

Chapter 3—Existing Conditions: Bowker Overpass

3.1 INTRODUCTION

This chapter describes the analysis of the Bowker Overpass sub-area of the Massachusetts Turnpike — Boston Ramps Study. As in Chapter 2, which discusses the larger study area, this section summarizes existing transportation conditions during a typical workday, emphasizing the peak-commuting hour. This section also reviews crash data and land use conditions. The Transit Data and Environmental Conditions provided in Chapter 2 apply to the Bowker Overpass sub-area of the study.

3.2 TRAFFIC CONDITIONS

Developing a base knowledge of current traffic conditions fosters an understanding of where congestion occurs now and where it likely would occur in the future. The first step in calculating traffic congestion requires using current or recent turning-movement and traffic counts. Traffic counts were obtained along the Massachusetts Turnpike between the Allston Tolls and Ted Williams Tunnel, and at specific intersections throughout the study area. The volumes used in this analysis are presented in Section 3.2.1. Section 3.2.2 summarizes system performance.

3.2.1 Existing (2010) Traffic Volumes

The Bowker Overpass delineates the Back Bay and Fenway/Kenmore neighborhoods, and runs roughly along the Muddy Brook between the Emerald Necklace/Back Bay Fens and the Charles River Esplanade. It connects Boylston Street and Fenway with Storrow Drive over the Massachusetts Turnpike, Commonwealth Avenue, and Beacon Street (Figure 3-1). The Bowker is also known as the Charlesgate Overpass, as Charlesgate is the name of the roadway that the overpass carries. On either side of the Bowker, Charlesgate East and Charlesgate West provide at-grade access to Commonwealth Avenue and Beacon Street. This study sub-area includes 13 study intersections between Kenmore Square to the west and Stuart Street at Arlington Street to the east (Figure 3-2 and Table 3-1). Those intersections not directly along the Charlesgate corridor were included to assess the impact of proposed alternatives elsewhere in the Back Bay area.

The overpass is roughly 1,600 feet long with two travel lanes in each direction. It is a limited-access roadway divided by a six-foot wide curbed median with a guardrail. There are off- and on-ramps for access to/from eastbound Commonwealth Avenue and both directions of Storrow Drive. As the Bowker descends at the north end, the roadway passes under eastbound Storrow Drive.

As shown in Figure 3-3, most of the roads in the area are owned and operated by the City of Boston. However, the Department of Conservation and Recreation (DCR) is responsible for Charlesgate, Charlesgate East, Charlesgate West, Storrow Drive, and a portion of Boylston Street.

Table 3-1
Bowker Overpass Study Intersections/Count Locations

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1. Charlesgate at Boylston Street and Fenway
 2. Charlesgate East at Commonwealth Avenue – Eastbound
 3. Charlesgate East at Commonwealth Avenue – Westbound
 4. Charlesgate West at Commonwealth Avenue – Eastbound
 5. Charlesgate West at Commonwealth Avenue – Westbound
 6. Charlesgate East at Beacon Street
 7. Charlesgate West at Beacon Street
 8. Charlesgate East at Marlborough Street
 9. Saint James Avenue at Dartmouth Street
 10. Stuart Street at Arlington Street
 11. Kenmore Square
 12. Bowker Overpass at Boylston Street
 13. Beacon Street at Massachusetts Avenue
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The Bowker Overpass, its on- and off-ramps, and its bridge structures are owned by MassDOT. The roadways leading to the Bowker Overpass are owned by DCR and, along with the Bowker Overpass, are functionally classified as principal arterials. Although it is part of the National Highway System (NHS), there is a truck restriction in place, as there is on many of DCR's parkways and roadways. The travel lanes are approximately 16-feet wide and there are no shoulders. There are sidewalks on either side of the overpass south of the Commonwealth Avenue ramps.

Charlesgate East and West also are DCR-owned principal arterials. As full-access roadways, they permit trucks; however, they are not designated truck routes, nor part of the NHS. Each roadway travels in one direction—northbound traffic runs on Charlesgate East (generally in two lanes), and southbound traffic on Charlesgate West (generally three lanes). There is no on-street parking, and there are sidewalks on both sides. Bicyclists on these sections ride with traffic or on the sidewalk; there is no on-road bicycle infrastructure.

Storrow Drive is a limited-access roadway owned by DCR and functionally classified as a principal arterial. Trucks are not allowed on it. It has two 12-foot wide lanes in each direction and is divided by a 12-foot wide median. There are three-foot wide shoulders on either side. The Dr. Paul Dudley White/Charles River Path parallels Storrow Drive on the north side for bicycles, pedestrians, and other nonmotorized users.

Beacon Street is one way westbound, with full access. It is a principal arterial owned by the City of Boston, but it is not part of the NHS. Parallel parking is permitted on both

Figure 3-1
Bowker Overpass Area



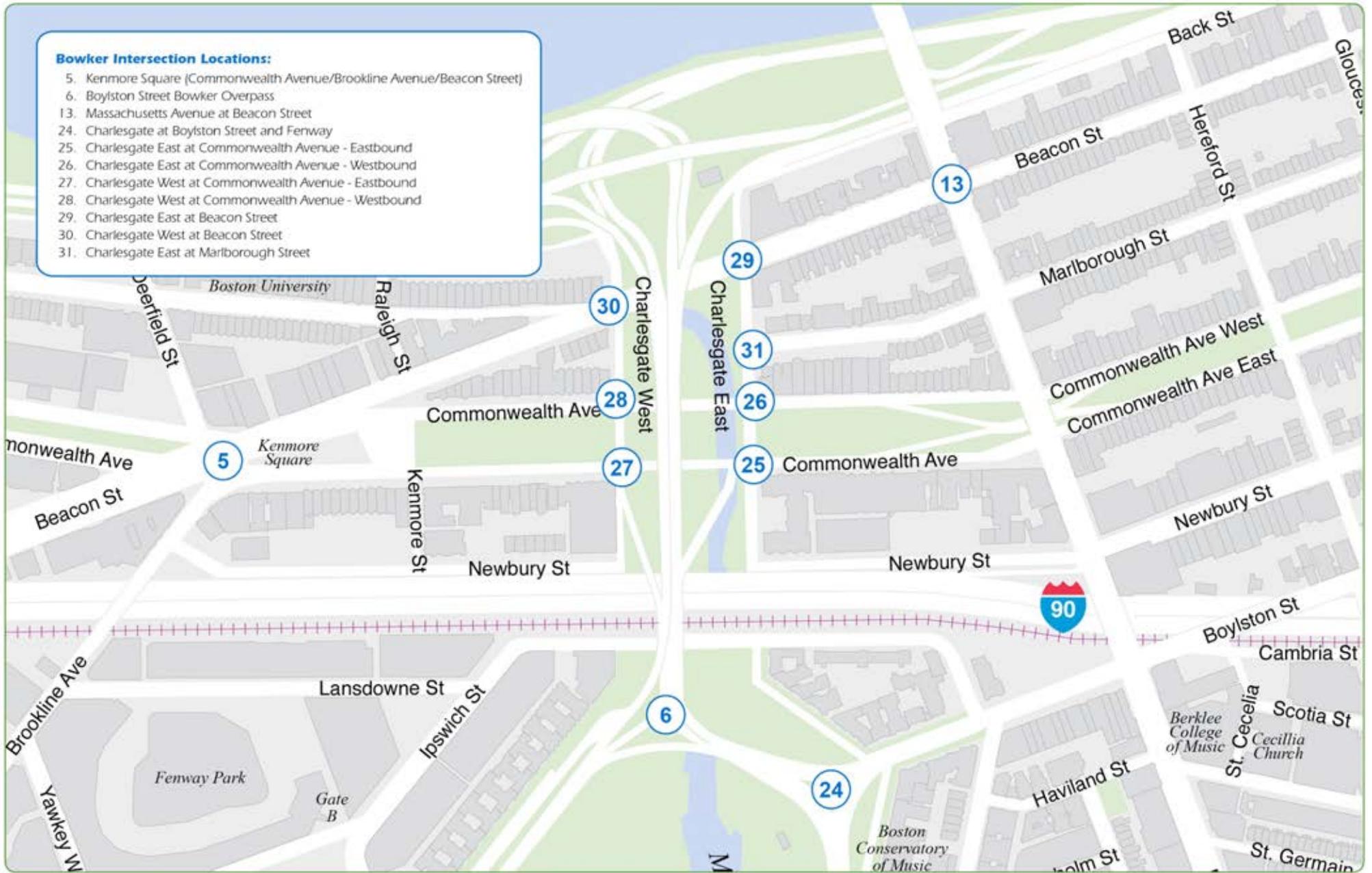


FIGURE 3-2
Bowker Overpass Study Intersections

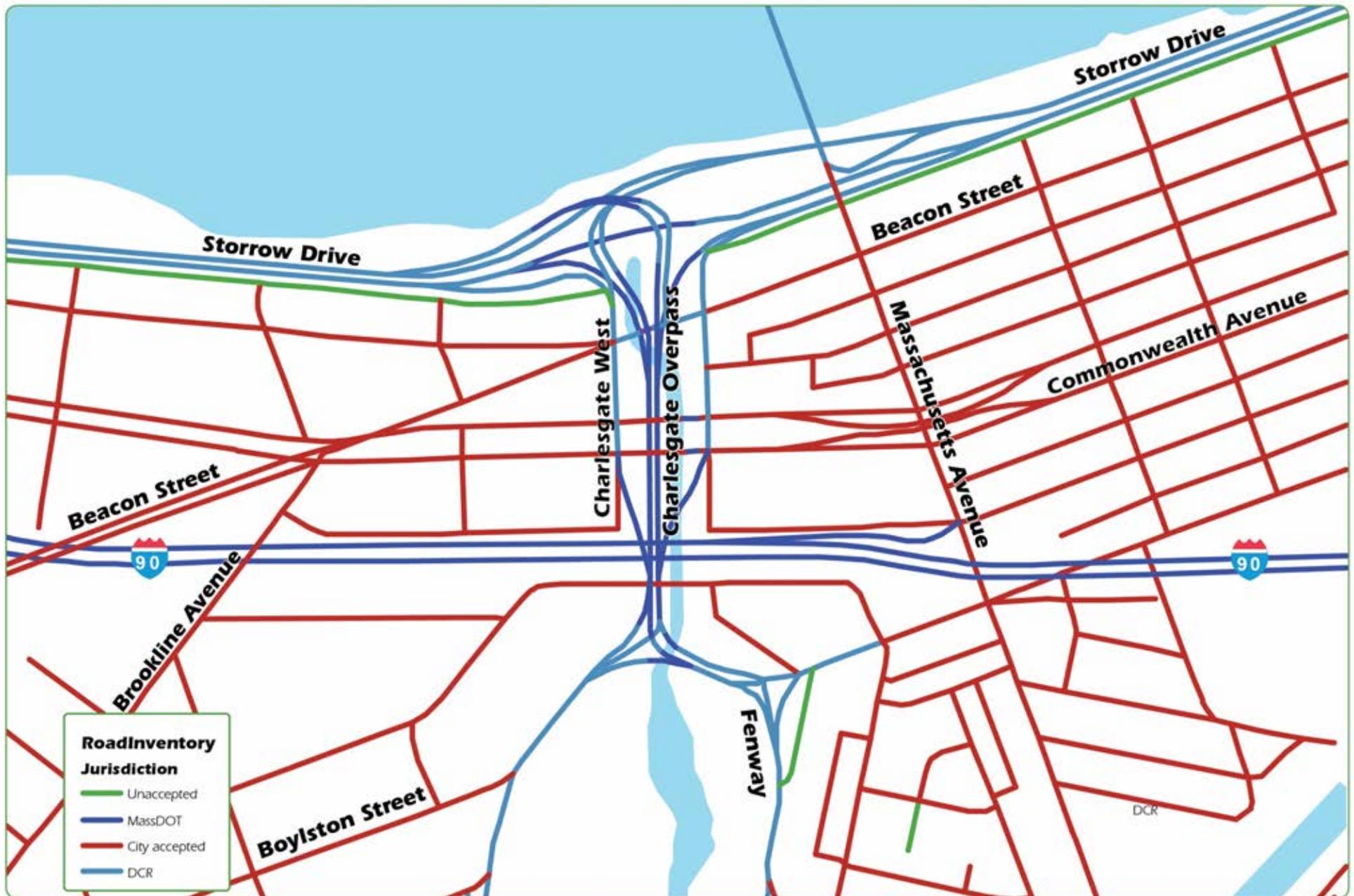


FIGURE 3-3
Roadway Jurisdiction

sides and there is a six-foot wide bike lane along the north side. The two travel lanes are approximately 11.5 feet wide each, with sidewalks on both sides.

Commonwealth Avenue (also Route 2) is a City-of Boston-owned principal arterial, classified as a full access roadway, and part of the NHS. East of Charlesgate, Commonwealth Avenue has two lanes in each direction and is divided by a 96-foot-wide median, where pedestrians can enjoy a park-like atmosphere. There are six-foot-wide bicycle lanes along the inner (median) sides and bicycle sharrows (pavement markings) in the outer travel lanes, as well as parallel parking and sidewalks. The travel lanes are approximately 10-feet wide. West of Charlesgate, the cross section varies through Kenmore Square.

