

Somerville as well as Boston and Cambridge. The goals of the study seek to create mixed use developments, strengthen and connect transit networks, create open space, and connect to a broader network of accessible districts in Somerville. The land use projections, transportation access issues, and future development of the Green Line station explored through the IBBB Study were incorporated in the Grounding McGrath study. Similarly, this study highlighted opportunities to address broader goals identified in the city's IBBB study.

Somerville Community Path

The extension of the Somerville Community Path would provide an excellent opportunity to improve the quality of life and livability for the city. It would be an extremely important asset for Somerville for a variety of reasons, such as its contributions to local accessibility, regional bicycle and pedestrian connectivity, and promotion of additional transportation options for local residents. There are also numerous public health benefits attributed to a creating more shared-use paths to support active modes of transportation. Supporting active modes of transportation through implementation of the Community Path would help to reduce pollution and improve the environment throughout the densely populated city.

The extension of the Community Path through the McGrath corridor to Cambridge and beyond is both a high priority for Somerville and the region at large. The City of Somerville, the "Friends of the Community Path" and numerous others have been working to provide an ultimate connection between the Minuteman Bikeway and the Charles River path networks. The current Somerville Community Path reaches from Grove Street to Cedar Street in Somerville, and complements the Alewife Linear Park stretching from Davis Square to Alewife MBTA station in Cambridge. The construction on Phase II of the Community Path is anticipated in 2013 and will extend it from Cedar Street to Lowell Street, which will ultimately provide access to the new Lowell Street GLX Station. The final phase of the project will connect Lowell Street to Inner Belt District in Somerville, and design of this portion is being planned in conjunction with the GLX.

The Community Path vision and goals have been ingrained in both the Grounding McGrath study as well as the GLX projects as integral components. In 2006, the

Somerville Community Path Feasibility Study identified the McGrath corridor as a major crossing to reach the desired terminus of NorthPoint in Cambridge. The Grounding McGrath study recognizes the importance of providing either a direct connection for the Community Path, as well as the critical need to provide cross connections to the path in whatever alignment is ultimately completed. MassDOT recognizes that the Community Path extension is a significant component in meeting the Commonwealth's GreenDOT initiatives to enhance non-auto mode share, as well as meeting health and environmental goals. Similarly, current designs for the MBTA's GLX include a continuation of the Community Path along the Green Line right-of-way as far south as Innerbelt Road, with associated connections to ground level at Washington Street and Poplar Street. This project realizes the broader multimodal connections and networks that both can help to support in Somerville.

Environmental

The McGrath corridor bisects a dense network of established neighborhoods, as well as commercial and historically industrial areas in Somerville. Environmental concerns associated with the Grounding McGrath study are legitimate given the industrial nature and land uses of the neighborhoods and districts adjacent to the highway. Since the highway was completed in the early 1950's, much of the built environment has also been affected by the combination of traffic volumes, speeds, congestion, and pollution. The project's goals include improving environmental conditions along the corridor, including remediating uncompensated environmental effects from uses outside of the corridor, and improving access and operations of the environmental resources already present in the area.

Open Space/Parkland

The neighborhoods surrounding the McGrath corridor generally have parks and open space available to residents. These open spaces and parkland include neighborhood amenities such as Foss Park, Prospect Hill Park and Senator Corbett Playground. However, as the McGrath corridor is such a pedestrian barrier, access to open space in the adjacent neighborhoods is often practically limited to residents on the side of the corridor where the park is located.

The only open space directly abutting the study area is the Otis Street Playground. This is a City of Somerville-owned and managed playground offering active recreation and play space on a tenth of an acre at the corner of Otis Street and Dana Street, just on the west side of the corridor. A pedestrian bridge, owned by the Department of Conservation and Recreation, connects over the McGrath corridor and provides access from East Somerville to the Otis Street playground.

Just north of the study area, to the west of McGrath, is the largest open space in the area – Foss Park. At 14.62 acres, Foss Park provides one of the largest

recreational park space(s) in Somerville. Equipped with multiple ball fields, basketball courts, and play structures it is a popular recreation destination for the surrounding neighborhoods, and is owned and managed by the Massachusetts Department of Conservation and Recreation. Pedestrian access to Foss Park from East Somerville is significantly encumbered by dangerous crossings at McGrath and Broadway.

Table 2-2 depicts a brief description of the parks and open space within relatively close proximity to the McGrath corridor by neighborhood, while Figure 2-30 shows the locations.

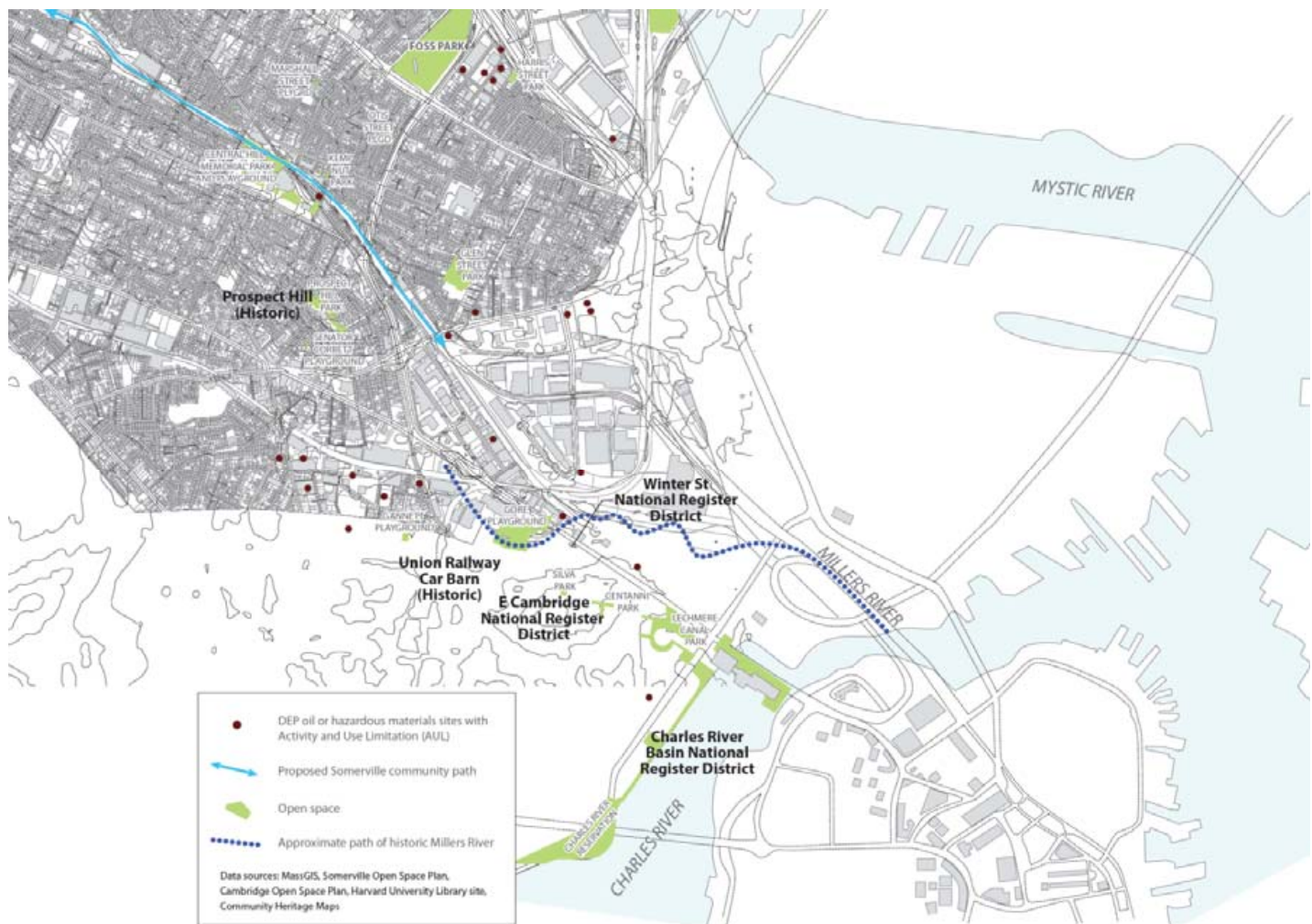


Figure 2-30 : Somerville Environmental Map

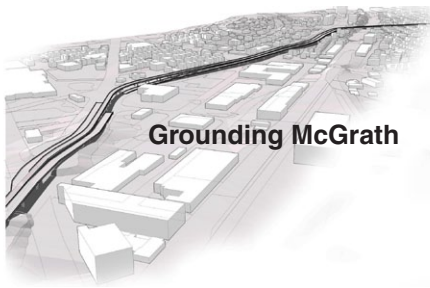


Table 2-2: Somerville Open Space and Parks by Neighborhood

East Somerville			
Park/Open Space	Size	Streets	Ownership
Edgerly Education Center	0.10 acres	Bonair Street/Cross Street	Somerville
East Somerville Community School	1.40 acres	Cross Street/Pearl Street	Somerville
Glen Park /Capuano Field	2.34 acres	Glen Street/Oliver Street	Somerville
Prospect Hill			
Park/Open Space	Size	Streets	Ownership
Central Hill Park	8.94 acres	Highland Avenue	Somerville
Central Library Lawn	0.61 acres	Highland Avenue/ Walnut Street	Somerville
Corbett-McKenna Park	0.61 acres	Munroe Street/ Prospect Hill Avenue	Somerville
Prospect Hill Park	2.10 acres	Prospect Hill Avenue	Somerville
Ten Hills			
Park/Open Space	Size	Streets	Ownership
Foss Park	14.62 acres	Broadway/McGrath corridor	DCR
Union Square/Beacon Street			
Park/Open Space	Size	Streets	Ownership
30 Allen Street Park and Garden	0.13 acres	Allen Street	Somerville
111 South Street OLRA	0.36 acres	South Street/Windsor Street	Somerville
Winter Hill			
Park/Open Space	Size	Streets	Ownership
Otis Street Playground	0.10 acres	Otis Street/McGrath corridor	Somerville
Edward W. Leathers Community Park	0.71 acres	Walnut Street/Gilman Street	Somerville
East Cambridge			
Park/Open Space	Size	Streets	Ownership
Centanni Way	0.30 acres	Third Street/Otis Street	Cambridge
Gold Star Mothers Park	3.6 acres	Gore Street/Sixth Street	Cambridge
Lindstrom Field	1.4 acres	Brookline Street/ Granite Street	Cambridge
Silva Park	0.30 acres	Otis Street/Sciarappa Street	Cambridge
Simoni Memorial Rink	n/a	Gore Street/Sixth Street	DCR

Wetlands/Water & Sewer/Flooding

A review of information available from MassGIS was completed to assess the extent to which wetlands are present within

the study area. As with much of the area around Boston Harbor, parts of this area are built on fill as marshes and tidal river areas were filled in the 19th century as the area industrialized. According to the Massachusetts Department of Environmental Protection (DEP), no wetlands are currently registered within the study area that would pose any obstacle or constraint to the redevelopment of the McGrath corridor.

The only historic waterway of note is the Millers River (or Willis Creek), a small flow along the southern border of Cambridge and Somerville that has long been piped, infilled, and channeled for industrial activity. The Millers River is a tributary to the Charles River. The water is drained through underground culverts with the exception of a small segment near the junction with the Charles River. It should be noted that during significant storm events, flooding from the Millers River and sewer overflow can be evidenced in lower portions of the study area, especially near the Somerville Avenue and Poplar Street intersections with the McGrath corridor.

The Mystic River borders Somerville to the north, and the Charles River runs to the east of Lechmere. The Charles River to the south and Mystic River to the east lie well beyond the scope of this project.

The MassDOT Highway Division is utilizing Best Management Practices (BMP) to improve stormwater management through both a retrofit and programmed projects initiative, particularly for older urban arterials such as the McGrath corridor.⁷

Air Quality

Specific information on the air quality directly adjacent to the McGrath corridor is not readily available. For planning purposes, air quality on a regional level is measured and available as part of the CTPS regional travel demand model. It is understood that air quality concerns are paramount for the abutting neighborhoods surrounding the McGrath corridor due to the heavy traffic volumes and congested intersections along the corridor. Moreover, because of the subsequent high levels of air pollutants in the immediate vicinity, those living in close

proximity to the McGrath corridor are at higher risk for respiratory diseases and other health risks.

Daily traffic volumes and intersection congestion on the McGrath corridor are significant. Using both traffic micro-simulation and regional travel demand modeling, the Grounding McGrath study effort catalogued estimates of emissions for the existing conditions, the 2035 No-Build conditions (discussed in Chapter 3) and for each of the alternatives. For all scenarios, estimated emissions for Carbon Monoxide (CO), Nitrous Oxide (NOx), Volatile Organic Compounds (VOC), Carbon Dioxide (CO₂), Particulate Matter 10 microns (PM₁₀) and Fine Particulate Matter (PM_{2.5}) were modeled and documented.

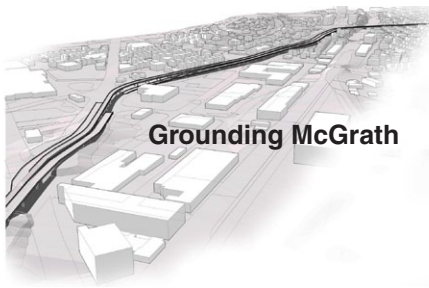
The Health Impact Assessment completed by the Massachusetts Department of Public Health in conjunction with this project also provides an opportunity to review the relationship between air pollutants and public health in a more detailed way.

