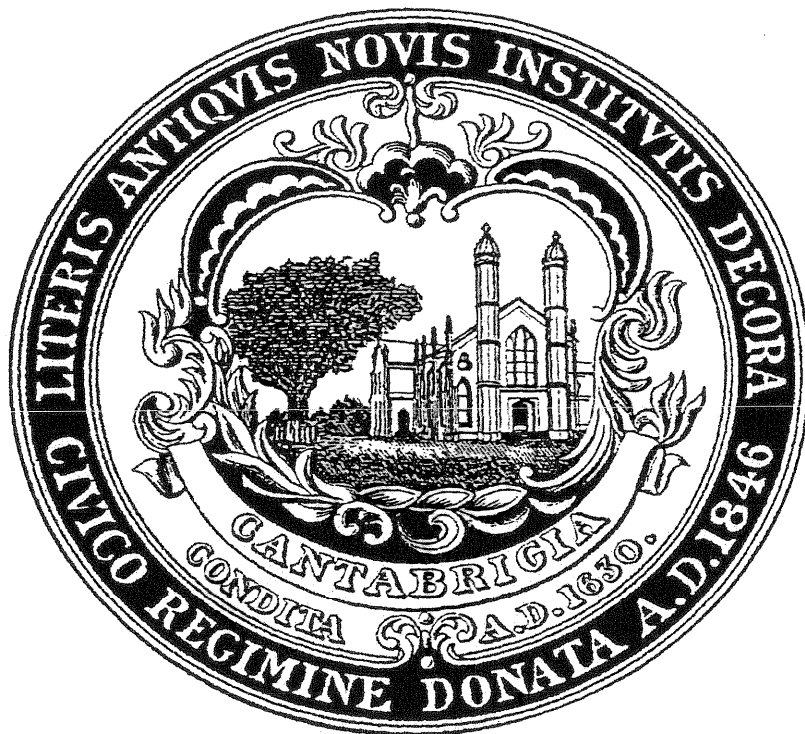


# FUNCTIONAL DESIGN REPORT

## BROADWAY CORRIDOR

### BETWEEN THIRD STREET AND AMES STREET



Prepared For:

DEPARTMENT OF PUBLIC WORKS  
CITY OF CAMBRIDGE, MA  
SEPTEMBER 2009

Prepared By:

Weston & Sampson Engineers, Inc.  
100 Foxborough Boulevard, Suite 250  
Foxborough, MA 02035

*Weston & Sampson*



## TABLE OF CONTENTS

<b>LIST OF FIGURES .....</b>	<b>ii</b>
<b>LIST OF TABLES .....</b>	<b>ii</b>
<b>EXECUTIVE SUMMARY .....</b>	<b>iii-v</b>
<b>1.0 INTRODUCTION.....</b>	<b>1-1</b>
1.1 Project Description .....	1-1
1.2 Data Collection And Field Investigation.....	1-3
1.3 Analysis Designation.....	1-3
1.4 Area Growth/Design Year Volumes .....	1-3
1.5 Safety Analysis.....	1-4
<b>2.0 EXISTING CONDITIONS .....</b>	<b>2-1</b>
2.1 Geometry .....	2-1
2.2 Peak Hour Traffic Volumes .....	2-2
2.3 Level Of Service.....	2-3
<b>3.0 FUTURE TRAFFIC CONDITIONS.....</b>	<b>3-1</b>
3.1 Traffic Signal Warrant Analysis.....	3-1
3.2 Intersection Analyses .....	3-1
3.3 Summary.....	3-5
<b>4.0 CONCLUSIONS AND RECOMMENDATIONS.....</b>	<b>4-1</b>

### LIST OF APPENDICES

APPENDIX A:	Average Daily Traffic Counts (24-hour ATR's)
APPENDIX B:	Turning Movement Counts Existing 2009 Peak Hour Traffic Volume
APPENDIX C:	Existing 2009 Volume Analyzed Under Existing Signalized Conditions
APPENDIX D:	Existing 2009 Volume Analyzed Under Proposed Signalized Conditions
APPENDIX E:	Projected 2029 Volume Analyzed Under Proposed Signalized Conditions
APPENDIX F	Accident History Data Crash Rate Worksheet

## LIST OF FIGURES

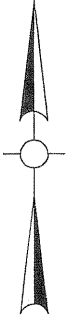
- FIGURE 1: Locus Map
- FIGURE 2: Existing Conditions Map
- FIGURE 3: Proposed Layout

## LIST OF TABLES

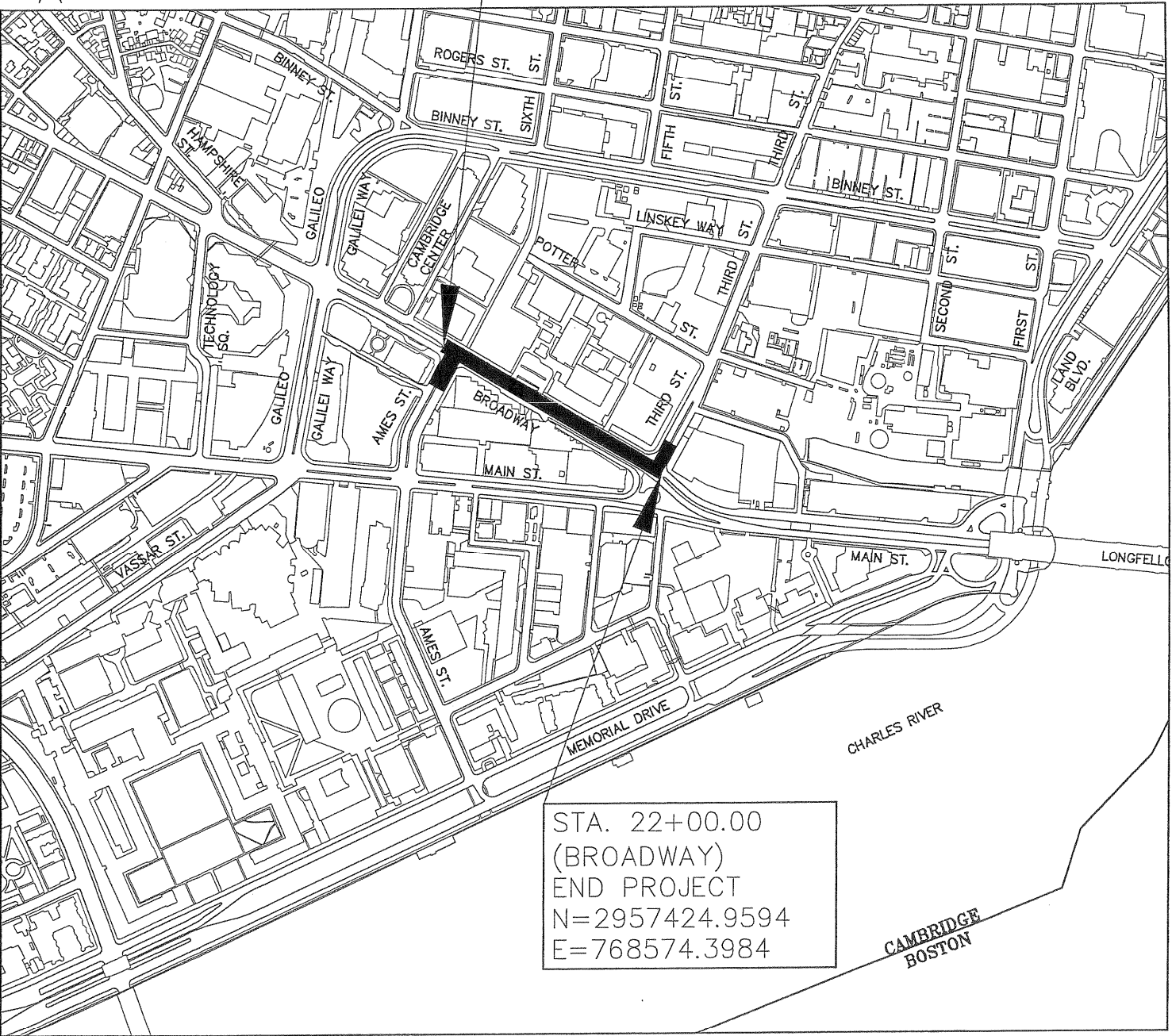
- TABLE 2.1: Daily Traffic Volumes ..... 2-2
- TABLE 2.2: Daily Pedestrian and Bicycle Volumes..... 2-3
- TABLE 2.3: Levels of Service Criteria for Non-Signalized Intersections ..... 2-4
- TABLE 2.4: Levels of Service Criteria for Non-Signalized Intersections ..... 2-4
- TABLE 2.5: Existing Level of Service (pre-timed) 2009 Signalized Intersection w/Proposed  
Geometry.....2-5
- TABLE 2.6: Existing Level of Service (Uncoord) 2009 Signalized Intersection w/Proposed  
Geometry.....2-6
- TABLE 3.1: Level of Service – 2009 vs 2029 (Uncoord Signalized Intersection w/Proposed  
Geometry).....3-4



N



STA. 10+00.00  
(BROADWAY)  
BEGIN PROJECT  
N=2958009.2974  
E=767526.2815



STA. 22+00.00  
(BROADWAY)  
END PROJECT  
N=2957424.9594  
E=768574.3984

FIGURE — 1

LOCATION MAP  
N.T.S.



## **EXECUTIVE SUMMARY**

The Broadway corridor project will be funded under the High Priority Project (HPP) program administered by MassHighway. As a result, we will provide designs for review by the City and MassHighway for the sidewalk, streetscape and roadway reconstruction on Broadway from Ames Street to Third Street (both sides of the street). Designs will include an in-depth survey of sidewalk/roadway area and the alignment and curb grades for the roadway segments in between as well as location and confirmation of the existing Right-of-Way (ROW) on Broadway.

### **General Project Goals:**

- Improve deteriorating roadway and sidewalk infrastructure.
- Provide improved facilities for bicyclists and pedestrians.
- Improve the safety of pedestrians and eliminate double jeopardy, where pedestrians who step into a traffic lane in front of or between a stopped vehicle, often in a crosswalk, and then into an adjacent traffic lane are struck by an oncoming vehicle.
- Enhance the area visually for all users – drivers, motorists, pedestrians.

### **Specific Facility Goals:**

#### **Vehicular Facilities**

- Improve condition of roadway.
- Clarify roadway layout for motorists and minimize conflicts between motorists, pedestrians and cyclists.
- Maintain appropriate vehicular capacity.

#### **Pedestrian Facilities**

- Improve safety of pedestrians.
- Eliminate double jeopardy situations.
- Shorten pedestrian crossings, particularly unsignalized crossings.
- Re-align “Volpe” crossing to improve sightlines.
- Improve driveways for pedestrians.
- Provide ADA / AAB compliant sidewalks.
- Enhance aesthetics of the area, while also providing high quality material for walking surface.

#### **Bicycle Facilities**

- Enhance safety and experience for cyclists.
- Clarify driveway and taxi areas along hotel edge to minimize conflicts.

#### **Green Space**

- Increase quantity and quality of greenspace.
- Reduce amount of stormwater entering drain system by facilitating stormwater recharge in mini rain gardens.

The key design considerations under this contract will include, but not be limited to, pedestrian and bicycle safety, design of a better bicycle facility than currently exists, management of the taxi traffic on Broadway, minimize bicycle facility conflicts with taxis and provide street life on Broadway through more prominent pedestrian/sidewalk areas.

The pedestrian crossing between the Volpe Center and the Marriott (Kendall Square MBTA Station) is currently an unsignalized multi-lane crossing, resulting in a double jeopardy situation. In addition, the crosswalk is at an angle, which increases the length of the crossing and degrades the sightlines. Improving this crosswalk is a high priority for this project and has been advocated by the Volpe Center staff for over 10 years.

The existing generous pavement widths were reviewed to better fit the appropriate lane types for bicycle, vehicular and pedestrian traffic and minimize their conflicts. In general, the proposed layout of one travel lane and one bicycle lane in each direction as well as pedestrian amenity and green areas adjacent to the sidewalks was reviewed and evaluated. Sidewalk and pedestrian amenities include lawn areas, trees, bicycle parking, sitting areas and pedestrian refuge areas where crosswalks are located. Surface treatments and pavement alternatives were investigated to enhance visual separation and definition of safer pedestrian, bicycle and vehicular areas. ***Minor traffic signal alteration work will be performed by the City prior to construction of this project.***

Automatic Traffic Recorder (ATR) counts were performed on Broadway and at all legs of the intersections between June 24 and 25, 2009 for a 48-hour period. Turning movement counts were also performed during a typical weekday in June between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM during this same time period.

Accident history and Crash Rate Data was obtained from MassHighway for the three latest recorded years of 2005 through 2007 at both intersections and on Broadway. A total of fifteen (15) accidents were recorded (ten (10) accidents at Broadway/Third, One (1) at Broadway/Ames and four (4) on Broadway) with the Registry of Motor Vehicles during this three year time period and are included in this report. This represents a total average of five (5) accidents per year with no fatalities and seven (7) injuries.

The two project intersections were evaluated for their Level of Service (LOS) based on the traffic volume counts taken in June 2009. Once the existing peak hour volumes were obtained, projected peak hour traffic volumes for the design year 2029 were developed. The 2029 traffic volume counts were based on the anticipated impacts of local development and an added half-percent per-year growth rate (.5% per year based on information from the City Traffic Department) was used to account for regional traffic growth. This rate was applied to existing traffic volumes over the entire 20-year period to accommodate for planned development, and regional increases in population and employment.

The existing signalized intersections are set to a pre-timed controller with overlaps of certain phases. The two intersections are not interconnected in any way.

The analysis of the existing (2009 w/ proposed geometry) traffic conditions indicate the pre-timed signalized intersection of Broadway @ Third Street, presently operates at a LOS C (26.9 secs delay) during the 2009 AM Peak Hour and a LOS C (31.6 secs delay) during the 2009 PM Peak Hour. When analyzed for the 2029 future conditions it was found that the pre-timed

signalized intersection of Broadway @ Third Street will operate at a slightly worse LOS C (33.8 secs delay) during the 2029 AM Peak Hour and a LOS D (36.9 secs delay) during the 2029 PM Peak Hour. The drop to the LOS D in the PM 2029 is a minor decrease in the actual delay.

The analysis of the existing (2009 w/ proposed geometry) traffic conditions indicate the pre-timed signalized intersection of Broadway @ Ames Street, presently operates at a LOS C (20.1 secs delay) during the 2009 AM Peak Hour and a LOS C (22.7 secs delay) during the 2009 PM Peak Hour. When analyzed for the 2029 future conditions it was found that the pre-timed signalized intersection of Broadway @ Ames Street will operate at a slightly worse LOS C (21.0 secs delay) during the 2029 AM Peak Hour and a slightly worse LOS C (24.8 secs delay) during the 2029 PM Peak Hour.

The differences in delay and queue lengths for the two time periods for both intersections are only slightly elevated in the 2029 analysis and the intersection operate at an acceptable LOS. As a result we conclude that the improvements proposed for the rehabilitation of the Broadway corridor from, and including, the intersections at Third Street and Ames Street will operate at an acceptable LOS.

## **1.0 INTRODUCTION**

Weston & Sampson Engineers Inc. (WSE) has been retained by the City of Cambridge (City) to prepare construction documents for transportation improvements to Broadway from Ames Street to Third Street including the intersections. The purpose of this report is to address traffic, safety and operational deficiencies within Broadway and at the intersections on either end. This report supplements the 25% design submission to the Massachusetts Highway Department (MHD).

This project will be funded under the High Priority Project (HPP) program administered by MassHighway. As a result we will provide designs for review by the City and MassHighway for the sidewalk, streetscape and roadway reconstruction on Broadway from Ames Street to Third Street (both sides of the street). Designs will include an in-depth survey of sidewalk/roadway area and the alignment and curb grades for the roadway segments in between as well as location and confirmation of the existing Right-of-Way (ROW) on Broadway.

The key design considerations under this contract will include, but not be limited to, pedestrian and bicycle safety, design of a better bicycle facility than currently exists, manage the taxi traffic on Broadway, minimize bicycle facility conflicts with taxis and provide street life on Broadway through more prominent pedestrian/sidewalk areas. The existing generous pavement widths were reviewed with the City to better fit the appropriate lanes for bicycle, vehicular and pedestrian traffic and minimize their conflicts. In general, the City's proposed layout of one travel lane, one bicycle lane and taxi circulation in each direction as well as pedestrian amenity and green areas adjacent to the sidewalks was reviewed and evaluated. Sidewalk and pedestrian amenities include lawn areas, trees, bicycle stands, sitting areas and pedestrian refuge areas where crosswalks are located. Surface treatments and pavement alternatives were investigated to enhance visual separation and definition of safer pedestrian, bicycle and vehicular areas. Any traffic signal alteration work will be performed by the city prior to construction of this project.

The purpose of this Functional Design Report (FDR) is to determine if the geometric changes to the Broadway corridor between, and including, the intersections at Third Street and Ames Street will operate at an acceptable Level of Service (LOS) after the proposed changes are implemented. The two intersections are already signalized and are intended to stay as such. The major difference is the narrowing of the pavement and dropping of one travel lane in each direction on Broadway to facilitate the safe flow of pedestrians, bicyclists and taxis and to avoid conflicts between these functions and the through movement of traffic on Broadway.

### **1.1 Project Description**

The City of Cambridge, through its Department of Public Works, is proposing to reconstruct Broadway and the sidewalk and pedestrian areas on both sides of the street. In addition, the traffic signals at the intersections at Ames Street and Third Street will be redesigned and reconfigured by the City prior to the start of this construction project. Timing and phasing will be adjusted to optimize the LOS for pedestrians as well as vehicles.

The entire Broadway corridor in this area is lined with commercial or educational uses and as such a high pedestrian population utilizes the corridor. The pedestrian crossing between the Volpe Center and the Marriott (Kendall Square MBTA Station) is currently an unsignalized

multi-lane crossing, resulting in a double jeopardy situation. In addition, the crosswalk is at an angle, which increases the length of the crossing and degrades the sightlines. Improving this crosswalk is a high priority for this project and has been advocated by the Volpe Center staff for over 10 years.

The intent of the project is to safely facilitate and improve pedestrian and bicycle safety at the intersections and at midblock locations in between. The timing and phasing of the signals at each intersection will be adjusted accordingly to act as traffic calming measures to ensure the safety of non-vehicular traffic. Specific improvements to be implemented towards this end will include the following:

- Roadway narrowing
- Geometric improvements to accommodate new lane configurations
- Elimination of the double jeopardy threat for pedestrians, where pedestrians who step into a traffic lane in front of or between a stopped vehicle, often in a crosswalk, and then into an adjacent traffic lane are struck by an oncoming vehicle.
- Creation of a dedicated Taxi Lane for taxis queuing at the Marriott drop off/driveway and the entrance to the local parking garage
- Minor drainage improvements to include mini rain gardens in sidewalk lawn areas
- Coordination of the reconfigured traffic signal system with the City (phasing/timing).
- Installation of new pavement markings and traffic signs.
- Installation of new updated pedestrian flashing signals at the existing crosswalk location at mid-block Broadway (at the Marriott Hotel)
- Realign the crosswalk from the Marriot to the Volpe Center to provide a shorter, more perpendicular walking route to the sidewalk and pedestrian areas on either side of Broadway
- Installation of new ADA/AAB compliant sidewalks, planting areas, bicycle parking areas and pedestrian amenities.

*Minor traffic signal alteration work will be performed by the City of Cambridge Traffic Department prior to the construction of this project.*

## **1.2 Data Collection And Field Investigation**

Automatic Traffic Recorder (ATR) counts were performed on Broadway and at all legs of the intersections between June 24 and 25, 2009 for a 48-hour period (See Appendix A). Turning movement counts were also performed during a typical weekday in June between 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM during this same time period.

Accident history and Crash Rate Data was obtained from MassHighway for the three latest recorded years of 2005 through 2007 at both intersections and on Broadway. A total of fifteen (15) accidents were recorded (ten (10) accidents at Broadway/Third, One (1) at Broadway/Ames and four (4) on Broadway) with the Registry of Motor Vehicles during this three year time period and are included in this report (See Appendix F). This represents a total average of five (5) accidents per year with no fatalities and seven (7) injuries.

Chappell Engineering, Inc. performed a topographical survey of the intersection during January 2009.

## **1.3 Analysis Designation**

The Massachusetts Highway Department (MassHighway) requires an evaluation of existing traffic flow operations and future operations with and without improvements in place. In addition to these scenarios, MassHighway requires analysis of how the design would impact existing traffic volume levels if it were in place today. The scenarios examined as part of this study include:

- *Existing 2009 volumes analyzed under existing signalized condition*
- *Existing 2009 volumes analyzed under proposed signalized condition*
- *Projected 2029 volumes analyzed under proposed signalized condition*

A twenty (20) year design condition has been utilized as a measure of continued effectiveness of the proposed improvements.

## **1.4 Area Growth/Design Year Volumes**

Once the existing peak hour volumes were obtained, projected peak hour traffic volumes for the design year 2029 were developed.

Based on the anticipated impacts of local development, a half-percent per-year growth rate per year (.5% per year based on information from the City Traffic Department) was used to account for regional traffic growth. This rate was applied to existing traffic volumes over the entire 20-year period to accommodate for planned development, and regional increases in population and employment. The 2029 morning and evening peak hour traffic volume networks derived from these projections are shown in Appendix E.



## 1.5 Safety Analysis

This report includes a detailed safety analysis for the Broadway corridor. Roadway safety deficiencies are defined and discussed based on this analysis with respect to existing conditions. Measures to remedy these deficiencies are defined in the 25% design. Appendix F provides a summary of accident history data.

Accident history and Crash Rate Data was obtained from MassHighway for the three latest recorded years of 2005 through 2007 at both intersections and on Broadway. A total of eighteen (18) accidents were recorded (ten (10) accidents at Broadway/Third, One (1) at Broadway/Ames and seven (7) on Broadway) with the Registry of Motor Vehicles during this three year time period and are included in this report (See Appendix F). This represents a total average of five (5) accidents per year with no fatalities and seven (7) injuries.

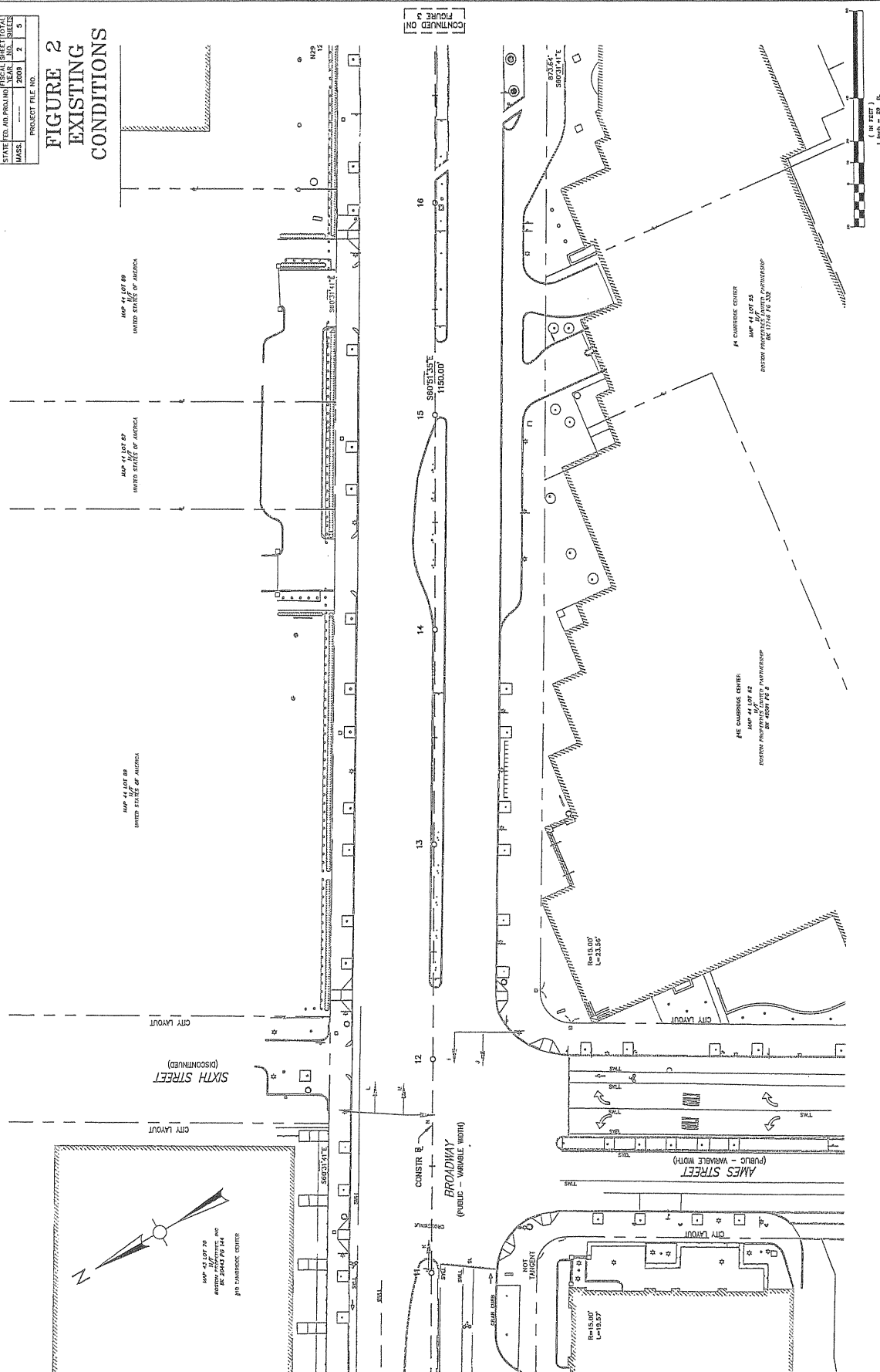
Most of the reported accidents indicated in the MassHighway database information were rear end accidents with some angle collisions. There were no fatalities during this period and eight (8) injuries. Most of the accidents during the three-year period occurred at the Broadway/Third intersection (10).

In an effort to create additional safe space for bicyclists and pedestrians, the configuration of the Broadway lane arrangement will be altered. The existing generous pavement widths were reviewed with the City to better fit the appropriate lanes for bicycle, vehicular and pedestrian traffic and minimize their conflicts. The reconfiguration will provide less conflicting movements for bicycles, pedestrians and vehicles and act as traffic calming for all vehicles. The double jeopardy pedestrian crossing at the Volpe crosswalk will be eliminated. Bicycle lanes will be configured to avoid right turning vehicles and align from one side of each intersection to the other. Taxis lining up to pick up passengers from the Marriott will be given a longer dedicated Taxi Lane/queue area on the south side of Broadway from Ames Street to the hotel entrance. This will allow more room for bicyclists to traverse Broadway without having to vie with the taxis in the line. The retiming and phasing of the signals at the two project intersections will be designed to more efficiently process the pedestrian, bicycle and vehicle volumes. With a more efficient processing of traffic it is the hope that the accident frequency will also be minimized due to less time waiting for green time and the like. Less driver frustration will lead to fewer rear end type accidents. Minor traffic signal improvements will be implemented by the City Traffic Department prior to the start of this project.

STATE	FED. AID. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MASS.		2008	2	5

PROJECT FILE NO.

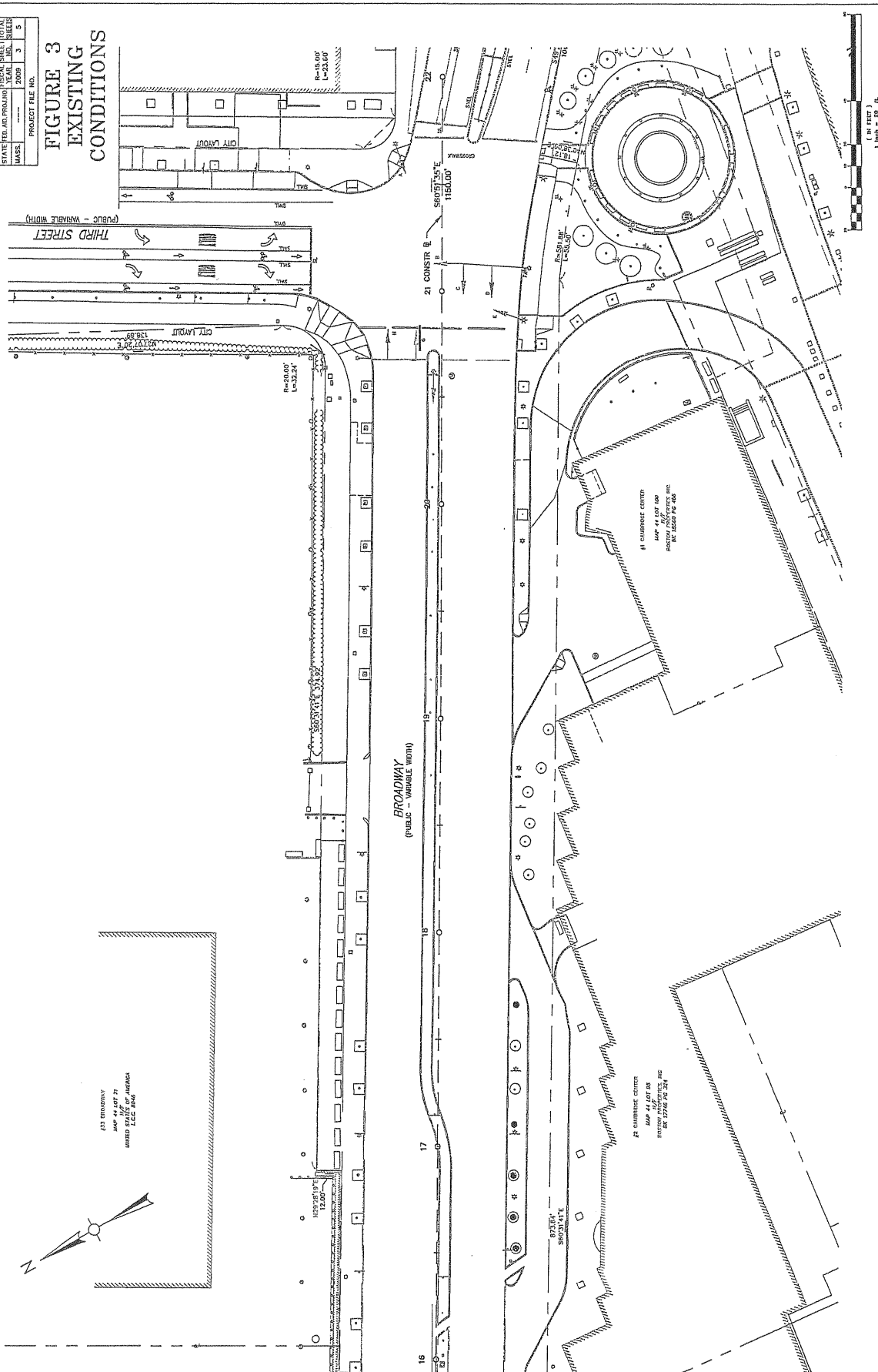
FIGURE 2  
EXISTING  
CONDITIONS



CAMBRIDGE  
BROADWAY

STATE	DATE	BY	NO.	REVISION
MASS.	2009	3	5	
PROJECT FILE NO.				

FIGURE 3  
EXISTING  
CONDITIONS



CONTINUED ON  
FIGURE 2

WESTON & SHAFER ENGINEERS, INC.

IN CHARGE  
DATE  
DATE  
CHECKED BY  
DRAWN BY

## 2.0 EXISTING CONDITIONS

### 2.1 Geometry

Broadway intersects Ames Street and Third Street as two “T” intersections. The intersections are located within the Kendall Square area of Cambridge. The current cross section of Broadway consists of two travel lanes and two bicycle lanes in each direction with a left turn lane for Broadway WBD at the Marriott Hotel entrance and at the approach to Ames Street. A similar left turn lane is provided at the approach to the Broadway/third Street intersection. A taxi queuing location on the south side of Broadway from the entrance to the Marriott Hotel towards Ames Street is currently too short to accommodate the number of taxis that service the area. As a result taxis line up from the end of their queue lane and into the right thru lane when sufficient room is not available. This leads to confusion and conflicts between taxis and bicyclists wishing to traverse Broadway. A bicycle lane exists on Broadway on the south side approaching the Ames Street intersection. This lane is against the curb/sidewalk. The roadway is split down the center by a raised, tree planted median and vertical granite curbed sidewalks line the roadway pavement area. Brick sidewalks of various widths are located on both sides of the Broadway corridor. These sidewalk/pedestrian areas have trees planted and some grass areas that are maintained by the Cambridge Housing Authority.

