

CHAPTER 3: FUTURE YEAR PROJECTIONS

Introduction

This chapter will analyze how the expected changes in population and other demographic characteristics between 2011 and 2035 will impact transportation in the McGrath corridor. The 2035 future condition without any improvements or changes associated with this study – or Future No-Build condition – assumes that the McGrath corridor functions much as it does today. The purpose of this analysis is to evaluate transportation issues that would be expected to arise in the McGrath corridor and to establish a baseline against which to compare proposed alternatives. Such a comparison is necessary to determine if those options will be functional and appropriate for projected growth within the project area in the future. The Future No-Build condition assumes that no alternatives (including any potential change to the elevated structures or lane configurations) are to be implemented along the McGrath corridor, but accounts for the expected changes in population and employment and the implementation of other transportation projects in the region.

Conditions in the study area are forecasted to the horizon year of 2035, consistent with the Boston Region Metropolitan Planning Organization (MPO)'s Regional Transportation Plan (RTP) and the regional travel demand model managed by the Central Transportation Planning Staff (CTPS), the organization that serves as technical staff for the Boston Region. The CTPS regional travel demand model is used to understand travel demand peak period forecasts under the existing conditions and under a future "no-build" condition in the horizon year of 2035.

The regional travel demand model is continually calibrated to transit counts, traffic volumes, and congested speeds on roadways. Using the Metropolitan Area Planning Council (MAPC) regional land use forecasts as an input into the model, CTPS estimates population, employment, alternative transportation, and vehicle volume growth for 2035. Projects such as the Green Line Extension (GLX), Assembly Square Orange Line Station, and Sullivan Square/Rutherford Avenue improvements are assumed to be completed by 2035, and are therefore included in the regional travel demand model for the horizon year of 2035. It also includes the population, households, and employment projections for the study area. The model is multimodal

and represents regional transportation patterns in 164 communities in eastern Massachusetts, including the 101 cities and towns in the Boston Region MPO, as well as 63 additional communities forming a buffer around the region in order to provide model results that are as robust and accurate as possible. Please see Figure 3 - 1 for the municipalities included in the Boston Region MPO.

Analysis

The No Build future year conditions for Grounding McGrath is developed using the adopted 2035 land use and transportation network from the Boston Region MPO's Long-Range Regional Transportation Plan. The socio-economic data in the regional travel demand model is typically developed into population and employment projections for specific transportation analysis zones (TAZ) for current and future analysis years.

- The number of person trips in each TAZ is calculated based upon the population and employment data.
- Mode shares are then applied to the person trips to estimate the vehicular and non-vehicular trips in the region.
- The vehicular trips are then assigned to the regional street network, weighing the trips productions and attractions of each zone and utilizing roadway capacity constraints.

As noted in Figure 3-2, population and employment growth in the Inner Belt/Brickbottom area of Somerville is expected to more than double from 2009 to 2035. This growth is expected to have a significant impact on the trips projected to and from that area in the form of new transit, automobile, and non-motorized (bicycle and pedestrian) trips.

CTPS provided a summary of mode share for the 2011 base year and 2035 No Build. Five neighborhoods were reviewed - Inner Belt/Brick Bottom, East Cambridge, East Somerville, Spring Hill, and Winter Hill. In the base year, the overall transit shares in these five neighborhoods varied from 7.7 percent to 28.2 percent in the AM peak period, and from 9.9 percent to 25.7 percent in the PM peak period. In 2035 with the impact of GLX project, the transit share became 11.8 percent - 32.3 percent in the AM, and 13.0 percent - 26.9 percent in the PM. Between

