CITY OF NEWTON

IN BOARD OF ALDERMEN

PUBLIC SAFETY & TRANSPORTATION COMMITTEE REPORT

WEDNESDAY, NOVEMBER 19, 2014

Present: Ald. Ciccone (Chair), Yates, Cote, Fuller, Lipof, Johnson and Harney
Absent: Ald. Schwartz
Also Present: Ald. Crossley (Chair), Lennon, Gentile, Albright, Lappin, Danberg, Laredo and Brousal-Glaser
City Staff: David Turocy, Commissioner of Public Works; Capt. Marc Gromada and Sgt. Jay Babcock, Newton Police Department; Bill Paille, Director of Transportation and David Koses, Transportation Coordinator

REFERRED TO PS&T AND PUBLIC FACILITIES COMMITTEES

#341-14 TRANSPORTATION DIVISION, requesting presentation of the Washington Street Access Improvement Study provided by the Central Transportation Planning Staff. [08/29/14 @ 11:08 AM]

ACTION: NO ACTION NECESSARY 6-0, Ald. Lipof not voting

NOTE: The Public Safety & Transportation Committee discussed the item jointly with the Public Facilities Committee. Please see the Public Facilities report for a detailed account of this discussion.

The Committees were provided with a PowerPoint presentation attached to this report. Attached to the agenda and the City's Website are the Washington Street Draft Memo and the Technical Appendix provided by the Central Transportation Planning Staff (CTPS) of the Boston Region Metropolitan Planning Organization (MPO).

Ald. Fuller made the motion for no action necessary. Committee members agreed 6-0, Ald. Lipof not voting.

REFERRED TO PUB. SAF. & TRANS. AND PUBLIC FACILITIES COMMITTEES

#310-10(3) ALD. DANBERG requesting an amendment to City of Newton Ordinances Chapter 26 Section 8D **Trial program for removal of snow and ice from sidewalks**. by extending the expiration date of the trial from November 1, 2014 to November 1, 2015. [11/07/14 @ 5:00 PM]

ACTION: APPROVED 5-0, Ald. Johnson and Lipof not voting

NOTE: The Public Safety & Transportation Committee discussed the item jointly with the Public Facilities Committee. Please see the Public Facilities report for a detailed account of this discussion.

Committee members were provided with a list of recommendations for the snow ordinance for

snow season 2014/2015 and the current Ordinance A-8, dated January 22, 2013. Both are attached to this report.

Ald. Yates made the motion to approve and extend the expiration date of the trial until November 1, 2015. Committee members agreed 5-0, Ald. Johnson and Lipof not voting.

#310-13(2) ALD. LENNON, on behalf of Dominic Proia, 17 Peabody Street, requesting an amendment to Resident Permit Parking Program Sec. 19-201(B)(1) regarding contiguous lots. [02/24/14 @ 9:08 AM]
HELD 6-0 on 03/19/14, Ald. Harney not voting
ACTION: HELD 4-0, Ald. Yates, Johnson and Fuller not voting

NOTE: Chair Ciccone stated that Ald. Lennon requests this item be held to allow him the opportunity to continue working with the Law Department.

Without discussion, Ald. Cote made the motion to hold this item. Council members agreed 4-0, Ald. Yates, Johnson and Fuller not voting.

At approximately 10:25 pm, Chair Ciccone made the motion to adjourn. Committee members agreed 5-0, Ald. Johnson and Lipof not voting.

Respectfully submitted,

Allan Ciccone, Jr. Chairman

Subregional Priority Roadway Study
Washington Street, Newton

Joint Meeting
Public Facilities and Public Safety & Transportation Committees
Newton Board of Aldermen

November 19, 2014

Boston Region Metropolitan Planning Organization

Study Background

- Funded by the Boston Region Metropolitan Planning Organization (MPO)
- Federal Fiscal Year 2014 Project: Addressing Safety, Mobility, and Access on Subregional Priority Roadways

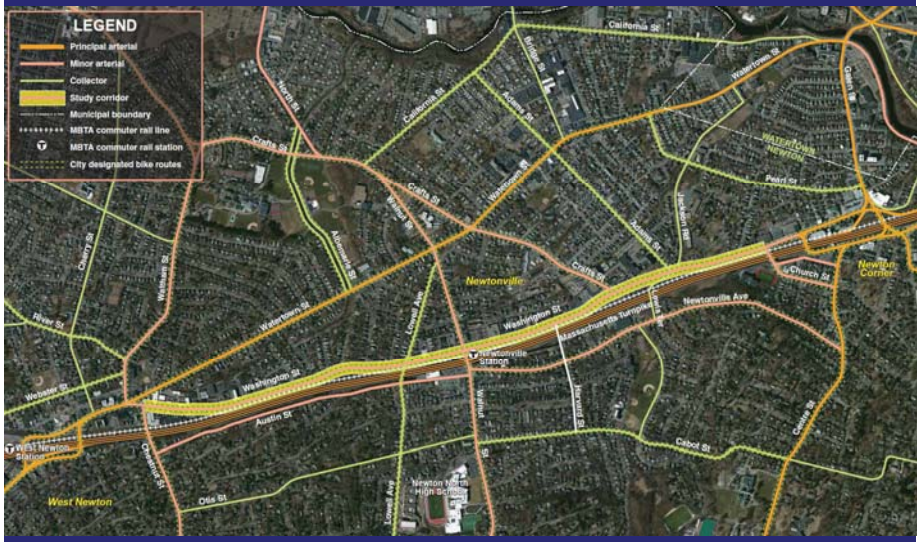
Study Objectives

- Identify safety, mobility, access, and other transportation-related problems
- Develop and evaluate potential multimodal transportation solutions

Study Procedure

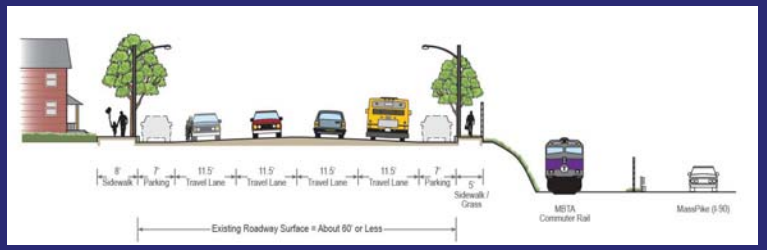
- Corridor selection approved (December 2013)
- Community listening meeting (February 2014)
- Data collection and analysis (spring 2014)
- Improvements development (summer 2014)
- Inputs from Newton Transportation Team (July/August 2014)
- Revisions and documentation (fall 2014)
- Study presentation (November 2014)

Study Area Map

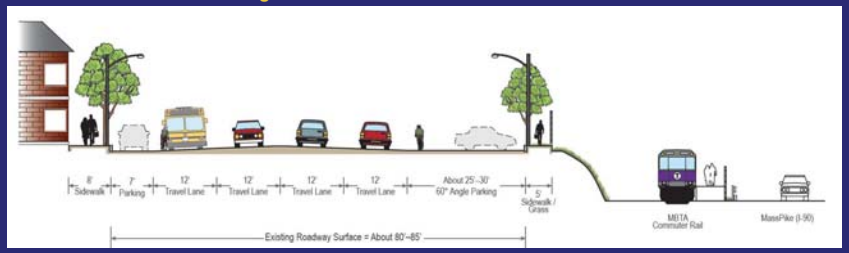


Existing Roadway Conditions

Typical Existing Roadway Cross-section



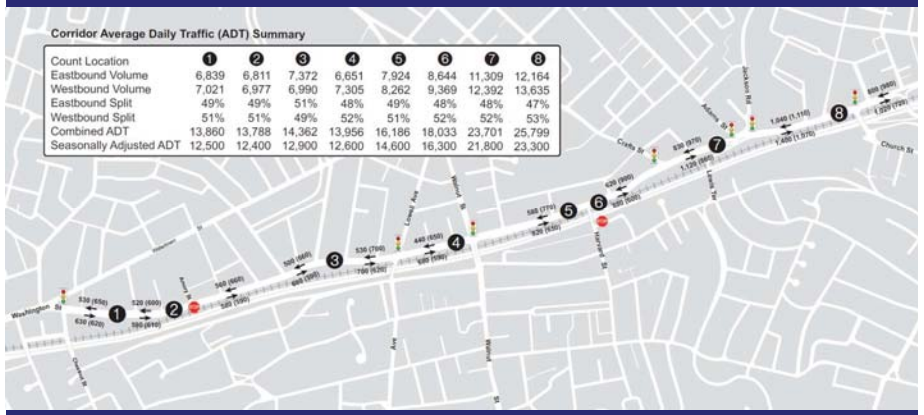
Existing Cross-section near Newtonville Station



Issues and Concerns

- High travel speeds and unsafe conditions
- High number of pedestrian and bicycle crashes
- Unsafe pedestrian crossings
- Lack of bicycle accommodations
- Unsafe and inconvenient access to/from adjacent developments
- Limited sight distance from side streets
- Parking management, noise, lighting, and other issues

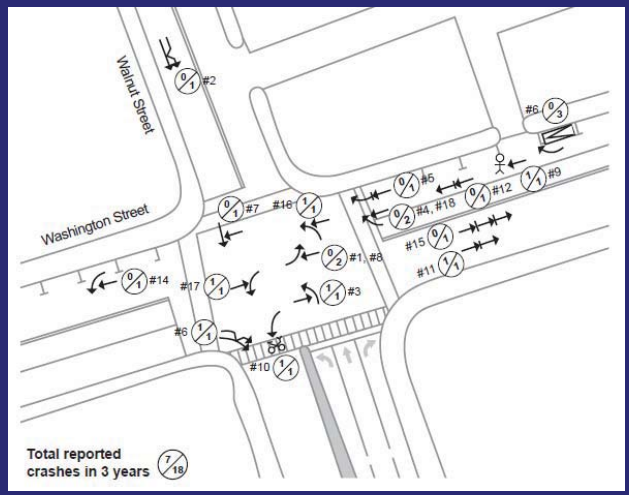
Corridor Traffic Volumes



Crash Data Analysis

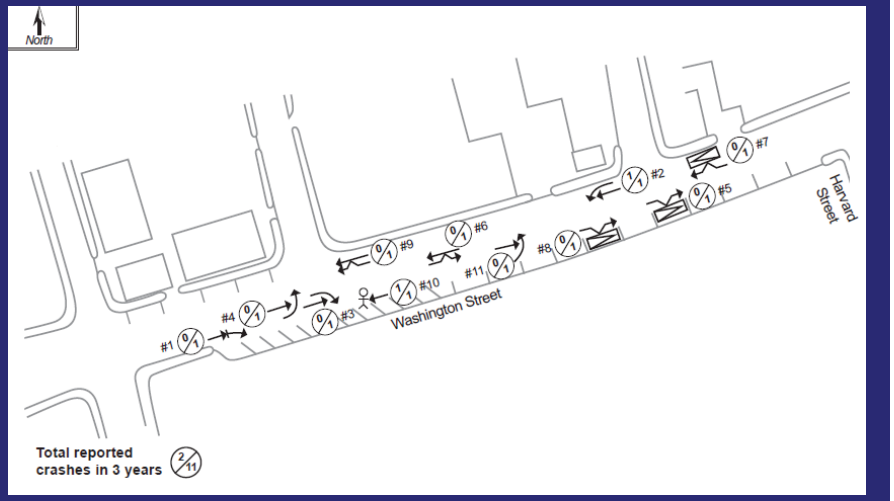
Intersection Collision Diagram

Washington Street at Walnut Street



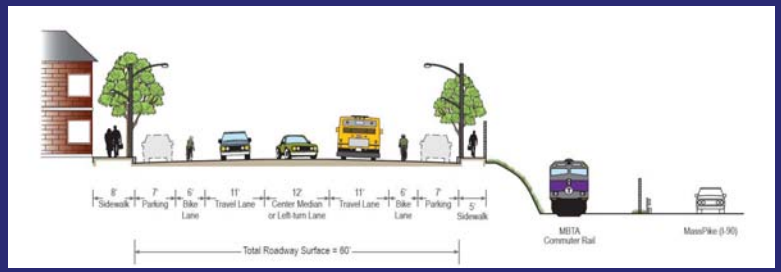
Segment Collision Diagram

Washington Street between Walnut Street and Harvard Street

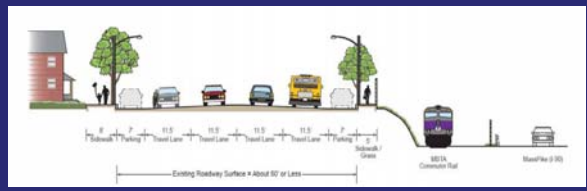


Proposed Roadway Modifications

Proposed Three-Lane Cross-section (Chestnut Street - Court Street)

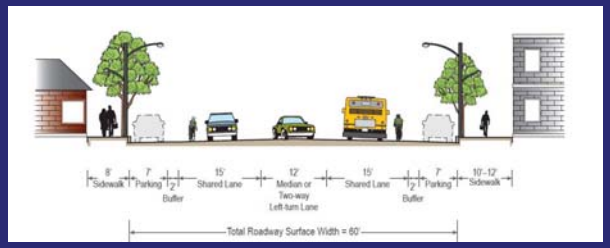


Existing Cross-section

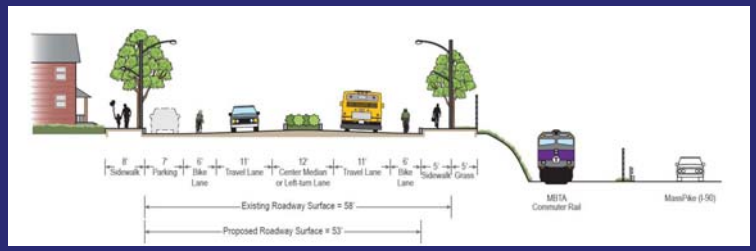


Proposed Roadway Modifications

Alternative Three-Lane Cross-section in Business Districts near West Newton

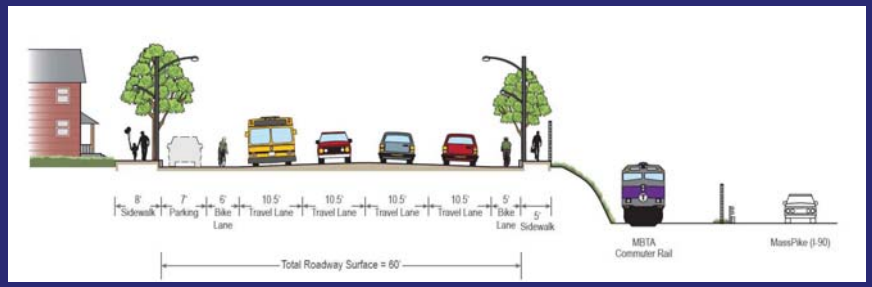


Alternative Three-Lane Cross-section in Residential Districts

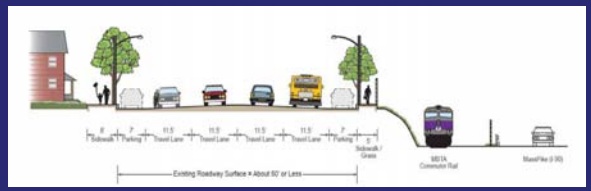


Proposed Roadway Modifications

Proposed Four-Lane Cross-section (Crafts Street - Church Street)



Existing Cross-section



Future-Year Conditions Analysis

- 2025 traffic growth scenarios

2014–25 Total Growth	AM Peak Hour	PM Peak Hour
Moderate traffic growth	3%	5%
Significant traffic growth	8%	10%

- Tests of existing corridor layout vs. proposed “road diet” layout
- Acceptable level of services under the proposed layout with significant traffic growth

Proposed Short-Term Improvements

- Install traffic signal backplates with reflective borders
- Maintain crosswalk markings
- Repair street lights as needed
- Adjust traffic signal timings
- Enforce no-parking at street corners

Proposed Long-Term Improvements

Major Components

- Remove one travel lane and convert the center lane to a dedicated turning lane (Chestnut Street – Court Street)
- Add dedicated bicycle lanes on both sides of the entire roadway corridor
- Remove some parking spaces for continuous bicycle lanes (Court Street – Church Street)

Proposed Long-Term Improvements

Other Key Recommendations

- Install crosswalks at suitable locations
- Reduce curb turning radii and install sidewalk extensions (bulb-outs)
- Widen sidewalks at suitable locations
- Adjust roadway speed limits
- Further review parking and access management
- Further examine lighting and landscaping improvements and noise reduction strategies at the design stages

Long-Term Improvement Conceptual Plan (Section 1)

Long-Term Improvement Conceptual Plan (Section 2)

Long-Term Improvement Conceptual Plan (Section 3)

Long-Term Improvement Conceptual Plan (Section 4)

Long-Term Improvement Conceptual Plan (Section 5)

Long-Term Improvement Conceptual Plan (Section 6)

Long-Term Improvement Conceptual Plan (Section 7)

Expected Benefits

- "Road diet" reconfiguration:
  Slow down traffic and improve safety for all
- Center turn lane/median:
  Provide safe access to adjacent developments
- Bicycle lane and crosswalk installations:
  Accommodate bicycles and pedestrians
- Sidewalk extensions/intersection modifications:
  Improve intersection safety, access, and mobility

Implementation Stages

- West Section: Chestnut Street to the west of Lowell Avenue
- Middle Section: Lowell Avenue to Harvard Street
- East Section: the east of Harvard Street to Church Street

Thank you!

Questions and Comments?

APPENDIX A

Newton Bike Map: 2012

#341-14

LEGEND

- Commuter Rail
- Green Line
- Grocery Store
- Farmers Market
- Hospital
- Office Park
- Police
- Library

INTERSECTIONS

- Dangerous Intersection
- Safe Crossing

SHARED-USE PATHS

- Unpaved
- Paved

STREETS

- Easy Bike Lane
- Easy
- Intermediate Bike Lane
- Intermediate
- Advanced

NEWTONBIKEMAP

Minutes: 3, 6, 9, 12

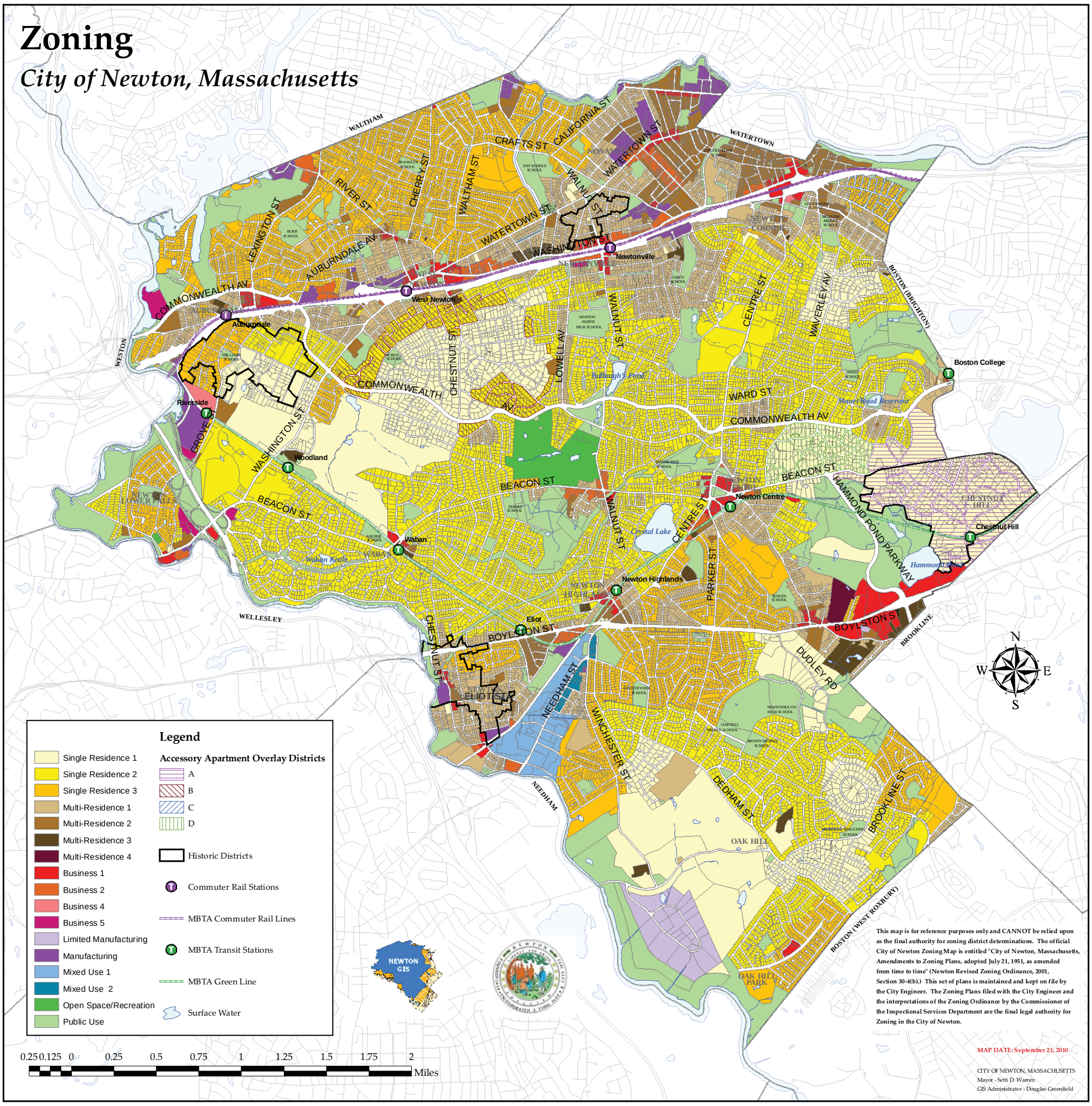
0, 0.25, 0.5, 1, 1.5, 2 Miles

APPENDIX B

Newton Zoning Map: 2010

Zoning

City of Newton, Massachusetts



Legend

- Single Residence 1
- Single Residence 2
- Single Residence 3
- Multi-Residence 1
- Multi-Residence 2
- Multi-Residence 3
- Multi-Residence 4
- Business 1
- Business 2
- Business 4
- Business 5
- Limited Manufacturing
- Manufacturing
- Mixed Use 1
- Mixed Use 2
- Open Space/Recreation
- Public Use

Accessory Apartment Overlay Districts

- A
- B
- C
- D

- Historic Districts
- Commuter Rail Stations
- MBTA Commuter Rail Lines
- MBTA Transit Stations
- MBTA Green Line
- Surface Water

0.25 0.125 0 0.25 0.5 0.75 1 1.25 1.5 1.75 2 Miles

NEWTON GIS

This map is for reference purposes only and CANNOT be relied upon as the final authority for zoning district determinations. The official City of Newton Zoning Map is entitled "City of Newton, Massachusetts, Amendments to Zoning Plans, adopted July 21, 1951, as amended from time to time" (Newton Revised Zoning Ordinance, 2001, Section 30-4(b).) This set of plans is maintained and kept on file by the City Engineer. The Zoning Plans filed with the City Engineer and the interpretations of the Zoning Ordinance by the Commissioner of the Inspectional Services Department are the final legal authority for Zoning in the City of Newton.

MAP DATE: September 21, 2010

CITY OF NEWTON, MASSACHUSETTS
Mayor - Setti D. Warren
GIS Administrator - Douglas Greenfield

APPENDIX C

Summary of Ridership and Trip Characteristics: MBTA Services in the Study Area

SUMMARY OF RIDERSHIP AND TRIP CHARACTERISTICS MBTA SERVICES IN THE STUDY AREA

General Summary

The public transit options along the Washington Street study corridor are the four express bus routes (553, 554, 556, and 558) to Downtown Boston, and two commuter rail stations, Newtonville and West Newton, of the Framingham/ Worcester Line. The four bus routes mainly serve the commuters and local travelers in Newton and Waltham.

According to the 2008–09 MBTA Systemwide Passenger Survey, 58.8 percent of the riders of these four bus routes travel from or to Newton, and 43.3 percent Waltham. The survey also shows that 56.9 percent of the trips on these four bus routes are regional (Newton/Waltham–Boston) and 19.1 percent are local (Newton–Newton, Waltham–Waltham, and Newton–Waltham).

For the commuter rail service, the survey focused on inbound riders, whose purpose is predominantly commuting (the computer model category is “home-based work,” which means traveling from home to work) from Newton to Downtown Boston. There were 240 riders boarding the line at Newtonville Station, and 230 riders at West Newton station from the survey data.

The following analyses further summarize the ridership and trip characteristics of these services based on the MBTA’s 2008–09 survey.

Bus Routes – Overview

Routes 553 and 554

Route 553 starts at Brandeis/Roberts, passes Central Square in Waltham, travels along Washington Street in Newton, and runs as an express bus to Downtown Boston after stopping at Newton Corner. Route 554 starts in Watertown and follows the same route as 553 after arriving at Central Square in Waltham. Both 553 and 554 have 24 stops in the Newton each; each route has 13 stops along the study corridor on Washington Street.

Route 556

Route 556 starts at Waltham Highlands, passes Central Square in Waltham, High Street, Craft Street, Washington Street in Newton, and the runs as an express bus to Downtown Boston after stopping at Newton Corner. Route 556 has 15 stops in the Newton, and eight of them are along the study corridor on Washington Street.

Route 558

Route 558 starts at Riverside in Newton, runs eastbound along the Charles River, passes Central Square in Waltham, and runs along the river again on the Watertown side. It follows the same route as Route 556 after it arrives at the intersection of Adam Street and Washington Street. Route 558 has 21 stops (10 at the west side and 11 at East Newton) in the Newton, and five of them are along the study corridor.

The Downtown Boston routes and stops for all four bus routes are the same.

Characteristics of Bus Riders

Although the survey does not specifically describe the bus ridership along Washington Street, we can still observe important characteristics along the corridor by analyzing activities in Newton as a whole. The following discussion is based on the survey data for Routes 553, 554, 556, and 558.

Activities at Origins or Destinations

The survey shows that 59.0 percent of all the bus trips have their origins and/or destinations in Newton. For the bus riders leaving from Newton, 89.9 percent indicate that they leave from home. These riders travel primarily to Boston (62.2 percent), with others traveling to Waltham (13.2 percent), Newton (10.5 percent), and other municipalities (14.1 percent). While we don't know at what time of day these trips took place, we can assume that there is a Newton-to-Boston, home-to-work morning commute pattern.

For the trips ends in Newton, the riders' destinations in Newtown are work (58.4 percent), home (20.8 percent), or "other"" (10.3 percent). These riders travel primarily from Boston (53.9 percent), with others from Waltham (21.6 percent), Newton (12.5 percent), and other municipalities (12.0 percent). There is a noticeable but less prevalent pattern of evening commuting from Boston to Newton, work to home. The survey also shows that a shorter-trip pattern (Waltham to Newton) is relatively common.

Popular Route: Local vs. Regional

The biggest shared characteristic of all four bus routes is the point-to-point connection from Waltham/Newton to Downtown Boston (express regional trips), which accounted for 56.9 percent of the bus rides. According to the survey, Route 556 has the highest percentage of Newton –Boston service (78.0 percent), followed by 558 (57.1 percent), 553 (51.6 percent), and 554 (45.8 percent). It is noteworthy that Route 556 has the most frequent morning inbound trips (six), that it originates in Waltham Highlands, and that it has the second-smallest number of stops (26, second to Route 558, with 24) between Central Square in Waltham,

and Newton Corner, which may make Route 556 the more popular choice for regional commuters.

Some of the bus routes also support local connections between Waltham, Riverside, Newton, and Watertown. Route 553 has the highest percentage of Newton–Waltham service (22.9 percent), followed by Route 554 (18.1 percent), Route 556 (13.8 percent), and Route 555 (10.4 percent). Routes 553 and 554 have the most bus stops (30 each) between Newton Corner and Waltham's Central Square, and Route 553 runs more buses during peak hours than does Route 554.

Access Mode

In general, most bus riders walk to bus stops (79.7 percent). This characteristic indicates that the buses primarily serve people who live or have activities in the vicinity of the bus routes. Other access modes included drive-park (4.1 percent), drop-off (2.3 percent), and "other public transit" (18.6 percent).

Commuter Rail Stations – Overview

Both Newtonville and West Newton stations are along the Framingham/ Worcester Line. There are four trips in the morning peak period, from 7:00 to 10:00, and four trips in the evening peak period, from 3:30 to 6:30.

Characteristics of Commuter Rail Riders

Trip Purpose: Home-Based Work

More than 95 percent of commuter rail riders indicated that their purpose of travel is "home-based work."