Noise Levels

Noise levels from highway traffic are affected by three factors: (1) the volume of traffic, (2) the speed of the traffic, and (3) the number of trucks in the flow of traffic. Generally, the loudness of traffic noise is increased by heavier traffic volumes, higher vehicle speeds, and greater numbers of trucks. As with Air Quality, no specific readings of current noise levels along the McGrath corridor are available as of this review.

Vehicular traffic on the McGrath corridor travels on the surface roads and along the elevated structures. Most of the McGrath corridor is surrounded by multi-story buildings. The presence of the elevated structure likely both shields and exacerbates noise from traffic on the directly adjacent neighborhood. Noise is generated by the structure itself as vehicles travel over bridge expansion joints. Similarly noise reflects off the underside of the elevated bridge structure and has the potential to increase noise pollution to neighborhoods and areas close by.

⁷ NPDES Phase II Small MS4 General Permit Annual Report, No. 9, April 2011-March 2012.



Soil and Geologic Features

A review of information made available by the City of Somerville helped to assess the types of soil and geologic features that are present in the study corridor. A majority of the McGrath corridor and adjacent lands are composed of Urban Land, which are areas that have been filled with crushed rock or other material that is resistant to weathering. Buildings, industrial areas, pavement, and railroad beds cover most of these areas and these are known as impervious surfaces.

Archaeological and Cultural Resources

Near the McGrath corridor are several National Register Districts. The Winter Street National Register District in Somerville and the East Cambridge National Register District are both near the southern part of the corridor. Prospect Hill and the surrounding neighborhood about the northwest portion of the Corridor. Prospect Hill played an important role in the American Revolutionary War and is known as the first place where the first true American Flag representing the united colonies was ever flown.

A review of existing environmental conditions indicates that there are no historic, cultural and archaeological resources affected by the McGrath corridor.

Areas of Critical Environmental Concern

The McGrath corridor does not contain directly abutting Areas of Critical Environmental Concern (ACECs).

Hazardous Materials Sites

The Massachusetts Department of Environmental Protection (DEP) has identified numerous sites that have been categorized Activity and Use Limitations (AUL) for development. The AUL categorization of these properties imposes limits and conditions on their future uses of the property based on identified onsite pollutants. The McGrath corridor right-of-way has been primarily built out and does not include any of these areas per this review. A number of sites within the study area located outside of the roadway have identified AULs and are shown in Figure 2-30. The more prominent sites with AULs include areas near Stop N Shop/Foss Park, Rufo Road, and the area east of Water Street.

Current Transportation Utilization

Traffic Volumes

In March and May of 2011, both MassDOT and a contractor to the project team conducted traffic counts during weekday morning and weekday afternoon peak periods.⁸ The counts completed by MassDOT in March 2011 are in the northern part of the McGrath corridor study area. The traffic data was collected during the Craigie Bridge closure (where Route 28 crosses the Charles River) but a comparison to prior counts indicated that volumes are consistent, and that the bridge closure appeared to have minimal impacts on those locations.

The data consisted of manual turning movement counts (MTMCs) and automatic traffic recordings (ATRs). MTMCs represent the various approach movements (left, through, right) that pass through an intersection over a given period of time. ATRs collect data regarding traffic volumes, speed, and vehicle classification over a period of days or a week.

MassDOT Highway Division provided ATRs for the following locations:

- Ramps and surface roads at the intersection of the McGrath corridor/Somerville Avenue/Medford Street⁹
- Ramps and surface roads at the intersection of the McGrath corridor and Washington Street¹⁰
- The McGrath corridor over Gilman Street¹¹
- The McGrath corridor north of Washington Street¹²

8 It should be noted the May 2011 counts were conducted after the commencement of construction activities associated with the Craigie Drawbridge. The bridge was re-opened to Boston bound traffic in April 2011.

- | | |
|----|--|
| 9 | Monday, March 28, 2011
to Wednesday, March 30, 2011 |
| 10 | Monday, March 28, 2011
to Wednesday, March 30, 2011 |
| 11 | Monday, May 16, 2011
to Thursday, May 19, 2011. |
| 12 | Tuesday, August 2, 2011
to Thursday, August 4, 2011 |

- Boylston between Fenway and Charlesgate Overpass
 - 38,000 at Gilman St (+/-5,000 ADT)



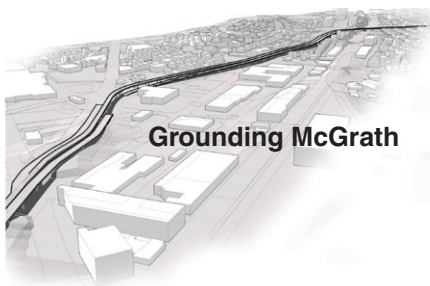
- Cambridge St east of Charles Circle
 - 38,000 at Gilman St (+/-5,000 ADT)



- Melnea Cass Blvd between Tremont St and Shawmut Ave
 - 38,000 at Gilman St (+/-5,000 ADT)



Figure 2-31 : Photos of comparable corridors by ADT in the Boston area



- The McGrath corridor over the railroad tracks at Linwood (Squire's Bridge)¹³.

Average Daily Traffic (ADT) can be determined from the ATR data. ADT represents the average number of vehicles that pass over a specific point in the roadway, in either direction, during the course of a 24-hour day. ADT volumes on the McGrath corridor at key points are:

- 38,000 on the Gilman Street Bridge,
- 32,500 over Washington Street (does not include ramps)
- 29,700 on the Squire's Bridge.

An ADT of about 38,000 vehicles is comparable to the following Boston roadways (within about 5,000 vehicles per day). However, it should be noted that these roadways likely do not experience comparable volumes of cross street traffic and therefore may have a different character and operational level than the McGrath corridor:

- Boylston Street between Fenway and Charlesgate Overpass
- Cambridge Street east of Charles Circle
- Melnea Cass Boulevard between Tremont Street and Shawmut Avenue

See Figure 2-31 for photos illustrating the characteristics of these roadways.

Based on available data in the vicinity of Rufo Road at the Somerville/Cambridge line, it is estimated that there has been a 27 percent decrease in traffic on the McGrath corridor since 1987. The ADT from 1987 to 2011 is presented in Figure 2-32. In 2003 traffic decreased and then leveled off, which coincides with the primary opening date of the new Central Artery/Tunnel in Boston. It is assumed that some vehicular traffic that had previously used Route 28 shifted to I-93 when congestion and delays decreased with the completion of the Central Artery/Tunnel project. The potential use of the McGrath corridor as an alternative to I-93 is discussed in a subsequent section.

MassDOT collected MTMCs during the morning and afternoon peak periods¹⁴ at the following intersections with the McGrath corridor:

- Pearl Street¹⁵
- Medford Street/Highland Avenue¹⁶
- Somerville Avenue/Medford Street¹⁷
- Washington Street¹⁸
- Austin Street/Land Boulevard¹⁹

MTMCs were collected by the project team at the following intersections with the McGrath corridor²⁰:

- Blakeley Avenue
- Broadway
- Poplar Street
- Rufo Road
- Third Street
- Cambridge Street/East Street

Traffic counts from the MTMCs between adjacent intersections were generally consistent, with traffic exiting one intersection matching traffic entering the next intersection within about 10 percent. This match rate is reasonable given the number of side streets and driveways along the McGrath corridor. Therefore, it was not necessary to "balance" (i.e. adjust traffic volumes to ensure consistency) traffic volumes along the corridor with the exception of McGrath corridor links where there is no additional vehicular access between the counted intersections. Locations where traffic volumes were balanced include:

- Blakeley Avenue
- Broadway
- Rufo Road
- Third Street
- Cambridge Street/East Street
- Land Boulevard/Austin Street

¹³ Tuesday, August 2, 2011
to Thursday, August 4, 2011

¹⁴ 7:00 AM to 10:00 AM and 4:00 PM to 7:00 PM
¹⁵ Tuesday, May, 18, 2011
¹⁶ Tuesday, May, 18, 2011
¹⁷ Tuesday, March 30, 2011
¹⁸ Tuesday, March 30, 2011
¹⁹ October 26, 2010
²⁰ 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM
on May 17, 2012

Based on the MTMC data, the morning peak hour was identified as 8:00 AM to 9:00 AM and the afternoon peak hour as 5:00 PM to 6:00 PM. Summaries of the turning movement counts by intersection are provided in Figure 2-33 and Figure 2-34. A complete set of MTMC data and ATR data can be found in Appendix C of this report.

In order to further understand the major movements within the corridor, the TMC data was summarized. The summary diagrams in Figure 2-35 and Figure 2-36 were prepared for the June 2011 Working Group meeting, depicting the sum of roadway volumes for specific roadway segments in the AM and PM peak hours. The volume associated with each arrow is the sum of the turning movement counts at a particular point along the McGrath corridor, and the width of each arrow is proportional to this volume. In this way, these figures provide a sense of the scale of traffic volumes throughout the corridor. The following key points emerged from traffic data analysis and is contained in the summary diagrams:

- There is an imbalanced directional split: Typically, the peak period in the morning mirrors the afternoon reverse movement. However, southbound volumes are 12% higher on the McCarthy Viaduct and 19% higher on Monsignor O'Brien Highway in Cambridge in the AM peak than are the northbound volumes in the PM peak. This indicates that drivers may seek alternative routes in the PM.
- There are more than 900 vehicles that use Medford Street southbound during the morning peak period. This serves as an alternative access route from Route 28 to reach points in East Cambridge.
- Traffic volumes are generally highest between Washington Street and Medford/Highland Avenue.
- There are substantial volumes (more than 1,000 vehicles during peak periods) on the major cross streets: Broadway, Medford/Highland, Washington, Somerville Avenue/Medford Street, Third Street, and Land Boulevard.