Boylston Street is a principal arterial with portions owned by DCR, the city of Boston, and MassDOT. It generally has a straight alignment except where it skirts the Emerald Necklace at the southern end of the Bowker Overpass. It has two travel lanes in each direction, and the Emerald Necklace path runs along the south side for pedestrians and bicyclists. Boylston Street is part of the NHS and trucks are allowed on it. There is no parking along this section. There are no on-road bicycle facilities. West of the overpass between Charlesgate and Park Drive, the 40-foot wide surface is undivided and there is a frontage road on the northwestern side. Although there is no sidewalk between the frontage road and Boylston Street, there is a pedestrian desire line, as evidenced by a path worn in the grass. East of the overpass between Charlesgate and Fenway, the 64-foot wide surface is divided by an 18-foot median, where there is a sidewalk on the north side.

For bicyclists, the Bowker Overpass presents a significant gap in the regional network. Two of Boston's most important off-road facilities, the Emerald Necklace and the Charles River Path, are isolated from each other because of the lack of an off-street connection (Figure 3-4). The Muddy Brook and the open space surrounding it present a natural linkage between these two major public areas. Efforts currently are proposed to help fill this gap. The Charlesgate Greenway Connection project seeks to re-open a two-acre parcel of parkland within the Storrow Drive median that presently is cut off from its surroundings. The project would provide a multi-use connection between Beacon Street and Massachusetts Avenue. This effort is currently in the design phase.

The MBTA Green Line runs under Charlesgate with stops at Hynes Convention Center to the east and Kenmore to the west. There is a commuter rail stop at Yawkey Way on the Worcester line. Table 3-2 lists the bus routes in the area.

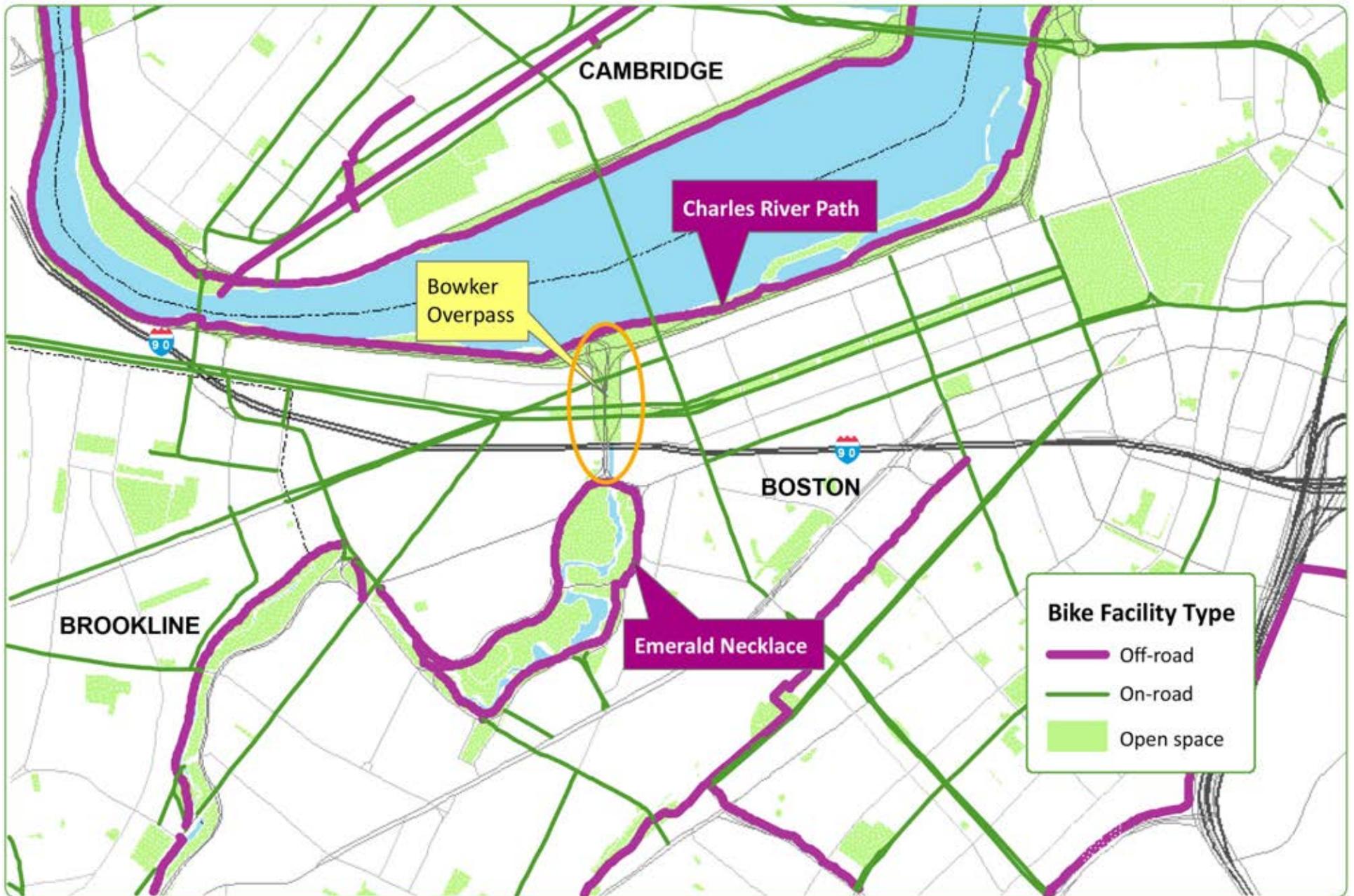


FIGURE 3-4
Gap Between Charles River Path and Emerald Necklace

Table 3-2
Bowker Overpass Study Area Bus Routes

Bus 1: Harvard/Holyoke Gate – Dudley Station
Express Bus 170: Central Square, Waltham and Dudley Square
Bus 19: Fields Corner Station – Kenmore or Ruggles Station via Grove Hall and Dudley Station
Bus 39: Forest Hills Station – Back Bay Station via Huntington Ave
Bus 55: Jersey and Queensberry – Copley Square or Park and Tremont Streets via Ipswich Street
Bus 57: Watertown Yard – Kenmore Station via Newton Corner and Brighton Center
Bus 60: Chestnut Hill – Kenmore Station via Brookline Village and Cypress Street
Bus 65: Brighton Center – Kenmore Station via Washington Street, Brookline Village, and Brookline Avenue
Bus 8: Harbor Point/UMass – Kenmore Station via BU Medical Center and Dudley Station
Bus 9: City Point - Copley Square via Broadway Station
Bus CT1: Central Square, Cambridge – BU Medical Center/Boston Medical Center via MIT
Express Bus 170: Central Square, Waltham and Dudley Square
Bus 19: Fields Corner Station – Kenmore or Ruggles Station via Grove Hall and Dudley Station

3.2.2 Intersection Volumes

The intersection counts for the Bowker study area were conducted in 2010; to ensure consistent counts seasonal adjustment factors were applied to them so they would reflect an average weekday peak period volume. Figure 3-5 shows the AM (7:00 AM–9:00 AM) and PM (4:00 PM–6:00 PM) peak volumes in the Bowker study area.

Site visits conducted by the project team found that there were more than 8,000 bicycle and pedestrian users of roads surrounding the Bowker Overpass in September 2013. Although many of these movements were east-west, more than 20 percent of these users accessed the area from Boylston Street to the south (despite poor travel conditions for bicyclists and pedestrians in the north-south direction). Improving safety conditions could result in a substantial increase of bicycle and pedestrian travel in this area.

3.2.3 Intersection Analysis

Using the data collected for the AM and PM peak periods, staff utilized SYNCHRO to assess the capacity and quality of traffic flow at the intersections. The analyses were conducted consistent with the Highway Capacity Manual (HCM) methodology, which demonstrates the driving conditions at signalized and unsignalized intersections in terms of level-of-service (LOS) ratings from A through F. LOS A represents the best operating conditions (little-to-no delay), while LOS F represents the worst operating conditions (very long delay). LOS E represents operating

2010 AM and PM Peak Hour Existing Traffic Volumes

Key

- xxx – AM Peak Hour
- (xxx) – PM Peak Hour

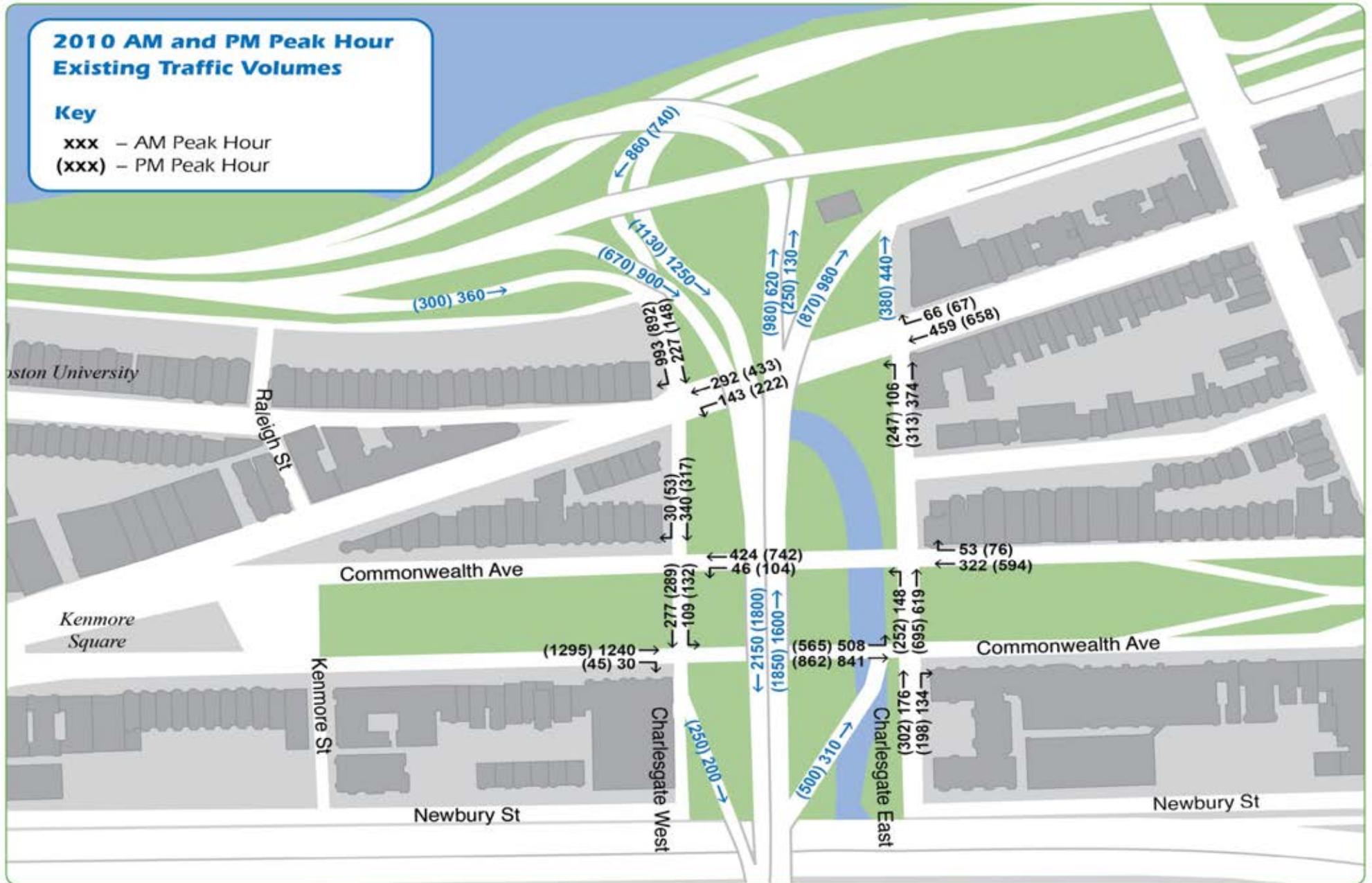


FIGURE 3-5
Peak Period Existing Volumes: Bowker Overpass

conditions at capacity (limit of acceptable delay). Table 3-3 shows the control delays associated with each level of service for signalized and unsignalized intersections.

TABLE 3-3
Level of Service Criteria
for Signalized Intersections

Level of Service	Control Delay (seconds per vehicle)
A	≤ 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

Figure 3-6 shows the AM and Figure 3-7 shows the PM peak-period existing LOS for each key intersection within the study area. Generally, the study area intersections operate better during the AM peak period than in the PM peak period. However, the Boylston-Charlesgate intersection immediately south of the Turnpike operates at LOS E during the AM peak period and LOS D during the PM peak period.

Bicycle and pedestrian LOS also was measured for the Bowker Overpass sub-area using a calculation provided by the League of Illinois Bicyclists and promoted by the National League of Cities Sustainable Cities Institute. The LOS measures include an evaluation of traffic volumes, on- and off-road bicycle and pedestrian infrastructure, lane widths (particularly of outside lanes), on-street parking, pavement conditions, and heavy-vehicle volumes to derive a grade of bicycle and pedestrian comfort along the same scale as a vehicular LOS. Figure 3-8 shows the bicycle and pedestrian level of service for corridors in the Bowker Overpass sub-area.