Access Mode

For both the Newtonville and West Newton stations, walking and driving-parking are the two major means of access, with 77.3 percent of the riders accessing Newtonville Station by walking and 20.5 percent by driving-parking. At West Newton Station, 55.6 percent of the riders accessed the station by walking and 42.2 percent driving-parking. No riders reported accessing those stations via other public transportation.

Popular Route: Newton–Boston

Only the inbound trips were recorded, and all of the riders from Newton who accessed commuter rail via those stations indicated Boston as their destination.

APPENDIX D

Summary of Public Comments:
Washington Street Study Scoping and Listening Meeting

Newton, February 26, 2014

Location	Category	Comments
Washington @ Lowell	Design/Geometry	Difficult geometry, "improvements" not ideal
Washington @ Walker	Visibility/Lighting	Visibility is poor
Washington @ Harvard	Visibility/Lighting	Poor lighting, unsafe for pedestrians even with ped. lights
West Newton	Traffic Signals	Lights and SQ not included, should be studied later
Rt. 16 Bypass	Misc.	Air Rights
Newton Corner	Scope of Study	Not included in study, most difficult area for bikes
Washington Street	Bikes	Nice to buffer bikers on Wash.
Newtonville	Pedestrians/Crossings	Parking demand causing more risk, esp. at crossing near Cook/Paintbar
Washington @ Walnut	Pedestrians/Crossings	Lots of kids and pedestrians, young school kids crossing
Washington Street	Design/Geometry	Road Diet is good use of space
Washington Street	Parking at Corners	Backups on roads coming into Washington St./cars parking near corners
Washington Street	Design/Geometry	Use street design to restrict parking at corners, not signs
West Newton	Scope of Study	Consider impact to W. Newton SQ traffic
West Newton	Pedestrians/Crossings	Peds. Crossing Washington Street at Trader Joes and Post Office
Washington @ Lowell	Bikes	Bumpout impact on cyclists - don't push bikes into traffic
Washington Street	Pedestrians/Crossings	Bumpouts not ideal for cyclists but safe for pedestrians
Washington @ Harvard	Traffic Signals	Rapid flash is helpful
Washington Street	Bikes	Opportunity for great E/W bike route, similar to beacon street. Bike Newton is moving ahead
Washington Street	Policy	Be consistent with GreenDOT policy, inc. bike travel, keep auto traffic level
Washington Street	Bikes	Cycle track possible on portion, but currently not safe
Washington Street	Bikes	Consider cycle track
Washington Street	Transit	Bus shelters needed
Washington Street	Transit	Need to speed up transit
Washington Street	Transit	Need safe crossings to bus stops
Washington Street	Scope of Study	Consider economics of making it easier to cross Washington - people don't like to cross it now
Washington Street	Policy	Consider making safety changes quickly - don't wait for a study to make obvious improvements
Washington @ Cross	Pedestrians/Crossings	Crossing here is difficult. There are 2 express busses, very full, many commuters, need to make crossing safer
Washington Street	Misc.	So many high volume businesses (trader joes, car dealers, Walgreens, etc.) make left turns very difficult
Washington Street	Access	Residential and commercial access is difficult
Washington Street	Design/Geometry	Continuous center lane or median
Washington Street	Policy	This is complicated work and an array of comments are helpful. There is room for an educational element to this. Great potential!
Washington Street	Transit	DMU on tracks sounds awesome! Increasing housing density along corridor is good too!
Washington Street	Bikes	Difficult for cyclists to make left turns
Washington Street	Policy	Frustration due to timing, slow, many meetings, progress could be faster. Ex. Move "no parking" signs at corner via police power
Washington Street	Misc.	A lot of potential on corridor because there is little development on the S. side.

Location	Category	Comments
Washington Street	Design/Geometry	Slow traffic with geometry and engineering to make pedestrian crossing easier (slow design speed = explicit goal)
Washington Street	Design/Geometry	Drive transportation choice for high school students (major route)
Washington Street	Transit	MBTA retrofit bus get priority green signal transponders? (like fire trucks)
Washington @ Walnut	Design/Geometry	There are 3 lanes NB, need a left turn lane SB
Washington Street	Parking at Corners	Temporary asphalt curbing at "no parking" areas. Is this as easy as moving signs? Ex. Washington @Walker St.
West Newton	Scope of Study	Timeframe and process to extend study through to W. Newton? City is looking at W. Newton
Washington @ Central Ave	Visibility/Lighting	Poor visibility
Washington @ Beach Street	Visibility/Lighting	Poor visibility
Washington @ Court	Visibility/Lighting	Poor visibility
Washington Street	Bikes	How do changes to street width affect bike lanes?
Washington Street	Pedestrians/Crossings	Walking on Wash. Is unpleasant - need sound barrier for sound and pollution
Washington Street	Design/Geometry	Could it be reduced to 3 lanes? 2 lanes?
Washington @ Brookline Street	Aesthetics	Landscape buffer from Sullivan Tire to Brookline Street (CDBG proj.)
Washington Street	Aesthetics	What would it take to get state to clean up dead trees along MBTA route?
Washington Street	Bikes	What makes Wash. better for bike path than Watertown St.?
Washington Street	Policy	How does city prioritize changes? Are any intersections in CIP included in this CTPS study? Yes.

Note: Summary of public comments were prepared and provided by Newton transportation planning team.

APPENDIX E

Summary of Crash Statistics:
Major Intersections in the Study Corridor

TABLE E-1
Summary of MassDOT Crash Data 2007–11
Intersections at Washington Streetreet

Cross Streetreet Name		Chestnut Street		Armory Street		Lowell Avenue		Walnut Street		Harvard Street		Crafts Street		Adams Street		Jackson Road		Church Street		Corridor Total	
Total number of crashes/Percentage		27	100.0%	27	100.0%	20	100.0%	33	100.0%	16	100.0%	25	100.0%	53	100.0%	23	100.0%	43	100.0%	267	100.0%
Severity	Property damage only	18	66.7%	15	55.6%	13	65.0%	15	45.5%	8	50.0%	16	64.0%	30	56.6%	13	56.5%	28	65.1%	156	58.4%
	Non-fatal injury	4	14.8%	4	14.8%	4	20.0%	11	33.3%	5	31.3%	5	20.0%	19	35.8%	6	26.1%	11	25.6%	69	25.8%
	Fatality	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Not reported/unknown	5	18.5%	8	29.6%	3	15.0%	7	21.2%	3	18.8%	4	16.0%	4	7.5%	4	17.4%	4	9.3%	42	15.7%
Collision type	Single vehicle	1	3.7%	4	14.8%	2	10.0%	4	12.1%	1	6.3%	3	12.0%	5	9.4%	2	8.7%	2	4.7%	24	9.0%
	Rear-end	5	18.5%	2	7.4%	1	5.0%	7	21.2%	2	12.5%	9	36.0%	8	15.1%	11	47.8%	18	41.9%	63	23.6%
	Angle	9	33.3%	15	55.6%	9	45.0%	12	36.4%	6	37.5%	9	36.0%	30	56.6%	5	21.7%	9	20.9%	104	39.0%
	Sideswipe, same direction	6	22.2%	2	7.4%	7	35.0%	6	18.2%	4	25.0%	3	12.0%	3	5.7%	3	13.0%	8	18.6%	42	15.7%
	Sideswipe, opposite direction	1	3.7%	2	7.4%	0	0.0%	0	0.0%	1	6.3%	0	0.0%	2	3.8%	1	4.3%	1	2.3%	8	3.0%
	Head-on	0	0.0%	0	0.0%	0	0.0%	2	6.1%	1	6.3%	0	0.0%	1	1.9%	0	0.0%	0	0.0%	4	1.5%
	Rear-to-rear	2	7.4%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.7%
Involved pedeStreetrian(s)		1	3.7%	1	3.7%	1	5.0%	2	6.1%	2	12.5%	2	8.0%	3	5.7%	0	0.0%	0	0.0%	12	4.5%
Involved cycliStreet(s)		0	0.0%	1	3.7%	1	5.0%	1	3.0%	0	0.0%	1	4.0%	3	5.7%	0	0.0%	2	4.7%	9	3.4%
Occurred during weekday peak periods*		9	33.3%	5	18.5%	8	40.0%	8	24.2%	7	43.8%	10	40.0%	14	26.4%	6	26.1%	15	34.9%	82	30.7%
Wet or icy pavement conditions		7	25.9%	7	25.9%	3	15.0%	13	39.4%	5	31.3%	8	32.0%	11	20.8%	3	13.0%	9	20.9%	66	24.7%
Dark conditions (lit or unlit)		7	25.9%	5	18.5%	4	20.0%	4	12.1%	1	6.3%	4	16.0%	11	20.8%	6	26.1%	8	18.6%	50	18.7%

* Peak periods are defined as 07:00–10:00 and 15:30–18:30.

TABLE E-2
Summary of Newton Police Crash Reports January 2011–February 2014
Intersections at Washington Streetreet

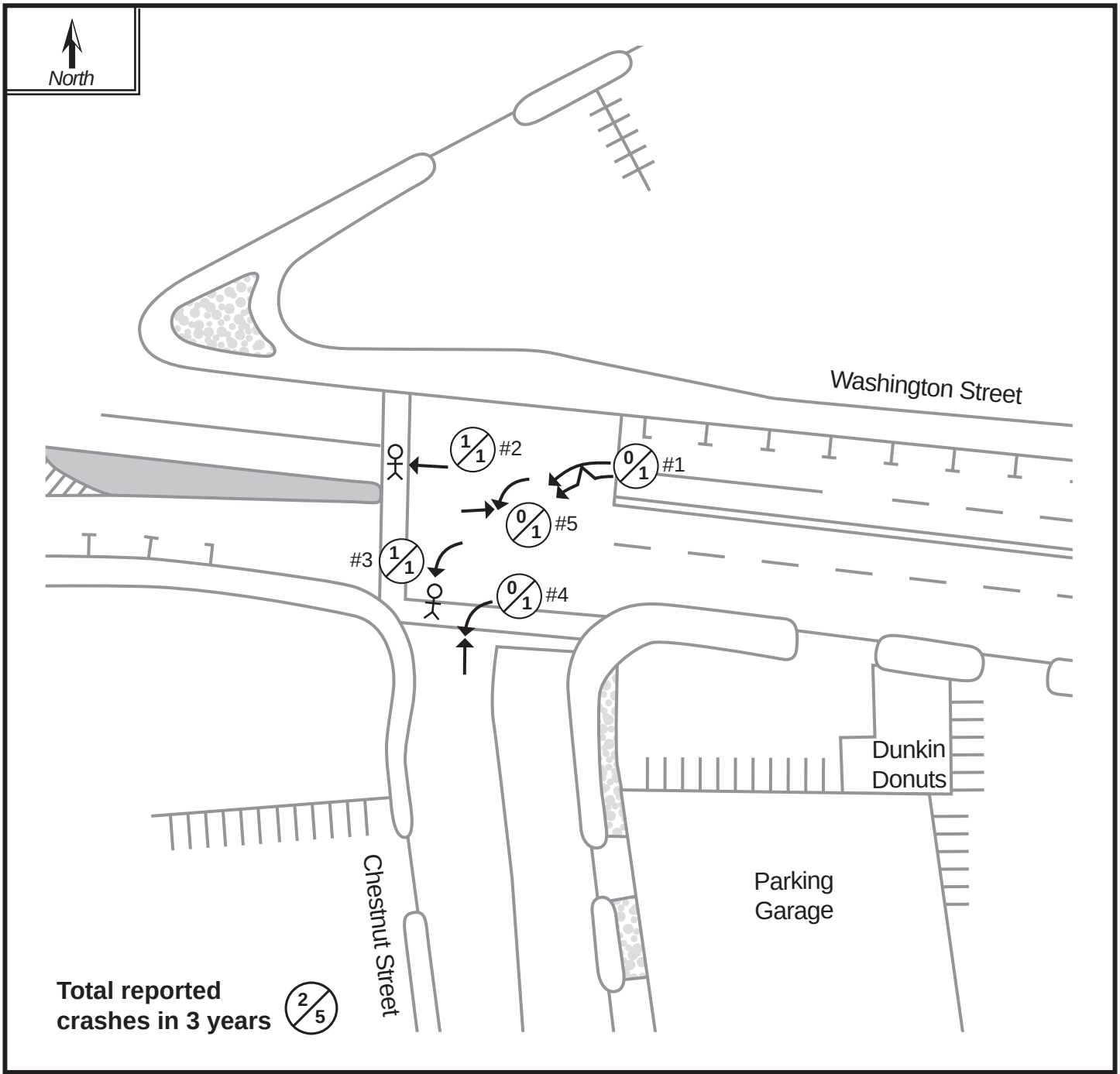
Cross Streetreet Name		Chestnut Street		Armory Street		Lowell Avenue		Walnut Street		Harvard Street		Crafts Street		Adams Street		Jackson Road		Church Street		Corridor Total	
Total number of crashes/Percentage		5	100.0%	9	100.0%	8	100.0%	18	100.0%	6	100.0%	15	100.0%	21	100.0%	11	100.0%	14	100.0%	107	100.0%
Severity	Property damage only	3	60.0%	6	66.7%	6	75.0%	10	55.6%	3	50.0%	9	60.0%	14	66.7%	5	45.5%	9	64.3%	65	60.7%
	Non-fatal injury	2	40.0%	2	22.2%	2	25.0%	7	38.9%	2	33.3%	4	26.7%	6	28.6%	3	27.3%	5	35.7%	33	30.8%
	Fatality	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
	Not reported/unknown	0	0.0%	1	11.1%	0	0.0%	1	5.6%	1	16.7%	2	13.3%	1	4.8%	3	27.3%	0	0.0%	9	8.4%
Collision type	Single vehicle	2	40.0%	0	0.0%	2	25.0%	2	11.1%	1	16.7%	2	13.3%	4	19.0%	2	18.2%	0	0.0%	15	14.0%
	Rear-end	0	0.0%	1	11.1%	1	12.5%	5	27.8%	0	0.0%	4	26.7%	4	19.0%	6	54.5%	6	42.9%	27	25.2%
	Angle	1	20.0%	6	66.7%	4	50.0%	9	50.0%	1	16.7%	4	26.7%	8	38.1%	1	9.1%	3	21.4%	37	34.6%
	Sideswipe, same direction	1	20.0%	1	11.1%	1	12.5%	2	11.1%	4	66.7%	3	20.0%	3	14.3%	2	18.2%	5	35.7%	22	20.6%
	Sideswipe, opposite direction	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	1	0.9%
	Head-on	1	20.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	6.7%	0	0.0%	0	0.0%	0	0.0%	2	1.9%
	Rear-to-rear	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Involved pedeStreetrian(s)		2	40.0%	0	0.0%	1	12.5%	1	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	4	3.7%
Involved cycliStreet(s)		0	0.0%	0	0.0%	1	12.5%	1	5.6%	1	16.7%	1	6.7%	4	19.0%	0	0.0%	0	0.0%	8	7.5%
Occurred during weekday peak periods*		2	40.0%	5	55.6%	5	62.5%	5	27.8%	2	33.3%	1	6.7%	7	33.3%	3	27.3%	6	42.9%	36	33.6%
Wet or icy pavement conditions		1	20.0%	2	22.2%	4	50.0%	4	22.2%	1	16.7%	3	20.0%	5	23.8%	5	45.5%	5	35.7%	30	28.0%
Dark conditions (lit or unlit)		0	0.0%	0	0.0%	2	25.0%	3	16.7%	0	0.0%	3	20.0%	4	19.0%	4	36.4%	6	42.9%	22	20.6%

* Peak periods are defined as 07:00–10:00 and 15:30–18:30.

APPENDIX F

Collision Diagram and Summary of Crash Reports: Major Intersections in the Study Corridor

FIGURE F-1
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Chestnut Street



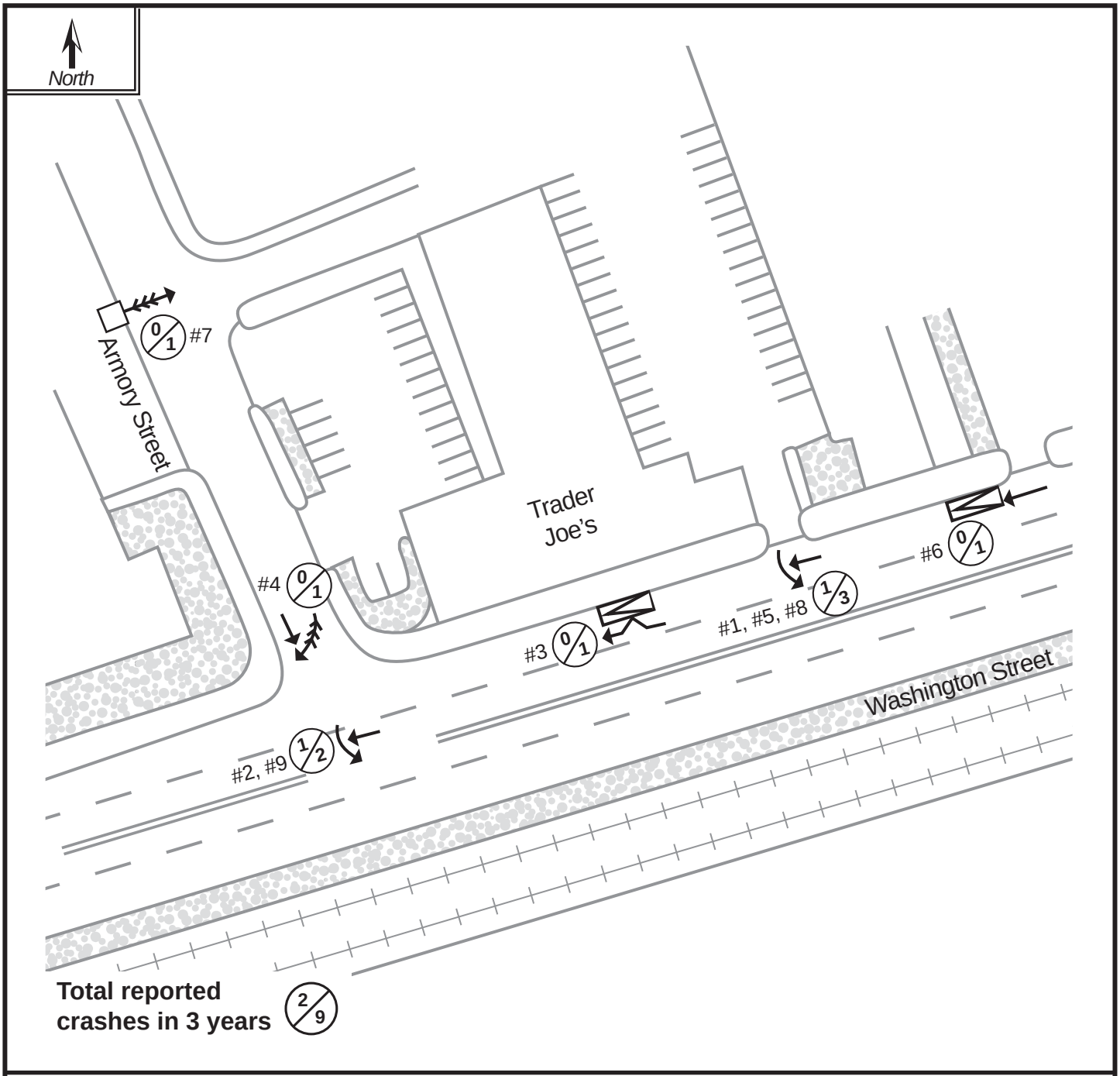
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-1
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Chestnut Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	23-Sep-2011	5:53 PM	Property damage only	2	Sideswipe, same dir.	Wet	Daylight	-	Failure to keep in proper lane or running off road
#2	9-Oct-2012	12:43 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	ped	No Improper Driving
#3	31-Jan-2013	2:58 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	ped	Failed to yield right of way
#4	28-Feb-2013	12:12 PM	Property damage only	2	Head-on	Dry	Daylight	-	Failed to yield right of way
#5	10-May-2013	3:55 PM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way

#341-14

FIGURE F-2
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Armory Street



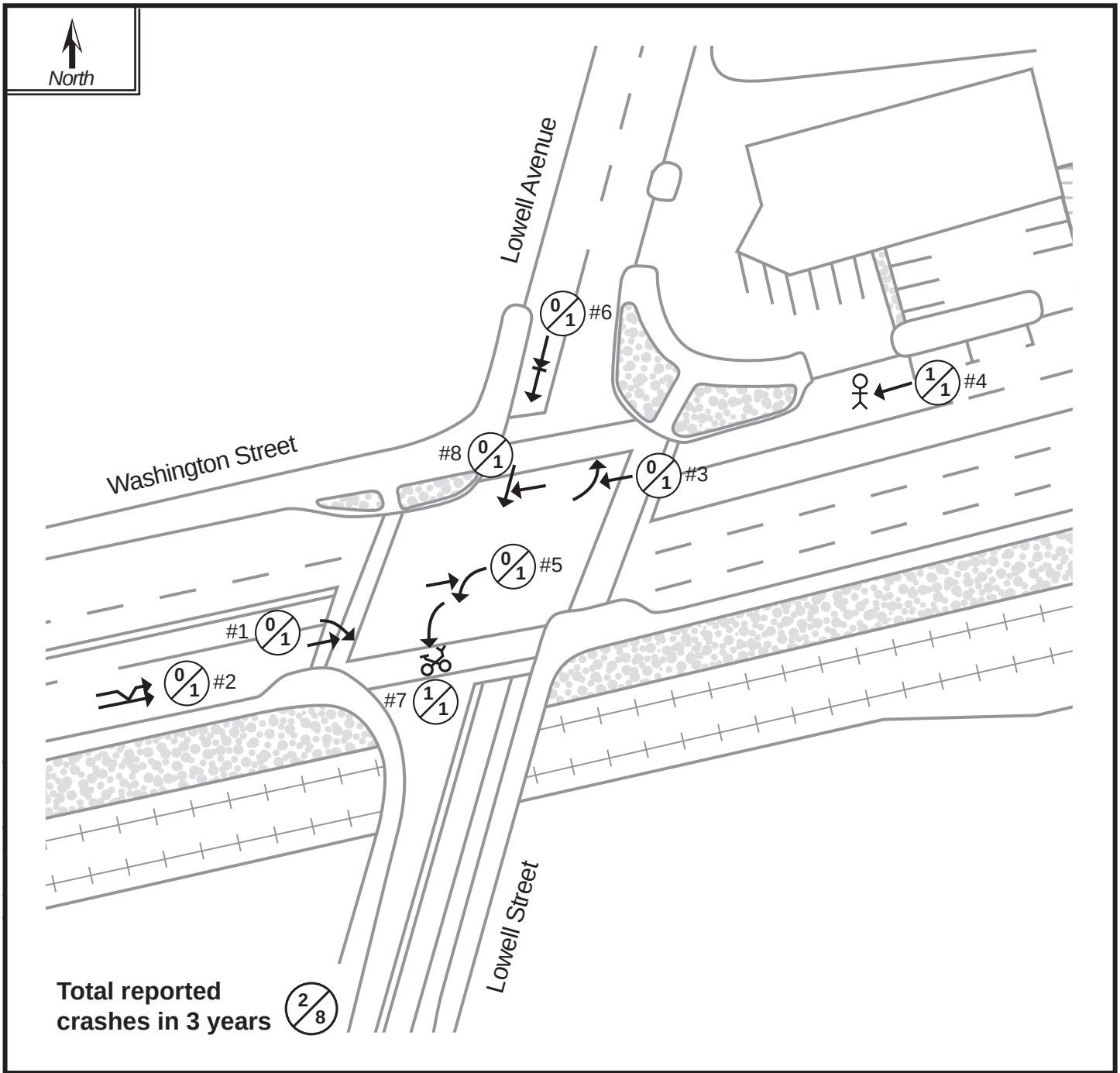
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-2
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Armory Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	6-Sep-2011	4:12 PM	Property damage only	2	Angle	Wet	Daylight	-	Failed to yield right of way
#2	7-Mar-2012	8:45 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#3	10-Apr-2012	9:38 PM	Not Reported	2	Sideswipe, same dir.	Dry	Daylight	-	No Improper Driving
#4	23-May-2012	7:02 PM	Property damage only	2	Angle	Dry	Dusk	-	Wrong side or wrong way
#5	12-Jul-2012	2:52 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Failed to yield right of way
#6	16-Aug-2012	8:02 AM	Property damage only	2	Rear-end	Wet	Daylight	-	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.
#7	4-May-2013	8:04 PM	Property damage only	1		Dry	Dusk	-	Visibility Obstructed
#8	9-Sep-2013	3:49 PM	Property damage only	2	Angle	Dry	Daylight	-	Inattention
#9	19-Sep-2013	5:27 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Visibility Obstructed

#341-14

FIGURE F-3
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Lowell Avenue



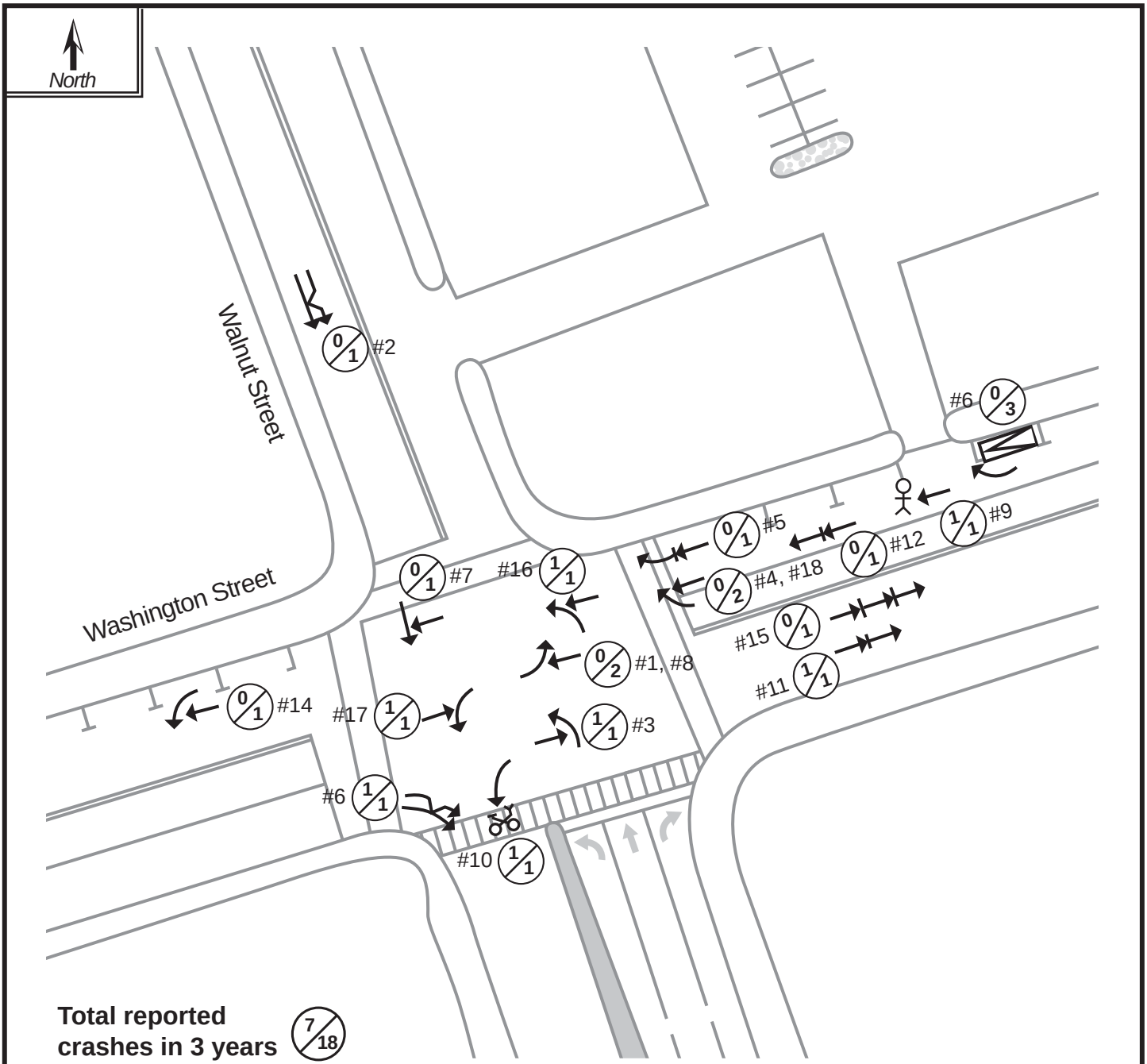
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-3
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Lowell Avenue