Ames Street is on the west end of the Broadway block and consists of a two travel lane cross section divided by a raised median. The northbound approach lane to Broadway consists of an exclusive right and exclusive left lane as well as a bicycle lane to the east of these lanes. There is a parking/loading lane against the curbline on the east side of the bicycle lane. Southbound from Broadway Ames Street consists of one travel lane against the median and an adjacent bicycle lane and parking/loading area against the curbline. Both east and west sides of Ames Street are lined with brick sidewalks and vertical granite curb.

Third Street is on the east end of the Broadway block and consists of a three lane cross section with a bicycle lane in the center of two exclusive turn lanes (left and right) and another bicycle lane against the curbline on the west side. Both sides of Third Street are lined with cement concrete sidewalks and vertical granite curb.

The pavement conditions for this section of Broadway were evaluated by WSE during a site visit. As a result, it was determined the pavement along Broadway was in fair condition with minor cracking and rutting in some locations. Similarly, it was determined that the pavement along Ames and Thirds Streets were fair to poor with cracks along the length of the roadways and localized trench patches throughout. At this time it is proposed to cold plane and overlay Broadway and make further pavement evaluation at the two project intersections.

The intersections are under the control of permanent, pre-timed traffic signals that are owned and maintained by the City. *Minor traffic signal adjustments to the project intersections will be implemented by the City prior to the start of this project.*

## 2.2 Peak Hour Traffic Volumes

Automatic Traffic Recorder (ATR) and Manual Turning Movement Counts were performed within the Broadway corridor between Ames Street and Third Street during the month of June 2009. The Average Daily Traffic (ADT) volumes have been determined from ATR counts and are listed in Table 2.1.

**Table 2.1**  
**Daily Traffic Volumes**

Location	Direction	ADT	
Broadway	Eastbound	7887	17,677
	Westbound	9790	
	Combined		
Ames Street	Northbound	3544	7378
	Southbound	3834	
	Combined		
Third Street	Northbound	5646	10,097
	Southbound	4451	
	Combined		

The peak hours for the AM and PM periods were determined from the largest sum of four 15-minute contiguous time periods from the turning movement counts. The AM peak hour occurred between 8:15 and 9:15 AM at the Third Street/Broadway intersection and between 8:00 and 9:00 AM at the Ames Street/Broadway intersection. The PM peak hour occurred between 5:00 and 6:00 PM at the Third Street/Broadway intersection and between 5:15 and 6:15 PM at the Ames Street/Broadway intersection.

These peak hour traffic volumes were used to determine existing Level of Service (LOS).

During the Peak Hour counting period pedestrians and bicyclists were also counted with the TMC's. the following are the results of these counts and are based on numbers of pedestrians or bicyclists entering the intersections during the AM and PM Peak Hours.

**Table 2.2**  
**Daily Pedestrian and Bicycle Volumes**

Location	Pedestrians	Bicycles
<b>Broadway @ Third</b>		
<b>AM Peak Hour</b>	1151	106
<b>PM Peak Hour</b>	1037	104
<b>Broadway @ Ames</b>		
<b>AM Peak Hour</b>	539	122
<b>PM Peak Hour</b>	272	89

### 2.3 Level Of Service

Level of Service (LOS) is an indicator of the operating conditions at a particular intersection or road segment during a particular hour. The LOS rating at an intersection is based upon the calculation of delay per approaching vehicle. The amount of delay is dependent upon many factors such as: traffic volumes, roadway characteristics, speed, and phasing and timing of traffic signals. There are six levels-of-service that are defined. These levels-of-service are expressed by the letters "A" through "F"; "A" being free flow, "F" being no movement. In practice, any given roadway or intersection may operate at a wide range of LOS ratings depending upon time of day, day of week, or period of year.

For non-signalized intersections, LOS is measured in terms of average vehicle delay. Delay time is an indicator of driver comfort and frustration, fuel consumption, and lost productivity due to time delays. The average delay is evaluated using a mathematical model that calculates the number of gaps in the traffic stream that will be available for each minor movement at the intersection. The minor movement consists of all side street movements plus left turns from the major street, with the basic assumption that the major street movement is not restricted by the minor street movement and the left turns from the major streets are made from left turn lanes. The definitions for the LOS ratings at non-signalized intersections are provided in Chapter 10 of the 2000 Highway Capacity Manual and are summarized in Table 2.3.

**Table 2.3**  
**Levels of Service Criteria**  
**Non-Signalized Intersections**

Levels of Service	Delay per Vehicle (Seconds)
A	< 10.0
B	10.1 To 15.0
C	15.1 To 25.0
D	25.1 To 35.0
E	35.1 To 50.0
F	> 50.0

For signalized intersections, LOS is measured in terms of average individual stopped delay. Delay time is an indicator of driver comfort and frustration, fuel consumption, and lost productivity due to time delays. Mathematically, delay time is a function of traffic progression, signal cycle length, and the ratio of volume to capacity for the lane group, approach, and intersection under study. The definitions for the LOS ratings at signalized intersections are provided in Chapter 10 of the 2000 Highway Capacity Manual and are summarized in Table 2.4.

**Table 2.4**  
**Levels of Service Criteria**  
**Signalized Intersections**

Levels of Service	Delay per Vehicle (Seconds)
A	< 10.0
B	10.1 To 20.0
C	20.1 To 35.0
D	35.1 To 55.0
E	55.1 To 80.0
F	> 80.0

### Existing Level of Service

The existing Level of Service for the Broadway @ Third Street intersection experiences an overall LOS C during the AM Peak Hour of traffic operation. The current pre-timed signal creates an acceptable LOS D for eastbound left turning vehicles and a higher LOS for all other approaches during this time period (see Table 2.5).

The intersection of Broadway @ Ames Street experiences almost 30% less vehicles during the day than the intersection at Third Street. As a result the LOS for the AM and PM Peak Hours is higher. The intersection operates at an overall LOS B during the AM and PM Peak Hour. The westbound left turn operates at a LOS E during the AM peak hour and an acceptable LOS D during the PM peak hour (see Table 2.5).

**Table 2.5**  
**Existing Level of Service (Pre-timed) 2009**  
**(Signalized Intersection w/Existing Geometry)**

Intersection	2009 AM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>29.7</b>
Eastbound Thru	B	4	16.6
Eastbound Left	D	10	54.6
Westbound Right	C	16	30.4
Westbound Thru	C	16	30.4
Southbound Left	C	4	30.0
Southbound Right	B	4	15.1
<b>Broadway @ Ames</b>	<b>B</b>		<b>17.7</b>
Eastbound Thru	B	5	10.9
Eastbound Right	B	5	10.9
Westbound Thru (2 Lns)	B	6	11.9
Westbound Left	E	9	59.8
Northbound Left	C	4	33.4
Northbound Right	A	2	5.1

Intersection	2009 PM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>31.5</b>
Eastbound Thru	C	7	23.4
Eastbound Left	E	13	62.8
Westbound Right	C	10	26.6
Westbound Thru	C	10	26.6
Southbound Left	D	13	42.0
Southbound Right	B	6	13.2
<b>Broadway @ Ames</b>	<b>B</b>		<b>19.9</b>
Eastbound Thru	B	7	17.5
Eastbound Right	B	7	17.5
Westbound Thru (2 Lns)	B	6	17.3
Westbound Left	D	6	46.5
Northbound Left	C	9	31.8
Northbound Right	A	2	3.9

Note: Queue length is 95 percentile and is measured in car lengths



**Table 2.6**  
**Existing Level of Service (Pre-timed)-2009**  
**(Signalized Intersection w/Prop Geometry)**

Intersection	2009 AM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>34.8</b>
Eastbound Thru	B	4	16.9
Eastbound Left	D	9	45.7
Westbound Right	D	14	45.8
Westbound Thru	D	24	39.6
Southbound Left	C	4	25.6
Southbound Right	B	4	12.8
<b>Broadway @ Ames</b>	<b>C</b>		<b>20.5</b>
Eastbound Thru	C	13	22.8
Eastbound Right	A	1	8.5
Westbound Thru (2 Lns)	B	7	17.8
Westbound Left	C	6	33.4
Northbound Left	C	4	33.4
Northbound Right	A	1	3.6

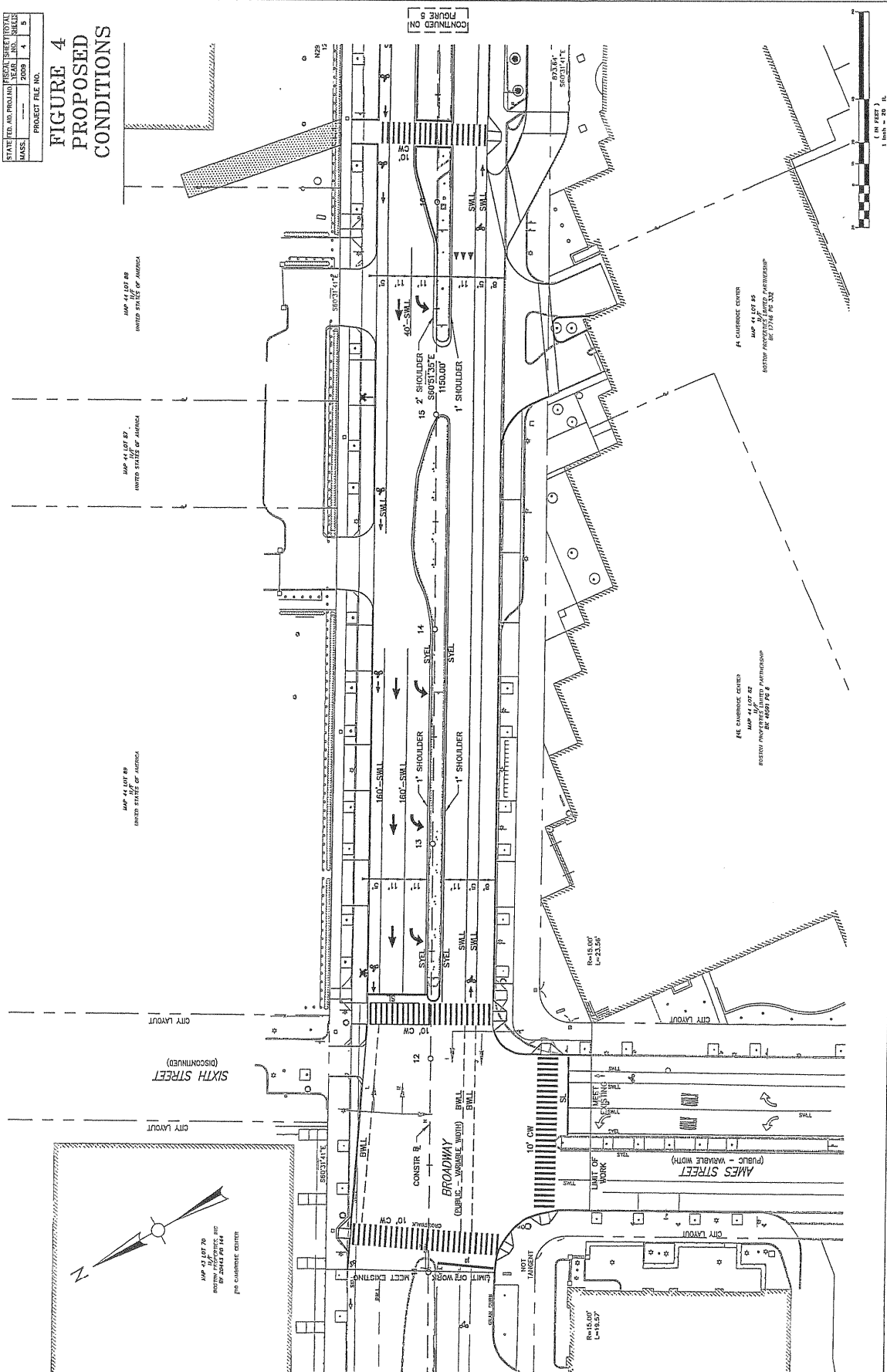
Intersection	2009 PM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>34.3</b>
Eastbound Thru	C	7	23.4
Eastbound Left	D	12	50.0
Westbound Right	C	7	34.7
Westbound Thru	D	17	37.7
Southbound Left	D	14	49.3
Southbound Right	B	6	13.2
<b>Broadway @ Ames</b>	<b>C</b>		<b>22.9</b>
Eastbound Thru	C	16	28.2
Eastbound Right	A	2	6.6
Westbound Thru (2 Lns)	B	6	18.7
Westbound Left	D	5	41.2
Northbound Left	C	9	31.8
Northbound Right	A	3	4.3

Note: Queue length is 95 percentile and is measured in car lengths

STATE	FED. AID. PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
MASS.		2009	4	5

PROJECT FILE NO.

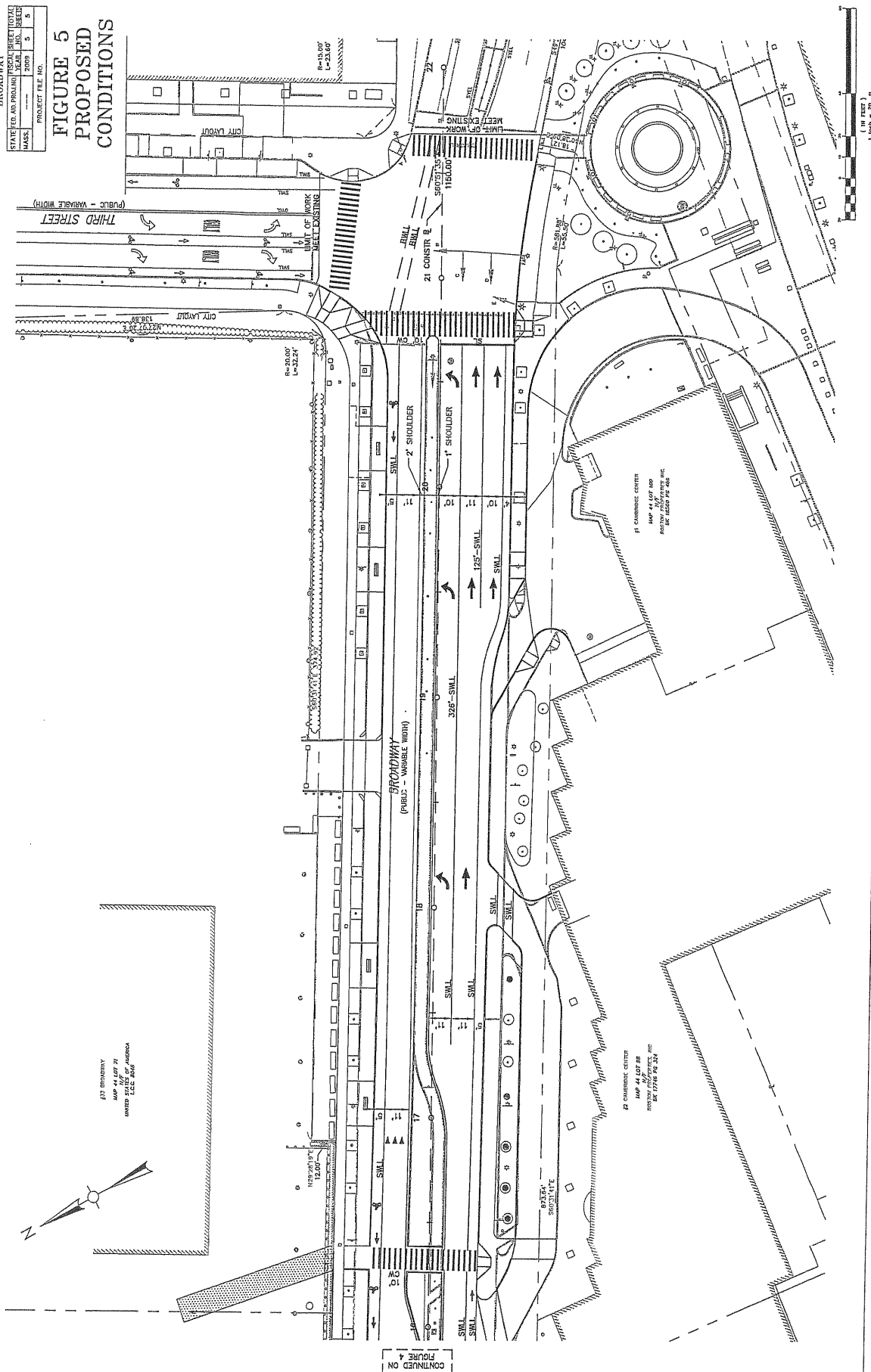
FIGURE 4  
PROPOSED  
CONDITIONS



STATE	FED. AID. PROJ. NO.	FISCAL YEAR	FISCAL SHEET NO.	TOTAL SHEETS
MASS.	---	2009	5	5

PROJECT FILE NO.

FIGURE 5  
PROPOSED  
CONDITIONS



### **3.0 FUTURE TRAFFIC CONDITIONS**

#### **3.1 Traffic Signal Warrant Analysis**

Part IV of the Manual on Uniform Traffic Control Devices (MUTCD) 2000 Millennium edition is normally utilized to perform the traffic signal warrant analysis for intersections. The MUTCD defines eight (8) criteria for which a signal may be warranted based upon vehicular or pedestrian volumes, roadway geometry, traffic accidents and/or vehicular delays. However, as the two intersections included within the Broadway corridor are currently signalized the analysis is not warranted and will be eliminated from this analysis.

#### **3.2 Intersection Analyses**

Roadway improvement projects are normally designed to accommodate traffic projected to a future design year, usually 10-20 years. A 20-year design horizon to a Design year 2029 has been selected for this project.

To provide analysis of proposed conditions, it is necessary to determine design year (2029) volumes. This was accomplished by increasing 2009 volumes based on a rate of 0.5% per year to the year 2029 (See Appendix E).

Traffic operations for this study were analyzed according to standard procedures and practices outlined in the "Highway Capacity Manual 2000" published by the Transportation Research Board.

Traffic flow through an intersection is measured in terms of capacity and LOS. Capacity of an intersection is defined for each approach as the maximum rate of flow that passes through the intersection under prevailing traffic, roadway and/or signalized conditions. LOS is the qualitative measure of the efficiency of traffic flow assigned as a result of the capacity analysis. LOS is described in terms of Levels A through F, where LOS A represents free-flow conditions and LOS F represents forced-flow conditions.

At signalized intersections, LOS is defined in terms of average delay per approach. For non-signalized intersections, reserve capacity is used to determine LOS conditions. Average delay measures the mean stopped delay experienced by vehicles entering a signalized intersection during the peak hour period. Average delay is measured for each individual approach and the intersection as a whole. The LOS tends to decrease as average delays increase.

Reserve capacity is the unused capacity of the minor approach and is typically the controlled approach. Reserve capacity is defined in vehicles per hour and indicates the number of additional vehicles using an individual approach that would bring the facility to capacity.

The following is a summary of the project intersections analyzed under Existing 2009 Signalized (Pre-timed) with Proposed Geometry and Future 2029 Signalized (Pre-timed) scenarios. The

pre-timed 2009 analysis with the Proposed Geometry was utilized to enable us to compare apples to apples when providing a side-by-side comparison.

#### **Broadway @ Third Street (2009)**

The signalized analysis of the existing AM peak hour volumes, with the proposed geometry, resulted in a LOS D for the eastbound left turn and a LOS B for the eastbound thru lane, a LOS D for the westbound right turn and a LOS D for the westbound through lane, a LOS C for the southbound left turn and a LOS B for the southbound right turn approach to the intersection. *The resultant LOS for the intersection was a LOS C.*

The signalized analysis of the existing PM peak hour volumes, with the proposed geometry, resulted in a LOS D for the eastbound left turn and a LOS C for the eastbound thru lane, a LOS C for the westbound right turn and a LOS D for the westbound through lane, a LOS D for the southbound left turn and a LOS B for the southbound right turn approach to the intersection. *The resultant LOS for the intersection was a LOS C.*

#### **Broadway @ Third Street (2029)**

With the narrowing to one through lane in each direction on Broadway the west side of the intersection now has only one receiving lane where there currently exists two. The drop of the additional lane appears to have only a minor influence on the LOS of the intersection and the evaluation shows that the intersection still operates, with the exception of several movements, at an acceptable LOS in the AM and PM Peak Hours.

The signalized analysis of the existing AM peak hour volumes, expanded to 20 years in the future, resulted in a LOS D for the eastbound left turn and a LOS B for the eastbound thru lane, a LOS E for the westbound right turn and a LOS E for the westbound through lane, a LOS C for the southbound left turn and a LOS B for the southbound right approach to the intersection. *The resultant LOS for the intersection was a LOS D.*

The signalized analysis of the existing PM peak hour volumes, expanded to 20 years in the future, resulted in a LOS D for the eastbound left turn and a LOS C for the eastbound thru lane, a LOS D for the westbound right turn and a LOS D for the westbound through lane, a LOS E for the southbound left turn and a LOS B for the southbound right approach to the intersection. *The resultant LOS for the intersection was a LOS D.*

See Table 3.1 to compare results of the analysis.

#### **Broadway @ Ames Street (2009)**

The signalized analysis of the existing AM peak hour volumes, with the proposed geometry, resulted in a LOS C for the eastbound thru lane and a LOS A for the eastbound right turn, a LOS B for the westbound thru (2 lns), a LOS C for the westbound left turn, a LOS C for the

northbound left turn and a LOS A for the northbound right turn. *The resultant LOS for the intersection was a LOS C.*

The signalized analysis of the existing PM peak hour volumes, with the proposed geometry, resulted in a LOS C for the eastbound thru lane and a LOS A for the eastbound right turn, a LOS B for the westbound thru (2 lns), a LOS D for the westbound left turn, a LOS C for the northbound left turn and a LOS A for the northbound right turn. *The resultant LOS for the intersection was a LOS C.*

### **Broadway @ Ames Street (2029)**

With the narrowing to one through lane in each direction on Broadway the east and west approaches to the intersection now have only one through lane where there are currently two. In addition, the far side of the eastbound Broadway drops a receiving lane. Two lanes currently go through from the west and in the future the Taxi Lane takes up one of the lanes. The drop of the additional lanes appear to have only a minor influence on the LOS of the intersection and the evaluation shows that the intersection still operates at an acceptable LOS in the AM and PM Peak Hours.

The signalized analysis of the existing AM peak hour volumes, expanded to 20 years in the future, resulted in a LOS C for the eastbound thru lane and a LOS A for the eastbound right turn, a LOS B for the westbound thru (2 lns), a LOS C for the westbound left turn, a LOS C for the northbound left turn and a LOS A for the northbound right turn. *The resultant LOS for the intersection was a LOS C.*

The signalized analysis of the existing PM peak hour volumes, expanded to 20 years in the future, resulted in a LOS C for the eastbound thru lane and a LOS A for the eastbound right turn, a LOS B for the westbound thru (2 lns), a LOS D for the westbound left turn, a LOS C for the northbound left turn and a LOS A for the northbound right turn. *The resultant LOS for the intersection was a LOS C.*

See Table 3.1 to compare results of the analysis.

It should be noted that, for traffic calming purposes, the LOS of an intersection may not be optimum at a higher LOS. Some delay can work in favor of the safety of pedestrians and bicyclists as long as the overall LOS is at an acceptable level.

**Table 3.1**  
**Level of Service-2009 vs. 2029**  
**(Signalized Intersection – Pre-timed/Prop Geometry)**

Intersection	2009 AM Peak Hour			2029 AM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>34.8</b>	<b>D</b>		<b>43.3</b>
Eastbound Thru	B	4	16.9	B	4	17.1
Eastbound Left	D	9	45.7	D	10	50.7
Westbound Right	D	14	45.8	E	16	55.8
Westbound Thru	D	24	39.6	E	27	55.4
Southbound Left	C	4	25.6	C	4	25.9
Southbound Right	B	4	12.8	B	4	13.0
<b>Broadway @ Ames</b>	<b>C</b>		<b>20.5</b>	<b>C</b>		<b>21.4</b>
Eastbound Thru	C	13	22.8	C	15	24.6
Eastbound Right	A	1	8.5	A	2	8.6
Westbound Thru (2 Lns)	B	7	17.8	B	8	18.4
Westbound Left	C	6	33.4	C	7	34.4
Northbound Left	C	4	33.4	C	4	33.8
Northbound Right	A	1	3.6	A	1	3.4

Intersection	2009 PM Peak Hour			2029 PM Peak Hour		
	LOS	Queue (Veh)	Delay (Sec)	LOS	Queue (Veh)	Delay (Sec)
<b>Broadway @ Third</b>	<b>C</b>		<b>34.3</b>	<b>D</b>		<b>40.3</b>
Eastbound Thru	C	7	23.4	C	8	25.1
Eastbound Left	D	12	50.0	D	13	53.2
Westbound Right	C	7	34.7	D	8	36.6
Westbound Thru	D	17	37.7	D	20	51.1
Southbound Left	D	14	49.3	E	16	60.8
Southbound Right	B	6	13.2	B	6	13.0
<b>Broadway @ Ames</b>	<b>C</b>		<b>22.9</b>	<b>C</b>		<b>24.9</b>
Eastbound Thru	C	16	28.2	C	19	32.3
Eastbound Right	A	2	6.6	A	2	6.7
Westbound Thru (2 Lns)	B	6	18.7	B	7	19.2
Westbound Left	D	5	41.2	D	6	42.8
Northbound Left	C	9	31.8	C	10	33.4
Northbound Right	A	3	4.3	A	3	6.6

Note: Queue length is 95 percentile and is measured in car lengths

### 3.3 Summary

The analysis of the existing (2009 w/ proposed geometry) and future (2029) traffic conditions indicates the pre-timed signalized intersection of Broadway @ Third Street, which presently operates at a LOS C during the AM Peak Hour and a LOS C during the PM Peak Hour, operate at an acceptable LOS while exhibiting some traffic calming traits. The proposed intersection includes the same basic geometry with the exception of one less receiving lane on westbound Broadway. The 2029 analysis indicates the pre-timed signalized intersection of Broadway @ Third Street is anticipated to operate at a LOS D during the AM Peak Hour and a LOS D during the PM Peak Hour.

The differences in delay and queue lengths for the two time periods for the intersection is only slightly elevated in most cases in the 2029 analysis and the intersection operates at an acceptable LOS.

The analysis of the existing (2009 w/ proposed geometry) and future (2029) traffic conditions indicates the pre-timed signalized intersection of Broadway @ Ames Street, which presently operates at a LOS C during the AM Peak Hour and a LOS C during the PM Peak Hour, operate at an acceptable LOS while exhibiting some traffic calming traits. The proposed intersection includes the same basic geometry with the exception of one less receiving lane on eastbound Broadway, due to the dedicated Taxi Lane, and one less westbound thru lane. The 2029 analysis indicates the pre-timed signalized intersection of Broadway @ Ames Street is anticipated to operate at a LOS C during the AM Peak Hour and a LOS C during the PM Peak Hour.

The differences in delay and queue lengths for the two time periods for the intersection is only slightly elevated in the 2029 analysis and the intersection operate at an acceptable LOS.

The exclusive bicycle lanes will be aligned to avoid conflicts with right turning vehicles. In many cases the bicycle lane will be in the center of two approach lanes to avoid this conflict. The lanes will be marked through the intersection to keep bicycles and cars within their own respective lanes.



## 4.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information and traffic volumes collected and the analysis contained herein, the following improvements are recommended at this intersection.

- Provide full-depth pavement at proposed-roadway widening or narrowing areas and cold plane the existing pavement surface and place new asphalt binder and top course to project limits for the existing paved areas to remain (w/leveling courses as required).
- Realign the walkway from the Volpe Center to the Marriott Hotel and add a new flashing pedestrian signal system at this location.
- Incorporate minor drainage improvements where necessary and connect to existing drainage system. Utilize mini rain gardens where possible to assist in keeping the runoff cleaner.
- Provide one through lane and one bicycle lane in both directions on Broadway. The dropping of one travel lane in each direction will eliminate double jeopardy, where pedestrians who step into a traffic lane in front of or between a stopped vehicle, often in a crosswalk, and then into an adjacent traffic lane are struck by an oncoming vehicle.
- Provide a dedicated Taxi Lane on the south side of Broadway from Ames Street to the Marriott Hotel entrance.
- Provide an exclusive left-turn lane from Broadway to Ames Street and from Broadway onto Third Street.
- Install new pavement markings consisting of lane lines, edge lines, stop lines, dashed lane continuance lines and arrow symbols.
- Install new warning, regulatory, and guide signs as required.

