

# APPENDIX G

## TRAFFIC IMPACT STUDY

# **TRAFFIC IMPACT STUDY**

***Town of Ballston, New York***

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## EXECUTIVE SUMMARY

The purpose of this study is to provide a comparison of the traffic impacts of two zoning scenarios, existing and proposed, under full build-out conditions. The analyses focus on the specific areas in the Town of Ballston where zoning changes are being considered. Potential infrastructure improvements to accommodate the estimated traffic volumes are described to give a sense of the magnitude of the infrastructure that would be required to accommodate the projected volumes.

Existing zoning in the Town includes retail, office, industrial and residential uses. The proposed zoning redefines zoning in three distinct areas of the Town, which would change the amount and type of development. These areas included a Mixed Use Center North, Two Mixed-Use Centers South, and a Transportation Corridor between them.

Levels-of-Service calculations were made under existing conditions for each movement at nine critical intersections. The analyses showed that one intersection exhibits unacceptable levels of delay (LOS F) in 2006. Peak hour traffic volumes with current zoning and with the proposed zoning were projected for Half Build-Out and Full Build-Out in the specified areas of the Town, and Levels-of-Service were calculated for the nine study intersections.

The total volume of trips generated was very similar for both zoning scenarios. With either the existing or the proposed zoning, peak hour traffic volumes will cause all nine study intersections to exhibit unacceptable Levels-of-Service under the Full Build-Out condition for 2016 PM. The 2011 Half Build-Out Levels-of-Service are projected to be unacceptable at eight intersections with the proposed zoning, as opposed to all nine with the existing zoning.

It is important to note that off-peak traffic volumes under the proposed zoning scenario should be significantly lower than the off-peak volumes under the existing zoning. Although this does not reduce overall infrastructure needs, it does affect the character of the area and the quality of life within the Town.

Potential improvements are identified for the intersections that are projected to fail in the future. At some locations new signalization may be sufficient to alleviate future congestion. In most locations, however, widened intersections or roundabouts would be necessary to accommodate the traffic volumes projected. Order of magnitude costs for these improvements and a discussion of potential funding are provided.

These potential improvements are based on an extremely conservative and very unlikely scenario of 100% build-out by 2016. The primary conclusion that should be drawn from this study is that adopting the proposed zoning will not significantly change peak hour traffic. This document is not intended to be, and should not be used as, a transportation plan for the Town of Ballston.

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## I. INTRODUCTION

The purpose of this study is to provide a comparison of the traffic impacts of two zoning scenarios, existing and proposed, under full build-out conditions. The analyses focus on the specific areas in the Town of Ballston where zoning changes are being considered. Potential infrastructure improvements to accommodate the estimated traffic volumes are described to give a sense of the magnitude of the infrastructure that would be required to accommodate the projected volumes.

Existing zoning in the Town includes retail, office, industrial and residential uses. The proposed zoning redefines zoning in three distinct areas of the Town, which would change the amount and type of development. These areas included a Mixed Use Center North around the intersection of State Routes (SR) 50 and 67; Two Mixed-Use Centers South at the intersections of Lake Hill Rd and SR 50 and SR 146A; and a Transportation Corridor between them along SR 50. The development areas specified in the Existing and Proposed Zoning are shown on *Figure 1*.

Both the existing and proposed zoning in the Town contain a mix of retail, office, industrial, and residential. Three distinct areas are outlined in the two zoning scenarios. Each area has a distinct character, which is reflected in each zoning scenario. Table 1-1, Existing and Proposed Zoning, shows the zoning in each of the areas with associated square footage and residential units for both zoning alternatives:

Table 1-1, Projected Square Footage under Full-Build-Out

| Alternative 1: Existing Zoning |                         |                |                       |                          |                  |             |           |                     |
|--------------------------------|-------------------------|----------------|-----------------------|--------------------------|------------------|-------------|-----------|---------------------|
| Area                           | Large Scale Retail (sf) | Lifestyle (sf) | Community Center (sf) | Neighborhood Center (sf) | Convenience (sf) | Office (sf) | Total SF  | Residential (units) |
| North Mixed Use Center         | 1,327,500               | ---            | ---                   | 470,000                  | 27,600           | ---         | 1,825,100 | ---                 |
| Business Highway               | 133,500                 | ---            | 1,168,125             | ---                      | 61,410           | ---         | 1,363,035 | 117                 |
| South Mixed Use Center         | 162,000                 | ---            | ---                   | 324,000                  | 41,400           | ---         | 527,400   | ---                 |
| Alternative 2: Proposed Zoning |                         |                |                       |                          |                  |             |           |                     |
| North Mixed Use Center         | ---                     | 500,000        | 318,000               | 350,000                  | 34,500           | 540,000     | 1,742,500 | 300                 |
| Business Highway               | ---                     | ---            | 459,375               | ---                      | 38,640           | ---         | 498,015   | 117                 |
| South Mixed Use Center         | ---                     | ---            | 462,000               | ---                      | 80,960           | ---         | 542,960   | ---                 |

As shown in Table 1-1, Projected Square Footage under Full-Build-Out, the land uses were separated into seven categories. Large Scale Retail allows big-box retail stores, outlet stores, and

strip malls. Lifestyle Centers include upscale national chains in a landscaped plaza. Community and Neighborhood Centers describe shopping centers targeted at the population center with supermarkets, restaurants and other small retail stores. Convenience describes gas stations and other service related businesses.

This study specifically analyzes the effects of the zoning scenarios on the traffic capacity and levels of service along State Route (SR) 50 and SR 67 in the Town of Ballston.

## **II. EXISTING CONDITIONS**

Adjacent land use in the vicinity of the project is commercial with some residential uses occurring along SR 50 and SR 67. The overall character of the area at this time is commercial.

### **A. Study Area Roadways**

SR 50 has one 12-foot through lane in each direction with 5 to 8-foot paved shoulders throughout the study area. SR 50 is classified as a rural principal arterial south of SR 67 and as an urban principal arterial north of SR 67. SR 50 extends in a north-south direction through Saratoga County. Along SR 50 the Right-of-Way (ROW) is typically 50- to 60-feet wide.

SR 67 has one 11-foot through lane in each direction with 2 to 3-foot paved shoulders throughout the study area. SR 67 is classified as an urban principal arterial east of SR 50 and as a rural minor arterial west of SR 50. SR 67 extends in an east-west direction through Saratoga County. Along SR 67 the Right-of-Way (ROW) is typically 50- to 60-feet wide.

SR 146A has one 12-foot through lane in each direction with 2 to 3-foot paved shoulders throughout the study area. SR 146A is classified as a rural major collector. SR 146A extends in an east-west direction from SR 50 to SR 146.

## **B. Study Area Intersections**

Traffic operations and Levels-of-Service were analyzed at nine intersections within the study area.

1. NYS Route 50\NYS Route 67\Ballston Avenue (V-Corners)
2. NYS Route 67\Brookline Road
3. NYS Route 67\Eastline Road
4. NYS Route 50\Brookline Road
5. NYS Route 50\NYS Route 146A
6. NYS Route 50\Forest Road
7. NYS Route 50\Lake Hill Road
8. NYS Route 50\Outlet Road\Charlton Road
9. NYS Route 50\Middleline Road

NYS Route 50\NYS Route 67\Ballston Road: This is a four-leg intersection operating under traffic signal control. The SR 50 NB and SR 50/67 SB approaches have a left-turn lane and a shared through/right-turn lane. The SR 67 WB and Ballston Avenue EB approaches have a single lane for shared travel movements.

NYS Route 67\Brookline Road: This is a three-leg intersection operating under stop sign control on the Brookline Road EB approach. Each approach has a single lane for shared travel movements.

NYS Route 67\Eastline Road: This is a four-leg intersection operating under traffic signal control. The SR 67 EB and WB approaches have a left-turn lane and a shared through/right-turn lane. The Eastline Road NB and SB approaches have a single lane for shared travel movements.

NYS Route 50\Brookline Road: This is a four-leg intersection operating under traffic signal control. Each approach has a single lane for shared travel movements.

NYS Route 50\NYS Route 146A: This is a three-leg intersection under stop sign control on the SR 146A WB approach. The SR 50 SB approach has a left-turn lane and a through lane. The SR 50 NB and SR 146A WB approaches have a single lane for shared travel movements.

NYS Route 50\Forest Road: This is a three-leg intersection operating under stop sign control on the Forest Road EB approach. Each approach has a single lane for shared travel movements.

NYS Route 50\Lake Hill Road: This is a four-leg intersection operating under traffic signal control. The SR 50 NB and SB approaches have a left-turn lane and a shared through/right-turn lane. The Lake Hill Road WB approach has a left-turn lane and shared through/right-turn lane. The Lake Hill Road EB approach has a single lane for shared travel movements.

NYS Route 50\Outlet Road\Charlton Road: This is a four-leg intersection operating under traffic signal control. Each approach has a single lane for shared travel movements.

NYS Route 50\Middleline Road: This is a three-leg intersection under stop sign control on the Middleline Road EB approach. The SR 50 NB approach has a left-turn lane and a through lane. The SR 50 SB and Middleline Road EB approaches have a single lane for shared travel movements.

The existing lane geometry at the study area intersections is shown on *Figure 2, Existing Lane Geometry*.

### **C. Existing Traffic**

Greenman-Pedersen, Inc. collected traffic volumes on SR 50 at five intersections on Tuesday February 28, 2006 during the AM and PM peak hours. The remaining intersection traffic

volumes were taken from the Route 67 Corridor Study<sup>1</sup>. The traffic volume data is included in Appendix A.