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	1-Feb-2011	5:50 PM	Property damage only	2	Angle	Snow	Dark - lighted roadway	-	No Improper Driving
#2	26-Nov-2011	11:21 AM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Failed to yield right of way
#3	20-Jan-2012	5:57 PM	Property damage only	2	Angle	Snow	Dark - lighted roadway	-	Inattention
#4	23-Jun-2012	12:41 PM	Non-fatal injury	1	Single vehicle crash	Not reported	Not reported	ped	No Improper Driving
#5	4-Oct-2012	9:57 AM	Property damage only	2	Angle	Wet	Daylight	-	No Improper Driving
#6	27-Nov-2012	3:43 PM	Property damage only	2	Rear-end	Wet	Dawn	-	Followed too closely
#7	15-Oct-2013	5:18 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	cyc	Glare
#8	2-Nov-2013	12:28 PM	Property damage only	2	Angle	Dry	Daylight	-	No Improper Driving

#341-14

FIGURE F-4
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Walnut Street



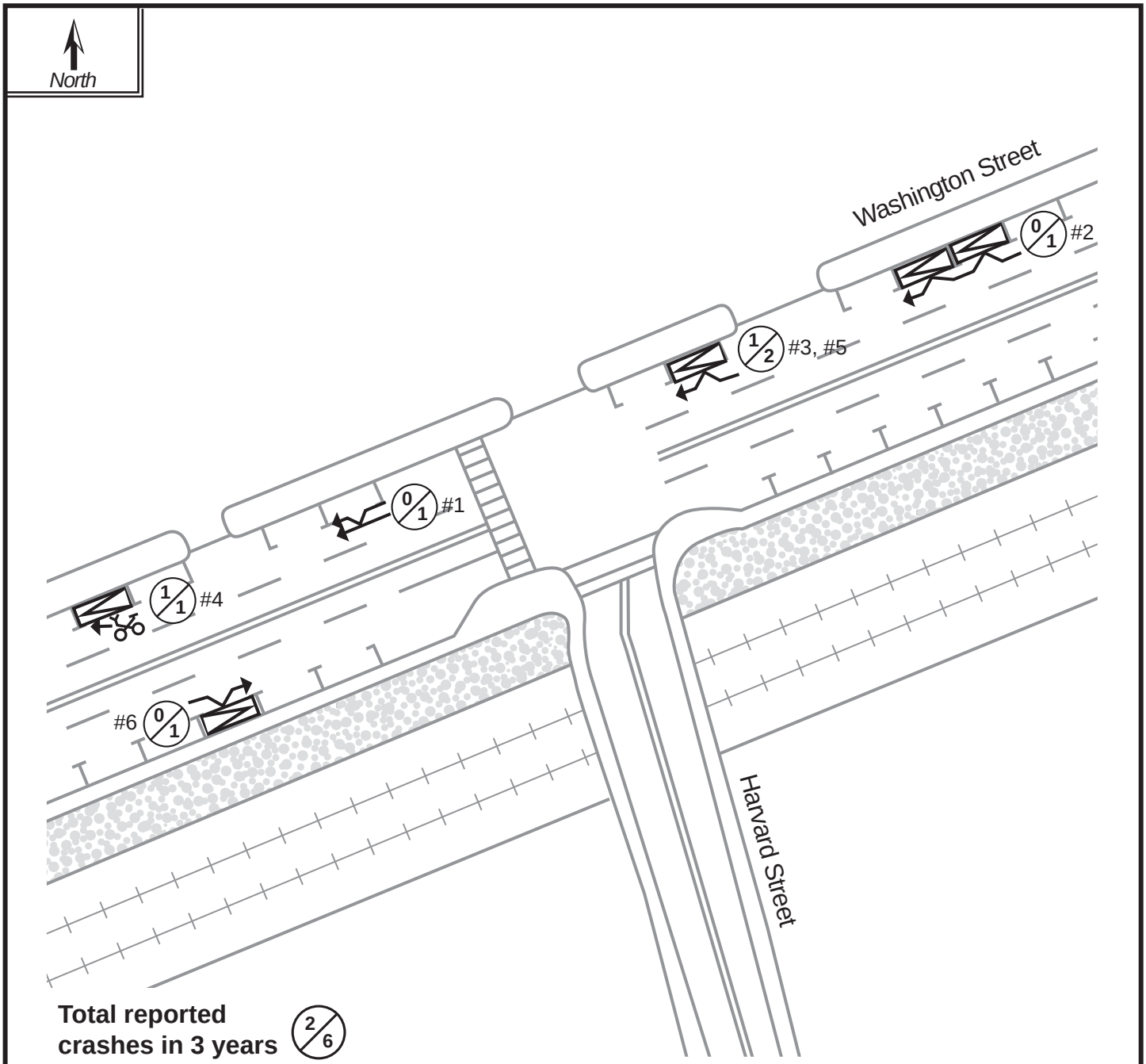
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-4
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Walnut Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	20-Jan-2011	2:54 PM	Property damage only	2	Angle	Wet	Daylight	-	Inattention
#2	4-Mar-2011	8:18 AM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#3	28-Apr-2011	7:15 PM	Non-fatal injury	2	Angle	Wet	Daylight	-	Failed to yield right of way
#4	8-Sep-2011	10:53 AM	Property damage only	2	Angle	Wet	Daylight	-	No Improper Driving
#5	15-Sep-2011	9:58 AM	Not Reported	2	Rear-end	Dry	Daylight	-	Inattention
#6	24-Oct-2011	10:41 AM	Non-fatal injury	2	Sideswipe, same dir.	Dry	Daylight	-	Visibility Obstructed
#7	2-Dec-2011	11:33 PM	Property damage only	2	Angle	Dry	Dark - lighted roadway	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#8	25-Mar-2012	9:36 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#9	24-Jun-2012	12:45 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	ped	Inattention
#10	2-Aug-2012	7:05 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	cycle	Inattention
#11	1-Oct-2012	8:14 AM	Non-fatal injury	2	Rear-end	Dry	Daylight	-	Visibility Obstructed
#12	2-Oct-2012	7:36 AM	Property damage only	2	Rear-end	Not reporte	Daylight	-	Followed too closely
#13	11-Dec-2012	8:17 PM	Property damage only	2	Angle	Dry	Dark - lighted roadway	-	Other improper action
#14	17-Jan-2013	12:55 PM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#15	25-Jun-2013	3:26 PM	Property damage only	3	Rear-end	Not reporte	Not reported	-	Followed too closely
#16	30-Oct-2013	11:29 PM	Non-fatal injury	2	Angle	Dry	Dark - lighted roadway	-	Disregarded traffic signs, signals, road markings
#17	31-Oct-2013	4:34 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Failed to yield right of way
#18	1-Dec-2013	3:53 PM	Property damage only	2	Rear-end	Wet	Daylight	-	Inattention

#341-14

FIGURE F-5
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Harvard Street

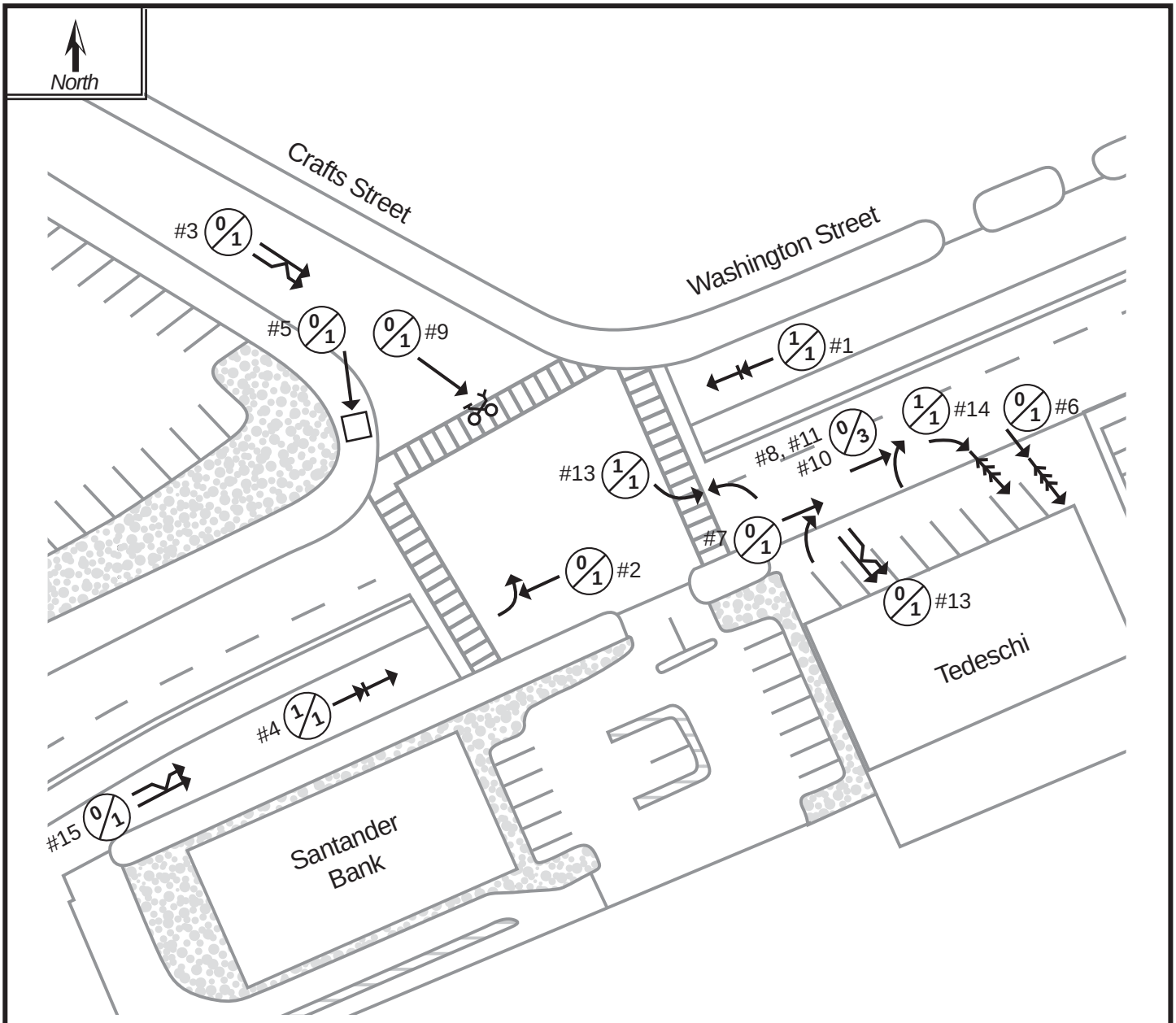


SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-5
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Harvard Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	29-Apr-2011	6:10 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Failed to yield right of way
#2	1-Sep-2011	12:32 PM	Property damage only	3	Angle	Dry	Daylight	-	Failed to yield right of way
#3	11-Jul-2012	6:08 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	No Improper Driving
#4	8-Aug-2012	10:19 AM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	cyc	Inattention
#5	8-Apr-2013	11:58 AM	Non-fatal injury	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#6	18-Feb-2014	11:27 AM	Not Reported	2	Sideswipe, same dir.	Wet	Daylight	-	Inattention

FIGURE F-6
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Crafts Street

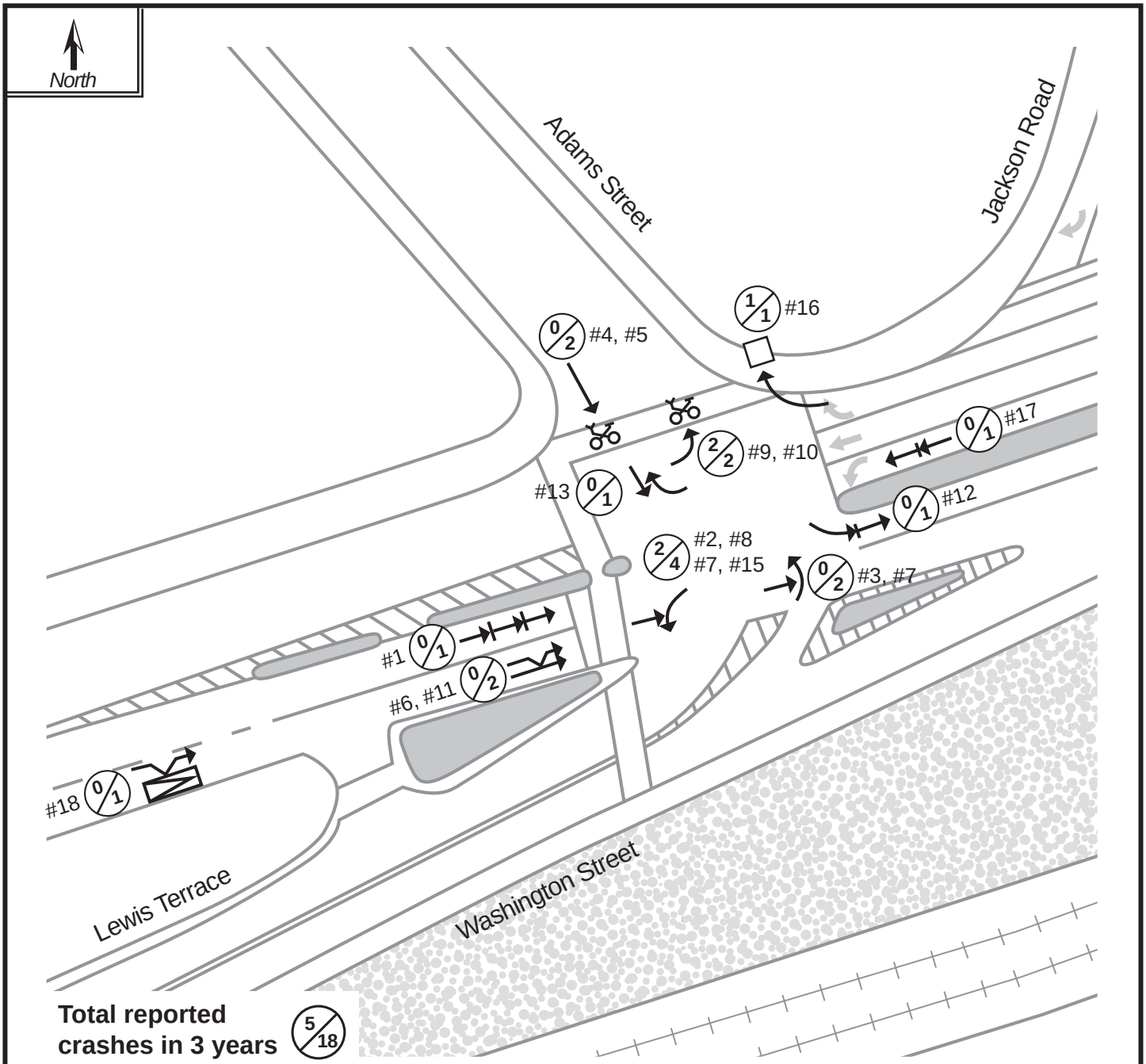


SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-6
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Crafts Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	2-Jan-2011	2:09 PM	Non-fatal injury	2	Rear-end	Wet	Daylight	-	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.
#2	4-Jan-2011	10:10 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#3	26-Apr-2011	7:36 AM	Not Reported	2	Sideswipe, same dir.	Dry	Daylight	-	Failure to keep in proper lane or running off road
#4	16-May-2011	11:06 PM	Non-fatal injury	2	Rear-end	Wet	Dark - lighted roadway	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#5	29-May-2011	1:02 AM	Property damage only	1	Single vehicle crash	Dry	Dark - lighted roadway	-	Failure to keep in proper lane or running off road
#6	02-Aug-2011	2:35 PM	Property damage only	2	Rear-end	Dry	Daylight	-	Other improper action
#7	30-Oct-2011	1:06 PM	Property damage only	2	Angle	Not reported	Daylight	-	Failed to yield right of way
#8	18-Dec-2011	11:10 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#9	27-Dec-2011	3:27 PM	Property damage only	1	Single vehicle crash	Not reported	Not reported	cyc	No Improper Driving
#10	6-Jan-2012	2:12 PM	Property damage only	2	Sideswipe, opposite dir	Dry	Daylight	-	Failed to yield right of way
#11	13-Mar-2012	6:55 AM	Property damage only	2	Angle	Wet	Daylight	-	Failed to yield right of way
#12	28-Mar-2012	6:49 PM	Not Reported	2	Sideswipe, same dir.	Dry	Daylight	-	No Improper Driving
#13	1-Aug-2012	9:23 PM	Non-fatal injury	2	Head-on	Dry	Dark - lighted roadway	-	Failed to yield right of way
#14	14-Nov-2012	12:44 PM	Non-fatal injury	2	Rear-end	Dry	Daylight	-	Followed too closely
#15	18-May-2013	7:16 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Visibility Obstructed

FIGURE F-7
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Adams Street/Lewis Terrace



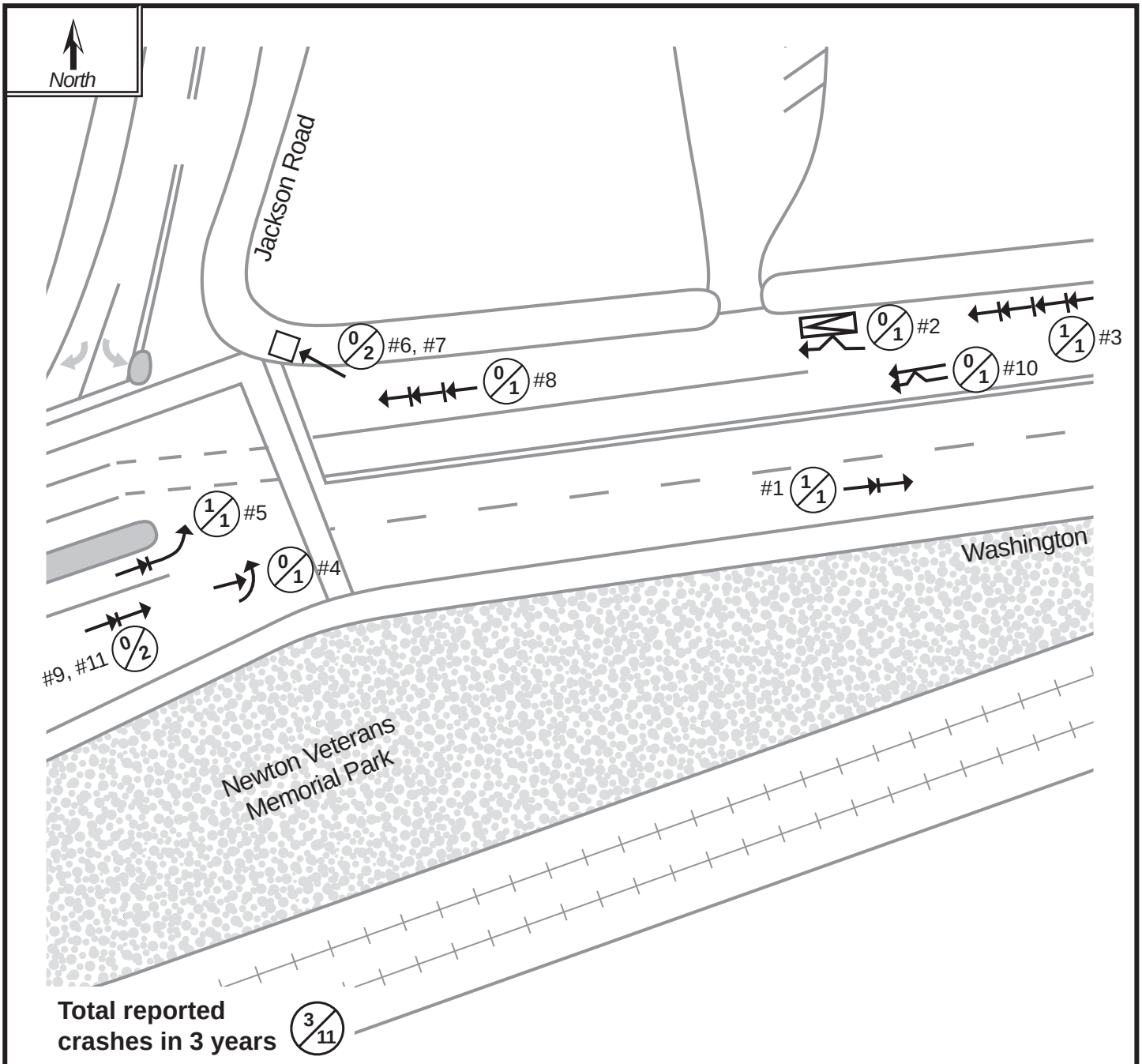
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-7
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Adams Street/ Lewis Terrace

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	4-Jan-2011	5:41 PM	Property damage only	3	Rear-end	Dry	Dark - lighted roadway	-	Cellular telephone
#2	20-Jan-2011	1:29 PM	Property damage only	2	Angle	Wet	Daylight	-	Visibility Obstructed
#3	23-Jan-2011	12:45 AM	Property damage only	1	Angle	Ice	Dark - lighted roadway	-	Disregarded traffic signs, signals, road markings
#4	18-Jul-2011	8:24 AM	Property damage only	1	Single vehicle crash	Not reported	Unknown	cyc	No Improper Driving
#5	3-Sep-2011	1:36 PM	Property damage only	2	Unknown	Dry	Daylight	cyc	Failed to yield right of way
#6	26-Oct-2011	4:23 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Made an improper turn
#7	14-Nov-2011	9:43 AM	Non-fatal injury	2	Angle	Dry	Daylight	-	Visibility Obstructed
#8	21-Jan-2012	8:57 AM	Non-fatal injury	2	Angle	Snow	Daylight	-	Failed to yield right of way
#9	20-Jun-2012	10:28 AM	Non-fatal injury	1	Angle	Dry	Daylight	cyc	No Improper Driving
#10	8-Jul-2012	8:55 PM	Non-fatal injury	1	Single vehicle crash	Dry	Dark - lighted roadway	cyc	Failed to yield right of way
#11	4-Sep-2012	8:00 AM	Property damage only	2	Sideswipe, same dir.	Wet	Daylight	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#12	8-Sep-2012	12:40 PM	Property damage only	2	Rear-end	Dry	Daylight	-	Inattention
#13	4-Oct-2012	9:10 AM	Property damage only	2	Angle	Wet	Daylight	-	Made an improper turn
#14	24-Nov-2012	8:23 AM	Property damage only	2	Angle	Dry	Daylight	-	Disregarded traffic signs, signals, road markings
#15	7-Dec-2012	12:58 PM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#16	31-Mar-2013	8:51 AM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	-	Disregarded traffic signs, signals, road markings
#17	22-Apr-2013	1:09 PM	Non-fatal injury	2	Rear-end	Dry	Daylight	-	No Improper Driving
#18	11-Dec-2013	5:42 PM	Property damage only	2	Sideswipe, same dir.	Dry	Dark - lighted roadway	-	Inattention

#341-14

FIGURE F-8
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Jackson Road

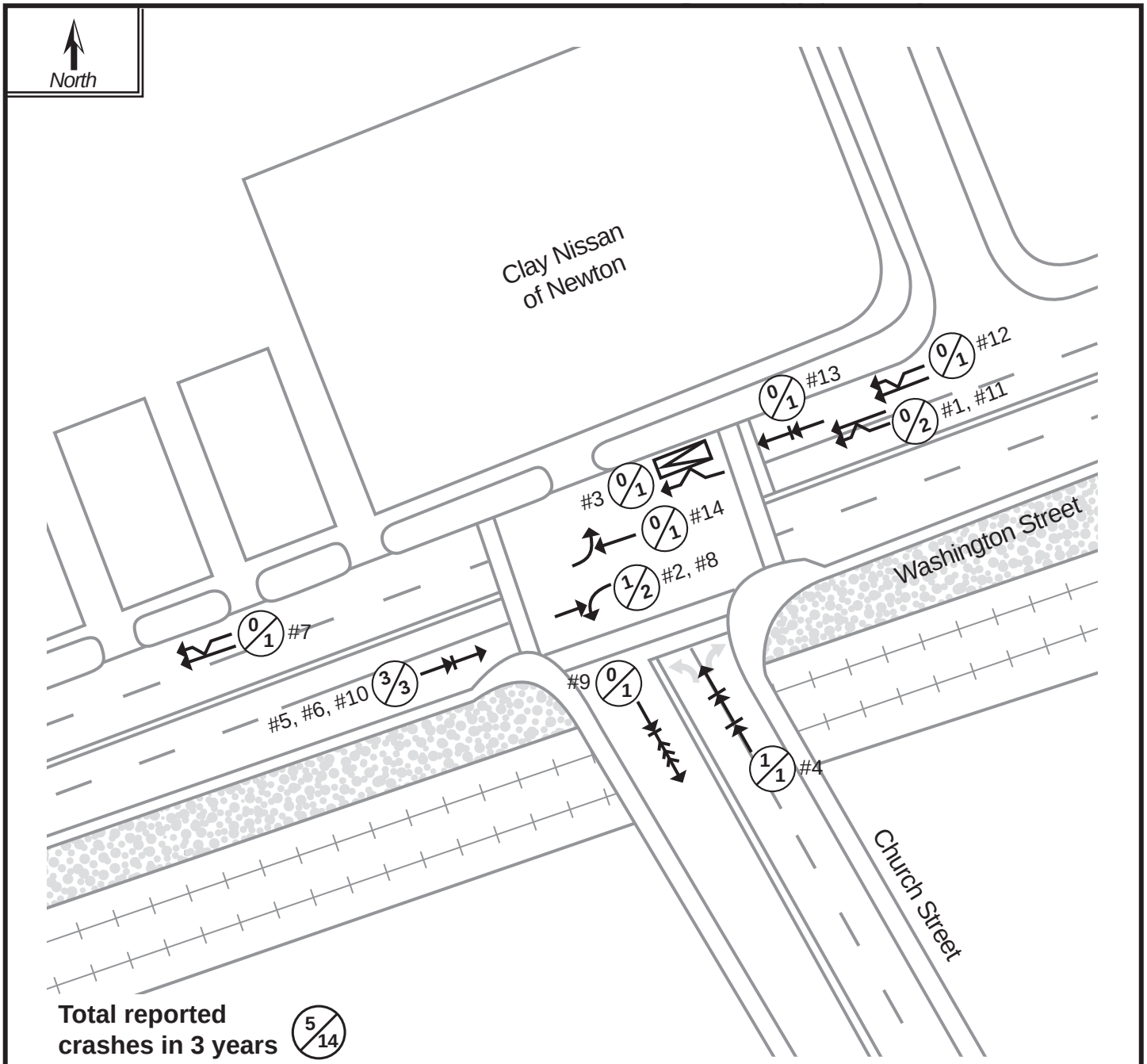


SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-8
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Jackson Road

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	2-Mar-2011	6:31 PM	Non-fatal injury	2	Rear-end	Ice	Dark - lighted roadway	-	No Improper Driving
#2	3-Feb-2011	6:36 PM	Property damage only	2	Sideswipe, same dir.	Ice	Dark - lighted roadway	-	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.
#3	12-Jul-2011	6:18 PM	Non-fatal injury	4	Rear-end	Dry	Daylight	-	Followed too closely
#4	20-Jan-2012	6:41 PM	Property damage only	2	Angle	Dry	Dark - lighted roadway	-	Made an improper turn
#5	2-Feb-2012	11:52 AM	Non-fatal injury	2	Rear-end	Dry	Daylight	-	Followed too closely
#6	9-Sep-2012	11:26 PM	Not Reported	1	Single vehicle crash	Dry	Dark - lighted roadway	-	Failure to keep in proper lane or running off road
#7	6-Dec-2012	8:41 AM	Not Reported	1	Single vehicle crash	Unknown	Daylight	-	Distracted
#8	1-Nov-2013	10:22 AM	Property damage only	3	Rear-end	Wet	Daylight	-	Followed too closely
#9	31-Dec-2013	3:10 PM	Property damage only	2	Rear-end	Dry	Daylight	-	Inattention
#10	1-Jan-2014	11:30 AM	Not Reported	2	Sideswipe, same dir.	Unknown	Daylight	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#11	12-Feb-2014	9:42 AM	Property damage only	2	Rear-end	Dry	Daylight	-	Visibility Obstructed