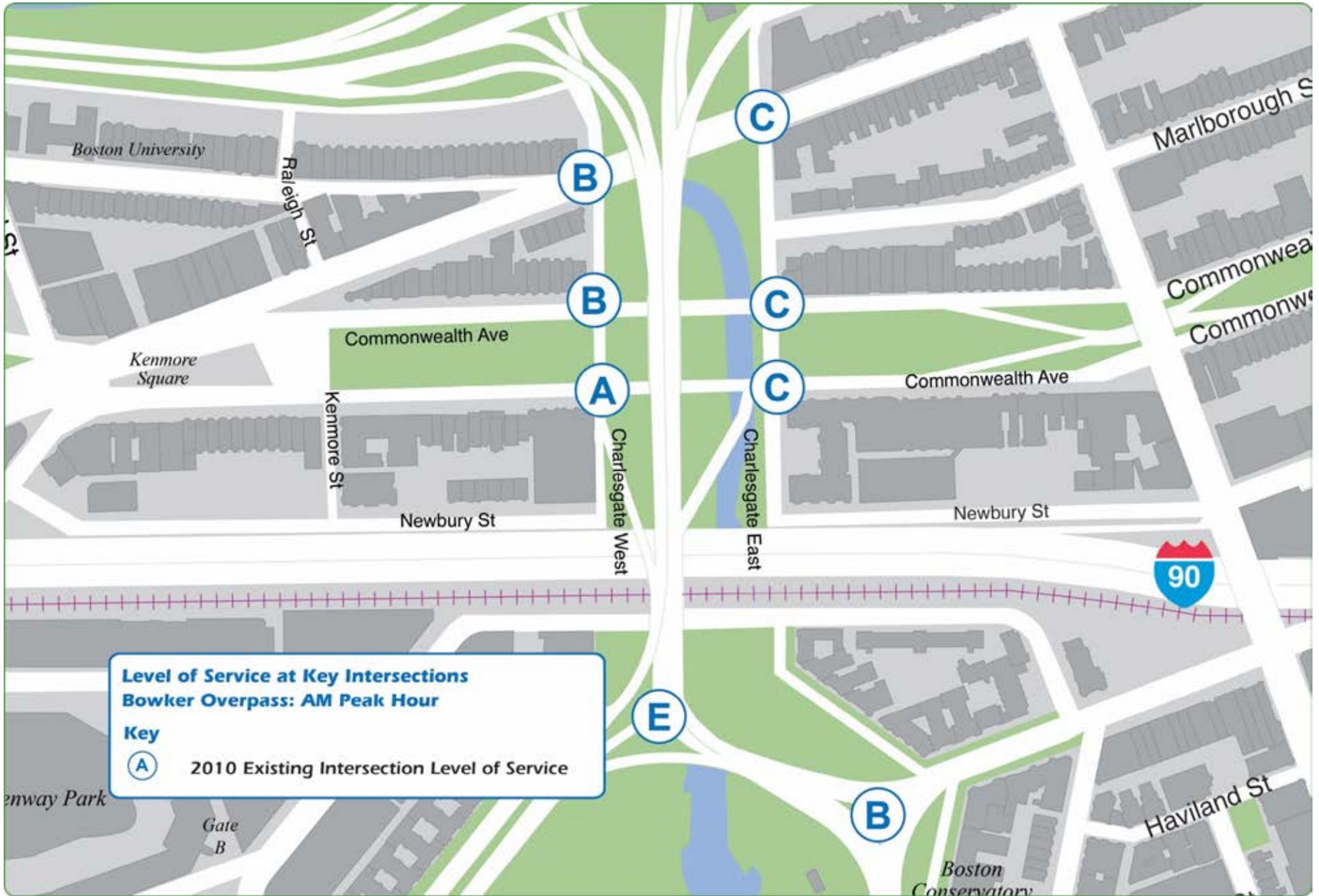


FIGURE 3-6
AM Peak Period LOS Under Existing Volumes:
Bowker Overpass

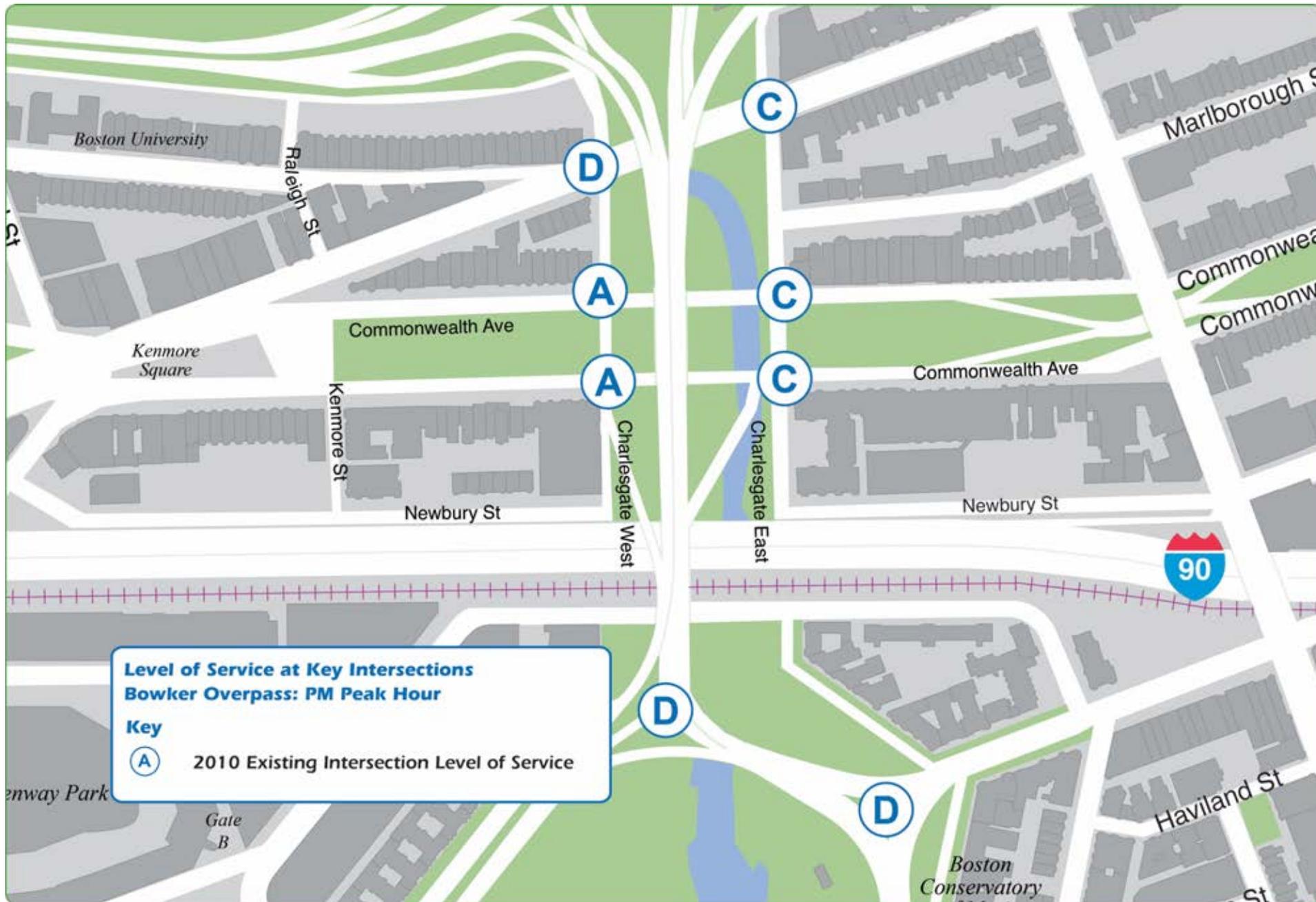


FIGURE 3-7
PM Peak Period LOS Under Existing Volumes:
Bowker Overpass

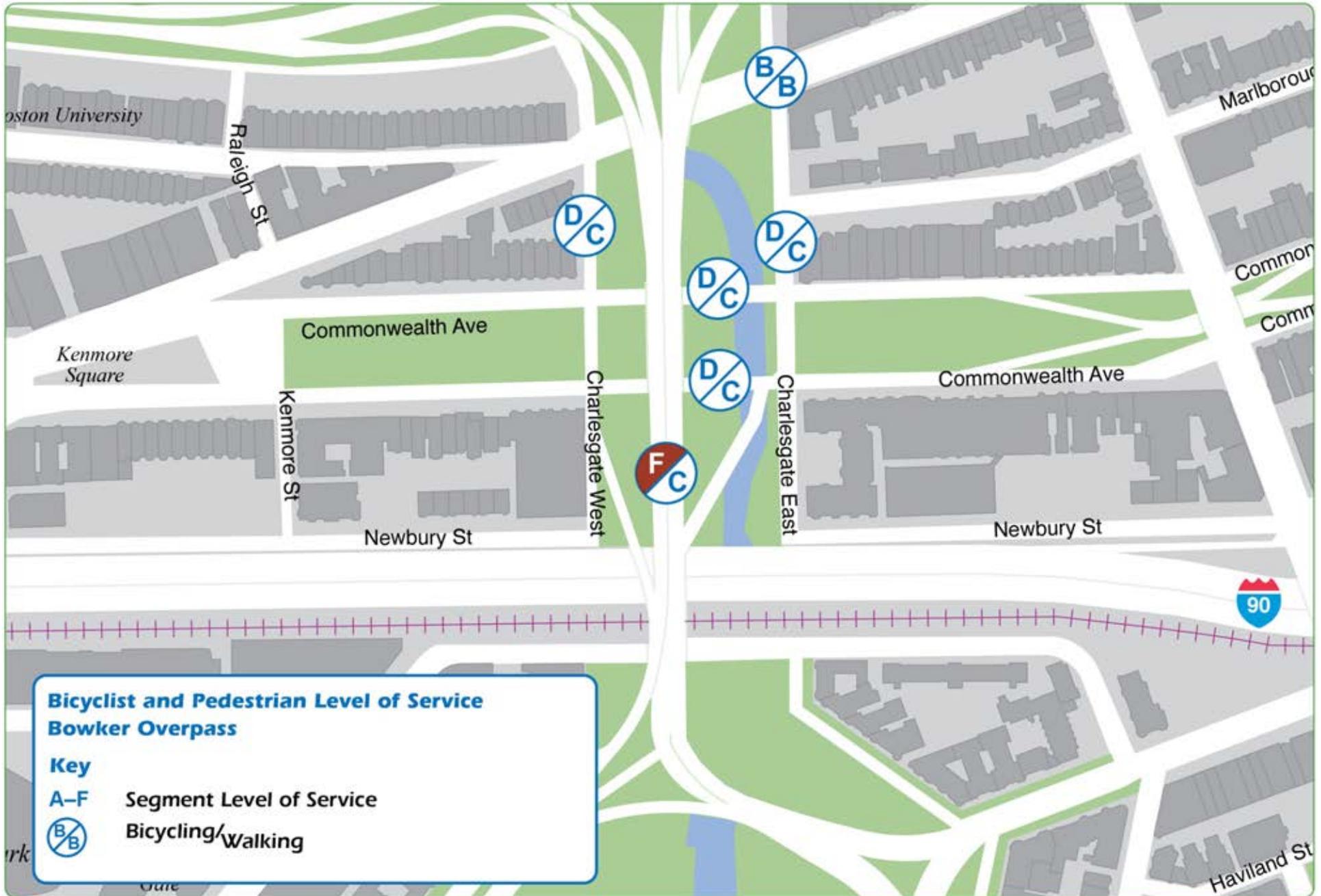


FIGURE 3-8
Bicycle and Pedestrian Level of Service
Bowker Overpass

3.3 CRASH DATA

The existing safety conditions within the Bowker Overpass study area were analyzed using crash report data for the 13 study intersections. The report database was created by the Registry of Motor Vehicles (RMV) using paper crash reports submitted by motorists involved in crashes. The following crash data is for the five-year period from 2006–10.

The MassDOT 2011 Top Crash Locations Report ranks Charlesgate West at Commonwealth Avenue as number 89 in the state (second in Boston) and Charlesgate East at Beacon Street as number 203 (fourth in Boston). Consistent with this, Figures 3-9 and 3-10 show that Charlesgate West at westbound Commonwealth Avenue and at Beacon Street and Charlesgate East at Beacon Street are the three study intersections with the most crashes.

While the majority of crash incidents involve property damage only, Charlesgate West at westbound Commonwealth Avenue and Charlesgate West at Beacon Street are the two intersections in the study area with the most personal injuries (Figure 3-11). The intersection of Beacon Street at Massachusetts Avenue has an equal number of crashes involving property damage only and injuries; and it has the most incidents involving bicyclists and pedestrians in the study area (Figure 3-12). St. James Avenue at Dartmouth Street is the only location in the study area with more injury than property-damage-only crashes. None of the crashes in the study area were fatal.