## **APPENDIX A**

### **Average Daily Traffic Counts (24 –hour ATR's)**

# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway East of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 13866

Site Code: 11620001  
11620001

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		23	98			40	151				
12:15		21	82			23	159				
12:30		18	100			20	118				
12:45		23	82	85	362	21	138	104	566	189	928
01:00		12	109			19	122				
01:15		14	94			14	132				
01:30		8	76			19	141				
01:45		3	94	37	373	17	149	69	544	106	917
02:00		9	132			7	124				
02:15		5	134			9	127				
02:30		7	115			8	144				
02:45		6	111	27	492	14	112	38	507	65	999
03:00		10	138			8	147				
03:15		3	141			8	144				
03:30		7	143			8	114				
03:45		0	110	20	532	8	152	32	557	52	1089
04:00		1	181			3	126				
04:15		4	169			14	148				
04:30		5	182			6	137				
04:45		12	178	22	710	15	143	38	554	60	1264
05:00		9	224			22	166				
05:15		15	210			36	149				
05:30		24	159			78	147				
05:45		34	156	82	749	123	171	259	633	341	1382
06:00		30	192			125	162				
06:15		33	191			157	162				
06:30		35	198			152	155				
06:45		86	172	184	753	139	150	573	629	757	1382
07:00		72	121			170	123				
07:15		66	143			158	112				
07:30		69	100			173	110				
07:45		96	109	303	473	191	116	692	461	995	934
08:00		121	87			198	67				
08:15		100	82			222	97				
08:30		124	70			285	96				
08:45		97	64	442	303	254	74	959	334	1401	637
09:00		96	80			244	84				
09:15		78	64			199	90				
09:30		91	84			193	70				
09:45		90	53	355	281	162	98	798	342	1153	623
10:00		77	69			138	89				
10:15		75	47			152	71				
10:30		77	39			117	56				
10:45		82	46	311	201	144	68	551	284	862	485
11:00		92	46			141	64				
11:15		95	35			132	52				
11:30		80	29			116	50				
11:45		81	30	348	140	126	44	515	210	863	350
Total		2216	5369			4628	5621			6844	10990
Percent		29.2%	70.8%			45.2%	54.8%			38.4%	61.6%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Broadway East of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 13866

Site Code: 11620001  
11620001

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		25	97			34	128				
12:15		26	106			35	138				
12:30		17	108			25	141				
12:45		12	80	80	391	27	120	121	527	201	918
01:00		16	127			30	132				
01:15		15	92			27	129				
01:30		15	112			25	133				
01:45		10	110	56	441	15	134	97	528	153	969
02:00		8	102			13	126				
02:15		8	116			7	122				
02:30		8	164			12	136				
02:45		4	129	28	511	7	139	39	523	67	1034
03:00		4	141			6	138				
03:15		4	168			4	133				
03:30		5	154			4	124				
03:45		2	130	15	593	11	171	25	566	40	1159
04:00		3	177			8	157				
04:15		4	189			8	164				
04:30		9	198			18	168				
04:45		12	198	28	762	15	147	49	636	77	1398
05:00		5	200			21	158				
05:15		17	229			42	137				
05:30		27	213			67	138				
05:45		25	178	74	820	125	153	255	586	329	1406
06:00		24	164			111	126				
06:15		38	170			146	154				
06:30		49	178			142	166				
06:45		74	123	185	635	164	142	563	588	748	1223
07:00		80	120			172	115				
07:15		68	114			171	105				
07:30		67	97			184	119				
07:45		97	89	312	420	180	90	707	429	1019	849
08:00		118	66			234	78				
08:15		108	75			226	75				
08:30		110	75			259	91				
08:45		91	72	427	288	209	77	928	321	1355	609
09:00		107	84			230	78				
09:15		95	73			205	83				
09:30		80	96			183	93				
09:45		95	76	377	329	146	90	764	344	1141	673
10:00		91	85			159	79				
10:15		82	67			150	86				
10:30		78	65			159	83				
10:45		78	67	329	284	120	60	588	308	917	592
11:00		103	53			125	69				
11:15		88	51			140	77				
11:30		91	43			150	57				
11:45		99	36	381	183	115	47	530	250	911	433
Total		2292	5657			4666	5606			6958	11263
Percent		28.8%	71.2%			45.4%	54.6%			38.2%	61.8%
Grand Total		4508	11026			9294	11227			13802	22253
Percent		29.0%	71.0%			45.3%	54.7%			38.3%	61.7%

ADT

ADT 18,028

AADT 18,028

# Accurate Counts 978-664-2565

Location : Broadway East of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 13866

Site Code: 11620001  
11620001

Start Time	22-Jun-09		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	85	104	80	121	*	*	*	*	*	*	82	112
01:00	*	*	*	*	37	69	56	97	*	*	*	*	*	*	46	83
02:00	*	*	*	*	27	38	28	39	*	*	*	*	*	*	28	38
03:00	*	*	*	*	20	32	15	25	*	*	*	*	*	*	18	28
04:00	*	*	*	*	22	38	28	49	*	*	*	*	*	*	25	44
05:00	*	*	*	*	82	259	74	255	*	*	*	*	*	*	78	257
06:00	*	*	*	*	184	573	185	563	*	*	*	*	*	*	184	568
07:00	*	*	*	*	303	692	312	707	*	*	*	*	*	*	308	700
08:00	*	*	*	*	<b>442</b>	<b>959</b>	<b>427</b>	<b>928</b>	*	*	*	*	*	*	<b>434</b>	<b>944</b>
09:00	*	*	*	*	355	798	377	764	*	*	*	*	*	*	366	781
10:00	*	*	*	*	311	551	329	588	*	*	*	*	*	*	320	570
11:00	*	*	*	*	348	515	381	530	*	*	*	*	*	*	364	522
12:00 PM	*	*	*	*	362	566	391	527	*	*	*	*	*	*	376	546
01:00	*	*	*	*	373	544	441	528	*	*	*	*	*	*	407	536
02:00	*	*	*	*	492	507	511	523	*	*	*	*	*	*	502	515
03:00	*	*	*	*	532	557	593	566	*	*	*	*	*	*	562	562
04:00	*	*	*	*	710	554	762	<b>636</b>	*	*	*	*	*	*	736	595
05:00	*	*	*	*	749	<b>633</b>	<b>820</b>	586	*	*	*	*	*	*	<b>784</b>	<b>610</b>
06:00	*	*	*	*	<b>753</b>	629	635	588	*	*	*	*	*	*	694	608
07:00	*	*	*	*	473	461	420	429	*	*	*	*	*	*	446	445
08:00	*	*	*	*	303	334	288	321	*	*	*	*	*	*	296	328
09:00	*	*	*	*	281	342	329	344	*	*	*	*	*	*	305	343
10:00	*	*	*	*	201	284	284	308	*	*	*	*	*	*	242	296
11:00	*	*	*	*	140	210	183	250	*	*	*	*	*	*	162	230
Lane	0	0	0	0	7585	10249	7949	10272	0	0	0	0	0	0	7765	10261
Day	0	0	0	0	17834	18221	18221	18221	0	0	0	0	0	0	18026	18026
AM Peak Vol.					08:00	08:00	08:00	08:00							08:00	08:00
					442	959	427	928							434	944
PM Peak Vol.					18:00	17:00	17:00	16:00							17:00	17:00
					753	633	820	636							784	610

Comb. Total	0	0	17834	18221	0	0	18026
ADT	ADT 18,028	ADT 18,028					

# **Accurate Counts** **978-664-2565**

Page 1

Location : Third Street North of  
Location : Broadway  
City/State: Cambridge, MA  
Counter : 2488

Site Code: 11620002  
11620002

Start Time	24-Jun-09 Wed	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	58			9	79				
12:15		6	59			2	72				
12:30		7	51			8	83				
12:45		2	44	25	212	4	64	23	298	48	510
01:00		4	47			4	64				
01:15		2	42			3	79				
01:30		1	45			7	90				
01:45		2	50	9	184	5	80	19	313	28	497
02:00		1	52			5	64				
02:15		1	71			3	78				
02:30		2	51			4	79				
02:45		5	51	9	225	4	65	16	286	25	511
03:00		3	77			2	81				
03:15		1	64			5	100				
03:30		5	91			4	82				
03:45		2	65	11	297	3	98	14	361	25	658
04:00		0	107			2	121				
04:15		9	87			2	129				
04:30		7	116			3	111				
04:45		8	111	24	421	5	141	12	502	36	923
05:00		11	119			13	152				
05:15		8	129			20	140				
05:30		12	127			31	103				
05:45		17	109	48	484	43	111	107	506	155	990
06:00		42	127			51	131				
06:15		29	111			47	139				
06:30		52	140			50	146				
06:45		51	93	174	471	66	87	214	503	388	974
07:00		71	67			58	79				
07:15		52	74			96	50				
07:30		76	50			85	69				
07:45		73	38	272	229	97	47	336	245	608	474
08:00		73	28			97	44				
08:15		73	37			119	34				
08:30		85	27			157	39				
08:45		90	36	321	128	132	37	505	154	826	282
09:00		63	37			128	53				
09:15		84	30			112	33				
09:30		61	25			102	27				
09:45		54	16	262	108	80	38	422	151	684	259
10:00		62	23			60	30				
10:15		51	16			74	26				
10:30		64	17			77	17				
10:45		62	14	239	70	51	27	262	100	501	170
11:00		44	12			69	34				
11:15		54	14			54	19				
11:30		44	9			61	15				
11:45		48	9	190	44	68	11	252	79	442	123
Total		1584	2873			2182	3498			3766	6371
Percent		35.5%	64.5%			38.4%	61.6%			37.2%	62.8%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Third Street North of  
Location : Broadway  
City/State: Cambridge, MA  
Counter : 2488

Site Code: 11620002  
11620002

Start Time	25-Jun-09 Thu	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	62			18	90				
12:15		11	72			13	82				
12:30		8	44			5	84				
12:45		6	61	32	239	9	79	45	335	77	574
01:00		3	46			6	66				
01:15		2	69			9	73				
01:30		4	55			5	79				
01:45		6	42	15	212	5	87	25	305	40	517
02:00		3	49			4	65				
02:15		2	61			2	77				
02:30		1	74			3	90				
02:45		1	65	7	249	2	90	11	322	18	571
03:00		1	89			2	89				
03:15		3	80			0	90				
03:30		2	83			3	98				
03:45		0	90	6	342	1	107	6	384	12	726
04:00		2	84			5	120				
04:15		5	88			2	113				
04:30		8	130			7	123				
04:45		8	95	23	397	9	97	23	453	46	850
05:00		9	126			7	98				
05:15		11	92			12	119				
05:30		21	130			26	126				
05:45		30	103	71	451	39	127	84	470	155	921
06:00		32	75			41	126				
06:15		46	86			58	102				
06:30		55	88			52	118				
06:45		53	70	186	319	66	65	217	411	403	730
07:00		71	50			74	65				
07:15		57	41			80	58				
07:30		67	33			99	48				
07:45		67	37	262	161	104	42	357	213	619	374
08:00		68	35			113	51				
08:15		87	31			111	33				
08:30		84	26			135	25				
08:45		69	28	308	120	130	40	489	149	797	269
09:00		90	35			116	33				
09:15		72	36			98	42				
09:30		81	38			96	66				
09:45		78	28	321	137	87	35	397	176	718	313
10:00		46	23			75	47				
10:15		54	14			49	34				
10:30		52	19			62	23				
10:45		62	26	214	82	58	31	244	135	458	217
11:00		60	16			71	26				
11:15		58	14			66	20				
11:30		58	10			69	24				
11:45		63	12	239	52	68	16	274	86	513	138
Total		1684	2761			2172	3439			3856	6200
Percent		37.9%	62.1%			38.7%	61.3%			38.3%	61.7%
Grand Total		3268	5634			4354	6937			7622	12571
Percent		36.7%	63.3%			38.6%	61.4%			37.7%	62.3%

ADT

ADT 10,096

AADT 10,096

# Accurate Counts

## 978-664-2565

Location : Third Street North of  
 Location : Broadway  
 City/State: Cambridge, MA  
 Counter : 2488

Site Code: 11620002  
 11620002

Start Time	22-Jun-09		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	*	*	*	*	*	*	*	*	*	*	*	*	*	*	28	34
01:00	*	*	*	*	25	23	32	45	*	*	*	*	*	*	12	22
02:00	*	*	9	19	9	19	15	25	*	*	*	*	*	*	8	14
03:00	*	*	9	16	9	16	7	11	*	*	*	*	*	*	8	10
04:00	*	*	11	14	11	14	6	6	*	*	*	*	*	*	24	18
05:00	*	*	24	12	24	12	23	23	*	*	*	*	*	*	60	96
06:00	*	*	48	107	48	107	71	84	*	*	*	*	*	*	180	216
07:00	*	*	174	336	174	336	186	217	*	*	*	*	*	*	267	346
08:00	*	*	272	505	272	505	262	357	*	*	*	*	*	*	314	497
09:00	*	*	321	422	321	422	308	489	*	*	*	*	*	*	292	410
10:00	*	*	262	262	262	262	321	397	*	*	*	*	*	*	226	253
11:00	*	*	239	252	239	252	214	244	*	*	*	*	*	*	214	263
12:00 PM	*	*	190	298	190	298	239	335	*	*	*	*	*	*	226	316
01:00	*	*	212	286	212	286	239	305	*	*	*	*	*	*	198	309
02:00	*	*	184	313	184	313	212	322	*	*	*	*	*	*	237	304
03:00	*	*	225	361	225	361	249	322	*	*	*	*	*	*	320	372
04:00	*	*	297	421	297	421	342	384	*	*	*	*	*	*	409	478
05:00	*	*	421	502	421	502	397	453	*	*	*	*	*	*	468	488
06:00	*	*	484	506	484	506	451	470	*	*	*	*	*	*	395	457
07:00	*	*	471	503	471	503	319	411	*	*	*	*	*	*	195	229
08:00	*	*	229	245	229	245	161	213	*	*	*	*	*	*	124	152
09:00	*	*	128	154	128	154	120	149	*	*	*	*	*	*	122	164
10:00	*	*	108	151	108	151	137	176	*	*	*	*	*	*	76	118
11:00	*	*	70	100	70	100	82	135	*	*	*	*	*	*	48	82
11:00	*	*	44	79	44	79	52	86	*	*	*	*	*	*	4451	5648
Lane	0	0	0	0	4457	5680	4445	5611	0	0	0	0	0	0	10099	5648
Day	0	0	0	0	10137	10137	10056	10056	0	0	0	0	0	0	10099	5648
AM Peak					08:00	08:00	09:00	08:00							08:00	08:00
Vol.					321	505	321	489							314	497
PM Peak					17:00	17:00	17:00	17:00							17:00	17:00
Vol.					484	506	451	470							468	488

Comb.  
Total

10099

ADT

ADT 10,096

AADT 10,096

0

0

0

ADT NB = 5646  
 ADT SB = 4451  
 ADT COMB = 10,097



# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		21	93			34	135				
12:15		19	90			28	146				
12:30		25	112			19	113				
12:45		29	93	94	388	22	129	103	523	197	911
01:00		11	108			18	121				
01:15		17	102			15	121				
01:30		10	99			17	108				
01:45		3	115	41	424	13	146	63	496	104	920
02:00		10	138			7	121				
02:15		11	116			12	110				
02:30		10	111			8	129				
02:45		8	108	39	473	15	115	42	475	81	948
03:00		11	121			10	137				
03:15		6	136			8	125				
03:30		7	125			8	130				
03:45		0	100	24	482	9	129	35	521	59	1003
04:00		2	141			2	119				
04:15		2	152			15	133				
04:30		3	144			10	151				
04:45		14	151	21	588	13	136	40	539	61	1127
05:00		7	193			18	164				
05:15		20	211			32	168				
05:30		20	163			49	185				
05:45		38	169	85	736	97	202	196	719	281	1455
06:00		40	134			114	190				
06:15		32	187			133	176				
06:30		49	171			142	174				
06:45		84	147	205	639	120	176	509	716	714	1355
07:00		71	114			166	121				
07:15		88	104			141	122				
07:30		89	99			161	107				
07:45		123	101	371	418	192	108	660	458	1031	876
08:00		126	86			174	75				
08:15		137	85			195	90				
08:30		144	72			241	89				
08:45		130	69	537	312	196	78	806	332	1343	644
09:00		112	89			194	84				
09:15		101	77			185	104				
09:30		117	92			163	82				
09:45		90	54	420	312	144	76	686	346	1106	658
10:00		93	69			121	79				
10:15		86	62			145	76				
10:30		88	44			121	55				
10:45		95	50	362	225	150	64	537	274	899	499
11:00		100	63			133	55				
11:15		101	36			128	46				
11:30		89	27			112	41				
11:45		96	29	386	155	137	43	510	185	896	340
Total		2585	5152			4187	5584			6772	10736
Percent		33.4%	66.6%			42.9%	57.1%			38.7%	61.3%

**Accurate Counts**  
**978-664-2565**

Page 2

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		30	116			25	116				
12:15		29	108			34	134				
12:30		18	123			28	125				
12:45		18	79	95	426	30	112	117	487	212	913
01:00		17	114			30	125				
01:15		21	98			19	117				
01:30		9	117			20	120				
01:45		11	128	58	457	15	116	84	478	142	935
02:00		8	105			14	122				
02:15		7	117			8	112				
02:30		8	148			9	135				
02:45		7	134	30	504	6	133	37	502	67	1006
03:00		5	129			7	150				
03:15		2	138			6	125				
03:30		5	127			3	123				
03:45		3	116	15	510	11	168	27	566	42	1076
04:00		6	151			5	131				
04:15		2	153			9	151				
04:30		7	156			16	166				
04:45		14	148	29	608	14	150	44	598	73	1206
05:00		4	166			21	185				
05:15		22	176			46	152				
05:30		17	198			54	140				
05:45		28	154	71	694	113	166	234	643	305	1337
06:00		25	165			92	132				
06:15		46	174			128	158				
06:30		59	173			140	169				
06:45		81	119	211	631	143	148	503	607	714	1238
07:00		82	115			156	112				
07:15		89	109			155	111				
07:30		90	93			165	119				
07:45		114	97	375	414	164	94	640	436	1015	850
08:00		125	74			187	95				
08:15		138	87			214	90				
08:30		143	75			235	93				
08:45		129	78	535	314	179	93	815	371	1350	685
09:00		121	91			200	83				
09:15		104	76			188	67				
09:30		109	90			153	82				
09:45		111	80	445	337	143	97	684	329	1129	666
10:00		113	93			130	82				
10:15		86	78			150	78				
10:30		87	71			152	77				
10:45		95	66	381	308	114	68	546	305	927	613
11:00		100	69			128	69				
11:15		90	56			133	73				
11:30		94	43			129	53				
11:45		97	39	381	207	126	44	516	239	897	446
Total		2626	5410			4247	5561			6873	10971
Percent		32.7%	67.3%			43.3%	56.7%			38.5%	61.5%
Grand Total		5211	10562			8434	11145			13645	21707
Percent		33.0%	67.0%			43.1%	56.9%			38.6%	61.4%

ADT

ADT 17,676

AADT 17,676

# Accurate Counts 978-664-2565

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	22-Jun-09	Tue	Wed	Thu	Fri	Sat	Sun	Week Average
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	94	95	*	*	*	94
01:00	*	*	41	58	*	*	*	50
02:00	*	*	39	30	*	*	*	34
03:00	*	*	24	15	*	*	*	20
04:00	*	*	21	29	*	*	*	25
05:00	*	*	85	71	*	*	*	78
06:00	*	*	205	211	*	*	*	208
07:00	*	*	371	375	*	*	*	373
08:00	*	*	537	535	*	*	*	536
09:00	*	*	420	445	*	*	*	432
10:00	*	*	362	381	*	*	*	372
11:00	*	*	386	510	*	*	*	384
12:00 PM	*	*	388	426	*	*	*	407
01:00	*	*	424	457	*	*	*	440
02:00	*	*	473	504	*	*	*	488
03:00	*	*	482	521	*	*	*	544
04:00	*	*	588	608	*	*	*	598
05:00	*	*	736	694	*	*	*	715
06:00	*	*	639	716	*	*	*	662
07:00	*	*	418	436	*	*	*	416
08:00	*	*	312	314	*	*	*	313
09:00	*	*	312	337	*	*	*	324
10:00	*	*	225	308	*	*	*	266
11:00	*	*	155	207	*	*	*	181
Lane	0	0	7737	8036	0	0	0	7885
Day	0	0	17508	17844	0	0	0	17677
AM Peak			08:00	08:00				08:00
Vol.			537	535				536
PM Peak			17:00	17:00				17:00
Vol.			736	694				715

Comb.  
Total

17677

ADT

ADT 17,676

AADT 17,676

17844

0

0

0

ADT EB = 7887  
ADT WB = 9790  
ADT COMB 17,677

# Accurate Counts

Page 1

Location : Mid Block Connector South (AMES ST.)  
 Location : of Broadway  
 City/State: Cambridge, MA  
 Counter : 14015

978-664-2565

Site Code: 11620004  
 11620004

Start Time	24-Jun-09 Wed	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	59			8	50				
12:15		5	65			2	73				
12:30		5	54			5	53				
12:45		1	42	21	220	2	68	17	244	38	464
01:00		4	49			5	42				
01:15		3	45			5	44				
01:30		0	46			3	39				
01:45		1	42	8	182	4	62	17	187	25	369
02:00		3	60			1	72				
02:15		0	35			1	70				
02:30		0	43			5	71				
02:45		1	33	4	171	1	93	8	306	12	477
03:00		2	45			3	66				
03:15		4	60			3	74				
03:30		0	50			3	83				
03:45		2	39	8	194	5	47	14	270	22	464
04:00		2	42			3	60				
04:15		0	58			4	70				
04:30		0	51			5	60				
04:45		5	96	7	247	7	61	19	251	26	498
05:00		0	107			7	53				
05:15		0	114			9	82				
05:30		2	115			11	85				
05:45		19	112	21	448	20	100	47	320	68	768
06:00		10	117			29	98				
06:15		23	129			29	89				
06:30		33	122			56	69				
06:45		33	76	99	444	49	72	163	328	262	772
07:00		59	49			46	69				
07:15		62	47			55	44				
07:30		48	51			54	42				
07:45		71	40	240	187	57	24	212	179	452	366
08:00		56	37			61	35				
08:15		68	26			95	39				
08:30		69	31			81	28				
08:45		76	20	269	114	67	24	304	126	573	240
09:00		72	23			48	47				
09:15		78	22			65	30				
09:30		75	24			48	35				
09:45		70	14	295	83	68	26	229	138	524	221
10:00		59	12			67	32				
10:15		64	21			54	18				
10:30		40	13			43	18				
10:45		51	13	214	59	61	26	225	94	439	153
11:00		46	17			51	18				
11:15		52	6			48	5				
11:30		47	9			48	7				
11:45		45	6	190	38	57	15	204	45	394	83
Total		1376	2387			1459	2488			2835	4875
Percent		36.6%	63.4%			37.0%	63.0%			36.8%	63.2%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Mid Block Connector South  
Location : of Broadway  
City/State: Cambridge, MA  
Counter : 14015

Site Code: 11620004  
11620004

Start Time	25-Jun-09 Thu	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		11	53			9	41				
12:15		9	49			5	42				
12:30		9	47			6	43				
12:45		7	37	36	186	10	45	30	171	66	357
01:00		4	40			9	53				
01:15		5	34			6	42				
01:30		1	36			8	34				
01:45		3	45	13	155	5	53	28	182	41	337
02:00		0	47			0	46				
02:15		2	41			4	45				
02:30		0	43			0	62				
02:45		0	53	2	184	0	61	4	214	6	398
03:00		0	47			4	78				
03:15		0	32			3	60				
03:30		0	40			3	72				
03:45		0	32	0	151	0	67	10	277	10	428
04:00		0	48			1	61				
04:15		2	44			2	63				
04:30		1	41			6	66				
04:45		2	46	5	179	3	62	12	252	17	431
05:00		1	68			3	80				
05:15		3	82			13	73				
05:30		6	69			13	94				
05:45		8	89	18	308	29	72	58	319	76	627
06:00		9	78			29	61				
06:15		28	88			32	63				
06:30		19	100			61	41				
06:45		46	49	102	315	69	49	191	214	293	529
07:00		44	44			67	58				
07:15		47	37			60	36				
07:30		51	27			61	48				
07:45		66	31	208	139	40	40	228	182	436	321
08:00		65	37			50	40				
08:15		81	19			51	23				
08:30		73	29			80	28				
08:45		82	17	301	102	62	47	243	138	544	240
09:00		89	29			63	36				
09:15		72	26			56	19				
09:30		55	18			63	28				
09:45		69	19	285	92	69	25	251	108	536	200
10:00		64	26			54	25				
10:15		40	21			62	25				
10:30		53	21			79	30				
10:45		65	17	222	85	53	22	248	102	470	187
11:00		50	14			47	16				
11:15		43	6			53	6				
11:30		43	7			63	15				
11:45		63	11	199	38	49	9	212	46	411	84
Total		1391	1934			1515	2205			2906	4139
Percent		41.8%	58.2%			40.7%	59.3%			41.2%	58.8%
Grand Total		2767	4321			2974	4693			5741	9014
Percent		39.0%	61.0%			38.8%	61.2%			38.9%	61.1%
ADT		ADT 7,378				AADT 7,378					

# Accurate Counts 978-664-2565

Site Code: 11620004  
11620004

Location : Mid Block Connector South (AMES ST)  
Location : of Broadway  
City/State: Cambridge, MA  
Counter : 14015

Start Time	22-Jun-09	Tue	Wed	Thu	Fri	Sat	Sun	Week Average
	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	21	17	36	30	*	28
01:00	*	*	8	17	13	28	*	10
02:00	*	*	4	8	2	4	*	3
03:00	*	*	8	14	0	10	*	4
04:00	*	*	7	19	5	12	*	6
05:00	*	*	21	47	18	58	*	20
06:00	*	*	99	163	102	191	*	100
07:00	*	*	240	212	208	228	*	224
08:00	*	*	269	304	301	243	*	285
09:00	*	*	295	229	285	251	*	290
10:00	*	*	214	225	222	248	*	218
11:00	*	*	190	204	199	212	*	194
12:00 PM	*	*	220	244	186	171	*	203
01:00	*	*	182	187	155	182	*	168
02:00	*	*	171	306	184	214	*	178
03:00	*	*	194	270	151	277	*	172
04:00	*	*	247	251	179	252	*	213
05:00	*	*	448	320	308	319	*	378
06:00	*	*	444	328	315	214	*	380
07:00	*	*	187	179	139	182	*	163
08:00	*	*	114	126	102	138	*	108
09:00	*	*	83	138	92	108	*	88
10:00	*	*	59	94	85	102	*	72
11:00	*	*	38	45	38	46	*	38
Lane	0	0	3763	3947	3325	3720	0	3543
Day	0	0	7710	7045	7045	7045	0	7378
AM Peak			09:00	08:00	08:00	09:00		09:00
Vol.			295	304	301	251		290
PM Peak			17:00	18:00	18:00	17:00		18:00
Vol.			448	328	315	319		380
Vol.								320

Comb. Total	0	0	7710	7045	0	0	0	7378
ADT	ADT 7,378							
			AADT 7,378					

ADT NB = 3544  
ADT SB = 3034  
ADT COMB = 7378

# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Site Code: 11620005  
11620005

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		21	92			34	120				
12:15		15	89			22	119				
12:30		18	106			16	85				
12:45		24	100	78	387	20	108	92	432	170	819
01:00		9	96			16	95				
01:15		13	70			10	100				
01:30		11	85			14	91				
01:45		8	94	41	345	12	109	52	395	93	740
02:00		9	121			7	84				
02:15		5	113			7	89				
02:30		11	102			6	94				
02:45		6	105	31	441	15	94	35	361	66	802
03:00		11	105			10	117				
03:15		7	120			5	99				
03:30		8	106			4	122				
03:45		4	98	30	429	9	127	28	465	58	894
04:00		1	117			2	106				
04:15		6	125			7	123				
04:30		5	124			4	139				
04:45		11	102	23	468	7	132	20	500	43	968
05:00		11	144			12	163				
05:15		18	164			19	189				
05:30		30	144			39	200				
05:45		40	159	99	611	62	230	132	782	231	1393
06:00		42	130			61	223				
06:15		51	114			83	209				
06:30		61	123			95	182				
06:45		111	105	265	472	90	162	329	776	594	1248
07:00		83	98			128	104				
07:15		107	85			108	108				
07:30		98	75			101	98				
07:45		136	85	424	343	128	95	465	405	889	748
08:00		147	70			136	66				
08:15		161	64			134	87				
08:30		166	87			163	75				
08:45		151	66	625	287	143	72	576	300	1201	587
09:00		143	71			149	70				
09:15		121	63			132	91				
09:30		125	71			125	68				
09:45		125	52	514	257	118	65	524	294	1038	551
10:00		99	67			86	66				
10:15		105	49			107	58				
10:30		96	39			93	44				
10:45		91	46	391	201	98	55	384	223	775	424
11:00		87	47			97	45				
11:15		101	27			93	42				
11:30		82	20			90	35				
11:45		97	31	367	125	101	38	381	160	748	285
Total		2888	4366			3018	5093			5906	9459
Percent		39.8%	60.2%			37.2%	62.8%			38.4%	61.6%

**Accurate Counts**  
**978-664-2565**

Page 2

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Site Code: 11620005  
11620005

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		22	108			25	88				
12:15		20	98			31	104				
12:30		16	99			22	104				
12:45		11	90	69	395	24	92	102	388	171	783
01:00		17	105			24	107				
01:15		12	89			17	98				
01:30		11	103			14	105				
01:45		11	109	51	406	15	92	70	402	121	808
02:00		5	102			12	96				
02:15		11	116			8	99				
02:30		8	130			9	112				
02:45		7	107	31	455	6	109	35	416	66	871
03:00		8	112			5	113				
03:15		6	104			4	100				
03:30		4	120			2	104				
03:45		3	109	21	445	7	123	18	440	39	885
04:00		7	136			4	126				
04:15		7	125			9	139				
04:30		6	118			8	126				
04:45		12	131	32	510	8	135	29	526	61	1036
05:00		10	140			10	163				
05:15		20	144			30	134				
05:30		25	146			39	124				
05:45		42	115	97	545	81	181	160	602	257	1147
06:00		30	130			57	134				
06:15		63	123			68	159				
06:30		78	125			87	170				
06:45		103	112	274	490	102	138	314	601	588	1091
07:00		86	101			122	100				
07:15		109	95			120	95				
07:30		101	92			110	102				
07:45		126	75	422	363	138	81	490	378	912	741
08:00		142	69			146	72				
08:15		163	82			172	78				
08:30		163	57			154	80				
08:45		165	71	633	279	122	74	594	304	1227	583
09:00		144	72			145	72				
09:15		120	67			138	64				
09:30		128	88			111	71				
09:45		132	67	524	294	104	84	498	291	1022	585
10:00		125	75			81	64				
10:15		85	59			101	65				
10:30		102	60			99	63				
10:45		89	68	401	262	87	60	368	252	769	514
11:00		95	52			97	48				
11:15		87	48			100	59				
11:30		94	47			99	47				
11:45		86	29	362	176	103	38	399	192	761	368
Total		2917	4620			3077	4792			5994	9412
Percent		38.7%	61.3%			39.1%	60.9%			38.9%	61.1%
Grand Total		5805	8986			6095	9885			11900	18871
Percent		39.2%	60.8%			38.1%	61.9%			38.7%	61.3%
ADT		ADT 15,386				AADT 15,386					



# Accurate Counts 978-664-2565

Site Code: 11620005  
11620005

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Start Time	22-Jun-09		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	78	92	69	102	*	*	*	*	*	*	74	97
01:00	*	*	*	*	41	52	51	70	*	*	*	*	*	*	46	61
02:00	*	*	*	*	31	35	31	35	*	*	*	*	*	*	31	35
03:00	*	*	*	*	30	28	21	18	*	*	*	*	*	*	26	23
04:00	*	*	*	*	23	20	32	29	*	*	*	*	*	*	28	24
05:00	*	*	*	*	99	132	97	160	*	*	*	*	*	*	98	146
06:00	*	*	*	*	265	329	274	314	*	*	*	*	*	*	270	322
07:00	*	*	*	*	424	465	422	490	*	*	*	*	*	*	423	478
08:00	*	*	*	*	<b>625</b>	<b>576</b>	<b>633</b>	<b>594</b>	*	*	*	*	*	*	<b>629</b>	<b>585</b>
09:00	*	*	*	*	514	524	524	498	*	*	*	*	*	*	519	511
10:00	*	*	*	*	391	384	401	368	*	*	*	*	*	*	396	376
11:00	*	*	*	*	367	381	362	399	*	*	*	*	*	*	364	390
12:00 PM	*	*	*	*	387	432	395	388	*	*	*	*	*	*	391	410
01:00	*	*	*	*	345	395	406	402	*	*	*	*	*	*	376	398
02:00	*	*	*	*	441	361	455	416	*	*	*	*	*	*	448	388
03:00	*	*	*	*	429	465	445	440	*	*	*	*	*	*	437	452
04:00	*	*	*	*	468	500	510	526	*	*	*	*	*	*	489	513
05:00	*	*	*	*	<b>611</b>	<b>782</b>	<b>545</b>	<b>602</b>	*	*	*	*	*	*	<b>578</b>	<b>692</b>
06:00	*	*	*	*	472	776	490	601	*	*	*	*	*	*	481	688
07:00	*	*	*	*	343	405	363	378	*	*	*	*	*	*	353	392
08:00	*	*	*	*	287	300	279	304	*	*	*	*	*	*	283	302
09:00	*	*	*	*	257	294	294	291	*	*	*	*	*	*	276	292
10:00	*	*	*	*	201	223	262	252	*	*	*	*	*	*	232	238
11:00	*	*	*	*	125	160	176	192	*	*	*	*	*	*	150	176
Lane	0	0	0	0	7254	8111	7537	7869	0	0	0	0	0	0	7398	7989
Day	0	0	0	0	15365		15406		0		0		0		15387	
AM Peak	08:00		08:00		08:00		08:00		08:00		08:00		08:00		08:00	
Vol.	625		576		633		594								629	
PM Peak	17:00		17:00		17:00		17:00		17:00		17:00		17:00		17:00	
Vol.	611		782		545		602								578	

Comb. Total 0 0 15365 15406 0 0 15387

ADT ADT 15,386 AADT 15,386



## **APPENDIX B**

### **Turning Movement Counts Existing 2009 Peak Hour Traffic Volume**



2009 TMC's

N/S Street : Third Street  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

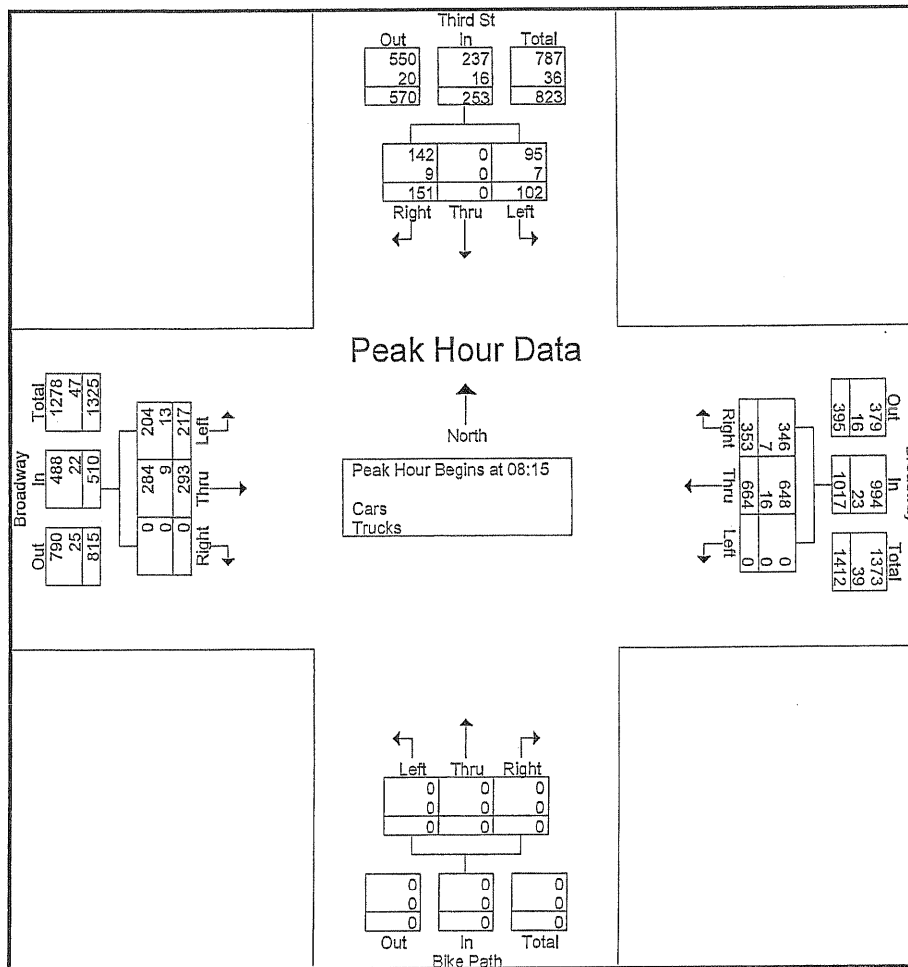
File Name : 11620001  
Site Code : 11620001  
Start Date : 6/24/2009  
Page No : 1