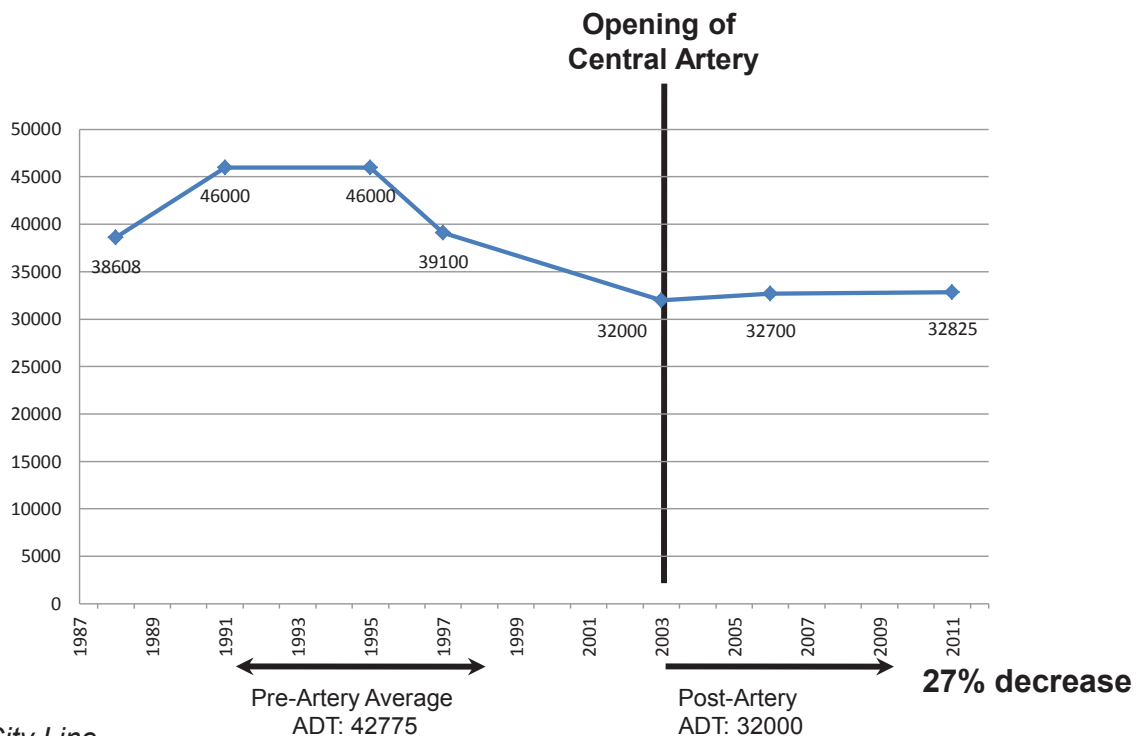


Figure 2-32 : Summary of ADT 1987-2011 at Somerville/Cambridge Line

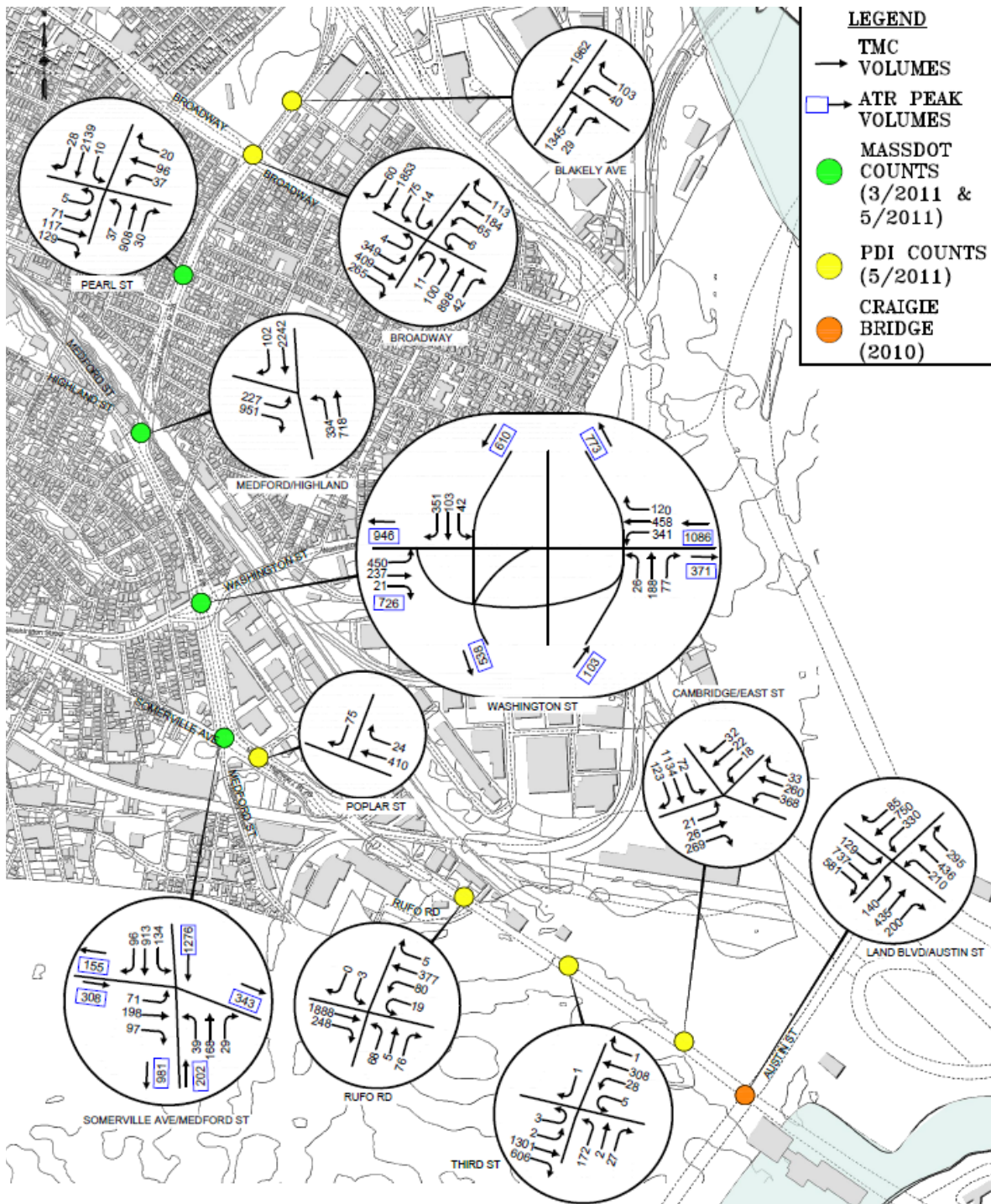
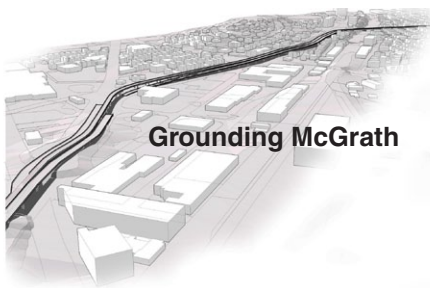


Figure 2-33 : Weekday Morning Peak Hour Traffic Volumes

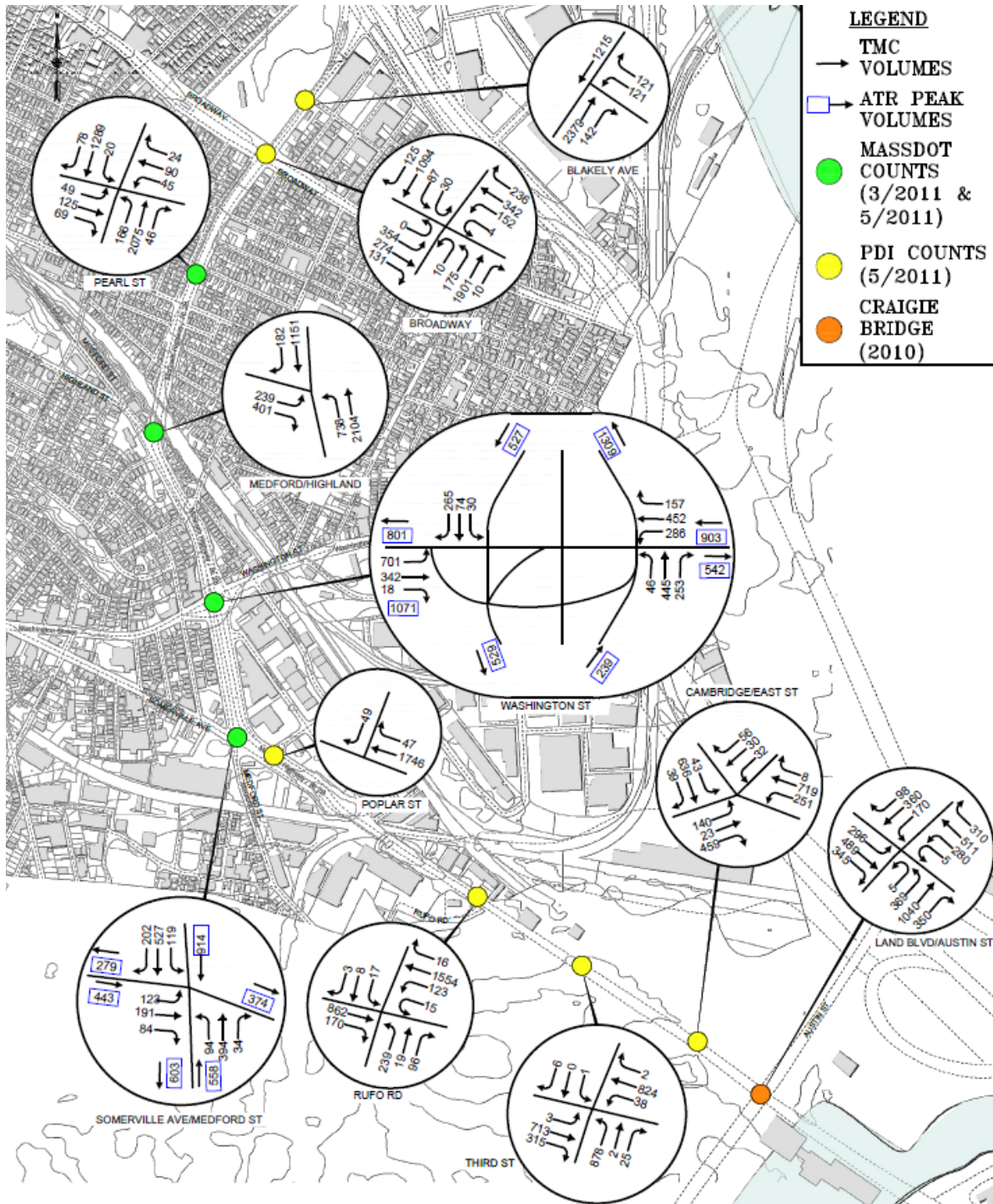
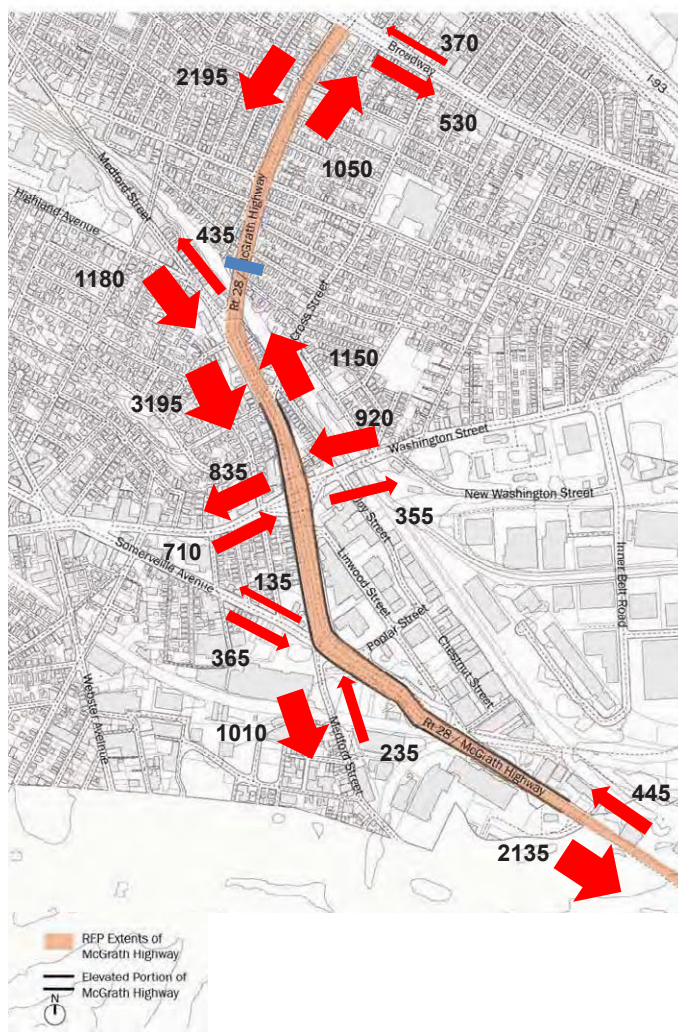
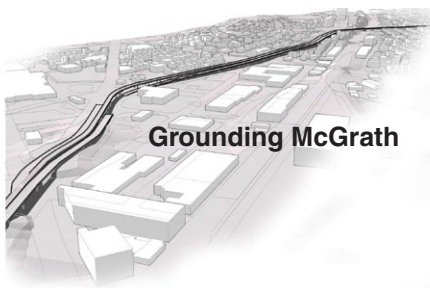
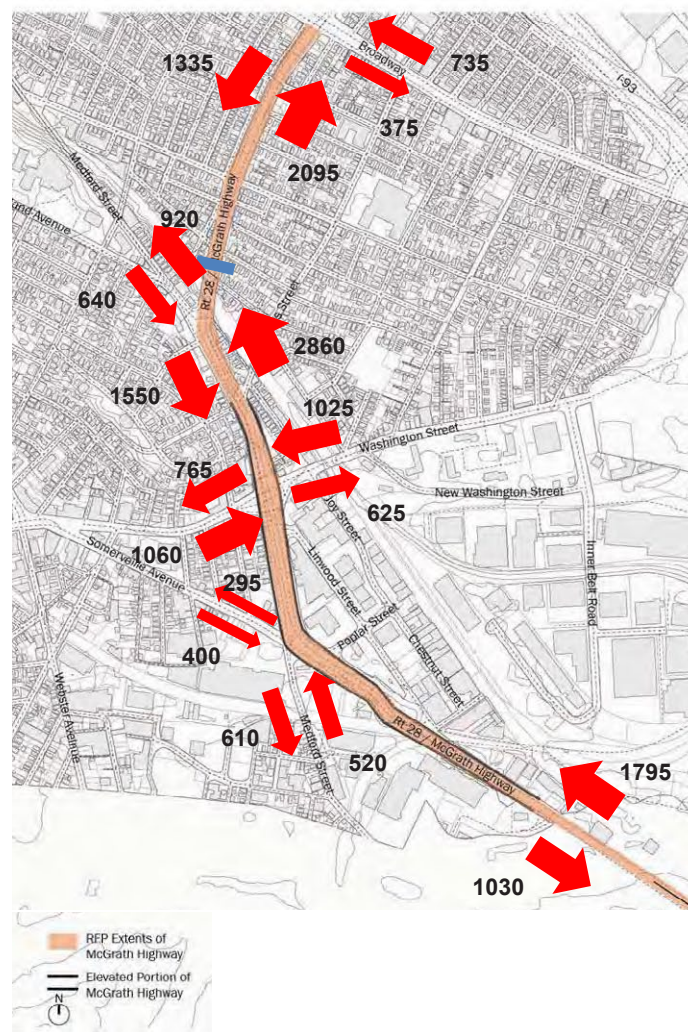


Figure 2-34 : Weekday Afternoon Peak Hour Traffic Volumes



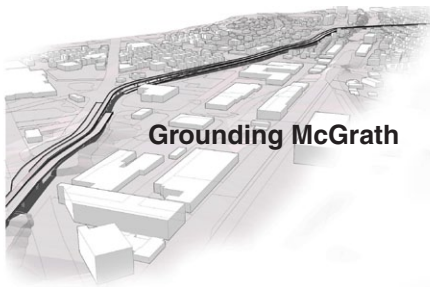
ADT (Average Daily Traffic) approximately 38,000
Figure 2-35 : Weekday AM - Summary of Peak Volumes



ADT (Average Daily Traffic) approximately 38,000
Figure 2-36 : Weekday PM - Summary of Peak Volumes