The AM peak hour was generally observed from 7:15 AM to 8:15 AM and the PM peak hour was generally observed from 4:45 PM to 5:45 PM. The existing traffic volumes are shown on *Figures 3 and 4*.

### **III. PROJECTED TRAFFIC**

#### **A. Generated Traffic**

The traffic generated by Half Build-Out and Full Build-Out of the three development areas being studied was calculated for both the existing zoning and the proposed zoning scenarios. For the purposes of this traffic study, it was assumed that these development areas within the Town would be 50% built by 2011 and 100% built-out by the 2016.

Based upon available data for the past decade, traffic volumes in the area have been increasing approximately 1.5 percent per year. CDTC currently predicts that traffic in this area will increase at a rate of 0.5% per year over the next decade. To account for this anticipated growth in traffic, the existing traffic volumes were increased by a factor of 0.5 percent per year to determine the project background volumes. This increase represents the growth in traffic generated by residential and industrial areas outside of the three development areas.

Based on information from the *ITE Trip Generation Manual, 6<sup>th</sup> edition*, the vehicle trips generated within the three development areas were calculated for the AM and PM peak hours for the existing and the proposed zoning. An average trip rate was calculated for each land use based upon comparisons with the rates for similar land uses. The trip generation rates can be seen in Table 3-1, Trip Generation Rates, for each of the land use categories within the Town Zoning Plans. The trip generation rates are given in trips per thousand square-feet (T/KSF) for the AM

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<sup>1</sup> Buckhurst Fish & Jacquemart, Inc. *Route 67 Corridor Study*. January 2006

and PM peak hours, except for the Residential land use which is in terms of trips per housing unit.

Table 3-1, Trip Generation Rates

| Land Use            | Trip Generation Rate (T/KSF) |       |
|---------------------|------------------------------|-------|
|                     | AM                           | PM    |
| Large Scale Retail  | 1.45                         | 3.48  |
| Lifestyle Center    | 1.45                         | 3.48  |
| Community Center    | 1.76                         | 6.5   |
| Neighborhood Center | 1.01                         | 3.99  |
| Convenience         | 55.49                        | 57.17 |
| Office              | 1.74                         | 1.5   |
| Residential         | 0.75                         | 1.01  |

The majority of the generated trips are considered New Trips however, a portion are Pass-By Trips and must be subtracted from the Generated Trips. Pass-By Trips are vehicles that are already traveling on the roadway, but will now use the adjacent developments and then continue to their original destination. The *ITE Trip Generation Manual* states that Large Scale Retail, Lifestyle Center, Community Center, and Neighborhood Center land uses have a pass-by rate of 25%, which means that 25% of the generated traffic is already on the roadways. The Convenience land use has a pass-by rate of 55%. There is no pass-by rate for Residential and Office land uses.

The total trip generation for the Town of Ballston is shown in Table 3-2, 2011 Half Build-Out Generated Trips, and Table 3-3, 2016 Full Build-Out Generated Trips. New Trips are then divided into Entering and Exiting Trips according to proportions taken from the *ITE Trip Generation Manual*.

Table 3-2, 2011 Half-Build Generated Trips

| Alternative 1: Existing Zoning |                 |               |           |       |       |
|--------------------------------|-----------------|---------------|-----------|-------|-------|
|                                | Generated Trips | Pass-By Trips | New Trips | Enter | Exit  |
| AM Peak Hour                   | 6,268           | 2,641         | 3,627     | 1,987 | 1,640 |
| PM Peak Hour                   | 11,990          | 4,103         | 7,887     | 3,911 | 3,976 |
| Alternative 2: Proposed Zoning |                 |               |           |       |       |
|                                | Generated Trips | Pass-By Trips | New Trips | Enter | Exit  |
| AM Peak Hour                   | 6,559           | 2,766         | 3,793     | 2,181 | 1,612 |
| PM Peak Hour                   | 10,715          | 3,848         | 6,867     | 3,306 | 3,561 |

Table 3-3, 2016 Full-Build Generated Trips

| Alternative 1: Existing Zoning |                 |               |           |       |       |
|--------------------------------|-----------------|---------------|-----------|-------|-------|
|                                | Generated Trips | Pass-By Trips | New Trips | Enter | Exit  |
| AM Peak Hour                   | 12,537          | 5,284         | 7,253     | 3,971 | 3,282 |
| PM Peak Hour                   | 23,984          | 8,203         | 15,781    | 7,824 | 7,957 |
| Alternative 2: Proposed Zoning |                 |               |           |       |       |
|                                | Generated Trips | Pass-By Trips | New Trips | Enter | Exit  |
| AM Peak Hour                   | 13,116          | 5,531         | 7,585     | 4,361 | 3,224 |
| PM Peak Hour                   | 21,428          | 7,693         | 13,735    | 6,610 | 7,125 |

The existing and proposed zoning plans express different approaches to traffic operations within the Town of Ballston. Currently the Existing Zoning allows large retail stores and shopping centers to be built. These developments typically have individual parking lots in front of and surrounding the building with little to no cross traffic between neighboring establishments. Trip generation for these large developments also includes traffic for off-peak hours, which is not considered in this study. The proposed zoning is designed to allow for smaller scale retail and offices to better fit into the residential area. These smaller scale retail developments typically have a centralized parking area in the rear to allow people to walk directly to landscaped storefronts, either along a main street or within a town square. Trip generation for offices and residential land uses, as in the Proposed Zoning, are typically contained within the peak hours of the roadways with very little traffic occurring during the off-peak hours, unlike the larger retail developments, in the Existing Zoning, which experience traffic throughout the day. Therefore, although the peak hour traffic volumes will be similar under either zoning scenario, it is expected that off-peak traffic volumes will be significantly lower under the proposed zoning scenario.

**B. Traffic Distribution**

The generated traffic volumes for each area were distributed to study area intersections based upon location and current traffic patterns. The projected trip distributions are shown on *Figures 5, 6, and 7 for the North Mixed Use Center, Business Highway, and South Mixed Use Center, respectively.*

The Trip Assignments for the AM and PM generated traffic volumes for the 2011 Half Build-Out condition are shown on *Figures 8 and 9 for the Existing Zoning, and Figures 12 and 13 for the*

*Proposed Zoning.* The Trip Assignments for the 2016 Full Build-Out condition are shown on *Figures 16 and 17 for the Existing Zoning, and Figures 20 and 21 for the Proposed Zoning.*

The AM and PM traffic volumes generated by the development areas under the two zoning alternatives were added to the projected background volumes to give the Build conditions. The total volumes projected under the 2011 Half Build-Out condition are shown on *Figures 10 and 11 for the Existing Zoning, and Figures 14 and 15 for the Proposed Zoning.* Total volumes for the 2016 Full Build-Out condition are shown on *Figures 18 and 19 for the Existing Zoning, and Figures 22 and 23 for the Proposed Zoning.*

### C. Level Of Service Analysis

The AM and PM peak hours are deemed the critical peak periods due to the higher volumes of traffic experienced within the Town of Ballston. The impact of the Existing and Proposed Zoning upon adjoining roadways has been analyzed for the AM and PM peak hours. The existing volumes were increased by a factor of 0.5 percent per year to determine the project background volumes. The traffic volumes generated by the two zoning alternatives in the Town of Ballston were added to the projected background volumes to give us the build conditions. The levels of service for the intersections were then assessed for the 2011 and 2016 Build Conditions using intersection capacity analysis. All procedures used for the analysis described herein are in conformance with the *Highway Capacity Manual.*

A description of the various levels of service for Signalized and Unsignalized intersections is given below:

The level of service (LOS) for a Signalized intersection is defined in terms of average control delay per vehicle. Delay is dependent on a number of variables including the quality of signal progression, cycle length, green ratio and volume/capacity ratio for the lane group or approach. Levels of service can be calculated for each movement or approach and for the total intersection

as a weighted average of all movements. LOS criteria for a signalized intersection are given as follows:

Level-of-Service Criteria for Signalized Intersections

| Level of Service | Delay Range (sec/veh) |
|------------------|-----------------------|
| A                | ≤ 10                  |
| B                | > 10 and ≤ 20         |
| C                | > 20 and ≤ 35         |
| D                | > 35 and ≤ 55         |
| E                | > 55 and ≤ 80         |
| F                | > 80                  |

The LOS for an unsignalized intersection is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. Delay is referred to driver discomfort, frustration, and fuel consumption and lost travel time. LOS criteria for an unsignalized intersection are given as follows:

Level-of-Service Criteria for Unsignalized Intersections

| Level of Service | Delay Range (sec/veh) |
|------------------|-----------------------|
| A                | ≤ 10                  |
| B                | > 10 and ≤ 15         |
| C                | > 15 and ≤ 25         |
| D                | > 25 and ≤ 35         |
| E                | > 35 and ≤ 50         |
| F                | > 50                  |

Tables 4-1 and 4-2 summarize the results of the level of service analysis for the AM and PM peak hours for both design years on the existing roadway network.