Groups Printed- Cars - Trucks

	Third St From North			Broadway From East			Bike Path From South			Broadway From West			Int. Total
Start Time	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:30	25	0	36	0	130	42	0	0	0	42	40	0	315
07:45	24	0	45	0	127	57	0	0	0	40	77	0	370
Total	49	0	81	0	257	99	0	0	0	82	117	0	685
08:00	33	0	29	0	146	56	0	0	0	40	90	0	394
08:15	22	0	36	0	156	71	0	0	0	65	68	0	418
08:30	30	0	35	0	192	90	0	0	0	61	84	0	492
08:45	29	0	43	0	159	102	0	0	0	58	67	0	458
Total	114	0	143	0	653	319	0	0	0	224	309	0	1762
09:00	21	0	37	0	157	90	0	0	0	33	74	0	412
09:15	19	0	41	0	146	59	0	0	0	57	55	0	377
Grand Total	203	0	302	0	1213	567	0	0	0	396	555	0	3236
Apprch %	40.2	0	59.8	0	68.1	31.9	0	0	0	41.6	58.4	0	
Total %	6.3	0	9.3	0	37.5	17.5	0	0	0	12.2	17.2	0	
Cars	188	0	285	0	1182	558	0	0	0	375	540	0	3128
% Cars	92.6	0	94.4	0	97.4	98.4	0	0	0	94.7	97.3	0	96.7
Trucks	15	0	17	0	31	9	0	0	0	21	15	0	108
% Trucks	7.4	0	5.6	0	2.6	1.6	0	0	0	5.3	2.7	0	3.3

2009 AM

	Third St From North				Broadway From East				Bike Path From South				Broadway From West				Int. Total
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:15																	
08:15	22	0	36	58	0	156	71	227	0	0	0	0	65	68	0	133	418
08:30	30	0	35	65	0	192	90	282	0	0	0	0	61	84	0	145	492
08:45	29	0	43	72	0	159	102	261	0	0	0	0	58	67	0	125	458
09:00	21	0	37	58	0	157	90	247	0	0	0	0	33	74	0	107	412
Total Volume	102	0	151	253	0	664	353	1017	0	0	0	0	217	293	0	510	1780
% App. Total	40.3	0	59.7		0	65.3	34.7		0	0	0	0	42.5	57.5	0		
PHF	.850	.000	.878	.878	.000	.865	.865	.902	.000	.000	.000	.000	.835	.872	.000	.879	.904
Cars	95	0	142	237	0	648	346	994	0	0	0	0	204	284	0	488	1719
% Cars	93.1	0	94.0	93.7	0	97.6	98.0	97.7	0	0	0	0	94.0	96.9	0	95.7	96.6
Trucks	7	0	9	16	0	16	7	23	0	0	0	0	13	9	0	22	61
% Trucks	6.9	0	6.0	6.3	0	2.4	2.0	2.3	0	0	0	0	6.0	3.1	0	4.3	3.4



Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	08:00				08:15				07:30				08:00			
+0 mins.	33	0	29	62	0	156	71	227	0	0	0	0	40	90	0	130
+15 mins.	22	0	36	58	0	192	90	282	0	0	0	0	65	68	0	133
+30 mins.	30	0	35	65	0	159	102	261	0	0	0	0	61	84	0	145
+45 mins.	29	0	43	72	0	157	90	247	0	0	0	0	58	67	0	125
Total Volume	114	0	143	257	0	664	353	1017	0	0	0	0	224	309	0	533
% App. Total	44.4	0	55.6		0	65.3	34.7		0	0	0		42	58	0	
PHF	.864	.000	.831	.892	.000	.865	.865	.902	.000	.000	.000	.000	.862	.858	.000	.919
Cars	105	0	136	241	0	648	346	994	0	0	0	0	213	298	0	511
% Cars	92.1	0	95.1	93.8	0	97.6	98	97.7	0	0	0	0	95.1	96.4	0	95.9
Trucks	9	0	7	16	0	16	7	23	0	0	0	0	11	11	0	22
% Trucks	7.9	0	4.9	6.2	0	2.4	2	2.3	0	0	0	0	4.9	3.6	0	4.1

Accurate Counts  
978-664-2565

N/S Street : Third Street  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

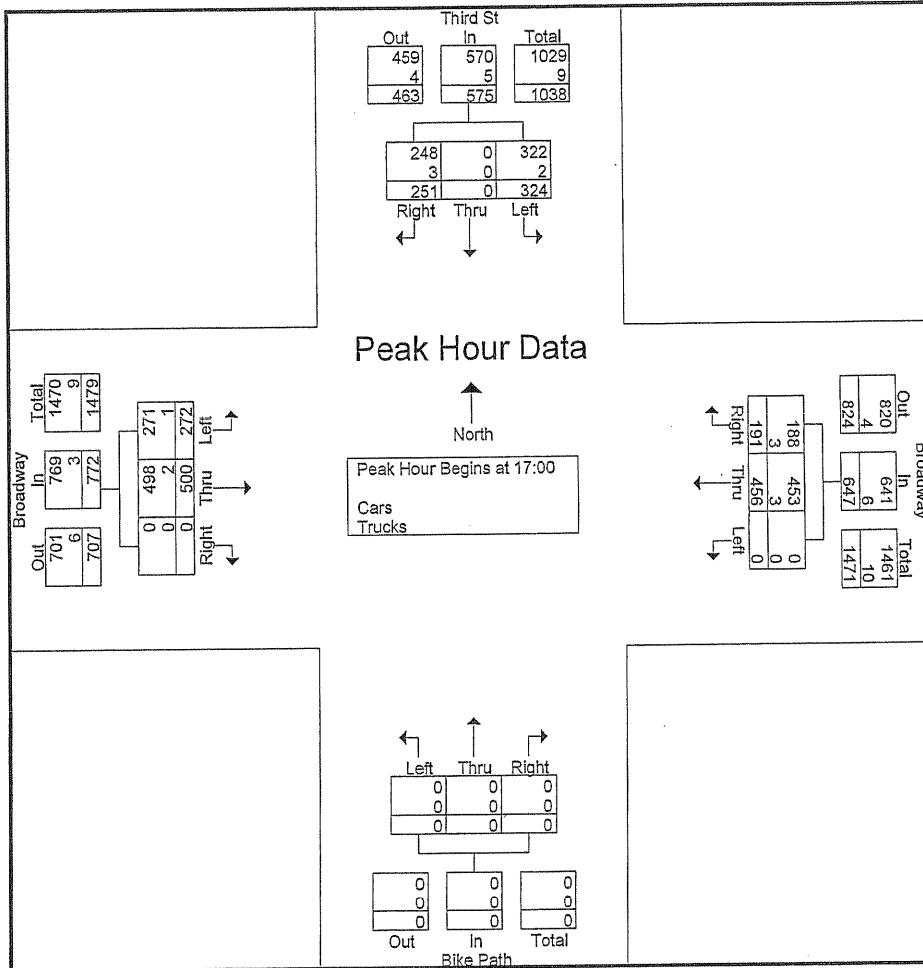
File Name : 11620001  
Site Code : 11620001  
Start Date : 6/24/2009  
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Third St From North			Broadway From East			Bike Path From South			Broadway From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:30	84	0	48	0	92	46	0	0	0	48	96	0	414
16:45	94	0	35	0	93	47	0	0	0	73	93	0	435
Total	178	0	83	0	185	93	0	0	0	121	189	0	849
17:00	91	0	40	0	121	55	0	0	0	78	141	0	526
17:15	82	0	73	0	103	53	0	0	0	78	137	0	526
17:30	78	0	82	0	101	42	0	0	0	55	108	0	466
17:45	73	0	56	0	131	41	0	0	0	61	114	0	476
Total	324	0	251	0	456	191	0	0	0	272	500	0	1994
18:00	85	0	63	0	129	47	0	0	0	61	107	0	492
18:15	86	0	52	0	124	56	0	0	0	75	116	0	509
18:30	98	0	52	0	117	35	0	0	0	102	84	0	488
18:45	72	0	43	0	123	28	0	0	0	41	100	0	407
Total	341	0	210	0	493	166	0	0	0	279	407	0	1896
19:00	46	0	30	0	98	26	0	0	0	45	82	0	327
19:15	60	0	29	0	96	21	0	0	0	24	68	0	298
Grand Total	949	0	603	0	1328	497	0	0	0	741	1246	0	5364
Apprch %	61.1	0	38.9	0	72.8	27.2	0	0	0	37.3	62.7	0	
Total %	17.7	0	11.2	0	24.8	9.3	0	0	0	13.8	23.2	0	
Cars	942	0	594	0	1312	487	0	0	0	740	1241	0	5316
% Cars	99.3	0	98.5	0	98.8	98	0	0	0	99.9	99.6	0	99.1
Trucks	7	0	9	0	16	10	0	0	0	1	5	0	48
% Trucks	0.7	0	1.5	0	1.2	2	0	0	0	0.1	0.4	0	0.9

2009 PM

	Third St From North				Broadway From East				Bike Path From South				Broadway From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	91	0	40	131	0	121	55	176	0	0	0	0	78	141	0	219	526
17:15	82	0	73	155	0	103	53	156	0	0	0	0	78	137	0	215	526
17:30	78	0	82	160	0	101	42	143	0	0	0	0	55	108	0	163	466
17:45	73	0	56	129	0	131	41	172	0	0	0	0	61	114	0	175	476
Total Volume	324	0	251	575	0	456	191	647	0	0	0	0	272	500	0	772	1994
% App. Total	56.3	0	43.7		0	70.5	29.5		0	0	0	0	35.2	64.8	0		
PHF	.890	.000	.765	.898	.000	.870	.868	.919	.000	.000	.000	.000	.872	.887	.000	.881	.948
Cars	322	0	248	570	0	453	188	641	0	0	0	0	271	498	0	769	1980
% Cars	99.4	0	98.8	99.1	0	99.3	98.4	99.1	0	0	0	0	99.6	99.6	0	99.6	99.3
Trucks	2	0	3	5	0	3	3	6	0	0	0	0	1	2	0	3	14
% Trucks	0.6	0	1.2	0.9	0	0.7	1.6	0.9	0	0	0	0	0.4	0.4	0	0.4	0.7



Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	17:15				17:45				16:30				17:00			
+0 mins.	82	0	73	155	0	131	41	172	0	0	0	0	78	141	0	219
+15 mins.	78	0	82	160	0	129	47	176	0	0	0	0	78	137	0	215
+30 mins.	73	0	56	129	0	124	56	180	0	0	0	0	55	108	0	163
+45 mins.	85	0	63	148	0	117	35	152	0	0	0	0	61	114	0	175
Total Volume	318	0	274	592	0	501	179	680	0	0	0	0	272	500	0	772
% App. Total	53.7	0	46.3		0	73.7	26.3		0	0	0		35.2	64.8	0	
PHF	.935	.000	.835	.925	.000	.956	.799	.944	.000	.000	.000	.000	.872	.887	.000	.881
Cars	316	0	268	584	0	497	175	672	0	0	0	0	271	498	0	769
% Cars	99.4	0	97.8	98.6	0	99.2	97.8	98.8	0	0	0	0	99.6	99.6	0	99.6
Trucks	2	0	6	8	0	4	4	8	0	0	0	0	1	2	0	3
% Trucks	0.6	0	2.2	1.4	0	0.8	2.2	1.2	0	0	0	0	0.4	0.4	0	0.4



N/S Street : Mid Block Connector **AMES ST.**  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

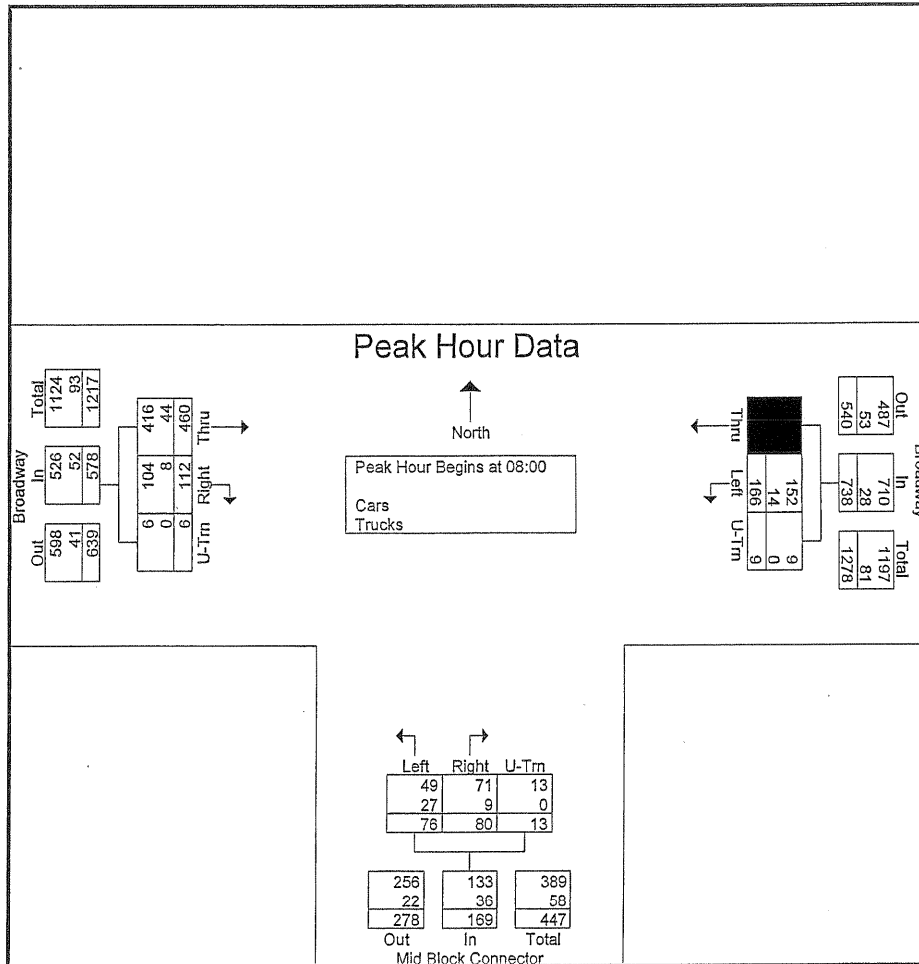
File Name : 11620002  
Site Code : 11620002  
Start Date : 6/24/2009  
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Broadway From East			Mid Block Connector From South			Broadway From West			Int. Total
	Left	Thru	U-Tn	Left	Right	U-Tn	Thru	Right	U-Tn	
07:30	31	131	1	18	22	2	79	28	0	312
07:45	39	133	4	20	19	3	95	23	0	336
Total	70	264	5	38	41	5	174	51	0	648
08:00	38	126	3	14	23	2	102	20	2	330
08:15	43	138	2	22	23	0	114	28	1	371
08:30	45	171	3	23	18	5	131	28	1	425
08:45	40	128	1	17	16	6	113	36	2	359
Total	166	563	9	76	80	13	460	112	6	1485
09:00	41	99	5	28	27	4	94	24	0	322
09:15	48	96	2	18	21	3	93	23	1	305
Grand Total	325	1022	21	160	169	25	821	210	7	2760
Apprch %	23.8	74.7	1.5	45.2	47.7	7.1	79.1	20.2	0.7	
Total %	11.8	37	0.8	5.8	6.1	0.9	29.7	7.6	0.3	
Cars	305	991	21	97	149	25	744	195	7	2534
% Cars	93.8	97	100	60.6	88.2	100	90.6	92.9	100	91.8
Trucks	20	31	0	63	20	0	77	15	0	226
% Trucks	6.2	3	0	39.4	11.8	0	9.4	7.1	0	8.2

**2009 AM**

	Broadway From East				Mid Block Connector From South				Broadway From West				
Start Time	Left	Thru	U-Trn	App. Total	Left	Right	U-Trn	App. Total	Thru	Right	U-Trn	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00													
08:00	38	126	3	167	14	23	2	39	102	20	2	124	330
08:15	43	138	2	183	22	23	0	45	114	28	1	143	371
08:30	45	171	3	219	23	18	5	46	131	28	1	160	425
08:45	40	128	1	169	17	16	6	39	113	36	2	151	359
Total Volume	166	563	9	738	76	80	13	169	460	112	6	578	1485
% App. Total	22.5	76.3	1.2		45	47.3	7.7		79.6	19.4	1		
PHF	.922	.823	.750	.842	.826	.870	.542	.918	.878	.778	.750	.903	.874
Cars	152	549	9	710	49	71	13	133	416	104	6	526	1369
% Cars	91.6	97.5	100	96.2	64.5	88.8	100	78.7	90.4	92.9	100	91.0	92.2
Trucks	14	14	0	28	27	9	0	36	44	8	0	52	116
% Trucks	8.4	2.5	0	3.8	35.5	11.3	0	21.3	9.6	7.1	0	9.0	7.8



Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:45				08:15				08:00			
+0 mins.	39	133	4	176	22	23	0	45	102	20	2	124
+15 mins.	38	126	3	167	23	18	5	46	114	28	1	143
+30 mins.	43	138	2	183	17	16	6	39	131	28	1	160
+45 mins.	45	171	3	219	28	27	4	59	113	36	2	151
Total Volume	165	568	12	745	90	84	15	189	460	112	6	578
% App. Total	22.1	76.2	1.6		47.6	44.4	7.9		79.6	19.4	1	
PHF	.917	.830	.750	.850	.804	.778	.625	.801	.878	.778	.750	.903
Cars	154	552	12	718	58	74	15	147	416	104	6	526
% Cars	93.3	97.2	100	96.4	64.4	88.1	100	77.8	90.4	92.9	100	91
Trucks	11	16	0	27	32	10	0	42	44	8	0	52
% Trucks	6.7	2.8	0	3.6	35.6	11.9	0	22.2	9.6	7.1	0	9

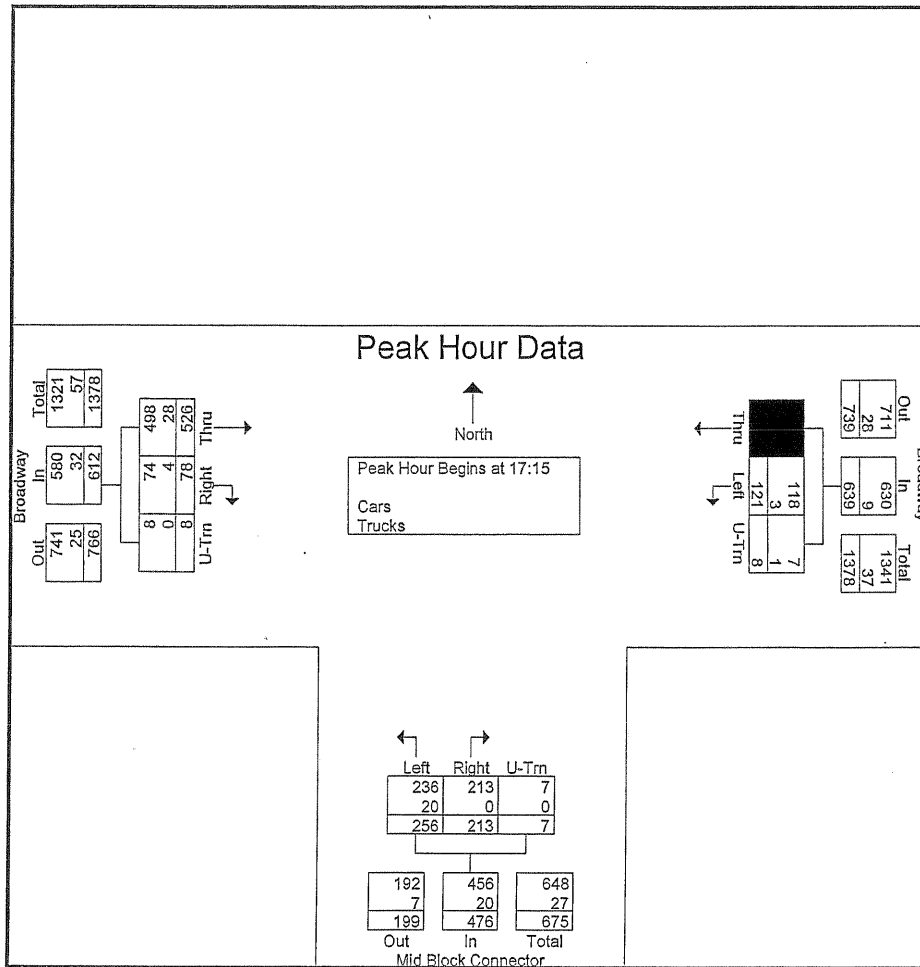
N/S Street : Mid Block Connector **AMES ST.**  
E/W Street : Broadway  
City/State : Cambridge, MA  
Weather : Rain

Groups Printed- Cars - Trucks

Start Time	Broadway From East			Mid Block Connector From South			Broadway From West			Int. Total
	Left	Thru	U-Trn	Left	Right	U-Trn	Thru	Right	U-Trn	
16:30	18	90	1	33	25	0	97	10	1	275
16:45	20	81	1	48	57	3	96	11	0	317
Total	38	171	2	81	82	3	193	21	1	592
17:00	23	105	3	57	49	0	120	10	0	367
17:15	33	116	1	52	61	1	144	18	1	427
17:30	26	128	1	62	48	2	134	19	2	422
17:45	34	128	3	78	40	2	131	21	4	441
Total	116	477	8	249	198	5	529	68	7	1657
18:00	28	138	3	64	64	2	117	20	1	437
18:15	37	129	1	74	55	4	94	14	2	410
18:30	33	103	4	64	53	1	114	15	2	389
18:45	28	116	2	30	23	2	97	17	1	316
Total	126	486	10	232	195	9	422	66	6	1552
19:00	13	125	2	45	44	3	87	15	1	335
19:15	26	134	1	27	35	2	55	19	1	300
Grand Total	319	1393	23	634	554	22	1286	189	16	4436
Apprch %	18.4	80.3	1.3	52.4	45.8	1.8	86.3	12.7	1.1	
Total %	7.2	31.4	0.5	14.3	12.5	0.5	29	4.3	0.4	
Cars	303	1382	21	571	547	22	1216	184	16	4262
% Cars	95	99.2	91.3	90.1	98.7	100	94.6	97.4	100	96.1
Trucks	16	11	2	63	7	0	70	5	0	174
% Trucks	5	0.8	8.7	9.9	1.3	0	5.4	2.6	0	3.9

2009 PM

	Broadway From East				Mid Block Connector From South				Broadway From West				
Start Time	Left	Thru	U-Trn	App. Total	Left	Right	U-Trn	App. Total	Thru	Right	U-Trn	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 17:15													
17:15	33	116	1	150	52	61	1	114	144	18	1	163	427
17:30	26	128	1	155	62	48	2	112	134	19	2	155	422
17:45	34	128	3	165	78	40	2	120	131	21	4	156	441
18:00	28	138	3	169	64	64	2	130	117	20	1	138	437
Total Volume	121	510	8	639	256	213	7	476	526	78	8	612	1727
% App. Total	18.9	79.8	1.3		53.8	44.7	1.5		85.9	12.7	1.3		
PHF	.890	.924	.667	.945	.821	.832	.875	.915	.913	.929	.500	.939	.979
Cars	118	505	7	630	236	213	7	456	498	74	8	580	1666
% Cars	97.5	99.0	87.5	98.6	92.2	100	100	95.8	94.7	94.9	100	94.8	96.5
Trucks	3	5	1	9	20	0	0	20	28	4	0	32	61
% Trucks	2.5	1.0	12.5	1.4	7.8	0	0	4.2	5.3	5.1	0	5.2	3.5



Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	17:30				17:45				17:15			
+0 mins.	26	128	1	155	78	40	2	120	144	18	1	163
+15 mins.	34	128	3	165	64	64	2	130	134	19	2	155
+30 mins.	28	138	3	169	74	55	4	133	131	21	4	156
+45 mins.	37	129	1	167	64	53	1	118	117	20	1	138
Total Volume	125	523	8	656	280	212	9	501	526	78	8	612
% App. Total	19.1	79.7	1.2		55.9	42.3	1.8		85.9	12.7	1.3	
PHF	.845	.947	.667	.970	.897	.828	.563	.942	.913	.929	.500	.939
Cars	121	519	7	647	253	210	9	472	498	74	8	580
% Cars	96.8	99.2	87.5	98.6	90.4	99.1	100	94.2	94.7	94.9	100	94.8
Trucks	4	4	1	9	27	2	0	29	28	4	0	32
% Trucks	3.2	0.8	12.5	1.4	9.6	0.9	0	5.8	5.3	5.1	0	5.2

## **APPENDIX A**

### **Average Daily Traffic Counts (24 –hour ATR's)**

# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway East of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 13866

Site Code: 11620001  
11620001

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		23	98			40	151				
12:15		21	82			23	159				
12:30		18	100			20	118				
12:45		23	82	85	362	21	138	104	566	189	928
01:00		12	109			19	122				
01:15		14	94			14	132				
01:30		8	76			19	141				
01:45		3	94	37	373	17	149	69	544	106	917
02:00		9	132			7	124				
02:15		5	134			9	127				
02:30		7	115			8	144				
02:45		6	111	27	492	14	112	38	507	65	999
03:00		10	138			8	147				
03:15		3	141			8	144				
03:30		7	143			8	114				
03:45		0	110	20	532	8	152	32	557	52	1089
04:00		1	181			3	126				
04:15		4	169			14	148				
04:30		5	182			6	137				
04:45		12	178	22	710	15	143	38	554	60	1264
05:00		9	224			22	166				
05:15		15	210			36	149				
05:30		24	159			78	147				
05:45		34	156	82	749	123	171	259	633	341	1382
06:00		30	192			125	162				
06:15		33	191			157	162				
06:30		35	198			152	155				
06:45		86	172	184	753	139	150	573	629	757	1382
07:00		72	121			170	123				
07:15		66	143			158	112				
07:30		69	100			173	110				
07:45		96	109	303	473	191	116	692	461	995	934
08:00		121	87			198	67				
08:15		100	82			222	97				
08:30		124	70			285	96				
08:45		97	64	442	303	254	74	959	334	1401	637
09:00		96	80			244	84				
09:15		78	64			199	90				
09:30		91	84			193	70				
09:45		90	53	355	281	162	98	798	342	1153	623
10:00		77	69			138	89				
10:15		75	47			152	71				
10:30		77	39			117	56				
10:45		82	46	311	201	144	68	551	284	862	485
11:00		92	46			141	64				
11:15		95	35			132	52				
11:30		80	29			116	50				
11:45		81	30	348	140	126	44	515	210	863	350
Total		2216	5369			4628	5621			6844	10990
Percent		29.2%	70.8%			45.2%	54.8%			38.4%	61.6%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Broadway East of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 13866

Site Code: 11620001  
11620001

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		25	97			34	128				
12:15		26	106			35	138				
12:30		17	108			25	141				
12:45		12	80	80	391	27	120	121	527	201	918
01:00		16	127			30	132				
01:15		15	92			27	129				
01:30		15	112			25	133				
01:45		10	110	56	441	15	134	97	528	153	969
02:00		8	102			13	126				
02:15		8	116			7	122				
02:30		8	164			12	136				
02:45		4	129	28	511	7	139	39	523	67	1034
03:00		4	141			6	138				
03:15		4	168			4	133				
03:30		5	154			4	124				
03:45		2	130	15	593	11	171	25	566	40	1159
04:00		3	177			8	157				
04:15		4	189			8	164				
04:30		9	198			18	168				
04:45		12	198	28	762	15	147	49	636	77	1398
05:00		5	200			21	158				
05:15		17	229			42	137				
05:30		27	213			67	138				
05:45		25	178	74	820	125	153	255	586	329	1406
06:00		24	164			111	126				
06:15		38	170			146	154				
06:30		49	178			142	166				
06:45		74	123	185	635	164	142	563	588	748	1223
07:00		80	120			172	115				
07:15		68	114			171	105				
07:30		67	97			184	119				
07:45		97	89	312	420	180	90	707	429	1019	849
08:00		118	66			234	78				
08:15		108	75			226	75				
08:30		110	75			259	91				
08:45		91	72	427	288	209	77	928	321	1355	609
09:00		107	84			230	78				
09:15		95	73			205	83				
09:30		80	96			183	93				
09:45		95	76	377	329	146	90	764	344	1141	673
10:00		91	85			159	79				
10:15		82	67			150	86				
10:30		78	65			159	83				
10:45		78	67	329	284	120	60	588	308	917	592
11:00		103	53			125	69				
11:15		88	51			140	77				
11:30		91	43			150	57				
11:45		99	36	381	183	115	47	530	250	911	433
Total		2292	5657			4666	5606			6958	11263
Percent		28.8%	71.2%			45.4%	54.6%			38.2%	61.8%
Grand Total		4508	11026			9294	11227			13802	22253
Percent		29.0%	71.0%			45.3%	54.7%			38.3%	61.7%

ADT

ADT 18,028

AADT 18,028

Site Code: 11620001  
11620001

Start Time	22-Jun-09		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	85	104	80	121	*	*	*	*	*	*	82	112
01:00	*	*	*	*	37	69	56	97	*	*	*	*	*	*	46	83
02:00	*	*	*	*	27	38	28	39	*	*	*	*	*	*	28	38
03:00	*	*	*	*	20	32	15	25	*	*	*	*	*	*	18	28
04:00	*	*	*	*	22	38	28	49	*	*	*	*	*	*	25	44
05:00	*	*	*	*	82	259	74	255	*	*	*	*	*	*	78	257
06:00	*	*	*	*	184	573	185	563	*	*	*	*	*	*	184	568
07:00	*	*	*	*	303	692	312	707	*	*	*	*	*	*	308	700
08:00	*	*	*	*	442	959	427	928	*	*	*	*	*	*	434	944
09:00	*	*	*	*	355	798	377	764	*	*	*	*	*	*	366	781
10:00	*	*	*	*	311	551	329	588	*	*	*	*	*	*	320	570
11:00	*	*	*	*	348	515	381	530	*	*	*	*	*	*	364	522
12:00 PM	*	*	*	*	362	566	391	527	*	*	*	*	*	*	376	546
01:00	*	*	*	*	373	544	441	528	*	*	*	*	*	*	407	536
02:00	*	*	*	*	492	507	511	523	*	*	*	*	*	*	502	515
03:00	*	*	*	*	532	557	593	566	*	*	*	*	*	*	562	562
04:00	*	*	*	*	710	554	762	636	*	*	*	*	*	*	736	595
05:00	*	*	*	*	749	633	820	586	*	*	*	*	*	*	784	610
06:00	*	*	*	*	753	629	635	588	*	*	*	*	*	*	694	608
07:00	*	*	*	*	473	461	420	429	*	*	*	*	*	*	446	445
08:00	*	*	*	*	303	334	288	321	*	*	*	*	*	*	296	328
09:00	*	*	*	*	281	342	329	344	*	*	*	*	*	*	305	343
10:00	*	*	*	*	201	284	284	308	*	*	*	*	*	*	242	296
11:00	*	*	*	*	140	210	183	250	*	*	*	*	*	*	162	230
Lane	0	0	0	0	7585	10249	7949	10272	0	0	0	0	0	0	7765	10261
Day	0	0	0	0	17834	18221	18221	18026	0	0	0	0	0	0	18026	18026
AM Peak					08:00	08:00	08:00	08:00							08:00	08:00
Vol.					442	959	427	928							434	944
PM Peak					18:00	17:00	17:00	16:00							17:00	17:00
Vol.					753	633	820	636							784	610

Comb.	0	0	17834	18221	0	0	18026
Total							
ADT	ADT 18,028	AADT 18,028					



# **Accurate Counts** **978-664-2565**

Page 1

Location : Third Street North of  
Location : Broadway  
City/State: Cambridge, MA  
Counter : 2488