Figure 2-37 : Average Heavy Vehicle Percentages by Intersection



McGrath Corridor Origin - Destination Study

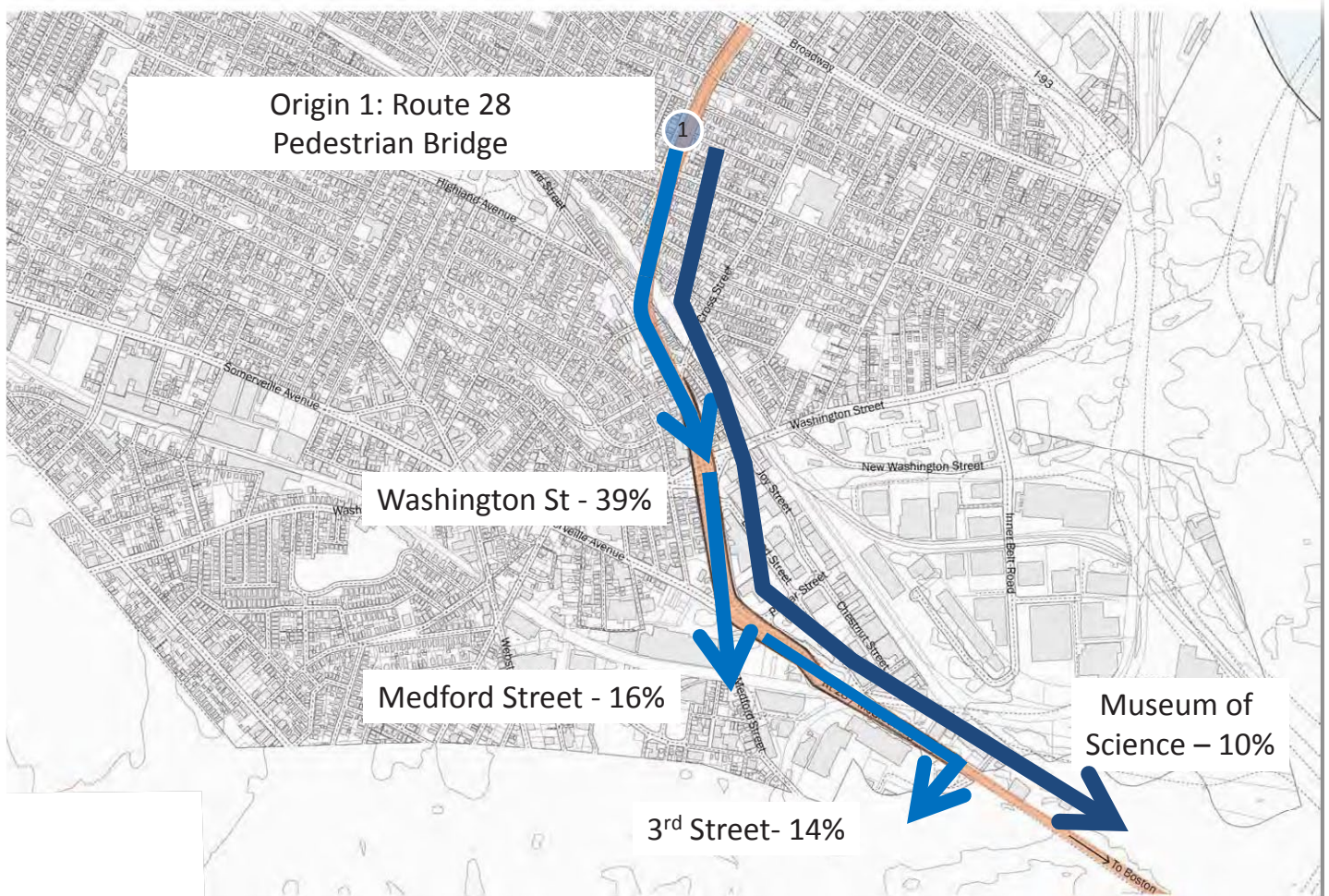
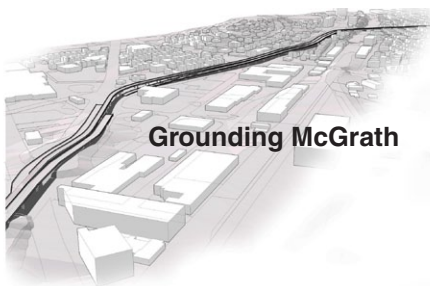


Figure 2-38 : CTPS License Plate Survey – Origin 1

McGrath Corridor Origin - Destination Study



Figure 2-39 : CTPS License Plate Survey - Origin 2



Grounding McGrath

The number of heavy vehicles were included in the weekday morning and weekday afternoon peak period MTMC conducted along the McGrath corridor, and are included in Appendix D. Average heavy vehicle percentages were calculated along the corridor and are depicted in Figure 2-37. A range of 2-4 percent heavy vehicles is typical for an urban area. The higher percentages on the cross-streets is likely reflective of the industrial nature of the abutting land uses that would have greater truck traffic as a percentage of total traffic than residential neighborhoods.

CTPS License Plate Survey

CTPS conducted a vehicular license plate survey in 2011 which focused on the segment of Route 28/ McGrath corridor between the Otis Street pedestrian overpass located between Broadway and Pearl Street in Somerville and the Museum of Science in Boston. The license plate survey was conducted at eleven locations on June 8, 2011, between 7:00 AM and 9:00 AM with follow-up data collection on September 13, 2011. A draft memorandum dated November 8, 2011 was provided to the Grounding McGrath project team, with key findings summarized below.

Based on the data collected, CTPS was able to identify where vehicles using the McGrath corridor are garaged and the typical trips along the corridor by tracking vehicles between three points of origin and eight destinations within the study corridor. See Figure 2-38 and Figure 2-39.

The analysis found that most drivers are using the route for local points of access, with 39 percent of vehicles observed in the McGrath corridor exiting at Washington Street. Only ten percent of the traffic passing the Otis Street pedestrian bridge was observed at the Museum of Science. This use of the McGrath corridor for local points of access will likely be continued as the highest percentage of population and employment growth predicted in the corridor is in the focus area adjacent to future development of the Inner Belt/Brickbottom area, as well as Cambridge destinations such as Kendall Square and NorthPoint.

Pedestrian and Bicycle Activity

Pedestrian and bicycle activity was gathered from a variety of sources, including new counts, as part of the data collection effort for the Grounding McGrath study. While additional counts from background sources both from McGrath corridor intersections and in the surrounding neighborhood have been compiled, the counts included in this section were from new counts collected in the Spring of 2011.

Pedestrian Counts

To show the level of activity and demand for crossings at the most visible locations along the McGrath corridor, both Table 2-3 and Figure 2-40 shows pedestrian crossing volumes for the 2 hour peak period collected in both the morning (7-9 AM) and evening (4-6 PM) peak periods. The highest volumes of AM and PM activity are at Washington Street, showing the importance of this crossing. The comparatively high volumes of pedestrians may be due, in part, to the bus stop on Washington Street, under the McCarthy Viaduct. As the main connection to the future Brickbottom/ Washington Street Green Line station, the need for crossing at this location is likely to grow significantly.

Table 2-3: Pedestrian Crossing Volumes along McGrath Corridor

Intersection	AM Counts	PM Counts
Broadway	33	15
Washington	177	297
Somerville Ave	125	154
Third Street	34	104

Additional pedestrian counts were collected at a number of other corridor locations. The total pedestrian crossings for each peak hour at each intersection are shown in Table 2-4.

Table 2-4: Additional Pedestrians Counts at other Corridor Locations

Intersection Name	AM Ped	PM Ped
O'Brien Highway/W. Cambridge Street	7	8
Lechmere Bus Station	37	43
McGrath /3rd Street	19	22
McGrath /Rufo Road	15	25
McGrath /Poplar Street	4	3
McGrath /Pearl Street	38	18
McGrath /Blakeley Avenue	3	6

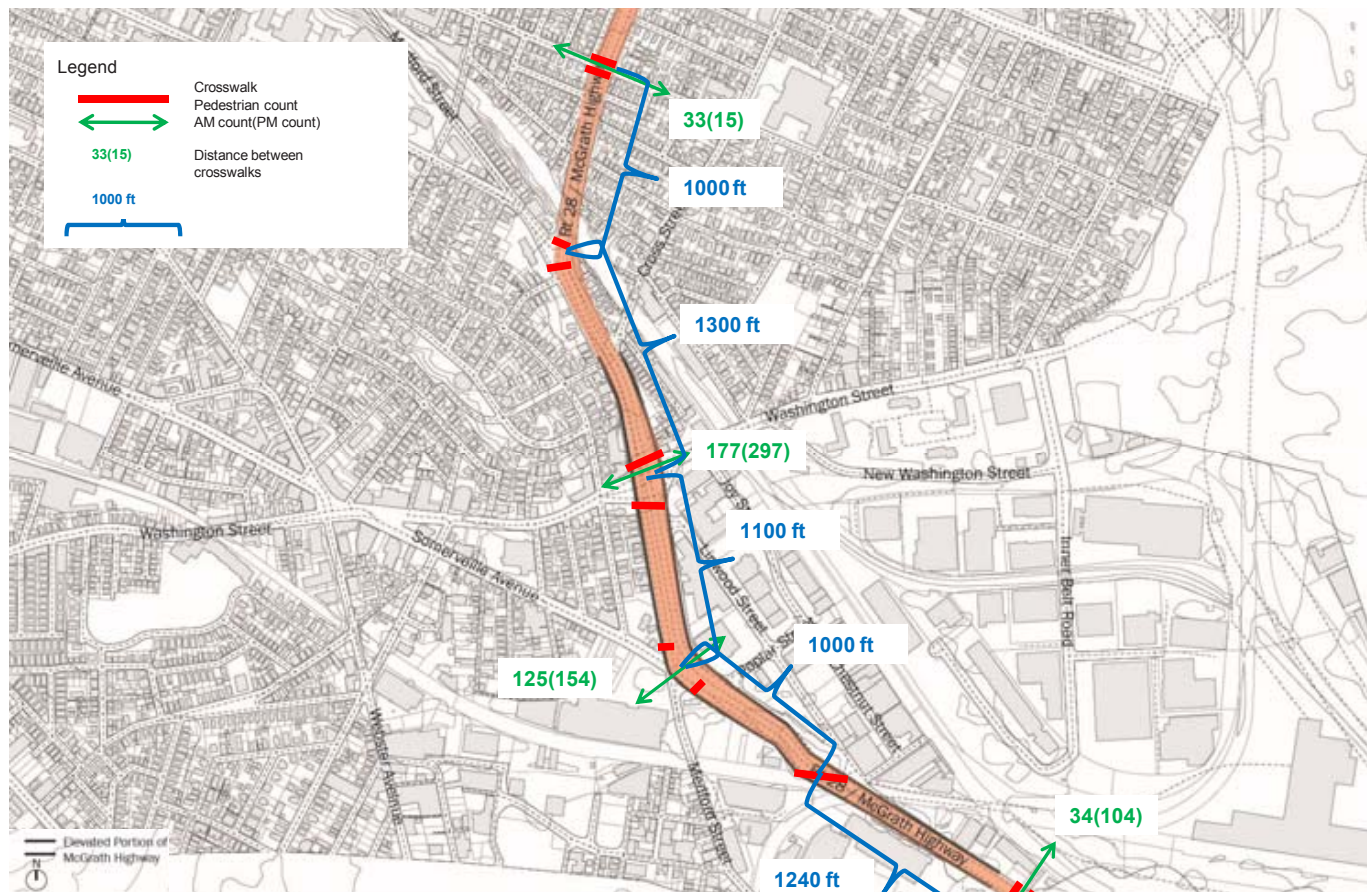
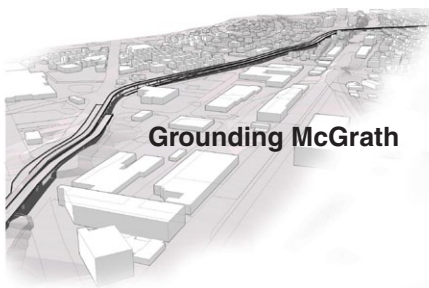


Figure 2-40 : Existing Crosswalk Length Measurements along McGrath



Bicycle Counts

Bicycle counts were taken in conjunction with the pedestrian counts in the corridor, and include both AM and PM peak counts. The observed counts are shown in the Table 2-5 and Figure 2-41. Bicycling activity along the McGrath corridor is relatively low. The observed counts show that bicyclists use the cross streets – Broadway, Washington Street – at higher volumes than along the McGrath corridor.