FIGURE F-9
Intersection Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street @ Church Street



SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE F-9
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street at Church Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	4-Feb-2011	12:35 PM	Property damage only	2	Sideswipe, same dir.	Snow	Daylight	-	Made an improper turn
#2	14-Mar-2011	9:07 AM	Non-fatal injury	2	Angle	Dry	Daylight	-	Inattention
#3	25-May-2011	1:23 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Fatigued/asleep
#4	28-Oct-2011	7:33 AM	Non-fatal injury	3	Rear-end	Ice	Daylight	-	No Improper Driving
#5	16-Nov-2011	7:41 AM	Non-fatal injury	2	Rear-end	Dry	Daylight	-	Followed too closely
#6	22-Jan-2012	8:35 PM	Non-fatal injury	2	Rear-end	Wet	Dark - lighted roadway	-	Followed too closely
#7	31-May-2012	10:42 PM	Property damage only	2	Sideswipe, same dir.	Dry	Dark - lighted roadway	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#8	4-Nov-2012	10:02 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#9	10-Dec-2012	6:45 PM	Property damage only	2	Rear-end	Wet	Dark - lighted roadway	-	Wrong side or wrong way
#10	5-Mar-2013	6:22 PM	Non-fatal injury	2	Rear-end	Dry	Dark - roadway not lighted	-	Followed too closely
#11	26-Mar-2013	7:35 PM	Property damage only	2	Sideswipe, same dir.	Dry	Dark - lighted roadway	-	Inattention
#12	30-May-2013	2:38 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Failure to keep in proper lane or running off road
#13	29-Jul-2013	5:12 PM	Property damage only	2	Rear-end	Wet	Daylight	-	Followed too closely
#14	7-Feb-2014	5:08 PM	Property damage only	2	Angle	Dry	Dark - lighted roadway	-	Inattention

APPENDIX G

Collision Diagram and Summary of Crash Reports: Roadway Segments between Major Intersections in the Corridor

FIGURE G-1
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Chestnut Street and Armory Street

#341-14

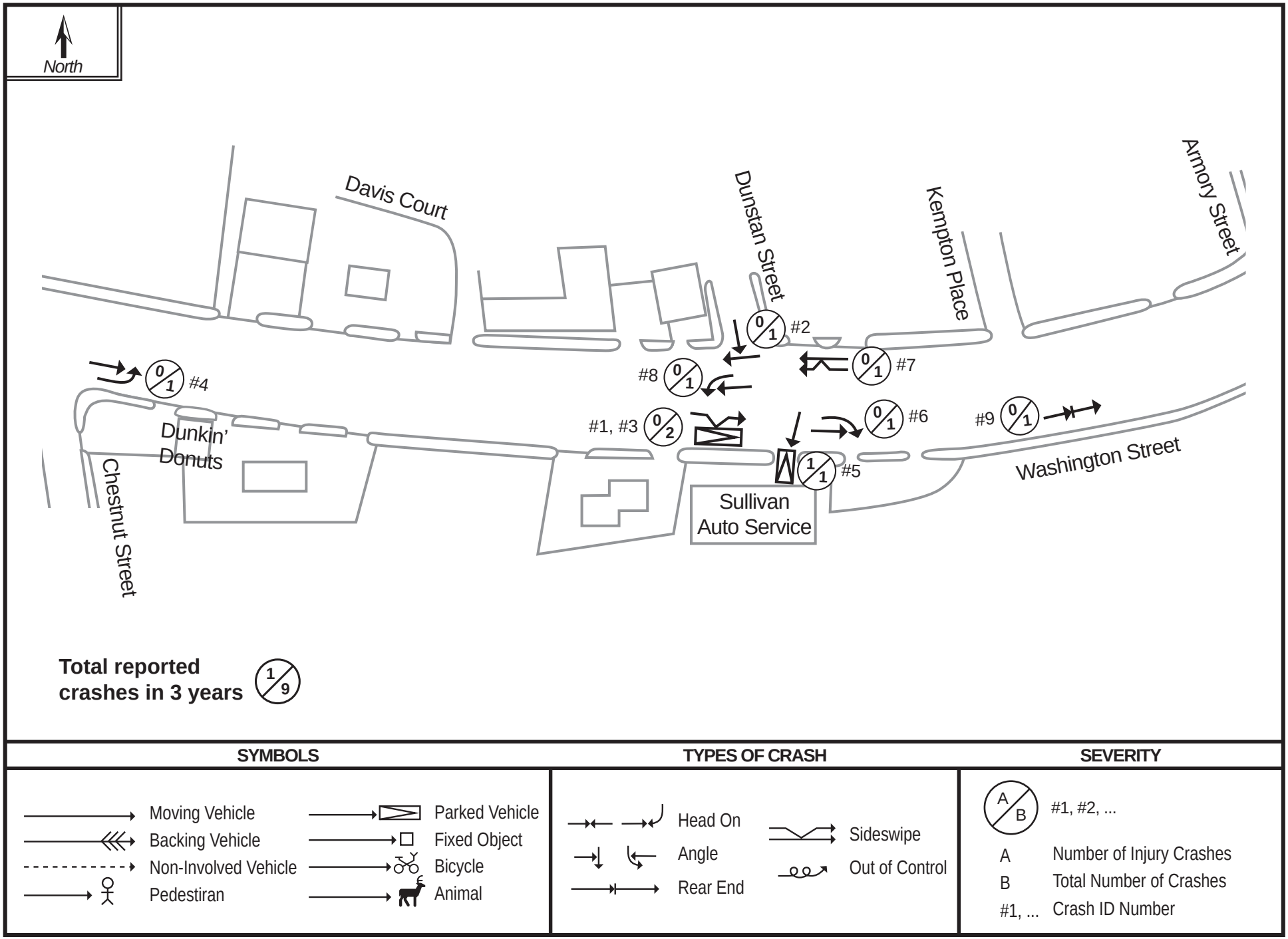
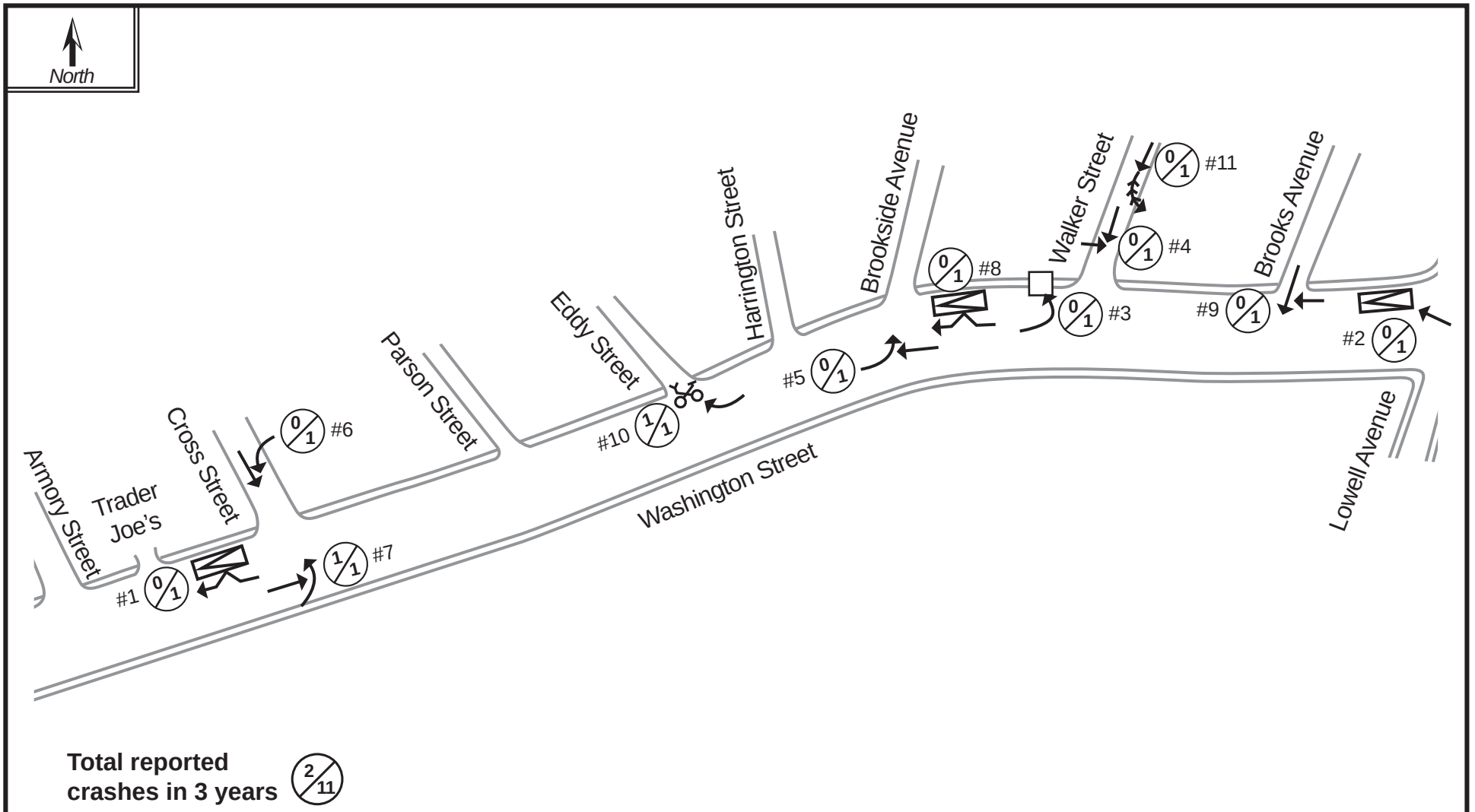


TABLE G-1
Summary of Newton Police Crash Reports January 2011–February 2014
Washington Street between Chestnut Street and Armory Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	12-Oct-2011	5:30 PM	Not Reported	2	Angle	Dry	Daylight	-	Hit and run
#2	07-Dec-2011	5:07 PM	Not Reported	2	Angle	Wet	Dark - lighted roadway	-	Failed to yield right of way
#3	13-Apr-2012	10:34 AM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#4	26-Jun-2012	10:10 AM	Property damage only	2	Angle	Dry	Daylight	-	Inattention
#5	30-Aug-2012	4:06 AM	Non-fatal injury	2	Single vehicle crash	Dry	Dark - lighted roadway	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#6	7-Oct-2012	10:06 AM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Made an improper turn
#7	2-Nov-2012	7:00 PM	Property damage only	2	Sideswipe, same dir.	Wet	Dark - lighted roadway	-	Inattention
#8	3-Dec-2012	9:17 AM	Property damage only	2	Angle	Dry	Daylight	-	Inattention
#9	10-Nov-2013	5:33 PM	Property damage only	2	Rear-end	Wet	Dark - lighted roadway	-	Followed too closely

FIGURE G-2
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Armory Street and Lowell Avenue

#341-14



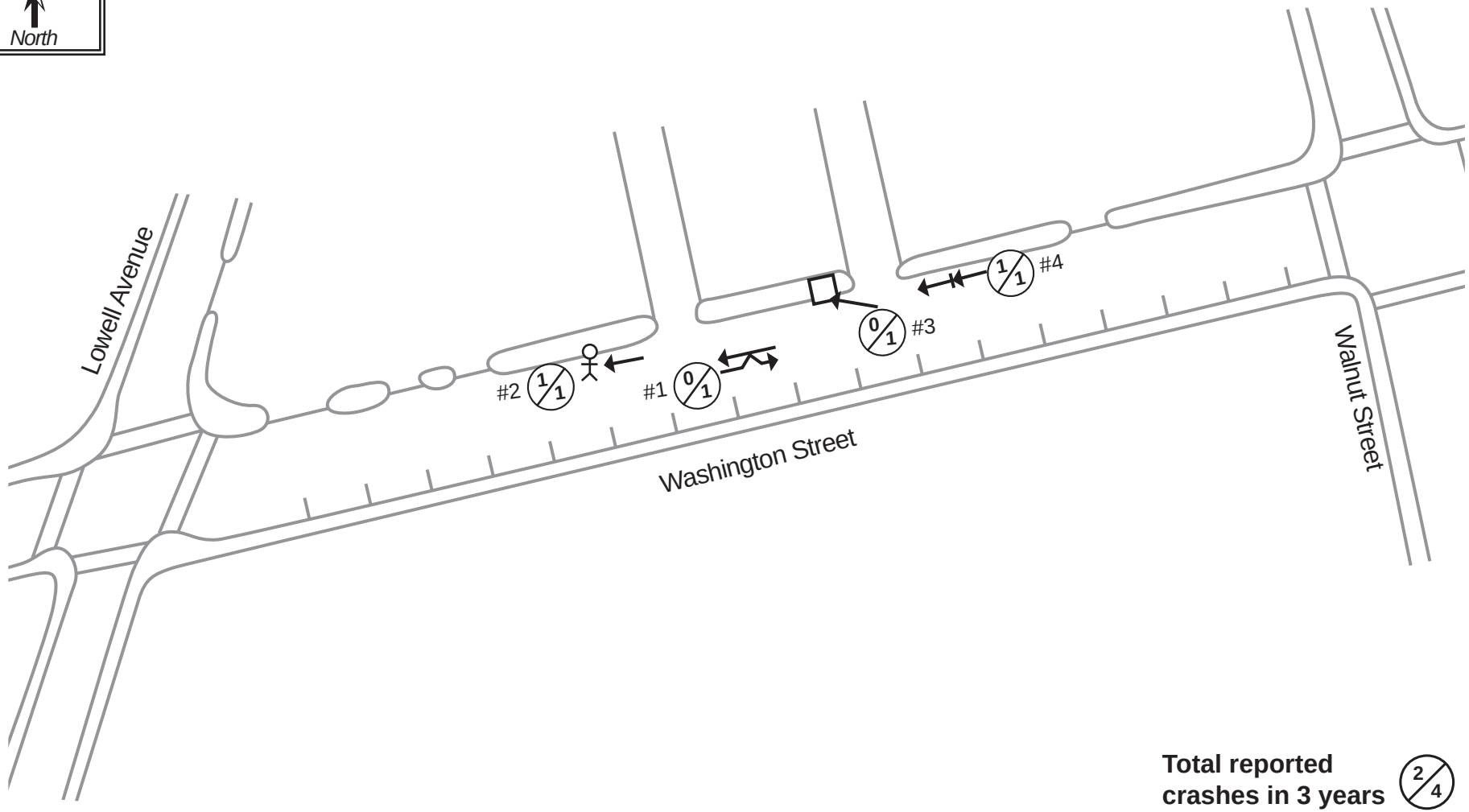
SYMBOLS	TYPES OF CRASH	SEVERITY
Moving Vehicle	Head On	A/B #1, #2, ...
Backing Vehicle	Angle	A Number of Injury Crashes
Non-Involved Vehicle	Rear End	B Total Number of Crashes
Pedestiran	Sideswipe	#1, ... Crash ID Number
Parked Vehicle	Out of Control	
Fixed Object		
Bicycle		
Animal		

TABLE G-2
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street between Armory Street and Lowell Avenue

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	22-Jan-2011	4:34 PM	Not Reported	2	Sideswipe, same dir.	Dry	Daylight	-	Hit and run
#2	19-May-2011	5:04 AM	Property damage only	2	Rear-end	Wet	Dawn	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#3	04-Jun-2011	8:29 AM	Property damage only	1	Single vehicle crash	Dry	Daylight	-	Made an improper turn
#4	30-Oct-2011	1:48 PM	Property damage only	2	Angle	Wet	Daylight	-	Failed to yield right of way
#5	5-Nov-2012	2:59 PM	Property damage only	2	Head on	Dry	Daylight	-	Inattention
#6	29-Nov-2013	8:16 AM	Property damage only	2	Angle	Dry	Daylight	-	Visibility Obstructed
#7	5-Dec-2012	9:08 AM	Non-fatal injury	2	Angle	Dry	Daylight	-	Made an improper turn
#8	10-May-2013	4:55 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#9	12-Jun-2013	9:09 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#10	14-Aug-2013	3:40 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	cyc	No Improper Driving
#11	27-Dec-2013	9:57 AM	Property damage only	2	Angle	Wet	Daylight	-	Failed to yield right of way

FIGURE G-3
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Lowell Avenue and Walnut Street

#341-14



Total reported crashes in 3 years 2/4

SYMBOLS

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

TYPES OF CRASH

- Head On
- Angle
- Rear End
- Sideswipe
- Out of Control

SEVERITY

A/B #1, #2, ...

A Number of Injury Crashes

B Total Number of Crashes

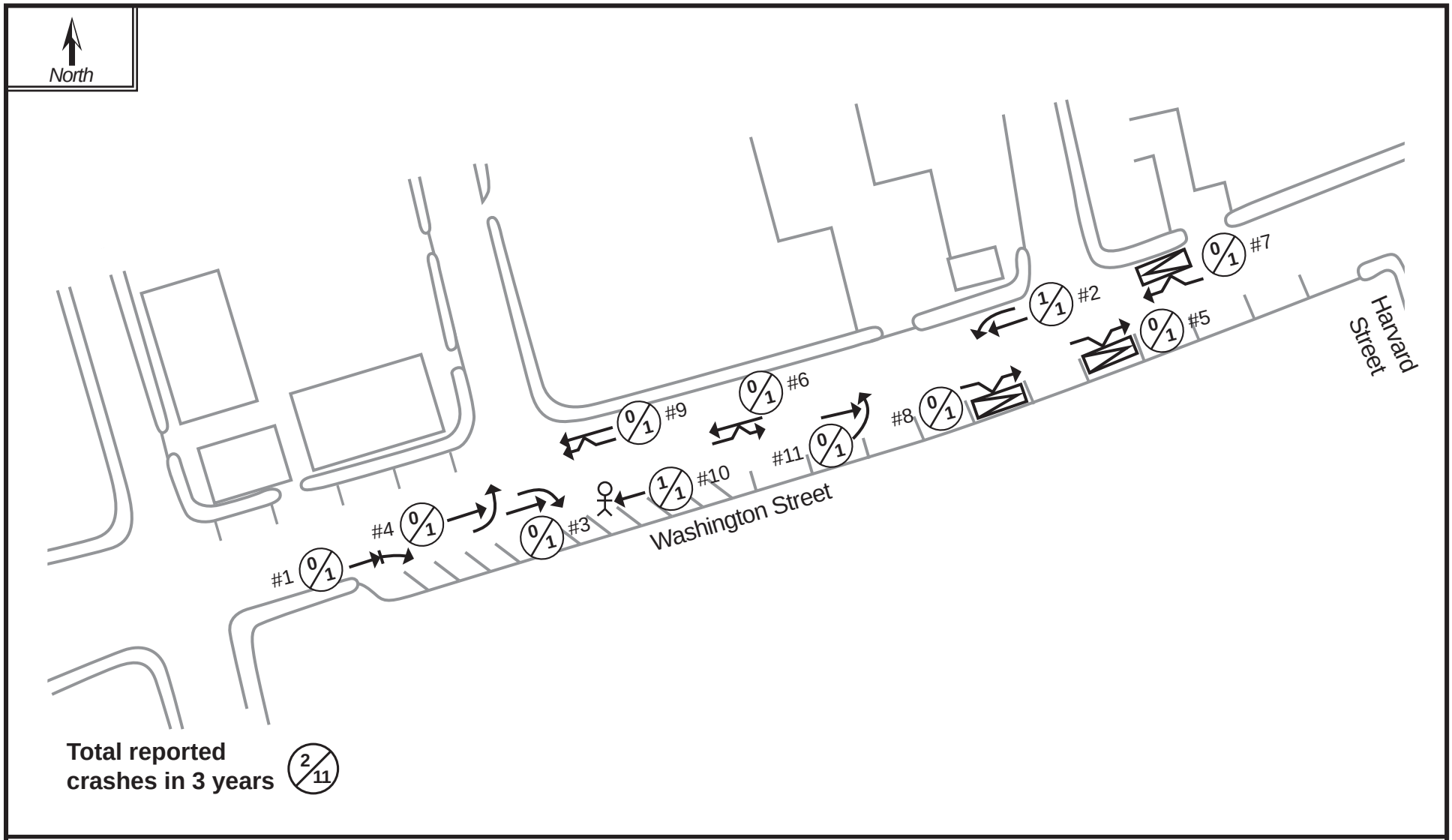
#1, ... Crash ID Number

TABLE G-3
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street between Lowell Avenue and Walnut Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	17-Feb-2011	7:19 AM	Property damage only	2	Sideswipe, opposite dir.	Ice	Daylight	-	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway, etc.
#2	3-Apr-2012	10:11 AM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	ped	Inattention
#3	2-Oct-2012	11:05 AM	Property damage only	2	Single vehicle crash	Dry	Daylight	-	Inattention
#4	30-Jan-2013	4:06 PM	Non-fatal injury	2	Rear-end	Wet	Daylight	-	Inattention

FIGURE G-4
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Walnut Street and Harvard Street

#341-14



SYMBOLS

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

TYPES OF CRASH

- Head On
- Angle
- Rear End
- Sideswipe
- Out of Control

SEVERITY

A/B #1, #2, ...

A Number of Injury Crashes

B Total Number of Crashes

#1, ... Crash ID Number

TABLE G-4
Summary of Newton Police Crash Reports January 2011–February 2014
Washington Street between Walnut Street and Harvard Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	11-Jan-2011	12:11 PM	Property damage only	2	Rear-end	Wet	Daylight	-	Followed too closely
#2	04-May-2011	7:39 PM	Non-fatal injury	2	Sideswipe, same dir.	Wet	Dusk	-	Failed to yield right of way
#3	17-Jul-2012	11:30 AM	Property damage only	2	Angle	Dry	Daylight	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#4	11-Dec-2012	12:57 PM	Property damage only	2	Angle	Dry	Daylight	-	Inattention
#5	28-Dec-2012	9:30 AM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Failure to keep in proper lane or running off road
#6	2-Jan-2013	5:12 PM	Property damage only	2	Sideswipe, opposite dir.	Dry	Dark - lighted roadway	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#7	18-Jan-2013	6:11 PM	Not Reported	2	Sideswipe, same dir.	Dry	Dark - lighted roadway	-	Hit and run
#8	2-Feb-2013	11:09 PM	Not Reported	2	Sideswipe, same dir.	Dry	Dark - lighted roadway	-	Hit and run
#9	2-Jun-2013	2:33 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#10	21-Sep-2013	7:33 PM	Non-fatal injury	1	Single vehicle crash	Dry	Dark - lighted roadway	ped	Inattention
#11	26-Sep-2013	6:11 PM	Non-fatal injury	2	Angle	Dry	Dusk	-	Made an improper turn

FIGURE G-5
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Harvard Street and Crafts Street

#341-14

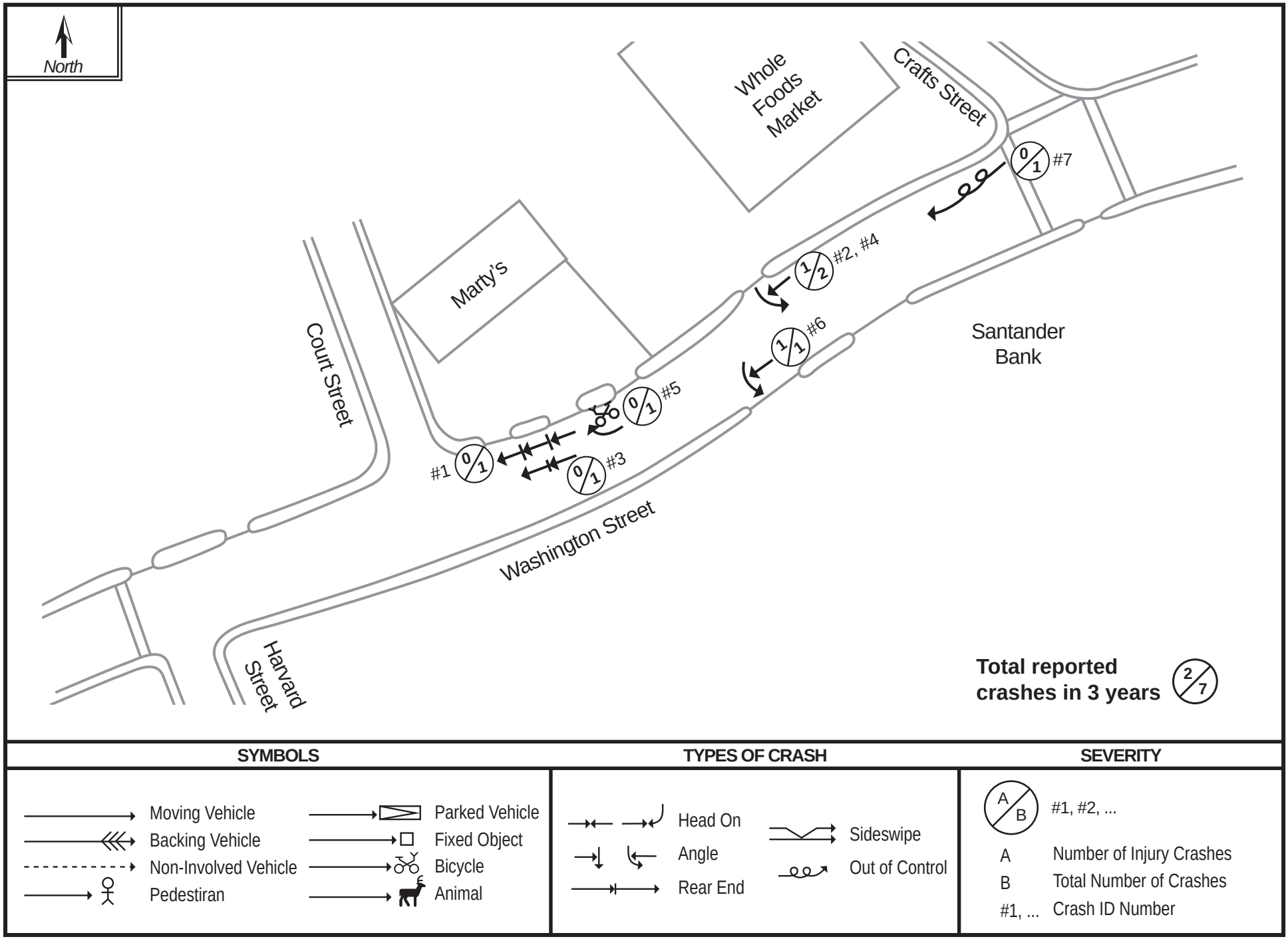


TABLE G-5
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street between Harvard Street and Crafts Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	20-Aug-2011	10:55 AM	Property damage only	3	Rear-end	Dry	Daylight	-	Driving too fast for conditions
#2	29-Apr-2012	6:25 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Visibility Obstructed
#3	9-Aug-2012	5:55 PM	Property damage only	2	Rear-end	Dry	Daylight	-	Followed too closely
#4	18-Oct-2012	8:03 PM	Property damage only	2	Angle	Dry	Dark - lighted roadway	-	Made an improper turn
#5	3-Nov-2012	6:36 PM	Not Reported	1	Single vehicle crash	Dry	Dark - lighted roadway	-	Failed to yield right of way
#6	19-May-2013	2:45 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Made an improper turn
#7	26-May-2013	2:59 PM	Property damage only	1	Single vehicle crash	Dry	Daylight	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner

FIGURE G-6
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Crafts Street and Adams Street