**Table 4-1, Level of Service Analysis AM Peak Hour  
Using Existing Roadway Network**

| Intersection                   | Control | 2006 Existing | Existing Zoning 2011<br>50% Build | Proposed Zoning 2011<br>50% Build | Existing Zoning 2016<br>100% Build | Proposed Zoning 2016<br>100% Build |
|--------------------------------|---------|---------------|-----------------------------------|-----------------------------------|------------------------------------|------------------------------------|
| Route 50/Route 67/Ballston Ave | S       |               |                                   |                                   |                                    |                                    |
| Route 67 NB                    |         | C             | D                                 | E                                 | F                                  | F                                  |
| Ballston Ave SB                |         | B             | D                                 | F                                 | F                                  | F                                  |
| Route 50 NEB                   |         | B             | C                                 | E                                 | C                                  | F                                  |
| Route 50/Route 67 SWB          |         | B             | C                                 | F                                 | F                                  | F                                  |
| Overall                        |         | B             | D                                 | E                                 | F                                  | F                                  |
| Route 67/Brookline Rd          | U       |               |                                   |                                   |                                    |                                    |
| Brookline Rd EB                |         | D             | F                                 | F                                 | F                                  | F                                  |
| Route 67 NB                    |         | A             | A                                 | A                                 | B                                  | C                                  |
| Route 67/Eastline Rd           | S       |               |                                   |                                   |                                    |                                    |
| Route 67 EB                    |         | D             | E                                 | F                                 | F                                  | F                                  |
| Route 67 WB                    |         | B             | C                                 | C                                 | D                                  | E                                  |
| Eastline Rd NB                 |         | E             | F                                 | F                                 | F                                  | F                                  |
| Eastline Rd SB                 |         | E             | F                                 | F                                 | E                                  | E                                  |
| Overall                        |         | D             | E                                 | E                                 | F                                  | F                                  |
| Route 50/Brookline Rd          | S       |               |                                   |                                   |                                    |                                    |
| Brookline Rd EB                |         | B             | B                                 | C                                 | E                                  | F                                  |
| Brookline Rd WB                |         | B             | D                                 | D                                 | F                                  | F                                  |
| Route 50 NB                    |         | A             | C                                 | D                                 | F                                  | F                                  |
| Route 50 SB                    |         | A             | C                                 | C                                 | F                                  | F                                  |
| Overall                        |         | B             | C                                 | C                                 | F                                  | F                                  |
| Route 50/Route 146A            | U       |               |                                   |                                   |                                    |                                    |
| Route 50 SB                    |         | A             | B                                 | B                                 | B                                  | C                                  |
| Route 146A WB                  |         | B             | D                                 | E                                 | F                                  | F                                  |
| Route 50/Forest Rd             | U       |               |                                   |                                   |                                    |                                    |
| Forest Rd EB                   |         | F             | F                                 | F                                 | F                                  | F                                  |
| Route 50 NB                    |         | A             | A                                 | A                                 | A                                  | A                                  |
| Route 50/Lake Hill Rd          | S       |               |                                   |                                   |                                    |                                    |
| Lake Hill Rd EB                |         | E             | F                                 | F                                 | F                                  | F                                  |
| Lake Hill Rd WB                |         | C             | E                                 | F                                 | F                                  | F                                  |
| Route 50 NB                    |         | B             | D                                 | E                                 | D                                  | F                                  |
| Route 50 SB                    |         | E             | F                                 | F                                 | F                                  | F                                  |
| Overall                        |         | D             | F                                 | F                                 | F                                  | F                                  |
| Route 50/Charlton Rd/Outlet Rd | S       |               |                                   |                                   |                                    |                                    |
| Charlton Rd EB                 |         | B             | B                                 | C                                 | C                                  | C                                  |
| Outlet Rd WB                   |         | B             | C                                 | C                                 | D                                  | D                                  |
| Route 50 NB                    |         | A             | A                                 | A                                 | A                                  | B                                  |
| Route 50 SB                    |         | A             | A                                 | A                                 | A                                  | B                                  |
| Overall                        |         | A             | A                                 | A                                 | B                                  | B                                  |
| Route 50/Middleline Rd         | U       |               |                                   |                                   |                                    |                                    |
| Route 50 NB                    |         | A             | B                                 | B                                 | B                                  | C                                  |
| Middleline Rd EB               |         | C             | F                                 | F                                 | F                                  | F                                  |

U = Unsignalized, S = Signalized  
 NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NEB = Northeastbound, SWB = Southwestbound

**Table 4-2, Level of Service Analysis PM Peak Hour  
Using Existing Roadway Network**

| Intersection                   | Control | 2006 Existing | Existing Zoning 2011 50% Build | Proposed Zoning 2011 50% Build | Existing Zoning 2016 100% Build | Proposed Zoning 2016 100% Build |
|--------------------------------|---------|---------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|
| Route 50/Route 67/Ballston Ave | S       |               |                                |                                |                                 |                                 |
| Route 67 NB                    |         | F             | F                              | F                              | F                               | F                               |
| Ballston Ave SB                |         | B             | F                              | F                              | F                               | F                               |
| Route 50 NEB                   |         | C             | F                              | F                              | F                               | F                               |
| Route 50/Route 67 SWB          |         | B             | F                              | F                              | F                               | F                               |
| <b>Overall</b>                 |         | D             | F                              | F                              | F                               | F                               |
| Route 67/Brookline Rd          | U       |               |                                |                                |                                 |                                 |
| Brookline Rd EB                |         | C             | F                              | F                              | F                               | F                               |
| Route 67 NB                    |         | A             | F                              | F                              | F                               | F                               |
| Route 67/Eastline Rd           | S       |               |                                |                                |                                 |                                 |
| Route 67 EB                    |         | E             | F                              | F                              | F                               | F                               |
| Route 67 WB                    |         | C             | F                              | F                              | F                               | F                               |
| Eastline Rd NB                 |         | D             | F                              | F                              | F                               | F                               |
| Eastline Rd SB                 |         | C             | B                              | D                              | D                               | D                               |
| <b>Overall</b>                 |         | D             | F                              | F                              | F                               | F                               |
| Route 50/Brookline Rd          | S       |               |                                |                                |                                 |                                 |
| Brookline Rd EB                |         | B             | C                              | E                              | F                               | F                               |
| Brookline Rd WB                |         | B             | F                              | F                              | F                               | F                               |
| Route 50 NB                    |         | B             | F                              | F                              | F                               | F                               |
| Route 50 SB                    |         | A             | F                              | E                              | F                               | F                               |
| <b>Overall</b>                 |         | B             | F                              | F                              | F                               | F                               |
| Route 50/Route 146A            | U       |               |                                |                                |                                 |                                 |
| Route 50 SB                    |         | A             | C                              | B                              | F                               | F                               |
| Route 146A WB                  |         | C             | F                              | F                              | F                               | F                               |
| Route 50/Forest Rd             | U       |               |                                |                                |                                 |                                 |
| Forest Rd EB                   |         | C             | F                              | F                              | F                               | F                               |
| Route 50 NB                    |         | A             | A                              | A                              | F                               | F                               |
| Route 50/Lake Hill Rd          | S       |               |                                |                                |                                 |                                 |
| Lake Hill Rd EB                |         | D             | F                              | F                              | F                               | F                               |
| Lake Hill Rd WB                |         | B             | C                              | F                              | F                               | F                               |
| Route 50 NB                    |         | B             | F                              | F                              | F                               | F                               |
| Route 50 SB                    |         | C             | F                              | F                              | F                               | F                               |
| <b>Overall</b>                 |         | C             | F                              | F                              | F                               | F                               |
| Route 50/Charlton Rd/Outlet Rd | S       |               |                                |                                |                                 |                                 |
| Charlton Rd EB                 |         | B             | C                              | C                              | C                               | D                               |
| Outlet Rd WB                   |         | B             | F                              | D                              | F                               | F                               |
| Route 50 NB                    |         | A             | C                              | B                              | F                               | F                               |
| Route 50 SB                    |         | A             | A                              | B                              | F                               | D                               |
| <b>Overall</b>                 |         | A             | C                              | B                              | F                               | F                               |
| Route 50/Middleline Rd         | U       |               |                                |                                |                                 |                                 |
| Route 50 NB                    |         | A             | D                              | C                              | F                               | F                               |
| Middleline Rd EB               |         | B             | F                              | F                              | F                               | F                               |

U = Unsignalized, S = Signalized  
 NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NEB = Northeastbound, SWB = Southwestbound

Table 4-1 shows Levels-of-Service during the AM peak hour for all movements and for intersections overall. In 2006 only one intersection shows a movement performing at LOS F in the AM peak hour - Forest Rd eastbound at SR 50. Two other movements, at SR 67 and Eastline

Rd and SR 50 and Lake Hill Rd are rated as E. LOS E indicates poor levels of performance, but not as severe as LOS F.

With Half Build-Out in 2011 under the current zoning, AM peak hour movements are projected to be LOS F at four additional intersections, with SR 50 and Lake Hill Rd operating at LOS F overall. With proposed zoning AM peak hour movements are better for SR 50 westbound at SR 146A but equal or worse at most other intersections. In 2016 with Full Build-Out LOS F is projected for nearly all movements at all intersections in the AM peak hour, with the exception of SR 50 and Outlet Rd.

Table 4-2 shows similar data for the PM peak hour. No intersections or intersection movements are currently operating at LOS F. In 2011 and in 2016, all intersections, with the exception of SR 50 and Outlet Rd, are projected to operate at LOS F overall and/or for several movements, with either the existing or proposed zoning.

#### **IV. IMPROVEMENTS TO ALLEVIATE PROJECTED TRAFFIC**

To alleviate projected congestion, potential improvements at the nine intersections and connecting roadway segments were developed. The intersections can be improved sufficiently with additional through and turning lanes and new or upgraded signals, or by constructing roundabouts. Three of these intersections were also proposed as roundabouts in the Route 67 Corridor Study to accommodate pending development.

This study analyzes the existing roadway system and traffic projected for the Town for 2011 and 2016. Unlike the Route 67 Corridor Study, this study does not review specific development projects currently proposed in the Town nor deal with their access requirements. In the Route 67 Corridor Study several roundabouts were proposed along SR 50 and SR 67. These roundabouts were designed to provide access to specific parcels based on specific development proposals, which include the proposed Wal-Mart, Widewaters Shopping Center, crossroad between SR 50

and SR 67 adjacent to Widewaters, and the parallel access road beginning at the intersection of Brookline Rd on SR 67.