Table 2-5: Bicycle Counts along McGrath Corridor

Segment	AM Counts	PM Counts
On The McGrath corridor		
Between Broadway and Medford	11	11
At Medford	4	4
McGrath below the McCarthy Viaduct	25	25
Squire's Bridge	8	5
Intersecting Streets		
Broadway	22	27
Pearl	5	9
Washington (west of McGrath)	33	67
Washington (at McGrath)	67	74
Washington (east of McGrath)	57	54
Medford Street	34	22

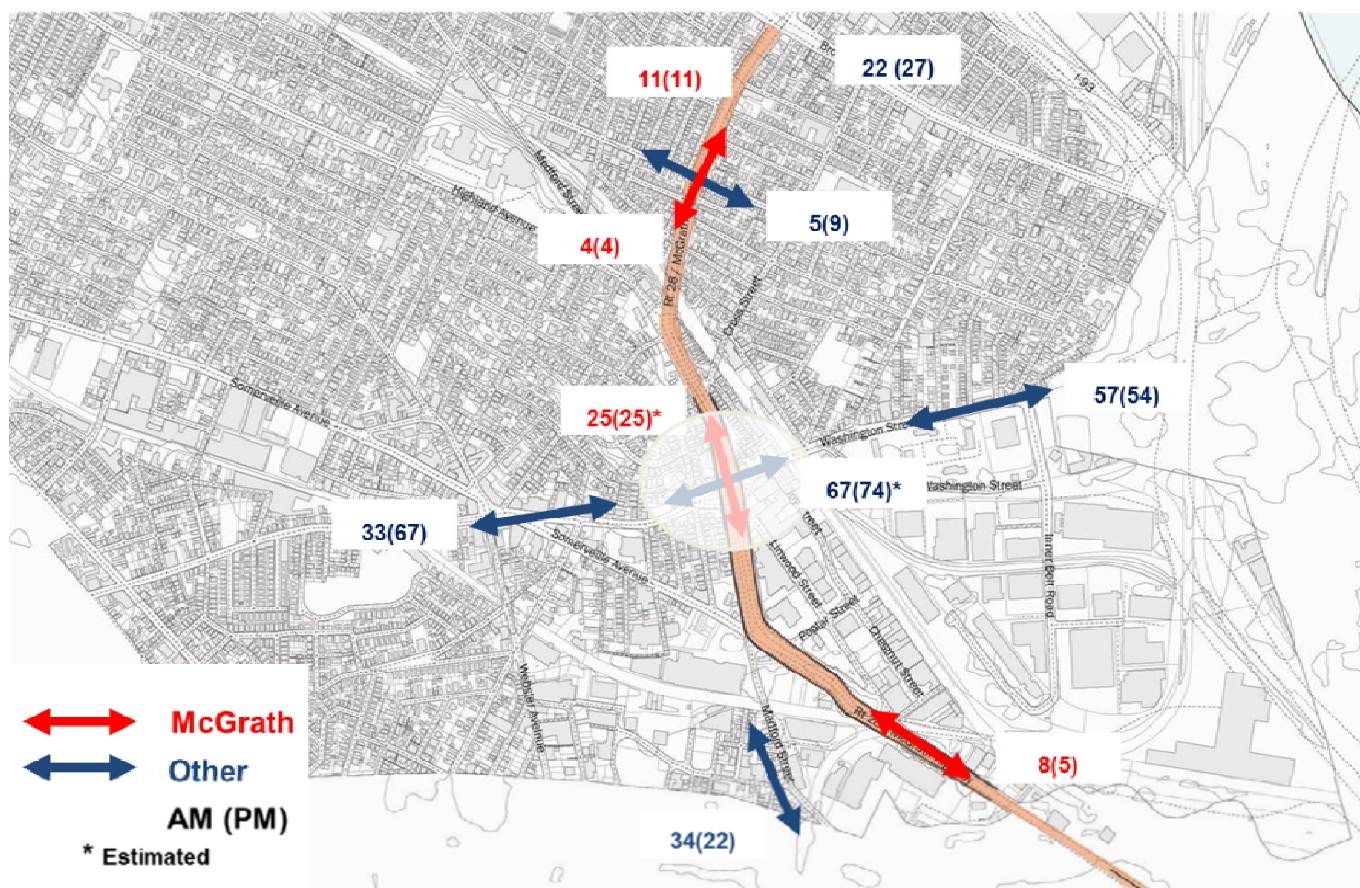


Figure 2-41 : McGrath Bicycle Counts

Vehicular Capacity Analysis

A detailed capacity and level-of-service analysis for the peak hours was performed using Synchro software based on existing traffic flows in the study area. The methodologies employed and analysis results are described in detail below. Detailed Existing Conditions capacity/queue analysis worksheets can be found in Appendix E.

A Synchro network was developed to represent the existing conditions at the eleven study area intersections of the Grounding McGrath study for the weekday morning and weekday afternoon peak hours. A number of sources were combined and utilized to create the existing conditions Synchro model. Below is a list of the original sources of Synchro models or signal plans from various municipalities and other projects:

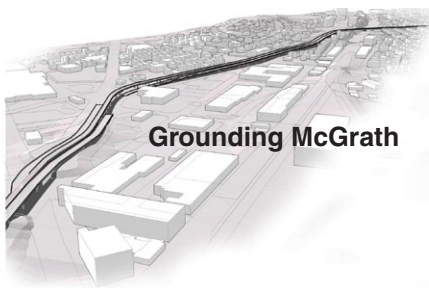
- City of Cambridge
 - » Land Boulevard/Austin Street
 - » Cambridge Street/East Street
 - » Third Street/Route 28
- MassDOT Record Plans
 - » Rufo Road/Route 28
 - » Medford Street/Highland Street
 - » Pearl Street/Route 28
 - » Broadway/Route 28
 - » Blakely Avenue/Route 28
- MassDOT Record Plans/Union Square Study
 - » Medford Street @ Somerville Avenue
 - » Medford Street @ Washington Street

Each of the primary intersections within the Synchro model was field verified in June 2011 for signal timings and intersection geometries. The original Synchro model compiled from other projects and existing signal timing plans was calibrated to reflect the observed signal timings and roadway geometries.

Based on the methodologies from the 2000 Highway Capacity Manual, detailed capacity/level-of-service analysis was completed using Synchro 7.0 software for the existing peak hour traffic volumes at the study area intersections. Operating levels of service (LOS) are reported on a scale of A to F, with A representing the best conditions (with little or no delay) and F representing the worst operating conditions (long delays). The methodology for calculating LOS for an intersection depends on the treatment of the intersection as traffic signal controlled, or stop/yield controlled.

At unsignalized intersections, a methodology for evaluating and reporting the relative functioning of stop or yield sign-controlled intersections is based on several assumptions, including:

- Major street flows are not affected by the minor (stop-sign controlled) street movements.
- Left turns from the major street to the minor street are influenced only by opposing major street through flow.
- Minor street left turns are impeded by all major street traffic plus opposing minor street traffic.
- Minor street through traffic is impeded by all major street traffic.
- Minor street right turns are impeded only by the major street traffic coming from the left.



The concept of stop-controlled or yield-controlled intersection analysis is based on the estimate of average total delay on minor streets. The methodology of analysis relies on three elements: the size and distribution of gaps in the major traffic stream, the usefulness of these gaps to the minor stream drivers, and the relative priority of the various traffic streams at the intersection. The results of the analysis provide an estimate of average total delay for the various critical movements at the unsignalized intersections. Correlation between average total delay and the respective levels of service are provided for unsignalized intersections in the following Table 2-6:

Table 2-6: Level of Service Criteria for Unsignalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	< 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.0

At signalized intersections, an additional element must be considered: time allocation. Therefore, level of service is based primarily on the average control delay per vehicle for various movements within the intersection. Volume-to-capacity relationships also affect level of service. Thus, both volume/capacity and delay must be considered to evaluate the overall operation of a signalized intersection. Correlation between average delay per vehicle and the respective levels of service are provided for signalized intersections in the following Table 2-7:

Table 2-7: Level of Service Criteria for Signalized Intersections

Level of Service	Control Delay Per Vehicle (seconds)
A	< 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.0

The overall weekday morning and weekday afternoon peak hour levels-of-service (LOS) for the study area intersections are summarized and depicted in Figure 2-42 and Figure 2-43. Please note that individual movements within each intersection may differ from the overall intersection LOS. For more detail, tables summarizing LOS, volume/capacity (v/c) ratios, queue lengths and delay are included in Appendix E.

Based on the existing conditions capacity analysis, the at-grade study area intersections currently operate with relatively moderate vehicular congestion and delay for an urban roadway, with a few exceptions. Those congested intersections with the McGrath corridor include:

- Broadway: This intersection operates at LOS D during the morning peak period, and degrades to LOS E in the evening peak with long queues and high delays for the northbound and southbound left-turn movements.
- Medford Street/Highland Avenue: During the morning peak period, this intersection has a volume of eastbound traffic

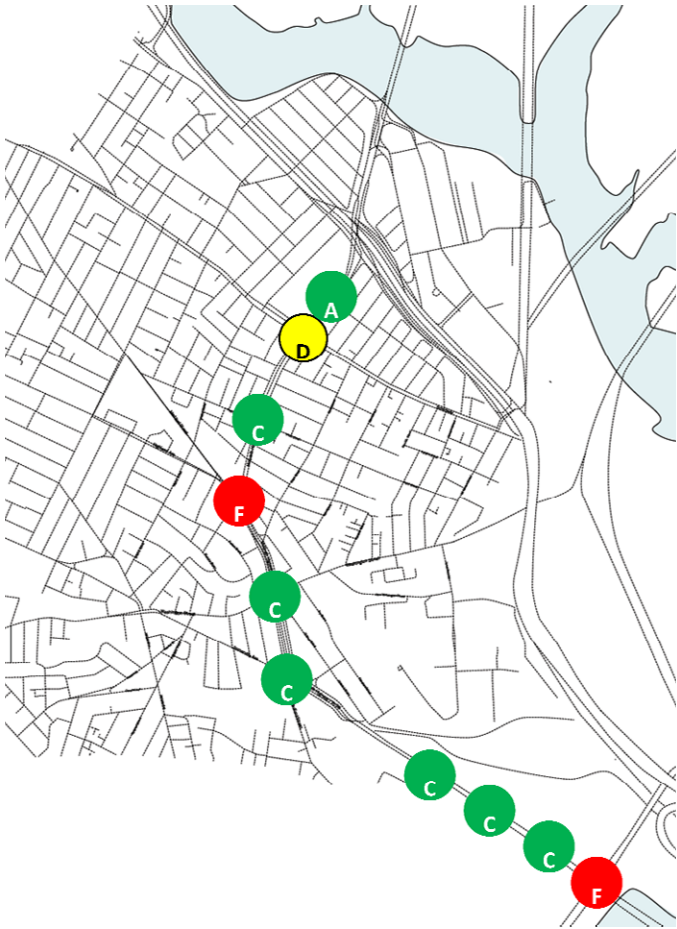


Figure 2-42 : 2011 Weekday AM LOS

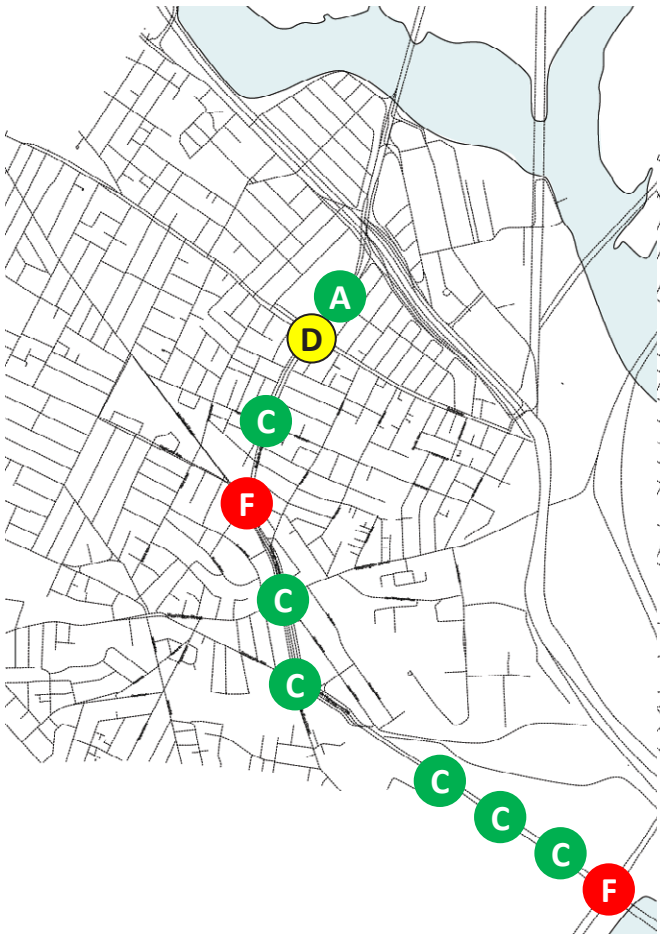


Figure 2-43 : 2011 Weekday PM LOS

Crash Summary

McGrath Highway														
(includes McGrath, Prospect Hill Ave. & Cross, Somerville Ave., Medford St. & Somerville Ave., Washington St. & Poplar St., Cambridge St., Land Blvd & Austin St.)														
On Highway (between intersections)	Blakeley Ave	Broadway	Pearl St	Medford St. & Greenville St.	Prospect Hill Ave. & Cross	St.	Washington St.	Somerville Ave. & Poplar St.	Medford St. & Somerville Ave	Rt. 6	Third St	Cambridge St	Austin St	
Year														
2006	8	23	12	5	0	0	17	7	12	0	3	7	7	
2007	12	14	8	11	0	0	21	18	19	1	5	5	18	
2008	16	14	9	9	3	3	20	10	9	0	6	11	18	
Total	36	51	29	25	3	3	58	35	40	1	14	23	43	
Type														
Angle	17	7	7	6	0	0	16	11	13	1	5	5	14	
Rear-end	16	29	11	7	1	1	12	6	10	0	0	7	18	
Sideswipe	2	5	6	5	0	0	12	4	4	0	4	2	6	
Head-on	0	1	1	0	0	0	0	0	0	0	1	0	0	
Single Vehicle	6	1	0	4	2	2	14	3	4	0	2	7	3	
Other	1	2	4	3	0	0	4	11	9	0	2	2	2	
Total	36	51	29	25	3	3	58	35	40	1	14	23	43	
Type II														
Peds	0	3	0	1	0	0	0	0	0	0	1	2	1	
Bikes	0	1	0	3	0	0	2	1	2	0	0	0	0	
Other (Wheelchair, etc.)	0	0	0	0	0	0	0	1	1	0	0	0	0	
Total	0	4	0	4	0	0	2	1	2	0	1	2	1	
Severity														
Property Damage	9	27	18	13	2	2	36	18	20	0	7	12	30	
Personal Injury	3	16	8	9	0	0	16	12	13	1	5	7	12	
Fatality	0	0	0	0	0	0	0	0	0	0	0	1	0	
Unknown	3	8	3	3	1	1	6	5	7	0	2	3	1	
Total	15	51	29	25	3	3	58	35	40	1	14	23	43	
Weather														
Clear	4	24	21	15	0	0	28	25	29	1	10	16	33	
Cloudy	8	4	1	7	1	1	15	4	3	0	1	2	4	
Rain	3	5	5	2	0	0	11	4	6	0	2	4	4	
Snow	0	0	1	1	1	1	1	0	0	0	1	0	1	
Ice	0	0	0	0	0	0	0	0	0	0	0	0	0	
Sleet	0	0	0	0	0	0	0	0	0	0	0	0	0	
Fog	0	0	0	0	0	0	0	0	0	0	0	0	0	
Unknown	0	3	1	0	1	1	3	2	2	0	0	1	1	
Total	15	36	29	25	3	3	58	35	40	1	14	23	43	
Time														
7:00 AM to 9:00 AM	1	2	5	3	0	0	8	3	4	0	3	1	5	
9:00 AM to 4:00 PM	7	17	8	6	0	0	19	13	18	0	4	7	10	
4:00 PM to 6:00 PM	2	2	7	4	1	1	3	5	6	0	2	0	7	
6:00 PM to 7:00 AM	5	15	17	12	2	2	28	14	12	1	5	15	21	
Total	15	36	29	25	3	3	58	35	40	1	14	23	43	
Crash Rate	n/a	0.74	0.85	0.58	1.29	0.13	1.55	1.56	1.86	0.03	0.41	0.78	0.76	
District 6 (4) Average		0.78	0.82	0.78	0.59	0.59	0.78	0.59	0.78	0.78	0.78	0.78	0.78	
State Average		0.82	0.82	0.82	0.62	0.62	0.82	0.62	0.82	0.82	0.82	0.82	0.82	