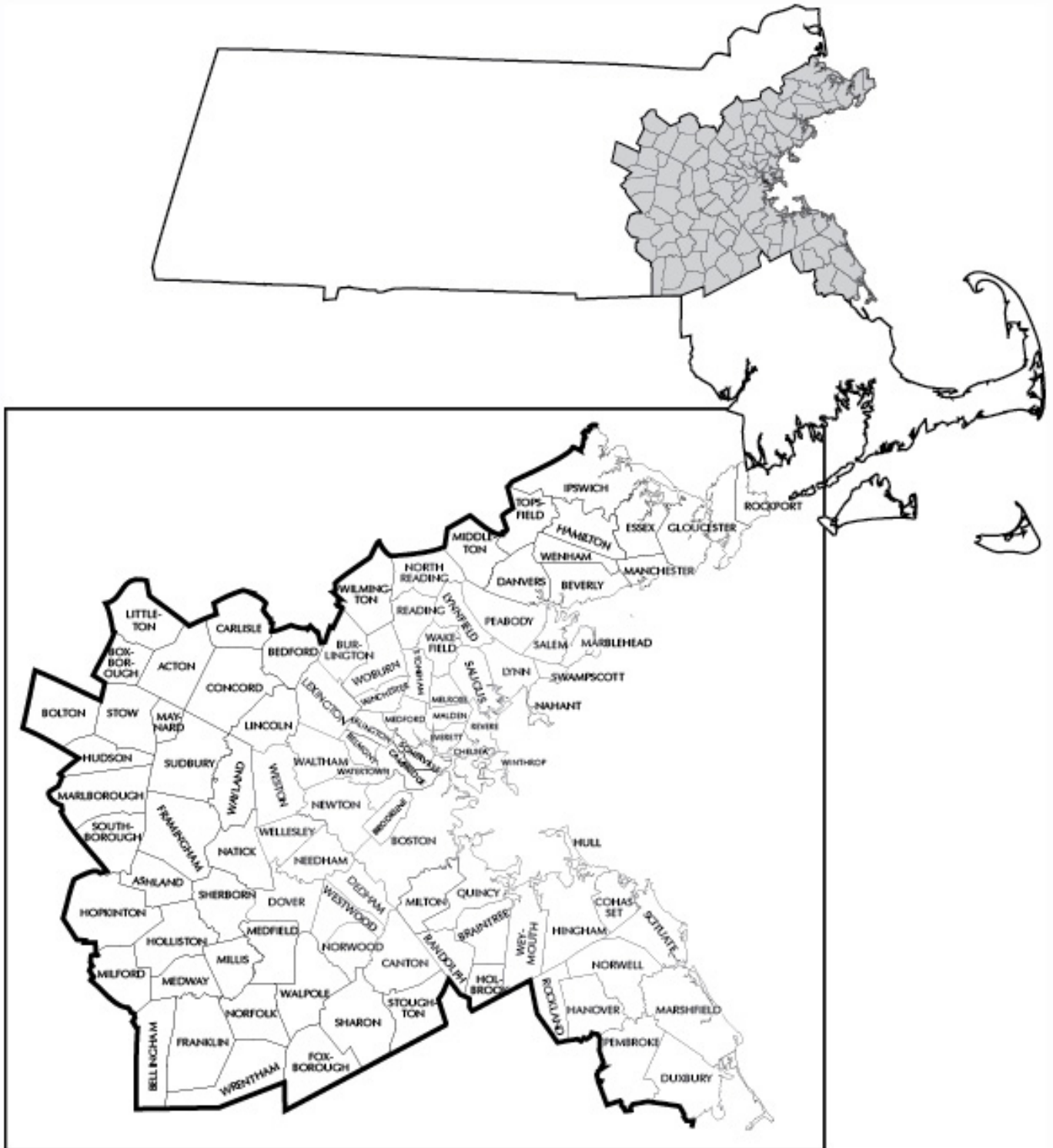


Figure 3-1 : Boston Regional Metropolitan Planning Organization Municipalities

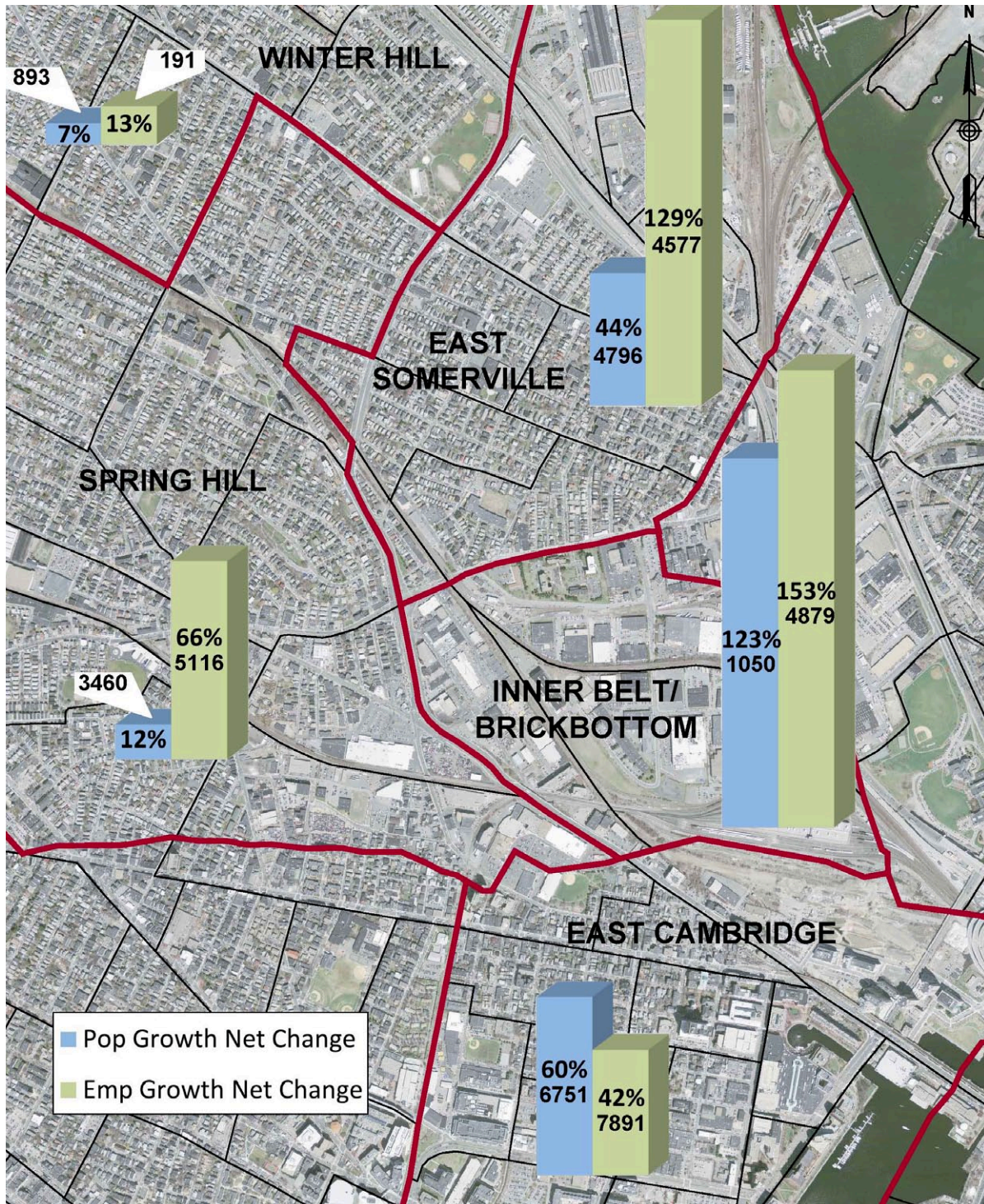
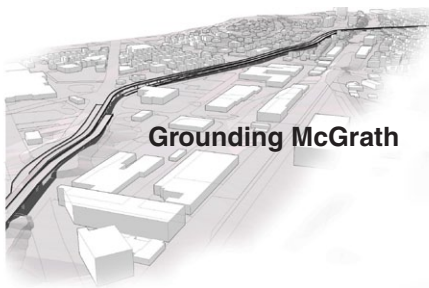