### A. Potential Improvements

The existing lane geometry and traffic control at most of the study area intersections adequately serve the current traffic volumes during the AM and PM peak hours. The PM peak hour is the more critical period with higher volumes and delays and will be the focus of the rest of this section. Furthermore, it has been shown that during the peak hour there is very little difference in traffic operations between the two zoning scenarios. Therefore, the improvements discussed in this section are applicable to both zoning scenarios.

During the 2011 Half Build-Out condition every intersection has a LOS F rating, with the exception of the SR 50 and Outlet Rd intersection. Table 5-1, Potential Improvements for 2011 and 2016 Build conditions, outlines the potential improvements at each intersection during the two different design years. The potential lane geometry is shown on *Figure 24 for the 2011 Half Build-Out Condition and Figure 25 for the 2016 Full Build-Out Condition*. In all cases two alternatives are shown, a roundabout or a traffic signal. These are potential improvements, not designs, and other alternatives should be considered as well. A decision on which type of traffic control is preferred at each intersection should be made after detailed studies are conducted on a site-specific basis, taking into account the surrounding topography, land use, environmental constraints, available funding, and other factors.

As shown in Table 5-1, improved traffic control is required at all study area intersections to accommodate the projected volumes.

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Table 5-1, Potential Improvements for 2011 and 2016 Build Conditions

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| Intersection                                  | 2011 Half Build-Out Condition:<br>Potential Improvements  | 2016 Full Build-Out Condition:<br>Potential Improvements  |
|---|---|---|
| Route 50/Route 67/Ballston Ave<br>(V-Corners) | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                  | New Traffic Signal. Additional through and turning lane on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                   |
| Route 67/Brookline Rd                         | Install a Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with a right turn bypass lanes on the Rt 67 SB approaches. | Same as 2011 Build Condition<br><br>OR<br><br>Install a Two-lane Roundabout with a right turn bypass lanes on the Rt 67 SB approaches.  |
| Route 67/Eastline Rd                          | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                  | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                  |
| Route 50/Brookline Rd                         | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.         | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.         |
| Route 50/Route 146A                           | Install a Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.   | Install a Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.   |
| Route 50/Forest Rd                            | Install a Traffic Signal. Additional through lanes on SR 50 NB.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.                     | Install a Traffic Signal. Additional through and turning lanes on SR 50 approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches. |
| Route 50/Lake Hill Rd                         | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                  | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on all approaches.                  |
| Route 50/Charlton Rd/Outlet Rd                | New Traffic Signal. Additional through and turning lanes on all approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.         | Same as 2011 Build Condition  |
| Route 50/Middleline Rd                        | Install a Traffic Signal.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches.   | Install a Traffic Signal. Additional through and turning lanes on SR 50 approaches.<br><br>OR<br><br>Install a Two-lane Roundabout with right turn bypass lanes on the Route 50 approaches. |

Tables 5-2 and 5-3 show the projected Levels-of-Service with the potential improvements.

Table 5-2, LOS Analysis AM Peak Hour With Improvements

| Intersection                   | Control | Existing Zoning 2011<br>50% Build<br>w/Imp | Proposed Zoning 2011<br>50% Build<br>w/Imp | Existing Zoning 2016<br>100% Build<br>w/Imp | Proposed Zoning 2016<br>100% Build<br>w/Imp |
|--------------------------------|---------|--|--|---|---|
| Route 50/Route 67/Ballston Ave | Sig     |  |  |   |   |
| Overall                        |         | A  | B  | C   | C   |
| Route 50/Route 67/Ballston Ave | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 67/Brookline Rd          | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | C   | C   |
| Route 67/Brookline Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 67/Eastline Rd           | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | C   | C   |
| Route 67/Eastline Rd           | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Brookline Rd          | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | C   | C   |
| Route 50/Brookline Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Route 146A            | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | A   | A   |
| Route 50/Route 146A            | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Forest Rd             | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | C   | B   |
| Route 50/Forest Rd             | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Lake Hill Rd          | Sig     |  |  |   |   |
| Overall                        |         | C  | C  | C   | D   |
| Route 50/Lake Hill Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Charlton Rd/Outlet Rd | S       |  |  |   |   |
| Overall                        |         | A  | A  | B   | B   |
| Route 50/Charlton Rd/Outlet Rd | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Middleline Rd         | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | B   | B   |
| Route 50/Middleline Rd         | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |

Sig = Signalized, RA = Roundabout

NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NEB = Northeastbound, SWB = Southwestbound

Table 5-3, LOS Analysis PM Peak Hour With Improvements

| Intersection                   | Control | Existing Zoning 2011<br>50% Build<br>w/Imp | Proposed Zoning 2011<br>50% Build<br>w/Imp | Existing Zoning 2016<br>100% Build<br>w/Imp | Proposed Zoning 2016<br>100% Build<br>w/Imp |
|--------------------------------|---------|--|--|---|---|
| Route 50/Route 67/Ballston Ave | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | B   | D   |
| Route 50/Route 67/Ballston Ave | RA      |  |  |   |   |
| Overall                        |         | A  | A  | C   | A   |
| Route 67/Brookline Rd          | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | B   | B   |
| Route 67/Brookline Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 67/Eastline Rd           | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | B   | C   |
| Route 67/Eastline Rd           | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Brookline Rd          | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | B   | C   |
| Route 50/Brookline Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | B   | A   |
| Route 50/Route 146A            | Sig     |  |  |   |   |
| Overall                        |         | B  | A  | C   | B   |
| Route 50/Route 146A            |         |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Forest Rd             | Sig     |  |  |   |   |
| Overall                        |         | C  | B  | C   | C   |
| Route 50/Forest Rd             | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Lake Hill Rd          | Sig     |  |  |   |   |
| Overall                        |         | C  | C  | C   | D   |
| Route 50/Lake Hill Rd          | RA      |  |  |   |   |
| Overall                        |         | A  | A  | B   | B   |
| Route 50/Charlton Rd/Outlet Rd | Sig     |  |  |   |   |
| Overall                        |         | A  | A  | B   | B   |
| Route 50/Charlton Rd/Outlet Rd | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |
| Route 50/Middleline Rd         | Sig     |  |  |   |   |
| Overall                        |         | B  | B  | A   | B   |
| Route 50/Middleline Rd         | RA      |  |  |   |   |
| Overall                        |         | A  | A  | A   | A   |

Sig = Signalized, RA = Roundabout  
 NB = Northbound, SB = Southbound, EB = Eastbound, WB = Westbound, NEB = Northeastbound, SWB = Southwestbound

As can be seen in the level of service analysis the potential traffic signal improvements for the 2011 Build Condition will be inadequate for the 2016 Build Condition at most intersections. The exceptions are the intersections of SR 67 and Brookline Rd, and SR 50 and Outlet Rd, which have the same recommendations for both design years. All intersections will operate at acceptable levels-of-service as roundabouts.

The intersection of SR 67 and the Curtis Lumber driveway was also studied in the Route 67 Corridor Study<sup>3</sup>. Three options were outlined in the study to determine the best possible traffic

mitigation. These options included: (a) the construction of an overpass and connecting ramps to SR 67; (b) widening the roadway, to provide 2 through lanes in each direction and a left-turn lane, and installing a traffic signal; and (c) making the Curtis Lumber facility accessible by right in/right out driveways and relying on roundabouts at Brookline Rd and Eastline Rd to provide vehicles the opportunity to turnaround. It was also suggested that along with whichever option is chosen Curtis Lumber connect the existing access points and form an internal roadway to extend to Eastline Road. Due to the low volume of traffic entering and exiting Curtis Lumber during the peak hours the access on Eastline Rd will have minor effects to the operation of the SR 67 and Eastline Rd intersection, therefore no adjustment was made to the volumes on Eastline Rd. Our overview of the Route 67 Corridor Study found that both (b) and (c) are viable solutions. The widening of SR 67 is already listed as a potential improvement, which is consistent with the improvements needed for (b).

#### **B. Improvement Costs**

Detailed designs and information on site characteristics - right of way, utilities, property values, environmental constraints, will be necessary before decisions on specific improvement projects are made for each intersection and roadway. Order-of-magnitude costs for the potential improvements are shown in Tables 5-4 and 5-5 for the Half Build and Full Build. Estimates are determined at each intersection and segment within the study area, and represent current year (2006) dollars.