Source: MassDOT

Prepared by McMahon Associates 6/29/11

Figure 2-44 : MassDOT Crash Rate Worksheet

- turning right and a high volume of southbound through volumes that result in vehicle delay and an overall LOS F.
- Land Boulevard: During both the morning and evening peak periods, this intersection experiences long queues and high delay, particularly the northbound and southbound left-turn movements, and the westbound movements.

The elevated sections of Route 28 generally operate with principally free-flow conditions for the mainline of the McGrath corridor, while the surface roads experience some delay. The queues from the Washington Street intersection frequently spill back onto the mainline of the McGrath corridor, which causes some mainline delay. This situation is complicated by driver confusion regarding appropriate use of lanes in the vicinity of Washington Street under the McCarthy Viaduct.

Safety Analysis

Crash Data

In addition to traffic volume data, a traffic safety analysis was performed for all study area intersections on the McGrath corridor using 2006-2008 crash data from MassDOT²¹ and crash data provided by the Somerville Police Department (PD). The crash data is a compilation of crash reports submitted to the Registry of Motor Vehicles (RMV) from local, state, and public transportation police departments as well as from citizens, and is summarized in this section. The crash data is summarized by year, type, severity, weather conditions and time of day.

A comparison of the overall number of crashes between the MassDOT and Somerville PD data was conducted to ensure that there were no gaps or discrepancies in the analysis, and is shown in Table 2-9. The differences between the two data sources in terms of the number of total crashes reported are slight (within 2 crashes), with the greatest difference in 2006 (less than 5 percent). Please note that although the Route 28 intersection with Mystic Avenue is not within the Grounding McGrath study area, it was part of the Somerville PD crash data. Therefore, in order to present a consistent comparison, MassDOT crash data for the Mystic Avenue intersection was included in the summary presented in Table 2-8.

Table 2-8: Comparison of Somerville PD and MassDOT Crash Data

Year	Somerville PD Data	MassDOT Data
2006	170	162
2007	167	168
2008	153	155

MassDOT Crash Rate Worksheets

MassDOT Crash Rate Worksheets were used to determine whether the crash frequencies at the study area intersections were unusually high given the volumes at each location. The MassDOT Crash Rate Worksheet is used to calculate the crash rate for an intersection, expressed in crashes per million entering vehicles. The calculated rate is then compared to the average crash rates for signalized and unsignalized intersections within the particular MassDOT District, which are shown in Figure 2-44: MassDOT Crash Rate Worksheet. The city of Somerville is located in MassDOT District 4 and the city of Cambridge is located within MassDOT District 6.

²¹ The most recent three year period for which data was available when the analysis was completed in early 2011.

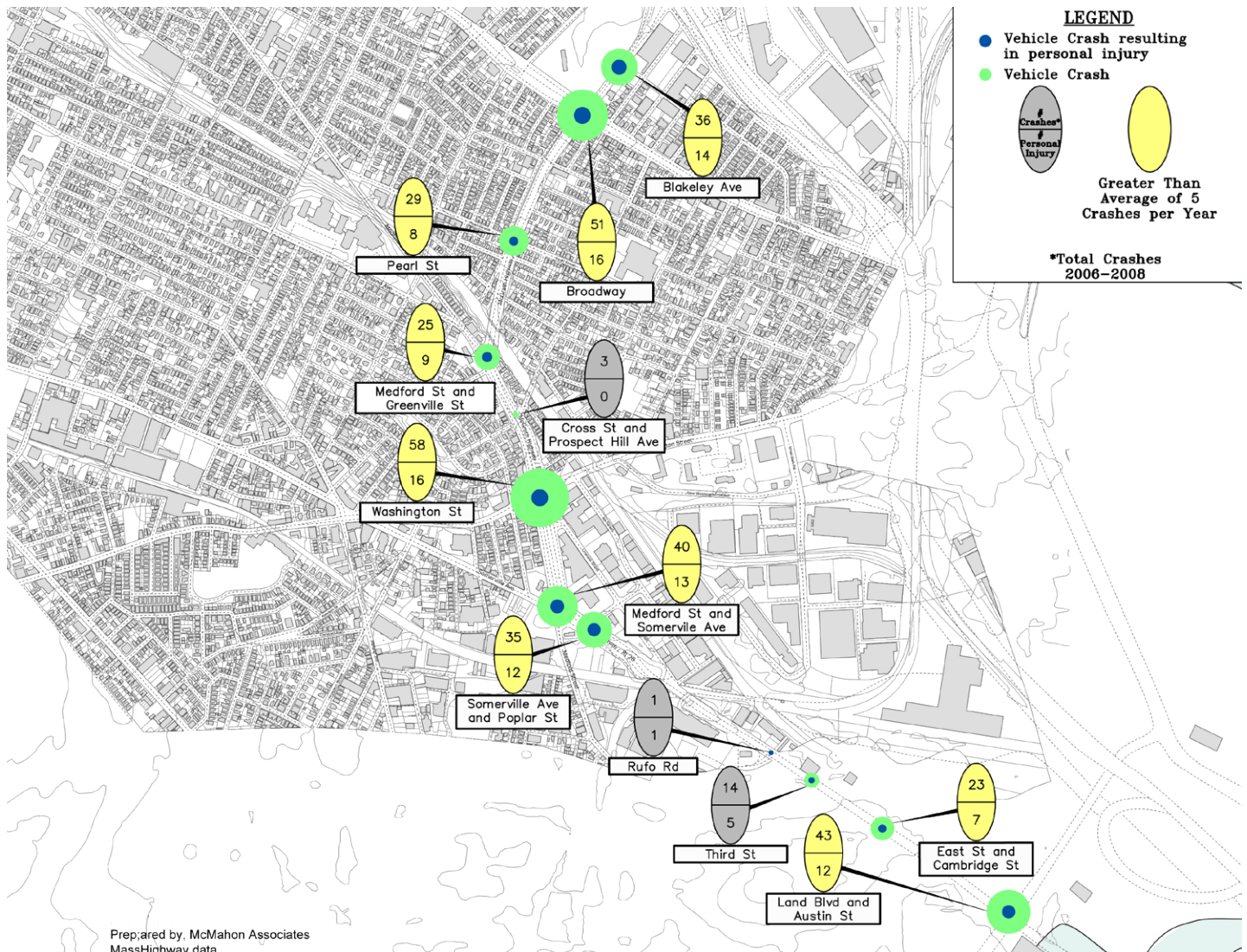
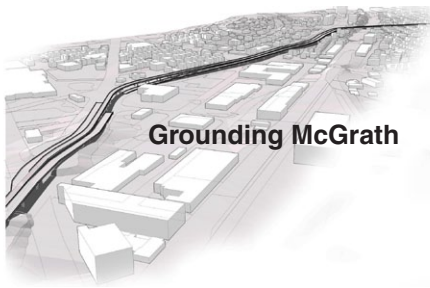


Figure 2-45 : Summary of Total Crashes by Intersection

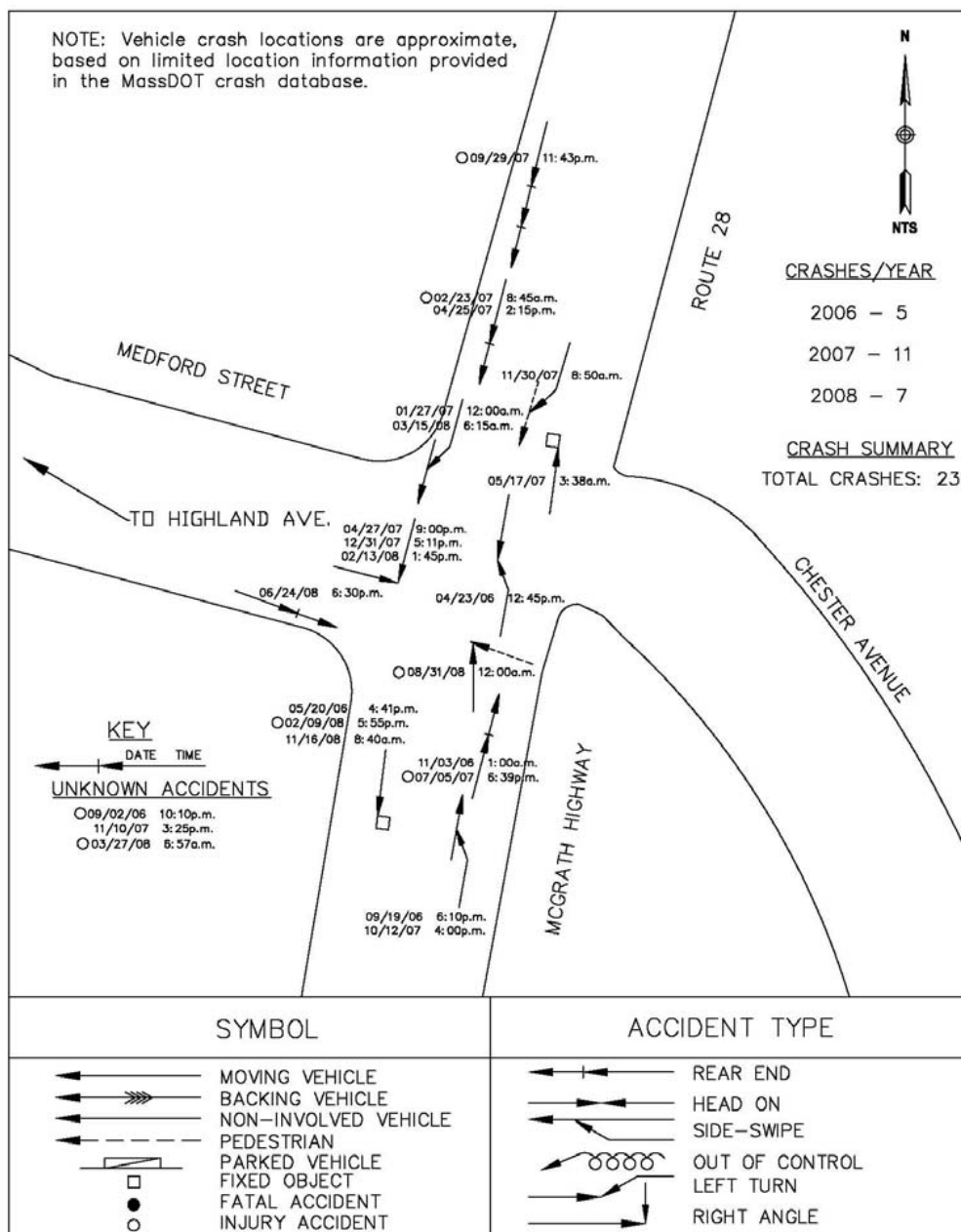
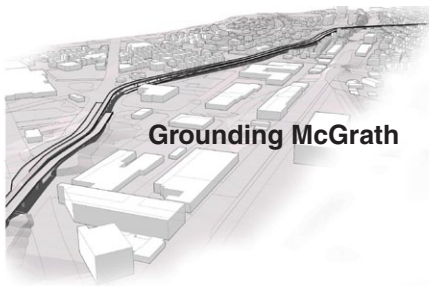


Figure 2-46 : Crash Diagram 2006-2008, Medford Street (Highland Avenue) at The McGrath corridor