Figure 3-2 : CTPS Population and Employment Growth for 2035 by Neighborhood

2011 and 2035, the estimated transit share increased, by an average of approximately 5 percent in the AM peak period, and by about 3 percent in the PM peak period.

CTPS supplied the project team with the estimates from the regional travel demand model for growth in traffic volumes, along roadways and at intersections, between the 2011 base year and the 2035 future year. The project team then incorporated the data into a micro-simulation capacity analysis model, using Synchro analysis software, to evaluate traffic operations within the project study area. Growth rates were calculated and applied to the 2011 existing peak hour traffic volumes using methods for three subareas of the study area:

- From Blakeley Street in the north to Highland Avenue/Medford Street. This segment of the McGrath

corridor is currently at grade. The CTPS generated outputs for both the McGrath corridor links and intersecting roadway links (Blakely Street, Broadway, Pearl Street, Medford Street) were averaged together for the weekday morning and weekday afternoon peak hours. The average growth rate was calculated and rounded to the nearest half percent, resulting in 7.5 percent growth, which was then applied to the 2011 existing weekday morning and weekday afternoon peak hour traffic volumes.

- Highland Avenue/Medford Street to Poplar Street. For the McGrath Highway segments and intersecting roadways between Highland Avenue/Medford Street and Poplar Street, a different methodology was used to establish growth rates to account for the elevated structure. The CTPS outputs for this

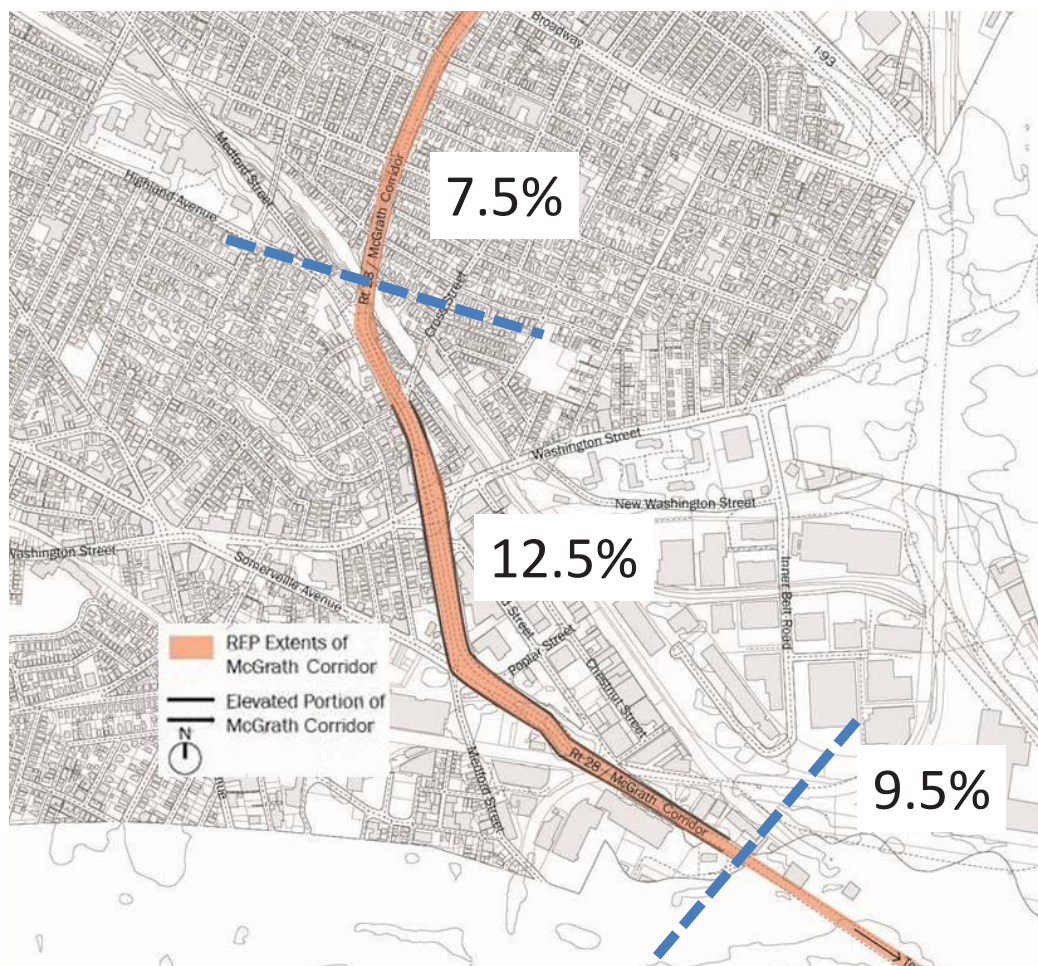
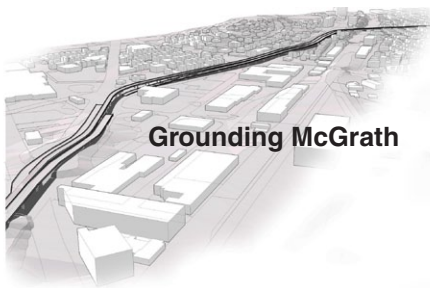