Site Code: 11620002  
11620002

Start Time	24-Jun-09 Wed	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	58			9	79				
12:15		6	59			2	72				
12:30		7	51			8	83				
12:45		2	44	25	212	4	64	23	298	48	510
01:00		4	47			4	64				
01:15		2	42			3	79				
01:30		1	45			7	90				
01:45		2	50	9	184	5	80	19	313	28	497
02:00		1	52			5	64				
02:15		1	71			3	78				
02:30		2	51			4	79				
02:45		5	51	9	225	4	65	16	286	25	511
03:00		3	77			2	81				
03:15		1	64			5	100				
03:30		5	91			4	82				
03:45		2	65	11	297	3	98	14	361	25	658
04:00		0	107			2	121				
04:15		9	87			2	129				
04:30		7	116			3	111				
04:45		8	111	24	421	5	141	12	502	36	923
05:00		11	119			13	152				
05:15		8	129			20	140				
05:30		12	127			31	103				
05:45		17	109	48	484	43	111	107	506	155	990
06:00		42	127			51	131				
06:15		29	111			47	139				
06:30		52	140			50	146				
06:45		51	93	174	471	66	87	214	503	388	974
07:00		71	67			58	79				
07:15		52	74			96	50				
07:30		76	50			85	69				
07:45		73	38	272	229	97	47	336	245	608	474
08:00		73	28			97	44				
08:15		73	37			119	34				
08:30		85	27			157	39				
08:45		90	36	321	128	132	37	505	154	826	282
09:00		63	37			128	53				
09:15		84	30			112	33				
09:30		61	25			102	27				
09:45		54	16	262	108	80	38	422	151	684	259
10:00		62	23			60	30				
10:15		51	16			74	26				
10:30		64	17			77	17				
10:45		62	14	239	70	51	27	262	100	501	170
11:00		44	12			69	34				
11:15		54	14			54	19				
11:30		44	9			61	15				
11:45		48	9	190	44	68	11	252	79	442	123
Total		1584	2873			2182	3498			3766	6371
Percent		35.5%	64.5%			38.4%	61.6%			37.2%	62.8%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Third Street North of  
Location : Broadway  
City/State: Cambridge, MA  
Counter : 2488

Site Code: 11620002  
11620002

Start Time	25-Jun-09 Thu	SB		Hour Totals		NB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		7	62			18	90				
12:15		11	72			13	82				
12:30		8	44			5	84				
12:45		6	61	32	239	9	79	45	335	77	574
01:00		3	46			6	66				
01:15		2	69			9	73				
01:30		4	55			5	79				
01:45		6	42	15	212	5	87	25	305	40	517
02:00		3	49			4	65				
02:15		2	61			2	77				
02:30		1	74			3	90				
02:45		1	65	7	249	2	90	11	322	18	571
03:00		1	89			2	89				
03:15		3	80			0	90				
03:30		2	83			3	98				
03:45		0	90	6	342	1	107	6	384	12	726
04:00		2	84			5	120				
04:15		5	88			2	113				
04:30		8	130			7	123				
04:45		8	95	23	397	9	97	23	453	46	850
05:00		9	126			7	98				
05:15		11	92			12	119				
05:30		21	130			26	126				
05:45		30	103	71	451	39	127	84	470	155	921
06:00		32	75			41	126				
06:15		46	86			58	102				
06:30		55	88			52	118				
06:45		53	70	186	319	66	65	217	411	403	730
07:00		71	50			74	65				
07:15		57	41			80	58				
07:30		67	33			99	48				
07:45		67	37	262	161	104	42	357	213	619	374
08:00		68	35			113	51				
08:15		87	31			111	33				
08:30		84	26			135	25				
08:45		69	28	308	120	130	40	489	149	797	269
09:00		90	35			116	33				
09:15		72	36			98	42				
09:30		81	38			96	66				
09:45		78	28	321	137	87	35	397	176	718	313
10:00		46	23			75	47				
10:15		54	14			49	34				
10:30		52	19			62	23				
10:45		62	26	214	82	58	31	244	135	458	217
11:00		60	16			71	26				
11:15		58	14			66	20				
11:30		58	10			69	24				
11:45		63	12	239	52	68	16	274	86	513	138
Total		1684	2761			2172	3439			3856	6200
Percent		37.9%	62.1%			38.7%	61.3%			38.3%	61.7%
Grand Total		3268	5634			4354	6937			7622	12571
Percent		36.7%	63.3%			38.6%	61.4%			37.7%	62.3%

ADT

ADT 10,096

AADT 10,096

# Accurate Counts 978-664-2565

Location : Third Street North of  
Location : Broadway  
City/State: Cambridge, MA  
Counter : 2488

Site Code: 11620002  
11620002

Start Time	22-Jun-09	Tue	Wed	Thu	Fri	Sat	Sun	Week Average
	SB	NB	SB	NB	SB	NB	SB	NB
12:00 AM	*	*	25	32	45	*	*	28
01:00	*	*	9	15	25	*	*	12
02:00	*	*	9	7	11	*	*	8
03:00	*	*	11	6	6	*	*	8
04:00	*	*	24	23	23	*	*	24
05:00	*	*	48	71	84	*	*	60
06:00	*	*	174	186	217	*	*	180
07:00	*	*	272	262	357	*	*	267
08:00	*	*	321	308	489	*	*	314
09:00	*	*	262	321	397	*	*	292
10:00	*	*	239	214	244	*	*	226
11:00	*	*	190	239	274	*	*	214
12:00 PM	*	*	212	239	335	*	*	226
01:00	*	*	184	212	305	*	*	198
02:00	*	*	225	249	322	*	*	237
03:00	*	*	297	342	384	*	*	320
04:00	*	*	421	397	453	*	*	409
05:00	*	*	484	451	470	*	*	468
06:00	*	*	471	319	411	*	*	395
07:00	*	*	229	161	213	*	*	195
08:00	*	*	128	120	149	*	*	124
09:00	*	*	108	137	176	*	*	122
10:00	*	*	70	82	135	*	*	76
11:00	*	*	44	52	86	*	*	48
Lane	0	0	4457	4445	5611	0	0	4451
Day	0	0	10137	10056	5611	0	0	10099
AM Peak			08:00	09:00	08:00			08:00
Vol.			321	321	489			314
PM Peak			17:00	17:00	17:00			17:00
Vol.			484	451	470			468

Comb. Total	0	0	10137	10056	0	0	0	10099
ADT	ADT 10,096	ADT 10,096	AADT 10,096					

ADT NB = 5646  
ADT SB = 4451  
ADT COMB = 10,097

# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		21	93			34	135				
12:15		19	90			28	146				
12:30		25	112			19	113				
12:45		29	93	94	388	22	129	103	523	197	911
01:00		11	108			18	121				
01:15		17	102			15	121				
01:30		10	99			17	108				
01:45		3	115	41	424	13	146	63	496	104	920
02:00		10	138			7	121				
02:15		11	116			12	110				
02:30		10	111			8	129				
02:45		8	108	39	473	15	115	42	475	81	948
03:00		11	121			10	137				
03:15		6	136			8	125				
03:30		7	125			8	130				
03:45		0	100	24	482	9	129	35	521	59	1003
04:00		2	141			2	119				
04:15		2	152			15	133				
04:30		3	144			10	151				
04:45		14	151	21	588	13	136	40	539	61	1127
05:00		7	193			18	164				
05:15		20	211			32	168				
05:30		20	163			49	185				
05:45		38	169	85	736	97	202	196	719	281	1455
06:00		40	134			114	190				
06:15		32	187			133	176				
06:30		49	171			142	174				
06:45		84	147	205	639	120	176	509	716	714	1355
07:00		71	114			166	121				
07:15		88	104			141	122				
07:30		89	99			161	107				
07:45		123	101	371	418	192	108	660	458	1031	876
08:00		126	86			174	75				
08:15		137	85			195	90				
08:30		144	72			241	89				
08:45		130	69	537	312	196	78	806	332	1343	644
09:00		112	89			194	84				
09:15		101	77			185	104				
09:30		117	92			163	82				
09:45		90	54	420	312	144	76	686	346	1106	658
10:00		93	69			121	79				
10:15		86	62			145	76				
10:30		88	44			121	55				
10:45		95	50	362	225	150	64	537	274	899	499
11:00		100	63			133	55				
11:15		101	36			128	46				
11:30		89	27			112	41				
11:45		96	29	386	155	137	43	510	185	896	340
Total		2585	5152			4187	5584			6772	10736
Percent		33.4%	66.6%			42.9%	57.1%			38.7%	61.3%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		30	116			25	116				
12:15		29	108			34	134				
12:30		18	123			28	125				
12:45		18	79	95	426	30	112	117	487	212	913
01:00		17	114			30	125				
01:15		21	98			19	117				
01:30		9	117			20	120				
01:45		11	128	58	457	15	116	84	478	142	935
02:00		8	105			14	122				
02:15		7	117			8	112				
02:30		8	148			9	135				
02:45		7	134	30	504	6	133	37	502	67	1006
03:00		5	129			7	150				
03:15		2	138			6	125				
03:30		5	127			3	123				
03:45		3	116	15	510	11	168	27	566	42	1076
04:00		6	151			5	131				
04:15		2	153			9	151				
04:30		7	156			16	166				
04:45		14	148	29	608	14	150	44	598	73	1206
05:00		4	166			21	185				
05:15		22	176			46	152				
05:30		17	198			54	140				
05:45		28	154	71	694	113	166	234	643	305	1337
06:00		25	165			92	132				
06:15		46	174			128	158				
06:30		59	173			140	169				
06:45		81	119	211	631	143	148	503	607	714	1238
07:00		82	115			156	112				
07:15		89	109			155	111				
07:30		90	93			165	119				
07:45		114	97	375	414	164	94	640	436	1015	850
08:00		125	74			187	95				
08:15		138	87			214	90				
08:30		143	75			235	93				
08:45		129	78	535	314	179	93	815	371	1350	685
09:00		121	91			200	83				
09:15		104	76			188	67				
09:30		109	90			153	82				
09:45		111	80	445	337	143	97	684	329	1129	666
10:00		113	93			130	82				
10:15		86	78			150	78				
10:30		87	71			152	77				
10:45		95	66	381	308	114	68	546	305	927	613
11:00		100	69			128	69				
11:15		90	56			133	73				
11:30		94	43			129	53				
11:45		97	39	381	207	126	44	516	239	897	446
Total		2626	5410			4247	5561			6873	10971
Percent		32.7%	67.3%			43.3%	56.7%			38.5%	61.5%
Grand Total		5211	10562			8434	11145			13645	21707
Percent		33.0%	67.0%			43.1%	56.9%			38.6%	61.4%

ADT

ADT 17,676

AADT 17,676

# Accurate Counts 978-664-2565

Location : Broadway West of  
Location : Third Street  
City/State: Cambridge, MA  
Counter : 16427

Site Code: 11620003  
11620003

Start Time	22-Jun-09	Tue	Wed	Thu	Fri	Sat	Sun	Week Average
	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	94	103	117	*	*	94
01:00	*	*	41	63	84	*	*	50
02:00	*	*	39	42	37	*	*	74
03:00	*	*	24	35	27	*	*	34
04:00	*	*	21	40	44	*	*	40
05:00	*	*	85	196	234	*	*	20
06:00	*	*	205	509	503	*	*	31
07:00	*	*	371	660	640	*	*	42
08:00	*	*	<b>537</b>	<b>806</b>	<b>815</b>	*	*	78
09:00	*	*	420	686	684	*	*	215
10:00	*	*	362	537	546	*	*	208
11:00	*	*	386	510	516	*	*	373
12:00 PM	*	*	388	523	487	*	*	<b>536</b>
01:00	*	*	424	496	478	*	*	432
02:00	*	*	473	475	502	*	*	372
03:00	*	*	482	521	566	*	*	384
04:00	*	*	588	539	598	*	*	407
05:00	*	*	<b>736</b>	<b>719</b>	<b>643</b>	*	*	440
06:00	*	*	639	716	607	*	*	488
07:00	*	*	418	458	436	*	*	496
08:00	*	*	312	332	371	*	*	598
09:00	*	*	322	346	329	*	*	<b>715</b>
10:00	*	*	225	274	305	*	*	635
11:00	*	*	155	185	239	*	*	662
Lane	0	0	7737	9771	8036	0	0	7885
Day	0	0	17508	17844	9808	0	0	17677
AM Peak			08:00	08:00	08:00			08:00
Vol.			537	806	815			536
PM Peak			17:00	17:00	17:00			17:00
Vol.			736	719	694			715
								681

Comb. Total 0 17508 17844 0 0 0 17677

ADT ADT 17,676 AADT 17,676

ADT EB = 7887  
ADT WB = 9790  
ADT COMB 17,677

# Accurate Counts

Page 1

Location : Mid Block Connector South (AMES ST.)  
 Location : of Broadway  
 City/State: Cambridge, MA  
 Counter : 14015

978-664-2565

Site Code: 11620004  
 11620004

Start Time	24-Jun-09 Wed	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		10	59			8	50				
12:15		5	65			2	73				
12:30		5	54			5	53				
12:45		1	42	21	220	2	68	17	244	38	464
01:00		4	49			5	42				
01:15		3	45			5	44				
01:30		0	46			3	39				
01:45		1	42	8	182	4	62	17	187	25	369
02:00		3	60			1	72				
02:15		0	35			1	70				
02:30		0	43			5	71				
02:45		1	33	4	171	1	93	8	306	12	477
03:00		2	45			3	66				
03:15		4	60			3	74				
03:30		0	50			3	83				
03:45		2	39	8	194	5	47	14	270	22	464
04:00		2	42			3	60				
04:15		0	58			4	70				
04:30		0	51			5	60				
04:45		5	96	7	247	7	61	19	251	26	498
05:00		0	107			7	53				
05:15		0	114			9	82				
05:30		2	115			11	85				
05:45		19	112	21	448	20	100	47	320	68	768
06:00		10	117			29	98				
06:15		23	129			29	89				
06:30		33	122			56	69				
06:45		33	76	99	444	49	72	163	328	262	772
07:00		59	49			46	69				
07:15		62	47			55	44				
07:30		48	51			54	42				
07:45		71	40	240	187	57	24	212	179	452	366
08:00		56	37			61	35				
08:15		68	26			95	39				
08:30		69	31			81	28				
08:45		76	20	269	114	67	24	304	126	573	240
09:00		72	23			48	47				
09:15		78	22			65	30				
09:30		75	24			48	35				
09:45		70	14	295	83	68	26	229	138	524	221
10:00		59	12			67	32				
10:15		64	21			54	18				
10:30		40	13			43	18				
10:45		51	13	214	59	61	26	225	94	439	153
11:00		46	17			51	18				
11:15		52	6			48	5				
11:30		47	9			48	7				
11:45		45	6	190	38	57	15	204	45	394	83
Total		1376	2387			1459	2488			2835	4875
Percent		36.6%	63.4%			37.0%	63.0%			36.8%	63.2%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Mid Block Connector South  
Location : of Broadway  
City/State: Cambridge, MA  
Counter : 14015

Site Code: 11620004  
11620004

Start Time	25-Jun-09 Thu	NB		Hour Totals		SB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		11	53			9	41				
12:15		9	49			5	42				
12:30		9	47			6	43				
12:45		7	37	36	186	10	45	30	171	66	357
01:00		4	40			9	53				
01:15		5	34			6	42				
01:30		1	36			8	34				
01:45		3	45	13	155	5	53	28	182	41	337
02:00		0	47			0	46				
02:15		2	41			4	45				
02:30		0	43			0	62				
02:45		0	53	2	184	0	61	4	214	6	398
03:00		0	47			4	78				
03:15		0	32			3	60				
03:30		0	40			3	72				
03:45		0	32	0	151	0	67	10	277	10	428
04:00		0	48			1	61				
04:15		2	44			2	63				
04:30		1	41			6	66				
04:45		2	46	5	179	3	62	12	252	17	431
05:00		1	68			3	80				
05:15		3	82			13	73				
05:30		6	69			13	94				
05:45		8	89	18	308	29	72	58	319	76	627
06:00		9	78			29	61				
06:15		28	88			32	63				
06:30		19	100			61	41				
06:45		46	49	102	315	69	49	191	214	293	529
07:00		44	44			67	58				
07:15		47	37			60	36				
07:30		51	27			61	48				
07:45		66	31	208	139	40	40	228	182	436	321
08:00		65	37			50	40				
08:15		81	19			51	23				
08:30		73	29			80	28				
08:45		82	17	301	102	62	47	243	138	544	240
09:00		89	29			63	36				
09:15		72	26			56	19				
09:30		55	18			63	28				
09:45		69	19	285	92	69	25	251	108	536	200
10:00		64	26			54	25				
10:15		40	21			62	25				
10:30		53	21			79	30				
10:45		65	17	222	85	53	22	248	102	470	187
11:00		50	14			47	16				
11:15		43	6			53	6				
11:30		43	7			63	15				
11:45		63	11	199	38	49	9	212	46	411	84
Total		1391	1934			1515	2205			2906	4139
Percent		41.8%	58.2%			40.7%	59.3%			41.2%	58.8%
Grand Total		2767	4321			2974	4693			5741	9014
Percent		39.0%	61.0%			38.8%	61.2%			38.9%	61.1%

ADT

ADT 7,378

AADT 7,378



# Accurate Counts 978-664-2565

Location : Mid Block Connector South (AMES ST)  
 Location : of Broadway  
 City/State: Cambridge, MA  
 Counter : 14015

Site Code: 11620004  
 11620004

Start Time	22-Jun-09	Tue	Wed	Thu	Fri	Sat	Sun	Week Average
	NB	SB	NB	SB	NB	SB	NB	SB
12:00 AM	*	*	21	36	*	*	*	28
01:00	*	*	8	13	*	*	*	10
02:00	*	*	4	2	*	*	*	3
03:00	*	*	8	0	*	*	*	4
04:00	*	*	7	5	*	*	*	6
05:00	*	*	21	18	*	*	*	20
06:00	*	*	99	102	*	*	*	100
07:00	*	*	240	208	*	*	*	224
08:00	*	*	269	301	*	*	*	285
09:00	*	*	295	285	*	*	*	290
10:00	*	*	214	222	*	*	*	218
11:00	*	*	190	199	*	*	*	194
12:00 PM	*	*	220	186	*	*	*	203
01:00	*	*	182	155	*	*	*	168
02:00	*	*	171	184	*	*	*	178
03:00	*	*	194	151	*	*	*	172
04:00	*	*	247	179	*	*	*	213
05:00	*	*	448	320	*	*	*	378
06:00	*	*	444	315	*	*	*	380
07:00	*	*	187	139	*	*	*	163
08:00	*	*	114	102	*	*	*	108
09:00	*	*	83	92	*	*	*	88
10:00	*	*	59	85	*	*	*	72
11:00	*	*	38	46	*	*	*	38
Lane	0	0	3763	3325	0	0	0	3543
Day	0	0	7710	7045	0	0	0	7378
AM Peak			09:00	08:00	09:00			09:00
Vol.			295	301	251			290
PM Peak			17:00	18:00	17:00			18:00
Vol.			448	315	319			380

Comb. Total	0	0	7710	7045	0	0	0	7378
ADT			ADT 7,378					
				AADT 7,378				

ADT NB = 3544  
 ADT SB = 3034  
 ADT COMB = 7378

# **Accurate Counts** **978-664-2565**

Page 1

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Site Code: 11620005  
11620005

Start Time	24-Jun-09 Wed	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		21	92			34	120				
12:15		15	89			22	119				
12:30		18	106			16	85				
12:45		24	100	78	387	20	108	92	432	170	819
01:00		9	96			16	95				
01:15		13	70			10	100				
01:30		11	85			14	91				
01:45		8	94	41	345	12	109	52	395	93	740
02:00		9	121			7	84				
02:15		5	113			7	89				
02:30		11	102			6	94				
02:45		6	105	31	441	15	94	35	361	66	802
03:00		11	105			10	117				
03:15		7	120			5	99				
03:30		8	106			4	122				
03:45		4	98	30	429	9	127	28	465	58	894
04:00		1	117			2	106				
04:15		6	125			7	123				
04:30		5	124			4	139				
04:45		11	102	23	468	7	132	20	500	43	968
05:00		11	144			12	163				
05:15		18	164			19	189				
05:30		30	144			39	200				
05:45		40	159	99	611	62	230	132	782	231	1393
06:00		42	130			61	223				
06:15		51	114			83	209				
06:30		61	123			95	182				
06:45		111	105	265	472	90	162	329	776	594	1248
07:00		83	98			128	104				
07:15		107	85			108	108				
07:30		98	75			101	98				
07:45		136	85	424	343	128	95	465	405	889	748
08:00		147	70			136	66				
08:15		161	64			134	87				
08:30		166	87			163	75				
08:45		151	66	625	287	143	72	576	300	1201	587
09:00		143	71			149	70				
09:15		121	63			132	91				
09:30		125	71			125	68				
09:45		125	52	514	257	118	65	524	294	1038	551
10:00		99	67			86	66				
10:15		105	49			107	58				
10:30		96	39			93	44				
10:45		91	46	391	201	98	55	384	223	775	424
11:00		87	47			97	45				
11:15		101	27			93	42				
11:30		82	20			90	35				
11:45		97	31	367	125	101	38	381	160	748	285
Total		2888	4366			3018	5093			5906	9459
Percent		39.8%	60.2%			37.2%	62.8%			38.4%	61.6%

# **Accurate Counts** **978-664-2565**

Page 2

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Site Code: 11620005  
11620005

Start Time	25-Jun-09 Thu	EB		Hour Totals		WB		Hour Totals		Combined Totals	
		Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon	Morning	Afternoon
12:00		22	108			25	88				
12:15		20	98			31	104				
12:30		16	99			22	104				
12:45		11	90	69	395	24	92	102	388	171	783
01:00		17	105			24	107				
01:15		12	89			17	98				
01:30		11	103			14	105				
01:45		11	109	51	406	15	92	70	402	121	808
02:00		5	102			12	96				
02:15		11	116			8	99				
02:30		8	130			9	112				
02:45		7	107	31	455	6	109	35	416	66	871
03:00		8	112			5	113				
03:15		6	104			4	100				
03:30		4	120			2	104				
03:45		3	109	21	445	7	123	18	440	39	885
04:00		7	136			4	126				
04:15		7	125			9	139				
04:30		6	118			8	126				
04:45		12	131	32	510	8	135	29	526	61	1036
05:00		10	140			10	163				
05:15		20	144			30	134				
05:30		25	146			39	124				
05:45		42	115	97	545	81	181	160	602	257	1147
06:00		30	130			57	134				
06:15		63	123			68	159				
06:30		78	125			87	170				
06:45		103	112	274	490	102	138	314	601	588	1091
07:00		86	101			122	100				
07:15		109	95			120	95				
07:30		101	92			110	102				
07:45		126	75	422	363	138	81	490	378	912	741
08:00		142	69			146	72				
08:15		163	82			172	78				
08:30		163	57			154	80				
08:45		165	71	633	279	122	74	594	304	1227	583
09:00		144	72			145	72				
09:15		120	67			138	64				
09:30		128	88			111	71				
09:45		132	67	524	294	104	84	498	291	1022	585
10:00		125	75			81	64				
10:15		85	59			101	65				
10:30		102	60			99	63				
10:45		89	68	401	262	87	60	368	252	769	514
11:00		95	52			97	48				
11:15		87	48			100	59				
11:30		94	47			99	47				
11:45		86	29	362	176	103	38	399	192	761	368
Total		2917	4620			3077	4792			5994	9412
Percent		38.7%	61.3%			39.1%	60.9%			38.9%	61.1%
Grand Total		5805	8986			6095	9885			11900	18871
Percent		39.2%	60.8%			38.1%	61.9%			38.7%	61.3%

ADT

ADT 15,386

AADT 15,386

# Accurate Counts

## 978-664-2565

Site Code: 11620005  
11620005

Location : Broadway West of  
Location : Mid-Block Connector  
City/State: Cambridge, MA  
Counter : 15840

Start Time	22-Jun-09		Tue		Wed		Thu		Fri		Sat		Sun		Week Average	
	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB	EB	WB
12:00 AM	*	*	*	*	78	92	69	102	*	*	*	*	*	*	74	97
01:00	*	*	*	*	41	52	51	70	*	*	*	*	*	*	46	61
02:00	*	*	*	*	31	35	31	35	*	*	*	*	*	*	31	35
03:00	*	*	*	*	30	28	21	18	*	*	*	*	*	*	26	23
04:00	*	*	*	*	23	20	32	29	*	*	*	*	*	*	28	24
05:00	*	*	*	*	99	132	97	160	*	*	*	*	*	*	98	146
06:00	*	*	*	*	265	329	274	314	*	*	*	*	*	*	270	322
07:00	*	*	*	*	424	465	422	490	*	*	*	*	*	*	423	478
08:00	*	*	*	*	<b>625</b>	<b>576</b>	<b>633</b>	<b>594</b>	*	*	*	*	*	*	<b>629</b>	<b>585</b>
09:00	*	*	*	*	514	524	524	498	*	*	*	*	*	*	519	511
10:00	*	*	*	*	391	384	401	368	*	*	*	*	*	*	396	376
11:00	*	*	*	*	367	381	362	399	*	*	*	*	*	*	364	390
12:00 PM	*	*	*	*	387	432	395	388	*	*	*	*	*	*	391	410
01:00	*	*	*	*	345	395	406	402	*	*	*	*	*	*	376	398
02:00	*	*	*	*	441	361	455	416	*	*	*	*	*	*	448	388
03:00	*	*	*	*	429	465	445	440	*	*	*	*	*	*	437	452
04:00	*	*	*	*	468	500	510	526	*	*	*	*	*	*	489	513
05:00	*	*	*	*	<b>611</b>	<b>782</b>	<b>545</b>	<b>602</b>	*	*	*	*	*	*	<b>578</b>	<b>692</b>
06:00	*	*	*	*	472	776	490	601	*	*	*	*	*	*	481	688
07:00	*	*	*	*	343	405	363	378	*	*	*	*	*	*	353	392
08:00	*	*	*	*	287	300	279	304	*	*	*	*	*	*	283	302
09:00	*	*	*	*	257	294	294	291	*	*	*	*	*	*	276	292
10:00	*	*	*	*	201	223	262	252	*	*	*	*	*	*	232	238
11:00	*	*	*	*	125	160	176	192	*	*	*	*	*	*	150	176
Lane	0	0	0	0	7254	8111	7537	7869	0	0	0	0	0	0	7398	7989
Day	0	0	0	0	15365	15365	15406	15406	0	0	0	0	0	0	15387	15387
AM Peak					08:00	08:00	08:00	08:00							08:00	08:00
Vol.					625	576	633	594							629	585
PM Peak					17:00	17:00	17:00	17:00							17:00	17:00
Vol.					611	782	545	602							578	692

Comb. Total	0	0	15365	15406	0	0	15387
ADT	ADT 15,386	ADT 15,386	AADT 15,386	15406	0	0	15387



## **APPENDIX B**

### **Turning Movement Counts Existing 2009 Peak Hour Traffic Volume**



2009 TMC's

N/S Street : Third Street  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

File Name : 11620001  
Site Code : 11620001  
Start Date : 6/24/2009  
Page No : 1

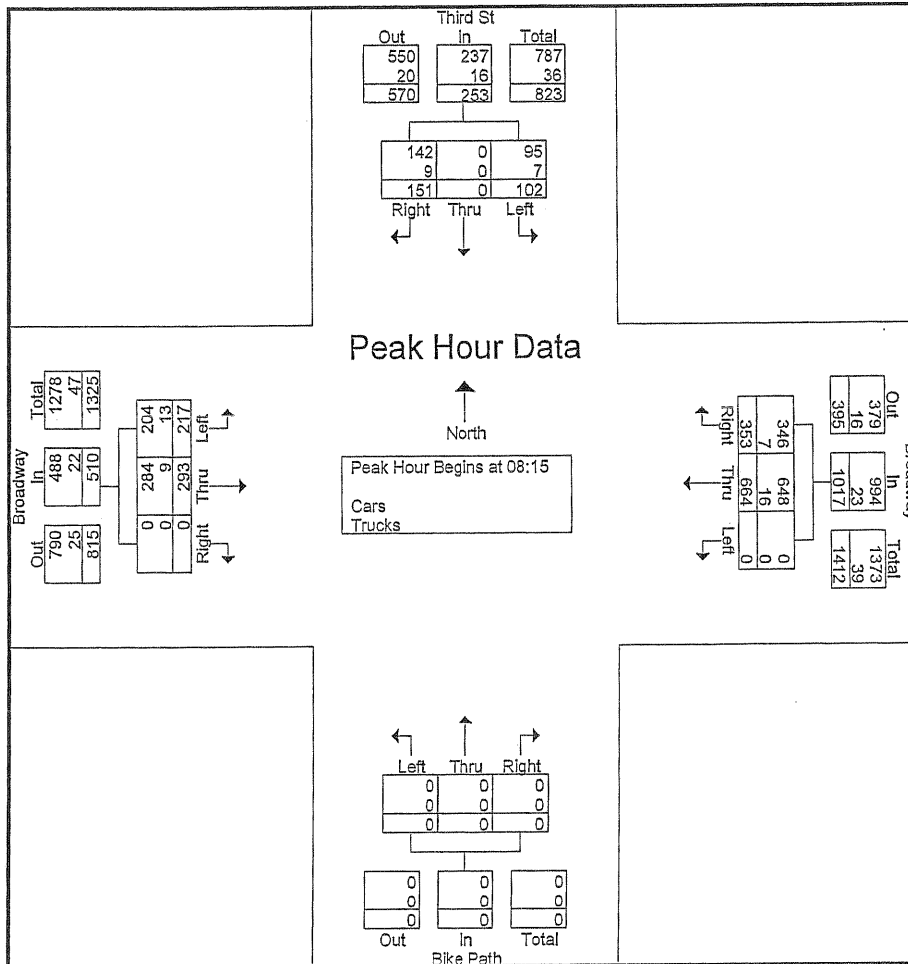
Groups Printed- Cars - Trucks

Start Time	Third St From North			Broadway From East			Bike Path From South			Broadway From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
07:30	25	0	36	0	130	42	0	0	0	42	40	0	315
07:45	24	0	45	0	127	57	0	0	0	40	77	0	370
Total	49	0	81	0	257	99	0	0	0	82	117	0	685
08:00	33	0	29	0	146	56	0	0	0	40	90	0	394
08:15	22	0	36	0	156	71	0	0	0	65	68	0	418
08:30	30	0	35	0	192	90	0	0	0	61	84	0	492
08:45	29	0	43	0	159	102	0	0	0	58	67	0	458
Total	114	0	143	0	653	319	0	0	0	224	309	0	1762
09:00	21	0	37	0	157	90	0	0	0	33	74	0	412
09:15	19	0	41	0	146	59	0	0	0	57	55	0	377
Grand Total	203	0	302	0	1213	567	0	0	0	396	555	0	3236
Apprch %	40.2	0	59.8	0	68.1	31.9	0	0	0	41.6	58.4	0	
Total %	6.3	0	9.3	0	37.5	17.5	0	0	0	12.2	17.2	0	
Cars	188	0	285	0	1182	558	0	0	0	375	540	0	3128
% Cars	92.6	0	94.4	0	97.4	98.4	0	0	0	94.7	97.3	0	96.7
Trucks	15	0	17	0	31	9	0	0	0	21	15	0	108
% Trucks	7.4	0	5.6	0	2.6	1.6	0	0	0	5.3	2.7	0	3.3

2009 AM

	Third St From North				Broadway From East				Bike Path From South				Broadway From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:15																	
08:15	22	0	36	58	0	156	71	227	0	0	0	0	65	68	0	133	418
08:30	30	0	35	65	0	192	90	282	0	0	0	0	61	84	0	145	492
08:45	29	0	43	72	0	159	102	261	0	0	0	0	58	67	0	125	458
09:00	21	0	37	58	0	157	90	247	0	0	0	0	33	74	0	107	412
Total Volume	102	0	151	253	0	664	353	1017	0	0	0	0	217	293	0	510	1780
% App. Total	40.3	0	59.7		0	65.3	34.7		0	0	0		42.5	57.5	0		
PHF	.850	.000	.878	.878	.000	.865	.865	.902	.000	.000	.000	.000	.835	.872	.000	.879	.904
Cars	95	0	142	237	0	648	346	994	0	0	0	0	204	284	0	488	1719
% Cars	93.1	0	94.0	93.7	0	97.6	98.0	97.7	0	0	0	0	94.0	96.9	0	95.7	96.6
Trucks	7	0	9	16	0	16	7	23	0	0	0	0	13	9	0	22	61
% Trucks	6.9	0	6.0	6.3	0	2.4	2.0	2.3	0	0	0	0	6.0	3.1	0	4.3	3.4





Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	08:00				08:15				07:30				08:00			
+0 mins.	33	0	29	62	0	156	71	227	0	0	0	0	40	90	0	130
+15 mins.	22	0	36	58	0	192	90	282	0	0	0	0	65	68	0	133
+30 mins.	30	0	35	65	0	159	102	261	0	0	0	0	61	84	0	145
+45 mins.	29	0	43	72	0	157	90	247	0	0	0	0	58	67	0	125
Total Volume	114	0	143	257	0	664	353	1017	0	0	0	0	224	309	0	533
% App. Total	44.4	0	55.6		0	65.3	34.7		0	0	0		42	58	0	
PHF	.864	.000	.831	.892	.000	.865	.865	.902	.000	.000	.000	.000	.862	.858	.000	.919
Cars	105	0	136	241	0	648	346	994	0	0	0	0	213	298	0	511
% Cars	92.1	0	95.1	93.8	0	97.6	98	97.7	0	0	0	0	95.1	96.4	0	95.9
Trucks	9	0	7	16	0	16	7	23	0	0	0	0	11	11	0	22
% Trucks	7.9	0	4.9	6.2	0	2.4	2	2.3	0	0	0	0	4.9	3.6	0	4.1

Accurate Counts  
978-664-2565

File Name : 11620001  
Site Code : 11620001  
Start Date : 6/24/2009  
Page No : 1

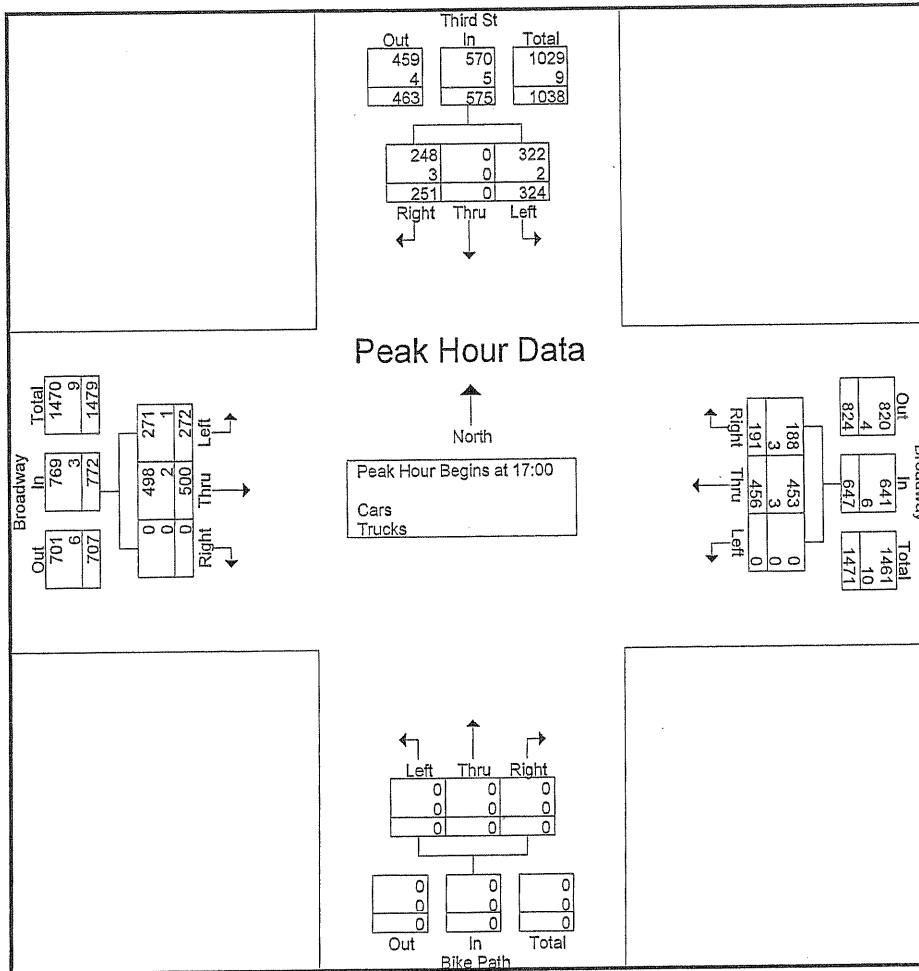
N/S Street : Third Street  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

Groups Printed- Cars - Trucks

Start Time	Third St From North			Broadway From East			Bike Path From South			Broadway From West			Int. Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:30	84	0	48	0	92	46	0	0	0	48	96	0	414
16:45	94	0	35	0	93	47	0	0	0	73	93	0	435
Total	178	0	83	0	185	93	0	0	0	121	189	0	849
17:00	91	0	40	0	121	55	0	0	0	78	141	0	526
17:15	82	0	73	0	103	53	0	0	0	78	137	0	526
17:30	78	0	82	0	101	42	0	0	0	55	108	0	466
17:45	73	0	56	0	131	41	0	0	0	61	114	0	476
Total	324	0	251	0	456	191	0	0	0	272	500	0	1994
18:00	85	0	63	0	129	47	0	0	0	61	107	0	492
18:15	86	0	52	0	124	56	0	0	0	75	116	0	509
18:30	98	0	52	0	117	35	0	0	0	102	84	0	488
18:45	72	0	43	0	123	28	0	0	0	41	100	0	407
Total	341	0	210	0	493	166	0	0	0	279	407	0	1896
19:00	46	0	30	0	98	26	0	0	0	45	82	0	327
19:15	60	0	29	0	96	21	0	0	0	24	68	0	298
Grand Total	949	0	603	0	1328	497	0	0	0	741	1246	0	5364
Apprch %	61.1	0	38.9	0	72.8	27.2	0	0	0	37.3	62.7	0	
Total %	17.7	0	11.2	0	24.8	9.3	0	0	0	13.8	23.2	0	
Cars	942	0	594	0	1312	487	0	0	0	740	1241	0	5316
% Cars	99.3	0	98.5	0	98.8	98	0	0	0	99.9	99.6	0	99.1
Trucks	7	0	9	0	16	10	0	0	0	1	5	0	48
% Trucks	0.7	0	1.5	0	1.2	2	0	0	0	0.1	0.4	0	0.9

**2009 PM**

	Third St From North				Broadway From East				Bike Path From South				Broadway From West				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 17:00																	
17:00	91	0	40	131	0	121	55	176	0	0	0	0	78	141	0	219	526
17:15	82	0	73	155	0	103	53	156	0	0	0	0	78	137	0	215	526
17:30	78	0	82	160	0	101	42	143	0	0	0	0	55	108	0	163	466
17:45	73	0	56	129	0	131	41	172	0	0	0	0	61	114	0	175	476
Total Volume	324	0	251	575	0	456	191	647	0	0	0	0	272	500	0	772	1994
% App. Total	56.3	0	43.7		0	70.5	29.5		0	0	0		35.2	64.8	0		
PHF	.890	.000	.765	.898	.000	.870	.868	.919	.000	.000	.000	.000	.872	.887	.000	.881	.948
Cars	322	0	248	570	0	453	188	641	0	0	0	0	271	498	0	769	1980
% Cars	99.4	0	98.8	99.1	0	99.3	98.4	99.1	0	0	0	0	99.6	99.6	0	99.6	99.3
Trucks	2	0	3	5	0	3	3	6	0	0	0	0	1	2	0	3	14
% Trucks	0.6	0	1.2	0.9	0	0.7	1.6	0.9	0	0	0	0	0.4	0.4	0	0.4	0.7



Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	17:15				17:45				16:30				17:00			
+0 mins.	82	0	73	155	0	131	41	172	0	0	0	0	78	141	0	219
+15 mins.	78	0	82	160	0	129	47	176	0	0	0	0	78	137	0	215
+30 mins.	73	0	56	129	0	124	56	180	0	0	0	0	55	108	0	163
+45 mins.	85	0	63	148	0	117	35	152	0	0	0	0	61	114	0	175
Total Volume	318	0	274	592	0	501	179	680	0	0	0	0	272	500	0	772
% App. Total	53.7	0	46.3		0	73.7	26.3		0	0	0		35.2	64.8	0	
PHF	.935	.000	.835	.925	.000	.956	.799	.944	.000	.000	.000	.000	.872	.887	.000	.881
Cars	316	0	268	584	0	497	175	672	0	0	0	0	271	498	0	769
% Cars	99.4	0	97.8	98.6	0	99.2	97.8	98.8	0	0	0	0	99.6	99.6	0	99.6
Trucks	2	0	6	8	0	4	4	8	0	0	0	0	1	2	0	3
% Trucks	0.6	0	2.2	1.4	0	0.8	2.2	1.2	0	0	0	0	0.4	0.4	0	0.4

N/S Street : Mid Block Connector **AMES ST.**  
E/W Street: Broadway  
City/State : Cambridge, MA  
Weather : Rain

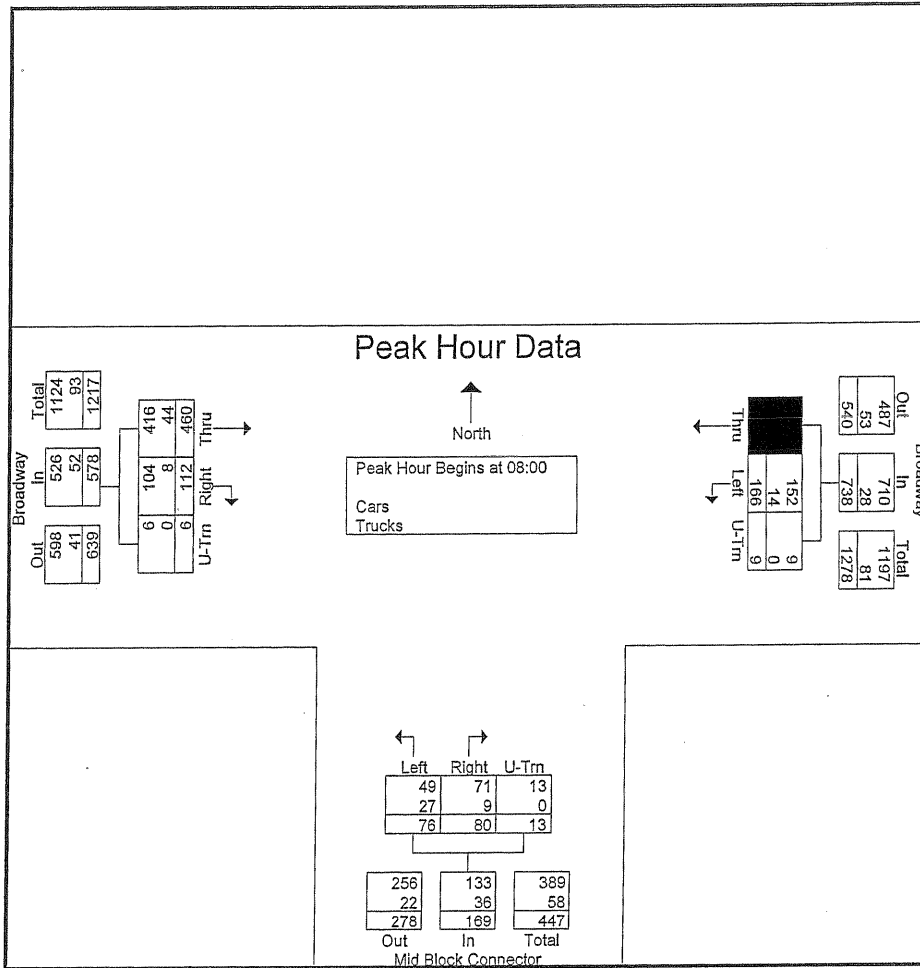
File Name : 11620002  
Site Code : 11620002  
Start Date : 6/24/2009  
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Broadway From East			Mid Block Connector From South			Broadway From West			Int. Total
	Left	Thru	U-Trn	Left	Right	U-Trn	Thru	Right	U-Trn	
07:30	31	131	1	18	22	2	79	28	0	312
07:45	39	133	4	20	19	3	95	23	0	336
Total	70	264	5	38	41	5	174	51	0	648
08:00	38	126	3	14	23	2	102	20	2	330
08:15	43	138	2	22	23	0	114	28	1	371
08:30	45	171	3	23	18	5	131	28	1	425
08:45	40	128	1	17	16	6	113	36	2	359
Total	166	563	9	76	80	13	460	112	6	1485
09:00	41	99	5	28	27	4	94	24	0	322
09:15	48	96	2	18	21	3	93	23	1	305
Grand Total	325	1022	21	160	169	25	821	210	7	2760
Apprch %	23.8	74.7	1.5	45.2	47.7	7.1	79.1	20.2	0.7	
Total %	11.8	37	0.8	5.8	6.1	0.9	29.7	7.6	0.3	
Cars	305	991	21	97	149	25	744	195	7	2534
% Cars	93.8	97	100	60.6	88.2	100	90.6	92.9	100	91.8
Trucks	20	31	0	63	20	0	77	15	0	226
% Trucks	6.2	3	0	39.4	11.8	0	9.4	7.1	0	8.2

2009 AM

	Broadway From East				Mid Block Connector From South				Broadway From West				
Start Time	Left	Thru	U-Trn	App. Total	Left	Right	U-Trn	App. Total	Thru	Right	U-Trn	App. Total	Int. Total
Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 08:00													
08:00	38	126	3	167	14	23	2	39	102	20	2	124	330
08:15	43	138	2	183	22	23	0	45	114	28	1	143	371
08:30	45	171	3	219	23	18	5	46	131	28	1	160	425
08:45	40	128	1	169	17	16	6	39	113	36	2	151	359
Total Volume	166	563	9	738	76	80	13	169	460	112	6	578	1485
% App. Total	22.5	76.3	1.2		45	47.3	7.7		79.6	19.4	1		
PHF	.922	.823	.750	.842	.826	.870	.542	.918	.878	.778	.750	.903	.874
Cars	152	549	9	710	49	71	13	133	416	104	6	526	1369
% Cars	91.6	97.5	100	96.2	64.5	88.8	100	78.7	90.4	92.9	100	91.0	92.2
Trucks	14	14	0	28	27	9	0	36	44	8	0	52	116
% Trucks	8.4	2.5	0	3.8	35.5	11.3	0	21.3	9.6	7.1	0	9.0	7.8



Peak Hour Analysis From 07:30 to 09:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	07:45				08:15				08:00			
+0 mins.	39	133	4	176	22	23	0	45	102	20	2	124
+15 mins.	38	126	3	167	23	18	5	46	114	28	1	143
+30 mins.	43	138	2	183	17	16	6	39	131	28	1	160
+45 mins.	45	171	3	219	28	27	4	59	113	36	2	151
Total Volume	165	568	12	745	90	84	15	189	460	112	6	578
% App. Total	22.1	76.2	1.6		47.6	44.4	7.9		79.6	19.4	1	
PHF	.917	.830	.750	.850	.804	.778	.625	.801	.878	.778	.750	.903
Cars	154	552	12	718	58	74	15	147	416	104	6	526
% Cars	93.3	97.2	100	96.4	64.4	88.1	100	77.8	90.4	92.9	100	91
Trucks	11	16	0	27	32	10	0	42	44	8	0	52
% Trucks	6.7	2.8	0	3.6	35.6	11.9	0	22.2	9.6	7.1	0	9

N/S Street : Mid Block Connector **AMES ST.**  
E/W Street : Broadway  
City/State : Cambridge, MA  
Weather : Rain

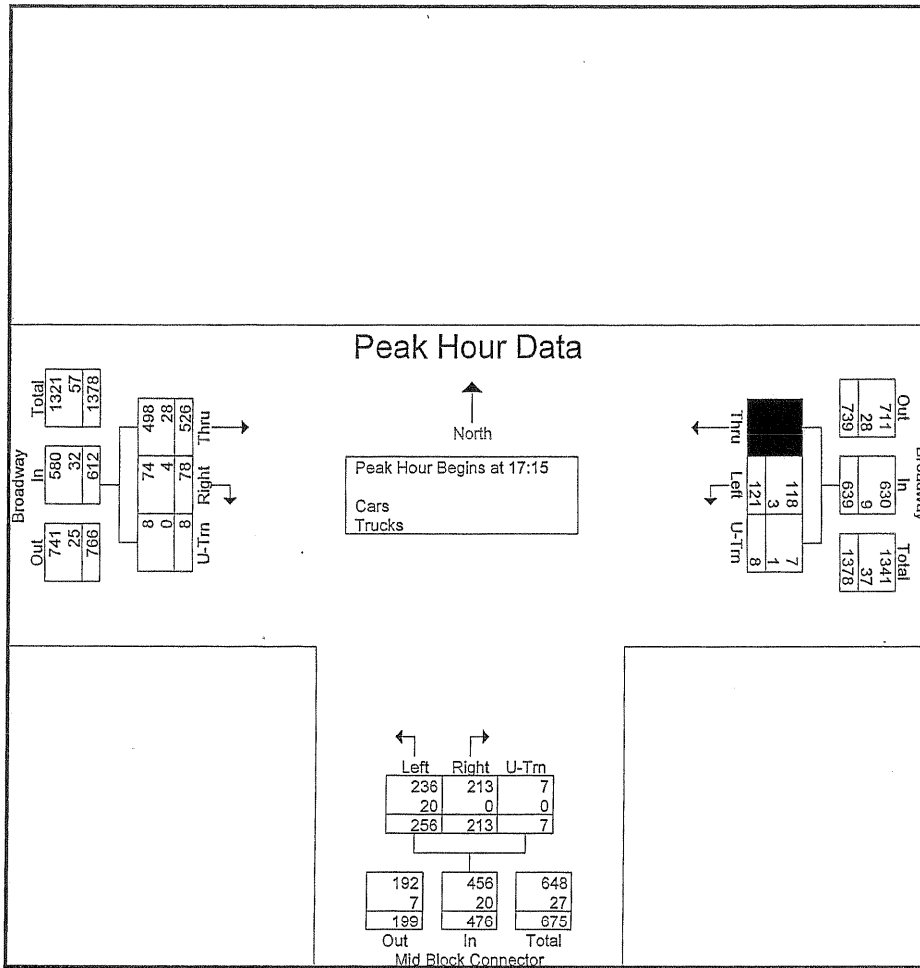
File Name : 11620002  
Site Code : 11620002  
Start Date : 6/24/2009  
Page No : 1

Groups Printed- Cars - Trucks

Start Time	Broadway From East			Mid Block Connector From South			Broadway From West			Int. Total
	Left	Thru	U-Trn	Left	Right	U-Trn	Thru	Right	U-Trn	
16:30	18	90	1	33	25	0	97	10	1	275
16:45	20	81	1	48	57	3	96	11	0	317
Total	38	171	2	81	82	3	193	21	1	592
17:00	23	105	3	57	49	0	120	10	0	367
17:15	33	116	1	52	61	1	144	18	1	427
17:30	26	128	1	62	48	2	134	19	2	422
17:45	34	128	3	78	40	2	131	21	4	441
Total	116	477	8	249	198	5	529	68	7	1657
18:00	28	138	3	64	64	2	117	20	1	437
18:15	37	129	1	74	55	4	94	14	2	410
18:30	33	103	4	64	53	1	114	15	2	389
18:45	28	116	2	30	23	2	97	17	1	316
Total	126	486	10	232	195	9	422	66	6	1552
19:00	13	125	2	45	44	3	87	15	1	335
19:15	26	134	1	27	35	2	55	19	1	300
Grand Total	319	1393	23	634	554	22	1286	189	16	4436
Apprch %	18.4	80.3	1.3	52.4	45.8	1.8	86.3	12.7	1.1	
Total %	7.2	31.4	0.5	14.3	12.5	0.5	29	4.3	0.4	
Cars	303	1382	21	571	547	22	1216	184	16	4262
% Cars	95	99.2	91.3	90.1	98.7	100	94.6	97.4	100	96.1
Trucks	16	11	2	63	7	0	70	5	0	174
% Trucks	5	0.8	8.7	9.9	1.3	0	5.4	2.6	0	3.9

2009 PM

	Broadway From East				Mid Block Connector From South				Broadway From West				
Start Time	Left	Thru	U-Trn	App. Total	Left	Right	U-Trn	App. Total	Thru	Right	U-Trn	App. Total	Int. Total
Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1													
Peak Hour for Entire Intersection Begins at 17:15													
17:15	33	116	1	150	52	61	1	114	144	18	1	163	427
17:30	26	128	1	155	62	48	2	112	134	19	2	155	422
17:45	34	128	3	165	78	40	2	120	131	21	4	156	441
18:00	28	138	3	169	64	64	2	130	117	20	1	138	437
Total Volume	121	510	8	639	256	213	7	476	526	78	8	612	1727
% App. Total	18.9	79.8	1.3		53.8	44.7	1.5		85.9	12.7	1.3		
PHF	.890	.924	.667	.945	.821	.832	.875	.915	.913	.929	.500	.939	.979
Cars	118	505	7	630	236	213	7	456	498	74	8	580	1666
% Cars	97.5	99.0	87.5	98.6	92.2	100	100	95.8	94.7	94.9	100	94.8	96.5
Trucks	3	5	1	9	20	0	0	20	28	4	0	32	61
% Trucks	2.5	1.0	12.5	1.4	7.8	0	0	4.2	5.3	5.1	0	5.2	3.5



Peak Hour Analysis From 16:30 to 19:15 - Peak 1 of 1  
Peak Hour for Each Approach Begins at:

	17:30				17:45				17:15			
+0 mins.	26	128	1	155	78	40	2	120	144	18	1	163
+15 mins.	34	128	3	165	64	64	2	130	134	19	2	155
+30 mins.	28	138	3	169	74	55	4	133	131	21	4	156
+45 mins.	37	129	1	167	64	53	1	118	117	20	1	138
Total Volume	125	523	8	656	280	212	9	501	526	78	8	612
% App. Total	19.1	79.7	1.2		55.9	42.3	1.8		85.9	12.7	1.3	
PHF	.845	.947	.667	.970	.897	.828	.563	.942	.913	.929	.500	.939
Cars	121	519	7	647	253	210	9	472	498	74	8	580
% Cars	96.8	99.2	87.5	98.6	90.4	99.1	100	94.2	94.7	94.9	100	94.8
Trucks	4	4	1	9	27	2	0	29	28	4	0	32
% Trucks	3.2	0.8	12.5	1.4	9.6	0.9	0	5.8	5.3	5.1	0	5.2

## **APPENDIX C**

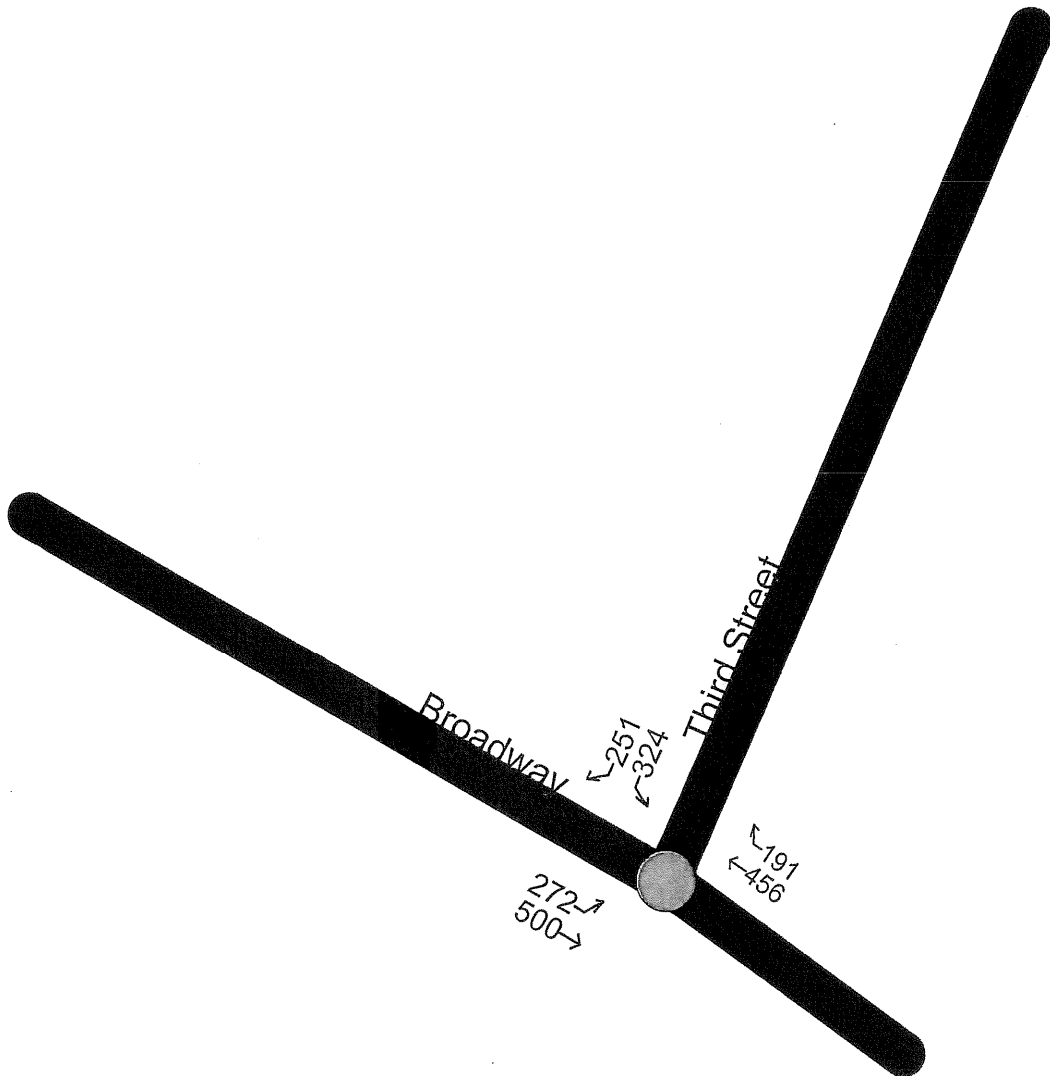
### **Existing 2009 Volume Analyzed under Existing Signalized Conditions**





CAMBRIDGE  
2009 PM












BROADWAY/THIRD  
7/14/2009



Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 PM EXIST

8/24/2009

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325			0	0	0
Storage Lanes	1			0	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	0.95	0.95	1.00	1.00
Frt			0.956			0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	3185	3045	0	1593	1425
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3185	3045	0	1593	1425
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		30	30		30	
Link Distance (ft)		977	393		1212	
Travel Time (s)		22.2	8.9		27.5	
Volume (vph)	272	500	456	191	324	251
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	543	496	208	352	273
Lane Group Flow (vph)	296	543	704	0	352	273
Turn Type	Prot				pt+ov	
Protected Phases	5	6	6		4	4 5
Permitted Phases						
Minimum Split (s)	21.0	21.0	21.0		21.0	
Total Split (s)	23.0	37.0	37.0	0.0	30.0	53.0
Total Split (%)	25.6%	41.1%	41.1%	0.0%	33.3%	58.9%
Maximum Green (s)	18.0	32.0	32.0		25.0	
Yellow Time (s)	3.0	3.0	3.0		3.0	
All-Red Time (s)	2.0	2.0	2.0		2.0	
Lead/Lag	Lag	Lead	Lead			
Lead-Lag Optimize?						
Act Effct Green (s)	19.0	33.0	33.0		26.0	49.0
Actuated g/C Ratio	0.21	0.37	0.37		0.29	0.54
v/c Ratio	0.88	0.46	0.63		0.77	0.35
Uniform Delay, d1	34.4	21.8	23.5		29.2	11.5
Control Delay	62.8	23.4	26.6		42.0	13.2
Queue Delay	0.0	0.0	0.0		0.0	0.0
Total Delay	62.8	23.4	26.6		42.0	13.2
LOS	E	C	C		D	B
Approach Delay		37.3	26.6		29.4	
Approach LOS		D	C		C	
Stops (vph)	236	367	516		282	136
Fuel Used(gal)	7	8	8		7	4
CO Emissions (g/hr)	479	574	583		516	265
NOx Emissions (g/hr)	93	112	113		100	52
VOC Emissions (g/hr)	111	133	135		120	62
Dilemma Vehicles (#)	0	0	0		0	0

Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 PM EXIST  
8/24/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	164	122	170		182	82
Queue Length 95th (ft)	#311	169	231		#313	136
Internal Link Dist (ft)		897	313		1132	
Turn Bay Length (ft)	325					
Base Capacity (vph)	336	1168	1117		460	776
Starvation Cap Reductn	0	0	0		0	0
Spillback Cap Reductn	0	0	0		0	0
Storage Cap Reductn	0	0	0		0	0
Reduced v/c Ratio	0.88	0.46	0.63		0.77	0.35

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:EBWB, Start of Green

Natural Cycle: 65

Control Type: Pretimed

Maximum v/c Ratio: 0.88

Intersection Signal Delay: 31.5

Intersection LOS: C

Intersection Capacity Utilization 67.5%

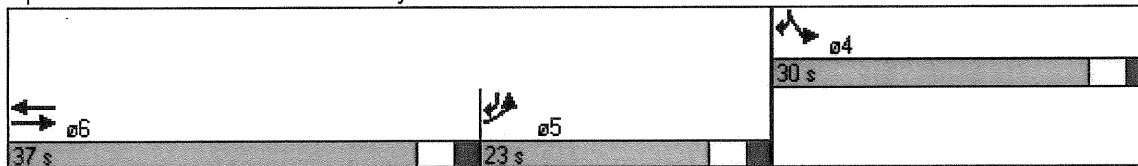
ICU Level of Service C

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

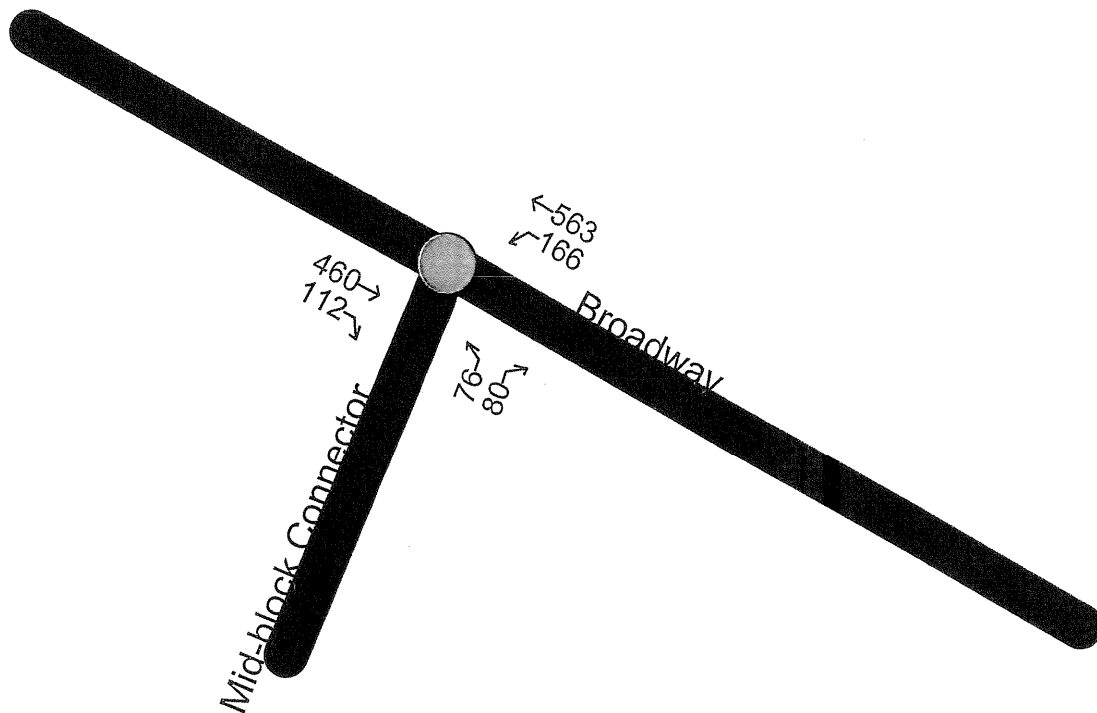
Queue shown is maximum after two cycles.