Grounding McGrath

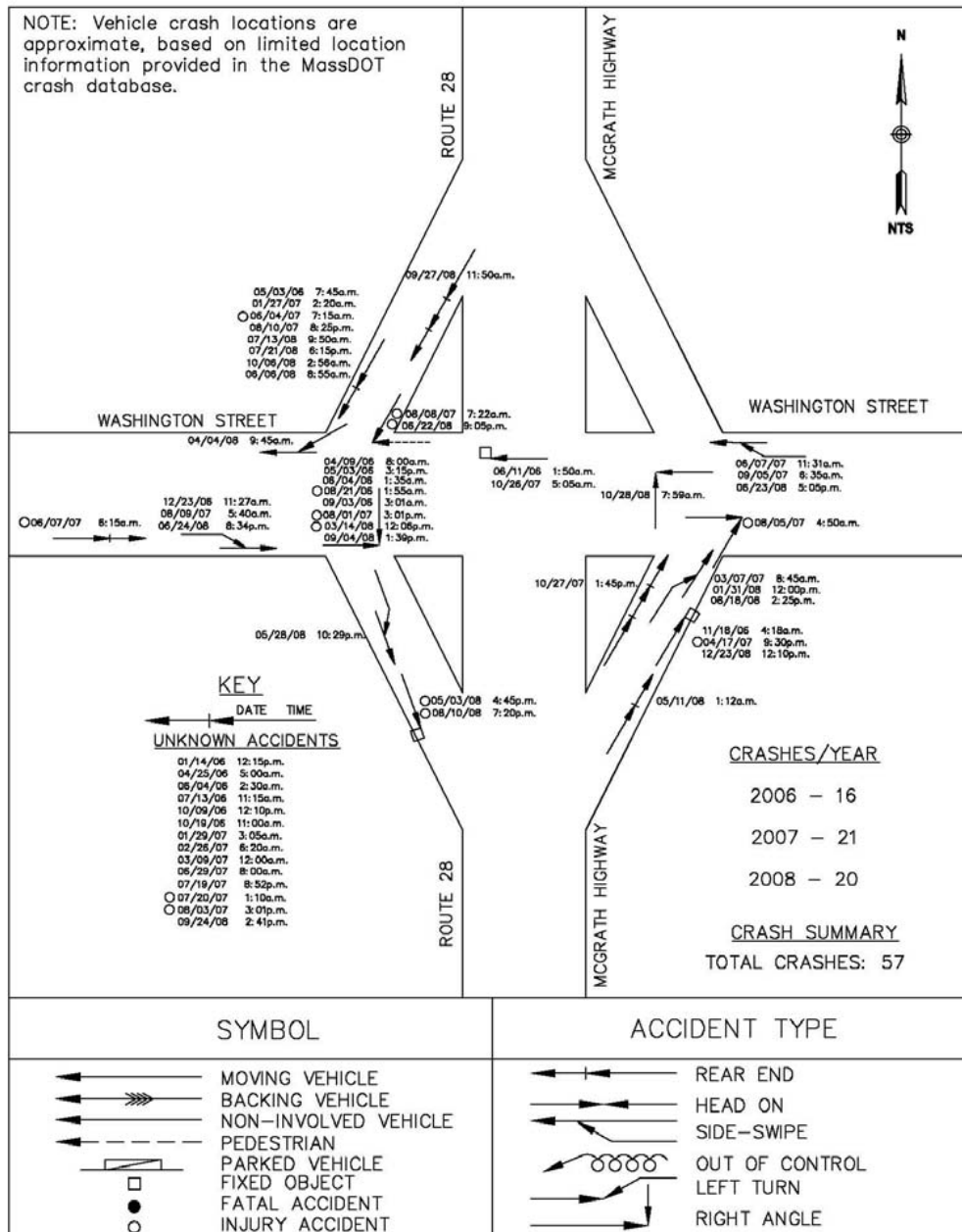


Figure 2-47 : Crash Diagram 2006-2008, Washington Street at The McGrath corridor

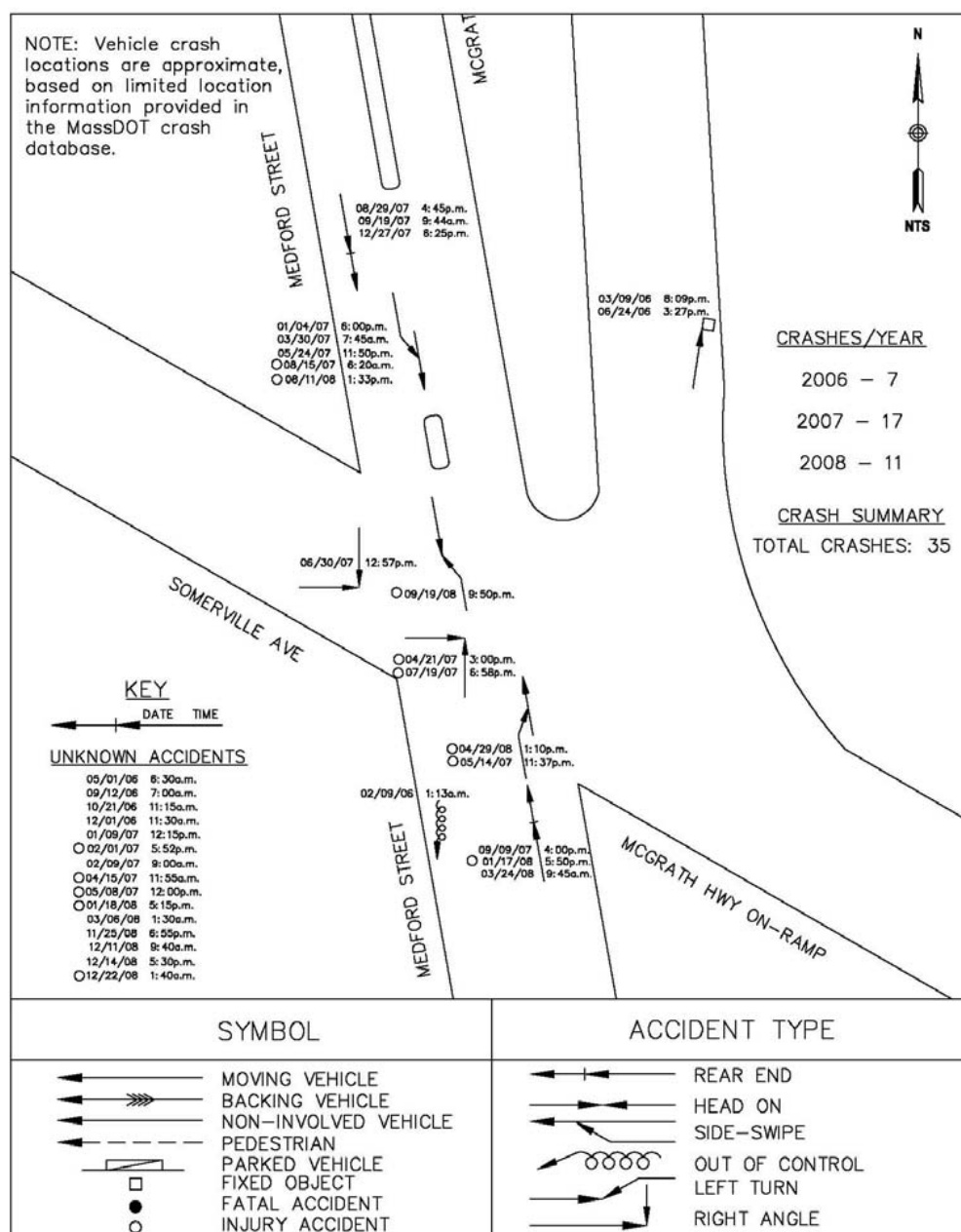
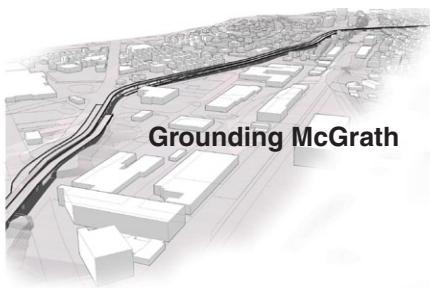


Figure 2-48 : Crash Diagram 2006-2008, Medford Street at Somerville Avenue



In 2010, MassDOT Districts 4 and 6 experienced an average crash rate of 0.78 crashes per million entering vehicles for signalized intersections and 0.59 crashes per million entering vehicles for unsignalized intersections. The statewide averages were 0.82 crashes per million entering vehicles for signalized intersections and 0.62 crashes per million entering vehicles for unsignalized intersections. MassDOT Crash Rate Worksheets are provided in Figure 2-44. Figure 2-45 is a summary of crash data for all study area intersections, and also highlights locations that experienced more than 5 crashes per year between 2006-2008.

Summary of safety analysis findings include:

- McGrath corridor intersections with Broadway, Washington Street, Somerville Avenue/Poplar Street exceed average crash rates.
- Personal injury was reported approximately 33 percent of the time as a result of the crashes at study area intersections. The intersections with greatest number of crashes resulting in personal injury included Route 28 at Washington Street, Poplar Street, and Medford/Highland Avenue/Greenfield Street.
- Approximately 17 percent of the reported crashes from 2006-2008 involved pedestrians or cyclists (based on the Somerville Police Department data).
- The remaining study area intersections experienced crash rates below the state wide and District 6 and District 4 averages, which suggests that there are no significant safety deficiencies at these intersections.

In order to more fully understand and possibly identify the cause of the crashes at the intersections that exceed the average Statewide and District 6 crash rates, it is necessary to determine not only the number of crashes, but also the type of crashes. For example, rear-end crashes can be typical of a signalized intersection or congested location. Angle collisions can be due to unusual or substandard roadway geometry. Angle collisions are often between vehicles traveling in opposite directions, and can be particularly dangerous due to higher effective speeds.

The Somerville Police Department was not able to provide detailed crash reports containing collision diagrams and narrative description of collisions.

Therefore, collision diagrams were developed by the Grounding McGrath project team based on approximate locations of crashes contained in the MassDOT crash database. Collision diagrams were developed for intersections that met the following criteria:

- Exceed a crash rate of 1.0 crashes per million entering vehicles²²
- More than five crashes per year
- High number of angle collision crashes

The following four intersections met these criteria:

- Medford Street (Highland Avenue) Avenue at McGrath (see Figure 2-46)
- Washington Street at McGrath (see Figure 2-47)
- Medford Street (including McGrath southbound ramps) at Somerville Avenue (see Figure 2-48)
- Somerville Avenue at Poplar Street (see Figure 2-48)

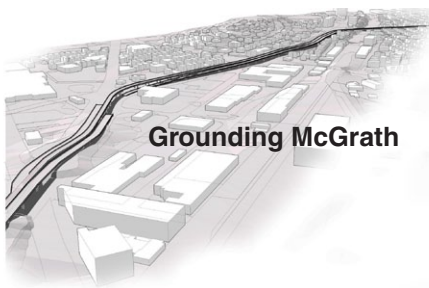
Medford Street (Highland Avenue) at McGrath

- Crash Rate= 1.29
- District 4 Average= 0.59
- State Average= 0.62
- Total Crashes from 2006-2008= 25
- Mostly angle and rear-end crashes
 - » Rear-end crashes occurred most often in the right-turn lane, particularly southbound on Route 28
 - » Side-swipe crashes occurred in both the northbound and southbound directions.
 - » A left-turn crash occurred in the northbound direction.
 - » Right angle crashes occurred in both the eastbound and northbound approaches.
 - » Several crashes occurred with a fixed object in the southbound direction, south of the intersection.
 - » The location of four crashes could not be determined based on the information available.

²² Engineering judgment and national standards suggest that rates exceeding 1.0 are worthy of further study. The district rate is an average rate and does not necessarily mean that it is a dangerously high crash rate – only that it is above the average.

<u>McGrath Hwy. Accident Report</u>												
	<u>2001</u>	<u>2002</u>	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>total</u>
Accident / Hit & Run	19	28	10	17	20	13	19	27	26	27	19	225
Accident / MV	120	128	106	88	117	125	124	101	127	108	41	1185
Accident / Pedestrian	2	4	6	4	4	4	4	4	5	0	4	41
Accident / Pedestrian / Injury	33	31	23	25	25	24	19	19	18	19	9	245
Accident / Bicycle	0	0	0	0	0	4	1	2	0	1	0	8
Accident / Property / Damage	0	0	0	0	0	0	0	0	0	1	0	1
Total Incidents	174	191	145	134	166	170	167	153	176	156	73	1705

Figure 2-49 : McGrath Corridor Bicycle and Pedestrian Crash Report



Washington Street at McGrath

- Crash Rate= 1.55
- District 4 Average= 0.78
- State Average= 0.82
- Total Crashes from 2006-2008= 58
- High number of crashes at this location, including 16 angle and 14 single vehicle crashes.
 - » Angle collisions may be due to driver confusion regarding lane assignments with difficult merges. Angle collisions occurred more frequently at the Washington Street eastbound approach and McGrath southbound ramps, than any other intersection approach for which crash details were available.
 - » Rear-end crashes occurred more frequently on the southbound ramp from McGrath than any other approach for which crash details were available. Rear-end crashes also occurred on the northbound approach to Washington Street.
 - » High number of single vehicle crashes could be due to confusing circulation patterns and traffic maneuvering around bridge columns and pedestrians.
 - » There are some side-swipe crashes for all approaches.
 - » The location of 14 crashes could not be determined based on the information available.

Medford Street (including McGrath southbound ramps) at Somerville Avenue

- Crash Rate= 1.86
- District 4 Average= 0.78
- State Average= 0.82
- Total Crashes from 2006-2008= 40
- Large number of angled collisions and rear-ends.
 - » Most crashes happened during the nighttime
 - » The majority of crashes, for which location information was available, involved the northbound and southbound approaches.
 - » Driver confusion may contribute to the crashes due to the intersection geometry with a very large open area in middle of the intersection, as well as unclear pavement markings.
 - » The location of 15 crashes could not be determined based on the information available.