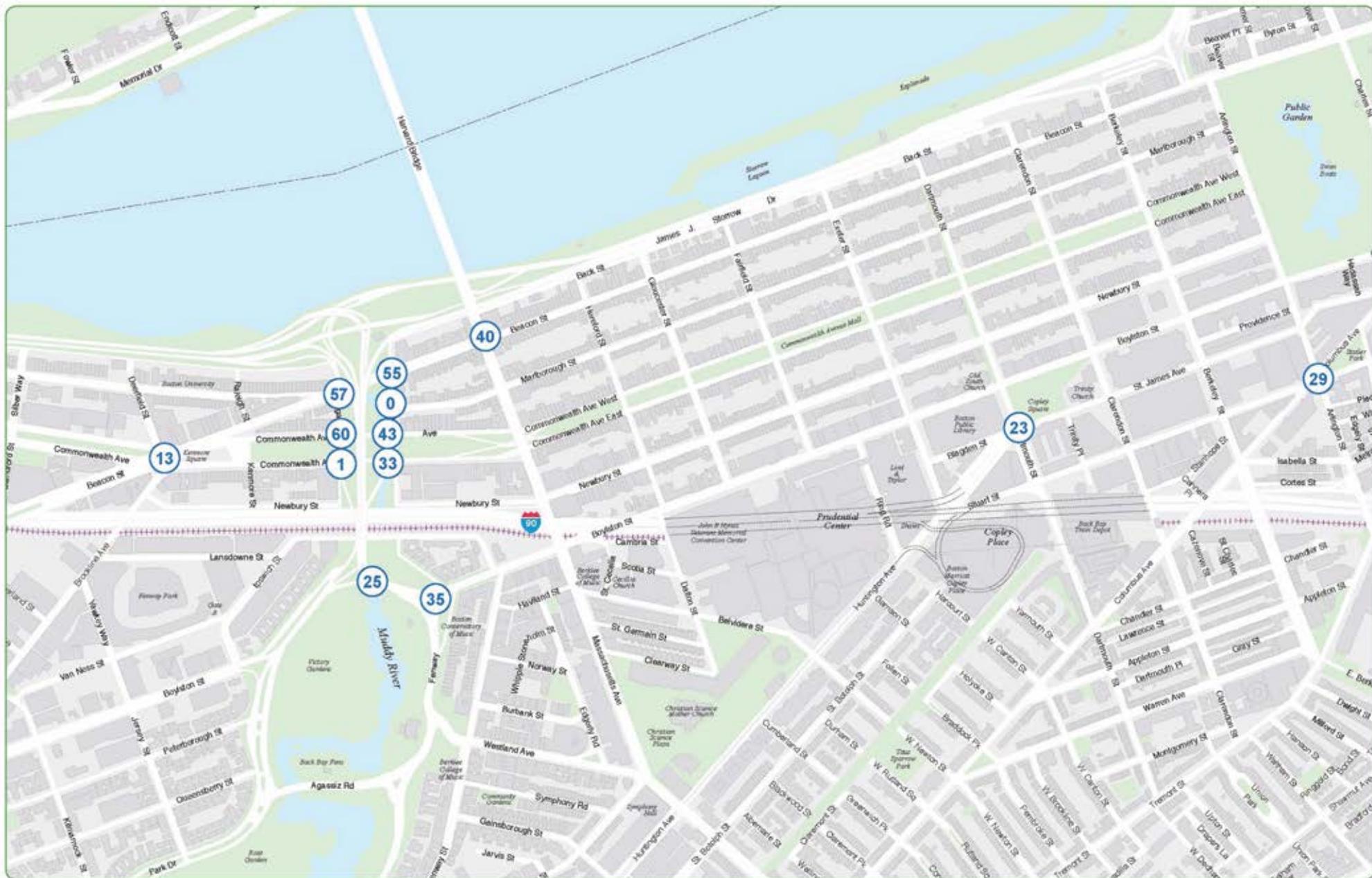
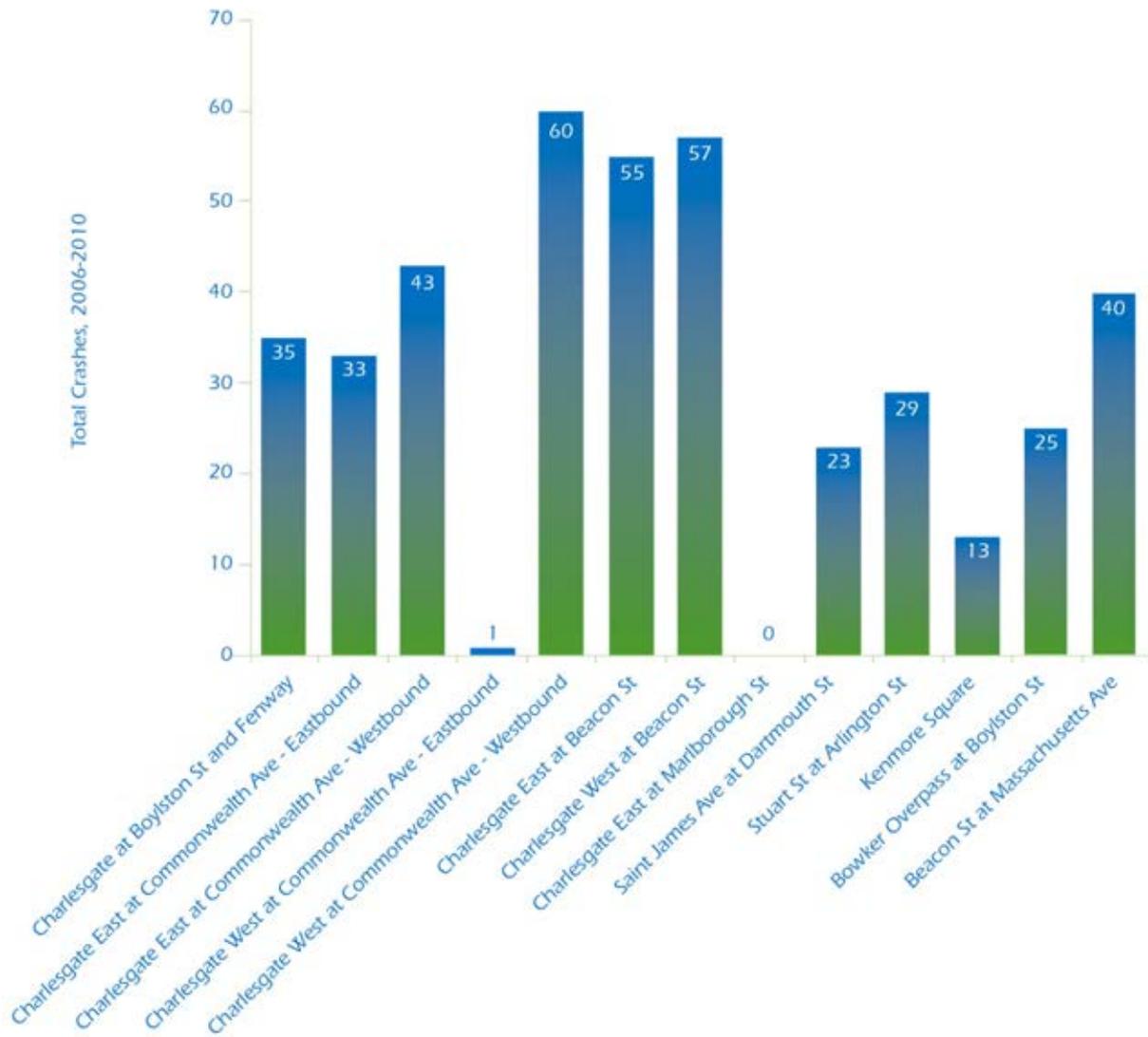


FIGURE 3-9
Crashes by Intersection

**Figure 3-10
Total Crashes by Intersection**



**Figure 3-11
Crash Severity by Intersection**

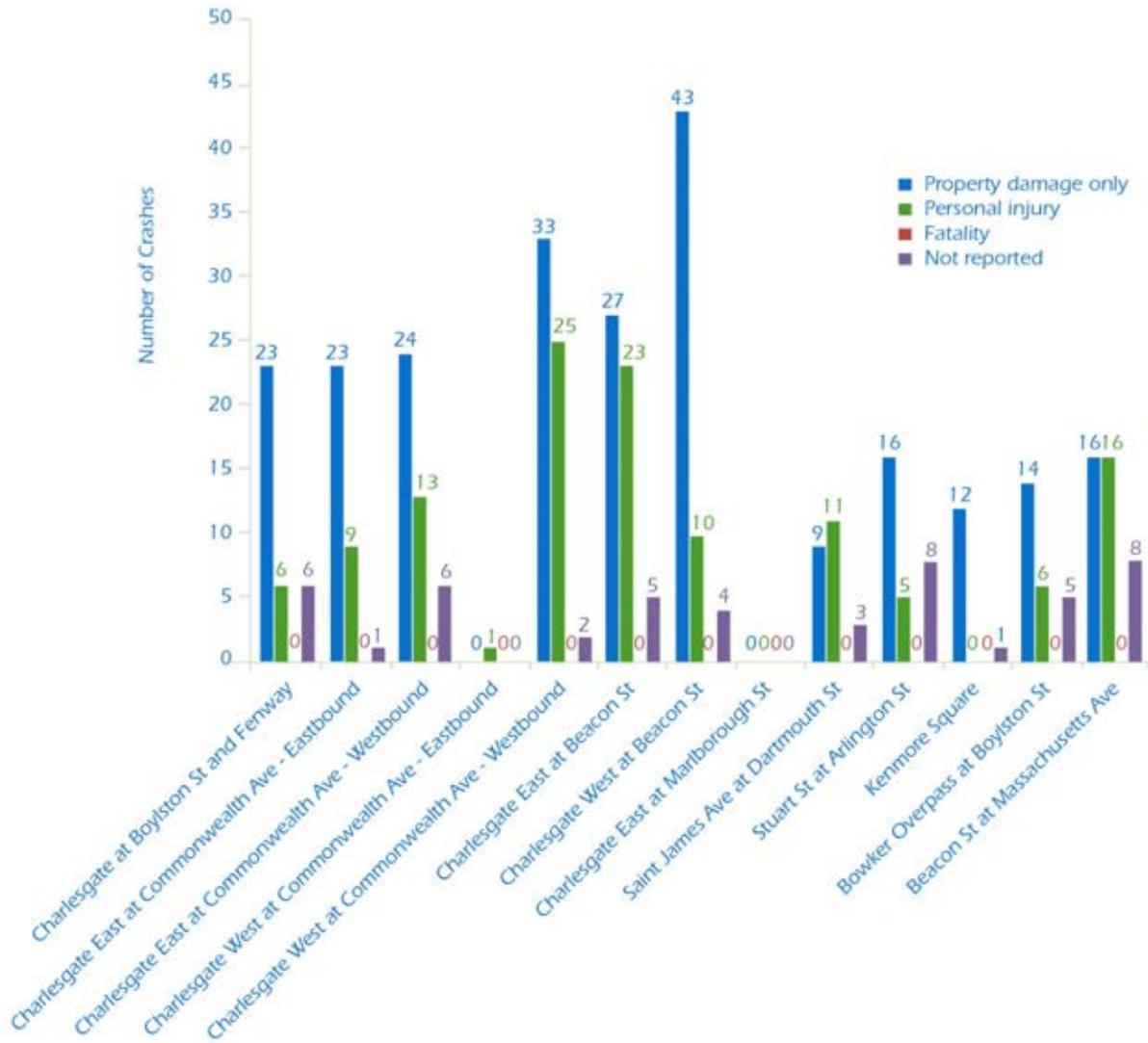


Figure 3-12
Number of Crashes Involving Bicyclists or Pedestrians

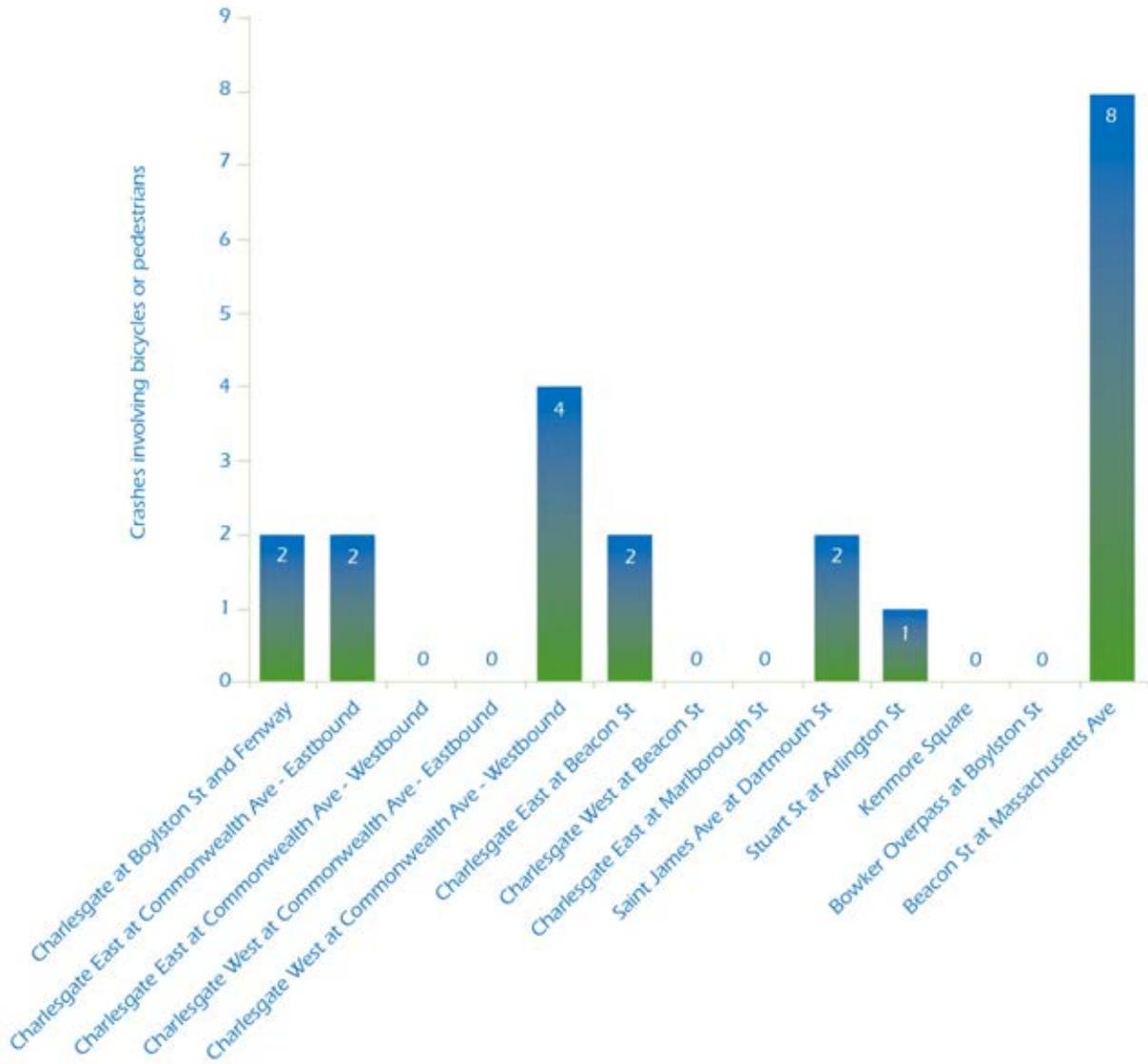


Figure 3-13 shows that the majority of crashes are angle type. However, at the Bowker Overpass at Boylston Street, Charlesgate at Boylston and Fenway, and Beacon Street at Massachusetts Avenue, rear-end crashes dominate. Sideswipes also occur frequently at nearly all the study intersections.