Table 5-4, 2011 Half Build-Out Cost Estimate

**Intersection Improvements**

| Intersection                           | Item                          | Length (ft) | Construction Cost  |
|--|-------------------------------|-------------|--------------------|
| Route 50\Route 67\Ballston Ave         | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 4,000       | \$800,000          |
| Route 67\Brookline Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 6,000       | \$1,200,000        |
| Route 67\Eastline Rd                   | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 1,000       | \$200,000          |
| Route 50\Brookline Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 5,000       | \$1,000,000        |
| <b>North Mixed Use Center Subtotal</b> |                               |             | <b>\$3,800,000</b> |
| Route 50\Outlet Rd (*)                 | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 1,000       | \$200,000          |
| Route 50\Middleline Rd                 | Traffic Signal or Roundabout* | NA          | \$150,000          |
| Route 50\Route 146A                    | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 2,000       | \$400,000          |
| Route 50\Forest Rd                     | Traffic Signal or Roundabout* | NA          | \$150,000          |
| <b>Business Highway Subtotal</b>       |                               |             | <b>\$1,200,000</b> |
| Route 50\Lake Hill Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 6,000       | \$1,200,000        |
| <b>South Mixed Use Center Subtotal</b> |                               |             | <b>\$1,350,000</b> |

**Segment Improvements**

| Route                                  | Segment            | Roadway Improvement Length (ft) | Construction Cost   |
|--|--------------------|---------------------------------|---------------------|
| Route 50                               | From: Route 67     | 6,300                           | \$5,000,000         |
|  | To: Brookline Rd   |                                 |                     |
| Route 67                               | From: Route 50     | 13,000                          | \$10,400,000        |
|  | To: Eastline Rd    |                                 |                     |
| <b>North Mixed Use Center Subtotal</b> |                    |                                 | <b>\$15,400,000</b> |
| Route 50                               | From: Brookline Rd | 9,000                           | \$7,200,000         |
|  | To: Outlet Rd      |                                 |                     |
| <b>Business Highway Subtotal</b>       |                    |                                 | <b>\$7,200,000</b>  |

|  |                     |
|--|---------------------|
| <b>North Mixed Use Center Subtotal</b> | <b>\$19,200,000</b> |
| <b>Business Highway Subtotal</b>       | <b>\$8,400,000</b>  |
| <b>South Mixed Use Center</b>          | <b>\$1,350,000</b>  |
| <b>Rounded Grand Total</b>             | <b>\$29,000,000</b> |

\* To estimate the cost of a roundabout at any intersection ADD \$150,000 to the cost of the intersection improvements

(\*) For this intersection under the Proposed Zoning subtract \$350,000

Table 5-5, 2016 Full Build-Out Construction Cost Estimate

**Intersection Improvements**

| Intersection                           | Item                          | Length (ft) | Construction Cost  |
|--|-------------------------------|-------------|--------------------|
| Route 50\Route 67\Ballston Ave         | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 10,000      | \$2,000,000        |
| Route 67\Brookline Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 6,000       | \$1,200,000        |
| Route 67\Eastline Rd                   | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 6,000       | \$1,200,000        |
| Route 50\Brookline Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 12,000      | \$2,400,000        |
| <b>North Mixed Use Center Subtotal</b> |                               |             | <b>\$7,400,000</b> |
| Intersection                           | Item                          | Length (ft) | Cost               |
| Route 50\Outlet Rd                     | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 1,000       | \$200,000          |
| Route 50\Middleline Rd                 | Traffic Signal or Roundabout* | NA          | \$150,000          |
| Route 50\Route 146A                    | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 2,000       | \$400,000          |
| Route 50\Forest Rd                     | Traffic Signal or Roundabout* | NA          | \$150,000          |
| <b>Business Highway Subtotal</b>       |                               |             | <b>\$1,200,000</b> |
| Route 50\Lake Hill Rd                  | Traffic Signal or Roundabout* | NA          | \$150,000          |
|  | Roadway Improvements          | 13,000      | \$2,600,000        |
| <b>South Mixed Use Center Subtotal</b> |                               |             | <b>\$2,750,000</b> |

**Segment Improvements**

| Route                                  | Segment            | Roadway Improvement Length (ft) | Construction Cost   |
|--|--------------------|---------------------------------|---------------------|
| Route 50                               | From: Route 67     | 6,300 (x 4)                     | \$5,000,000         |
|  | To: Brookline Rd   |                                 |                     |
| Route 67                               | From: Route 50     | 13,000 (x 4)                    | \$10,400,000        |
|  | To: Eastline Rd    |                                 |                     |
| <b>North Mixed Use Center Subtotal</b> |                    |                                 | <b>\$15,400,000</b> |
| Route 50                               | From: Brookline Rd | 22,000 (x 4)                    | \$17,600,000        |
|  | To: Forest Rd      |                                 |                     |
| <b>Business Highway Subtotal</b>       |                    |                                 | <b>\$17,600,000</b> |
| Route 50                               | From: Forest Rd    | 7,000 (x 4)                     | \$5,600,000         |
|  | To: Lake Hill Rd   |                                 |                     |
| <b>South Mixed Use Center Subtotal</b> |                    |                                 | <b>\$5,600,000</b>  |

North Mixed Use Center Subtotal     \$22,800,000  
 Business Highway Subtotal         \$18,800,000  
 South Mixed Use Center Subtotal     \$8,350,000

**Rounded Grand Total     \$50,000,000**

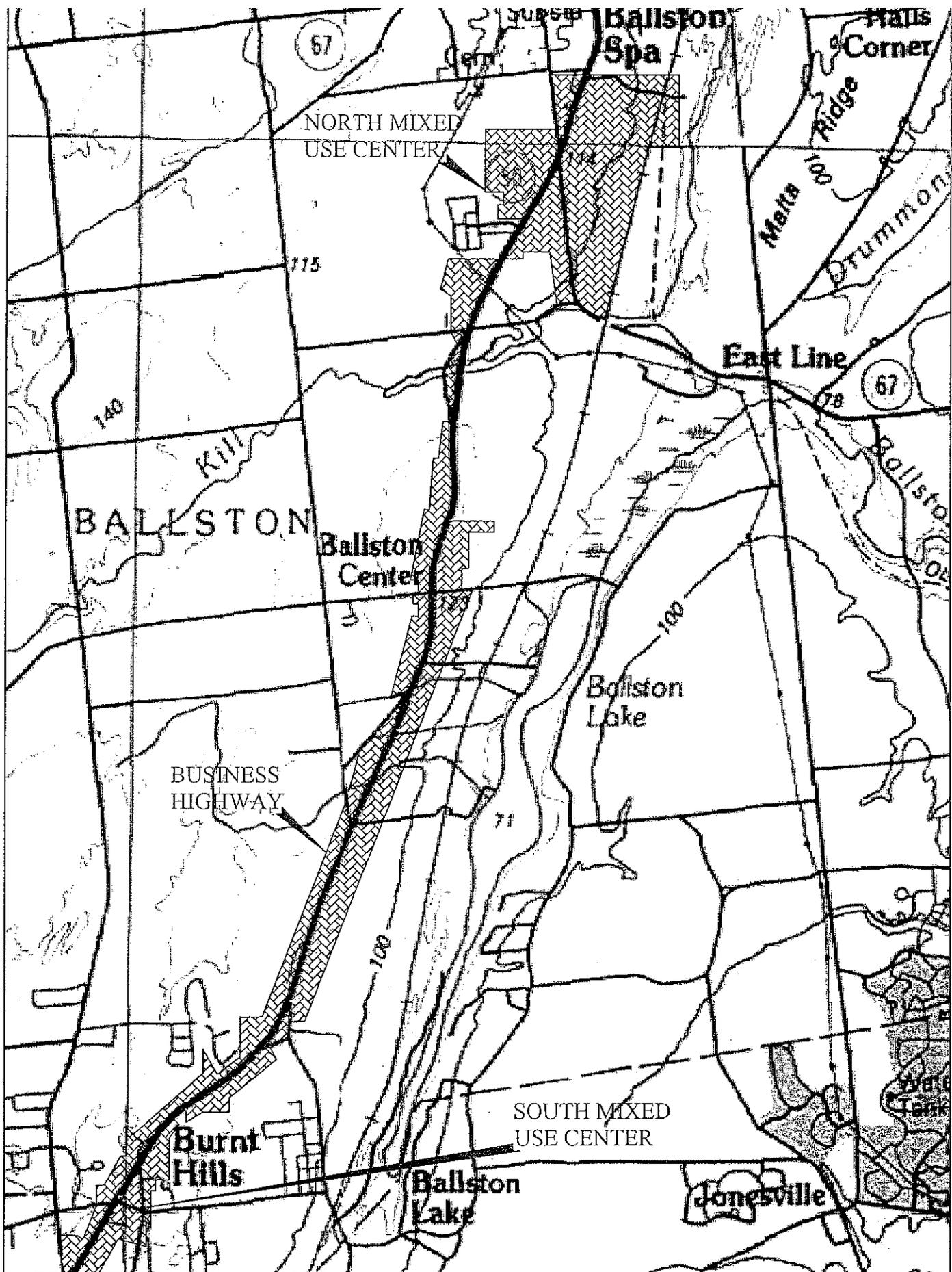
\*To estimate the cost of a roundabout at any intersection ADD \$150,000 to the cost of the intersection improvements

During the 2011 Build-Out for the Proposed zoning scenario, the intersection of SR 50/Charlton Rd/Outlet Rd will not need to be improved due to the acceptable levels-of-service. By the Full Build-Out in 2016 all potential improvements will be necessary.

All of the roadways and intersections requiring improvement are on state highways, and therefore the improvement costs are eligible for state and federal funding. State and federally funded projects compete for the limited amount of available funding in the region's annual Transportation Improvement Program (TIP). In this area, the TIP is developed by the Capital District Transportation Committee, on which Saratoga County and other local governments are represented. The full cost of the needed improvements in Ballston may not be available from the TIP even over a 10-year period.

There are other opportunities for funding highway improvements. Major developers along highways may be assessed the costs of improvements necessary for providing proper access to the property and maintaining adequate traffic operations on the highway; these may include such items as signals, access lanes and driveways. The needed improvements in Ballston identified in this study affect large development areas, however, and go well beyond those for which adjacent property owners can be expected to pay.

There is increasing use of relatively new funding mechanisms to supplement traditional funding sources. In one approach a portion of the cost of needed improvements is assessed on all new development in a district and collected when the property is developed. It is collected by the local government and banked until specific improvements are needed. Although past use in this region has been primarily for local projects, it would be appropriate in this case for funds from such a fund to be directed at the state highway improvements identified here.