Somerville Avenue at Poplar Street

- Crash Rate= 1.56
- District 4 Average= 0.59
- State Average= 0.62
- Total Crashes from 2006-2008= 35
- 11 angled crashes and 11 unknown crashes.
 - » Vehicles have to merge onto The McGrath corridor without any “taper zone”, which can cause an angle-type crash
 - » Lack of a stop bar or “yield lines” may have contributed to these crashes

Several of these intersections are considered for substantial changes from elevated to at-grade in the long-term alternatives. However, it may be possible to modify intersection geometry in the short-term to improve safety. Intersections are further evaluated in Chapter 5 – Alternatives Analysis as part of the safety analysis. Crash expectancies according to nationally published factors will also be determined for proposed intersection treatments associated with recommendations for the future.

Pedestrian and Bicycle Crash Analysis

The crash analysis described previously was also analyzed further to determine the level of pedestrian and bicycle incidents in the corridor. According to the Somerville Police Department records, approximately 17 percent of the reported crashes from 2006-2008 involved pedestrians and cyclists (see Figure 2-49).

While 17 percent is not necessarily a high rate of incidents, it is higher than the proportion of vehicles to pedestrians generally in the corridor given the high vehicle counts, and relatively low level of pedestrian and bicycle activity. Intersection specific crash data is available for years 2006-2008, but the Somerville Police Department provided a summary of the types of crashes on the McGrath corridor from 2001-2011. This data show pedestrian safety is a significant concern; nearly 86 percent of the 286 pedestrian incidents recorded by the Somerville Police Department between 2001-2011 resulting in injury. There were very few bicycle accidents during this period, but there is also very little bicycle activity in the corridor. It should also be noted that many

of these incidents are reported solely as being on the McGrath corridor, and there is limited ability to trace them to a specific location along the corridor. There also may have been crashes that were not reported, and therefore are not considered in this information.

Several of the intersections with the McGrath corridor are considered for substantial changes from elevated to at-grade in the long-term alternatives. However, it may be possible to modify intersection geometry in the short-term to improve safety. Intersections are further evaluated in Chapter 5- Alternatives Analysis as part of the safety analysis.

Issues and Opportunities

The Existing Conditions analysis has identified many critical issues and opportunities that will drive the development of alternatives and form the quantitative basis for measuring them against the goals and objectives. The issues and opportunities are listed below by category.

Structures

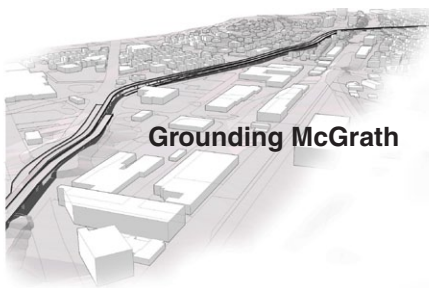
- Two structures on the McGrath corridor are currently slated for or are undergoing repair and/or rehabilitation.
 - » The Gilman Street Bridge is being replaced under MassDOT's Accelerated Bridge Program (ABP). This replacement is currently under design.
 - » The McCarthy Viaduct is currently undergoing a limited but substantive program of short-term repairs and rehabilitation.
- The three structures not slated for repair (the Squire's Bridge, the Lowell Line Bridge, and the Otis Street pedestrian bridge) have condition ratings of Fair or Satisfactory. These three structures typically exhibit isolated areas with deterioration, but do not currently require any repairs in the short term.
- Due to clearance requirements by the MBTA, there are two "fixed points" in the study area: (1) the truss bridge over the Lowell Line and (2) the Squire's

Bridge over the MBTA Fitchburg Commuter Rail Line. Grade separation of roadway and railroad must be maintained in order to avoid creation of a new railroad grade crossing, and the clearance provided at these locations cannot be reduced.

- Roadway design standards for maximum roadway gradient limit the distance required to bring the McGrath corridor to grade from these two fixed points. This distance will be dependent on the design speed for the road, and whether pedestrian routes along McGrath will follow the traffic alignment.
- Changes to the McGrath corridor provide opportunity to improve the cost-effectiveness of infrastructure. Maintenance costs are a significant factor for the corridor. The McGrath corridor is carried by approximately 1,500 feet of bridge structures and 258 feet of tunnel. Maintaining these structures is a large cost.
 - » This is exacerbated by the age of these bridges. They are decades old and have construction details which increase corrosion rates. Deck joints, which expose steel beams to water and de-icing salts, are one example.
 - » New structures would be required to carry McGrath from the fixed points to grade. New construction technologies available today would reduce future maintenance costs required for these structures relative to the requirements for the existing structures.

Pedestrians and Bicyclists

- Pedestrian and bicyclist access, accommodation, and safety must be paramount in any alternatives.
- The Somerville Community Path is planned through this area as part of the GLX, but it should also be incorporated in all alternatives for this study.
- Pedestrian and bicycle connections across and along the McGrath corridor should be developed to ensure the success of this project and the adjacent projects in the study area. Creating new pedestrian access points and sight lines is critical to development of the adjacent neighborhoods.
- There are few legal pedestrian crossings (crosswalks) across the McGrath corridor, with an average of over ¼ mile between crossings. Even where pedestrian crossings exist, they are difficult,



confusing, long, and uninviting. Elevated and at-grade, the McGrath corridor is a pedestrian barrier. Sidewalks and pedestrian connections along the corridor are inconsistent.

- A surprisingly high volume of pedestrians cross the McGrath corridor at crosswalks, showing very strong pedestrian desire lines, and may be due to the location of the bus stop on Washington Street under the McCarthy Viaduct.
- Pedestrian connections to the planned Green Line stations are important to consider as part of all alternatives.
- Bicycling is allowed on the McGrath corridor, including on the elevated portions, but this is unclear to bicyclists, and volumes are comparatively low.

Transit

- The MBTA's Green Line serves the eastern part of the study area, with Lechmere as the current end of the line. Lechmere Station also functions as a bus hub for routes 69, 80, 87 and 88. The planned GLX through Somerville provides an opportunity for decreased traffic demands and enhanced economic development.
- Two MBTA commuter rail lines (Fitchburg and Lowell) from North Station pass through the corridor, but do not have station stops in Somerville. While the lines do not service Somerville, the elevated roadway structures over the rail lines are necessary.
- Eleven MBTA bus routes operate in, across, or around the McGrath corridor, including routes CT2, 69, 80, 86, 87, 88, 89, 90, 91, 95, and 101. These are primarily east-west routes, providing an opportunity to improve coordination of fixed route service and headways with the planning for the McGrath corridor.
- There are no bus routes that provide a consistent and complete connection along the entirety of the study area from Broadway to Lechmere.
- For the most part, buses do not use the elevated portion of the McGrath corridor, and none use the McCarthy Viaduct. Buses use the surface streets to the extent possible, and must use the Squire's Bridge and the bridge over the Lowell Line. While Union Square and the adjacent corridor neighborhoods all have direct service; the Inner Belt and Brickbottom areas are served along the periphery of either

Washington Street or the McGrath corridor.

- Bus stops on the routes that bisect the corridor (Broadway, Washington Street) tend to be close to the McGrath corridor and have challenging pedestrian crossings.
- The total daily ridership boarding and alighting at stops on, or immediately under, or adjacent to, the McGrath corridor, that could potentially be affected by the project is approximately 1,315 passenger trips (Routes CT2, 80, 86, 87, 88, and 91)

Demographics and Land Use

- Removal of elevated portions of the McGrath corridor has the potential to significantly enhance the businesses and residential prospective in neighborhoods and areas that are directly adjacent to the highway. Furthermore, removal could have a positive effect on adjacent businesses and properties. These areas have an opportunity to create a new identity, such as a Main Street or a mixed use boulevard and enhance the economic vitality previously hindered by the shadow and lack of visibility created by McGrath's elevated structure.
- The land use surrounding the McGrath corridor will directly impact and guide the future redevelopment of these areas and impacts would come in stages based on the land use. Overall, owners of existing residential and business properties would gain enhanced access and visibility through removal. Residential development property values would likely increase as neighborhoods become more attractive to developers and visitors.
- Excess right-of-way can be converted and developed into facilities and amenities to support Somerville's neighborhoods such as parks and open space.
- The study area population of 56,560 is growing compared to the rest of Somerville. The population is undergoing an increase in ethnic diversity, as well as an overall decrease in average age, with the percentage of children and elderly shrinking.
- The demographic conditions for significant redevelopment and some new construction exist in the market today, including younger households with higher education levels than before and increasing relative incomes.
- Housing and commercial prices vary widely but

have high points which represent levels at which redevelopment of existing properties and in some places, new construction can be supported.

- The area has seen more development interest based on the GLX project; Decisions about neighborhood character are important and will be based on plans for the McGrath corridor (i.e. is this a main-street style district or part of a larger-scale mixed-use district?).

Environmental

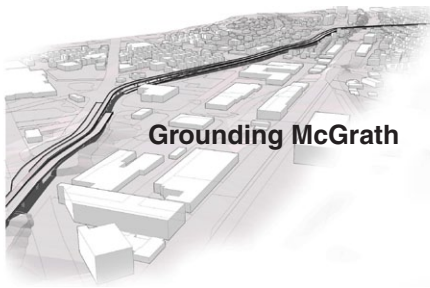
- There are approximately fifteen small parks, playgrounds, and recreation areas along the McGrath corridor or in the immediate study area. Connections to these areas should be enhanced through the McGrath alternatives.
- During significant storm events flooding from the Millers River and sewer overflow can be evidenced in lower portions of the study area, especially near the Somerville Avenue and Poplar Street intersections with the McGrath corridor.
- The roadway itself primarily runs through the soil type “Urban land, wet substratum.” However there are segments of the highway and adjacent to the highway of other soil types.
- There are no DEP wetlands in the study area.
- Historically significant areas and neighborhoods, including the Prospect Hill area in Somerville and the Union Railway Car Barn in Cambridge, as well as three National Register Districts: East Cambridge, Winter Street, and Charles River Basin, should be considered in planning the future of the McGrath corridor.
- There are a few DEP oil or hazardous materials sites with Activity and Use Limitation (AUL) along the corridor or immediately adjacent to the McGrath corridor:
 - » Opposite Foss Park
 - » Across the highway from Rufo Road
 - » To the east of Water Street
- In addition, there are several sites in the immediate study area in the Brickbottom and Inner Belt areas, south of the Fitchburg Commuter Rail Line and opposite Foss Park.
- Abutting neighborhoods surrounding the McGrath corridor are at higher risk for respiratory diseases

and other health risks due to the heavy traffic volumes and congested intersections along the corridor.

- The presence of the elevated structure likely both shields and exacerbates noise pollution from traffic on the directly adjacent neighborhood.

Vehicular Traffic

- There is an imbalanced directional split: Southbound volumes are 12 percent higher on the McCarthy Viaduct and 19 percent higher on Monsignor O'Brien Highway in Cambridge in the AM peak than are the northbound volumes in the PM peak. This indicates that drivers may seek alternative routes in the PM.
- There are more than 900 vehicles that use Medford Street southbound (at Somerville Avenue) during the morning peak period. This serves as an alternative access point from the McGrath corridor to reach points in East Cambridge.
- Traffic volumes are generally highest between Washington Street and Medford/Highland Avenue.
- There are substantial volumes (more than 1,000 vehicles during peak periods) on major cross streets with the McGrath corridor: Broadway, Medford/Highland, Washington, Somerville Avenue/Medford Street, Third Street, and Land Boulevard. With the exception of Washington Street, these intersections are already at-grade and experience long queues and high delay during peak periods. The intersections with the McGrath corridor include:
 - » Broadway: This intersection operates at LOS D during the morning peak period, and degrades to LOS E in the evening peak with long queues and high delays for the northbound and southbound left-turn movements.
 - » Medford/Highland: During the morning peak period, this intersection has a high volume of eastbound traffic turning right and a high volume of southbound through volumes that result in vehicle delay and an overall LOS F.
 - » Land Boulevard: During both the morning and evening peak periods, this intersection experiences long queues and high delay, particularly the northbound and southbound left-turn movements, and the westbound movements.



- The elevated sections of the McGrath corridor's east-west cross-streets result in relatively free-flow conditions for the mainline of the McGrath corridor, while the surface roads experience some delay. The queues from the Washington Street intersection spill back onto the mainline of the McGrath corridor causing some delay. This situation is complicated by driver confusion regarding appropriate use of lanes in the vicinity of Washington Street under the McCarthy Viaduct.
- Based on the CTPS License Plate Survey, only 10 percent of vehicles observed in the AM period use the McGrath corridor segment from the Otis Street pedestrian bridge to the Museum of Science. About 39 percent of vehicles observed exited at Washington Street, indicating the McGrath corridor is used for access to and from destinations in Somerville and Cambridge, more than a through route to Boston. This trend will likely be continued as the highest percentage of population and employment growth predicted in the corridor is in the focus area adjacent to future development of the Inner Belt/Brickbottom area, as well as Cambridge destinations such as Kendall Square and NorthPoint.
- Through the Grounding McGrath process a number of immediate concerns about traffic, intersection design and pedestrian safety were raised. These are described further in the Recommendations chapter, but many were evaluated and implemented by the MassDOT District 4 Office in conjunction with this effort.
- Approximately 17 percent of the reported crashes from 2006-2008 involved pedestrians or cyclists (according to the Somerville Police Department).

