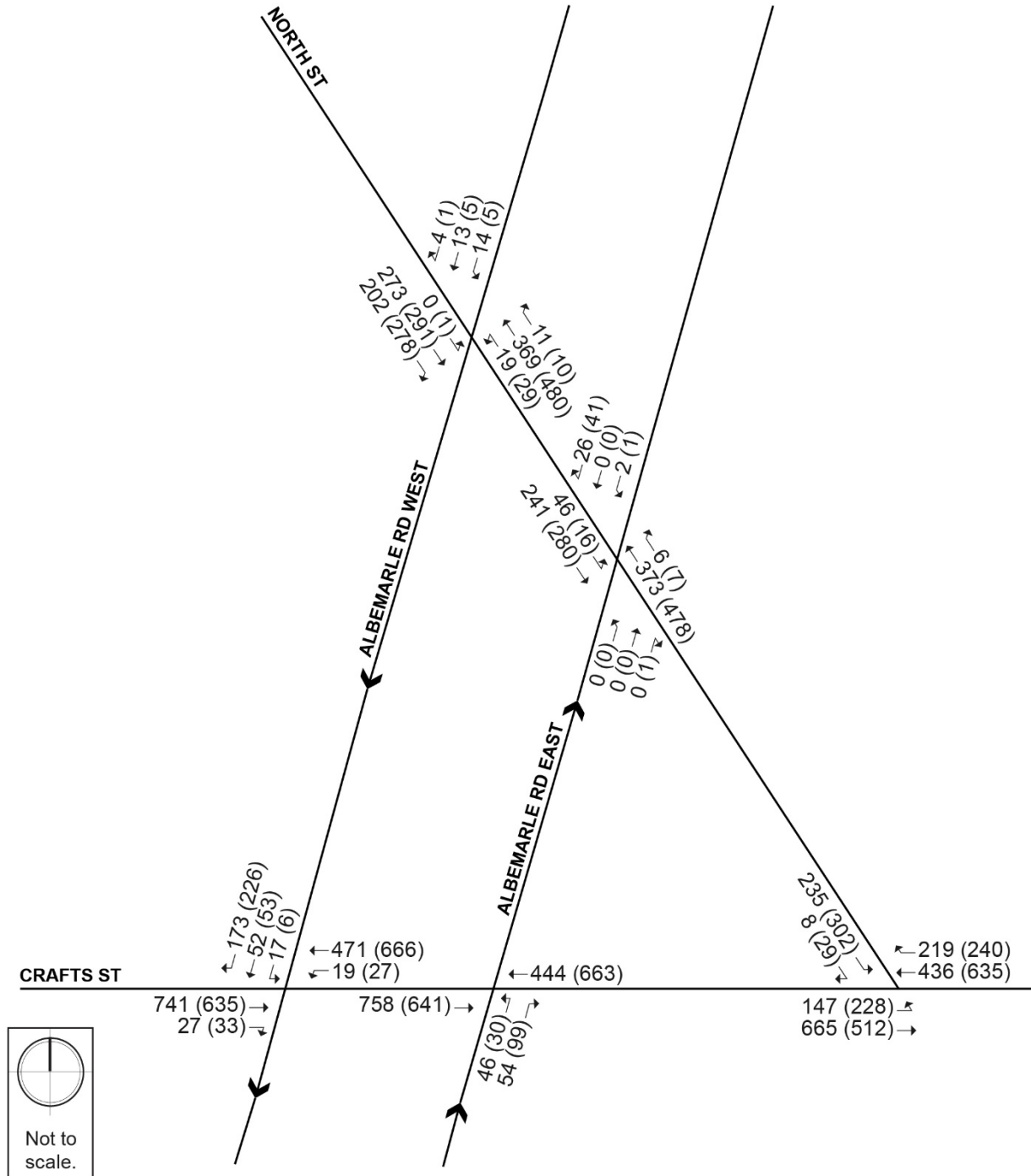
## Appendix C. Detailed Crash Data

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