Greenman-Pedersen, Inc.  
CONSULTING ENGINEERS

**GPI**

43 Fuller Road  
Albany, NY 12205

Town of Ballston Traffic Impact Study

LOCATION MAP

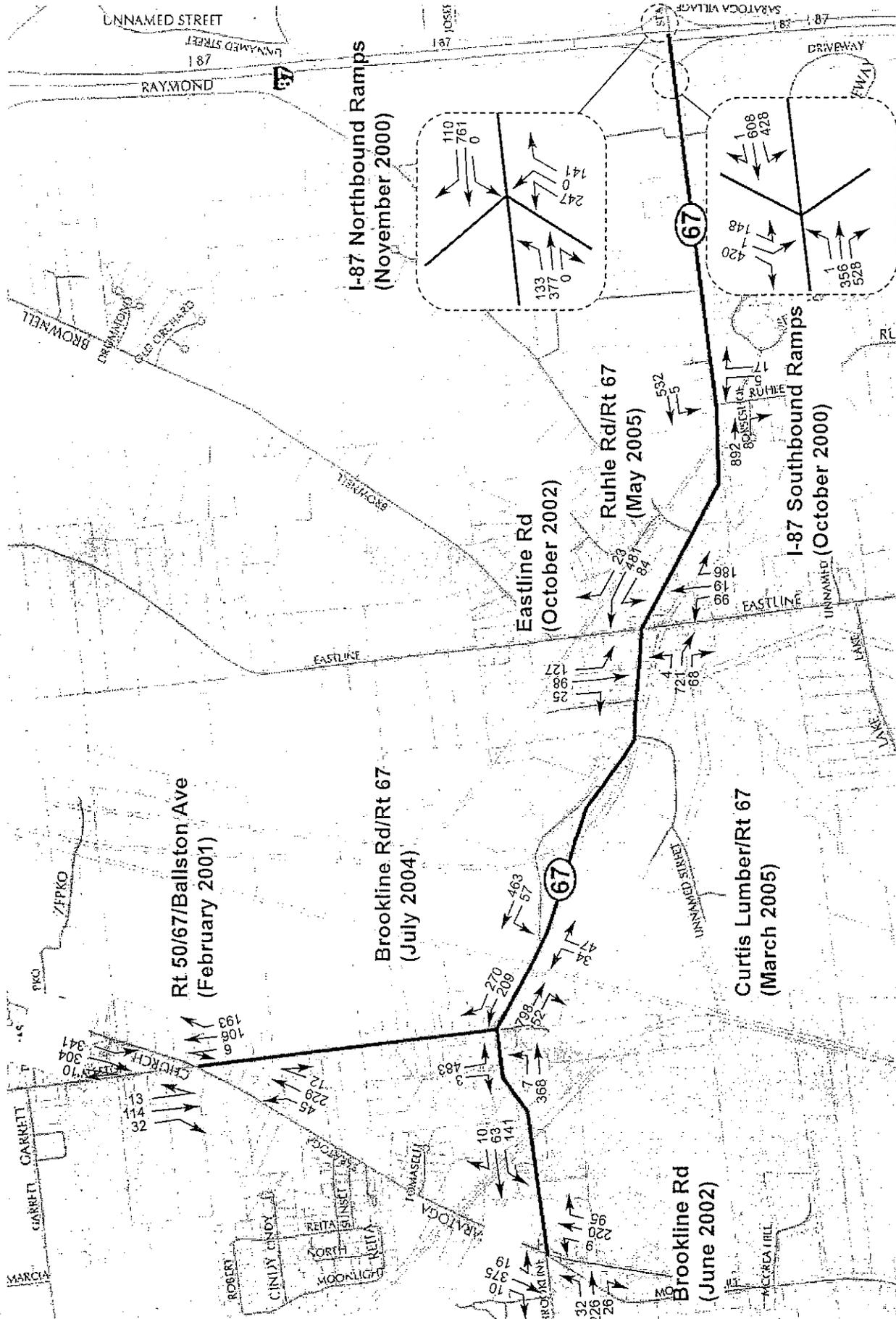
JOB NO.  
2006016

SCALE  
NO SCALE

DATE  
3/06

FIGURE NO.  
1

**APPENDIX A**  
**TRAFFIC VOLUME DATA**



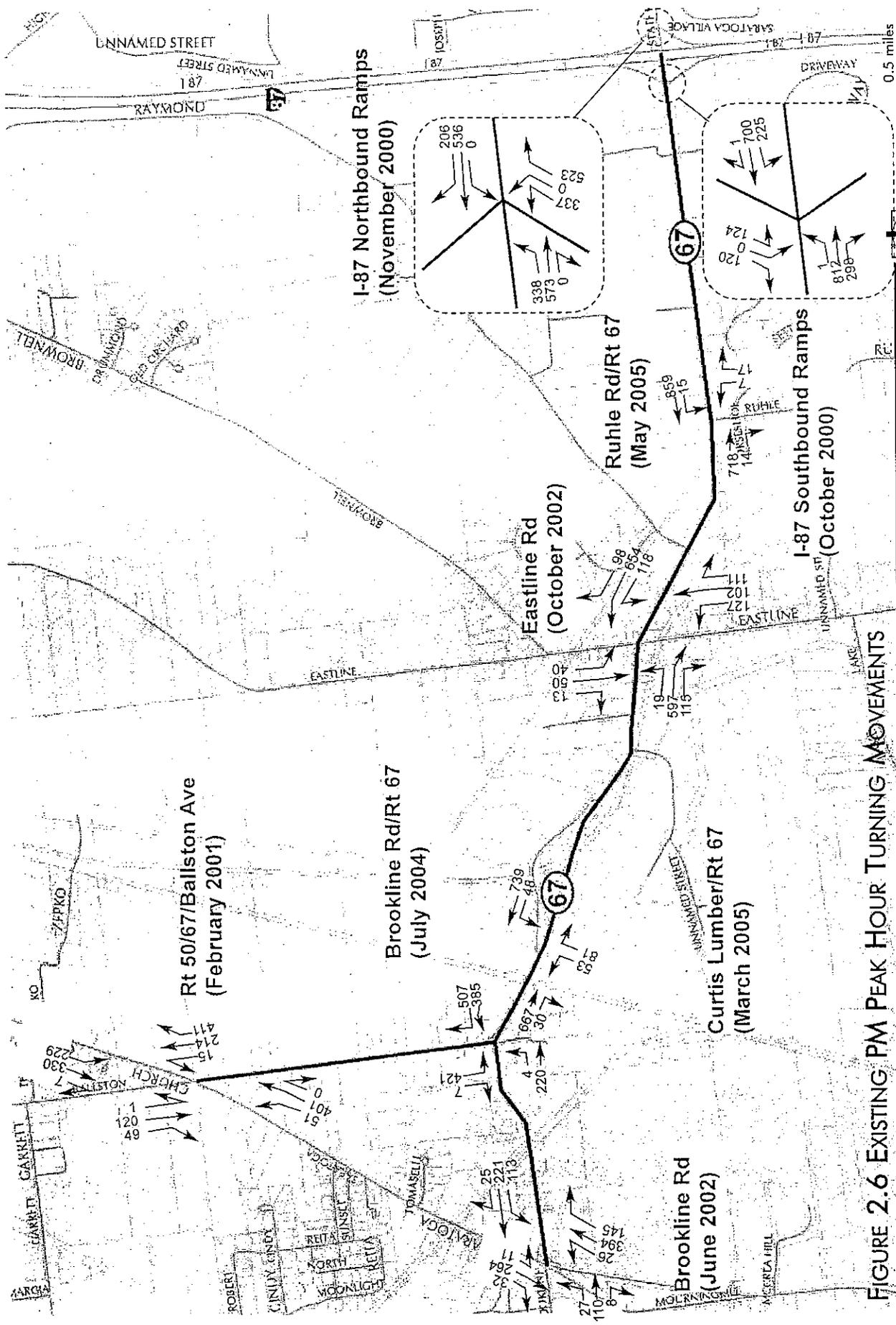
**FIGURE 2.5 EXISTING AM PEAK HOUR TURNING MOVEMENTS**

**ROUTE 67 CORRIDOR STUDY**

0.5 miles



BRF Planning May 2005  
Source: CDTC, NYSDOT  
Creighton Manning



**FIGURE 2.6 EXISTING PM PEAK HOUR TURNING MOVEMENTS**

**ROUTE 67 CORRIDOR STUDY**

BEJ Planning May 2005  
 Source: CDTC, NYS DOT  
 Creighton Manning

2006016.00

Manual Traffic Count Volumes - Tuesday February 28, 2006

|           | Lake Hill Rd EB |     |      |   |       |     | Rt 50 NB |   |      |     |      |   | Lake Hill Rd WB |   |      |   |      |     | Rt 50 SB |    |       |   |      |  |
|-----------|-----------------|-----|------|---|-------|-----|----------|---|------|-----|------|---|-----------------|---|------|---|------|-----|----------|----|-------|---|------|--|
|           | Left            |     | Thru |   | Right |     | RTOR     |   | Left |     | Thru |   | Right           |   | RTOR |   | Left |     | Thru     |    | Right |   | RTOR |  |
|           |                 |     |      |   |       |     |          |   |      |     |      |   |                 |   |      |   |      |     |          |    |       |   |      |  |
| 7:00 AM   | 13              | 64  | 23   | 0 | 12    | 62  | 18       | 0 | 34   | 32  | 1    | 0 | 0               | 0 | 0    | 0 | 0    | 0   | 88       | 6  | 0     | 0 | 0    |  |
| 7:15 AM   | 12              | 75  | 22   | 0 | 12    | 62  | 24       | 0 | 26   | 61  | 3    | 0 | 0               | 0 | 0    | 0 | 0    | 1   | 93       | 8  | 0     | 0 | 0    |  |
| 7:30 AM   | 10              | 80  | 31   | 0 | 12    | 61  | 24       | 0 | 36   | 52  | 0    | 0 | 0               | 0 | 0    | 0 | 0    | 0   | 115      | 10 | 0     | 0 | 0    |  |
| 7:45 AM   | 12              | 49  | 30   | 0 | 7     | 66  | 20       | 0 | 47   | 27  | 3    | 0 | 0               | 0 | 0    | 0 | 1    | 188 | 5        | 0  | 0     | 0 | 0    |  |
| 8:00 AM   | 15              | 42  | 29   | 0 | 12    | 55  | 18       | 0 | 36   | 19  | 3    | 0 | 0               | 0 | 0    | 0 | 1    | 58  | 7        | 0  | 0     | 0 | 0    |  |
| 8:15 AM   | 13              | 47  | 30   | 0 | 12    | 64  | 16       | 0 | 27   | 20  | 3    | 0 | 0               | 0 | 0    | 0 | 1    | 74  | 4        | 0  | 0     | 0 | 0    |  |
| 8:30 AM   | 12              | 47  | 24   | 0 | 15    | 76  | 26       | 0 | 31   | 22  | 4    | 0 | 0               | 0 | 0    | 0 | 2    | 81  | 5        | 0  | 0     | 0 | 0    |  |
| 8:45 AM   | 10              | 39  | 18   | 0 | 10    | 48  | 15       | 0 | 26   | 22  | 3    | 0 | 0               | 0 | 0    | 0 | 0    | 56  | 3        | 0  | 0     | 0 | 0    |  |
| Total     | 97              | 443 | 207  | 0 | 92    | 494 | 161      | 0 | 263  | 255 | 20   | 0 | 0               | 0 | 0    | 0 | 6    | 753 | 48       | 0  | 0     | 0 | 0    |  |
| Peak Hour | 47              | 268 | 106  | 0 | 43    | 251 | 86       | 0 | 143  | 172 | 7    | 0 | 0               | 0 | 0    | 0 | 2    | 484 | 29       | 0  | 0     | 0 | 0    |  |

Peak Hour: 7:00AM to 8:00AM

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.870 |
|     | NB | 0.969 |
|     | WB | 0.894 |
|     | SB | 0.664 |

Manual Traffic Count Volumes - Tuesday February 28, 2006

|           | Lake Hill Rd EB |     |      |   |       |     | Rt 50 NB |   |      |     |      |   | Lake Hill Rd WB |   |      |   |      |     | Rt 50 SB |   |       |   |      |  |
|-----------|-----------------|-----|------|---|-------|-----|----------|---|------|-----|------|---|-----------------|---|------|---|------|-----|----------|---|-------|---|------|--|
|           | Left            |     | Thru |   | Right |     | RTOR     |   | Left |     | Thru |   | Right           |   | RTOR |   | Left |     | Thru     |   | Right |   | RTOR |  |
|           |                 |     |      |   |       |     |          |   |      |     |      |   |                 |   |      |   |      |     |          |   |       |   |      |  |
| 4:00 PM   | 17              | 37  | 19   | 0 | 29    | 97  | 16       | 0 | 33   | 52  | 6    | 0 | 0               | 0 | 0    | 0 | 2    | 76  | 13       | 0 | 0     | 0 | 0    |  |