Splits and Phases: 1: Broadway & Third Street



CAMBRIDGE  
2009 AM

BROADWAY/AMES  
7/14/2009



Lanes, Volumes, Timings  
BROADWAY/AMES

2009 AM EXIST

8/19/2009

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑↑		↘	↑↑	↘	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		0	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Frt	0.971					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3437	0	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3437	0	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	52					87	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	460	112	166	563	76	80	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	500	122	180	612	83	87	
Lane Group Flow (vph)	622	0	180	612	83	87	
Turn Type			Prot		pt+ov		
Protected Phases	2		1	6	8	1 8	5
Permitted Phases							
Minimum Split (s)	21.0		9.0	21.0	21.0		8.5
Total Split (s)	53.0	0.0	16.0	53.0	21.0	37.0	16.0
Total Split (%)	58.9%	0.0%	17.8%	58.9%	23.3%	41.1%	18%
Maximum Green (s)	48.0		11.0	48.0	16.0		11.5
Yellow Time (s)	3.0		3.0	3.0	3.0		4.0
All-Red Time (s)	2.0		2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0			5.0	5.0		
Flash Dont Walk (s)	11.0			11.0	11.0		
Pedestrian Calls (#/hr)	0			0	0		
Act Effct Green (s)	49.0		12.0	49.0	17.0	33.0	
Actuated g/C Ratio	0.54		0.13	0.54	0.19	0.37	
v/c Ratio	0.33		0.76	0.32	0.25	0.14	
Uniform Delay, d1	10.3		37.6	11.3	31.0	0.0	
Control Delay	10.9		59.8	11.9	33.4	5.1	
Queue Delay	0.0		0.0	0.1	0.0	0.0	
Total Delay	10.9		59.8	11.9	33.4	5.1	
LOS	B		E	B	C	A	
Approach Delay	10.9			22.8	18.9		
Approach LOS	B			C	B		
Stops (vph)	273		148	292	64	13	
Fuel Used(gal)	5		4	7	1	0	
CO Emissions (g/hr)	377		277	501	84	35	

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	73		54	97	16	7	
VOC Emissions (g/hr)	87		64	116	19	8	
Dilemma Vehicles (#)	0		0	0	0	0	
Queue Length 50th (ft)	87		100	94	41	0	
Queue Length 95th (ft)	121		#203	128	82	29	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	1895		236	1927	334	636	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	303	0	0	
Reduced v/c Ratio	0.33		0.76	0.38	0.25	0.14	

#### Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green

Natural Cycle: 55

Control Type: Pretimed

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 17.7

Intersection LOS: B

Intersection Capacity Utilization 39.7%

ICU Level of Service A

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

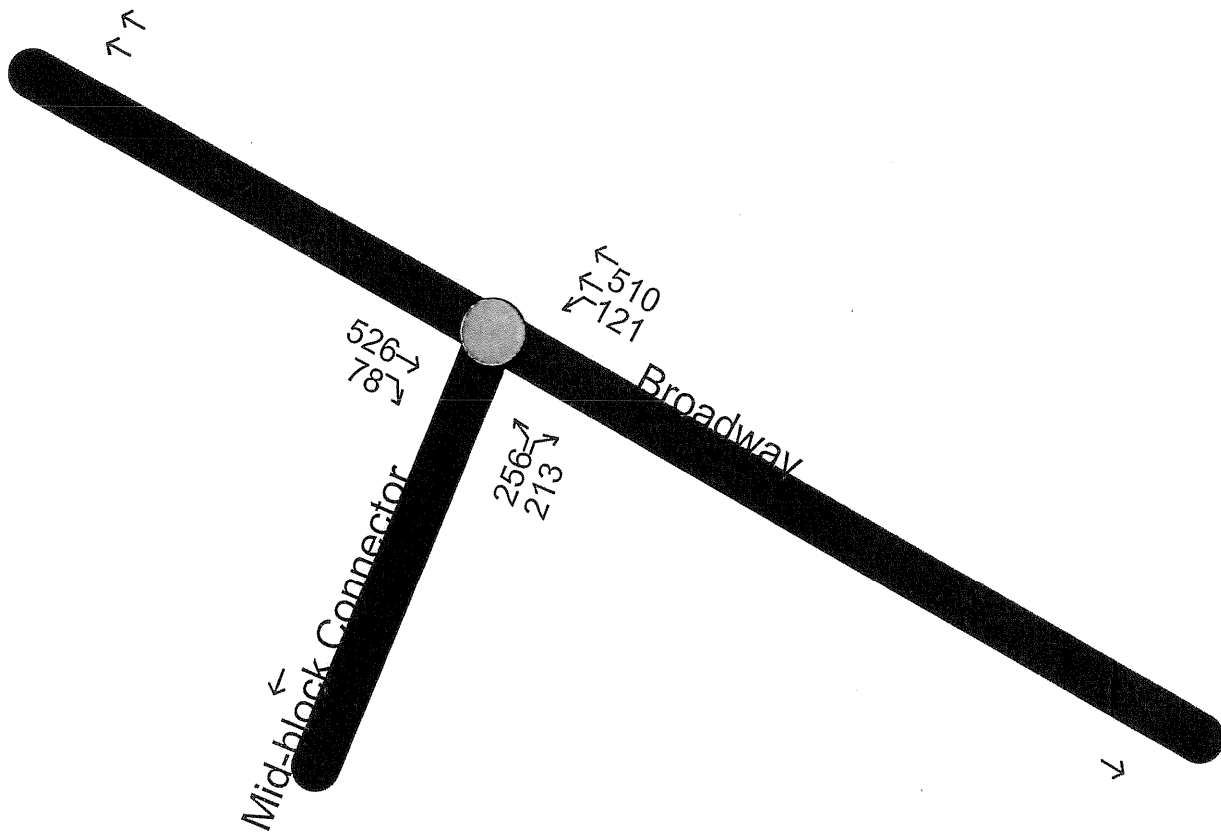
Queue shown is maximum after two cycles.

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↖ ø1	
53 s	16 s	
← ø6	↗ ø5	↘ ø8
53 s	16 s	21 s

CAMBRIDGE  
2009 PM

BROADWAY/AMES  
7/14/2009





	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑↑		↘	↑↑	↘	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		0	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	0.95	0.95	1.00	0.95	1.00	1.00	
Frt	0.981					0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	3472	0	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	3472	0	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)	23					203	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	526	78	121	510	256	213	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	572	85	132	554	278	232	
Lane Group Flow (vph)	657	0	132	554	278	232	
Turn Type			Prot		pt+ov		
Protected Phases	2		1	6	8	1 8	5
Permitted Phases							
Minimum Split (s)	21.0		9.0	21.0	21.0		8.5
Total Split (s)	44.0	0.0	16.0	44.0	30.0	46.0	16.0
Total Split (%)	48.9%	0.0%	17.8%	48.9%	33.3%	51.1%	18%
Maximum Green (s)	39.0		11.0	39.0	25.0		11.5
Yellow Time (s)	3.0		3.0	3.0	3.0		4.0
All-Red Time (s)	2.0		2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0			5.0	5.0		
Flash Dont Walk (s)	11.0			11.0	11.0		
Pedestrian Calls (#/hr)	0			0	0		
Act Effct Green (s)	40.0		12.0	40.0	26.0	42.0	
Actuated g/C Ratio	0.44		0.13	0.44	0.29	0.47	
v/c Ratio	0.42		0.56	0.35	0.54	0.27	
Uniform Delay, d1	16.4		36.5	16.4	27.0	1.6	
Control Delay	17.5		46.5	17.3	31.8	3.9	
Queue Delay	0.0		0.0	0.0	0.0	0.0	
Total Delay	17.5		46.5	17.3	31.8	3.9	
LOS	B		D	B	C	A	
Approach Delay	17.5			22.9	19.1		
Approach LOS	B			C	B		
Stops (vph)	381		113	320	213	28	
Fuel Used(gal)	7		3	7	4	1	
CO Emissions (g/hr)	479		181	508	275	87	

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	93		35	99	54	17	
VOC Emissions (g/hr)	111		42	118	64	20	
Dilemma Vehicles (#)	0		0	0	0	0	
Queue Length 50th (ft)	125		71	105	133	9	
Queue Length 95th (ft)	170		130	145	212	48	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	1556		236	1573	511	847	
Starvation Cap Reductn	0		0	0	0	0	
Spillback Cap Reductn	0		0	0	0	0	
Storage Cap Reductn	0		0	0	0	0	
Reduced v/c Ratio	0.42		0.56	0.35	0.54	0.27	

#### Intersection Summary

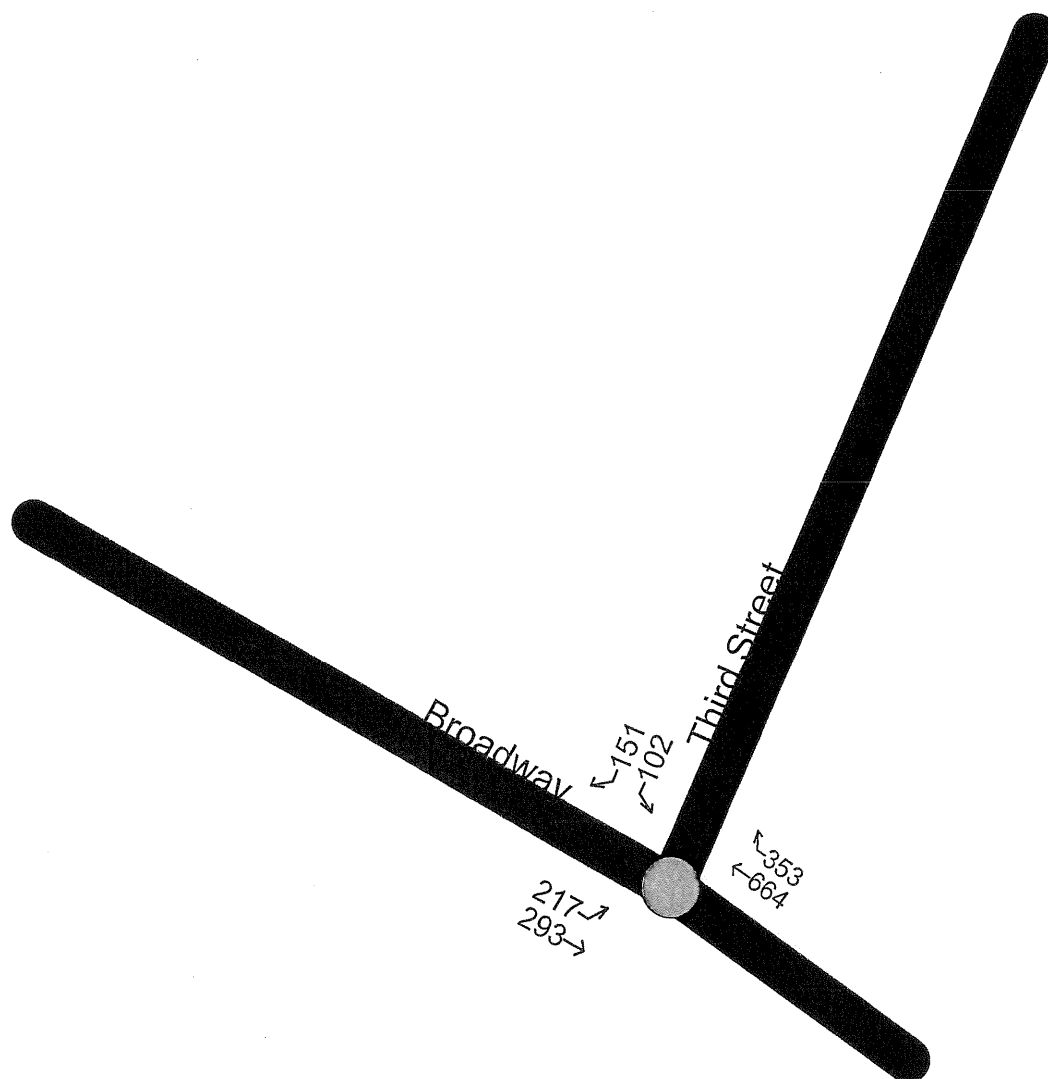
Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 55  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.56  
 Intersection Signal Delay: 19.9  
 Intersection LOS: B  
 Intersection Capacity Utilization 47.9%  
 ICU Level of Service A  
 Analysis Period (min) 15

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↖ ø1	
44 s	16 s	
← ø6	↗ ø5	↘ ø8
44 s	16 s	30 s

## **APPENDIX D**













### **Existing 2009 Traffic Volume Analyzed under Proposed Signalized Conditions**



Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 AM PROP

8/27/2009

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325			0	0	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	1863	1583	1770	1583
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		977	393		1212	
Travel Time (s)		22.2	8.9		27.5	
Volume (vph)	217	293	664	353	102	151
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	228	308	699	372	107	159
Lane Group Flow (vph)	228	308	699	372	107	159
Turn Type	Prot			Over		pt+ov
Protected Phases	5	6	6	4	4	4 5
Permitted Phases						
Minimum Split (s)	15.0	21.0	21.0	21.0	21.0	
Total Split (s)	20.0	41.0	41.0	29.0	29.0	49.0
Total Split (%)	22.2%	45.6%	45.6%	32.2%	32.2%	54.4%
Maximum Green (s)	16.0	37.0	37.0	25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lag	Lead	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Act Effct Green (s)	17.0	38.0	38.0	26.0	26.0	46.0
Actuated g/C Ratio	0.19	0.42	0.42	0.29	0.29	0.51
v/c Ratio	0.68	0.21	0.89	0.81	0.21	0.20
Uniform Delay, d1	33.9	16.4	24.0	29.7	24.2	12.0
Control Delay	45.7	16.9	39.6	45.8	25.6	12.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.7	16.9	39.6	45.8	25.6	12.8
LOS	D	B	D	D	C	B
Approach Delay		29.2	41.8		17.9	
Approach LOS		C	D		B	
Stops (vph)	196	176	566	307	74	79
Fuel Used(gal)	5	4	11	6	2	2
CO Emissions (g/hr)	332	295	735	425	133	158
NOx Emissions (g/hr)	65	57	143	83	26	31
VOC Emissions (g/hr)	77	68	170	98	31	37
Dilemma Vehicles (#)	0	0	0	0	0	0

Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 AM PROP

8/27/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	122	56	358	196	46	47
Queue Length 95th (ft)	#215	85	#578	#343	88	82
Internal Link Dist (ft)		897	313		1132	
Turn Bay Length (ft)	325					
Base Capacity (vph)	334	1494	787	457	511	809
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.68	0.21	0.89	0.81	0.21	0.20

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 6:EBWB, Start of Green

Natural Cycle: 70

Control Type: Pretimed

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 34.8

Intersection LOS: C

Intersection Capacity Utilization 62.6%

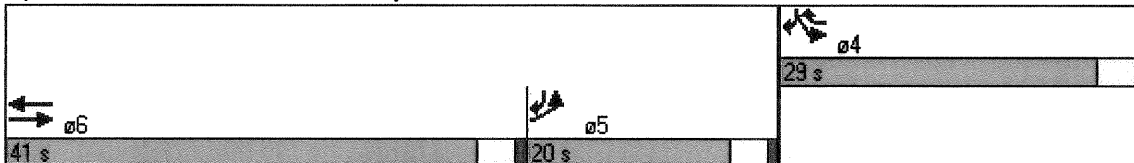
ICU Level of Service B

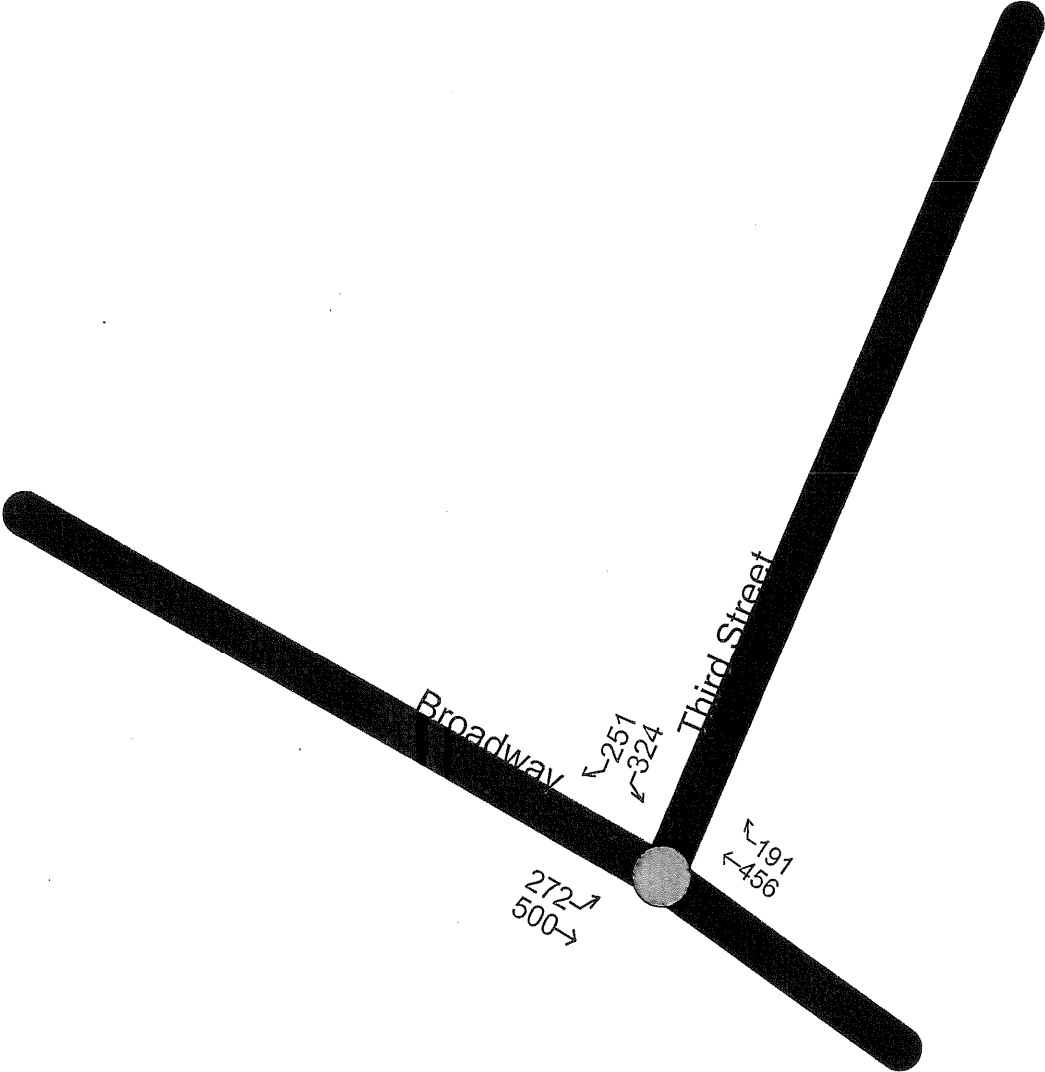
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Broadway & Third Street

















Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 PM PROP

8/26/2009

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325			0	0	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Friction				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	3185	1676	1425	1593	1425
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3185	1676	1425	1593	1425
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		30	30		30	
Link Distance (ft)		977	393		1212	
Travel Time (s)		22.2	8.9		27.5	
Volume (vph)	272	500	456	191	324	251
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	543	496	208	352	273
Lane Group Flow (vph)	296	543	496	208	352	273
Turn Type	Prot			Over		pt+ov
Protected Phases	5	6	6	4	4	4 5
Permitted Phases						
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	25.0	37.0	37.0	28.0	28.0	53.0
Total Split (%)	27.8%	41.1%	41.1%	31.1%	31.1%	58.9%
Maximum Green (s)	20.0	32.0	32.0	23.0	23.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lead/Lag	Lag	Lead	Lead			
Lead-Lag Optimize?						
Act Effct Green (s)	21.0	33.0	33.0	24.0	24.0	49.0
Actuated g/C Ratio	0.23	0.37	0.37	0.27	0.27	0.54
v/c Ratio	0.80	0.46	0.81	0.55	0.83	0.35
Uniform Delay, d1	32.5	21.8	25.6	28.3	31.1	11.5
Control Delay	50.0	23.4	37.7	34.7	49.3	13.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.0	23.4	37.7	34.7	49.3	13.2
LOS	D	C	D	C	D	B
Approach Delay		32.8	36.9		33.5	
Approach LOS		C	D		C	
Stops (vph)	239	367	390	163	283	136
Fuel Used(gal)	6	8	7	3	8	4
CO Emissions (g/hr)	431	574	493	198	551	265
NOx Emissions (g/hr)	84	112	96	39	107	52
VOC Emissions (g/hr)	100	133	114	46	128	62
Dilemma Vehicles (#)	0	0	0	0	0	0



Lanes, Volumes, Timings  
BROADWAY/THIRD

2009 PM PROP

8/26/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	159	122	250	102	188	82
Queue Length 95th (ft)	#289	169	#416	173	#334	136
Internal Link Dist (ft)		897	313		1132	
Turn Bay Length (ft)	325					
Base Capacity (vph)	372	1168	615	380	425	776
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.80	0.46	0.81	0.55	0.83	0.35

Intersection Summary

Area Type: CBD

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 2: and 6:EBWB, Start of Green

Natural Cycle: 75

Control Type: Pretimed

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 34.3

Intersection LOS: C

Intersection Capacity Utilization 73.4%

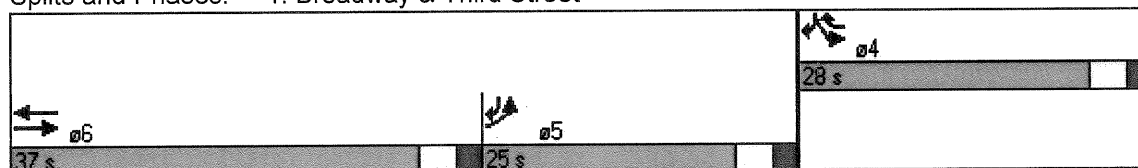
ICU Level of Service D

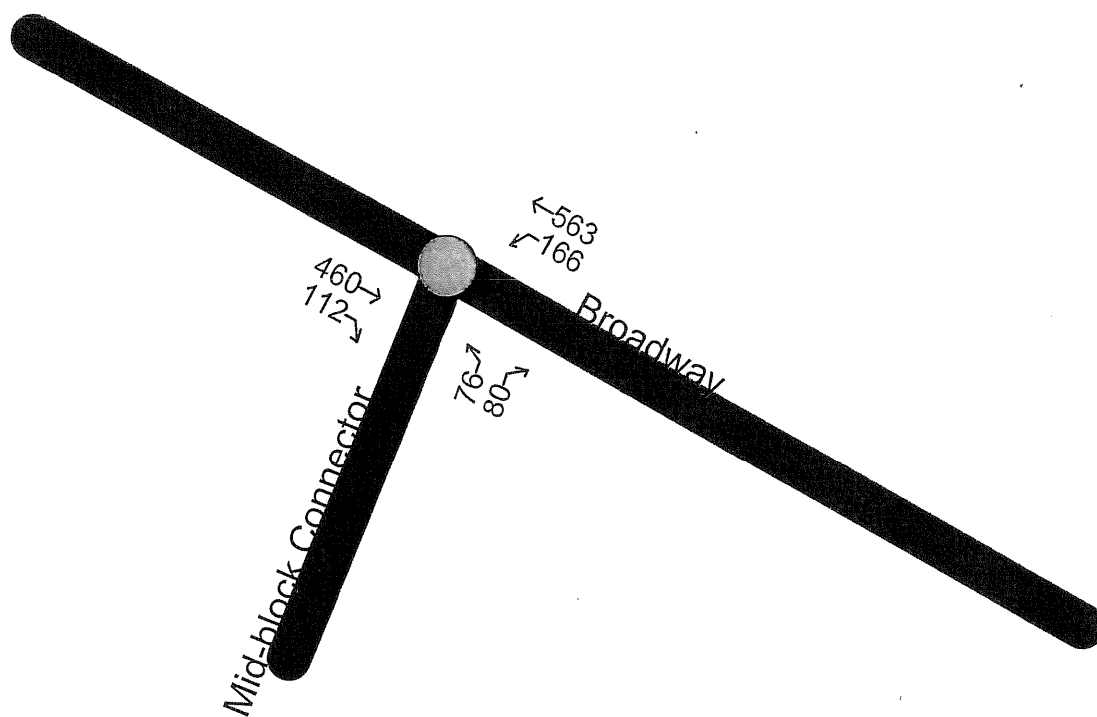
Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Broadway & Third Street





Lanes, Volumes, Timings  
BROADWAY/AMES

2009 AM PROP

8/26/2009

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑	↗	↙	↑↑	↙	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1863	1583	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	1863	1583	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		122				87	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	460	112	166	563	76	80	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	500	122	180	612	83	87	
Lane Group Flow (vph)	500	122	180	612	83	87	
Turn Type		Over	Prot			pt+ov	
Protected Phases	2	8	1	6	8	18	5
Permitted Phases							
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0		8.5
Total Split (s)	44.0	21.0	25.0	44.0	21.0	46.0	25.0
Total Split (%)	48.9%	23.3%	27.8%	48.9%	23.3%	51.1%	28%
Maximum Green (s)	39.0	16.0	20.0	39.0	16.0		20.5
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0	5.0		5.0	5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0		0	0		
Act Effct Green (s)	40.0	17.0	21.0	40.0	17.0	42.0	
Actuated g/C Ratio	0.44	0.19	0.23	0.44	0.19	0.47	
v/c Ratio	0.60	0.31	0.44	0.39	0.25	0.11	
Uniform Delay, d1	19.0	0.0	29.4	16.8	31.0	0.0	
Control Delay	22.8	8.5	33.4	17.7	33.4	3.6	
Queue Delay	0.0	0.0	0.0	0.1	0.0	0.0	
Total Delay	22.8	8.5	33.4	17.8	33.4	3.6	
LOS	C	A	C	B	C	A	
Approach Delay	20.0			21.4	18.1		
Approach LOS	C			C	B		
Stops (vph)	340	19	138	360	64	10	
Fuel Used(gal)	6	1	3	8	1	0	
CO Emissions (g/hr)	413	61	212	566	84	32	

Lanes, Volumes, Timings  
BROADWAY/AMES

2009 AM PROP  
8/26/2009



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	80	12	41	110	16	6	
VOC Emissions (g/hr)	96	14	49	131	19	7	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	209	0	88	118	41	0	
Queue Length 95th (ft)	313	45	151	161	82	24	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	828	398	413	1573	334	785	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	244	0	0	
Reduced v/c Ratio	0.60	0.31	0.44	0.46	0.25	0.11	

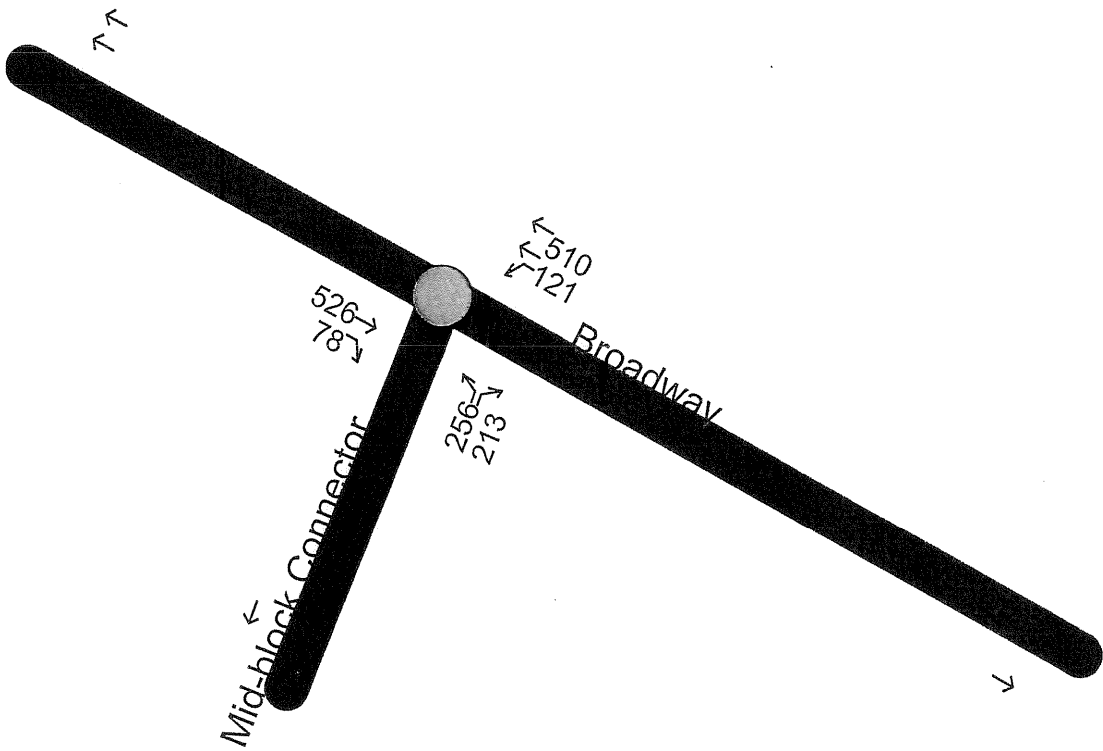
Intersection Summary

Area Type: Other  
Cycle Length: 90  
Actuated Cycle Length: 90  
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 60  
Control Type: Pretimed  
Maximum v/c Ratio: 0.60  
Intersection Signal Delay: 20.5  
Intersection Capacity Utilization 47.6%  
Analysis Period (min) 15

Intersection LOS: C  
ICU Level of Service A

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↖ ø1	
44 s	25 s	
← ø6	↗ ø5	↘ ø8
44 s	25 s	21 s



Lanes, Volumes, Timings  
BROADWAY/AMES

2009 PM PROP

8/26/2009

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑	↗	↖	↑↑	↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1863	1583	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	1863	1583	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		85				185	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	526	78	121	510	256	213	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	572	85	132	554	278	232	
Lane Group Flow (vph)	572	85	132	554	278	232	
Turn Type		Over	Prot			pt+ov	
Protected Phases	2	8	1	6	8	1 8	5
Permitted Phases							
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0		8.5
Total Split (s)	42.0	30.0	18.0	42.0	30.0	48.0	18.0
Total Split (%)	46.7%	33.3%	20.0%	46.7%	33.3%	53.3%	20%
Maximum Green (s)	37.0	25.0	13.0	37.0	25.0		13.5
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0	5.0		5.0	5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0		0	0		
Act Effct Green (s)	38.0	26.0	14.0	38.0	26.0	44.0	
Actuated g/C Ratio	0.42	0.29	0.16	0.42	0.29	0.49	
v/c Ratio	0.73	0.16	0.48	0.37	0.54	0.27	
Uniform Delay, d1	21.7	0.0	34.7	17.8	27.0	2.5	
Control Delay	28.2	6.6	41.2	18.7	31.8	4.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	28.2	6.6	41.2	18.7	31.8	4.3	
LOS	C	A	D	B	C	A	
Approach Delay	25.4			23.1	19.3		
Approach LOS	C			C	B		
Stops (vph)	430	14	108	334	213	32	
Fuel Used(gal)	8	1	2	7	4	1	
CO Emissions (g/hr)	524	40	170	522	275	89	



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	102	8	33	102	54	17	
VOC Emissions (g/hr)	122	9	39	121	64	21	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	264	0	69	110	133	13	
Queue Length 95th (ft)	391	33	127	151	212	52	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	787	518	275	1494	511	868	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.73	0.16	0.48	0.37	0.54	0.27	

#### Intersection Summary

Area Type: Other  
Cycle Length: 90  
Actuated Cycle Length: 90  
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
Natural Cycle: 60  
Control Type: Pretimed  
Maximum v/c Ratio: 0.73  
Intersection Signal Delay: 22.9  
Intersection Capacity Utilization 58.6%  
Analysis Period (min) 15

Intersection LOS: C  
ICU Level of Service B

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↗ ø1	
42 s	18 s	
← ø6	↘ ø5	↘ ø8
42 s	18 s	30 s