Figure 3-13
Crash Type by Intersection

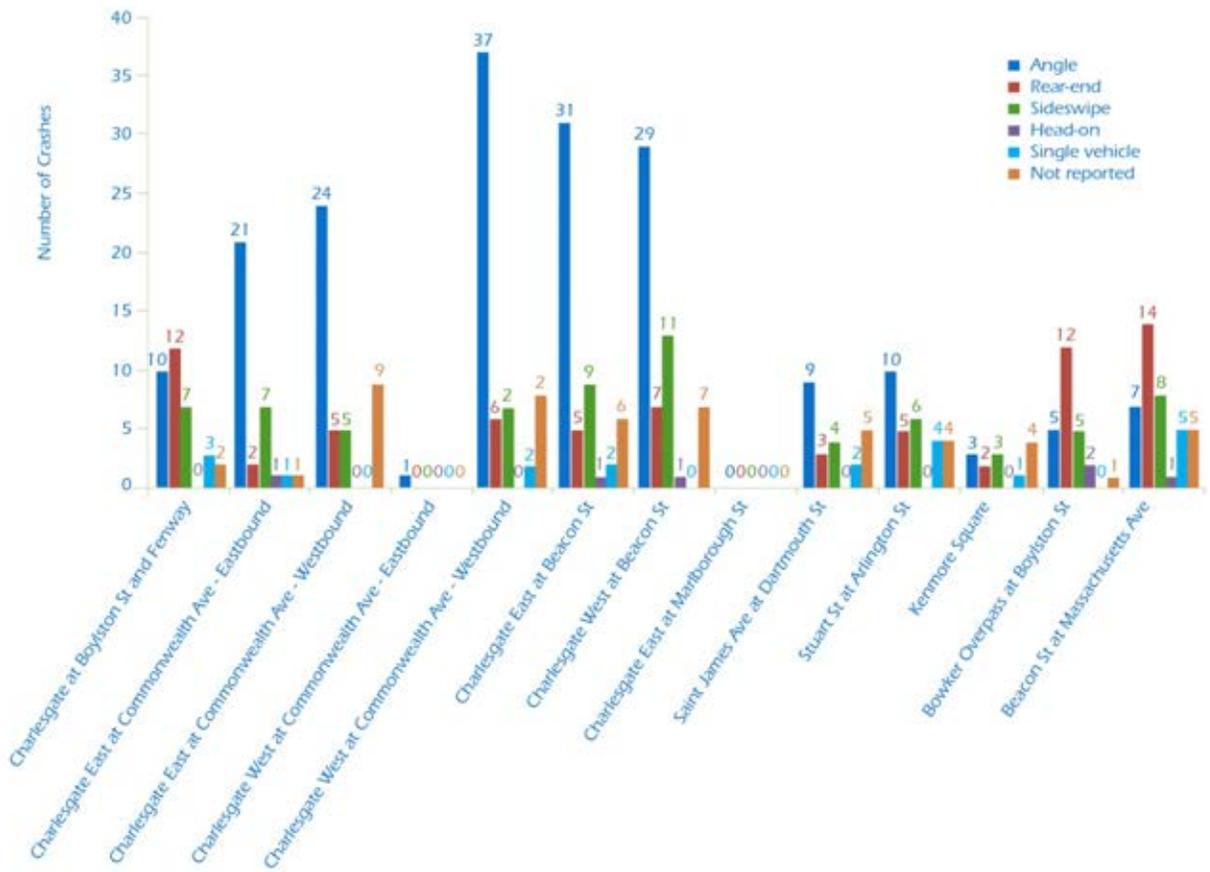
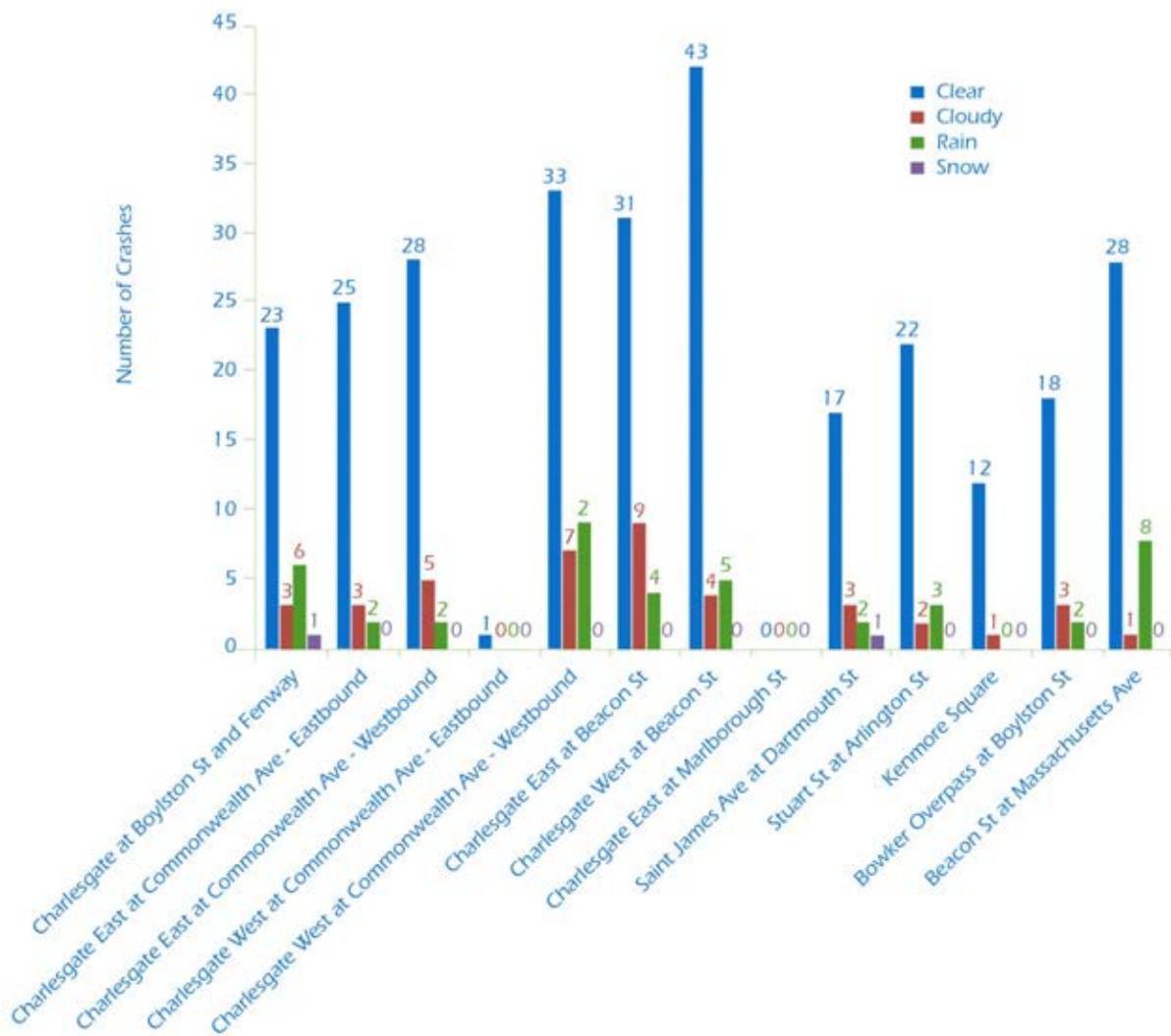
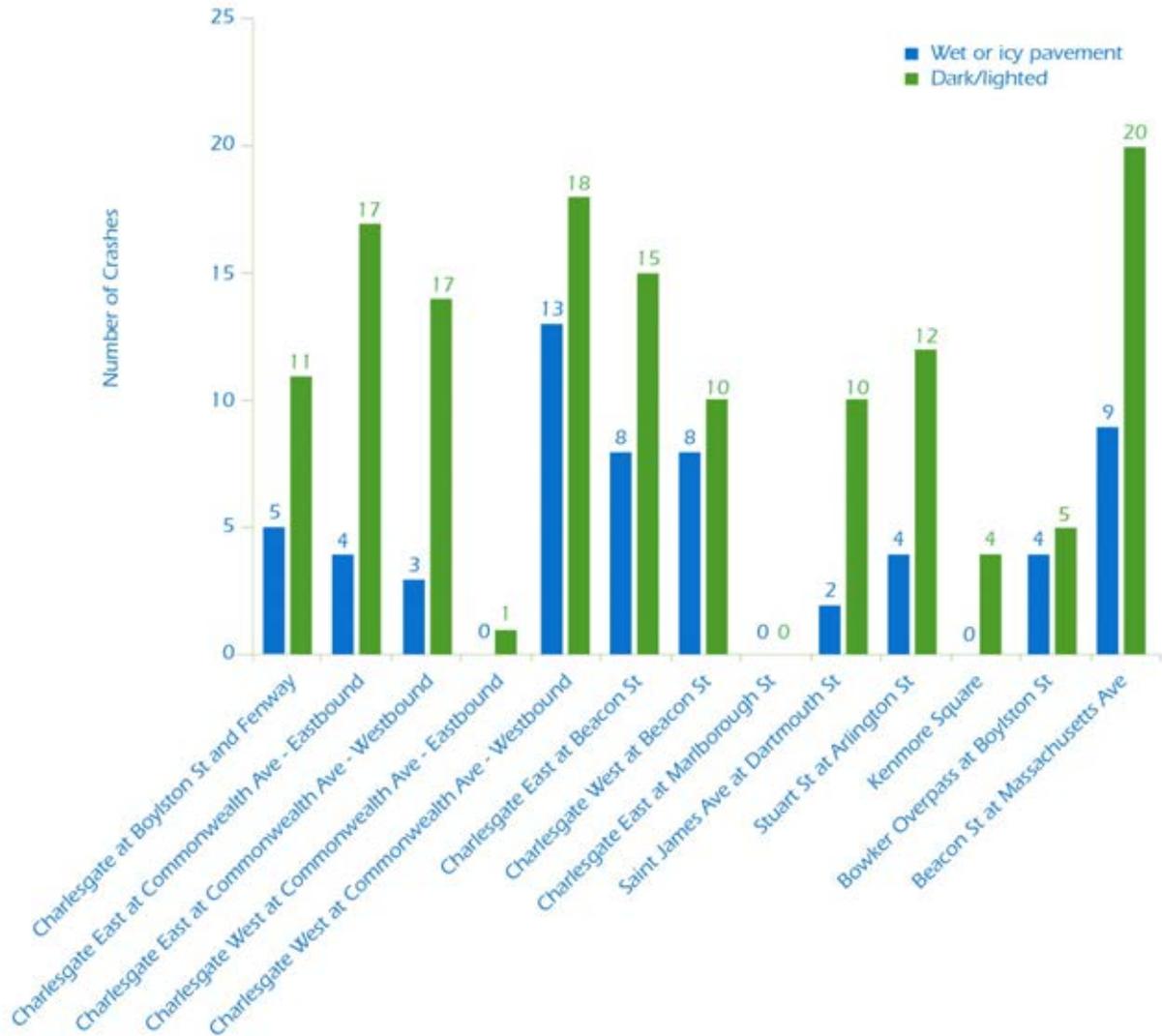


Figure 3-14 shows that weather does not appear to be a contributing factor to crashes at the study intersections. However, lighting conditions may be a factor at Beacon Street at Massachusetts Avenue and at both the Charlesgate East at Commonwealth Avenue-Eastbound and Charlesgate West at Commonwealth Avenue-Westbound intersections (Figure 3-15).

Figure 3-14
Weather Conditions at Time of Crash



**Figure 3-15
Road Surface and Lighting Conditions
At Time of Crashes**



3.3.1 Intersection Crash Data

Crash data for the Bowker Overpass study intersections was gathered from the RMV database for the five-year period 2006 to 2010. This crash data provides an overview of safety conditions at key Bowker study area intersections and will be useful in assessing the potential effects of proposed alternatives.