Figure 3-3: McGrath Corridor Traffic Growth Rates



segment were averaged separately for the McGrath corridor elevated roadway and the McGrath ramps. The growth rates generated by CTPS for Washington Street, Somerville Avenue, Medford Street and Poplar Street were each rounded to the nearest half percent. The average growth rate in this segment is 12.5 percent, reflective of the high level of population and employment growth projected for this segment of the McGrath corridor. These averaged McGrath corridor and individual side street growth rates were applied to their respective existing intersection approach volumes to obtain the 2035 No Build peak hour traffic volumes.

- Rufo Road to Land Boulevard. For the study area

intersections along the McGrath corridor from Rufo Road to Land Boulevard in the south, the growth rates generated by CTPS for each of the roadway links were rounded to the nearest half percent and applied individually to each of the intersection approaches. The average growth rate for this segment is 9.5 percent.

Based on the outputs from CTPS' regional travel demand model, automobile trips along the McGrath corridor are expected to increase in the range of 7.5 percent to 12.5 percent between 2011 and 2035, depending on the area in the corridor (see Figure 3-3). After applying the calculated roadway link growth rates, the resulting traffic

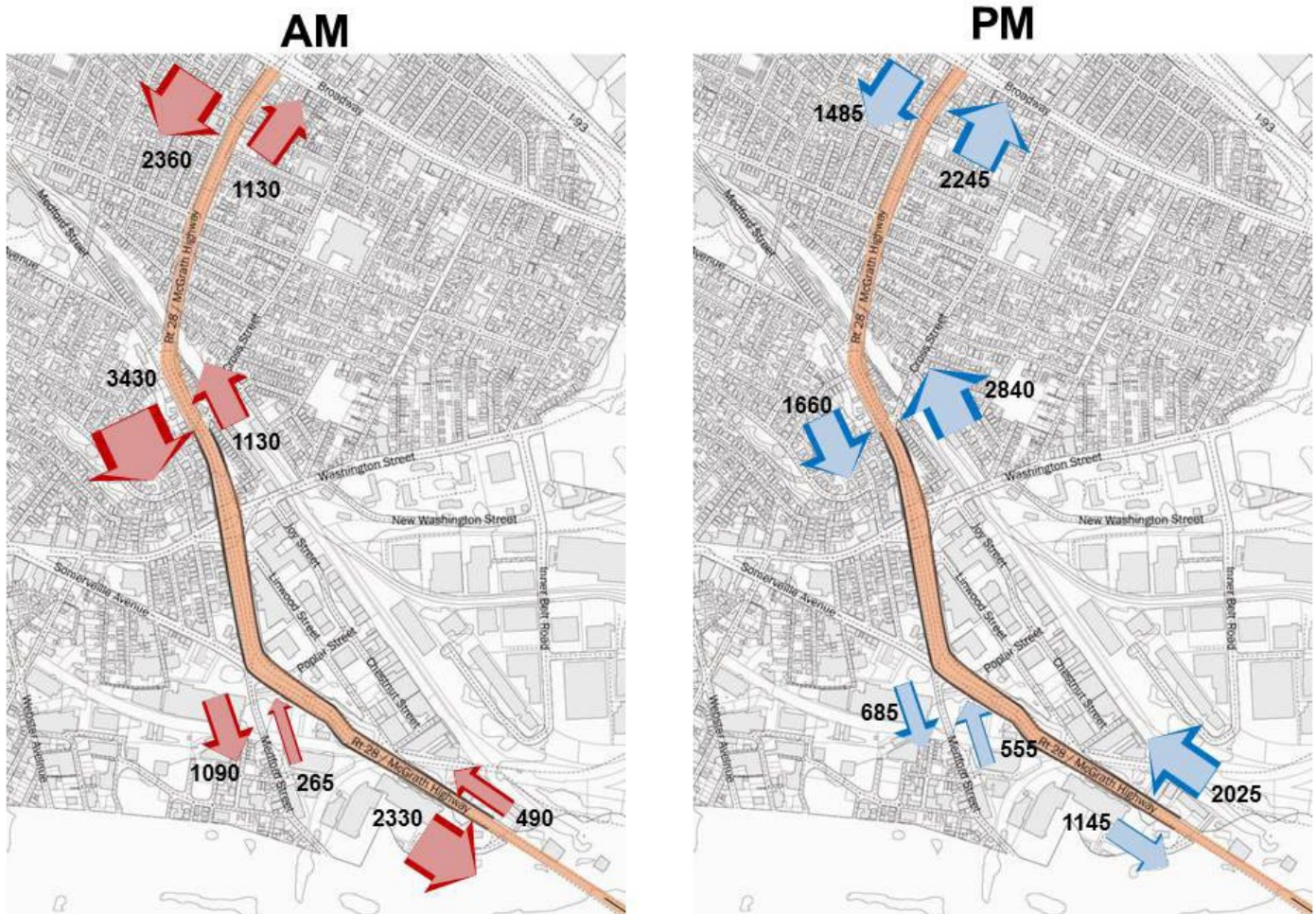


Figure 3-4: Projected Volumes for North/South Segments

volumes represent the 2035 No Build traffic volumes for the weekday morning and weekday afternoon peak hours.

Figure 3-4 and Figure 3-5 indicate the resulting change in vehicular volume by roadway segment. The lighter color arrows depict the 2011 volumes, while the darker arrows represent the projected 2035 No Build Volumes. The total volume for each segment is provided in bold text.

Figure 3-6 and Figure 3-7 compare the Level of Service (LOS) for the weekday morning and weekday afternoon peak periods for the base year 2011 and the 2035 No

Build. A summary table comparing the LOS and queue lengths for 2011 and 2035 No Build is provided in Appendix E.

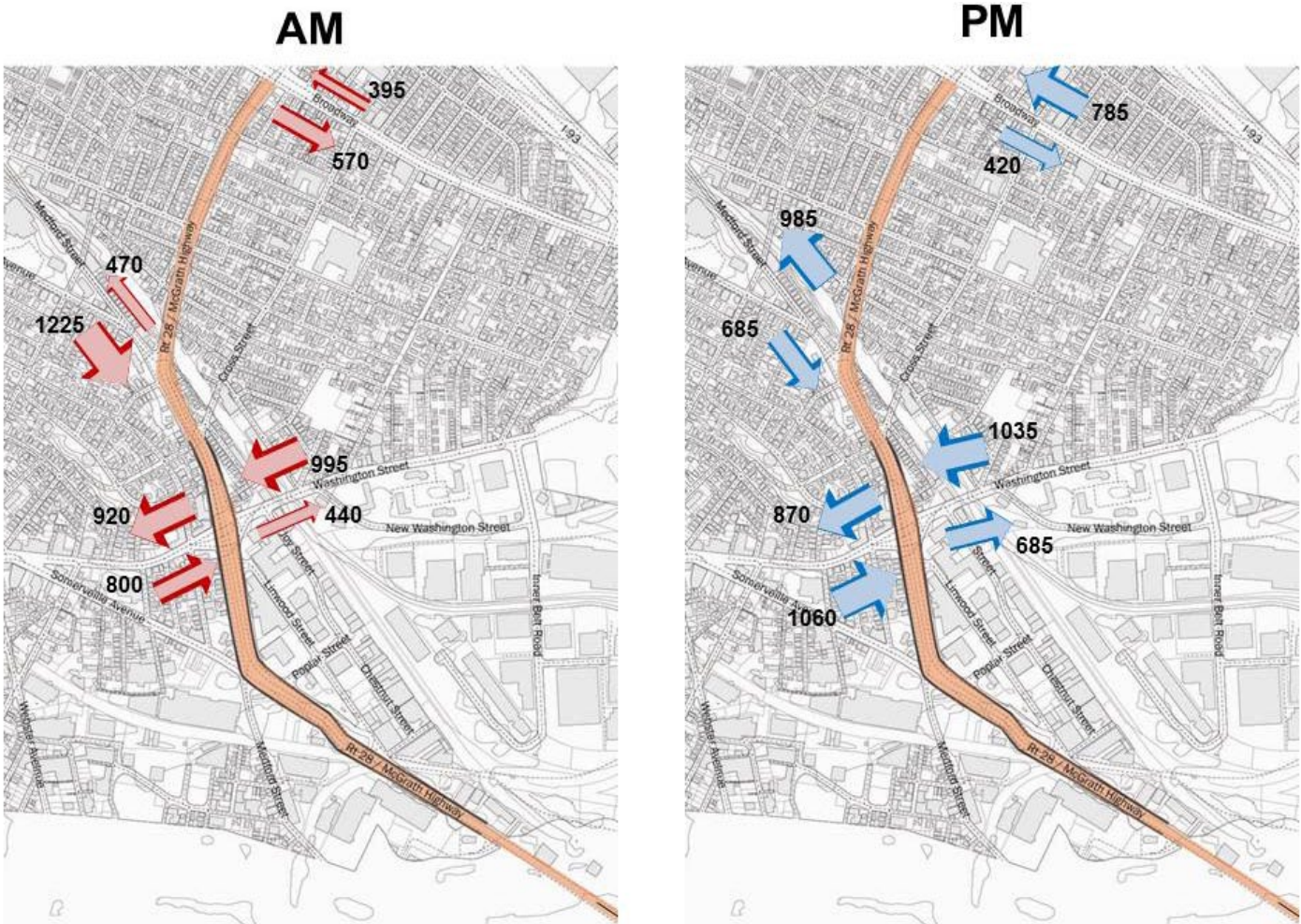
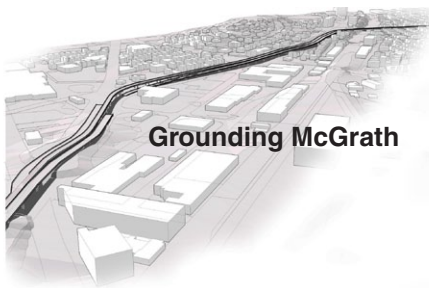