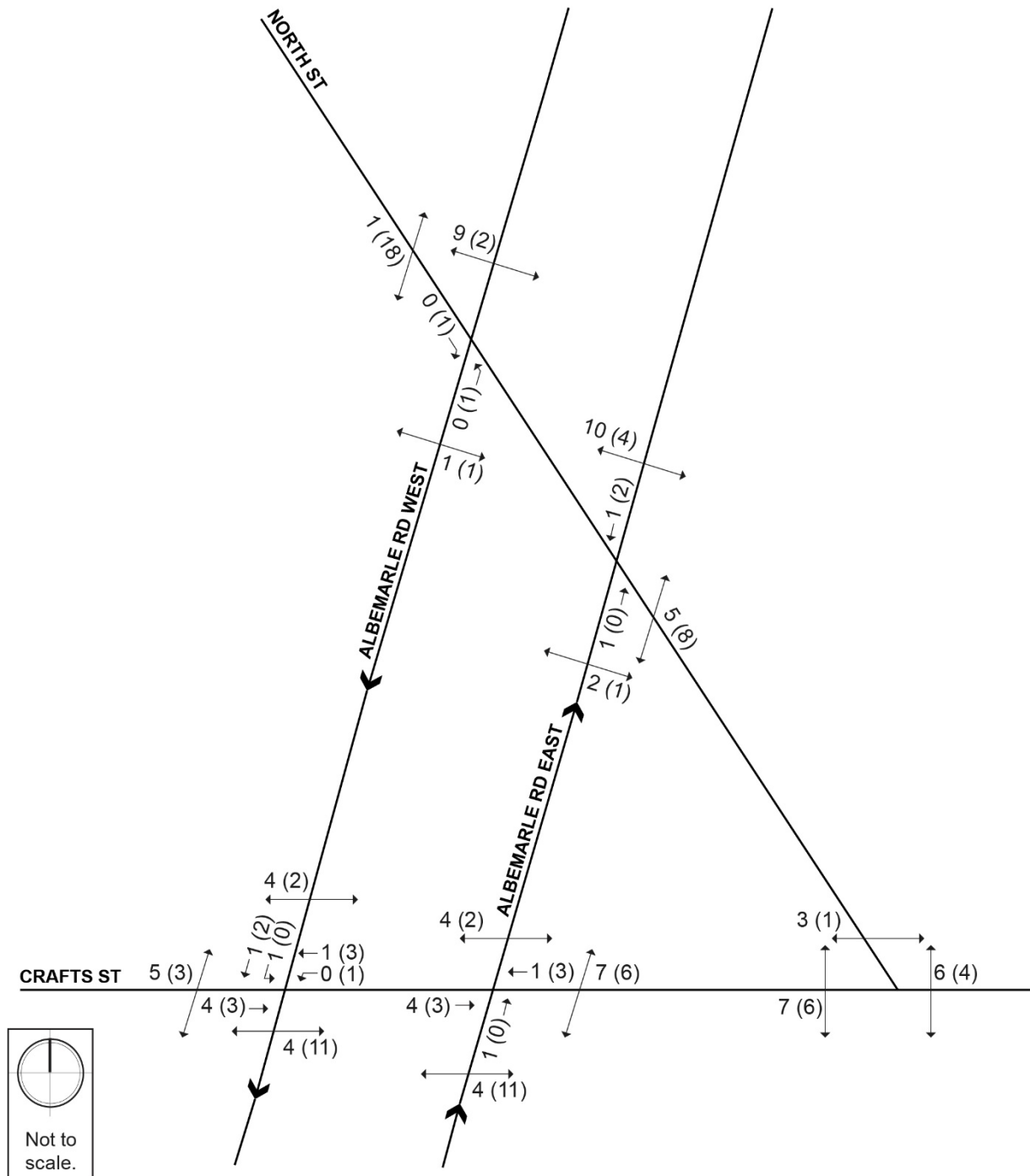
## Appendix D. Traffic Volume Data