## **APPENDIX E**

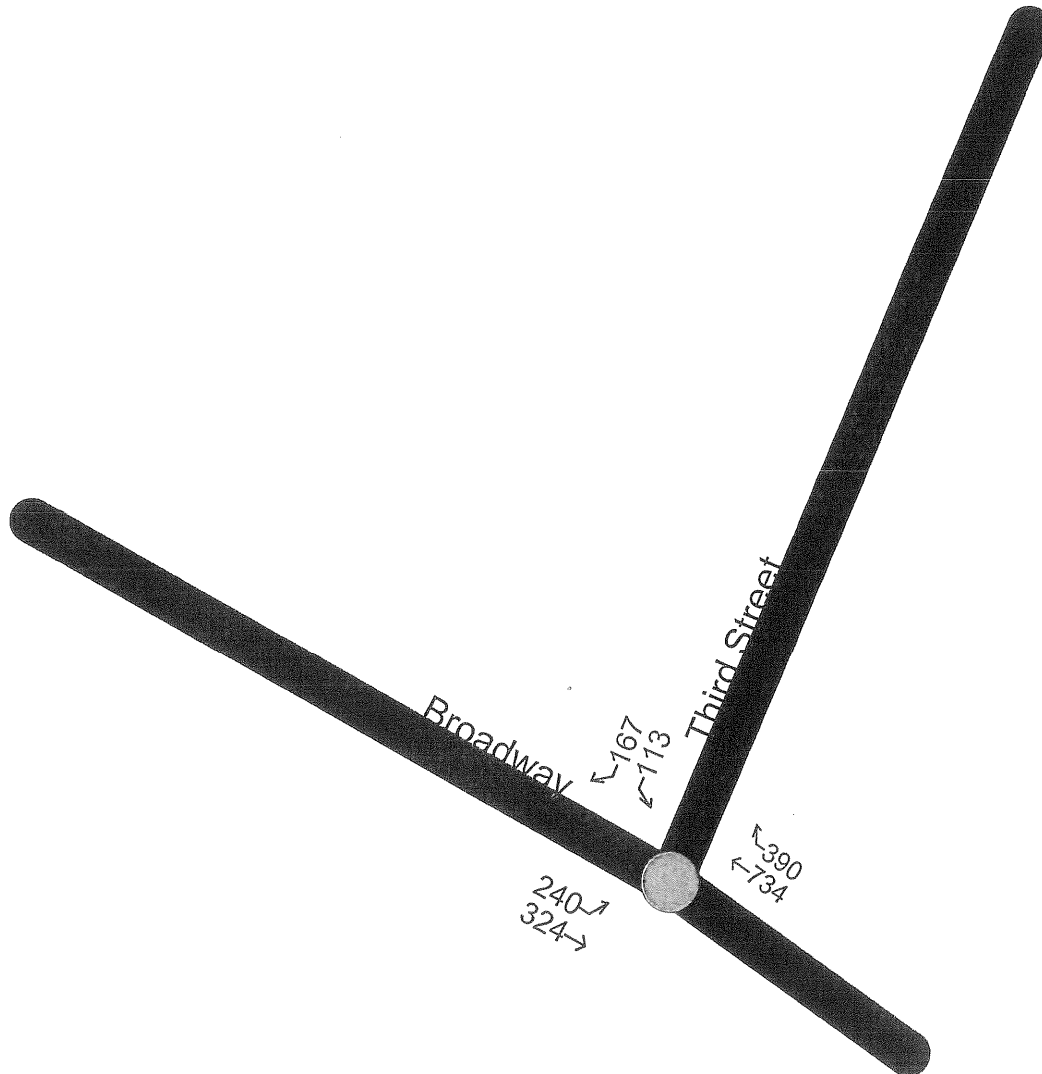
### **Projected 2029 Traffic Volume Analyzed under Proposed Signalized Conditions Control**





CAMBRIDGE  
2029 AM













BROADWAY/THIRD  
7/17/2009



Lanes, Volumes, Timings  
BROADWAY/THIRD

2029 AM PROP

8/27/2009

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325			0	0	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	3.0	3.0	3.0	3.0	3.0	3.0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1770	3539	1863	1583	1770	1583
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1770	3539	1863	1583	1770	1583
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Link Speed (mph)		30	30		30	
Link Distance (ft)		977	393		1212	
Travel Time (s)		22.2	8.9		27.5	
Volume (vph)	240	324	734	390	113	167
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	253	341	773	411	119	176
Lane Group Flow (vph)	253	341	773	411	119	176
Turn Type	Prot			Over		pt+ov
Protected Phases	5	6	6	4	4	4 5
Permitted Phases						
Minimum Split (s)	15.0	21.0	21.0	21.0	21.0	
Total Split (s)	20.0	41.0	41.0	29.0	29.0	49.0
Total Split (%)	22.2%	45.6%	45.6%	32.2%	32.2%	54.4%
Maximum Green (s)	16.0	37.0	37.0	25.0	25.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	
Lead/Lag	Lag	Lead	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Act Effct Green (s)	17.0	38.0	38.0	26.0	26.0	46.0
Actuated g/C Ratio	0.19	0.42	0.42	0.29	0.29	0.51
v/c Ratio	0.76	0.23	0.98	0.90	0.23	0.22
Uniform Delay, d1	34.5	16.6	25.7	30.7	24.4	12.1
Control Delay	50.7	17.1	55.4	55.8	25.9	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	50.7	17.1	55.4	55.8	25.9	13.0
LOS	D	B	E	E	C	B
Approach Delay		31.4	55.6		18.2	
Approach LOS		C	E		B	
Stops (vph)	214	197	622	336	84	87
Fuel Used(gal)	5	5	14	7	2	3
CO Emissions (g/hr)	384	328	977	523	149	175
NOx Emissions (g/hr)	75	64	190	102	29	34
VOC Emissions (g/hr)	89	76	226	121	34	41
Dilemma Vehicles (#)	0	0	0	0	0	0

Lanes, Volumes, Timings  
BROADWAY/THIRD

2029 AM PROP

8/27/2009



Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	137	63	422	224	51	52
Queue Length 95th (ft)	#250	93	#673	#396	95	91
Internal Link Dist (ft)		897	313		1132	
Turn Bay Length (ft)	325					
Base Capacity (vph)	334	1494	787	457	511	809
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.76	0.23	0.98	0.90	0.23	0.22

Intersection Summary

Area Type: Other

Cycle Length: 90

Actuated Cycle Length: 90

Offset: 0 (0%), Referenced to phase 6:EBWB, Start of Green

Natural Cycle: 80

Control Type: Pretimed

Maximum v/c Ratio: 0.98

Intersection Signal Delay: 43.3

Intersection LOS: D

Intersection Capacity Utilization 68.2%

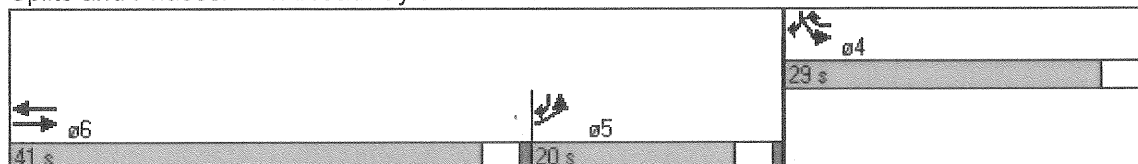
ICU Level of Service C

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.

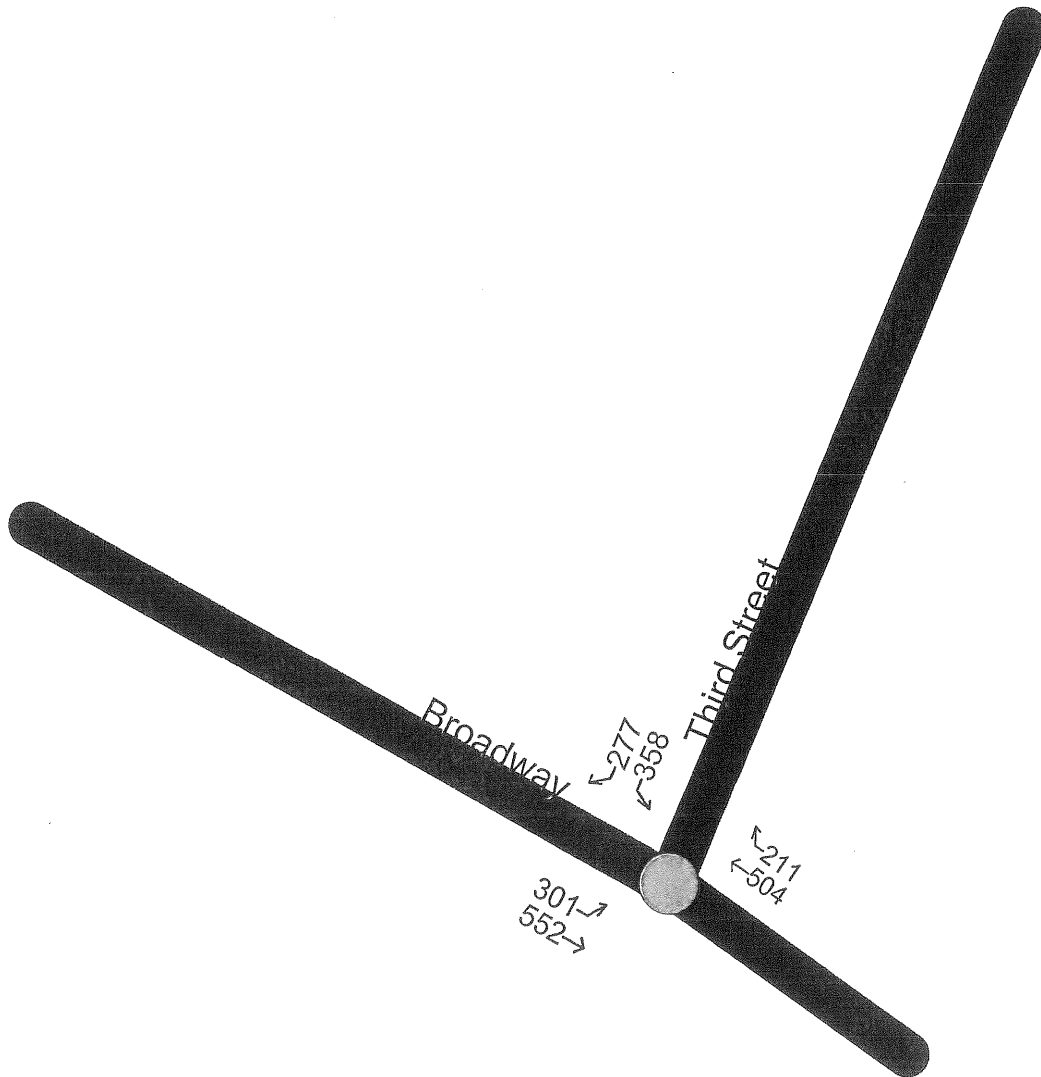
Queue shown is maximum after two cycles.

Splits and Phases: 1: Broadway & Third Street



CAMBRIDGE  
2029 PM

BROADWAY/THIRD  
7/17/2009
















WESTON & SAMPSON

Lanes, Volumes, Timings  
BROADWAY/THIRD

2029 PM PROP

8/26/2009

						
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		 				
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)	325			0	0	0
Storage Lanes	1			1	1	1
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Turning Speed (mph)	15			9	15	9
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00
Frt				0.850		0.850
Flt Protected	0.950				0.950	
Satd. Flow (prot)	1593	3185	1676	1425	1593	1425
Flt Permitted	0.950				0.950	
Satd. Flow (perm)	1593	3185	1676	1425	1593	1425
Right Turn on Red				No		No
Satd. Flow (RTOR)						
Headway Factor	1.14	1.14	1.14	1.14	1.14	1.14
Link Speed (mph)		30	30		30	
Link Distance (ft)		977	393		1212	
Travel Time (s)		22.2	8.9		27.5	
Volume (vph)	301	552	504	211	358	277
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	327	600	548	229	389	301
Lane Group Flow (vph)	327	600	548	229	389	301
Turn Type	Prot			Over		pt+ov
Protected Phases	5	6	6	4	4	4 5
Permitted Phases						
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	
Total Split (s)	26.0	36.0	36.0	28.0	28.0	54.0
Total Split (%)	28.9%	40.0%	40.0%	31.1%	31.1%	60.0%
Maximum Green (s)	21.0	31.0	31.0	23.0	23.0	
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0	
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	
Lead/Lag	Lag	Lead	Lead			
Lead-Lag Optimize?						
Act Effct Green (s)	22.0	32.0	32.0	24.0	24.0	50.0
Actuated g/C Ratio	0.24	0.36	0.36	0.27	0.27	0.56
v/c Ratio	0.84	0.53	0.92	0.60	0.92	0.38
Uniform Delay, d1	32.3	23.0	27.7	28.8	32.0	11.3
Control Delay	53.2	25.1	51.1	36.6	60.8	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	25.1	51.1	36.6	60.8	13.0
LOS	D	C	D	D	E	B
Approach Delay		35.0	46.8		40.0	
Approach LOS		D	D		D	
Stops (vph)	263	423	431	183	307	150
Fuel Used(gal)	7	9	9	3	10	4
CO Emissions (g/hr)	490	655	641	226	665	292
NOx Emissions (g/hr)	95	127	125	44	129	57
VOC Emissions (g/hr)	113	152	149	52	154	68
Dilemma Vehicles (#)	0	0	0	0	0	0

Lanes, Volumes, Timings  
BROADWAY/THIRD

2029 PM PROP  
8/26/2009



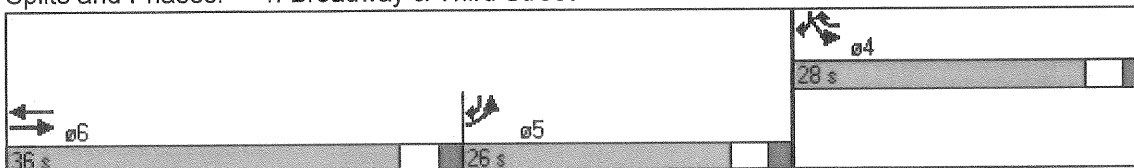
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR
Queue Length 50th (ft)	177	140	294	114	215	90
Queue Length 95th (ft)	#322	193	#496	191	#386	148
Internal Link Dist (ft)		897	313		1132	
Turn Bay Length (ft)	325					
Base Capacity (vph)	389	1132	596	380	425	792
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.84	0.53	0.92	0.60	0.92	0.38

Intersection Summary

Area Type: CBD  
Cycle Length: 90  
Actuated Cycle Length: 90  
Offset: 0 (0%), Referenced to phase 2: and 6:EBWB, Start of Green  
Natural Cycle: 80  
Control Type: Pretimed  
Maximum v/c Ratio: 0.92  
Intersection Signal Delay: 40.3  
Intersection Capacity Utilization 80.0%  
Analysis Period (min) 15  
# 95th percentile volume exceeds capacity, queue may be longer.  
Queue shown is maximum after two cycles.

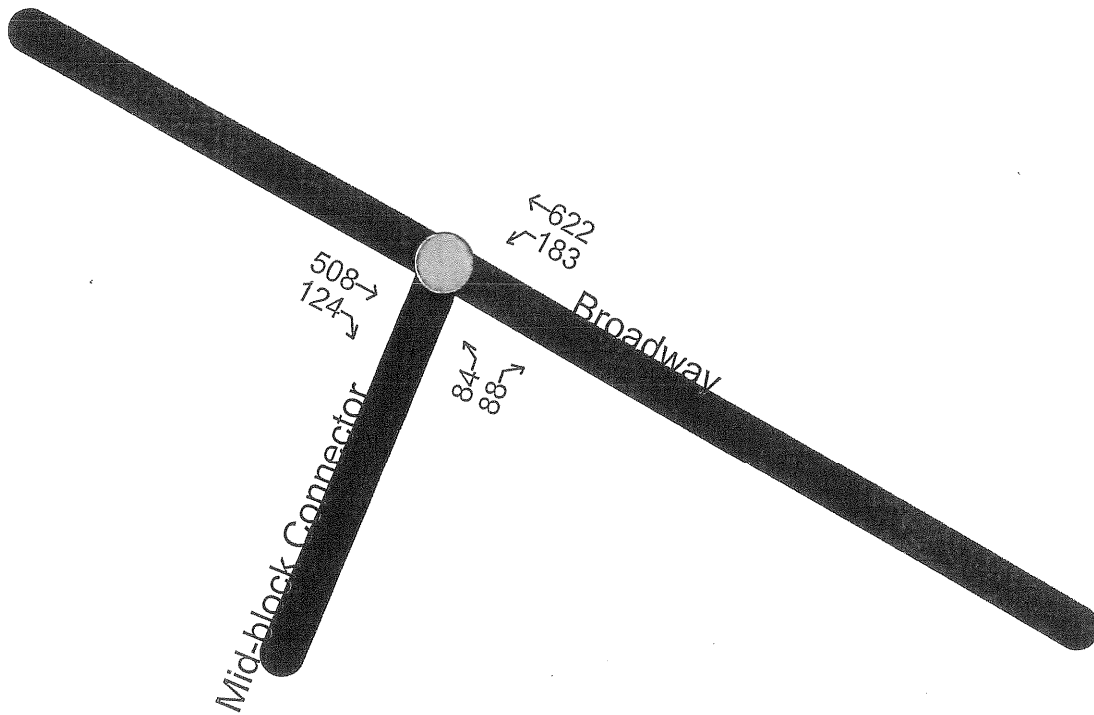
Intersection LOS: D  
ICU Level of Service D

Splits and Phases: 1: Broadway & Third Street



CAMBRIDGE  
2029 AM

BROADWAY/AMES  
7/17/2009





Lanes, Volumes, Timings  
BROADWAY/AMES

2029 AM PROP  
8/26/2009

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑	↗	↙	↑↑	↙	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Frt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1863	1583	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	1863	1583	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		133				96	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	508	124	183	622	84	88	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	552	135	199	676	91	96	
Lane Group Flow (vph)	552	135	199	676	91	96	
Turn Type		Over	Prot			pt+ov	
Protected Phases	2	8	1	6	8	1 8	5
Permitted Phases							
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0		8.5
Total Split (s)	44.0	21.0	25.0	44.0	21.0	46.0	25.0
Total Split (%)	48.9%	23.3%	27.8%	48.9%	23.3%	51.1%	28%
Maximum Green (s)	39.0	16.0	20.0	39.0	16.0		20.5
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0	5.0		5.0	5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0		0	0		
Act Effct Green (s)	40.0	17.0	21.0	40.0	17.0	42.0	
Actuated g/C Ratio	0.44	0.19	0.23	0.44	0.19	0.47	
v/c Ratio	0.67	0.33	0.48	0.43	0.27	0.12	
Uniform Delay, d1	19.7	0.4	29.8	17.2	31.2	0.0	
Control Delay	24.6	8.6	34.4	18.3	33.8	3.4	
Queue Delay	0.0	0.0	0.0	0.2	0.0	0.0	
Total Delay	24.6	8.6	34.4	18.4	33.8	3.4	
LOS	C	A	C	B	C	A	
Approach Delay	21.5			22.1	18.2		
Approach LOS	C			C	B		
Stops (vph)	391	22	154	408	71	10	
Fuel Used(gal)	7	1	3	9	1	0	
CO Emissions (g/hr)	474	68	237	633	93	35	

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	92	13	46	123	18	7	
VOC Emissions (g/hr)	110	16	55	147	22	8	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	240	1	98	134	45	0	
Queue Length 95th (ft)	356	48	165	180	88	25	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	828	407	413	1573	334	790	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	244	0	0	
Reduced v/c Ratio	0.67	0.33	0.48	0.51	0.27	0.12	

#### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.67  
 Intersection Signal Delay: 21.4  
 Intersection Capacity Utilization 51.5%  
 Analysis Period (min) 15

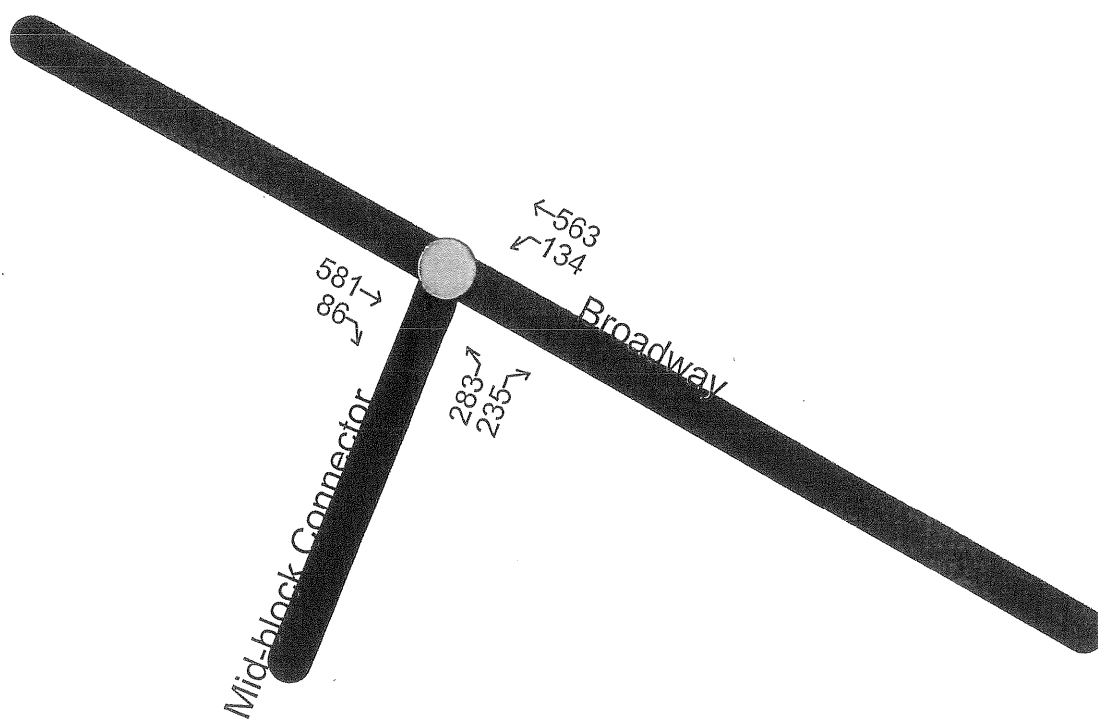
Intersection LOS: C  
 ICU Level of Service A

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↘ ø1	
44 s	25 s	
← ø6	↙ ø5	↗ ø8
44 s	25 s	21 s

CAMBRIDGE  
2029 PM

BROADWAY/AMES  
7/17/2009



Lanes, Volumes, Timings  
BROADWAY/AMES

2029 PM PROP  
8/26/2009

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
Lane Configurations	↑	↗	↖	↑↑	↖	↗	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Storage Length (ft)		0	160		0	0	
Storage Lanes		1	1		1	1	
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	
Turning Speed (mph)		9	15		15	9	
Lane Util. Factor	1.00	1.00	1.00	0.95	1.00	1.00	
Flt		0.850				0.850	
Flt Protected			0.950		0.950		
Satd. Flow (prot)	1863	1583	1770	3539	1770	1583	
Flt Permitted			0.950		0.950		
Satd. Flow (perm)	1863	1583	1770	3539	1770	1583	
Right Turn on Red		Yes				Yes	
Satd. Flow (RTOR)		91				152	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Link Speed (mph)	25			25	30		
Link Distance (ft)	631			977	552		
Travel Time (s)	17.2			26.6	12.5		
Volume (vph)	581	86	134	563	283	235	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	632	93	146	612	308	255	
Lane Group Flow (vph)	632	93	146	612	308	255	
Turn Type		Over	Prot			pt+ov	
Protected Phases	2	8	1	6	8	18	5
Permitted Phases							
Minimum Split (s)	21.0	21.0	9.0	21.0	21.0		8.5
Total Split (s)	42.0	30.0	18.0	42.0	30.0	48.0	18.0
Total Split (%)	46.7%	33.3%	20.0%	46.7%	33.3%	53.3%	20%
Maximum Green (s)	37.0	25.0	13.0	37.0	25.0		13.5
Yellow Time (s)	3.0	3.0	3.0	3.0	3.0		4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0		0.5
Lead/Lag	Lead		Lag	Lead			Lag
Lead-Lag Optimize?	Yes		Yes	Yes			Yes
Walk Time (s)	5.0	5.0		5.0	5.0		
Flash Dont Walk (s)	11.0	11.0		11.0	11.0		
Pedestrian Calls (#/hr)	0	0		0	0		
Act Effct Green (s)	38.0	26.0	14.0	38.0	26.0	44.0	
Actuated g/C Ratio	0.42	0.29	0.16	0.42	0.29	0.49	
v/c Ratio	0.80	0.18	0.53	0.41	0.60	0.30	
Uniform Delay, d1	22.7	0.5	35.0	18.1	27.5	5.1	
Control Delay	32.3	6.7	42.8	19.2	33.4	6.6	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	32.3	6.7	42.8	19.2	33.4	6.6	
LOS	C	A	D	B	C	A	
Approach Delay	29.0			23.8	21.3		
Approach LOS	C			C	C		
Stops (vph)	485	16	122	376	241	57	
Fuel Used(gal)	9	1	3	8	4	2	
CO Emissions (g/hr)	616	45	192	582	313	115	

	→	↘	↙	←	↖	↗	
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	ø5
NOx Emissions (g/hr)	120	9	37	113	61	22	
VOC Emissions (g/hr)	143	10	45	135	73	27	
Dilemma Vehicles (#)	0	0	0	0	0	0	
Queue Length 50th (ft)	305	1	77	124	150	31	
Queue Length 95th (ft)	#472	35	138	168	237	75	
Internal Link Dist (ft)	551			897	472		
Turn Bay Length (ft)			160				
Base Capacity (vph)	787	522	275	1494	511	852	
Starvation Cap Reductn	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	
Reduced v/c Ratio	0.80	0.18	0.53	0.41	0.60	0.30	

#### Intersection Summary

Area Type: Other  
 Cycle Length: 90  
 Actuated Cycle Length: 90  
 Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green  
 Natural Cycle: 60  
 Control Type: Pretimed  
 Maximum v/c Ratio: 0.80  
 Intersection Signal Delay: 24.9  
 Intersection Capacity Utilization 63.7%  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 5: Broadway & Mid-block Connector

→ ø2	↖ ø1	
42 s	18 s	
← ø6	↗ ø5	↘ ø8
42 s	18 s	30 s

## **APPENDIX F**

### **Accident History Data Crash Rate Worksheet**



# MassHighway Crash Report for CAMBRIDGE in the year 2005

Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Number of Injuries	Number of Fatal Injuries	Direction of Collision	Vehicle Travel Direction	Most Harmful Events	Road Surface Condition	Ambient Light	Weather Condition	At Roadway Intersection	Distance from Nearest Roadway Intersection	Distance from Nearest Landmark	Address	X Coordinate	Y Coordinate
13	CAMBRIDGE	16-Jun-2005	9:18 PM	Not Reported	2	2	0	Axle	V1 Eastbound / V2 Southbound	V1: Not reported / V2: Not reported	Snow	Dark - Lighted roadway	Snow	BROADWAY					
13	CAMBRIDGE	24-Jun-2005	6:15 PM	Not Reported	2	0	0	Rear-end	V1 Northbound / V2 Northbound	V1: Collision with motor vehicle in traffic. V2: Collision with motor vehicle in traffic.	Dry	Dark - Lighted roadway	Clear	BROADWAY / THIRD STREET	112 PROSPECT STREET		112 PROSPECT STREET	232776.610260745	502006.571432703
22	CAMBRIDGE	22-Jun-2005	12:00 AM	Not Reported	2	0	0	Unknown	V1 Not reported / V2 Not reported	V1: Collision with parked motor vehicle. V2: Not reported	Snow	Unknown	Snow	BROADWAY / THIRD STREET	222 CHARLES STREET		222 CHARLES STREET	234109.265147745	502040.301500539
15	CAMBRIDGE	03-Jul-2005	10:45 PM	Property damage only from	2	0	0	Not reported	V1 Southbound / V2 Eastbound	V1: Collision with motor vehicle in traffic. V2: Collision with motor vehicle in traffic.	Dry	Dark - Lighted roadway	Clear	THIRD STREET				232589.234335684	501436.312304033
22	CAMBRIDGE	17-Nov-2005	12:30 PM	Property damage only from	3	0	0	Rear-end	V1 Eastbound / V2 Eastbound	Collision with motor vehicle in traffic	Dry	Daylight	Clear	BROADWAY / THIRD STREET			BROADWAY	234238.234185382	501440.31502465



# MISSISSIPPI HIGHWAY

	MassHighway Crash Report for CAMBRIDGE in the year 2006
-----------------------------------------------------------------------------------	---------------------------------------------------------

MASS HIGHWAY MassHighway Crash Report for CAMBRIDGE in the year 2007														
Crash Number	City/Town Name	Crash Date	Crash Time	Crash Severity	Number of Vehicles	Total Injuries	Total Property Damage	Vehicle Action Prior to Crash	Vehicle Travel Direction	Most Harmful Events	Vehicle Configuration	Read Status	Read Status	Read Status
2148105	CAMBRIDGE	22 Jun 2007	8:22 AM	Non-fatal injury	1	0	0	Single vehicle crash	V1 Northbound	V1 Collision with cyclist	V1 Passenger car	Wet	Clear	Wet
2148117	CAMBRIDGE	22 Jun 2007	8:40 AM	Property damage only	3	0	0	V1 Traveling straight ahead / V2 Traveling straight ahead / V3 Traveling straight ahead	V1 Northbound / V2 Northbound / V3 Northbound	V1 Collision with motor vehicle / V2 Collision with motor vehicle / V3 Collision with motor vehicle	V1 Passenger car / V2 Passenger car / V3 Passenger car	Wet	Clear	Wet
2221134	CAMBRIDGE	18 Jun 2007	8:54 AM	Property damage only	2	0	0	V1 Traveling straight ahead / V2 Traveling straight ahead	V1 Southbound / V2 Southbound	V1 Collision with motor vehicle in traffic / V2 Collision with motor vehicle in traffic	V1 Passenger car / V2 Passenger car	Wet	Clear	Wet
2221135	CAMBRIDGE	28 Nov 2007	3:10 PM	Non-fatal injury	2	2	0	Not recorded	V1 Not reported / V2 Not reported	V1 Collision with motor vehicle / V2 Collision with motor vehicle	V1 Passenger car / V2 Passenger car	Wet	Clear	Wet
2222485	CAMBRIDGE	20 Dec 2007	10:00 AM	Not recorded	3	0	0	Not recorded	V1 Not reported / V2 Not reported / V3 Not reported	V1 Collision with motor vehicle / V2 Collision with motor vehicle / V3 Collision with motor vehicle	V1 Passenger car / V2 Passenger car / V3 Passenger car	Wet	Clear	Wet
3141455	BROADWAY	25/07/2007	8:00 AM	Not recorded	11	0	0	Not recorded	V1 Northbound / V2 Northbound / V3 Northbound / V4 Northbound / V5 Northbound / V6 Northbound / V7 Northbound / V8 Northbound / V9 Northbound / V10 Northbound	V1 Collision with motor vehicle / V2 Collision with motor vehicle / V3 Collision with motor vehicle / V4 Collision with motor vehicle / V5 Collision with motor vehicle / V6 Collision with motor vehicle / V7 Collision with motor vehicle / V8 Collision with motor vehicle / V9 Collision with motor vehicle / V10 Collision with motor vehicle	V1 Passenger car / V2 Passenger car / V3 Passenger car / V4 Passenger car / V5 Passenger car / V6 Passenger car / V7 Passenger car / V8 Passenger car / V9 Passenger car / V10 Passenger car	Wet	Clear	Wet
5785455	BROADWAY	6/07/2007	Unknown	Unknown	12	0	0	Not recorded	V1 Northbound / V2 Northbound / V3 Northbound / V4 Northbound / V5 Northbound / V6 Northbound / V7 Northbound / V8 Northbound / V9 Northbound / V10 Northbound	V1 Collision with motor vehicle / V2 Collision with motor vehicle / V3 Collision with motor vehicle / V4 Collision with motor vehicle / V5 Collision with motor vehicle / V6 Collision with motor vehicle / V7 Collision with motor vehicle / V8 Collision with motor vehicle / V9 Collision with motor vehicle / V10 Collision with motor vehicle	V1 Passenger car / V2 Passenger car / V3 Passenger car / V4 Passenger car / V5 Passenger car / V6 Passenger car / V7 Passenger car / V8 Passenger car / V9 Passenger car / V10 Passenger car	Wet	Clear	Wet
5854455	BROADWAY	10/07/2007	Unknown	Unknown	8	0	0	Not recorded	V1 Northbound / V2 Northbound / V3 Northbound / V4 Northbound / V5 Northbound / V6 Northbound / V7 Northbound / V8 Northbound / V9 Northbound / V10 Northbound	V1 Collision with motor vehicle / V2 Collision with motor vehicle / V3 Collision with motor vehicle / V4 Collision with motor vehicle / V5 Collision with motor vehicle / V6 Collision with motor vehicle / V7 Collision with motor vehicle / V8 Collision with motor vehicle / V9 Collision with motor vehicle / V10 Collision with motor vehicle	V1 Passenger car / V2 Passenger car / V3 Passenger car / V4 Passenger car / V5 Passenger car / V6 Passenger car / V7 Passenger car / V8 Passenger car / V9 Passenger car / V10 Passenger car	Wet	Clear	Wet