| 4:15 PM   | 10              | 44  | 23   | 0 | 39    | 130 | 19       | 0 | 28   | 54  | 5    | 0 | 0               | 0 | 0    | 0 | 0    | 77  | 12       | 0 | 0     | 0 | 0    |  |
| 4:30 PM   | 13              | 31  | 17   | 0 | 41    | 106 | 21       | 0 | 28   | 55  | 4    | 0 | 0               | 0 | 0    | 0 | 1    | 82  | 20       | 0 | 0     | 0 | 0    |  |
| 4:45 PM   | 10              | 25  | 17   | 0 | 35    | 113 | 24       | 0 | 32   | 64  | 1    | 0 | 0               | 0 | 0    | 0 | 4    | 86  | 15       | 0 | 0     | 0 | 0    |  |
| 5:00 PM   | 17              | 47  | 17   | 0 | 47    | 110 | 35       | 0 | 30   | 60  | 1    | 0 | 0               | 0 | 0    | 0 | 3    | 86  | 19       | 0 | 0     | 0 | 0    |  |
| 5:15 PM   | 6               | 43  | 18   | 0 | 46    | 135 | 27       | 0 | 17   | 73  | 3    | 0 | 0               | 0 | 0    | 0 | 0    | 79  | 13       | 0 | 0     | 0 | 0    |  |
| 5:30 PM   | 11              | 40  | 37   | 0 | 49    | 112 | 24       | 0 | 24   | 59  | 2    | 0 | 0               | 0 | 0    | 0 | 2    | 83  | 14       | 0 | 0     | 0 | 0    |  |
| 5:45 PM   | 14              | 43  | 13   | 0 | 48    | 96  | 17       | 0 | 25   | 46  | 5    | 0 | 0               | 0 | 0    | 0 | 3    | 70  | 10       | 0 | 0     | 0 | 0    |  |
| Total     | 98              | 310 | 161  | 0 | 334   | 899 | 183      | 0 | 217  | 463 | 27   | 0 | 0               | 0 | 0    | 0 | 15   | 639 | 116      | 0 | 0     | 0 | 0    |  |
| Peak Hour | 44              | 155 | 89   | 0 | 177   | 470 | 110      | 0 | 103  | 256 | 7    | 0 | 0               | 0 | 0    | 0 | 9    | 334 | 61       | 0 | 0     | 0 | 0    |  |

Peak Hour: 4:15PM to 5:15PM

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.818 |
|     | NB | 0.910 |
|     | WB | 0.984 |
|     | SB | 0.935 |

\*PHF = Peak Hour Factor

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |              |       |          |      |          |       |
|--|--------------|-------|----------|------|----------|-------|
|  | Forest Rd EB |       | Rt 50 NB |      | Rt 50 SB |       |
|  | Left         | Right | Left     | Thru | Thru     | Right |
| 7:00 AM  | 11           | 21    | 8        | 76   | 145      | 1     |
| 7:15 AM  | 9            | 32    | 5        | 93   | 169      | 3     |
| 7:30 AM  | 18           | 56    | 7        | 85   | 175      | 3     |
| 7:45 AM  | 9            | 20    | 11       | 95   | 181      | 2     |
| 8:00 AM  | 13           | 16    | 3        | 74   | 137      | 3     |
| 8:15 AM  | 10           | 22    | 4        | 103  | 119      | 1     |
| 8:30 AM  | 11           | 10    | 7        | 95   | 103      | 1     |
| 8:45 AM  | 5            | 7     | 2        | 83   | 80       | 1     |
| Total  | 86           | 184   | 47       | 704  | 1109     | 15    |

|           |    |     |    |     |     |   |
|-----------|----|-----|----|-----|-----|---|
| Peak Hour | 47 | 129 | 31 | 349 | 670 | 9 |
|-----------|----|-----|----|-----|-----|---|

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.595 |
|     | NB | 0.896 |
|     | SB | 0.928 |

Peak Hour: 7:00AM to 8:00AM

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |              |       |          |      |          |       |
|--|--------------|-------|----------|------|----------|-------|
|  | Forest Rd EB |       | Rt 50 NB |      | Rt 50 SB |       |
|  | Left         | Right | Left     | Thru | Thru     | Right |
| 4:00 PM  | 8            | 12    | 14       | 144  | 94       | 4     |
| 4:15 PM  | 4            | 7     | 9        | 162  | 91       | 7     |
| 4:30 PM  | 0            | 14    | 9        | 145  | 100      | 9     |
| 4:45 PM  | 2            | 4     | 18       | 156  | 110      | 10    |
| 5:00 PM  | 4            | 4     | 15       | 181  | 113      | 9     |
| 5:15 PM  | 3            | 7     | 20       | 144  | 100      | 11    |
| 5:30 PM  | 8            | 16    | 10       | 164  | 104      | 9     |
| 5:45 PM  | 4            | 7     | 8        | 124  | 83       | 6     |
| Total  | 33           | 71    | 103      | 1220 | 795      | 65    |

|           |    |    |    |     |     |    |
|-----------|----|----|----|-----|-----|----|
| Peak Hour | 17 | 31 | 63 | 645 | 427 | 39 |
|-----------|----|----|----|-----|-----|----|

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.500 |
|     | NB | 0.903 |
|     | SB | 0.955 |