#341-14

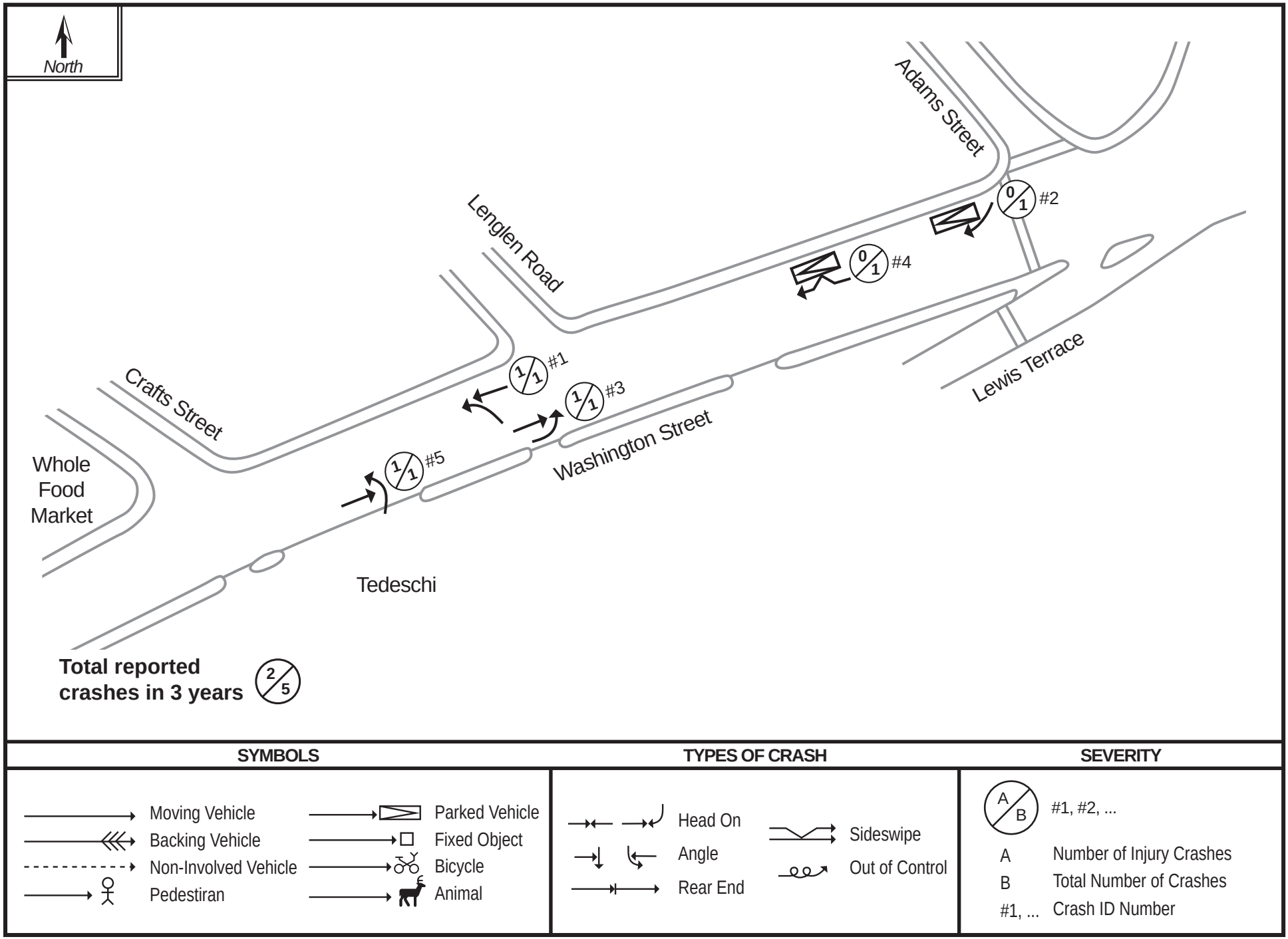


TABLE G-6
Summary of Newton Police Crash Reports, January 2011–February 2014
Washington Street between Crafts Street and Adams Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	10-Jan-2011	4:02 PM	Non-fatal injury	2	Angle	Dry	Daylight	-	Failed to yield right of way
#2	02-Mar-2011	12:45 PM	Property damage only	2	Angle	Dry	Daylight	-	Inattention
#3	22-Mar-2012	7:37 AM	Non-fatal injury	2	Angle	Dry	Daylight	-	Made an improper turn
#4	7-Mar-2013	12:18 PM	Not Reported	2	Sideswipe, same dir.	Unknown	Unknown	-	Operating vehicle in erratic, reckless, careless, negligent or aggressive manner
#5	23-Oct-2013	5:33 AM	Non-fatal injury	2	Angle	Dry	Dawn	-	Made an improper turn

FIGURE G-7
Segment Collision Diagram, Newton Police Reports 1/1/2011–2/28/2014
Washington Street between Jackson Road and Church Street

#341-14

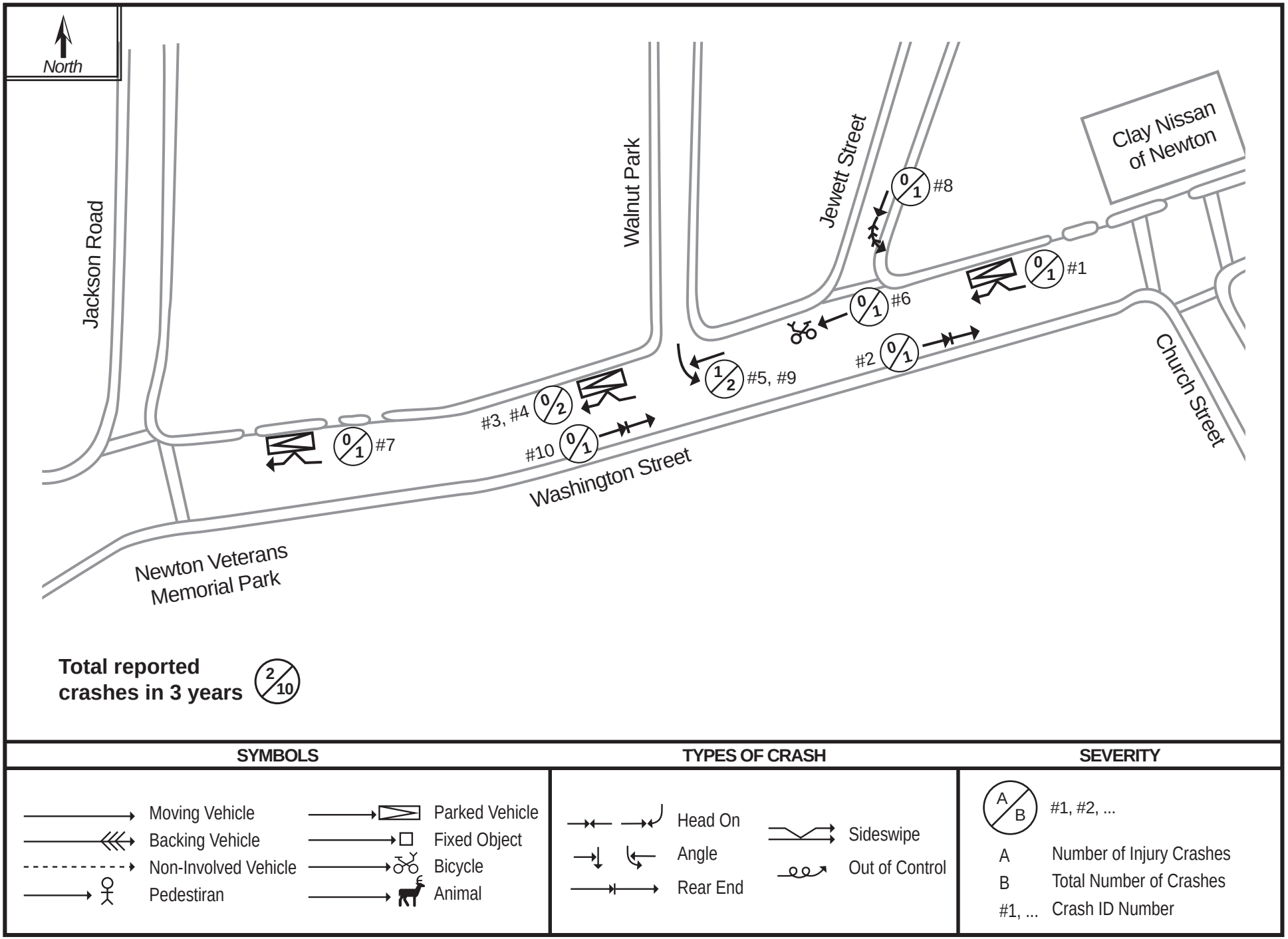


TABLE G-7
Summary of Newton Police Crash Reports, January 2011 February 2014
Washington Street between Jackson Street and Church Street

Crash Number	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Manner of Collision	Road Surface	Light Conditions	Nonmotorist Type	Contributing Factor (s)
#1	09-Aug-2011	12:34 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#2	30-Sep-2011	8:11 AM	Property damage only	2	Rear-end	Dry	Daylight	-	Followed too closely
#3	11-Oct-2011	5:44 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Followed too closely
#4	26-Oct-2011	1:53 PM	Not Reported	2	Sideswipe, same dir.	Wet	Daylight	-	Hit and run
#5	30-Nov-2011	8:19 AM	Property damage only	2	Angle	Dry	Daylight	-	Failed to yield right of way
#6	3-May-2012	12:59 PM	Non-fatal injury	1	Single vehicle crash	Dry	Daylight	cyc	Cellular telephone
#7	1-Nov-2012	2:01 PM	Property damage only	2	Sideswipe, same dir.	Dry	Daylight	-	Inattention
#8	11-May-2013	1:03 PM	Property damage only	2	Single vehicle crash	Wet	Daylight	-	Inattention
#9	17-Sep-2013	8:23 AM	Non-fatal injury	2	Angle	Dry	Daylight	-	Inattention
#10	6-Oct-2013	12:08 PM	Property damage only	2	Rear-end	Wet	Daylight	-	Inattention

APPENDIX H

Observed 85th Percentile and Average Speeds: MassDOT Spot Speed Studies

April 7–9, 2014

TABLE H-1
Summary of Washington Street Spot Speed Studies

Location 1: Washington Street west of Armory Street

Eastbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	37.0	36.9	37.8	37.2
Average Speed	30.9	31.1	31.3	31.1
Westbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	35.6	34.8	35.4	35.3
Average Speed	29.3	28.8	29.2	29.1

Location 2: Washington Street west of Cross Street

Eastbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	39.0	39.1	38.7	38.9
Average Speed	33.2	33.3	32.2	32.9
Westbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	33.9	33.9	33.9	33.9
Average Speed	27.7	27.8	26.6	27.4

Location 3: Washington Street west of Walker Street

Eastbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	37.2	37.4	38.3	37.6
Average Speed	31.9	32.2	33	32.4
Westbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	34.8	34.8	35.7	35.1
Average Speed	30.0	30.4	30.9	30.4

Location 4: Washington Street west of Harvard Street

Eastbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	34.0	33.7	34.2	34.0
Average Speed	26.6	26.5	26.6	26.6
Westbound (curb-lane only)				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	33.8	33.3	33.9	33.7
Average Speed	27.4	27.0	27.6	27.3

Location 5: Washington Street west of Adams Street

Eastbound				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	29.3	29.3	29.5	29.4
Average Speed	19.2	18.9	19.0	19.0
Westbound				
Speed Count Date	4/7 Mon	4/8 Tue	4/9 Wed	Average
85th Percentile Speed	34.1	33.6	34.1	33.9
Average Speed	28.3	27.7	28.2	28.1

DRAFT TECHNICAL MEMORANDUM

DATE: October 22, 2014
TO: Boston Region MPO
FROM: Chen-Yuan Wang, MPO Staff
RE: Washington Street Subregional Priority Roadway Study in Newton

The roadway segment of Washington Street between Chestnut Street and Church Street in Newton was selected for analysis in a study funded by the Boston Region MPO in the project for federal fiscal year (FFY) 2014: "Addressing Safety, Mobility, and Access on Subregional Priority Roadways." The study work program for this corridor was approved on September 12, 2013 and the selection was approved on December 19, 2013.

1 INTRODUCTION

This memorandum summarizes the existing conditions and issues, roadway operations and safety analyses, and proposed short- and long-term improvements for the entire study corridor and for specific locations. It contains the following sections:

1. Introduction
2. Existing Conditions and Issues
3. Crash Data Analysis
4. Roadway Operations Analysis
5. Proposed Improvements
6. Summary and Recommendations

This memorandum also includes technical appendices that contain the data and methods that were applied in the study.

1.1 Study Background

During the MPO's outreach for the development of the Unified Planning Work Program (UPWP) and the Long-Range Transportation Plan (LRTP), Metropolitan Area Planning Council (MAPC) subregional groups and other entities submit comments and identify transportation problems and issues that concern them. These issues are related to bicycle, pedestrian, and freight accommodation, bottlenecks, safety, or lack of safe or convenient access for abutters along

roadway corridors. They can affect not only mobility and safety along a roadway and its side streets, but also quality of life, including economic development and air quality.

This study was undertaken to identify roadway corridors in the MPO region that are of concern to Boston Region MPO subregional groups but that have not been identified in the LRTP regional needs assessment. It focuses on the issues that were identified by relevant subregional groups, and developing improvement recommendations to address those issues. In addition to mobility, safety, and access, the study considered transit feasibility, truck issues, bicycle and pedestrian transportation, preservation, and other topics.

1.2 Selection Procedure

The Washington Street corridor was selected through a comprehensive process. First, MPO staff identified potential study locations using various sources: soliciting suggestions during the outreach process for the FFY 2014 UPWP; reviewing meeting records from the UPWP outreach process for the past five years; and appraising potential locations from the monitored roadways in the MPO's Congestion Management Process (CMP) program.

MPO staff identified 29 roadway corridors in the MPO region as potential study locations. The staff assembled detailed data on the identified roadways and evaluated them according to five selection criteria:

- *Safety*: The location has a high crash rate for its functional class,[1] or contains areas with a high number of crashes or with a significant number of pedestrian-bicycle collisions.
- *Multimodal Significance*: The location supports transit, bicycle, or pedestrian activity, or has an implementation project to support one or more of these activities.
- *Subregional Significance*: The location carries a significant proportion of subregional vehicle, bicycle, or pedestrian traffic.
- *Subregional Priority*: The location is endorsed by a subregion and is a priority for the subregion.
- *Implementation Potential*: The location was proposed by the roadway agency or related agencies that have identified prospective funding resources for design and implementation.

[1] The location has a segment crash rate (crashes per million vehicle-miles traveled) higher than the statewide average for its functional class.

The selected corridor is a four-lane roadway that serves residents, commuters, and local businesses, and supports transit—Massachusetts Bay Transit Authority (MBTA) bus service and access to commuter rail stations on the Framingham/Worcester Line. The City of Newton expressed interest in this corridor study that focuses on 1) urban design and multiuse roadways with pedestrian and bicycle facilities; 2) improved transportation access and mobility; and 3) safety enhancements. It meets the objectives of this study, especially in supporting the transportation improvement priorities of its respective subregions.

1.3 Study Objectives

The objectives of this study were to:

- Identify the safety, mobility, access, and other transportation-related problems in the corridor.
- Develop and evaluate potential multimodal transportation solutions to the problems, including pedestrian, bicycle, truck, and transit modes.

1.4 Study Area and Data Collection

This study focuses on a two-mile corridor of Washington Street between Chestnut Street in West Newton and Church Street near Newton Corner. The selected roadway segment is under the jurisdiction of the City of Newton. Massachusetts Department of Transportation (MassDOT) Highway Division District 6 Office oversees the area's roadway system developments.

With the assistance of MassDOT and the City, MPO staff collected extensive roadway traffic and speed data; intersection turning-movement counts (including pedestrian and bicycle movements and the percentages of heavy vehicles); on-street parking regulations; adjacent developments information; and multiple-year crash reports for the study corridor.

1.5 Input from City Staff and Public Involvement

The study included significant public involvement. During the course of the study, MPO staff worked closely with the City's transportation team, with whom three major meetings were held, two of which were open to the public.

The purpose of the first meeting, hosted by the City on February 26, 2014, was to introduce the study and to get input on the issues and concerns about the study corridor from members of the public, including the area's residents, business owners, and citizen groups. The second meeting, conducted by MPO staff on July 31, 2014, focused on reviewing the findings and preliminary improvement proposals with the City's transportation team and MassDOT District 6 staff.

At the last meeting, held on November XX, 2014. MPO staff presented the study findings and improvement proposals to the City's Public Facilities and Public Safety and Transportation Committees. That meeting was open to the public.

2 EXISTING CONDITIONS AND ISSUES

This section examines the corridor's location; roadway configurations; adjacent developments; public transportation facilities; parking regulations; and observed traffic, pedestrian, and bicycle conditions. It also summarizes the issues and concerns raised in the first public meeting and learned from observations of these existing conditions.

2.1 Study Corridor and Major Transportation Facilities in the Area

Washington Street is a major regional roadway for Newton and the adjacent communities. It starts in West Wellesley (as a part of state Route 16 until Watertown Street in West Newton), runs through the heart of Wellesley, crossing and connects with Interstate 95/Route 128, passes Newton Lower Falls and Auburndale, crosses and connects with Interstate 90 (I-90, Massachusetts Turnpike), runs parallel to I-90 until Newton Corner, again crosses and connects with I-90, and continues into Brighton and Brookline.

The study corridor, between Chestnut Street and Church Street, contains most of the Washington Street corridor that is parallel to I-90 and carries a high proportion of commuting traffic. In addition, it functions like a service road for I-90 between Exit 16 (West Newton) and Exit 17 (Newton Corner), providing access to the neighborhoods in Newton, Waltham, and Watertown on both sides of I-90. Locally, the corridor links three major Newton villages (neighborhoods): West Newton, Newtonville, and Newton Corner.

Figure 1 shows the location of the study corridor and major transportation facilities in the area. Located on the north side of I-90, the entire corridor is classified as a minor urban arterial. It is a four-lane roadway with on-street parking allowed on both sides for most of its length. There are sidewalks on both sides of the roadway. The roadway, which currently contains no separate bicycle lanes, is designated as a bicycle route for advanced (experienced) cyclists (see Appendix A: Newton Bicycle Map).

The adjacent land uses are mainly multifamily residential and business, with some institutional and parkland use. The land uses in the area from between Chestnut Street and Lowell Avenue are mainly residential, except the area near West Newton (business and office). Land use in the area adjacent to Newtonville (between Lowell Avenue and Harvard Street) is mainly business. The area between Harvard Street and Church Street) are mixed, with businesses, offices,

apartments and condos, schools, institutions, and parkland (see Appendix B, Newton Zoning Map).

The study area contains a dense roadway network. The selected Washington Street corridor intersects three other minor arterials—Chestnut Street, Walnut Street, and Crafts Street—and a few collector roadways: Lowell Avenue, Lewis Terrace, Adams Street, and Jackson Road. In total, there were seven signalized intersections and a few major unsignalized intersections that had stop controls on side streets. The corridor also contains a high number of driveways from adjacent business developments.

2.2 MBTA Transit Services in the Area

In the study area, there are various transit services provided by the MBTA, include several express and local buses and the Framingham/Worcester commuter rail line. The bus routes run mainly along arterials and major collector roadways. The commuter rail line runs along the north side of I-90 just south of the study corridor. Figure 2 shows these services in the study area.

The transit services in the study corridor are four express bus routes (Routes 553, 554, 556, and 558) that run to and from Downtown Boston, and two commuter rail stations, Newtonville and West Newton, on the Framingham/Worcester Line. The four bus routes mainly serve the commuters and local travelers in Newton and Waltham. Routes 553 and 554 traverse the entire corridor, with about ten stops in each direction. Routes 556 and 558, traversing only part of the corridor, divert from the corridor at Walnut Street and Adams Street, respectively.

According to the 2008–09 MBTA Systemwide Passenger Survey, 58.8 percent of the riders of the four bus routes travel to or from Newton and 43.3 percent to or from Waltham. The survey also shows that 56.9 percent of the trips on these four bus routes are regional (Newton/Waltham–Boston) and 19.1 percent are local (Newton–Newton, Waltham–Waltham, or Newton–Waltham).

For commuter rail service, the survey focused on inbound riders, whose purpose is predominantly commuting (referred to as a “home-based work” trip purpose in the regional travel demand model) from Newton to Downtown Boston. The survey data indicate that there were 240 riders boarding the line at Newtonville Station, and 230 riders at West Newton Station. Walking and driving-parking are two major means of access. At Newtonville, about 20 percent of the riders parked their cars near the station.

Further analyses of the ridership and trip characteristics of the four bus routes and at the two commuter rail stations are presented in Appendix C.

In the study area, there are also a number of bus connections at various locations along Washington Street. At Newton Corner, the bus Routes that connect are Route 52 (Watertown–Dedham), Route 57 (Watertown–Kenmore Square), and two other express buses: Route 502 (Watertown–Copley Square) and Route 504 (Watertown–Downtown Boston). At Newtonville Station, the connection is Route 59 that runs between Needham and Watertown. At West Newton Station, the connecting bus is Route 170, which travels to Downtown Boston from Waltham. Among these bus connections, Newton Corner is especially attractive because the high number of express bus routes to Downtown Boston.

2.3 Traffic, Pedestrian, and Bicycle Volumes

The study corridor carries both local and regional traffic from residents and businesses in the study area and vicinity. It is also an alternative commuting route to I-90 for people working in Boston, Brookline, Newton, and adjacent communities. Based on the traffic counts conducted by MassDOT for this study in April 2014, the corridor carried about 14,000 to 26,000 vehicles per weekday.

Figure 3 shows traffic volumes on Washington Street and at major intersections in the study corridor. The volumes represent recently observed traffic flows in the morning and evening peak hours of a typical weekday. As a reference, average daily traffic (ADT) volumes at eight locations in the corridor are also cited in Figure 3. Generally the daily volumes in the westbound direction are about 3 to 4 percent higher than in the eastbound direction at almost all of the count locations.

The traffic volumes increase gradually from the western to the eastern segments in the corridor. In the morning, traffic gradually feeds into the corridor from local streets, Lowell Avenue, Walnut Street, Harvard Street, Crafts Street, Adams Street, and Jackson Road, mainly in the eastbound direction. Some traffic leaves the corridor, but the most of the traffic continues to Newton Corner. In the evening, the corridor has a reverse traffic pattern, with traffic peaking in the westbound direction and gradually leaving the corridor.

Turning movements at major intersections in the corridor were also collected for the study, in 15-minute intervals between 7:00 to 9:00 AM and 4:00 to 6:00 PM. Traffic movements in the morning and evening peak hours were then identified and summarized for operational analyses. In general, the signalized intersections carry a total volume of entering vehicles ranging from 1,450 (at Chestnut Street) to 2,650 vehicles (at Jackson Road) per peak hour, and the unsignalized

intersections carry a total volume ranging from 1,150 (at Armory Street) to 1,650 vehicles (at Harvard Street) per peak hour.

It is essential to examine the proportion of heavy-vehicle traffic in a corridor, since an unusually high share of heavy vehicles (trucks and buses) may seriously affect roadway and intersection operations. The recent counts indicate that the study corridor carries a heavy-vehicle percentage that is lower than the average for urban minor arterials, at about 2 percent to 3 percent of the daily traffic and at 1 percent to 2 percent of the peak-hour traffic.

The intersection turning-movement counts also include pedestrian crossings and bicycle counts. The pedestrian crossing counts indicate that pedestrians are active in the study corridor, especially in the business districts in Newtonville. The intersection of Washington Street at Walnut Street has about 100 to 150 pedestrian crossings per peak hour.

The bicycle counts at major intersections indicate that on average five to ten bicycles travel on or cross the corridor per peak hour on a spring weekday. Intersections on major bicycle routes, such as Jackson Road, Adams Street, and Walnut Street, carry higher bicycle volumes (about 11 to 14 bicycles per peak hour). Note that these observations were performed on April 9, 2014, a relatively cold early spring day. The volumes are assumed to be higher in the late spring, summer, and early fall.

2.4 On-Street Parking Conditions

There is on-street parking on both sides of the roadway in most segments of the corridor. In total, there are 558 parking spaces, under varying regulations depending on their locations. They comprise 357 spaces on the south side and 201 spaces on the north side.[2]

Table 1 summarizes the parking regulations for these spaces. For some of the spaces, the number of spaces is estimated by using 22 feet per space length, since those spaces are not metered and have no space delineation.

[2] Off-street parking is limited in the corridor. They are mainly associated with three major commercial developments: Whole Foods Market, Marty's, and Trader Joe's.

TABLE 1
Summary of Parking Spaces by Regulation

Parking Regulation	South Side	North Side	Both Sides
Meter: 1-hour limit	0	60	60
Meter: 2-hour limit	19	21	40
Meter: 12-hour limit	107	0	107
Free: 1-hour limit	4	12	16
Free: 2-hour limit	50	25	75
No regulation	177	83	260
Total	**357**	**201**	**558**

Tables 2 and 3 further summarize the parking spaces by the street segment, by the associated land use, and by regulation, for the south and north side, respectively. In general, the spaces are metered, with a 1-, 2-, or 12-hour limit in the business areas, or free with 1-hour, 2-hour limits or with no limit in the residential and other areas. The 12-hour metered parking spaces, 107 in total, are distributed around Newtonville Station and are mainly intended for commuter rail riders.

TABLE 2
Summary of South Side Parking Spaces by Location and Regulation

Street Segment	Land Use	Regulation	Number of Spaces
Chestnut Street - Armory Street	Commercial	No regulation	30
	N/A	No regulation	24
Armory Street - Lowell Avenue	N/A	No regulation	100
Lowell Avenue - Walnut Street	N/A	Meter: 2-hour limit	7
	N/A	Meter: 12-hour limit	17
Walnut Street - Harvard Street	N/A	Meter: 2-hour limit	12
	N/A	Meter: 12-hour limit	69
Harvard Street - Crafts Street	N/A	Meter: 12-hour limit	21
	Commercial	Free: 1-hour limit	4
Crafts Street - Jackson Road	Commercial/office/ residential	No regulation	23
Jackson Road - Church Street	N/A	Free: 2-hour limit	50
Total			**357**

N/A = not applicable (vacant or adjacent to commuter rail tracks)

TABLE 3
Summary of North Side Parking Spaces by Location and Regulation

Street Segment	Land Use	Regulation	Number of Spaces
Church Street - Jackson Road	Residential/office	Free: 1-hour limit	12
	School/office/residential	Free: 2-hour limit	25
Jackson Road - Crafts Street	Institutional	Prohibited	0
Jackson Road - Crafts Street	Residential	No regulation	7
Crafts Street - Harvard Street	Commercial	Prohibited	0
	Commercial	Meter: 2-hour limit	9
Harvard Street - Walnut Street	Commercial	Meter: 1-hour limit	30
	Commercial	Meter: 2-hour limit	12
Walnut Street - Lowell Avenue	Commercial	Meter: 1-hour limit	20
Lowell Avenue - Armory Street	Residential/commercial/office	No regulation	52
Armory Street - Chestnut Street	Commercial/office/residential	No regulation	24
	Commercial	Meter:1-hour limit	10
Total			**201**

The short-term (1-hour and 2-hour) metered spaces in Newtonville are frequently utilized (about 80 percent or more of the spaces are occupied), especially in the area adjacent to Walnut Street. The 12-hour parking spaces distributed between Lowell Avenue and Crafts Street are generally underutilized (about only half of the spaces are occupied).

Between Crafts Street and Jackson Road, the free and metered parking spaces for adjacent businesses, offices, and residences are generally utilized during business hours. Between Jackson Road and Church Street, the free short-term parking spaces are generally fully occupied during the day. They are intended for visitors of the adjacent schools, institutions, offices, Newton Veterans Memorial Park, and the residences and offices near Church Street. However, some of the spaces might be used by Boston-bound commuters and visitors who are transferring to buses at Newton Corner.

2.5 Issues and Concerns

In the February study-scoping meeting, which was also a listening session, residents and business owners raised a number of issues and concerns related

to the safety and operations of the corridor. Their comments, summarized by location and issue category, are in Appendix D.

The issues and concerns for the corridor in general, based on comments from the meeting and the above existing conditions analyses, are summarized below:

- High travel speeds and unsafe conditions for all users due to multiple-lane traffic operations
- Difficult and unsafe pedestrian crossings, including access to bus stops
- Lack of bicycle accommodations
- High number of pedestrian and bicycle crashes
- Inconvenient and unsafe access from Washington Street to adjacent businesses and residences
- Limited sight distances to Washington Street from side streets due to roadway geometry and parking at street corners
- Parking management and enforcement issues
- Noise from I-90
- Insufficient lighting

3 CRASH DATA ANALYSIS

Crash data are an essential source for identifying safety and operational problems in a study area. Analyses of crash locations, collision types, time-of-day, roadway conditions, and other factors also assist in developing improvement strategies. Staff collected two sets of data for the analyses. The two datasets are:

- 2007–11 MassDOT Registry of Motor Vehicles (RMV) Division Crash Data
- Recent three-plus-years (January 2011 through February 2014) crash reports from the Newton Police Department

The five-year MassDOT data were used to examine the crash locations and crash rates. The Newton police reports were used to construct collision diagrams for further analysis of safety and operational problems at major intersections and in different segments.

3.1 Crash Locations and Crash Rates

Figure 4 shows the crash locations and the crash rates at major intersections and in different segments of the corridor during the five-year period 2007–11. Among the total 434 crashes, 267 were identified as having occurred at nine major intersections and 167 in different segments between those intersections.