Charlesgate at Bolyston Street and Fenway

Table 3-4 provides a summary of the 35 crashes that took place at this intersection between 2006 and 2010. Thirty-four percent were rear end; 29 percent were angle; and 20 percent were sideswipe collisions. The majority (66 percent) occurred during clear weather and nearly one-third (31 percent) took place during the AM or PM peak period.

Table 3-4
Crashes at Charlesgate at Boylston

		2006	2007	2008	2009	2010	2006–10	
							Total	Average
Total Number of Crashes		10	8	6	5	6	35	7
Crash	Property Damage Only	7	4	4	4	4	23	4.6
	Severity							
	Personal injury	1	1	2	1	1	6	1.2
	Fatality	0	0	0	0	0	0	0
	Not Reported	2	3	0	0	1	6	1.2
Collision Type	Angle	0	3	3	2	2	10	2
	Rear-end	5	2	1	1	3	12	2.4
	Sideswipe	1	3	2	0	1	7	1.4
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	1	0	0	2	0	3	0.6
	Not Reported	2	0	0	0	0	2	0.4
Roadway Conditions	Wet/Icy Pavement	1	1	1	1	1	5	1
	Dark/Lit	5	2	1	1	2	11	2.2
Weather Conditions	Clear	8	4	5	2	4	23	4.6
	Cloudy	0	1	0	1	1	3	0.6
	Rain	2	1	1	1	1	6	1.2
	Snow	0	1	0	0	0	1	0.2
Crashes During Weekday Peak Periods*		6	2	1	2	0	11	2.2
Crashes Involving Pedestrian(s)		0	0	0	1	0	1	0.2
Crashes Involving Bicyclist(s)		0	0	0	1	0	1	0.2

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate East at Commonwealth Avenue – Eastbound

Thirty-three crashes are shown in Table 3-5 for this location and 64 percent of them were angle type. A large proportion (52 percent) occurred in the dark, suggesting that better lighting may help to address safety issues.

Table 3-5
Crashes at Charlesgate East at Commonwealth Avenue – Eastbound

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		4	12	11	6	0	33	6.6
Crash	Property Damage Only	3	8	7	5	0	23	4.6
	Severity							
	Personal injury	1	3	4	1	0	9	1.8
	Fatality	0	0	0	0	0	0	0
	Not Reported	0	1	0	0	0	1	0.2
Collision Type	Angle	2	6	7	6	0	21	4.2
	Rear-end	0	1	1	0	0	2	0.4
	Sideswipe	1	3	3	0	0	7	1.4
	Head-on	0	1	0	0	0	1	0.2
	Single Vehicle	0	1	0	0	0	1	0.2
	Not Reported	1	0	0	0	0	1	0.2
Roadway Conditions	Wet/Icy Pavement	0	2	1	1	0	4	0.8
	Dark/Lit	2	4	8	3	0	17	3.4
Weather Conditions	Clear	3	11	7	4	0	25	5
	Cloudy	1	0	2	0	0	3	0.6
	Rain	0	1	1	0	0	2	0.4
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		0	5	2	1	0	8	1.6
Crashes Involving Pedestrian(s)		0	0	0	1	0	1	0.2
Crashes Involving Bicyclist(s)		0	0	1	0	0	1	0.2

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate East at Commonwealth Avenue – Westbound

Of the 43 crashes at this intersection, shown in Table 3-6, the collision type was not reported 21 percent of the time. The number of crashes in each of the past two years of the analysis is almost equivalent to that of the first three years combined.

Table 3-6
Crashes at Charlesgate East at Commonwealth Avenue – Westbound

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		9	2	4	15	13	43	8.6
Crash	Property Damage Only	4	2	2	8	8	24	4.8
	Severity							
	Personal injury	4	0	0	6	3	13	2.6
	Fatality	0	0	0	0	0	0	0
	Not Reported	1	0	2	1	2	6	1.2
Collision Type	Angle	2	2	0	11	9	24	4.8
	Rear-end	2	0	1	2	0	5	1
	Sideswipe	0	0	2	0	3	5	1
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	0	0	0	0	0	0	0
	Not Reported	5	0	1	2	1	9	1.8
Roadway	Wet/Icy Pavement	0	0	1	1	1	3	0.6
Conditions	Dark/Lit	4	1	0	3	6	14	2.8
Weather Conditions	Clear	7	2	3	9	7	28	5.6
	Cloudy	1	0	0	2	2	5	1
	Rain	0	0	1	1	0	2	0.4
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		2	0	2	8	3	15	3
Crashes Involving Pedestrian(s)		0	0	0	0	0	0	0
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate West at Commonwealth Avenue – Eastbound

There was only one crash reported between 2006 and 2010 at this intersection. The crash occurred on an evening in March 2010, and involved a personal injury; it was an angle crash and weather did not appear to be a contributing factor.

Charlesgate West at Commonwealth Avenue – Westbound

There were 60 crashes at this intersection and 42percent of them involved an injury, as shown in Table 3-7. Three of the crashes involved pedestrians and one involved a bicyclist. The majority of the crash types were angle. Thirty-eight percent of the crashes took place during the AM or PM peak period. There were more crashes in 2008, 2009, and 2010 than there were in 2006 or 2007.

Table 3-7
Crashes at Charlesgate West at Commonwealth Avenue – Westbound

		2006	2007	2008	2009	2010	2006–10	
							Total	Average
Total Number of Crashes		9	8	13	14	16	60	12
Crash	Property Damage Only	6	4	8	6	9	33	6.6
	Severity							
	Personal injury	3	4	4	7	7	25	5
	Fatality	0	0	0	0	0	0	0
	Not Reported	0	0	1	1	0	2	0.4
Collision Type	Angle	4	5	6	10	12	37	7.4
	Rear-end	1	1	2	1	1	6	1.2
	Sideswipe	0	1	3	1	2	7	1.4
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	0	0	0	1	1	2	0.4
	Not Reported	4	1	2	1	0	8	1.6
Roadway	Wet/Icy Pavement	1	4	1	2	5	13	2.6
Conditions	Dark/Lit	1	2	5	7	3	18	3.6
Weather Conditions	Clear	8	3	10	6	6	33	6.6
	Cloudy	0	1	3	2	1	7	1.4
	Rain	1	3	0	2	3	9	1.8
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		4	4	5	6	4	23	4.6
Crashes Involving Pedestrian(s)		0	0	0	3	0	3	0.6
Crashes Involving Bicyclist(s)		0	0	0	0	1	1	0.2

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate East at Beacon Street

Table 3-8 indicates that there were 55 crashes at this intersection, and 42 percent of them involved injuries. Forty-seven percent occurred during the peak period, suggesting that they may be congestion related. More than half of the crashes were angle, followed by sideswipe collisions (16 percent).

**Table 3-8
Crashes at Charlesgate East at Beacon Street**

		2006	2007	2008	2009	2010	2006–10	
							Total	Average
Total Number of Crashes		12	10	11	8	14	55	11
Crash	Property Damage Only	7	3	7	3	7	27	5.4
	Severity							
	Personal injury	4	6	3	5	5	23	4.6
	Fatality	0	0	0	0	0	0	0
	Not Reported	1	1	1	0	2	5	1
Collision Type	Angle	7	3	6	6	9	31	6.2
	Rear-end	3	1	0	0	1	5	1
	Sideswipe	0	2	4	1	2	9	1.8
	Head-on	0	0	0	0	1	1	0.2
	Single Vehicle	0	0	1	0	1	2	0.4
	Not Reported	2	3	0	1	0	6	1.2
Roadway	Wet/Icy Pavement	3	2	0	0	3	8	1.6
Conditions	Dark/Lit	1	4	4	1	5	15	3
Weather Conditions	Clear	8	6	9	3	5	31	6.2
	Cloudy	2	2	1	2	2	9	1.8
	Rain	1	1	0	0	2	4	0.8
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		6	3	5	6	6	26	5.2
Crashes Involving Pedestrian(s)		0	0	0	0	0	0	0
Crashes Involving Bicyclist(s)		0	1	0	1	0	2	0.4

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate West at Beacon Street

As shown in Table 3-9, most of the 57 crashes involved property damage only and occurred during clear weather, daylight, and dry road conditions. Fifty-one percent of the crashes were angle, followed by 23 percent sideswipe collisions.

Table 3-9
Crashes at Charlesgate West at Beacon Street

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		11	16	10	9	11	57	11.4
Crash	Property Damage Only	8	12	8	7	8	43	8.6
Severity	Personal injury	3	2	2	1	2	10	2
	Fatality	0	0	0	0	0	0	0
	Not Reported	0	2	0	1	1	4	0.8
Collision Type	Angle	3	9	5	6	6	29	5.8
	Rear-end	2	0	1	1	3	7	1.4
	Sideswipe	2	5	4	0	2	13	2.6
	Head-on	0	0	0	1	0	1	0.2
	Single Vehicle	0	0	0	0	0	0	0
	Not Reported	4	2	0	1	0	7	1.4
Roadway	Wet/Icy Pavement	1	0	2	2	3	8	1.6
Conditions	Dark/Lit	2	1	3	1	3	10	2
Weather	Clear	9	16	7	4	6	42	8.4
Conditions	Cloudy	1	0	2	0	1	4	0.8
	Rain	1	0	1	2	1	5	1
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		5	5	4	5	3	22	4.4
Crashes Involving Pedestrian(s)		0	0	0	0	0	0	0
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Charlesgate East at Marlborough Street

There were no crashes reported at this intersection between 2006 and 2010.

Saint James Avenue at Dartmouth Street

This location had considerably fewer crashes (23) than many of the other study intersections. However, the predominate number of the incidents shown in Table 3-10 (48 percent) involved personal injuries. Forty-three percent of the crashes occurred in the dark during clear weather, suggesting that lighting might have been an issue; and 43 percent took place during the peak period.

**Table 3-10
Crashes at Saint James Avenue at Dartmouth Street**

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		6	4	8	3	2	23	4.6
Crash	Property Damage Only	2	2	3	0	2	9	1.8
	Severity							
	Personal injury	3	2	4	2	0	11	2.2
	Fatality	0	0	0	0	0	0	0
	Not Reported	1	0	1	1	0	3	0.6
Collision Type	Angle	3	1	4	1	0	9	1.8
	Rear-end	1	1	0	1	0	3	0.6
	Sideswipe	0	2	2	0	0	4	0.8
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	0	0	0	1	1	2	0.4
	Not Reported	2	0	2	0	1	5	1
Roadway	Wet/Icy Pavement	0	1	1	0	0	2	0.4
Conditions	Dark/Lit	2	2	3	1	2	10	2
Weather	Clear	5	2	6	3	1	17	3.4
Conditions	Cloudy	1	0	2	0	0	3	0.6
	Rain	0	2	0	0	0	2	0.4
	Snow	0	0	0	0	1	1	0.2
Crashes During Weekday Peak Periods*		3	2	3	1	1	10	2
Crashes Involving Pedestrian(s)		0	1	0	1	0	2	0.4
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Stuart Street at Arlington Street

Table 3-11 shows that there were 29 incidents at this location, and the collision types were more varied than at most of the other study intersections: thirty-four percent were angle; 21 percent were sideswipe; 17 percent were rear-end; 14 percent were single vehicle crashes; and 14 percent were unreported. Forty-one percent of incidents occurred during non-daylight hours.

Table 3-11
Crashes at Stuart Street at Arlington Street

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		6	4	8	3	2	23	4.6
Crash	Property Damage Only	2	2	3	0	2	9	1.8
	Severity							
	Personal injury	3	2	4	2	0	11	2.2
	Fatality	0	0	0	0	0	0	0
	Not Reported	1	0	1	1	0	3	0.6
Collision Type	Angle	3	1	4	1	0	9	1.8
	Rear-end	1	1	0	1	0	3	0.6
	Sideswipe	0	2	2	0	0	4	0.8
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	0	0	0	1	1	2	0.4
	Not Reported	2	0	2	0	1	5	1
Roadway	Wet/Icy Pavement	0	1	1	0	0	2	0.4
Conditions	Dark/Lit	2	2	3	1	2	10	2
Weather	Clear	5	2	6	3	1	17	3.4
Conditions	Cloudy	1	0	2	0	0	3	0.6
	Rain	0	2	0	0	0	2	0.4
	Snow	0	0	0	0	1	1	0.2
Crashes During Weekday Peak Periods*		3	2	3	1	1	10	2
Crashes Involving Pedestrian(s)		0	1	0	1	0	2	0.4
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Kenmore Square

As shown in Table 3-12, only 13 incidents were reported at this location between 2006 and 2010; and none during 2009 or 2010. There were an equal number (3) of angle and sideswipe collisions.

Table 3-12
Crashes at Kenmore Square

		2006	2007	2008	2009	2010	2006–10	
							Total	Average
Total Number of Crashes		5	5	3	0	0	13	2.6
Crash	Property Damage Only	5	4	3	0	0	12	2.4
	Severity							
	Personal injury	0	0	0	0	0	0	0
	Fatality	0	0	0	0	0	0	0
	Not Reported	0	1	0	0	0	1	0.2
Collision Type	Angle	2	1	0	0	0	3	0.6
	Rear-end	0	2	0	0	0	2	0.4
	Sideswipe	2	0	1	0	0	3	0.6
	Head-on	0	0	0	0	0	0	0
	Single Vehicle	0	1	0	0	0	1	0.2
	Not Reported	1	1	2	0	0	4	0.8
Roadway	Wet/Icy Pavement	0	0	0	0	0	0	0
Conditions	Dark/Lit	1	2	1	0	0	4	0.8
Weather	Clear	5	5	2	0	0	12	2.4
Conditions	Cloudy	0	0	1	0	0	1	0.2
	Rain	0	0	0	0	0	0	0
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		0	0	0	0	0	0	0
Crashes Involving Pedestrian(s)		0	0	0	0	0	0	0
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Bowker Overpass at Boylston Street

As shown in Table 3-13, 25 incidents were reported at this location, and 48 percent of them were rear-end collisions. Twenty percent were in non-daylight hours and 72 percent were during clear weather.