Figure 3-5: Projected Volumes for East/West Segments



Improvements in traffic operations from the 2011 base year to the 2035 No Build conditions are primarily due to assumed optimization of traffic signals in 2035. The slight improvements in the capacity analysis of the No Build scenario are generally a result of minor signal timing adjustments expected to be made in 2035. The changes to the signals are likely to be conducted as part of general signal maintenance and are expected to optimize traffic operations as traffic flows and volumes change over the years. In order to achieve these potential signal timing changes, the traffic signals within the No Build Synchro model were “optimized”. No specific modifications were made to signal phasing, equipment or coordination at individual intersections under the No Build conditions. It is also noted that the pedestrian signal improvements implemented by MassDOT in December 2011 for the Washington Street and Medford Street intersections with the McGrath corridor are included as part of the 2035 No Build condition.

Issues and Opportunities

As noted previously the No Build analysis establishes a future baseline against which to compare proposed alternatives presented in Chapters 4 and 5. Many of the issues and opportunities identified in Chapter 2 – Existing Conditions, also apply to the Future No Build condition. In addition to the existing conditions analysis, the following key issues and opportunities from the No Build informed the development of the alternatives:

- As noted in Figure 3-2, population and employment growth in the Inner Belt/Brickbottom area of Somerville is expected to more than double from 2009 to 2035. This growth is expected to have a significant impact on the trips projected to and from that area in the form of new transit, automobile, and non-motorized (bicycle and pedestrian) trips.
- The regional travel demand model assumes transit projects such as the Green Line Extension (GLX) and Assembly Square Orange Line Station are in place. As a result, there is projected to be an increase in transit mode share in the corridor for the future year of 2035 of approximately 5 percent in AM peak period, and about 3 percent increase of transit share in the PM peak period.
- Based on the outputs from the regional travel demand model, automobile trips along the McGrath corridor are expected to increase in the range of 7.5 percent to 12.5 percent between 2011 and 2035, depending on the area along the corridor.
- There are some improvements in level of service (LOS) for intersections in 2035 compared to existing conditions. This is primarily due to assumed optimization of traffic signals in 2035. Intersections with McGrath Highway projected to improve in overall LOS include:
 - » Broadway (PM peak)
 - » Cambridge Street/East Street (AM peak)
 - » Land Boulevard/Austin Street (AM and PM peak)
- Intersections with McGrath Highway projected to decrease in overall LOS include:
 - » Broadway (AM peak)
 - » Pearl Street (AM peak)
 - » Medford Street/Highland Avenue (PM peak)
 - » Somerville Avenue/Medford Street (PM peak)
 - » Cambridge Street/East Street (AM peak)
 - » Land Boulevard/Austin Street (AM and PM peak)
- Intersections with McGrath Highway projected to experience a worsening in overall LOS include:
 - » Broadway (AM peak)
 - » Pearl Street (AM peak)
 - » Medford Street/Highland Avenue (PM peak)
 - » Somerville Avenue/Medford Street (PM peak)