The Crash rates at the intersections and in the roadway segments were calculated. Among the seven signalized intersections, the crash rates at Chestnut Street (0.96), Adams Street/Lewis Terrace (1.05), and Church Street (0.90) are higher than the MassDOT District 6 average of 0.76 crashes per million entering vehicles. The crash rate at the Walnut Street intersection is calculated as 0.69 crashes per million entering vehicles, which is close to the District 6 average.

For unsignalized intersections, the crash rate at Armory Street (1.04) is higher than the MassDOT District 6 average of 0.58 crashes per million entering vehicles, and the crash rate at Harvard Street is 0.49 crashes per million entering vehicles, which is slightly lower than the District 6 average.

The segment crash analysis indicates that the crash rates in the mostly business segments, Chestnut Street–Armory Street (5.13), Lowell Avenue–Walnut Street (5.87), Walnut Street–Harvard Street (4.80), and Harvard Street–Crafts Street (6.70), are all higher than the state average for urban minor arterials of 3.63 crashes per million miles traveled. The crash rates in the mostly institutional and office segments, Crafts Street–Adams Street (2.21) and Jackson Road–Church Street (2.02), are lower than the state average. The crash rate in the mostly residential segment, Armory Street–Lowell Avenue (1.60), is much lower than the state average.

3.2 Pedestrian and Bicycle Crashes

Figure 4 also shows the pedestrian and bicycle crash locations in the corridor that were identified from both of the datasets in the recent period of slightly more than seven years. In total, 20 pedestrian crashes and 16 bicycle crashes were identified at various locations in the corridor.[3]

In average, about five crashes involved at least one pedestrian or a cyclist per year in the corridor. Based on the judgment of MPO staff, this crash rate is relatively high for urban minor arterials in the region. Locations with a high rate of pedestrian and bicycle crashes are:

- Adams Street/Lewis Terrace Intersection: five bicycle crashes (2010–12) and three pedestrian crashes (2007–09)

[3] In this study, the term “pedestrian crashes” refers to the crashes that involve at least one vehicle and one pedestrian and the term “bicycle crashes” refers to crashes involving at least one vehicle and one bicycle. No crashes between at least one bicycle and one pedestrian were identified from the available data.

- Segment adjacent to Newtonville Station: three pedestrian crashes (2010, 2012, 2013) and one bicycle crash (2010)
- Walnut Street Intersection: two pedestrian crashes (2007, 2008) and one bicycle crash (2012)
- Lowell Avenue Intersection: two bicycle crashes (2008, 2013) and one pedestrian crash (2010)
- Segment between Walnut Street and Lowell Avenue: three pedestrian crashes (one in 2010 and two in 2012)
- Chestnut Street Intersection: three pedestrian crashes (2011–13)
- Crafts Street Intersection: two pedestrian crashes (2007, 2009) and one bicycle crash (2012)[4]

3.4 Intersection Crash Analyses

To further investigate safety and operational problems, the staff summarized the crash data for the study intersections according to crash severity (property damage only, non-fatal injury, fatality, unknown), collision type (single-vehicle, rear-end, angle, sideswipe, head-on, rear-to-rear, unknown), pedestrian or bicycle involvement, time of day, pavement conditions, and light conditions.

Crash statistics for the intersections each dataset are summarized in Table E-1 and Table E-2 in Appendix E, respectively. The data show that the number of crashes in the three recent years at Chestnut Street, Armory Street, Lowell Avenue, Harvard Street, and Church Street has been trending somewhat lower, while the number of crashes at Walnut Street Intersection has increased slightly. The other intersections remain about the same.

The collision diagrams for the intersections were constructed by using the recent crash reports provided by Newton Police Department, which cover more than three years. The crash reports contain detailed information about how and where those crashes occurred. The collision diagrams for the intersections, in order from west to east, are in Appendix F. The date and time, severity, collision type, road conditions, and contributing factors for each of the crashes used in the analysis are also summarized in tables that follow their respective collision diagrams, in Appendix F.

Major factors and findings from the collision diagrams for each of the intersections are summarized below:

[4] The intersection was reconstructed in 2012, with countdown pedestrian signals installed.

Washington Street at Chestnut Street (Figure F-1 and Table F-1)

- High westbound left-turn traffic volume during peak hours
- Most crashes involved a westbound left-turning vehicle
- Two pedestrian crashes in the last two years

Washington Street at Armory Street (Figure F-2 and Table F-2)

- A popular Trader Joe's is located at the intersection.
- The low-volume Armory Street traffic, under a stop control, mainly increasing in the PM peak hour and weekend midday hours.
- Most Trader Joe's traffic exits from its driveway east of the intersection, not from Armory Street.
- Noticeable number of crashes at the Trader Joe's driveway.

Washington Street at Lowell Avenue (Figure F-3 and Table F-3)

- Located in the path to Newton North High School
- No noticeable patterns of crashes
- One bicycle crash in 2013
- One pedestrian crash in 2012

Washington Street at Walnut Street (Figure F-4 and Table F-4)

- High number of crashes in recent years
- High number of left-turn crashes
- Four crashes possibly related to the parking maneuvers near the intersection
- One pedestrian crash and one bicycle crash in 2012

Washington Street at Harvard Street (Figure F-5 and Table F-5)

- Unsignalized intersection adjacent to the stairs from Harvard Street to the Newtonville Station commuter rail platform
- Recently installed hybrid pedestrian crossing warning beacon
- No pedestrian or bicycle crash at the intersection
- One bicycle crash involving a parked car near the intersection
- All of the crashes involve a parked vehicle

Washington Street at Crafts Street (Figure F-6 and Table F-6)

- Recently reconstructed intersection (2012) with pedestrian countdown signals

- High number of crashes related to parking at, and exiting from, the adjacent Tedeschi Food Shops, which appears to be in decline after the intersection was reconstructed
- One bicycle crash in 2011

Washington Street at Adams Street/Lewis Terrace (Figure F-7 and Table F-7)

- High traffic volumes on all approaches during peak hours
- High number of crashes in recent years
- High number of left-turn crashes
- Four bicycle crashes in 2011–12

Washington Street at Jackson Road (Figure F-8 and Table F-8)

- Traffic signals under the same controller at Adams Street/Lewis Terrace
- High traffic volumes on Washington Street during peak hours
- Mostly rear-end collisions on Washington Street
- No pedestrian or bicycle crashes

Washington Street at Church Street (Figure F-9 and Table F-9)

- High traffic volumes on Washington Street during peak hours
- Limited space between on-street parking and travel lanes
- High number of rear-end and sideswipe collisions on Washington Street
- No pedestrian or bicycle crashes

3.5 Segment Crash Analyses

Based on the Newton Police crash reports, MPO staff constructed collision diagrams for the segments between major intersections. The collision diagrams for these segments, in order from west to east, are included in Appendix G. The date and time, severity, collision type, road conditions, and contributing factors for each of the crashes used in the analysis are summarized in tables that follow their respective segments, in Appendix G.

In general, the segments that have commercial developments experience many more crashes than those with residences, offices, and institutions. Major findings from the analyses of all of the segment collision diagrams are summarized below:

- Nearly 25 percent of the total crashes involved a parked or parking vehicle, mainly in the commercial segments

- About 20 percent of the total crashes were related to accessing adjacent commercial developments, that is, involving a vehicle going to and from these developments[5]
- Two midblock-crossing pedestrian crashes, one near the post office and one near Newtonville Station
- Three bicycle crashes, two involving a turning vehicle and one rear-ended

4 ROADWAY OPERATIONS ANALYSIS

To address issues and concerns related to roadway operations, this section examines the roadway's prevailing travel speeds, existing roadway cross-sections, and operations at major intersections, and explores an alternative roadway design for accommodating pedestrians and bicycles and improving access to and from adjacent developments. It also examines the roadway's operations under various projected future-year traffic conditions.

4.1 Roadway Travel Speeds

High travel speeds in the corridor are a major concern of the area's residents. In order to understand about how fast drivers travel in the corridor, MPO staff requested MassDOT's assistance in collecting spot speeds during the period when automatic traffic counts were being conducted, in April 2014. The speed counts were collected at five selected locations in the corridor from April 7 to April 9. Appendix H summarizes the average and 85th percentile speeds for each location.

The "85th percentile" is the principal value used for establishing speed controls. It is the speed at or below which 85 percent of vehicles passing a given point are traveling. Currently most segments in the corridor are posted with a 35 mph (miles per hour) speed limit, except for the segments west of Davis Court and east of Jewett Street, where the speed limits are 25 mph.

Table 4 shows the observed 85th percentile speeds and the posted speed limits at the five locations in the corridor.[6] In general, the eastbound speeds gradually decrease from west to east and the westbound speeds gradually increase from east to west. The 85th percentile speeds indicate that most vehicles in the

[5] The percentage does not include some rear-end collisions that might have been caused by a vehicle on Washington Street waiting to turn into adjacent developments.

[6] Data shown in Table 4 are the average of three weekdays' observations from April 7 to 9 in 2014. The 85th percentile speeds were derived from spot speed data collected from automatic traffic recorders. To establish or modify speed controls, MassDOT requires that data be collected using radar or laser guns at critical locations for an area not to exceed 0.25 miles, in addition to vehicle trial runs in the study area.

corridor travel within a range of plus or minus 5 mph of the 35-mph speed limit. Note that roadside construction works on water supplies were ongoing in the corridor and most of the speed counts were performed only on the curb lane in both directions (except the last location). Because of these factors, the actual travel speeds should be assumed to be somewhat higher than those shown in Table 4.

TABLE 4
Observed 85th Percentile Speeds in the Corridor

Speed Study Location	Eastbound Speed	Westbound Speed	Posted Speed Limit
1. Washington Street west of Armory Street	37.2 mph	35.3 mph	35 mph
2. Washington Street west of Cross Street	38.9 mph	33.9 mph	35 mph
3. Washington Street west of Walker Street	37.6 mph	35.1 mph	35 mph
4. Washington Street west of Harvard Street	34.0 mph	33.7 mph	35 mph
5. Washington Street west of Adams Street	29.4 mph	33.9 mph	35 mph

The nearly 40 mph travel speeds observed at the different locations in the corridor are not considered unusual for roadways with a speed limit of 35 mph. The current speed regulations in the corridor generally comply with the MassDOT speed zoning requirements.[7]

Simply lowering the speed limit in the corridor would not slow down the traffic. That would have to be accomplished through roadway redesign.

4.2 Existing Roadway Cross-Sections

The top graphic in Figure 5 shows a roadway cross-section that is typical of most segments of the study corridor, presenting the street view of an eastbound driver. The four-lane roadway generally has two travel lanes (about 11.5 feet wide each) and on-street parking (about seven feet wide) in each direction. There are no separate bicycle lanes. Cyclists usually have to ride with the outside-lane traffic and close to the parked (or being parked) vehicles.

There are sidewalks on both sides of the roadway. On the north side, they are eight feet wide in most of the corridor segments. Some sidewalks in the

[7] MassDOT procedures for speed zoning require that at speed observation locations, the established safe speed shall not be more than 7 mph below the 85th percentile speed, and not higher than the 95th percentile speed. See *Procedures for Speed Zoning on State and Municipal Roadways*, MassDOT Highway Division, May 2012.

commercial districts have a width of 10 to 12 feet, mainly in the area west of Armory Street. On the south side, they are generally located next to the commuter rail fence, and have a width of five feet or less. Some are unpaved in the areas that are far from the commercial districts.

Most of the segments in the corridor have a roadway surface width (curb to curb) of about 60 feet. Some segments in the residential districts, from Armory Street to Lowell Avenue, have a surface width of 58 feet or less. The segment adjacent to Newtonville Station has a roadway surface that is wider than other segments in the corridor, at about 80 to 85 feet.

The bottom graphic in Figure 5 shows that the segment adjacent to Newtonville Station has a roadway width of about 80 to 85 feet. It contains four 12-foot travel lanes, 7-foot parallel parking on the north side, and 60-degree angle parking on the south side that takes about 25 to 30 feet of roadway width. There are sidewalks on both sides of the roadway. There are no bicycle lanes. Although on the south side bicycles have a wider space between the angle parking and the outside-lane traffic, it is difficult for drivers who are backing out from the angle parking to see them, making this an unsafe area for bicyclists.

Some of the major issues and concerns related to the existing roadway include:

- Lack of separate or safe bicycle accommodations
- Four through traffic lanes (two in each direction) permitting fast traffic
- Unsafe pedestrian crossings
- Lack of safe and convenient turning lanes for accessing adjacent developments
- On-street parking and the outside-lane traffic encroaching on each other
- Narrow or discontinuous sidewalks on the north side
- Frequent curb cuts in some commercial districts

4.3 Potential Roadway Cross-Sections (Designs)

The recent counts indicate that most segments of the corridor (about 70 percent) carry an average daily traffic of fewer than 20,000 vehicles. These segments have the potential for a “road diet” application, which involve reducing the number of travel lanes from four to three in order to accommodate bicycles and improve safety for pedestrians crossing the roadway and for vehicles accessing adjacent developments.

The top graphic in Figure 6-1 shows the potential three-lane roadway cross-section that could be applied to most of the existing four-lane roadway. The cross-section contains a 12-foot center median or left-turn-only lane, two 11-foot travel lanes (one in each direction), two 6-foot bicycle lanes (one in each direction), and a 7-foot lane parking on both sides.[8]

The 6-foot bicycle lane would provide a slightly larger buffer zone separating bicycles from the parking lane and from adjacent traffic than a standard 5-foot bicycle lane. In this cross-section, pedestrians could stop at the center median and cross only one lane of traffic at a time. Meanwhile, vehicles could stay in the center left-turn lane to access the adjacent developments. It's much safer for both the turning and through vehicles.

For the roadway segments that are not suitable for the "road diet" application, the bicycle accommodation could be accomplished by slightly reducing the width of travel lanes and removing on-street parking from one side of the roadway (mainly the south side). As shown in the bottom graphic in Figure 6-1, the proposed cross-section contains four 10.5-foot travel lanes (two in each direction), two 6-foot bicycle lanes (one in each direction), and a 7-foot parking lane on one side of the roadway.

The analysis in Section 2.4 indicates that many on-street parking spaces are currently not fully utilized, especially on the south side. However, removing parking in these segments would be likely to impact the adjacent developments. On the other hand, it would provide a safe, separate accommodation for bicycles and would reduce unsafe pedestrian crossings. The goal of this study was to preserve, as many of the parking spaces in the business districts of the corridor as possible.

Taking into consideration the variations in roadway configurations, adjacent land uses, and pedestrian and bicycle activities, MPO staff proposed two alternative three-lane cross-sections. Figure 6-2 shows the two alternative cross-sections, one for business districts with closely spaced driveways, and one for residential districts with limited roadway surface width.

The top graphic in Figure 6-2 shows the potential three-lane roadway cross-section for business districts with intensive driveways. The cross-section contains

[8] A three-lane cross-section such as this is not limited to roadways with a daily traffic volume of fewer than 20,000 vehicles. Its application depends on a number of factors, including traffic flow patterns, the spacing of major intersections, adjacent land uses, and consideration of modes other than motor vehicles. A recent MassDOT project for improving Needham Street in Newton, which carries about 25,000 vehicles per weekday, had proposed a similar three-lane cross-section.

a 12-foot two-way left-turn (TWLT) lane or center median (striped or concrete-stamped), two 15-foot shared lanes for motor vehicles and bicycles (one in each direction), and a 7-foot parking lane with a 2-foot buffer from the shared lane, on both sides of the roadway.

This cross-section could potentially be applied to the business district near West Newton between Chestnut Street and Kempton Place. The TWLT lane would provide access to the dense business developments on both sides of the roadway. The wide shared lane would be more practical than separate bicycle lanes, which would be discontinuous and have frequent intrusion by turning vehicles.

The bottom graphic in Figure 6-2 shows the potential three-lane roadway cross-section for residential districts that have limited roadway width. The cross-section contains a 12-foot center median (raised) or left-turn-only lane, two 11-foot travel lanes (one in each direction), two 6-foot bicycle lanes (one in each direction), and a 7-foot parking lane on the north side of the roadway.

This cross-section could potentially be applied to the residential districts between Cross Street and Walker Street, where the roadway surface width (about 58 feet or less) is narrower than in other segments of the corridor and most of the on-street parking areas on the south side are vacant. The proposed roadway surface would be about 53 feet wide. The remaining space, which is 5 feet or less, could be used to increase the sidewalk space on the south side so that pedestrians and cyclists would have more buffer space between the sidewalk and the adjacent commuter rail tracks.

4.4 Existing Conditions at Major Intersections

The corridor contains seven signalized intersections and two major unsignalized intersections. These are the major locations that could affect traffic flow and pedestrian and bicycle movements in the corridor.

Based on the recently collected turning-movement data, MPO staff constructed AM and PM peak-hour traffic models for the entire corridor by using the Synchro traffic capacity and simulation program.[9] Table 5 summarizes the capacity analyses for six of the seven signalized intersections. The intersection of Washington Street at Chestnut Street is not included in the table, as its traffic signal is part of a coordinated system of a series of signals in the West Newton Square area. The signal system is currently being reviewed by the City.

[9] Synchro Version 8.0 was used for the analyses. This software is developed and distributed by Trafficware Ltd. It can perform capacity analysis and traffic simulation (when combined with SimTraffic) for an individual intersection or a series of intersections in a roadway network.

TABLE 5
Intersection Capacity Analyses
Existing (2014) Conditions

	AM Peak Hour					PM Peak Hour				
Name of Cross Street	**LOS[1]**	**Avg. Delay[2]**	**50th PQ[3]**	**95th PQ[4]**	**Cong. App.[5]**	**LOS**	**Avg. Delay**	**50th PQ**	**95th PQ**	**Cong. App.**
Lowell Avenue	C	21.8	100	260	None	C	25.7	145	300	None
Walnut Street	D	38.3	300	435	None	D	36.7	160	570	None
Crafts Street	E	73.9	370	495	SB	D	50.9	295	380	SB
Adams Street/ Lewis Terrace	D	37.1	250	325	SB	D	35.7	30	120	SB
Jackson Road	D	48.9	100	150	None	C	25.4	375	470	None
Church Street	C	21.3	190	570	None	C	20.5	160	535	None

[1] Level of service: A to F, based on 2010 Highway Capacity Manual criteria. LOS F is considered undesirable in urban areas.

[2] Average delay at the intersection: estimated in seconds per entering vehicle.

[3] 50th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).

[4] 95th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).

[5] Congested approach: any approach of the intersection evaluated as operating at LOS F.

In general, the existing lane assignments and timing settings for the six intersections all appear to be appropriate. They were evaluated as operating at an acceptable level of service (LOS)E or better. However, Synchro signal timing optimization tests indicated that the signal timings of three intersections could be adjusted slightly in order to improve pedestrian safety or traffic operations.

The three intersections are:

- Washington Street at Lowell Avenue: Currently it has an exclusive pedestrian signal phase of 21 seconds, which is not sufficient for pedestrians to cross at some of the approaches (nearly 60 feet wide). It should be increased to at least 27 seconds, the same duration as the Walnut Street intersection.
- Washington Street at Crafts Street: Synchro analyses indicated that the Crafts Street approach is operated at an undesirable LOS of F, and it could be somewhat improved by appropriating five seconds of green time from the Washington Street approach; the Washington Street approach would maintain the same level of service after the timing change.
- Washington Street at Adams Street/Lewis Terrace: Currently the Adams Street approach has a high left-turn volume, with the existing layout of a left-turn/through shared lane and a right-turn-only lane. It could be rearranged as one left-turn-only lane and one right-turn/through shared lane using the same signal timing settings. Although the Lewis Terrace

approach's LOS would slightly deteriorate, the Adams Street LOS would significantly improve.

Table 6 summarizes the capacity analyses for the three intersections with the proposed signal timing adjustments under existing traffic conditions.

TABLE 6
Intersection Capacity Analyses
Existing Conditions with Signal Timing Adjustments

	AM Peak Hour					PM Peak Hour				
Name of Cross Street	**LOS[1]**	**Avg. Delay[2]**	**50th PQ[3]**	**95th PQ[4]**	**Cong. App.[5]**	**LOS**	**Avg. Delay**	**50th PQ**	**95th PQ**	**Cong. App.**
Adams Street./ Lewis Terrace	C	27.4	250	325	NB	C	23.3	30	120	NB
Crafts Street	E	66.0	215	280	SB	D	45.3	325	410	None
Lowell Avenue	C	25.5	115	260	None	C	25.9	145	300	None

[1] Level of service: A to F based on 2010 Highway Capacity Manual criteria. LOS F is considered undesirable in urban areas.
[2] Average delay at the intersection: estimated in seconds per entering vehicle.
[3] 50th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).
[4.] 95th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).
[5.] Congested approach: any approach of an intersection evaluated as operating at LOS F.

4.5 Future-Year Conditions

MPO staff also conducted future-year analyses based on projected traffic conditions for an approximately 10-year period for the horizon year 2025. One major concern about future-year conditions is the plan to reinstate tolls at I-90 Exits 16 and 17.[10] Taking this recent development into consideration, the staff developed two sets of future-year projections for this study.

The first set is basically a trend-extending projection that assumes that toll reinstatement would have a minimal impact on future-year conditions. It predicts that the study corridor would have 0.3 percent annual traffic growth in the AM peak hour and 0.4 percent annual growth in the PM peak hour.[11]

[10] In June 2014, MassDOT announced a comprehensive tolling plan for additional Interstate and controlled-access state highways. The plan includes applying AET (All Electronic Tolling) at the two I-90 exits, potentially within the next two years. AET is a form of toll collection that allows drivers to pay their toll without stopping or slowing down.
[11] The projection was derived from the Boston Region MPO's most recent 2035 regional travel demand model. MPO staff reviewed the growth at all of the major intersections in the corridor and calculated the average annual growth rate for the study corridor.

The second set assumes that the toll reinstatement would have a significant impact on the study corridor. Based on a previous MPO study of an adjacent area, the staff estimated that the toll reinstatement would cause an increase of approximately 5 percent more total traffic in 2025 during the peak hours.[12]

Table 7 summarizes the total percentage of traffic growth from 2014 to 2025 for each of the peak-hour models.

TABLE 7
Future-Year (2025) Traffic Growth Projections

2014–25 Total Growth	AM Peak Hour	PM Peak Hour
Moderate traffic growth	3%	5%
Significant traffic growth	8%	10%

Based on the projections, the staff analyzed three different future-year scenarios:

1) Existing corridor layouts with moderate traffic growth
2) Existing corridor layouts with significant traffic growth
3) Proposed "road diet" layouts with significant traffic growth

Table 8 summarizes capacity analyses of these major intersections in these scenarios. For the scenarios that use existing layouts, signal timings were adjusted within reasonable ranges to accommodate future traffic conditions. In general, traffic would deteriorate from the existing conditions but would still operate at an acceptable LOS of E or better at all locations.

The proposed "road diet" layouts include two major modifications:

- Roadway configuration between Chestnut Street and Court Street: converting from four lanes (two lanes in each direction) to three lanes (one lane in each direction with a center lane for left turns or medians)
- Intersection layout at Lowell Avenue and at Walnut Street: converting the inside lane of both of the Washington Street approaches from a left-turn/through shared lane to a left-only lane.

[12] This rough estimation was based on data in the Boston Region MPO's study, *Newton Corner Rotary Study, Phase II*, January 8, 2009.

TABLE 8
Future-Year (2025) Capacity Analyses

Scenario 1: Existing Corridor Layout with Moderate Traffic Growth

Name of Cross Street	AM Peak Hour					PM Peak Hour				
	LOS[1]	Avg. Delay[2]	50th PQ[3]	95th PQ[4]	Cong. App.[5]	LOS	Avg. Delay	50th PQ	95th PQ	Cong. App.
Lowell Avenue	C	26.5	130	270	None	C	27	155	350	None
Walnut Street	D	39.8	325	460	None	D	41.1	170	620	None
Crafts Street	E	70.1	410	540	SB	D	50.7	350	440	SB
Adams Street/ Lewis Terrace	C	33.6	265	345	NB	C	28	100	130	NB
Jackson Road	D	50.2	100	150	None	C	28.5	405	505	None
Church Street	C	22.5	210	600	None	C	23.6	190	585	None

Scenario 2: Existing Corridor Layout with Significant Traffic Growth

Name of Cross Street	AM Peak Hour					PM Peak Hour				
	LOS	Avg. Delay	50th PQ	95th PQ	Cong. App.	LOS	Avg. Delay	50th PQ	95th PQ	Cong. App.
Lowell Avenue	C	27.9	145	285	None	C	28.8	170	385	None
Walnut Street	D	42.9	390	500	None	D	48.3	195	660	None
Crafts Street	E	71.4	460	595	SB	E	56.8	375	470	SB
Adams Street/ Lewis Terrace	D	46.8	290	380	NB	D	39.4	120	150	NB
Jackson Road	D	53.2	100	150	None	D	35.6	435	580	None
Church Street	C	24.9	240	650	None	C	30.8	225	635	None

Scenario 3: Proposed "Road Diet" Layouts with Significant Traffic Growth

Name of Cross Street	AM Peak Hour					PM Peak Hour				
	LOS	Avg. Delay	50th PQ	95th PQ	Cong. App.	LOS	Avg. Delay	50th PQ	95th PQ	Cong. App.
Lowell Avenue	D	48.6	425	900	None	D	45.5	295	635	None
Walnut Street	E	61.1	420	880	SB	D	45.2	230	600	None
Crafts Street	E	71.4	460	595	SB	E	56.5	375	470	SB
Adams Street/ Lewis Terrace	D	46.8	290	380	NB	D	39.4	120	150	NB
Jackson Road	D	53.2	100	150	None	D	35.6	435	580	None
Church Street	C	24.9	240	650	None	C	30.8	225	635	None

[1] Level of service: A to F based on 2010 Highway Capacity Manual criteria.

[2] Average delay at the intersection: estimated in seconds per entering vehicle.

[3] 50th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).

[4] 95th percentile queue: length estimated in feet on Washington Street in the peak direction (AM: eastbound, PM: westbound).

[5] Congested approach: any approach of an intersection evaluated as operating a LOS F.

As shown in Table 8, the "road-diet" scenario would maintain the same levels of service at all of the locations except the Walnut Street intersection. However, the Walnut Street intersection would operate at an acceptable LOS of E during peak hours.[13] Most significantly, the safety and operations of pedestrians, bicyclists, and vehicles in the entire corridor would be greatly improved under the "road diet" scenario.

5 PROPOSED IMPROVEMENTS

Based on the above analyses, MPO staff developed a series of short- and long-term improvements to address the identified safety and operational problems. The short-term improvements could be implemented within a year, at relatively low costs. The long-term improvements are generally more complicated and cover large areas, which would require intensive planning and design efforts and funding resources.

5.1 Short-Term Improvements

In the short term, a number of improvements could be considered for the corridor in order to enhance safety for pedestrians and cyclists and to moderately improve traffic operations. These improvements are:

- Install traffic signal backplates with reflective borders (yellow stripes).
- Repair street lights as needed.[14]
- Repaint faded crosswalk markings at intersections. Currently most intersections' crosswalks have been marked by a series of white longitudinal lines parallel to traffic.[15] At the intersections of Washington Street at Adams Street/Lewis Terrace and at Jackson Road, the crosswalk markings have almost totally disappeared.

[13] The intersection appears to have room for some layout modifications if that is necessitated by further unexpected traffic growth from the toll reinstatement or the adjacent Austin Street project. Further engineering studies could also examine the feasibility of adding concurrent pedestrian signal phasing at the functional design stage.

[14] On July 26, 2014, MPO staff drove through the corridor to survey night-time roadway conditions and observed about four to five street lights were not working.

[15] *Manual on Uniform Traffic Control Devices*, Section 3B.18: Crosswalk Markings, 2009 Edition with Revisions 1 and 2, Federal Highway Administration, US Department of Transportation, May 2012.

- Adjust signal timing or lane assignments at the following intersections:
    - Washington Street at Lowell Avenue: Increase the exclusive pedestrian signal phase from 21 to 27 seconds.
    - Washington Street at Crafts Street: Consider relocating 5 seconds of green time from Washington Street to Crafts Streets.
    - Washington Street at Adams Street/Lewis Terrace: Consider rearranging the southbound approach so it has one left-turn only lane and one through/right-turn shared lane.