Table 3-13
Crashes at Bowker Overpass at Boylston Street

							2006–10	
		2006	2007	2008	2009	2010	Total	Average
Total Number of Crashes		8	3	10	1	3	25	5
Crash	Property Damage Only	5	2	7	0	0	14	2.8
	Severity							
	Personal injury	3	0	2	0	1	6	1.2
	Fatality	0	0	0	0	0	0	0
	Not Reported	0	1	1	1	2	5	1
Collision Type	Angle	2	0	3	0	0	5	1
	Rear-end	5	1	3	1	2	12	2.4
	Sideswipe	1	1	2	0	1	5	1
	Head-on	0	0	2	0	0	2	0.4
	Single Vehicle	0	0	0	0	0	0	0
	Not Reported	0	1	0	0	0	1	0.2
Roadway	Wet/Icy Pavement	1	0	2	0	1	4	0.8
Conditions	Dark/Lit	2	0	1	0	2	5	1
Weather Conditions	Clear	7	1	8	1	1	18	3.6
	Cloudy	0	1	1	0	1	3	0.6
	Rain	0	0	1	0	1	2	0.4
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		2	0	0	0	0	2	0.4
Crashes Involving Pedestrian(s)		0	0	0	0	0	0	0
Crashes Involving Bicyclist(s)		0	0	0	0	0	0	0

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

Beacon Street at Massachusetts Avenue

Table 3-14 indicates that there were 40 crashes at this intersection and 40 percent of them involved injuries. Four involved pedestrians, and another four involved bicyclists.

Thirty-five percent were rear-end collisions; 20 percent were sideswipe; and 18 percent were angle crashes. Fifty percent of the crashes occurred during daylight hours.

Table 3-14
Crashes at Beacon Street at Massachusetts Avenue

		2006	2007	2008	2009	2010	2006–10	
							Total	Average
Total Number of Crashes		12	10	3	7	8	40	8
Crash	Property Damage Only	5	5	3	2	1	16	3.2
	Severity							
	Personal injury	5	3	0	4	4	16	3.2
	Fatality	0	0	0	0	0	0	0
	Not Reported	2	2	0	1	3	8	1.6
Collision Type	Angle	2	1	1	2	1	7	1.4
	Rear-end	5	3	2	2	2	14	2.8
	Sideswipe	3	3	0	1	1	8	1.6
	Head-on	0	0	0	0	1	1	0.2
	Single Vehicle	0	1	0	1	3	5	1
	Not Reported	2	2	0	1	0	5	1
Roadway	Wet/Icy Pavement	1	3	1	2	2	9	1.8
Conditions	Dark/Lit	4	5	2	4	5	20	4
Weather Conditions	Clear	9	8	1	5	5	28	5.6
	Cloudy	1	0	0	0	0	1	0.2
	Rain	1	2	2	1	2	8	1.6
	Snow	0	0	0	0	0	0	0
Crashes During Weekday Peak Periods*		6	2	1	2	0	11	2.2
Crashes Involving Pedestrian(s)		0	0	0	2	2	4	0.8
Crashes Involving Bicyclist(s)		0	0	0	1	3	4	0.8

*Peak periods are defined as 7:00–10:00 AM and 3:30–6:30 PM.

3.4 BOWKER OVERPASS: ORIGINS/DESTINATIONS VEHICLE TRIP PATHS

During the course of the study, staff determined it would be vital to include where the vehicles that are using the Bowker Overpass are coming from and where are they going. The Boston Region MPO's regional transportation model was used to develop vehicle origins and destinations, and determine the primary roadways that were being used to access the Bowker Overpass.

3.4.1 Bowker Overpass: Origin and Destinations

The following figures provide information related to the origin and destination of vehicles using the Bowker Overpass based on data for the AM peak period. Table 3-15 summarizes the origins and destinations of vehicles using the Bowker Overpass in both directions. As the table shows, 56.2 percent of all northbound vehicles using the Bowker Overpass originate in seven Boston neighborhoods, with nearly a quarter of the vehicles coming from the Fenway/Kenmore neighborhoods. In the southbound direction, 91 percent of all vehicles are destined for these same neighborhoods, with 51.3 percent going to Fenway and Kenmore.

Table 3-15
Summary of Vehicles Using the Bowker Overpass:
Origins and Destinations in AM Peak Period

Boston Neighborhood	Origins (Bowker NB)	Destinations (Bowker SB)
Back Bay	2.0%	15.8%
Fenway/Kenmore	22.9%	51.3%
Jamaica Plain	12.7%	7.3%
North Dorchester	2.3%	1.1%
Roxbury	7.6%	4.9%
South End	2.7%	5.8%
Brookline	6.1%	4.9%
TOTAL	56.2%	91.0%

Northbound Bowker Overpass Origin and Destinations

Figures 3-16 and 3-17 show where vehicle trips using the Bowker Overpass originate from. This data is reflected by traffic analysis zone (TAZ), a unit of geography used for travel demand modelling and designed to capture households with similar socioeconomic characteristics. The majority of the vehicle trips originated from the Fenway/Kenmore District, which includes the Longwood Medical Area and Jamaica Plain.

The primary destinations for northbound Bowker Overpass vehicle trips are Cambridge and other Boston districts, as shown in Figures 3-18 and 3-19. Figure 3-19 displays a detailed map indicating that the primary Boston destinations are Beacon Hill, the West End, Charlestown, and East Boston.

Southbound Bowker Overpass Origin and Destinations

Vehicle trips using the southbound Bowker Overpass originate from a number of places, as shown in Figure 3-20. Figure 3-21 shows that many trips originate in Beacon Hill, the West End, Charlestown, and East Boston.

The primary destinations for southbound Bowker Overpass vehicle trips are shown in Figures 3-22 and 3-23. The primary destination is immediately south of the Bowker Overpass, in the Fenway and Kenmore neighborhoods, and the LMA area.