Peak Hour: 4:45PM to 5:45PM

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |          |       |            |       |          |      |
|--|----------|-------|------------|-------|----------|------|
|  | Rt 50 NB |       | Rt 146A WB |       | Rt 50 SB |      |
|  | Thru     | Right | Left       | Right | Left     | Thru |
| 7:00 AM  | 60       | 1     | 0          | 10    | 11       | 137  |
| 7:15 AM  | 103      | 0     | 1          | 12    | 30       | 179  |
| 7:30 AM  | 75       | 0     | 2          | 11    | 34       | 190  |
| 7:45 AM  | 93       | 0     | 1          | 18    | 24       | 175  |
| 8:00 AM  | 71       | 0     | 0          | 11    | 22       | 150  |
| 8:15 AM  | 91       | 0     | 0          | 13    | 27       | 117  |
| 8:30 AM  | 91       | 0     | 0          | 21    | 22       | 105  |
| 8:45 AM  | 86       | 0     | 2          | 12    | 14       | 79   |
| Total  | 670      | 1     | 6          | 108   | 184      | 1132 |

|           |     |   |   |    |    |     |
|-----------|-----|---|---|----|----|-----|
| Peak Hour | 331 | 1 | 4 | 51 | 99 | 681 |
|-----------|-----|---|---|----|----|-----|

|     |    |       |
|-----|----|-------|
| PHF | NB | 0.806 |
|     | WB | 0.724 |
|     | SB | 0.871 |

Peak Hour: 7:15AM to 8:15AM

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |          |       |            |       |          |      |
|--|----------|-------|------------|-------|----------|------|
|  | Rt 50 NB |       | Rt 146A WB |       | Rt 50 SB |      |
|  | Thru     | Right | Left       | Right | Left     | Thru |
| 4:00 PM  | 134      | 1     | 1          | 29    | 16       | 104  |
| 4:15 PM  | 148      | 1     | 0          | 18    | 13       | 94   |
| 4:30 PM  | 144      | 2     | 1          | 21    | 14       | 99   |
| 4:45 PM  | 140      | 1     | 0          | 25    | 14       | 107  |
| 5:00 PM  | 161      | 1     | 0          | 28    | 26       | 107  |
| 5:15 PM  | 161      | 0     | 0          | 27    | 14       | 90   |
| 5:30 PM  | 173      | 0     | 4          | 21    | 16       | 104  |
| 5:45 PM  | 129      | 0     | 1          | 13    | 8        | 75   |
| Total  | 1190     | 6     | 7          | 182   | 121      | 780  |

|           |     |   |   |     |    |     |
|-----------|-----|---|---|-----|----|-----|
| Peak Hour | 635 | 2 | 4 | 101 | 70 | 408 |
|-----------|-----|---|---|-----|----|-----|

|     |    |       |
|-----|----|-------|
| PHF | NB | 0.921 |
|     | WB | 0.938 |
|     | SB | 0.898 |

Peak Hour: 4:45PM to 5:45PM

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |                  |       |          |      |          |       |
|--|------------------|-------|----------|------|----------|-------|
|  | Middleline Rd EB |       | Rt 50 NB |      | Rt 50 SB |       |
|  | Left             | Right | Left     | Thru | Thru     | Right |
| 7:00 AM  | 0                | 39    | 10       | 21   | 50       | 0     |
| 7:15 AM  | 0                | 69    | 27       | 67   | 105      | 0     |
| 7:30 AM  | 0                | 73    | 12       | 81   | 148      | 0     |
| 7:45 AM  | 0                | 52    | 20       | 86   | 147      | 1     |
| 8:00 AM  | 0                | 45    | 12       | 71   | 118      | 0     |
| 8:15 AM  | 0                | 35    | 23       | 75   | 95       | 0     |
| 8:30 AM  | 0                | 34    | 21       | 101  | 85       | 1     |
| 8:45 AM  | 0                | 23    | 21       | 82   | 70       | 0     |
| Total  | 0                | 370   | 146      | 584  | 818      | 2     |

|           |   |     |    |     |     |   |
|-----------|---|-----|----|-----|-----|---|
| Peak Hour | 0 | 239 | 71 | 305 | 518 | 1 |
|-----------|---|-----|----|-----|-----|---|

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.818 |
|     | NB | 0.887 |
|     | SB | 0.877 |

Peak Hour: 7:15AM to 8:15AM

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |                  |       |          |      |          |       |
|--|------------------|-------|----------|------|----------|-------|
|  | Middleline Rd EB |       | Rt 50 NB |      | Rt 50 SB |       |
|  | Left             | Right | Left     | Thru | Thru     | Right |
| 4:00 PM  | 0                | 17    | 41       | 123  | 92       | 0     |
| 4:15 PM  | 0                | 21    | 43       | 113  | 88       | 0     |
| 4:30 PM  | 0                | 19    | 60       | 125  | 95       | 0     |
| 4:45 PM  | 0                | 22    | 47       | 107  | 102      | 0     |
| 5:00 PM  | 1                | 23    | 62       | 120  | 103      | 1     |
| 5:15 PM  | 0                | 29    | 67       | 122  | 69       | 1     |
| 5:30 PM  | 0                | 17    | 55       | 149  | 93       | 0     |
| 5:45 PM  | 1                | 13    | 30       | 104  | 76       | 1     |
| Total  | 2                | 161   | 405      | 963  | 718      | 3     |

|           |   |    |     |     |     |   |
|-----------|---|----|-----|-----|-----|---|
| Peak Hour | 1 | 91 | 231 | 498 | 367 | 2 |
|-----------|---|----|-----|-----|-----|---|

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.793 |
|     | NB | 0.893 |
|     | SB | 0.887 |

Peak Hour: 4:45PM to 5:45PM

Manual Traffic Count Volumes - Tuesday February 28, 2006

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |      |       |      |          |      |       |      |              |      |       |      |          |      |       |      |
|--|------|-------|------|----------|------|-------|------|--------------|------|-------|------|----------|------|-------|------|
| Charlton Rd EB   |      |       |      | Rt 50 NB |      |       |      | Outlet Rd WB |      |       |      | Rt 50 SB |      |       |      |
| Left   | Thru | Right | RTOR | Left     | Thru | Right | RTOR | Left         | Thru | Right | RTOR | Left     | Thru | Right | RTOR |
| 5  | 14   | 3     | 0    | 1        | 43   | 11    | 0    | 24           | 7    | 3     | 0    | 0        | 76   | 0     | 0    |
| 2  | 17   | 1     | 0    | 1        | 62   | 12    | 0    | 21           | 6    | 3     | 0    | 3        | 106  | 2     | 0    |
| 4  | 17   | 0     | 0    | 1        | 67   | 18    | 0    | 16           | 7    | 3     | 0    | 3        | 113  | 3     | 0    |
| 15   | 28   | 1     | 0    | 1        | 79   | 13    | 0    | 21           | 7    | 7     | 0    | 1        | 119  | 1     | 0    |
| 8  | 13   | 1     | 0    | 0        | 65   | 8     | 0    | 16           | 3    | 3     | 0    | 1        | 98   | 3     | 0    |
| 9  | 14   | 4     | 0    | 1        | 64   | 17    | 0    | 8            | 1    | 3     | 0    | 1        | 74   | 5     | 0    |
| 5  | 13   | 5     | 0    | 1        | 88   | 14    | 0    | 10           | 2    | 5     | 0    | 1        | 82   | 1     | 0    |
| 3  | 12   | 2     | 0    | 1        | 78   | 7     | 0    | 7            | 3    | 4     | 0    | 3        | 44   | 1     | 0    |
| 51   | 128  | 17    | 0    | 7        | 546  | 100   | 0    | 123          | 36   | 31    | 0    | 13       | 712  | 16    | 0    |
| Peak Hour  |      |       | 0    | 3        | 273  | 51    | 0    | 74           | 23   | 16    | 0    | 8        | 436  | 9     | 0    |

Peak Hour: 7:15AM to 8:15AM

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.608 |
|     | NB | 0.879 |
|     | WB | 0.807 |
|     | SB | 0.936 |

Manual Traffic Count Volumes - Tuesday February 28, 2006

| Manual Traffic Count Volumes - Tuesday February 28, 2006 |      |       |      |          |      |       |      |              |      |       |      |          |      |       |      |
|--|------|-------|------|----------|------|-------|------|--------------|------|-------|------|----------|------|-------|------|
| Charlton Rd EB   |      |       |      | Rt 50 NB |      |       |      | Outlet Rd WB |      |       |      | Rt 50 SB |      |       |      |
| Left   | Thru | Right | RTOR | Left     | Thru | Right | RTOR | Left         | Thru | Right | RTOR | Left     | Thru | Right | RTOR |
| 5  | 5    | 3     | 0    | 2        | 108  | 15    | 0    | 13           | 11   | 5     | 0    | 1        | 82   | 7     | 0    |
| 6  | 7    | 1     | 0    | 2        | 94   | 17    | 0    | 16           | 12   | 3     | 0    | 1        | 81   | 12    | 0    |
| 6  | 8    | 0     | 0    | 1        | 110  | 10    | 0    | 15           | 12   | 0     | 0    | 4        | 72   | 6     | 0    |
| 8  | 10   | 3     | 0    | 4        | 84   | 14    | 0    | 16           | 13   | 3     | 0    | 4        | 83   | 6     | 0    |
| 5  | 6    | 1     | 0    | 1        | 114  | 11    | 0    | 17           | 16   | 0     | 0    | 3        | 89   | 11    | 0    |
| 5  | 6    | 0     | 0    | 3        | 112  | 19    | 0    | 18           | 22   | 4     | 0    | 2        | 66   | 11    | 0    |
| 4  | 6    | 2     | 0    | 4        | 117  | 19    | 0    | 10           | 16   | 1     | 0    | 3        | 75   | 6     | 0    |
| 3  | 9    | 1     | 0    | 3        | 97   | 18    | 0    | 15           | 10   | 3     | 0    | 5        | 49   | 4     | 0    |
| 42   | 57   | 11    | 0    | 20       | 836  | 123   | 0    | 120          | 112  | 19    | 0    | 23       | 597  | 63    | 0    |
| Peak Hour  |      |       | 0    | 12       | 427  | 63    | 0    | 61           | 67   | 8     | 0    | 12       | 313  | 34    | 0    |

Peak Hour: 4:45PM to 5:45PM

|     |    |       |
|-----|----|-------|
| PHF | EB | 0.667 |
|     | NB | 0.896 |
|     | WB | 0.773 |
|     | SB | 0.871 |

\*PHF = Peak Hour Factor