- Enforce the no-parking regulations at the corners of Washington Street westbound near the following streets:
    - Jackson Road
    - Walnut Street (MBTA bus stop location)
    - Walker Street
    - Armory Street and the Trader Joe's driveway

5.2 Long-Term Improvements

Figures 7-1 to 7-7 show the locations and layouts of the proposed long-term improvements in a series of conceptual plans from west to east within the study corridor. The conceptual plans were not created to scale, but in approximate proportion, in order to show how the proposed improvements would relate to their surroundings.

For the roadway cross-sections related to these conceptual plans, please refer to Figures 6-1 and 6-2.

Major proposed improvements include:

- Convert the corridor's travel lanes from four to three from Chestnut Street to Court Street (see the top graphic in Figure 6-1), which constitutes about 70 percent of the study corridor.

- Maintain four travel lanes between Court Street and Church Street with a slightly reduced lane width, and remove on-street parking from one side (mainly the south side) of the roadway (see the bottom graphic in Figure 6-1).[16]

- Provide bicycle accommodations on both sides of the corridor. They would in slightly different forms, but their paths would be continuous (Figures 6-1 and 6-2).

[16] Most of the on-street parking in the business districts would be preserved.

  - 6-foot separate bicycle lanes on both sides (in the majority of the proposed three-lane sections)
  - 6-foot separate bicycle lane on the north side and 5-foot bicycle lane on the south side (in the proposed four-lane sections that currently have a limited right-of-way)
  - 15-foot shared lane in the business districts with intensive driveways between Chestnut Street and Kempton Place

- Provide the center lane (in the proposed three-lane sections) as a median, a left-turn-only lane, or a two-way left-turn lane for accessing the adjacent businesses and other developments.[17] It would significantly improve the safety and mobility of travel to and from these developments, not only for vehicles but also for pedestrians and bicyclists.

- Reduce the curb turning radii in order to slow down turning vehicles and reduce pedestrian crossing distances. Potential locations for such improvement include:

  - Washington Street at Eddy Street
  - Washington Street at Walker Street
  - Washington Street at Lowell Avenue
  - Washington Street at Court Street
  - Washington Street at Jewett Street

- Add sidewalk extensions (pedestrian bulb-outs) to provide staging areas for pedestrians, enhance their view of traffic, and shorten their crossing distances. Potential locations for such improvement include:

  - Washington Street at Armory Street
  - Washington Street at Eddy Street
  - Washington Street at Walker Street
  - Washington Street at Lowell Avenue (north side)

- Install crosswalks at locations with a significant number of pedestrian crossings or adjacent to MBTA bus stops. Suitable locations for such improvement are:

  - Washington Street at Armory Street
  - Washington Street at Cross Street
  - Washington Street at Eddy Street

[17] The traffic median would be concrete-stamped or striped in the business districts and would be raised in the residential districts of the corridor.

- Washington Street at Walker Street

- Install midblock crosswalks at locations in business districts that have a significant number of pedestrian crossings. Proposed locations for such improvement are:

  - Washington Street at the post office in Newtonville
  - Washington Street at Newtonville Station

- Consider combining some adjacent MBTA bus stops in the corridor in order to increase the efficiency of bus travel. A potential case would be to combine the existing stops at Armory Street and Cross Street.

- Increase the sidewalk width on the south side wherever adequate right-of-way is available.

- Change the corridor's posted speed limit from 35 mph to 30 mph, after the above proposed roadway modifications are in place. The travel speed analysis (Section 4.1) supports such potential. At the design stage, this would have to be further examined, applying the MassDOT speed zoning procedures.

In addition, the following items should be considered at the design stage:

- Further evaluate parking conditions, locations, and pricing strategies, and develop a comprehensive parking and business access management plan for the entire corridor.

- Further examine design option alternatives to the existing angle parking at Newtonville Station.[18]

- Review the existing lighting facilities and conditions. If resources are available, consider a new lighting system powered by renewable energy

[18] The existing angle parking is substandard, with insufficient vehicle backing space. A number of crashes, including one involving a pedestrian, occurred in that parking area in the past three years. Two options were preliminarily examined in this study. The first is to convert the angle parking to parallel parking. It would eliminate about half of the existing spaces but would provide more room for wider and more comfortable sidewalks on both sides of Washington Street. The second option is to convert it to "reverse angle parking, which is a type of angle parking that requires vehicles to back into parking spots instead of pulling into them. It allows drivers to make eye contact with pedestrians and cyclists when they exit their spots and is thus considered safer than the usual angle parking. The conversion would not eliminate any of the existing parking spaces. However, it would require educating the public about its operations, as it is not widely used in this country and many drivers may not be familiar with and skilled in its operations.

for the entire corridor and adding pedestrian scale lighting in the Newtonville business districts.

- Further examine the potential of replacing the existing fences adjacent to the MBTA commuter rail and I-90 with well-designed concrete walls or other features that are more effective in blocking the noises.

6 SUMMARY AND RECOMMENDATIONS

This study performed a series of safety and operations analyses, identified safety and operational problems, and proposed a number of short- and long-term improvements to address the identified problems in the study corridor. The long-term improvements conceptual plans together provide a vision that would accommodate all users and would significantly enhance their safety, mobility, and access in the corridor.

Benefits expected from some major proposed long-term improvements include:

- The “road diet” (from four-lane to three-lane) modification of majority (70 percent) of the corridor would slow down the traffic and reduce pedestrian crossing distances and risks.
- Center lane in the modified sections, functioning as a median, left-turn-only, or two-way left-turn lane, would significantly improve the safety and mobility to and from the adjacent developments not only for the vehicles but for the pedestrians and bicycles.
- Bicycle accommodation on both sides of Washington Street would improve cyclists’ safety and mobility.
- Redesign of intersections with tighter curb radii and sidewalk extensions would slow down turning vehicles and enhance safety for pedestrians and cyclists.
- Crosswalk installations would enhance pedestrian crossing safety in business districts and at MBTA bus stops.
- Speed limit reduction from 35 to 30 mph would make traffic speeds more compatible with the adjacent land use activities, thus improving safety for all users in the corridor.

In addition, the corridor would benefit from a comprehensive parking and access management program. Lighting and noise conditions should also be further examined during the design stage.

Implementing the proposed long-term improvements would require sufficient resources. MPO staff recommends the following implementation stages for consideration:

1) West Section: Chestnut Street to the west of Lowell Avenue
2) Middle Section: Lowell Avenue to Harvard Street
3) East Section: the east of Harvard Street to Church Street

This study shows that the corridor has great potential to operate safely and efficiently for all users, in various transportation modes. The study provides a vision for the corridor's long-term development. However, it would require significant effort and collaboration on the part of all stakeholders, including the City of Newton, residents and owners of adjacent developments, the MBTA, and MassDOT, to advance the vision.

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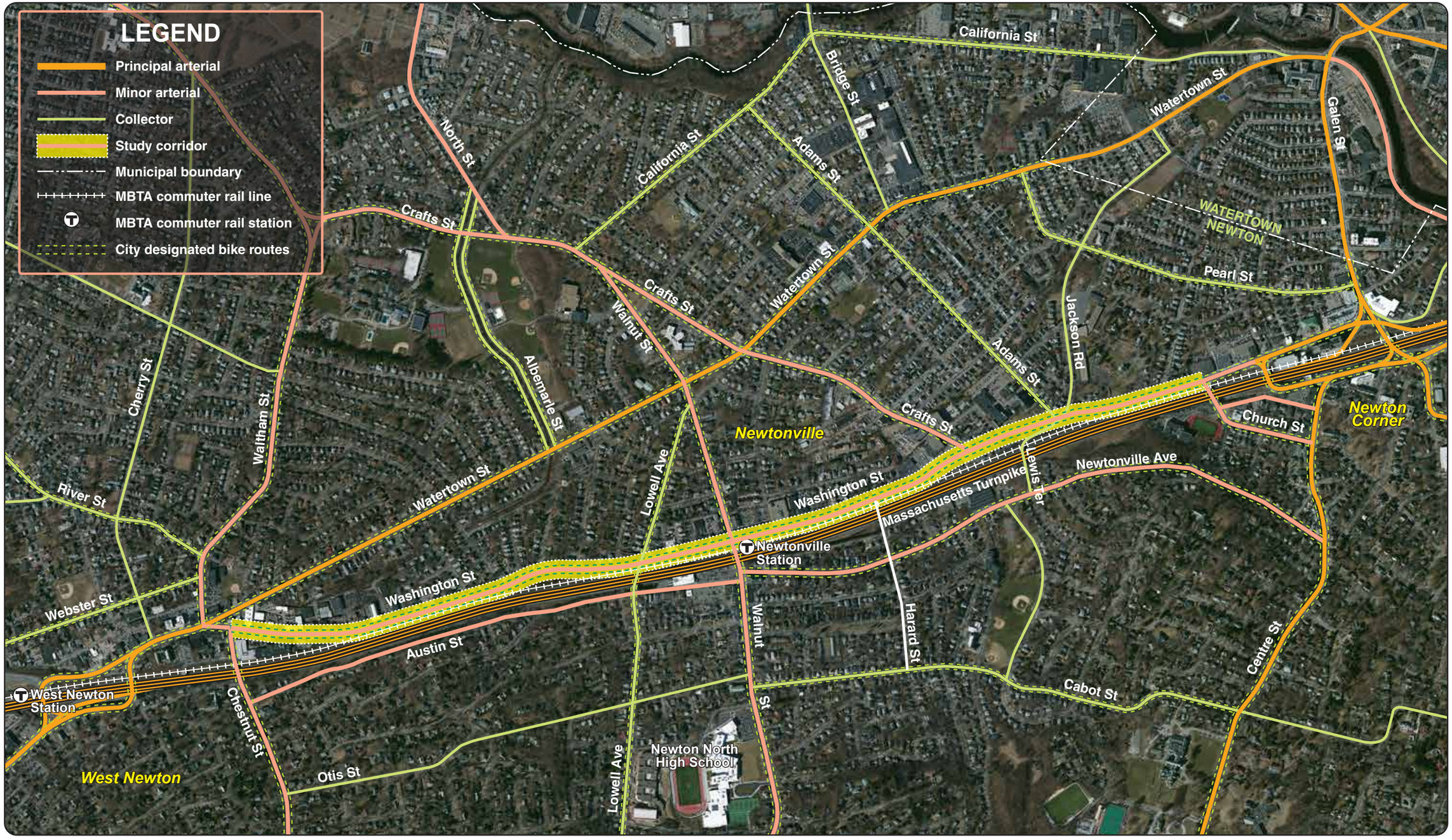

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FIGURE 1
Study Area Map

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

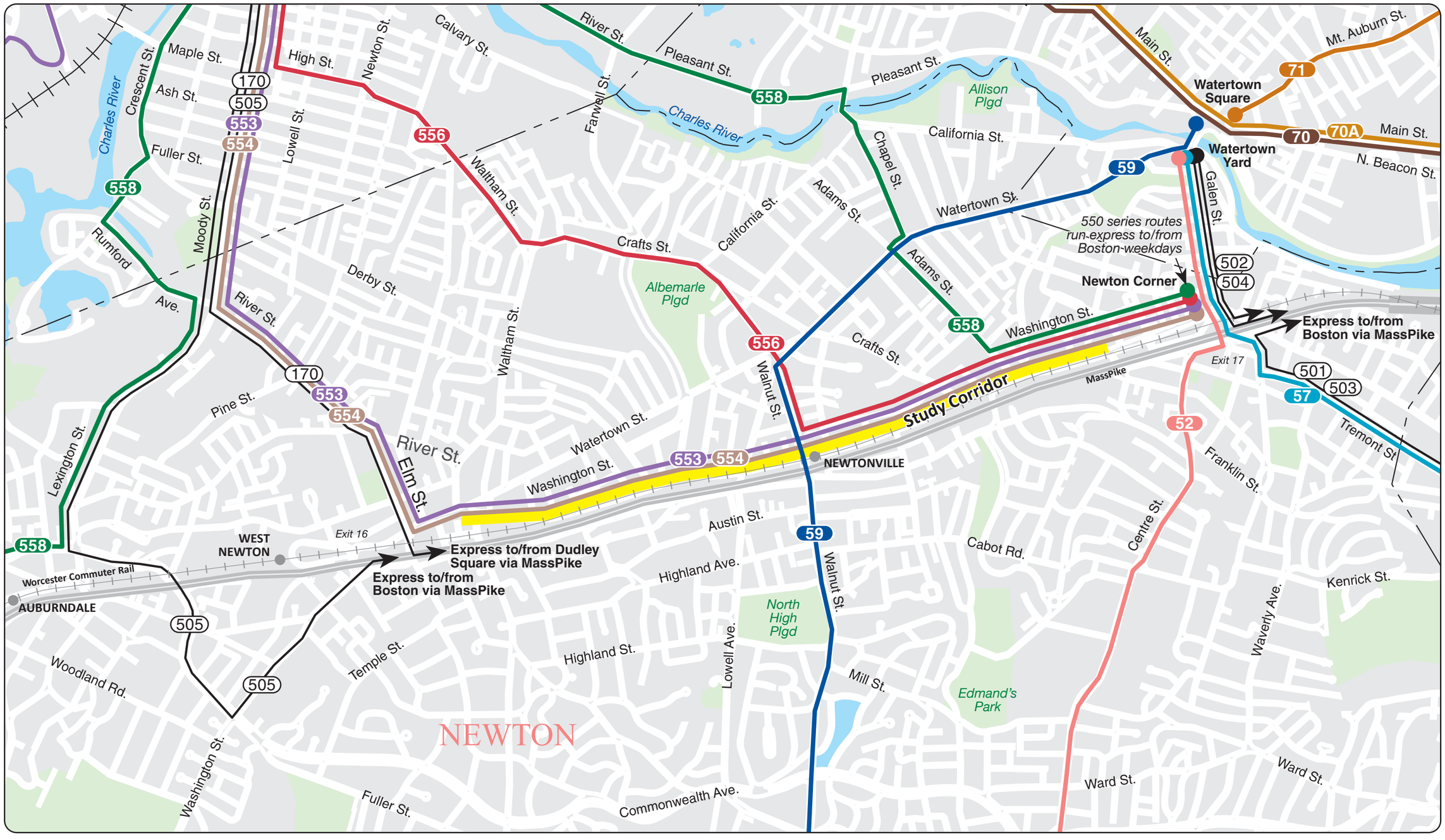

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FIGURE 2
MBTA Transit Services in the Area

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

Corridor Average Daily Traffic (ADT) Summary

Count Location	❶	❷	❸	❹	❺	❻	❼	❽
Eastbound Volume	6,839	6,811	7,372	6,651	7,924	8,644	11,309	12,164
Westbound Volume	7,021	6,977	6,990	7,305	8,262	9,369	12,392	13,635
Eastbound Split	49%	49%	51%	48%	49%	48%	48%	47%
Westbound Split	51%	51%	49%	52%	51%	52%	52%	53%
Combined ADT	13,860	13,788	14,362	13,956	16,186	18,033	23,701	25,799
Seasonally Adjusted ADT	13,860	12,400	12,900	12,600	14,600	16,300	21,800	23,300

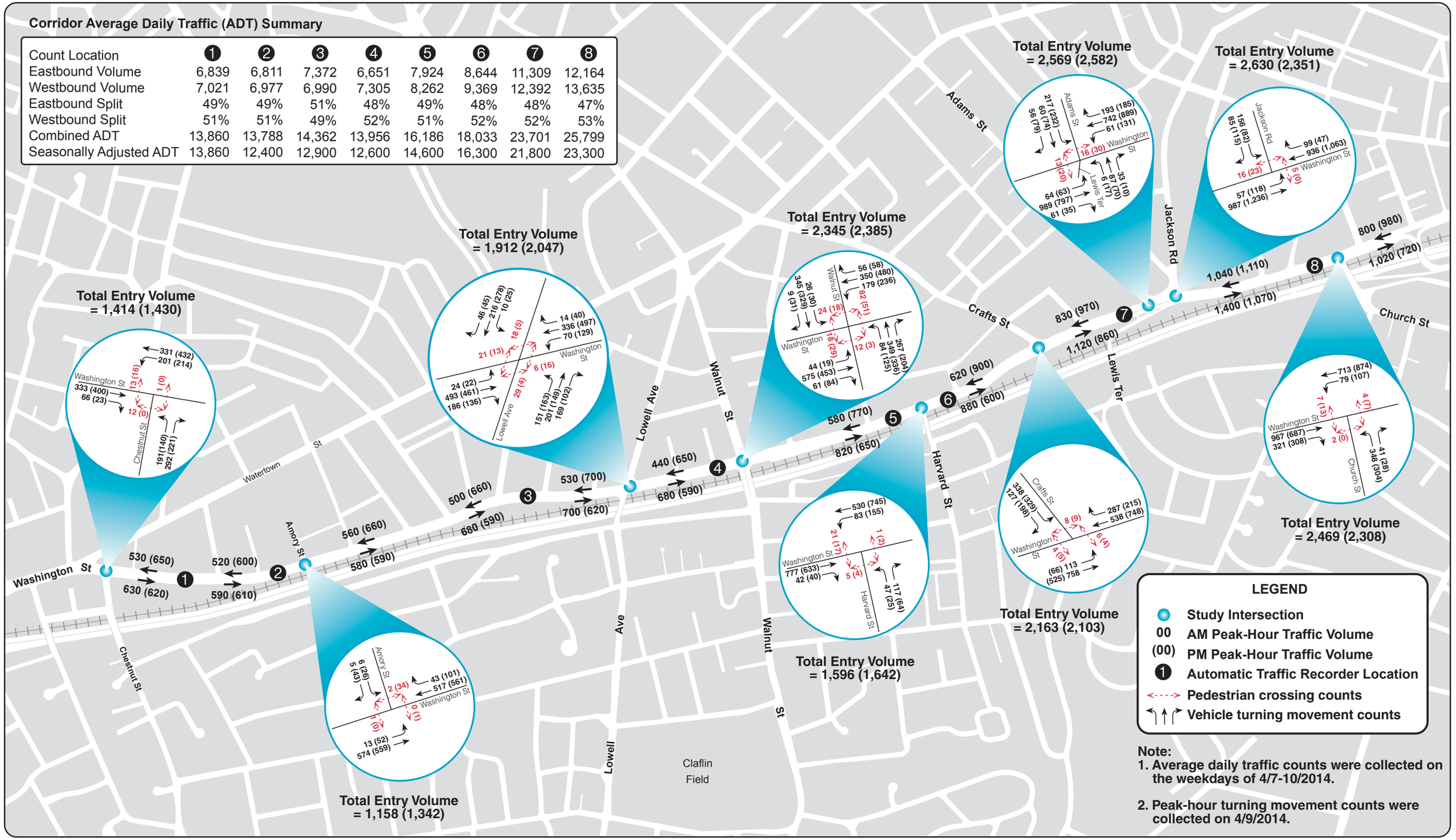

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FIGURE 3
Traffic Volumes in the Corridor and at Major Intersections
Washington Street, Newton

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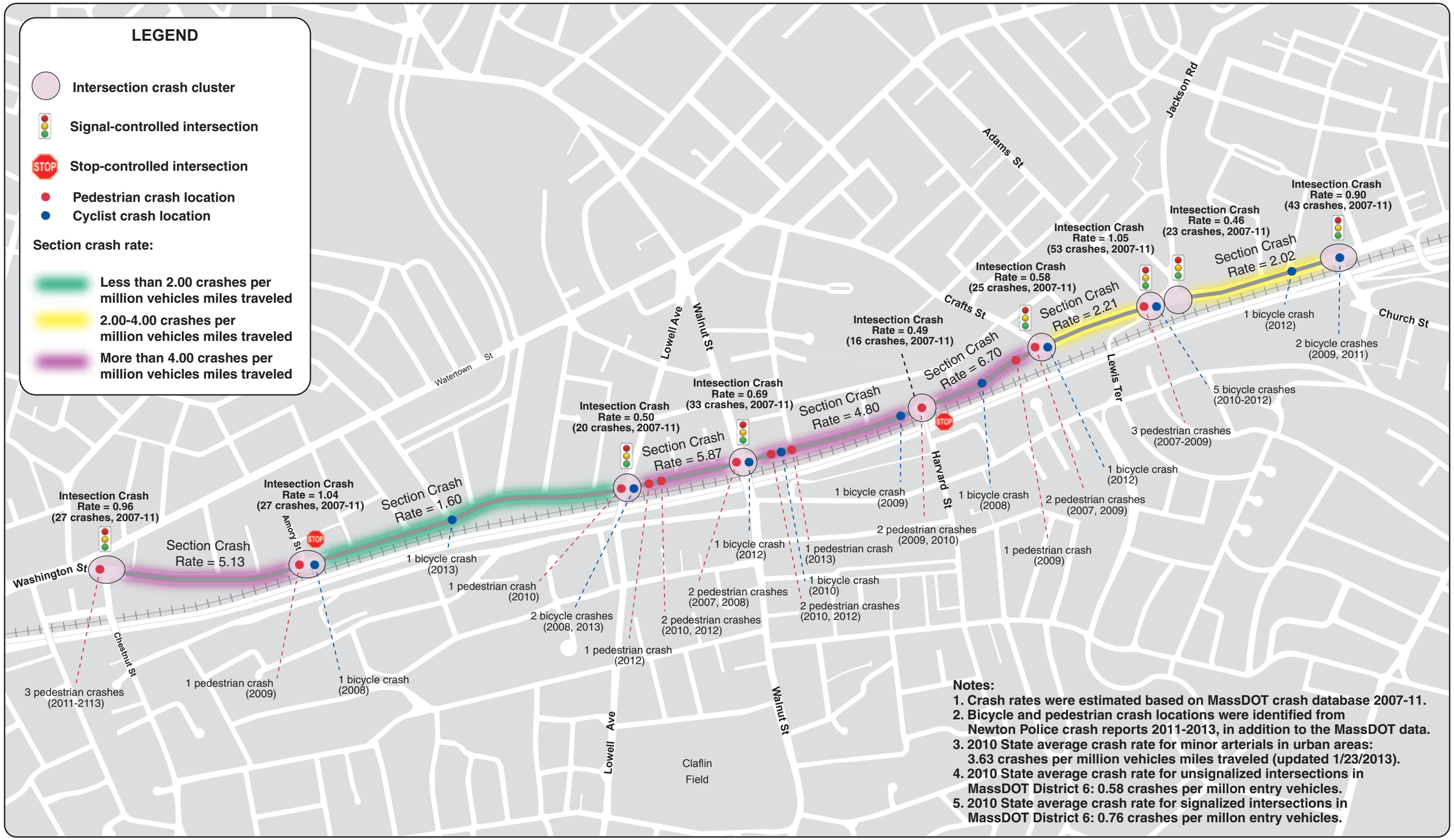

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FIGURE 4
Crash Locations and Crash Rates
Washington Street, Newton

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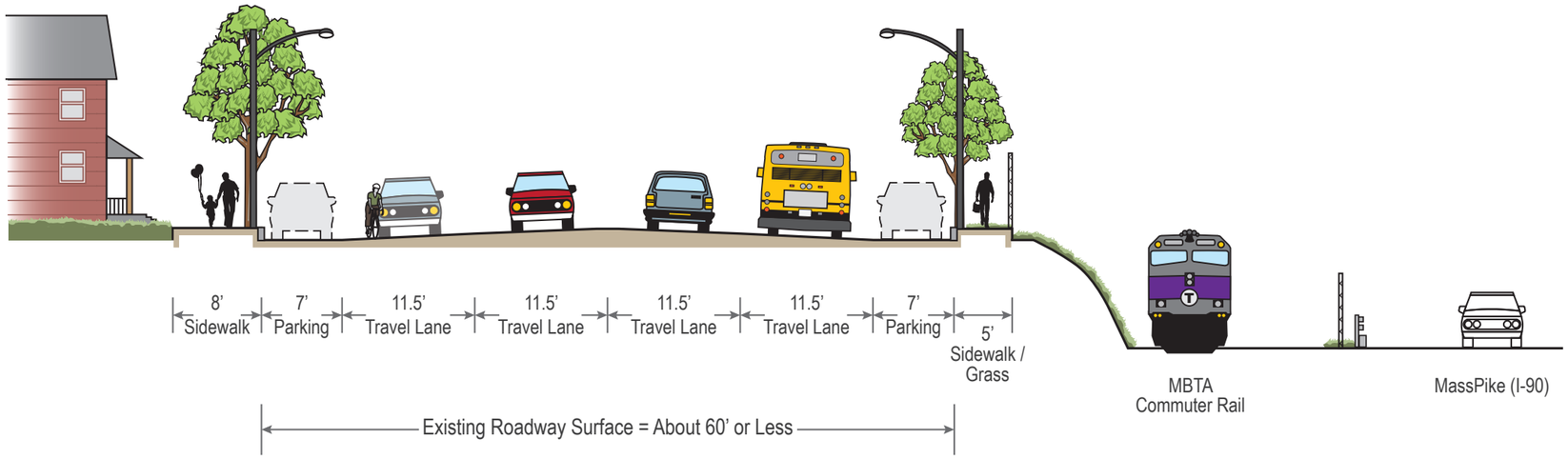
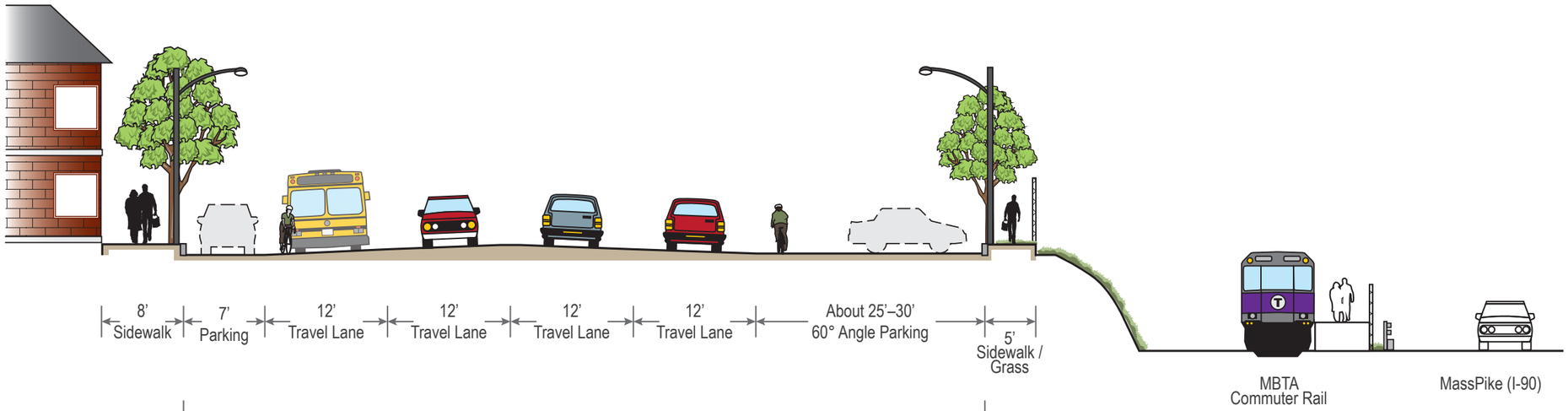
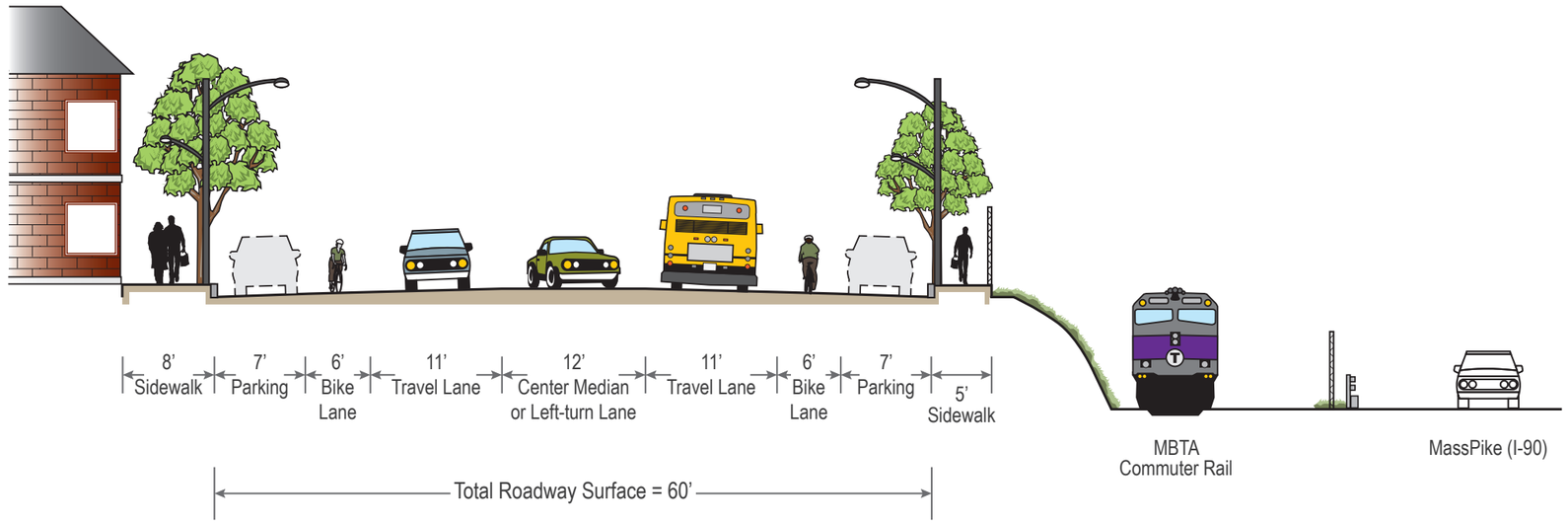