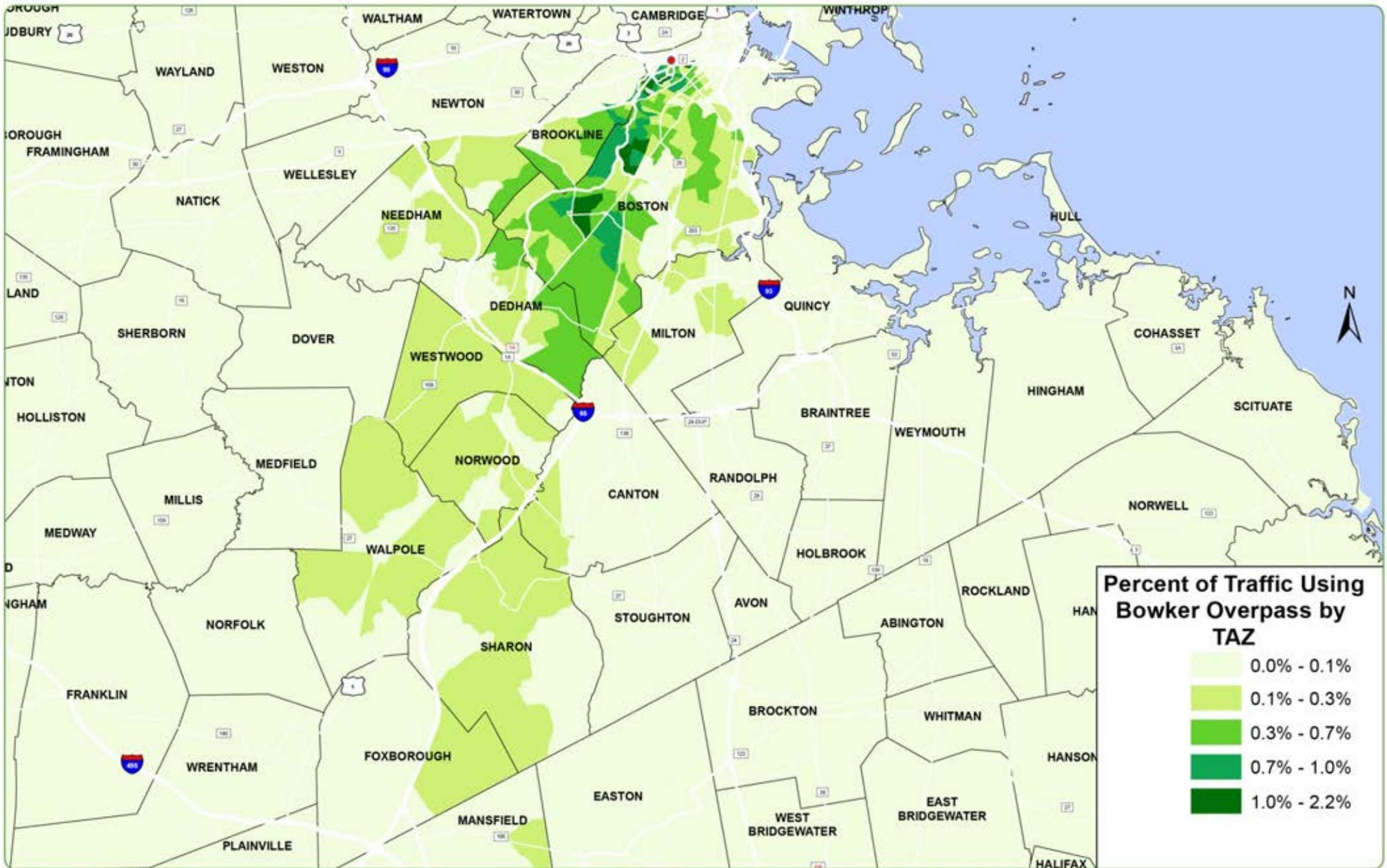


FIGURE 3-16
Northbound Bowker Origins - Regional View

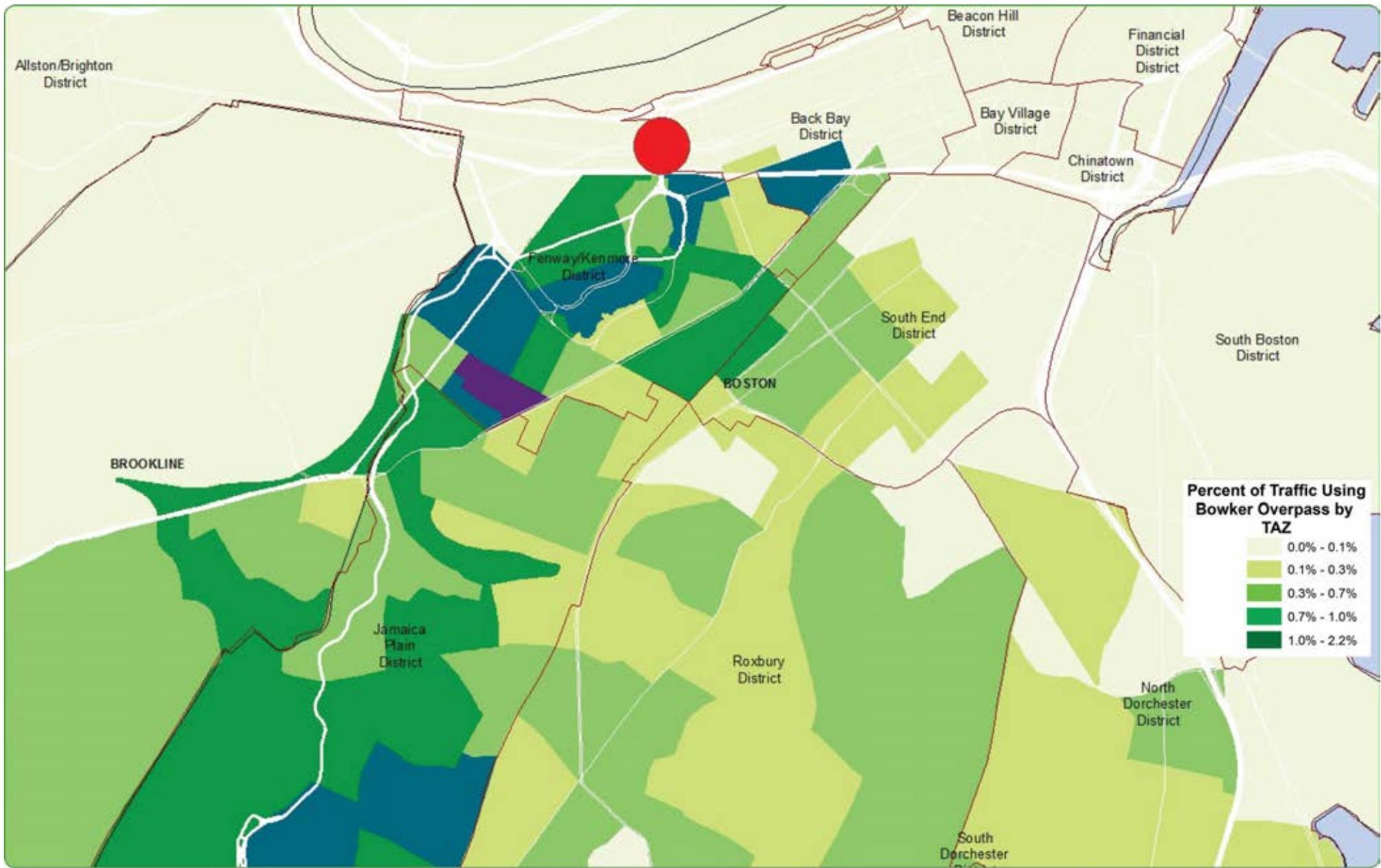


FIGURE 3-17
Northbound Bowker Origins - Neighborhood View

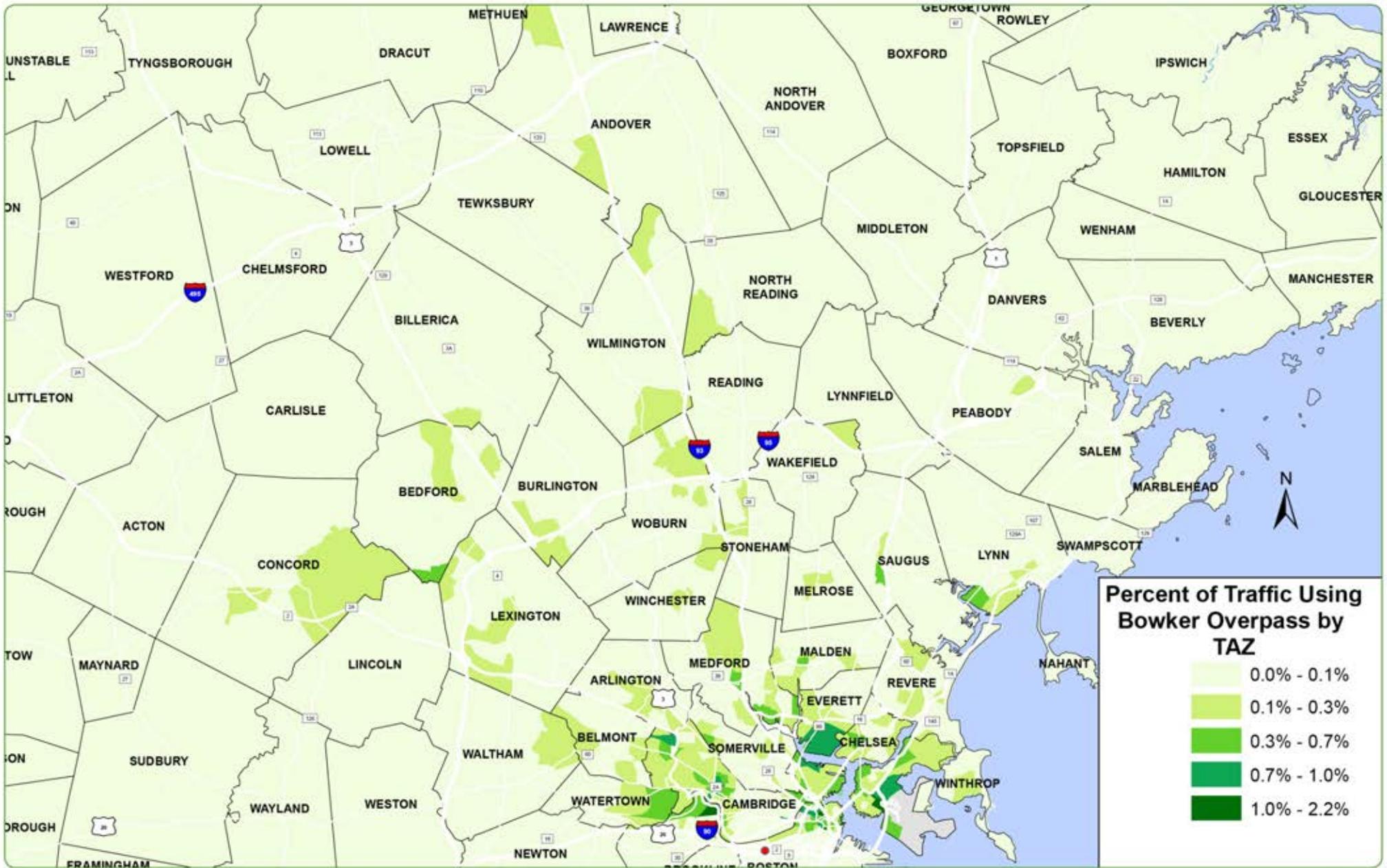


FIGURE 3-18
Northbound Bowker Destinations - Regional View



FIGURE 3-19
Northbound Bowker Destinations - Neighborhood View



FIGURE 3-20
Southbound Bowker Origins - Regional View



FIGURE 3-21
Southbound Bowker Origins - Neighborhood View

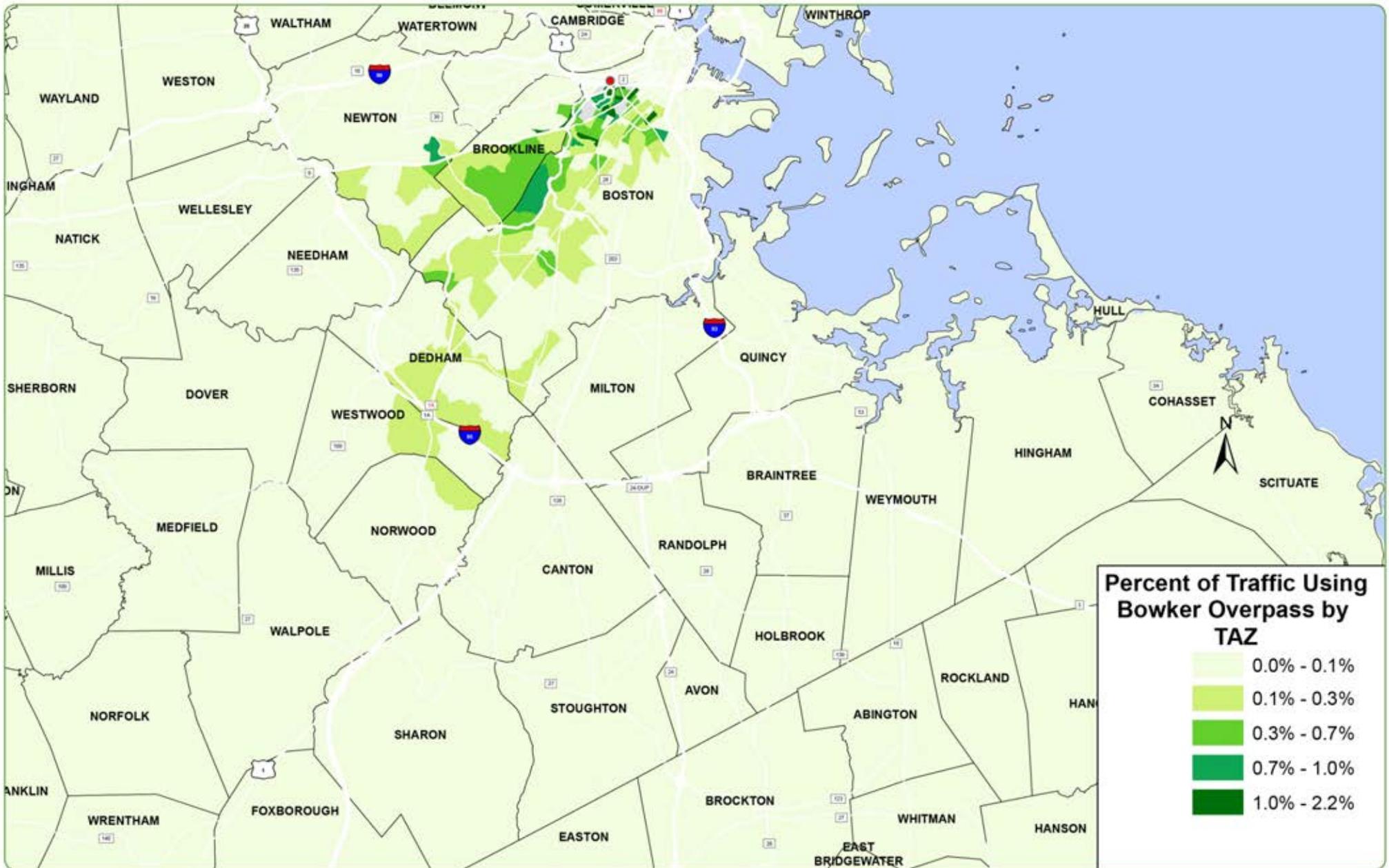


FIGURE 3-22
Southbound Bowker Destinations - Regional View



FIGURE 3-23
Southbound Bowker Destinations - Neighborhood View

3.4.2 Bowker Overpass: Vehicle Trip Paths

The following figures provide information related to the various paths Bowker Overpass vehicle trips use. Figure 3-24 shows the paths that northbound Bowker Overpass vehicle trips use. As shown, many trips use the Jamaicaway and Brookline Avenue south of the Bowker Overpass, represented by the heavy blue lines. North of the overpass, Storrow Drive in both directions is the primary roadway used by northbound trips.

**Figure 3-24
Northbound Bowker Roadways**

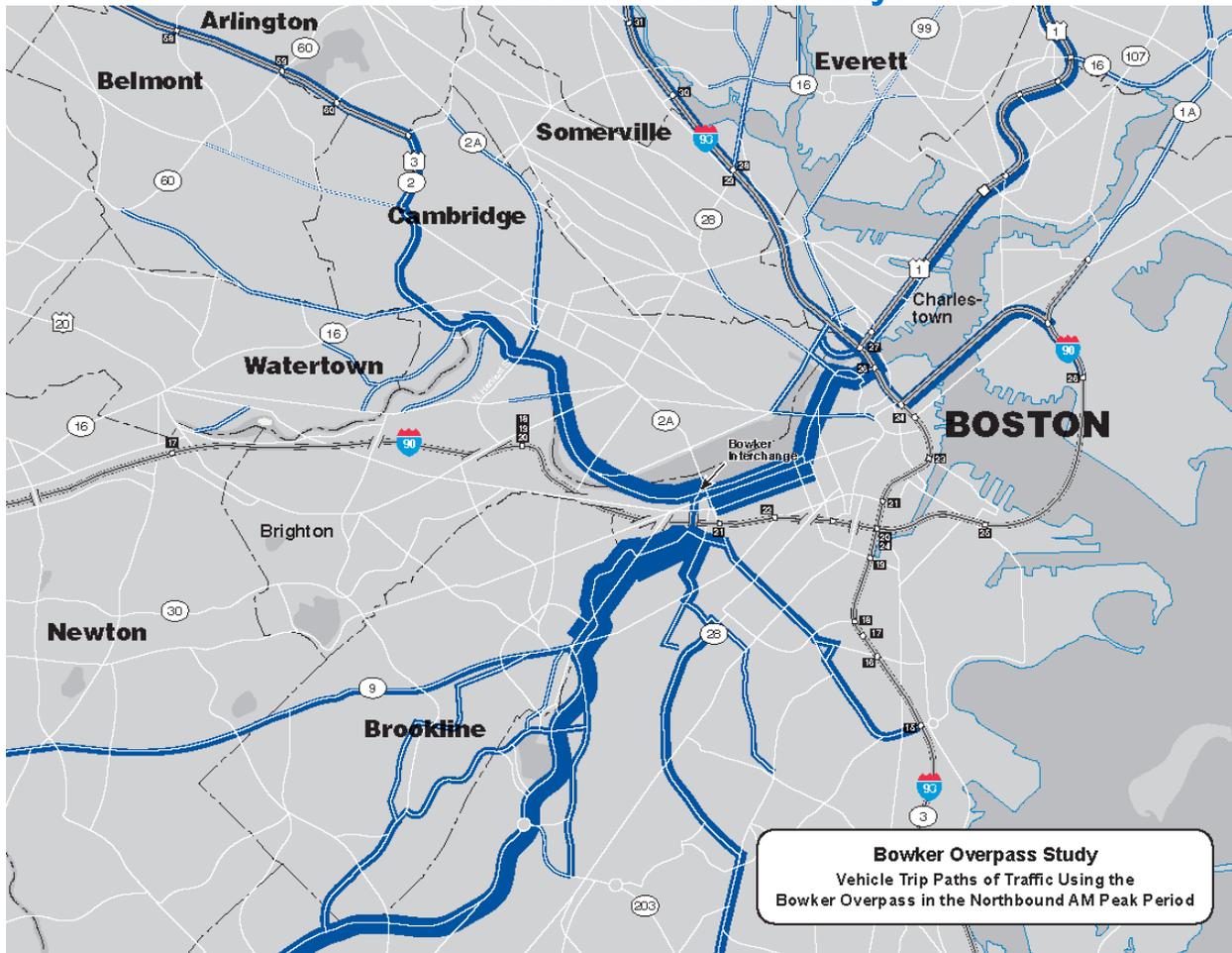


Figure 3-25 shows the roadways used by the southbound Bowker Overpass vehicle trips. As shown in the figure, north of the Bowker Overpass the primary roadways are I-93, Route 1, and Storrow Drive from both directions. South of the overpass the primary roadways are Brookline Avenue, Jamaicaway, and Route 9 west.

Figure 3-25
Southbound Bowker Roadways