2035 No Build



2011 Existing

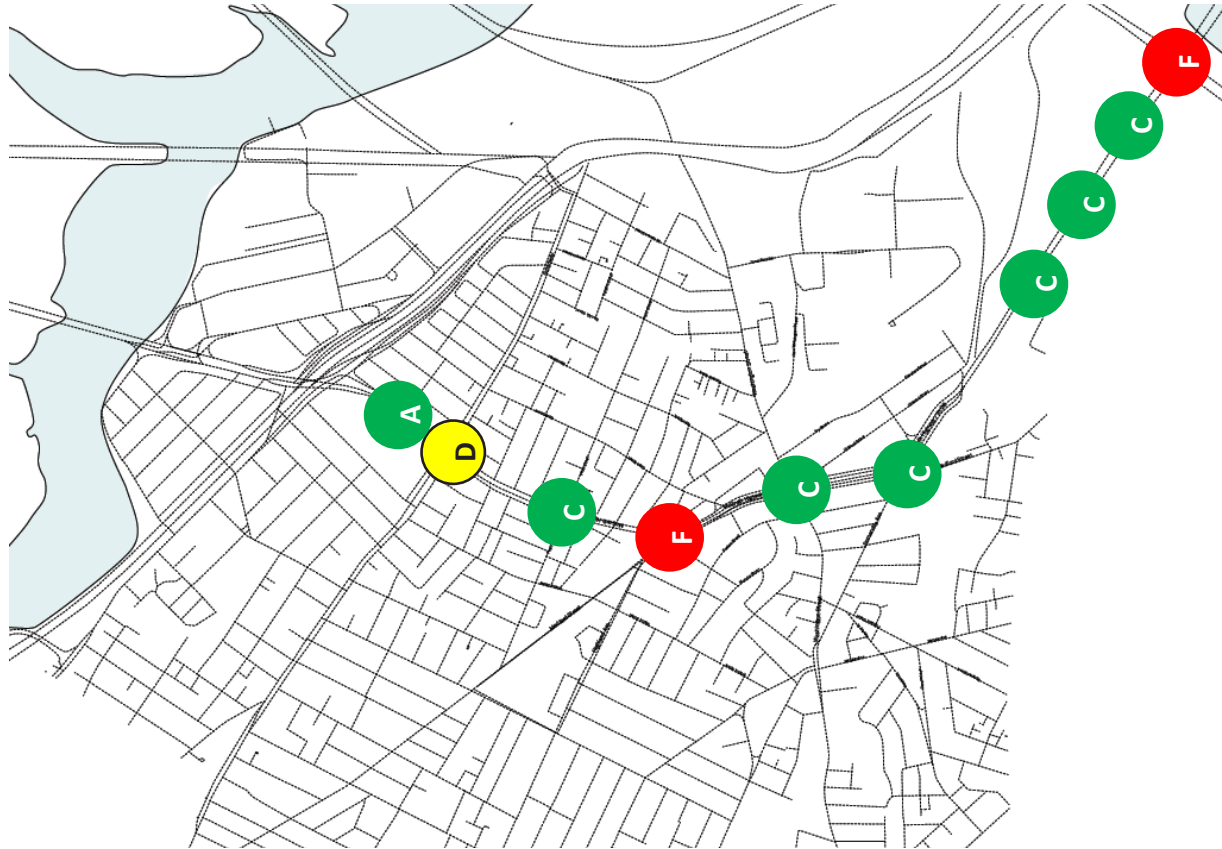
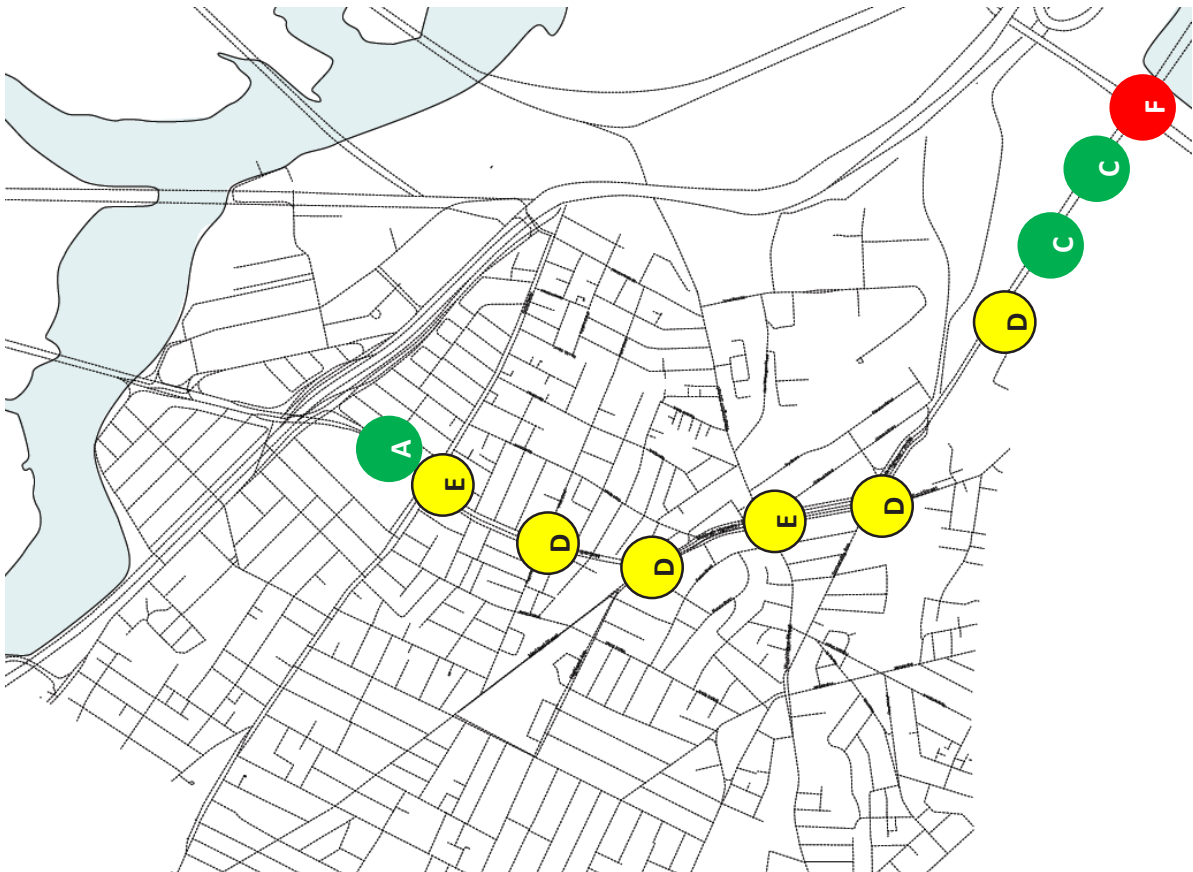