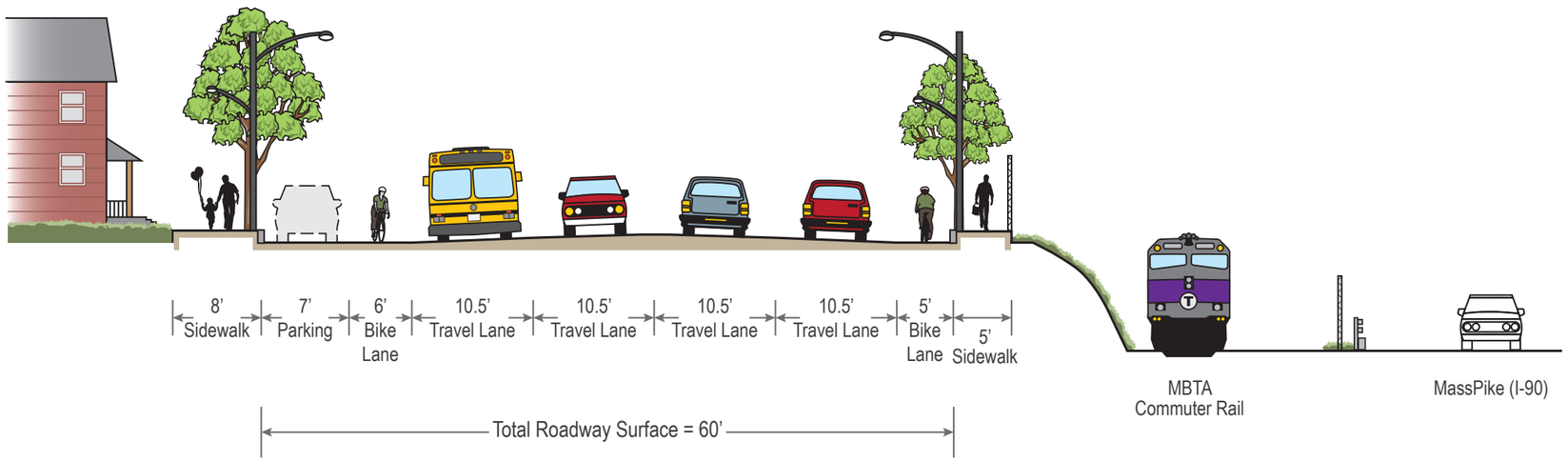
Typical Roadway Cross-Section in the Study Corridor



Roadway Cross-Section in the Newtonville Station Area



Proposed Three-Lane Cross-Section



Proposed Four-Lane Cross-Section

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FIGURE 6-1
Proposed Roadway Cross-Sections (I)

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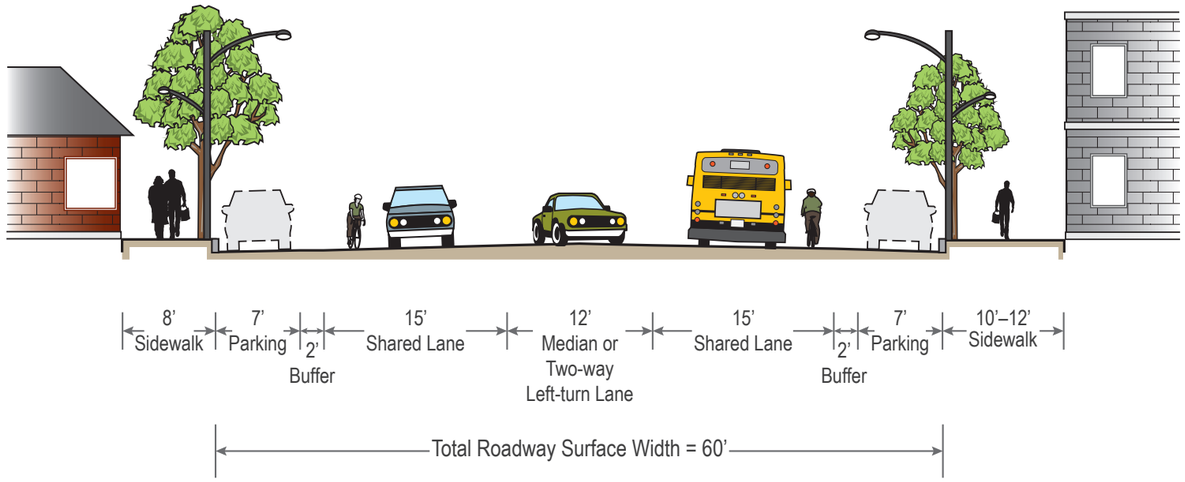
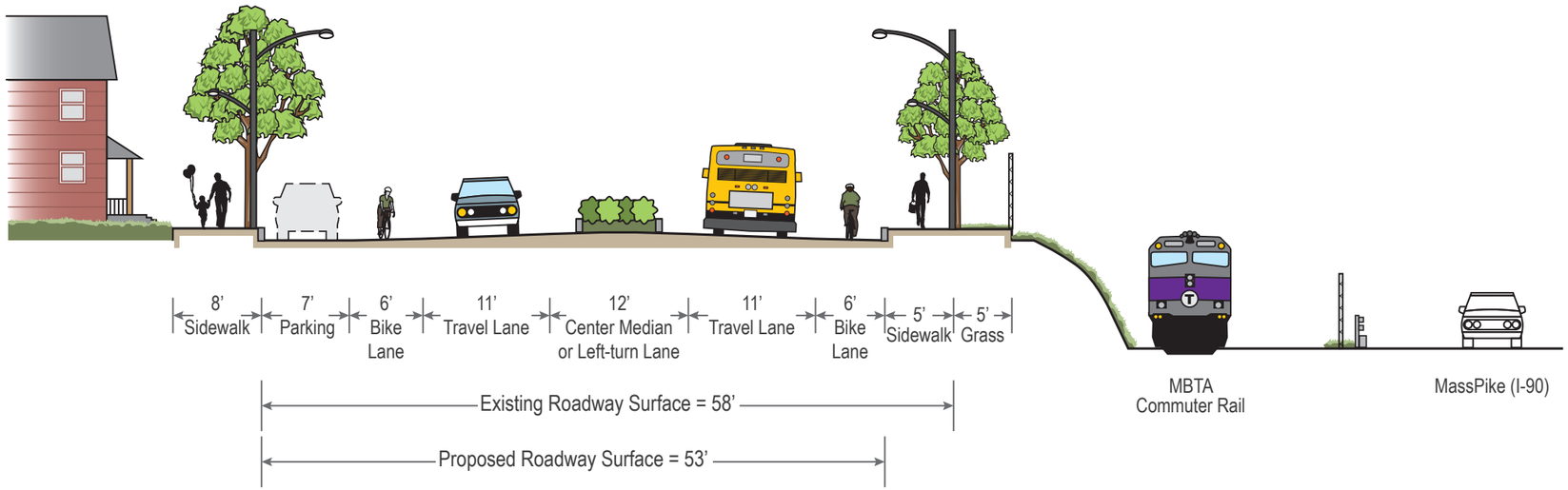


Proposed Alternative Three-Lane Cross-Section for Business Districts with Intensive Driveways



Proposed Alternative Three-Lane Cross-Section for Residential Districts with Limited Right-of-Way

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FIGURE 6-2
Proposed Roadway Cross-Sections (II)

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FIGURE 7-1
Proposed Long-Term Improvements Conceptual Plan (1)
Washington Street, Newton

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FIGURE 7-2
Proposed Long-Term Improvements Conceptual Plan (2)
Washington Street, Newton

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FIGURE 7-3
Proposed Long-Term Improvements Conceptual Plan (3)
Washington Street, Newton

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

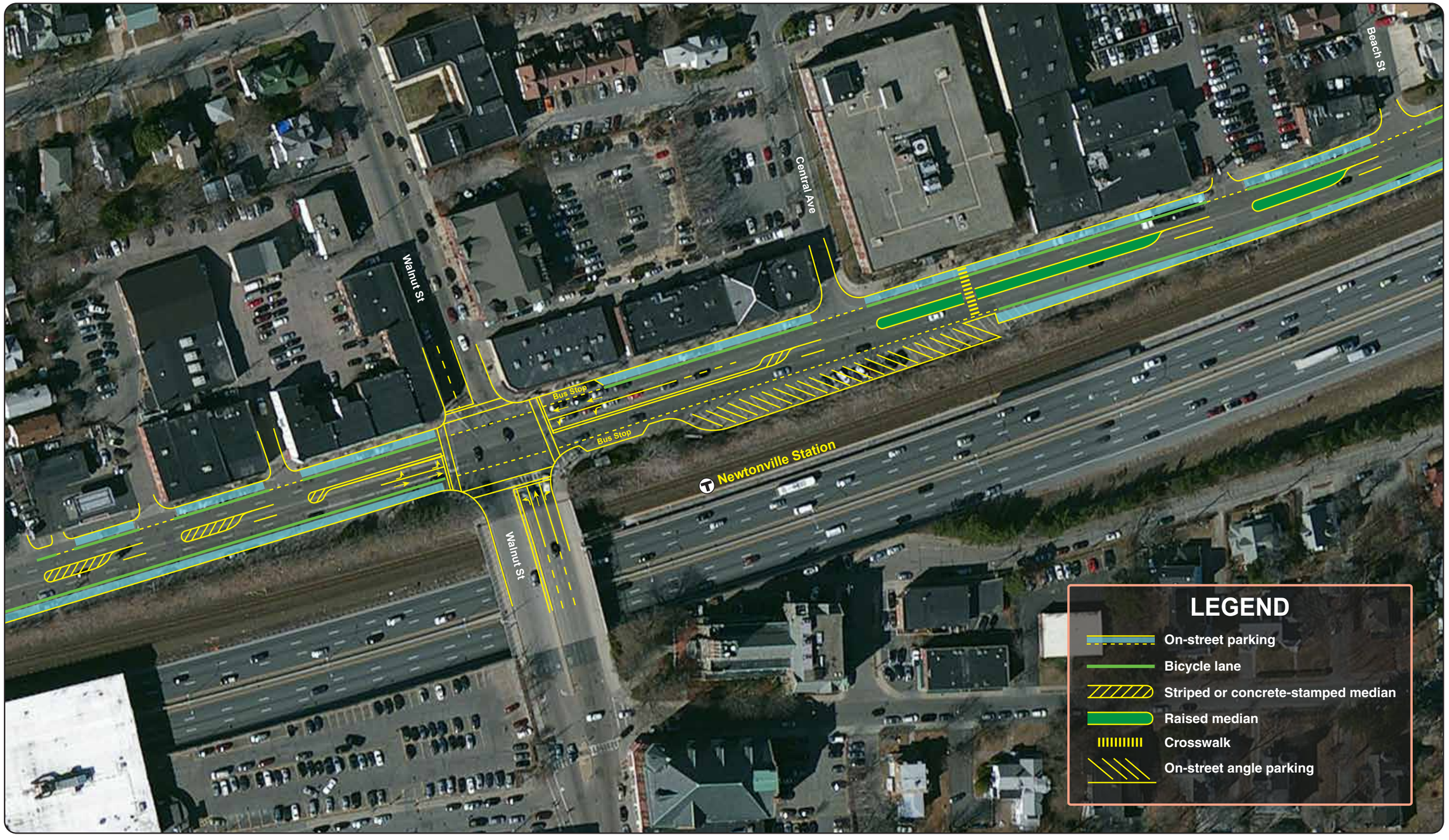

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FIGURE 7-4
Proposed Long-Term Improvements Conceptual Plan (4)
Washington Street, Newton

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

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FIGURE 7-5
Proposed Long-Term Improvements Conceptual Plan (5)
Washington Street, Newton

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

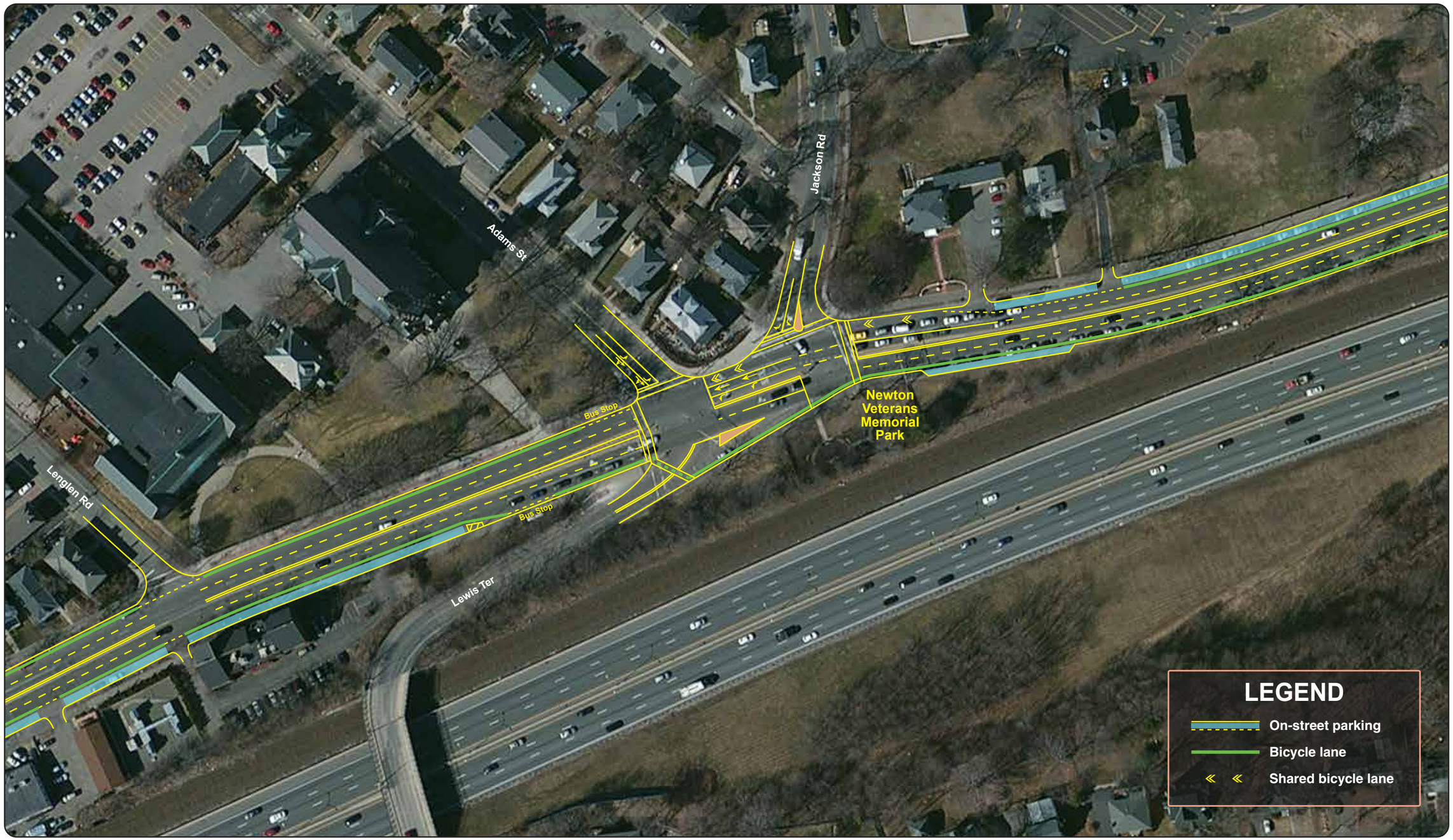

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FIGURE 7-6
Proposed Long-Term Improvements Conceptual Plan (6)
Washington Street, Newton

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FIGURE 7-7
Proposed Long-Term Improvements Conceptual Plan (7)
Washington Street, Newton

Addressing Safety, Mobility, and Access on Subregional Priority Roadways

RECOMMENDATIONS FOR THE SNOW ORDINANCE FOR SNOW SEASON 2014/2015

The major outcome of interest for snow is that both streets and sidewalks (especially along major walking routes) be open for passage. Plowing streets alone is not sufficient for a city in which residents are encouraged to use the sidewalks including those with disabilities.

We recommend extending the current pilot program for another year in order to accomplish:

- Setting up a mechanism for enforcement if the BOA chooses to go with a fine
- Ensuring that the City is monitoring for plows of all types piling up on the curb cuts and sidewalks
- Ensuring that the City is doing a good job on clearing the sidewalks on routes for which it has taken responsibility
- Developing a plan for clearing sidewalks in front of residences where individuals are exempt from the ordinance due to the combination of health and financial considerations
- Enforcing the existing ordinance that businesses are required to clear snow in front of their establishments
- Examining school bus stops for snow clearing during this snow season and figuring out an appropriate mechanism for clearing
- Analyzing problem areas from reports of last year and looking at alternatives for clearing
- Collecting information on problem areas identified this year and looking at alternatives for clearing
- Compiling information on sidewalk clearing policies in nearby communities that are more suburban and contain more single family homes than Boston, Brookline, and Cambridge

#310-10

CITY OF NEWTON

IN BOARD OF ALDERMEN

ORDINANCE NO. Z-83

March 21, 2011

BE IT ORDAINED BY THE BOARD OF ALDERMEN
OF THE CITY OF NEWTON AS FOLLOWS:

That the Revised Ordinances of Newton, Massachusetts, 2007, as amended, be further amended with respect to Chapter 26, **STREETS AND SIDEWALKS**, as follows:

In add a new **Sec. 26-8D. Trial program for removal of snow and ice from sidewalks.**

"In order to allow for safe pedestrian and wheelchair passage, every owner or occupant of a building or lot of land abutting upon a paved sidewalk or any person having charge of such property shall use reasonable efforts to remove snow and ice from the sidewalk and handicap access ramps, and shall use reasonable efforts to treat said sidewalk and ramps to allow for a safe passageway of approximately thirty-six (36) inches in width, provided that where such sidewalk is less than thirty-six (36) inches in width the passageway shall encompass its entire width and handicap access ramps. Snow and ice shall be removed, and sidewalks and ramps shall be treated, within thirty (30) hours after such snow has ceased to fall or such ice has formed. This section shall apply to snow and ice which falls from buildings, other structures, trees or bushes, as well as to that which falls from clouds. This section shall not apply to owners or occupants of a building or lot covered by Section 26-8. The mayor or his designee is authorized to coordinate volunteer snow clearing assistance or to grant an exemption, renewable annually, for citizens who upon written petition demonstrate hardship due to a combination of health and financial duress. The provisions of this section shall take effect on November 1, 2011 and shall expire on November 1, 2013 unless terminated earlier or renewed or modified by the board of aldermen. During this trial period, enforcement shall be limited to issuance of notices of non-compliance for violations of any provision of this section."

Approved as to legal form and character:

Donnalyn B. Lynch Kahn

DONNALYN B. LYNCH KAHN
City Solicitor

Under Suspension of Rules
Readings Waived and Adopted
18 yeas 6 nays (Aldermen Ciccone, Lappin, Salvucci, Shapiro, Swiston, and Lennon)

(SGD) ~~DAVID A. OLSON~~
~~City Clerk~~
acting city clerk

(SGD) SETTI D. WARREN
Mayor
Date: 3/31/11

#409-12

CITY OF NEWTON

IN BOARD OF ALDERMEN

January 22, 2013

ORDINANCE NO. A-8

BE IT ORDAINED BY THE BOARD OF ALDERMEN
OF THE CITY OF NEWTON AS FOLLOWS:

That the Revised Ordinances of Newton, Massachusetts, 2012, as amended, be further amended with respect to Chapter 26, **STREETS AND SIDEWALKS**, as follows:

In **Sec. 26-8D. Trial program for removal of snow and ice from sidewalks.** strike in the sixth sentence the words "November 1, 2013" and insert in place thereof the words "November 1, 2014.

Approved as to legal form and character:
Donnalyn B Lynch Kahn
DONNALYN B. LYNCH KAHN
City Solicitor

Under Suspension of Rules
Readings Waived and Adopted
20 yeas 1 nay (Alderman Lappin) 3 absent (Aldermen Baker, Ciccone, and Merrill)

(SGD) DAVID A. OLSON
City Clerk

(SGD) SETTI D. WARREN
Mayor
Date: 1/30/13

Resident Permit Parking § 19-201(B)(1) – proposed amendments concerning contiguous lots

OPTION #1 (removes contiguous lot eligibility entirely)

B. *Issuance of resident parking stickers:*

(1) Resident parking stickers shall identify the restricted area to which they apply and shall be of a design specified by the chief of police. One such sticker for a restricted area shall be issued by the chief of police or his designee to an owner of a motor vehicle which is registered in the Commonwealth of Massachusetts, with a registered gross weight of under two and one half (2½) tons, which is principally garaged in the City of Newton at an address which borders a restricted area. ~~or which is contiguous to a lot that borders said restricted area,~~ as established in accordance with subsection (a) above, which is owned or used by a resident of the City of Newton at said address, and which otherwise qualifies for issuance of a sticker under this section. Notwithstanding the foregoing, the owner of a motor vehicle principally garaged at a lot which is contiguous to the rear lot line of a non-corner lot bordering the restricted area will not be entitled to a sticker.

OPTION #2 (Traffic Council determines case by case)

B. *Issuance of resident parking stickers:*

(1) Resident parking stickers shall identify the restricted area to which they apply and shall be of a design specified by the chief of police. One such sticker for a restricted area shall be issued by the chief of police or his designee to an owner of a motor vehicle which is registered in the Commonwealth of Massachusetts, with a registered gross weight of under two and one half (2½) tons, which is principally garaged in the City of Newton at an address which borders a restricted area ~~or which is contiguous to a lot that borders said restricted area,~~ as established in accordance with subsection (a) above, which is owned or used by a resident of the City of Newton at said address, and which otherwise qualifies for issuance of a sticker under this section. Notwithstanding the foregoing, the owner of a motor vehicle principally garaged at a lot which is contiguous to a lot that borders said restricted area may be eligible provided the traffic council finds that inclusion of such contiguous lot will not place an undue demand on available parking spaces in the restricted area. In no event will the owner of a motor vehicle principally garaged at a lot which is contiguous to the rear lot line of a non-corner lot bordering the restricted area ~~will not~~ be entitled to a sticker.

CITY OF NEWTON

IN BOARD OF ALDERMEN

PUBLIC SAFETY & TRANSPORTATION COMMITTEE REPORT

WEDNESDAY, MARCH 19, 2014

Present: Ald. Ciccone (Chair), Yates, Cote, Fuller, Schwartz, Johnson and Harney
Absent: Ald. Lipof
Also Present: Ald. Crossley (Chair), Lennon, Gentile, Albright, Lappin, Danberg and Laredo
Absent: Ald. Salvucci
City Staff: David Turocy, Commissioner of Public Works; Lou Taverna, City Engineer; Capt. Marc Gromada and Sgt. Jay Babcock, Newton Police Department; Bill Paille, Director of Transportation and David Koses, Transportation Planner

#310-13(2) ALD. LENNON, on behalf of Dominic Proia, 17 Peabody Street, requesting an amendment to Resident Permit Parking Program Sec. 19-201(B)(1) regarding contiguous lots. [02/24/14 @ 9:08 AM]

ACTION: HELD 6-0, Ald. Harney not voting

NOTE: Ald. Lennon, Mr. Koses and Sgt. Babcock joined the Committee for discussion on this item.

Committee members were provided with proposed amendments concerning contiguous lots as requested when docket item #310-13 was discussed in October 2013 with Ald. Lennon and Mr. Proia to discuss an amendment to the resident permit parking program. Attached to this report.

Ald. Lennon said that Peabody Street residents continue to experience parking difficulties due to the language in the City Ordinance stating that residents are entitled to a resident permit if their vehicle is garaged in the City at an address which borders a restricted area or which is contiguous to a lot that borders said restricted area of the resident permit parking program for every permit program in the City. He then said that Traffic Council does not have the authority to change City ordinance or to remove parking permits, but the Board of Aldermen, if they desire, could modify the City ordinance. Traffic Council could decide whether such a lot would be eligible on a case-by-case basis.

The proposed amendment provides two options for consideration:
Option 1- Removes contiguous lot eligibility entirely.
Option 2 - Traffic Council determines case-by-case basis.

Ald. Lennon said that Option 1 may work with certain permit programs in the City, not all. Option 2 may benefit residents of Peabody Street, by striking the 'contiguous lot language that borders said restricted area'.

Ald. Lennon explained that the program (using Peabody Street as an example) allows residents of Washington and Pearl Streets can apply for permits allowing them to park on Peabody Street.

Peabody Street residents were allowed to participate in the program because commuters, patrons and merchants were parking up the area. Peabody Street is a narrow street, allowing safe parking on one side, with multiple driveways and driveway cuts. Peabody Street has approximately 16 legal parking spaces. The large Washington Street apartment building is on the contiguous lot allowing them to obtain permits. The "Resident Permit Parking Only" program allows two permits per unit and two guest passes per unit. Perhaps this amendment would allow residents whose home fronts a street be issued permits first. Sgt. Babcock informed him that he has denied permits to Washington Street residents.

Committee members raised suggestions, concerns and questions regarding amendments to the "Resident Permit Parking Only" program.

Suggestions:

- A Committee member suggested that if Option 2 is approved; perhaps the following should be striked because the following means that residents will not be entitled to a sticker. "*Notwithstanding the foregoing, the owner of a motor vehicle principally garaged at a lot which is contiguous to a lot that borders said restricted area may be eligible provided the traffic council finds that inclusion of such contiguous lot will not place an undue demand on available parking spaces in the restricted area. In no event will the owner of a motor vehicle principally garaged at a lot which is contiguous to the rear lot line of a non-corner lot bordering the restricted area be entitled to a sticker.*
- Committee members then said that Option 2 has a double-negative *" In no event will the owner of a motor vehicle principally garaged at a lot which is contiguous to the rear lot line of a non-corner lot bordering the restricted area be entitled to a sticker"*
- Establish perimeters of permit programs when enacted, perhaps limiting the number of permits issued, allowing residents whose home fronts a street be issued permits first.
- Limit the number of permits to households with driveways.

Concerns:

- Committee members feel that residents of #337 Washington Street should be forced to find alternative parking, perhaps on the opposite side of Washington Street.
- Traffic Council should not have to determine on a case-by-case basis.

Questions:

- Where do residents' park in the winter and are the municipal lots available each season?

Mr. Koses said that he is concerned if the language is modified allowing Traffic Council to decide whether such a lot would be eligible on a case-by-case basis because residents will request program amendments to their streets and Traffic Council may have to revoke permits.

Sgt. Babcock said that the program allows two permits per household and two guest passes per unit. The department has issued nineteen permits on Peabody Street (ten from Washington Street and nine from Peabody Street). The department has stopped issuing permits to Washington Street residents. Each permit receives two guest passes, totaling thirty cars being permitted to park on Peabody Street in approximately 16 legal parking spaces.

Ald. Fuller made the motion to approve Option 2 while Ald. Lennon continues to work with the Law Department.

Mr. Koses suggested that perhaps the language should be modified allowing Traffic Council review the supply of parking spaces perhaps limiting the permits to one per household.

Ald. Lennon said that he will continue working with the Law Department requesting clarification on suggestions made and inquire if the current parking permit program could be amended limiting the number of parking permits issued and if residents whose homes front a street be issued permits first.

Ald. Fuller then withdrew her motion to approve Option 2 and made the motion to hold this item for additional information and clarification from the Law Department as requested. Committee members agreed 6-0, Ald. Harney not voting.