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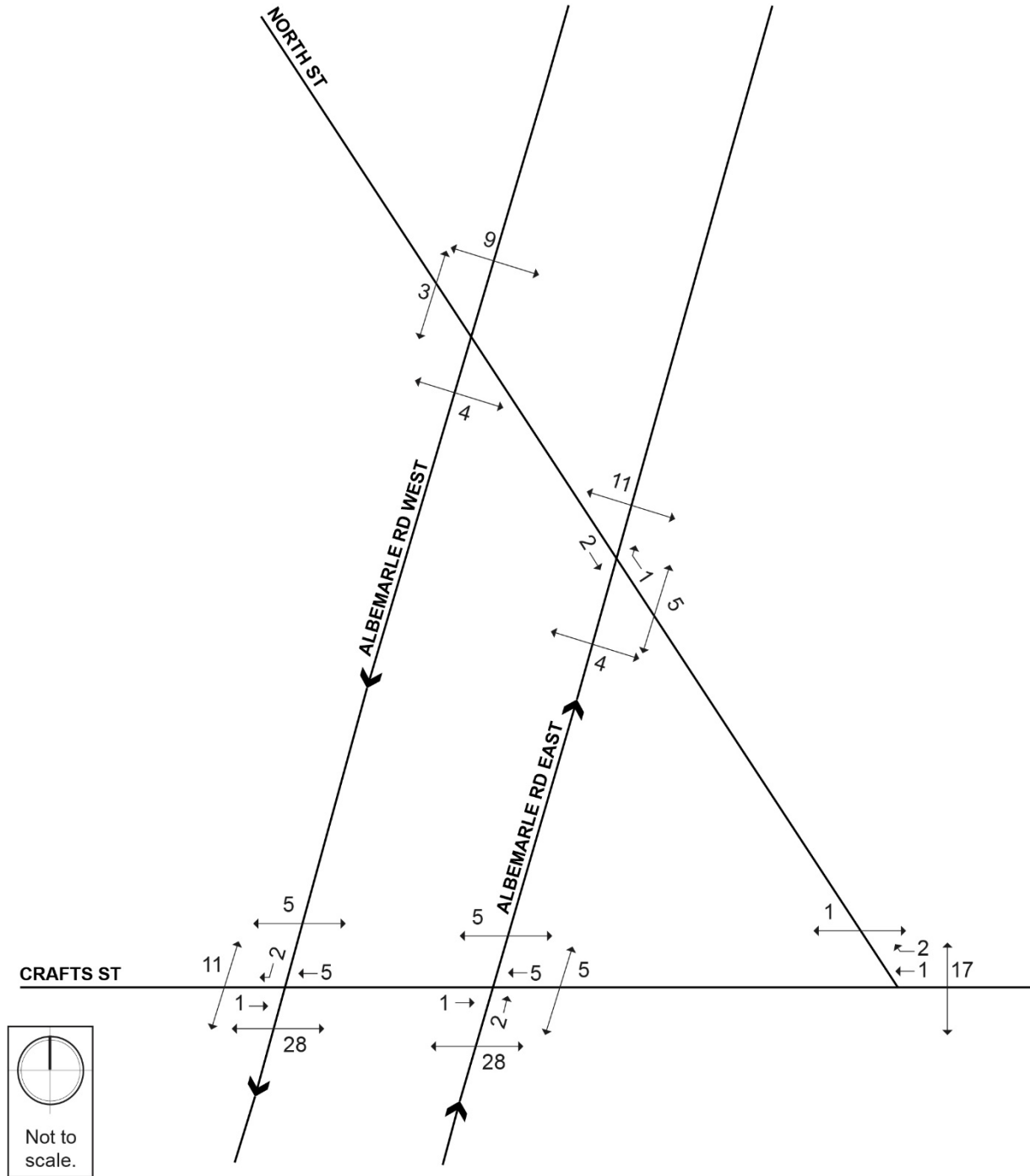
Existing (2022) Condition Traffic Volumes, Weekday (7:30-8:30 a.m.) and (4:15-5:15 p.m.) Peak Hours



Existing (2022) Condition Pedestrian/Bicycle Volumes, Weekday (7:30-8:30 a.m.) and (4:15-5:15 p.m.) Peak Hours



Existing (2022) Condition Pedestrian/Bicycle Volumes, School Peak (2:30-3:30 p.m.) Peak Hours



## Appendix E. Road Safety Audit References

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## Road Safety Audit References

*Massachusetts Traffic Safety Toolbox*, Massachusetts Highway Department,  
[www.mhd.state.ma.us/safetytoolbox](http://www.mhd.state.ma.us/safetytoolbox).

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

*Road Safety Audits*. Institute of Transportation Engineers and U.S. Department of Transportation, Federal Highway Administration, [www.roadwaysafetyaudits.org](http://www.roadwaysafetyaudits.org).

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

*Road Safety Audit*, 2<sup>nd</sup> edition. Austroads, 2000.

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