Figure 3-6: LOS 2011 and 2035 Weekday AM Peak

2011 Existing



2035 No Build

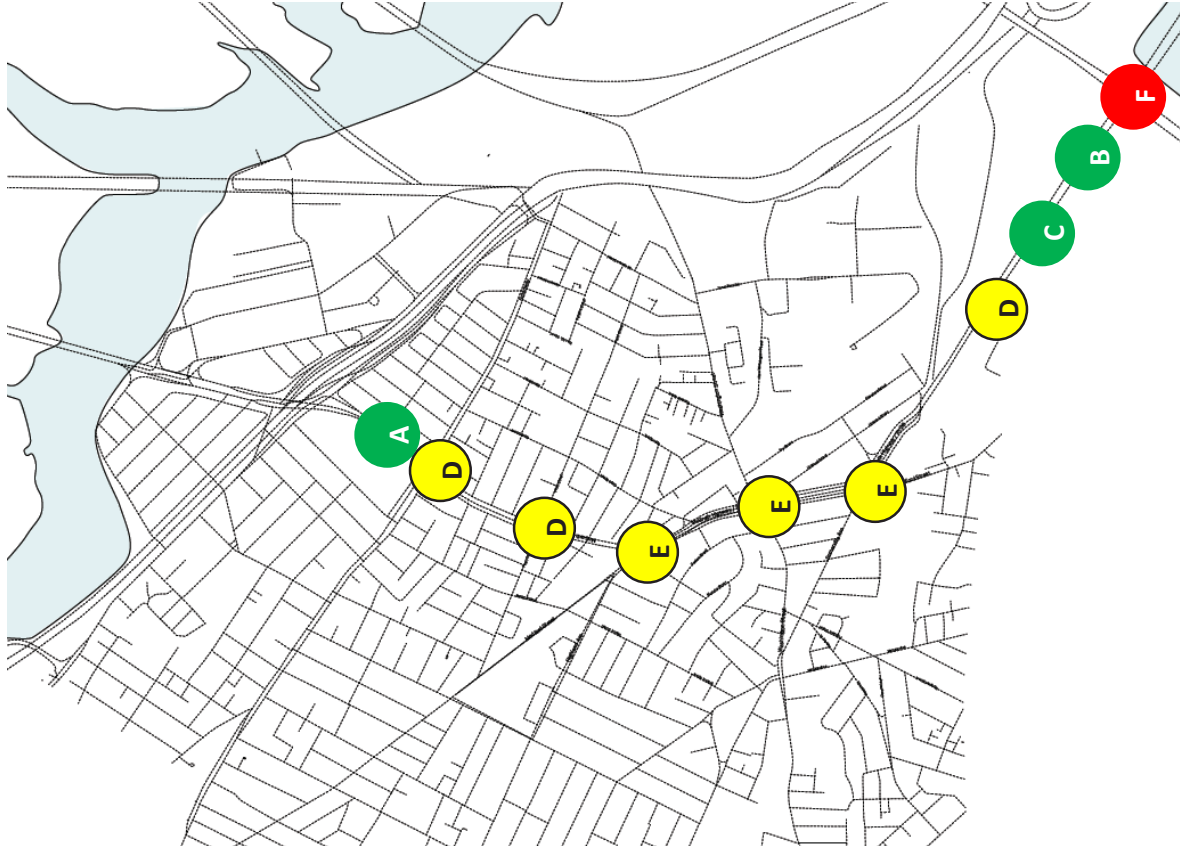


Figure 3-7: LOS 2011 and 2035 Weekday PM Peak

